



Installation, use and maintenance manual

M

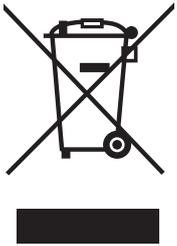
Gas unit heaters for use in industrial and commercial installations

Powered by natural gas/LPG



DISPOSAL

The appliance and all its accessories must be disposed of separately in accordance with the regulations in force.



Use of the WEEE symbol (Waste Electrical and Electronic Equipment) indicates that this product cannot be disposed of as household waste. Proper disposal of this product helps to prevent potential negative consequences for the environment and human health.

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I INTRODUCTION

Installation, use and maintenance manual

This Manual is an integral part of the M unit and must be handed to the end user together with the appliance.

I.1 RECIPIENTS

This Manual is intended for:

- ▶ End user, for appropriate and safe use of the appliance.
- ▶ Qualified installer, for correct appliance installation.
- ▶ Planner, for specific information on the appliance.

I.2 CONTROL DEVICE

In order to work, the M unit requires a control device to be connected by the installer (see Paragraph 1.4 p. 11).

II SYMBOLS AND DEFINITIONS

II.1 KEY TO SYMBOLS



DANGER



WARNING



NOTE



PROCEDURE



REFERENCE (to other document)

III WARNINGS

III.1 GENERAL AND SAFETY WARNINGS

Installer's qualifications

Installation must exclusively be performed by a qualified firm and by skilled personnel, with specific knowledge on heating, electrical systems and gas appliances, in compliance with the laws in force in the Country of installation.

Declaration of conformity

Upon completing installation, the installing firm shall issue to the owner/client the appliance's workmanlike conformity declaration, according to national/local regulations in force and the manufacturer's instructions/provisions.



Misuse

The appliance must only be used for the purposes for which it has been designed. Any other use is deemed hazardous. Incorrect use may affect operation, duration and safety of the appliance. Adhere to the manufacturer's instructions.

II.2 TERMS AND DEFINITIONS

Appliance / Unit = equivalent terms, both used to refer to the gas unit heater.

TAC = Technical Assistance Centre authorised by Robur.

External request = generic control device (e.g. thermostat, timer or any other system) equipped with a voltage-free NO contact and used as control to start/stop the unit.

Chronothermostat = control device that integrates the functions of room thermostat and clock programmer.

First start-up = appliance commissioning operation which may only and exclusively be carried out by a TAC.

Use of the appliance by children

The device can be used by children over 8 years old, and by people with reduced physical, sensory or mental capabilities, or lack of experience or knowledge, only if they are under surveillance or after they have received instructions regarding safe use of the appliance and understanding the dangers inherent in it. Children should not play with the appliance.



Hazardous situations

- Do not start the appliance in hazardous conditions, such as: gas smell, problems with the electrical/gas system, parts of the appliance under water or damaged, malfunctioning, disabling or bypassing control and safety devices.
- In case of danger, request intervention by qualified personnel.
- In case of danger, switch off the electrical power and gas supplies only if this can be done in total safety.
- Do not entrust children, persons with physical, sensory or mental disabilities or persons with poor knowledge and experience with use of the

appliance.



Gas component tightness

- Before performing any operation on gas ducting components, close the gas valve.
- Upon completing any procedure, perform the tightness test according to regulations in force.



Gas smell

If you smell gas:

- Do not use electrical devices such as telephones, multimeters or other equipment that may cause sparks next to the appliance.
- Shut off the gas supply by turning the valve off.
- Open immediately doors and windows to create a cross-current of air to purify the room.
- Switch off the power supply via the external disconnect switch in the power supply electrical panel.
- Use a telephone away from the appliance to ask for intervention from qualified personnel.



Poisoning

- Ensure the flue gas ducts are tightness and compliant with the regulations in force.
- Upon completing any procedure, ensure the tightness of the components.



Moving parts

The appliance contains moving parts.

- Do not remove guards during operation, and in any case prior to disconnecting the power supply.



Burn hazard

The appliance contains very hot parts.

- Do not open the appliance and do not touch internal components before the appliance has cooled down.
- Do not touch the flue gas exhaust before it has cooled down.



Electrocution hazard

- Disconnect the electrical power supply before any operation on appliance components.
- For electrical connections exclusively use compliant components and according to the specifications provided by the manufacturer.
- Ensure the appliance cannot be accidentally switched back on.



Earthing

Electrical safety depends on an effective earthing system, correctly connected to the appliance and carried out in accordance with the regulations in force. Do not use gas pipes to ground electrical

equipment.



Air flow

Do not obstruct the fan intake or the warm air outlet.



Distance from combustible or flammable materials

- Do not deposit flammable materials (paper, diluents, paints, etc.) near the appliance.
- Comply with current regulations.



Aggressive substances in the air

The air of the installation site must be free from aggressive substances.



Acid flue gas condensate

- Discharge the acid condensate of combustion flue gas, as indicated in Paragraph 3.3.4 p. 20, in compliance with current exhaust regulations.



Switching the appliance off

Disconnecting the power supply while the appliance is running may cause permanent damage to internal components.

- Except in the event of danger, do not disconnect the power supply to switch off the appliance, but always and exclusively act through the provided control device.



In the event of failure

Operations on internal components and repairs may exclusively be carried out by a TAC, using only original parts.

- In the event of failure of the appliance and/or breakage of any component, do not attempt to repair and/or restore and immediately contact the TAC.



Routine maintenance

Proper maintenance assures the efficiency and good operation of the appliance over time.

- Maintenance must be performed according to the manufacturer's instructions (see Chapter 7 p. 31) and in compliance with current regulations.
- Appliance maintenance and repairs may only be entrusted to firms legally authorised to work on gas appliances and systems.
- Enter into a maintenance contract with an authorised specialised firm for routine maintenance and for servicing in case of need.
- Use only original parts.



Keep the Manual

This Installation, use and maintenance manual must always accompany the appliance and must be handed to the new owner or installer in the event of sale or removal.

- ▶ Environmental protection and combustion products exhaust.
- ▶ Fire safety and prevention.
- ▶ Any other applicable law, standard and regulation.

III.2 CONFORMITY

EU directives and standards

The M series gas unit heaters meet the essential requirements of the following Directives:

- ▶ 2014/30/EC "Electromagnetic Compatibility Directive" as amended and added.
- ▶ 2014/35/EC "Low Voltage Directive" as amended and added.
- ▶ 2006/42/EC "Machine Directive" as amended and added.

Furthermore, they comply with the requirements of the following standards:

- ▶ EN 1020 Non-domestic forced convection gas-fired air heaters for space heating not exceeding a net heat input of 300 kW incorporating a fan to assist transportation of combustion air or combustion products.
- ▶ prEN 17082 Domestic and non-domestic gas-fired forced convection air heaters for space heating not exceeding a net heat input of 300 kW.

Other applicable provisions and standards

The design, installation, operation and maintenance of the systems shall be carried out in compliance with current applicable regulations, depending on the Country and location, and in accordance with the manufacturer's instructions. In particular, regulations regarding the following shall be complied with:

- ▶ Gas systems and equipment.
- ▶ Electrical systems and equipment.
- ▶ Heating systems.

III.3 EXCLUSIONS OF LIABILITY AND WARRANTY



Any contractual or extra-contractual liability of the manufacturer for any damage caused by incorrect installation and/or improper use and/or failure to comply with regulations and with the manufacturer's directions/instructions shall be disclaimed.



In particular, the warranty on the appliance may be rendered void by the following conditions:

- Incorrect installation.
- Misuse.
- Failure to comply with the manufacturer's indications on installation, use and maintenance.
- Alteration or modification of the product or any part thereof.
- Extreme operational conditions or however outside of the operational ranges set forth by the manufacturer.
- Damages caused by external agents such as salts, chlorine, sulphur or other chemical substances present in the air of the installation site.
- Abnormal actions transmitted to the appliance by the system or installation (mechanical stresses, pressure, vibrations, thermal expansion, electrical surges...).
- Accidental damages or due to force majeure.

1 FEATURES AND TECHNICAL DATA

1.1 FEATURES

1.1.1 Available range

M gas unit heater gas unit heaters are available in two versions:

- ▶ with horizontal flow, with axial fan (M gas unit heater series)
- ▶ with horizontal flow, ductables, with centrifugal fan (M gas unit heater C series)

1.1.2 Operation

The M series gas unit heater is an independent heating appliance with airtight combustion circuit and forced air draft.

It has been designed to be installed inside the room to be heated.

The combustion circuit is room sealed and meets the requirements for type C appliances: combustion air supply and flue gas exhaust discharge take place outdoors and are ensured by the functioning of an extractor fan inserted in the combustion circuit.

The appliance is also approved for type B for installations where it is allowed to take the combustion air directly from the room to be heated.

The operation of the gas unit heater is controlled by a control device (not supplied).

The generator works on/off, on or off, at the heat output and the ventilation speed of the license plate.

Products of gas combustion (natural gas or LPG) flow internally through the heat exchangers, which are invested externally by the air current produced by the fan, delivering warm air flow into the room.

The fan operates automatically only when it receives the enabling signal from the fan thermostat, i.e. with hot heat exchangers, in order to avoid the introduction of cold air into the room, and it will switch off with cold exchangers. The air flow direction is adjustable vertically by means of the revolving louvres of the grille.

A 'vertical louvres kit' is also available on request for horizontal regulation of the airflow.

If heat exchangers overheat due to malfunction, a temperature limit thermostat cuts off the supply to the gas valve,

thus interrupting fuel flow and turning off the burner.

In case of obstruction of the suction or exhaust duct, or in case of malfunction of the extractor fan, the differential pressure switch intervenes, causing the gas valve to stop and the heater to switch off.

The winter operation of the gas unit heater can be automatic or manual.

In summer it is possible to operate the fan only in order to provide a pleasant air flow within the room.

1.1.3 Mechanical components

- ▶ Stainless steel atmospheric burner.
- ▶ Flue gas extractor for forced draft of combustion products.
- ▶ Cylindrical stainless steel combustion chamber.
- ▶ Robur patented heat exchangers, made out of a special aluminium die-cast alloy, with horizontal finning on the air side and vertical finning on the flue gas exhaust side, with a very high heat exchange capacity.
- ▶ External steel panelling with epoxy powder enamel finish.
- ▶ External panels made of stainless steel (available on request).
- ▶ Axial fan(s) with high flow rate.
- ▶ Centrifugal fan (for the M gas unit heater C series).
- ▶ Flange for duct connection (for series M gas unit heater C).
- ▶ Ground control with lock signal and reset button.

1.1.4 Control and safety devices

- ▶ Electronic control unit, which provides the following functions:
 - burner ignition
 - flame monitoring
- ▶ 100 °C limit thermostat with manual reset against heat exchangers overheating.
- ▶ Thermostat to protect the internal components from overheating, with manual reset.
- ▶ Differential pressure switch.
- ▶ Fan thermostat.
- ▶ Gas solenoid valve.

1.2 DIMENSIONS

Figure 1.1 M series generators size

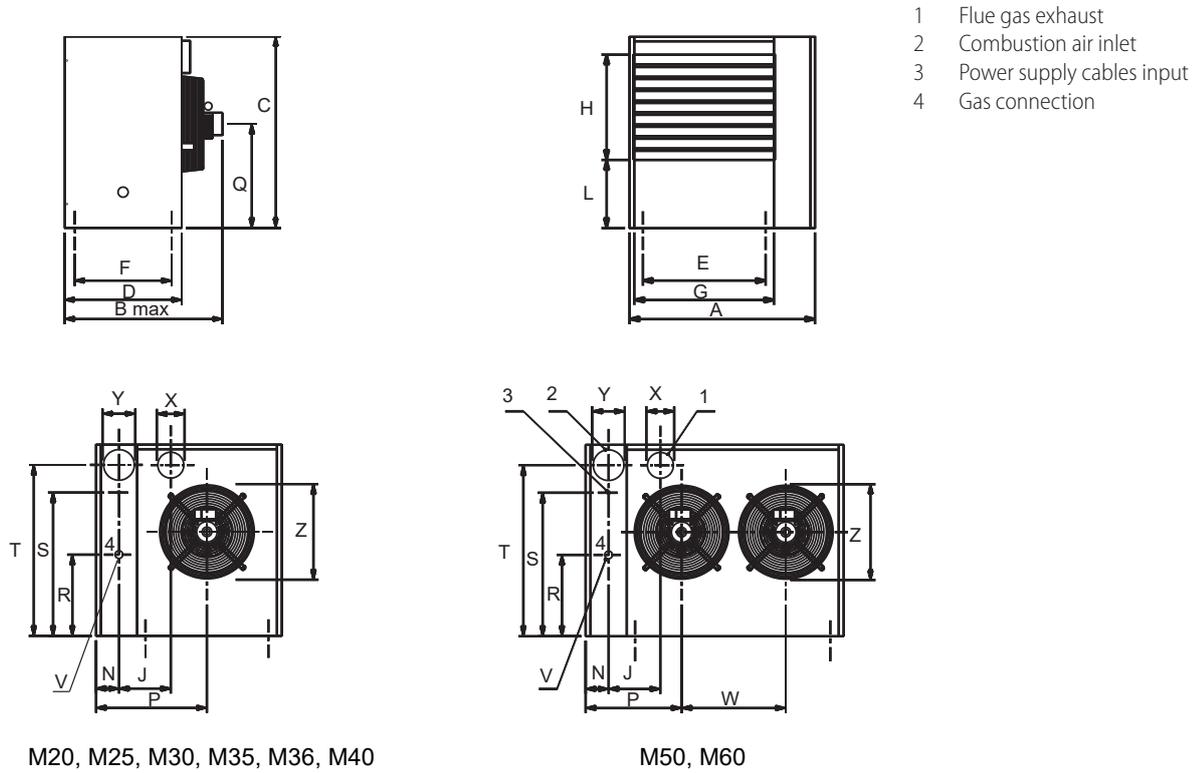


Figure 1.2 M C series generators size

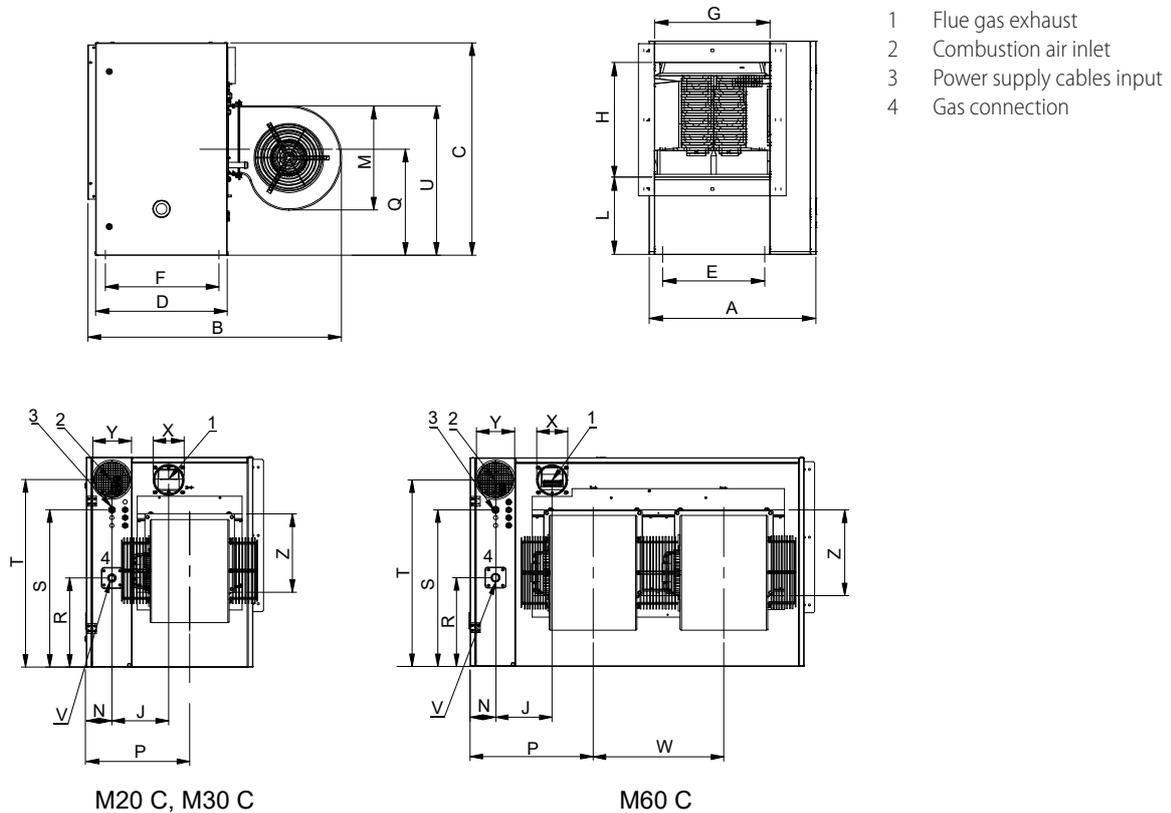
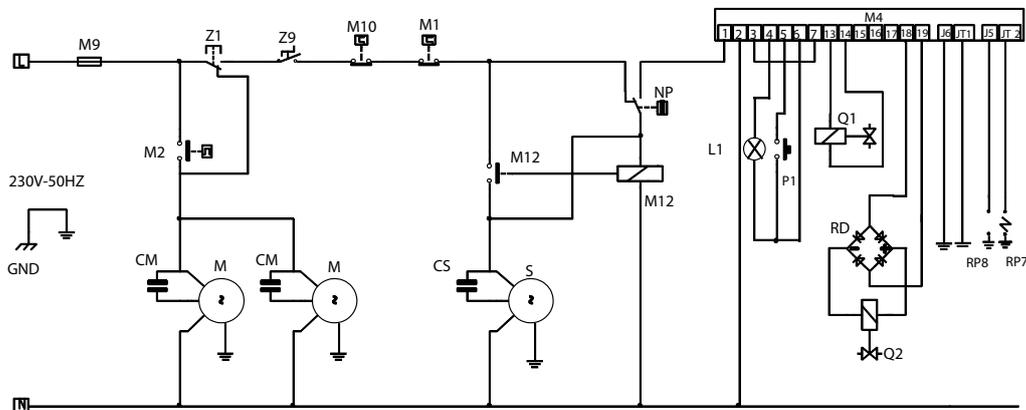


Table 1.1 Dimensions

	M20	M20 C	M25	M30	M30 C	M35 /M36	M40	M50	M60	M60 C
A	630	630	630	770	770	880	880	1070	1270	1270
B	631	947	590	624	988	624	643	590	624	988
C	800	800	800	800	800	800	800	800	800	800
D	490	490	490	490	490	490	490	490	490	490
E	370	370	370	510	510	620	620	810	1010	1010
F	405	405	405	405	405	405	405	405	405	405
G	440	438	440	580	578	690	690	880	1080	1078
H	430	431	430	430	431	430	430	430	430	431
J	215	215	215	215	215	215	215	215	215	215
L	285	284	285	285	284	285	285	285	285	284
M	-	393	-	-	393	-	-	-	-	393
N	95	95	95	95	95	95	95	95	95	95
P	390	390	390	460	460	515	515	398	468	468
Q	435	435	435	435	435	435	435	435	435	435
R	340	340	340	340	340	340	340	340	340	340
S	600	600	600	600	600	600	600	600	600	600
T	715	715	715	715	715	715	715	715	715	715
U	-	563	-	-	580	-	-	-	-	580
V	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	3/4"	3/4"	3/4"	3/4"
W	-	-	-	-	-	-	-	432	495	495
X	113	113	113	113	113	113	113	113	113	113
Y	133	133	133	133	133	133	133	133	133	133
Z	355	300	355	410	324	410	410	355	410	324

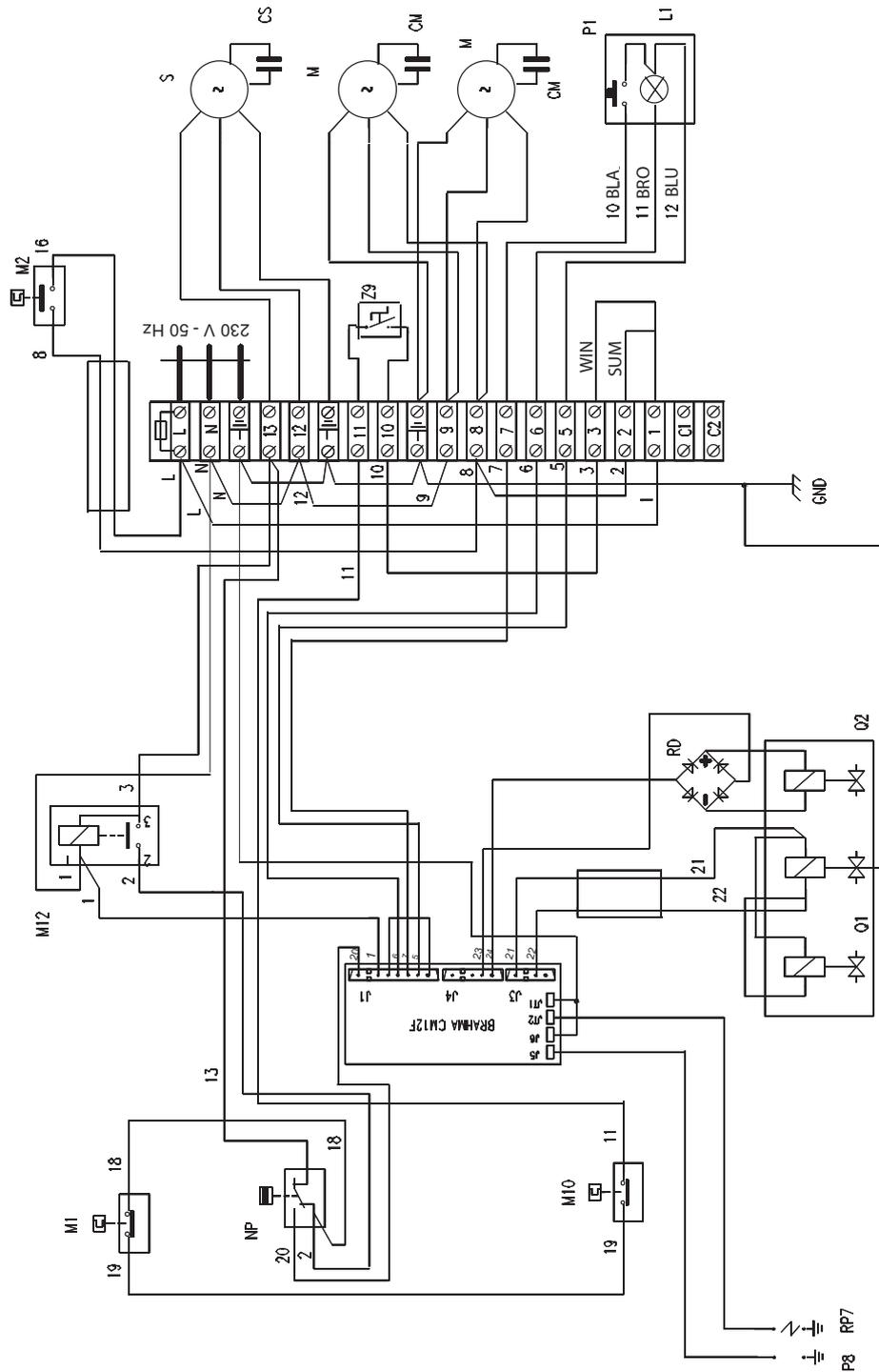
1.3 ELECTRICAL WIRING DIAGRAM

Figure 1.3 Operating wiring diagram



CM	Fan condenser	NP	Differential pressure switch
CS	Extractor fan condenser	P1	Reset button
L1	Lockout lamp	Q1	Gas electrovalve
M	Fan motor (2 motors for M50 and M60 models)	Q2	Soft opening coil (for M50 and M60 models)
M1	Limit thermostat	RD	Rectifier bridge (for M50 and M60 models)
M10	Internal component protection thermostat	RP7	Ignition electrode
M12	Pressure switch control relay	RP8	Detection electrode
M2	Fan thermostat	S	Extractor fan motor
M4	Controller for ignition, adjustment and flame control	Z1	Summer/winter diverter (not supplied)
M9	Fuse 4,0 A	Z9	External request (not supplied)

Figure 1.5 Mounting electrical diagram for M50/M60 units



(see legend Figure 1.3 p. 9)

BLA Black
BRO Brown

BLU Blue
WIN Winter
SUM Summer

1.4 CONTROLS

1.4.1 Control device

The appliance may only work if it is connected to a control device, selected from:

1. 1 button basic control OCDS012 (supplied)
2. OCTR000 2-key basic control
3. OTRG005 thermoregulator
4. OCDS008 digital chronothermostat (in association with OTRG005 thermoregulator)
5. OSWR000 Genius software for remote management

of gas unit heaters (in association with OTRG005 thermoregulator)

6. External request

1.4.2 OCDS012 1-key basic control

Figure 1.6 OCDS012 1-key basic control



OCDS012 1-key basic control signals the flame lockout and allows its resetting.

It does not allow to control the switching on and off of the unit for space heating, nor for the summer ventilation. Its functions are:

- ▶ Light signalling the status of the flame lockout.
- ▶ Reset of the flame lockout.

For further details and diagrams see Paragraph 4.4.1 p. 24.

1.4.3 OCTR000 2-key basic control

Figure 1.7 OCTR000 2-key basic control



OCTR000 2-key basic control signals the flame lockout and allows its resetting. In addition, it allows activating the summer ventilation mode.

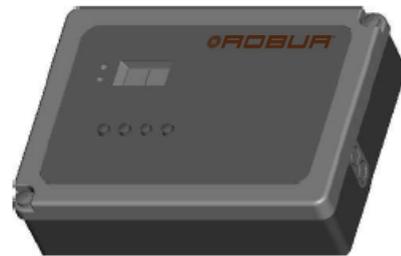
It does not allow to control the switching on and off of the unit for space heating.

Its functions are:

- ▶ Light signalling the status of the flame lockout.
- ▶ Reset of the flame lockout.
- ▶ Summer ventilation mode activation.

1.4.4 OTRG005 thermoregulator

Figure 1.8 OTRG005 thermoregulator



The thermoregulator is a device that can directly manage gas unit heaters: the simple and intuitive display interface allows the user to change the control parameters, manage the power on/off and change the operating mode (heating or summer ventilation); a serial interface also allows to create cascading systems managed by a single chronothermostat (optional OCDS008, described in Paragraph 1.4.5 p. 12), with considerable advantages in terms of temperature control, especially in large spaces.

The main functions are:

- ▶ Turning the gas unit heater on/off.
- ▶ Ambient temperature measurement by NTC probe.
- ▶ Diagnostics.
- ▶ Reset of the flame lockout.
- ▶ Gas unit heater data display and parameters setting.
- ▶ Space heating and summer ventilation setpoint setting.
- ▶ Summer ventilation mode activation.
- ▶ Possibility of creating cascaded systems.
- ▶ Modbus interfacing for remote control.

For further details and diagrams see the OTRG005 temperature controller instruction sheet.

1.4.5 OCDS008 digital chronothermostat

Figure 1.9 OCDS008 digital chronothermostat



OCDS008 digital chronothermostat integrates the functions of room temperature control and remote control of the gas unit heaters heating system in a single interface, specifically designed to make all functions available to the user in a clear and intuitive way.

It may be used only in association with the OTRG005 thermoregulator.

The remote control of the heating system allows managing the operational parameters of more than one gas unit heater with the relative control boards connected in

cascade and also resetting any locking.

The weekly programming includes 3 adjustable temperature levels and daily times slots.

The main functions are:

- ▶ Multilingual interface.
- ▶ Gas unit heaters cascade system management (up to 10).
- ▶ Hourly programming on a weekly basis on 3 temperature levels.
- ▶ Diagnostics.
- ▶ Reset.
- ▶ Gas unit heater data display and parameters setting.
- ▶ Space heating and summer ventilation setpoint setting.
- ▶ Summer ventilation mode activation.

For further details and diagrams see the instruction sheet of the digital chronothermostat OCDS008.

1.4.6 OSWR000 Genius software for remote management of gas unit heaters

This is a software that allows, through the OTRG005 thermostats, to centralize the management of up to 100 gas unit heaters, allowing them to be freely divided into zones, for an even more personalized heating management.

If the PC on which the software is installed is accessible remotely, the software allows remote management of the whole heating system from multiple devices, as well as sending emails to report any anomalies to the gas unit heaters or to the heating system.

The main functions are:

- ▶ Centralized system to control up to 100 gas unit heaters.
- ▶ Division of gas unit heaters into zones, up to 10

different zones.

- ▶ Independent or centralized gas unit heaters control.
- ▶ Remote control of the system from multiple devices.
- ▶ Diagnostics, also by email.
- ▶ Reset.
- ▶ Gas unit heater data display and parameters setting.
- ▶ Space heating and summer ventilation setpoint setting.
- ▶ Summer ventilation mode activation.

For further details and diagrams see the Genius software instruction sheet for remote control of the OSWR000 generators.

1.4.7 External request

The appliance may also be controlled via generic enable devices (e.g. thermostat, timer, switch, contactor...) fitted with voltage-free NO contact.

For managing the request signal (Z9 contact), Robur provides as optional different models of thermostats and chronothermostats.

For a list of thermostats and chronothermostats available as optional, see Paragraph 1.4.8 p. 13.

For further details and diagrams see Paragraph 4.4.2 p. 24.

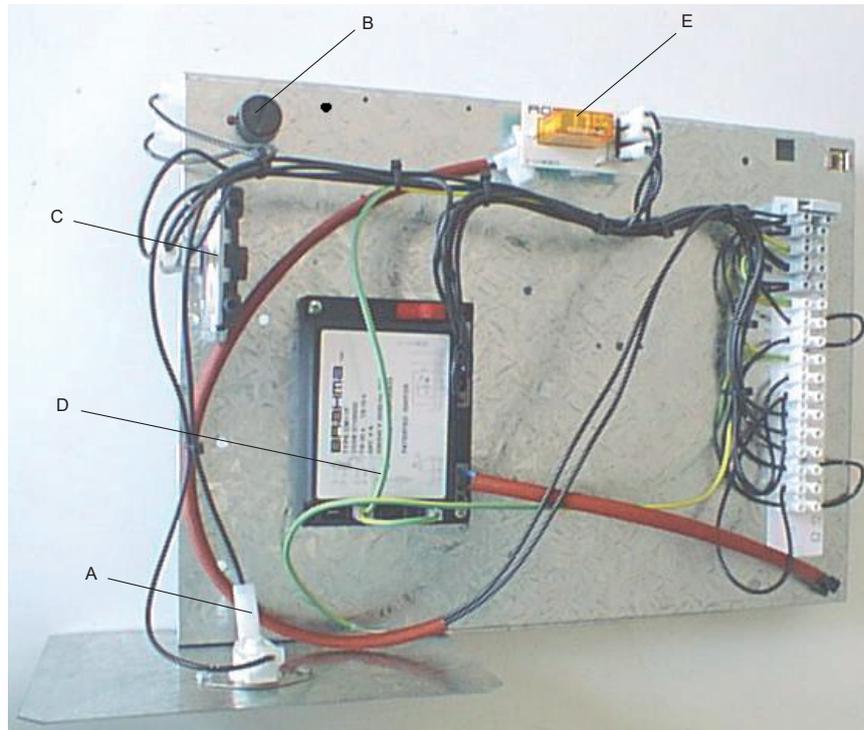
1.4.8 Other optional thermostats and chronothermostats

For managing the request signal (Z9 contact), Robur provides as optional different models of thermostats and chronothermostats, listed below.

- ▶ Room thermostat with ON/OFF switch (optional O12301035)
- ▶ Sealed room thermostat IP55 (optional O12301025)
- ▶ Digital programmable chronothermostat (optional OCDS005)

1.5 ELECTRICAL PANEL

Figure 1.10 Electrical panel



- A Internal components protection thermostat
- B Limit thermostat
- C Differential pressure switch
- D Controller for ignition, adjustment and flame control
- E Pressure switch control relay

1.6 TECHNICAL DATA

Table 1.2 Technical data

Axial fan models

			M20	M25	M30	M35	M36	M40	M50	M60
Heating mode										
Heat input	nominal (1013 mbar - 15 °C) (1)	kW	20,6	28,8	34,8	42,2	39,4	48,2	57,3	72,5
Heat output	nominal	kW	18,3	25,5	30,7	37,4	34,9	42,5	50,7	63,8
Efficiency	nominal heat input	%	88,8	88,5	88,2	88,6	88,5	88,2	88,5	88,0
	useful at 100% heat input	%	88,5	88,2	87,9	88,3	88,2	87,8	88,0	87,5
Heat losses	to flue in operation	%	11,20	11,50	11,80	11,40	11,50	11,80	11,50	12,00
	to casing in operation	%	0,30					0,40	0,50	
	with burner off	%	0,25							
Temperature rise	nominal heat input	K	20,5	29,4	23,8	28,6	26,6	27,8	29,8	27,3
length of throw (residual speed < 0,5 m/s) (2)		m	12,0	15,0	18,0	20,0		21,0	23,0	25,0
Ambient air temperature (dry bulb)	maximum	°C	35							
	minimum	°C	0							
Electrical specifications										
Power supply	voltage	V	230							
	type	-	single-phase							
	frequency	Hz	50							
Electrical power absorption	nominal	kW	0,25	0,24	0,34		0,40	0,50	0,61	
fuse		A	4,0							
Degree of protection	fan motor	IP	42	44	54		44		54	
	appliance	IP	20							

(1) Relative to NCV (net calorific value).

(2) 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).

			M20	M25	M30	M35	M36	M40	M50	M60
Installation data										
Gas consumption	G20 natural gas (nominal)	m ³ /h	2,18	3,05	3,68	4,47	4,17	5,10	6,06	7,67
	G25 (nominal)	m ³ /h	2,54	3,54	4,28	5,19	4,85	5,93	7,05	8,92
	G25.1 (nominal)	m ³ /h	2,53	3,54	4,28	5,19	4,84	5,92	7,04	8,91
	G25.3 (nominal)	m ³ /h	2,48	3,47	4,19	5,08	4,74	5,80	6,89	8,72
	G27 (nominal)	m ³ /h	2,66	3,72	4,49	5,45	5,09	6,22	7,40	9,36
	G2.350 (nominal)	m ³ /h	3,03	4,23	5,12	6,20	5,79	7,09	8,42	10,66
	G30 (nominal)	kg/h	1,63	2,27	2,74	3,33	3,11	3,80	4,52	5,72
	G31 (nominal)	kg/h	1,60	2,24	2,70	3,28	3,06	3,75	4,45	5,63
Air flow	nominal	m ³ /h	2630	2550	3800	3850		4500	5000	6875
Gas connection	type	-	M							
	thread	"	1/2						3/4	
Flue gas exhaust	diameter (Ø)	mm	110							
	residual head	Pa	40	30	35	42		30	27	69
	type of installation	-	B22, C12, C32, C62							
Combustion air intake connection	diameter (Ø)	mm	130							
recommended height		m	2,5	2,5 ÷ 3,0	3,0 ÷ 3,5					
sound power L_w (max)		dB(A)	67,5	70,5	72,5	72,0		74,5	71,5	76,5
sound pressure L_p at 5 metres (max)		dB(A)	45,5	48,5	50,5	50,0		52,5	49,5	54,5
Dimensions	width	mm	630		770	880			1070	1270
	depth	mm	631	590	624			643	590	624
	height	mm	800							
Weight	in operation	kg	55	59	68	80		90		108

(1) Relative to NCV (net calorific value).

(2) 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).

Centrifugal fan models

			M20 C	M30 C	M60 C	
Heating mode						
Temperature rise	nominal heat input		K	19,2	22,6	23,5
Electrical specifications						
Electrical power absorption	nominal		kW	0,41	0,75	1,30
fuse			A	6,3		
Installation data						
Air flow	at maximum available head		m ³ /h	1900	3100	6400
	free blowing		m ³ /h	2800	4000	8000
maximum useful pressure head			Pa	110		
minimum pressure drop on heat flow delivery			Pa	0	50	30
sound power L_w (max)			dB(A)	74,0	78,0	81,0
sound pressure L_p at 5 metres (max)			dB(A)	52,0	56,0	59,0
Dimensions	width		mm	632	772	1272
	depth		mm	948	992	
	height		mm	800		
Weight	in operation		kg	66	82	133



The M36 model is only available for the French market.

2 TRANSPORT AND POSITIONING

2.1 WARNINGS



Damage from transport or installation

The manufacturer shall not be liable for any damage during appliance transport and installation.



On-site inspection

- Upon arrival at the site, ensure there is no transport damage on packing or metal panels.
- After removing the packing materials, ensure the appliance is intact and complete.



Packing

- Only remove the packing after placing the appliance on site.
- Do not leave parts of the packing within the reach of children (plastic, polystyrene, nails...) since they are potentially dangerous.



Weight

- The lifting equipment must be suitable for the load.
- Lift up the unit and secure it to its support bracket (Paragraph 2.5 p. 17).

2.2 HANDLING

2.2.1 Handling and lifting

- ▶ Always handle the appliance in its packing, as delivered by the factory.
- ▶ Comply with safety regulations at the installation site.

2.3 APPLIANCE POSITIONING

The unit must be installed in the room to be heated.

2.3.1 Where to install the appliance



The wall or structure on which the unit is to be

installed must be load-bearing or, in any case, suitable for supporting its weight.



Installation must not be made on walls with poor strength that do not guarantee adequate resistance to the stresses produced by the unit. The manufacturer does not assume any responsibility if the appliance is installed on surfaces or walls that are not suitable for supporting its weight.

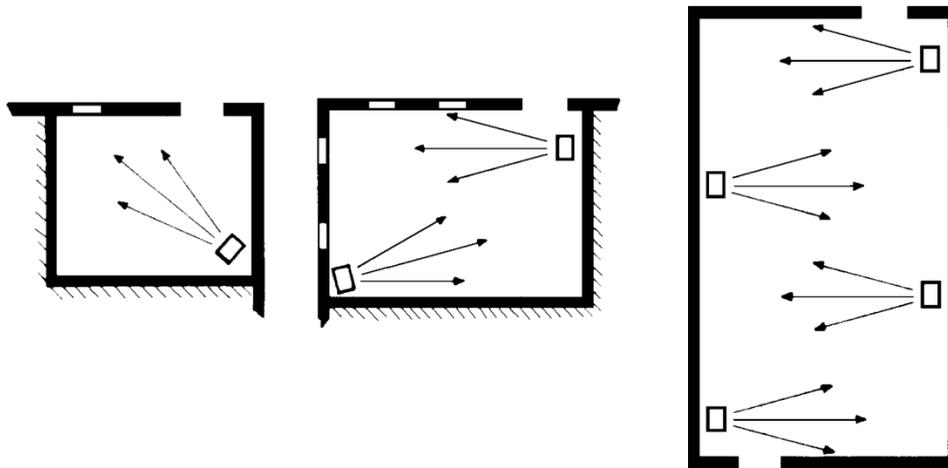


The appliance's flue gas exhaust must not be immediately close to openings or air intakes of buildings, and must comply with safety and environmental regulations.

To obtain the maximum system efficiency it is advisable to comply with the following rules:

- ▶ Make sure that the air flow does not directly impinge on the staff (by tilting the grille louveres appropriately).
- ▶ Take any obstacles into account (pillars or other).
- ▶ Consider length of throw of the unit (Table 1.2 p. 14).
- ▶ For better heat distribution in the case of multiple unit installations, create alternate flows of warm air (see Figure 2.1 p. 16).
- ▶ In some cases it may also be suitable to place the units close to the main doors, so that they can also operate as air barriers when doors are opened.

Figure 2.1 Airflow distribution



2.4 MINIMUM CLEARANCE DISTANCES

2.4.1 Distances from combustible or flammable materials

- ▶ Keep the appliance away from combustible or flammable materials or components, in compliance with applicable regulations.

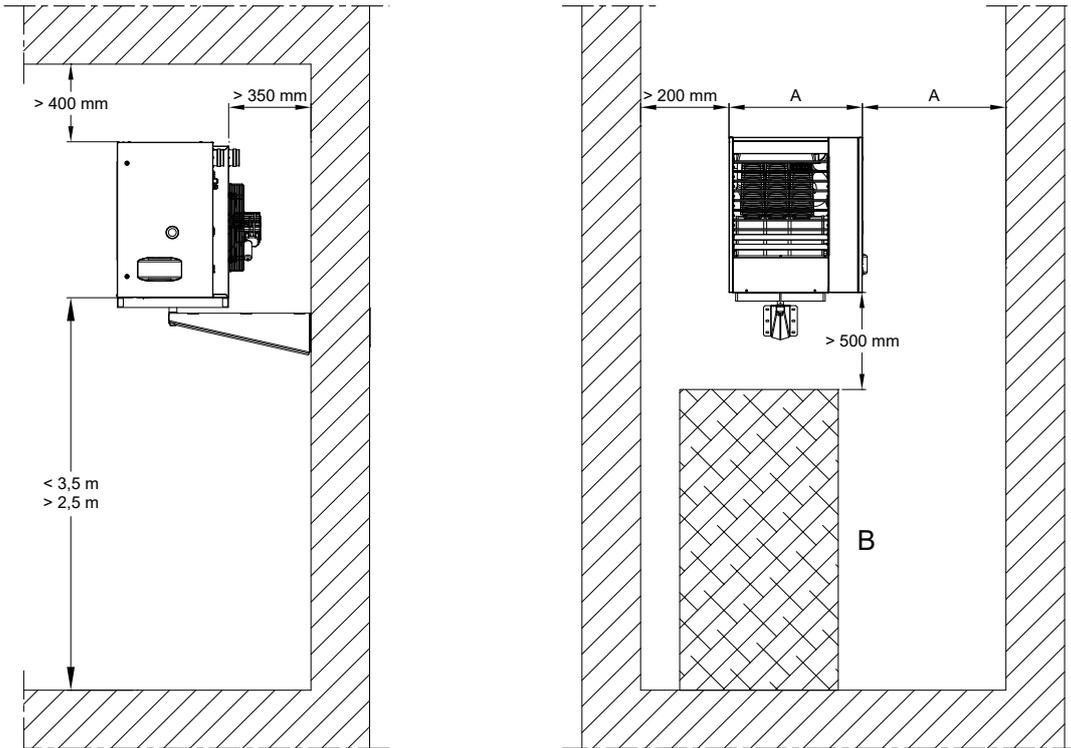
2.4.2 Clearances around the appliance

Axial gas unit heaters



The minimum clearance distances are required for safety, operation and maintenance.

Figure 2.2 Clearances



A Gas unit heater width

B Object or structure underneath the gas unit heater

i The recommended height from the floor to the gas unit heater base is 2,5 to 3,5 m (see Figure 2.2 p. 17). We do not recommend installing the gas unit heaters at heights below 2,5 m from the floor.

i The minimum distance from the wall must be at least 35 cm.

2.4.2.1 Centrifugal gas unit heaters

The position of gas unit heaters with centrifugal fan must consider the position of the warm air duct. This must be suitably sized and verified in relation to the air flow rate and the head of the centrifugal fan (Paragraph 3.4 p. 22).

i The recommended height from the floor to the gas unit heater base is 2,5 to 3,5 m (see Figure 2.2 p. 17). We do not recommend installing the gas unit heaters at heights below 2,5 m from the floor.

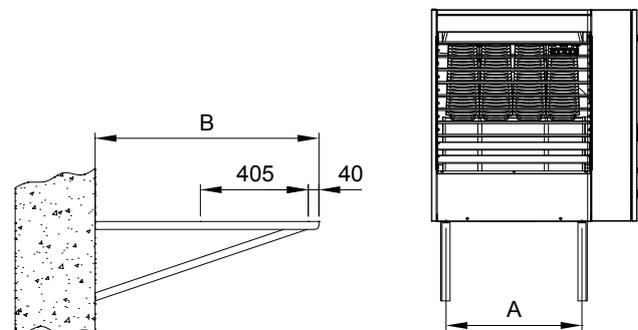
2.5 SUPPORT BRACKET

Robur provides easy mounting support brackets as an optional, suitably designed for M series gas unit heaters, which allow simplifying the wall fixing.

If you do not want to use these options, refer to Figure 2.3 p. 17.

When fixing the unit to the support brackets, use 4 M10 bolts.

Figure 2.3 Installation with support bracket



A Gas unit heater fixing points centre distance

B Support bracket length

Table 2.1 Support bracket dimensions for axial gas unit heaters

	M20	M25	M30	M35/M36	M40	M50	M60
A	370	370	510	620	620	810	1010
B	840						

Table 2.2 Support bracket dimensions for centrifugal gas unit heaters

	M20 C	M30 C	M60 C
A	370	510	1010
B	1400		

2.5.1 Axial gas unit heaters

For axial gas unit heaters the following support brackets are available as optional:

- ▶ O19800020 revolving wall support bracket (M20, M25 models)
- ▶ O19800024 revolving wall support bracket (M30 model)
- ▶ OKMN000 swivel bracket (models M35, M36, M40)
- ▶ O19800026 revolving wall support bracket (M50 model)
- ▶ O19800028 revolving wall support bracket (M60 model)
- ▶ OSTF009 support bracket 1,4 m length

- ▶ Tubular bracket OSTF005

All support brackets are supplied with bolts and the rear support plate.

For mounting instructions of the brackets, refer to the relevant instruction sheets.

2.5.2 Centrifugal gas unit heaters

For centrifugal gas unit heaters, the following mounting brackets are available as optional:

- ▶ OSTF009 support bracket 1,4 m length

All support brackets are supplied with bolts and the rear support plate.

For mounting instructions of the brackets, refer to the relevant instruction sheets.

3 HEATING ENGINEER

3.1 WARNINGS

3.1.1 General warnings



Read the warnings in Chapter III.1 *p. 4*, providing important information on regulations and on safety.



Compliance with installation standards

Installation must comply with applicable regulations in force, based on the installation Country and site, in matters of safety, design, implementation and maintenance of:

- heating systems
- gas systems
- flue gas exhaust
- flue gas condensate discharge



Installation must also comply with the manufacturer's provisions.

3.2 FUEL GAS SUPPLY

3.2.1 Gas connection

- ▶ 1/2" M (models M20, M25, M30, M35, M36, M40)

- ▶ 3/4" M (M50, M60 models)

on the rear, to the left (see dimensional diagrams, Paragraph 1.2 *p. 8*).

- ▶ Install an anti-vibration connection between the appliance and the gas piping.

3.2.2 Mandatory shut-off valve

- ▶ Provide a gas shut-off valve (manual) on the gas supply line, next to the appliance, to isolate it when required.
- ▶ Provide a three-piece pipe union.
- ▶ Perform connection in compliance with applicable regulations.

3.2.3 Gas pipes sizing

The gas pipes must not cause excessive pressure drops and, consequently, insufficient gas pressure for the appliance.

3.2.4 Supply gas pressure



This appliance is equipped for a maximum gas supply pressure of 50 mbar.

The appliance's gas supply pressure, both static and dynamic, must comply with Table 3.1 *p. 18*, with tolerance $\pm 15\%$.



Non compliant gas pressure (Table 3.1 *p. 18*) may damage the appliance and be hazardous.

Table 3.1 Network gas pressure

Product category	Countries of destination	Gas supply pressure [mbar]							
		G20	G25	G25.1	G25.3	G2.350	G27	G30	G31
II _{2H3B/P}	AL, BG, CH, CY, CZ, DK, EE, FI, GR, HR, IT, LT, LV, MK, NO, RO, SE, SI, SK, TR	20						30	30
	AT, CH	20					50	50	
II _{2H3P}	AL, BG, CH, CZ, ES, GB, GR, HR, IE, IT, LT, LV, MK, PT, SI, SK, TR	20							37
	RO	20							30
	AT	20							50
II _{2ELL3B/P}	DE	20	20					50	50

II ₂ EsI3P	FR	20	25						37
II ₂ Er3P		20	25						37
II ₂ H3B/P	HU	25						30	30
II ₂ HS3B/P		25		25				30	30
II ₂ E3P	LU	20							50
II ₂ L3B/P	NL		25					30	30
II ₂ L3P			25						37
II ₂ EK3B/P		20			25			30	30
II ₂ EK3P		20			25				30
II ₂ E3B/P	PL	20						37	37
I ₂ E		20							
II ₂ ELwLs3B/P		20				13	20	37	37
II ₂ ELwLs3P		20				13	20		37
I ₂ E(R)	BE	20	25						
I ₂ E(S)		20	25						
I ₃ P									37
I ₃ P	IS								30
I ₂ H	LV	20							
I ₃ B/P	MT							30	30
I ₃ B								30	

The appliance gas supply pressure, both static and dynamic, must comply with the values in the Table, with a tolerance of $\pm 15\%$.

3.2.5 Vertical pipes and condensate

- ▶ Vertical gas pipes must be fitted with siphon and discharge of the condensate that may form inside the pipe.
- ▶ If necessary, insulate the piping.

3.2.6 LPG pressure reducers

With LPG the following must be installed:

- ▶ A first stage pressure reducer, close to the liquid gas tank.
- ▶ A second stage pressure reducer, close to the appliance.

3.3 COMBUSTION PRODUCTS EXHAUST

Compliance with standards

The appliance is approved for connection to a combustion products exhaust duct for the types shown in Table 1.2 p. 14.

3.3.1 Flue gas exhaust connection

- ▶ \varnothing 110 mm, on the rear side, at the top (see dimensional drawings in the 1.2 p. 8 Section).

3.3.2 Combustion air intake fitting

- ▶ \varnothing 130 mm, on the rear side, at the top (see dimensional drawings in the 1.2 p. 8 Section).

3.3.3 Installation types

 If ducts other than those supplied by the manufacturer are used, make sure that they are suitable for the unit on which they are installed. In particular, the temperature class of the duct must be appropriate for the operating characteristics of the unit, and must also respect the chemical-physical

stability of the system itself.

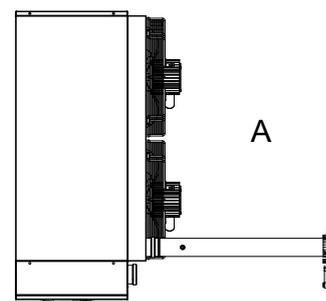


In any case, use approved ducts according to the type of installation to be made. Upon request, Robur can supply rigid pipes, coaxial ducts and terminals, all of approved type.

Gas unit heaters of the M series can be installed to one of the following ways.

3.3.3.1 B22 type installation with wall flue gas exhaust pipe

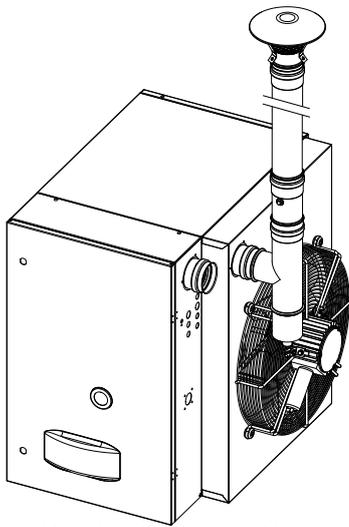
Figure 3.1 B22 type installation with wall flue gas exhaust pipe



A View from above

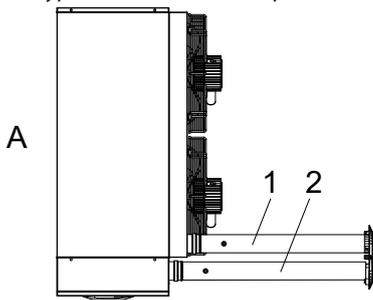
3.3.3.2 B22 type installation with roof flue gas exhaust pipe

Figure 3.2 B22 type installation with roof flue gas exhaust pipe



3.3.3.3 C12 type installation with separate ducts

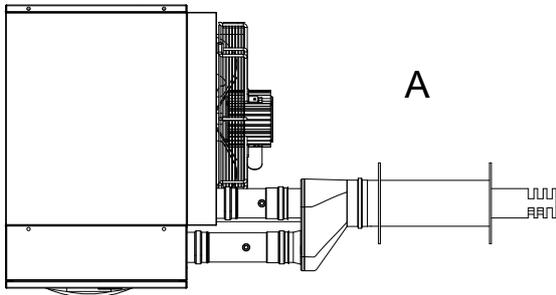
Figure 3.3 C12 type installation with separate ducts



A View from above
1 Flue gas exhaust
2 Combustion air inlet

3.3.3.4 C12 type installation with wall coaxial terminal

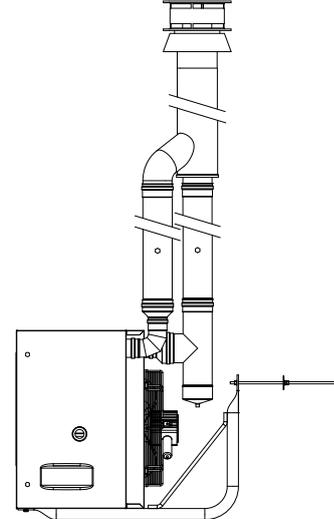
Figure 3.4 C12 type installation with wall coaxial terminal



A View from above

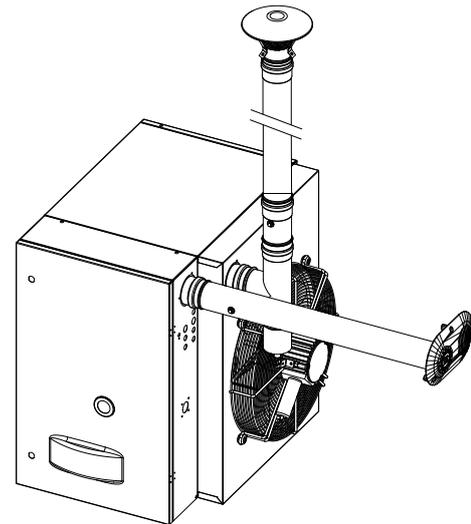
3.3.3.5 C32 type installation with roof coaxial terminal

Figure 3.5 C32 type installation with roof coaxial terminal



3.3.3.6 C62 type installation with separate ducts

Figure 3.6 C62 type installation with separate ducts



3.3.4 Sizing and installing combustion air/ exhaust fumes ducts

In order to dimension the duct system, the total pressure drop of the system must be calculated.

The total permissible pressure drop in the pipe system depends on the model of the instrument and any diaphragm fitted (Table 3.2 p. 21).

The pressure drops of the flue and air pipes available as Robur optional are shown in Table 3.3 p. 21.

The pressure drops of the coaxial pipes available as Robur optional are shown in Table 3.3 p. 21.

Resistance from the separate terminals are negligible since they are very low.

In the design phase it is necessary to verify that the sum of the pressure drops of the pipe system used is lower than the maximum pressure drop allowed by the device (Table 3.2 p. 21). The 3.3.5 p. 22 Section provides an example of how to calculate the pressure drop.

Table 3.2 Permissible pressure drop depending on model and mounted diaphragm

	Air diaphragm		Fumes diaphragm		Admissible pressure drop (Pa)	
	Height (mm)	Code	Height (mm)	Code	maximum	Minimum
M20, M20 C	----	----	60	019	40	----
M25	----	----	----	----	30	12
	----	----	45	012	16	----
M30, M30 C	84	007	----	----	35	23
	84	007	55	013	25	----
M35, M36	----	----	----	----	42	25
	----	----	40	014	24	10
	----	----	50	020	12	----
M40	----	----	----	----	30	19
	----	----	35	026	19	----
M50	----	----	----	----	27	8
	----	----	35	026	8	----
M60, M60 C	----	----	----	----	69	45
	----	----	45	012	46	22
	----	----	55	013	21	----

Table 3.3 Pressure drop for air and flue pipes and coaxial exhausts

				M20	M20 C	M25	M30	M30 C	M35	M36	M40	M50	M60	M60 C	
Flue gas exhaust pressure drop															
Ø 110 mm	Pipe	1 m	Pa	0,4	0,6	0,7	1,7	1,3	1,7	2,3	3,8				
	Elbow	90°	Pa	0,7	1,3	1,4	3,7	2,8	3,7	5,1	8,6				
	Tee		Pa	1,1	1,9	2,0	5,1	4,0	5,1	6,9	11,3				
Ø 130 mm	Pipe	1 m	Pa	0,2		0,3	0,8	0,6	0,8	1,0	1,7				
	Elbow	90°	Pa	0,4	0,6	0,7	1,9	1,5	1,9	2,6	4,3				
	Tee		Pa	0,5	0,8	0,9	2,3	1,8	2,3	3,1	5,0				
Air intake pressure drop															
Ø 130 mm	Pipe	1 m	Pa		0,1		0,2	0,4	0,2	0,4	0,5	0,7			
	Elbow	90°	Pa	0,2	0,3	0,4	0,9	0,5	0,9	1,2	1,8				
	Tee		Pa	0,3	0,4	0,5	1,1	0,7	1,2	1,5	2,2				
Coaxial exhaust pipe pressure drop															
Ø 130/180 mm	wall (1)		Pa	2,0	3,7	4,4	9,3	7,4	9,3	13,2	24,9				
Ø 130/210 mm	roof		Pa	2,2	4,3	4,9	10,6	8,2	10,6	14,5	29,4				

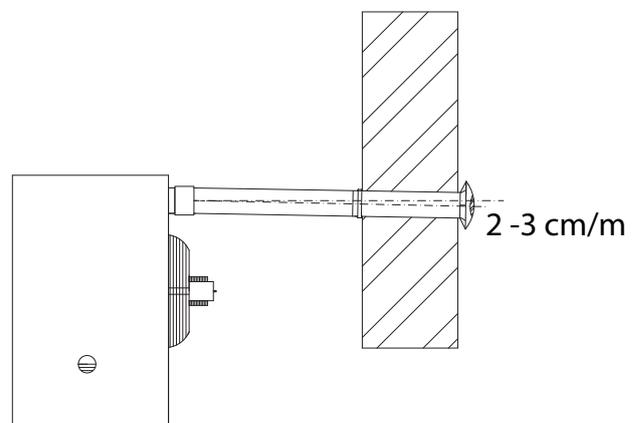
(1) Can be used only with OSTF009 support bracket



If horizontal flue gas exhaust pipes having lengths above 1 m are installed, the flue gas exhaust pipe must be mounted with a downward slope of 2 to 3 cm each 1-m length (Figure 3.7 p. 21), to prevent condensate drops entering the unit.



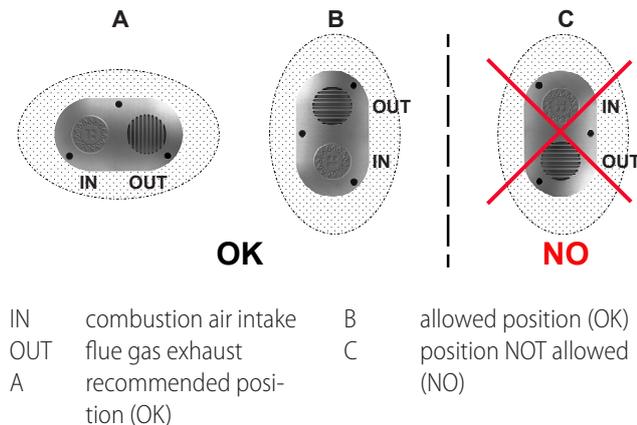
In the case of installations of vertical flue pipes longer than 1.5 m, to prevent any drops of condensation entering the generator, it is necessary to provide a Tee element on the base of the vertical flue pipe to collect any condensation (Figure 3.2 p. 20).

Figure 3.7 Slope of horizontal pipes

For proper installation of the wall external terminals for the flue gas exhaust and combustion air intake, follow the

details given in Figure 3.8 p. 22.

Figure 3.8 Wall terminal position



3.3.5 Example of calculation

If a M35 unit equipped with a 50 mm high flue diaphragm is to be installed, the air/flue system will be realized in the following way:

- ▶ 3 metres of Ø 110 flue pipe
- ▶ 2 90° Ø 110 elbows attached to the flue pipe
- ▶ 2 metres of Ø 130 air pipe

It is then possible to proceed with the verification calculation, remembering that the maximum permissible pressure drop is 12 Pa (see Table 3.2 p. 21).

Q.ty Resistance

- ▶ Ø 110 flue pipe
3 m x 1,7 Pa = 5,1 Pa
- ▶ 90° curve
2 x 3,7 Pa = 7,4 Pa
- ▶ Ø 130 air pipe
2 m x 0,8 Pa = 1,6 Pa

Total pressure drop = 14,1 Pa

Total pressure drop of the piping system is greater than the maximum allowed pressure drop (12 Pa), therefore the installation is not allowed.

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

- ▶ fit a flue diaphragm 40 mm high
- ▶ use the Ø 130 flue pipe
- ▶ reduce the length in metres of the flue duct

In this case the flue diaphragm cannot be removed, as this will result in the total pressure drop of the flue system to be lower than the minimum pressure drop allowed for the unit.



If the total length of the pipe system exceeds 16 metres, it is advisable to contact the technical service Robur by telephone.

3.3.6 Installing the flue diaphragm

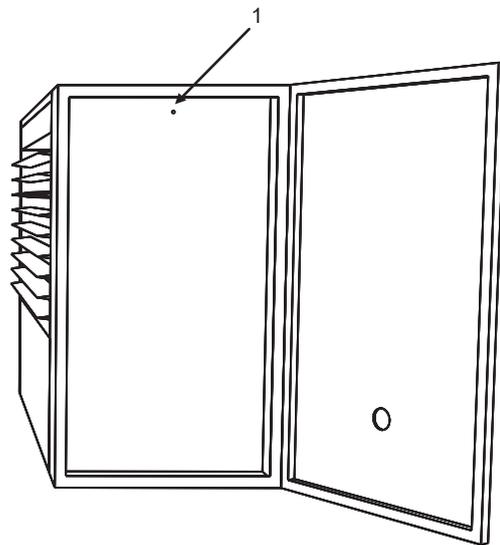
One or more smoke diaphragm is supplied with the M series generators.



How to mount the smoke diaphragm

1. Ensure the appliance is not live.
2. Open the electrical panel door.
3. Loosen the screw which secures the cover (see Figure 3.9 p. 22).
4. Remove the cover.
5. Undo the two lower screws which secure the flue fan and loosen the two upper screws.
6. Insert the flue diaphragm between the flue outlet flange and the flue fan flange, so that the holes in the diaphragm are turned downwards.
7. Make the holes in the diaphragm match with the lower holes.
8. Tighten again the lower and upper screws that secure the flue fan.
9. Replace the electrical panel cover and tighten the fixing screw.

Figure 3.9 Assembly of flue diaphragm



1 Cover locking screw

3.4 AIR DUCTING

Only models equipped with a centrifugal fan (M gas unit heater C series) can be combined with air ducting systems, which can be positioned both on the air intake (with or without mixing chambers) and on the delivery.

For this purpose, the delivery outlet of the M gas unit heater C gas unit heaters is provided with fixing flanges for the delivery air ducting.

Refer to the Paragraph 2.4.2.1 p. 17 for the dimensions of the flange connection.



In order to avoid vibrations (possible source of noise and mechanical failures), it is advisable to install anti-vibration connections, easily removable for maintenance operation, at the connection between the gas unit heater and the air duct.

Set up the air ducting using a traditional sufficiently

smooth sheet metal duct.

The insulation of the duct must be assessed, in order to avoid heat losses.

For the dimensioning of the air duct, consider the data of air flow and available head of the fan, summarized in Table 1.2 p. 14.



Minimum pressure drop on heat flow delivery

In order to grant that the centrifugal fan operates within the operating limits in any situation, it is mandatory to ensure a minimum pressure drop on the air delivery. The minimum pressure drop values are detailed in Table 1.2 p. 14.

4 ELECTRICAL INSTALLER

4.1 WARNINGS



General warnings

Read the warnings in Chapter III.1 p. 4, providing important information on regulations and on safety.



Compliance with installation standards

Installation must comply with applicable regulations in force, based on the installation Country and site, in matters of safety, design, implementation and maintenance of electrical systems.



Installation must also comply with the manufacturer's provisions.



Live components

- After placing the appliance in the final position, and prior to making electrical connections, ensure not to work on live components.



Earthing

- The appliance must be connected to an effective earthing system, installed in compliance with regulations in force.
- It is forbidden to use gas pipes as earthing.



Cable segregation

Keep power cables physically separate from signal ones.



Do not use the power supply switch to turn the appliance on/off

- Never use the power supply switch to turn the appliance on and off, since it may be damaged in the long run (occasional blackouts are tolerated).
- To turn the appliance on and off, exclusively use the suitably provided control device.

4.2 ELECTRICAL SYSTEMS

Electrical connections provide:

A. Power supply (Paragraph 4.3 p. 23).

B. Control system (Paragraph 4.4 p. 24).



How to make connections

All electrical connections must be made on the terminal board in the electrical panel of the unit:

1. Ensure the appliance is not live.
2. To access the electrical board open the door on the right side of the unit.
3. Insert cables through cable gland (detail 3 on dimensional diagrams, Paragraph 1.2 p. 8).
4. Identify the appropriate connection terminals.
5. Make the connections.
6. Close the door.

4.3 ELECTRICAL POWER SUPPLY

4.3.1 Power supply line

Provide (by the installer) a protected single phase line (230 V 1-N 50 Hz) with:

- ▶ Cable type H05 VVF 3x1,5 mm² with maximum external diameter of 8,4 mm.
- ▶ Bipolar disconnecter with minimum contact opening of 3 mm.



How to connect the power supply

To connect the three-pole power supply cable:

1. Access the connection terminal block according to Procedure 4.2 p. 23.
2. Connect the three wires to the terminal block as shown in Figure 4.1 p. 24.
3. Provide the earth lead-in wire longer than live ones (last to be torn in the event of accidental pulling).

Figure 4.1 Appliance connection to the mains power supply

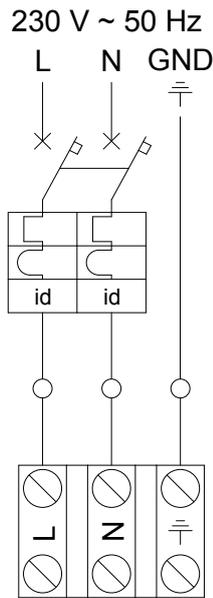
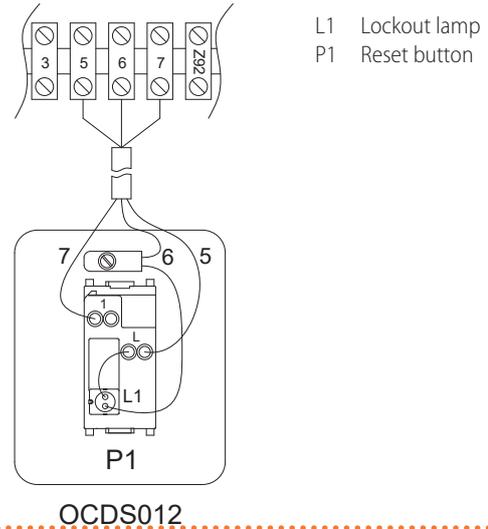


Figure 4.2 1-key basic control connection



4.4 CONTROL SYSTEM

4.4.1 OCDS012 1-key basic control

A basic 1-button command OCDS012 is supplied with the unit.



How to connect the OCDS012 1-key basic control

The control must be installed on the wall in a suitable position, using expansion screws.

1. Access the connection terminal block according to Procedure 4.2 p. 23.
2. Use 3x1 mm² cable for connection.
3. Connect the wires to the terminal block as shown in Figure 4.2 p. 24.
4. For further information refer to the instruction sheet supplied with the OCDS012 optional.



The cable may not be longer than 20 metres.

4.4.2 External request

Depending on the required operation, it is required to arrange:

- ▶ Request device (e.g. thermostat, timer, switch, ...) equipped with a voltage-free NO contact, used for managing start/stop of the gas unit heater.
- ▶ Request device (switch) equipped with a changeover contact, for managing winter/summer mode operation.

For details on the position and possible presence of temporary jumpers on terminals of the unit terminal block, refer to the wiring diagrams in Paragraph 1.3 p. 9.



All the contacts for external requests of the terminal block in the electrical panel inside the unit have a 230 V voltage applied to the relative terminals.

4.4.2.1 Gas unit heater start/stop management



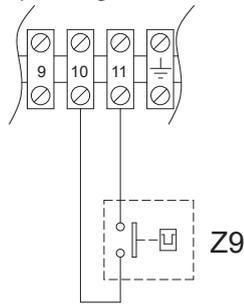
How to connect the external request for gas unit heater start/stop management

1. Access the electrical board of the appliance according to the Procedure 4.2 p. 23.
2. Connect the voltage-free contact of the external request, using a 2x1 mm² cable, to 10-11 terminals of the terminal block, as shown in Figure 4.3 p. 25.



The cable may not be longer than 20 metres.

Figure 4.3 Connection of external request for gas unit heater start/stop management



Z9 External request (e.g. thermostat, timer, switch, ...)

4.4.2.2 Summer/winter mode management



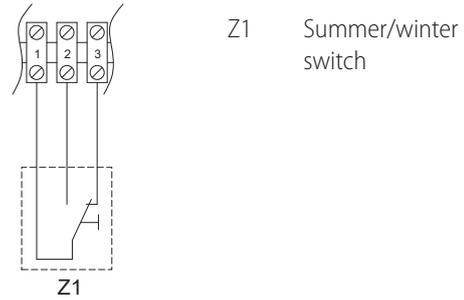
How to connect the external request for summer/winter mode management

1. Access the electrical board of the appliance according to the Procedure 4.2 p. 23.
2. Remove the 28 temporary jumper between 1-3 terminals on the internal terminal block.
3. Connect the voltage-free contact of the external request, using a 3x1 mm² cable, to 1, 2, 3 terminals of the terminal block, as shown in Figure 4.4 p. 25.



The cable may not be longer than 20 metres.

Figure 4.4 Summer/winter switch connection

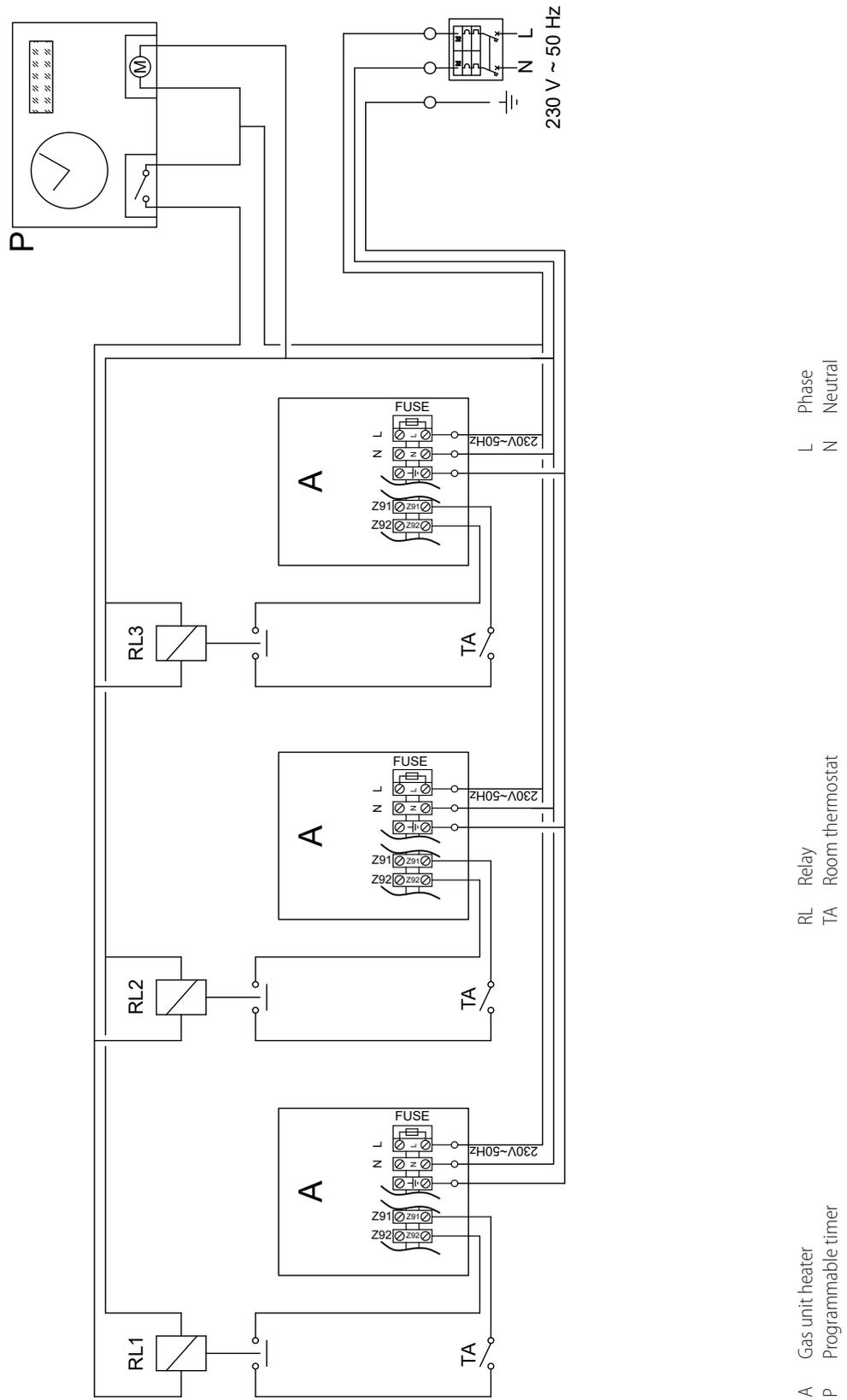


4.4.2.3 Control of multiple gas unit heaters with a single external request

Through a suitable connection to the terminals described above, it is possible to manage the specific function on more than one gas unit heater using a single external request.

The centralised management of the on/off switch can be carried out as described in Figure 4.5 p. 26, using a time programmer and several room thermostats. The presence of the room thermostats serving each generator allows to activate the generator itself only when the specific area has a real need for heat, avoiding waste of energy. The presence of a time programmer makes it possible to subordinate the ignition of the heater, even in the presence of a request from the room thermostat, to a centralised consent.

Figure 4.5 Multiple appliances wiring diagram with one programmable timer and more room thermostats



4.4.3 Positioning the control system

Install the chosen thermostat/control system according to the following guidelines:

- ▶ At about 1,5 m from the floor, protected against air draughts, direct exposure to sun rays and direct heat

sources (lamps, hot air flow from the unit itself, etc.).

- ▶ If possible, do not place the control system on walls bordering the outside, to avoid false temperature readings and therefore affect system operation. If this is not possible, shield the control system by placing a

sheet of insulating material (cork, polystyrene or other similar) between the control system and the wall.



By following the above guidelines, unwanted

starting and stopping of the system can be avoided and optimal comfort in the heated space can be guaranteed.

5 FIRST START-UP



First start-up entails checking/setting up the combustion parameters and may exclusively be carried out by a Robur TAC. NEITHER the user NOR the installation technician is authorised to perform such operations, under penalty of voiding the warranty.

The installer is obliged to carry out preliminary checks described in Paragraph 5.1 p. 27.

5.1 PRELIMINARY CHECKS



Paragraph dedicated to the installer.

5.1.1 Preliminary checks for first start-up

Upon completing installation, before contacting the TAC the installer must check:

- ▶ Electrical and gas systems suitable for the required capacities and equipped with all safety and control devices required by the regulations in force.
- ▶ Absence of leaks in the gas system.
- ▶ Type of gas for which the appliance is designed (natural gas, LPG or other gas).
- ▶ Supply gas pressure complying with the values of Table 3.1 p. 18, with max tolerance $\pm 15\%$.
- ▶ Correct operation of the flue exhaust duct.
- ▶ Combustion air feed and flue gas exhaust correctly carried out according to the regulations in force.
- ▶ Power supply mains complying with the appliance's rating plate data.
- ▶ Appliance correctly installed, according to the manufacturer's instructions.
- ▶ System installed in a workmanlike manner, according to national and local regulations.

5.1.2 Abnormal or hazardous installation situations

Should any abnormal or hazardous installation situations be found, the TAC shall not perform first start-up and the appliance shall not be commissioned.

These situations may be:

- ▶ Failed compliance with minimum clearances.
- ▶ Insufficient distance from combustible materials.
- ▶ Conditions that do not warrant access and maintenance in safety.
- ▶ Appliance switched on/off with the main switch, instead of the provided control device.
- ▶ Appliance defects or faults caused during transport or installation.
- ▶ Gas smell.

- ▶ Non-compliant mains gas pressure.
- ▶ Non-compliant flue gas exhaust.
- ▶ All situations that may involve operation abnormalities or are potentially hazardous.

5.1.3 Non-compliant system and corrective actions

Should the TAC find any non conformities, the user/installer is bound to perform any corrective procedures required by the TAC.

After performing the remedial actions (the installer's responsibility), if the TAC deems that safety and conformity conditions are in place, first start-up may be effected.

5.2 BURNER PRESSURE ADJUSTMENT



Paragraph reserved exclusively to TACs.



The generator is supplied with the gas valve already calibrated with respect to the fuel indicated on the adhesive next to the gas connection. Consequently, during the first ignition phase, only the burner pressure value must be checked and, only if this is not successful, or during a gas change, the entire verification procedure must be carried out.

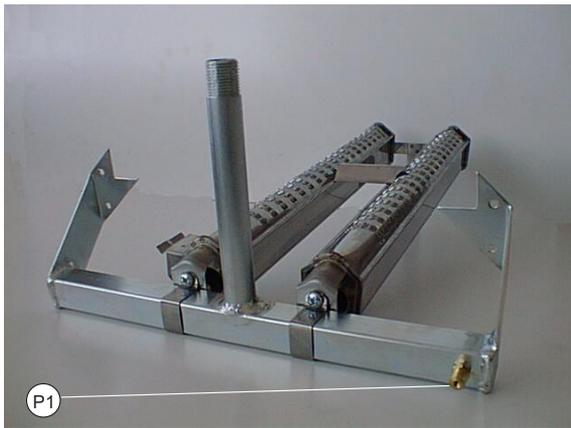


The pressure must be checked by means of the pressure intake (P1) on the gas manifold (Figure 5.1 p. 28).



After setting the gas pressure, stop and start the unit, and check that burner pressure has stabilised. If necessary perform a new adjustment. After completing the gas pressure adjustment, seal the valve setting screw.

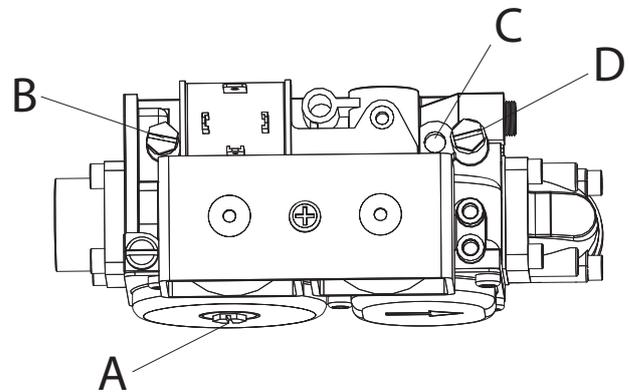
Figure 5.1 Burner



P1 Pressure intake

1. If the appliance is running, switch it off with the applicable control system.
2. Open the door.
3. Turn the pressure regulator (A) clockwise to increase the pressure or counterclockwise to decrease it until the value indicated in the 5.1 p. 28 table is reached.

Figure 5.2 Gas valve



A Pressure regulator
 B Inlet pressure intake
 C Slow opening adjustment
 D Outlet pressure intake

5.2.1 M20/M25/M30/M35/M36/M40

Figure 5.2 p. 28

1. If the appliance is running, switch it off with the

Table 5.1 Burner gas pressure

				M20	M20 C	M25	M30	M30 C	M35	M36	M40	M50	M60	M60 C
Installation data														
Burner gas pressure	Nominal heat input	G20	mbar	11,8	11,0	7,8	7,0	9,4	7,8	9,5	8,0			
		G25	mbar	15,0	15,5	9,8	9,6	-(1)	10,5	12,1	10,2			
		G2.350	mbar	5,1	5,7	5,5	5,1	-(1)	3,0	4,1	-(1)			
		G27	mbar	7,5	8,4	7,5	8,5	-(1)	7,5	7,8				
		G30	mbar				29,0							
		G31	mbar	34,2	33,3	32,5	33,6	32,8	32,7	31,2				
	Slow opening pressure	LPG	mbar				29,0							
		G20	mbar							5,4	4,0			
		G25	mbar							6,8	5,0			
		G2.350	mbar							3,0	-(1)			
		G27	mbar							3,6	3,9			
		G30	mbar							16,5	14,1			
		G31	mbar							19,0	16,0			
		LPG	mbar							16,5	14,1			

(1) The gas unit heater cannot operate with this type of gas.

The appliance's gas supply pressure, both static and dynamic, must comply with Table 3.1 p. 18, with tolerance $\pm 15\%$.

shown in table Table 5.1 p. 28 (the use of a spanner no. 10 is recommended)

6. Then adjust the slow opening pressure (Paragraph 5.2.2.3 p. 29).

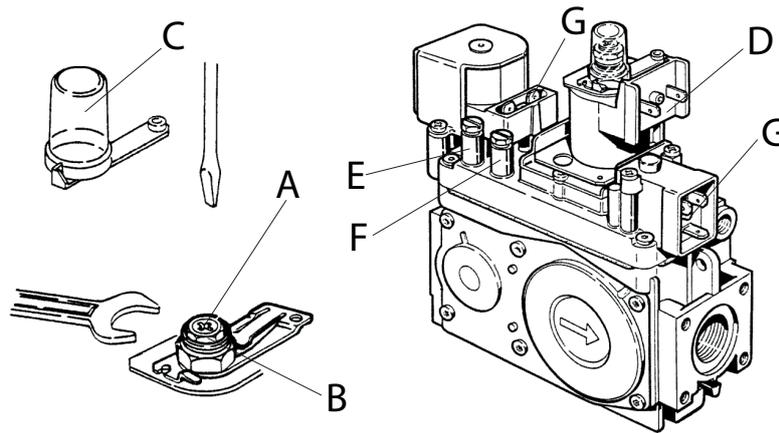
5.2.2 M50/M60

5.2.2.1 Natural gas

Figure 5.3 p. 29

1. If the appliance is running, switch it off with the applicable control system.
2. Open the door.
3. Remove plastic cover (C).
4. Switch on the appliance.
5. By way of screw B set burner pressure to the value

Figure 5.3 Gas valve



- | | | | |
|---|--|---|--------------------------------------|
| A | Slow opening adjustment | E | Inlet gas pressure detection socket |
| B | Burner gas pressure setting screw | F | Outlet gas pressure detection socket |
| C | Setting screw cap | G | Electricity supply connectors |
| D | Connector for electrical supply of the soft opening SMD coil | | |

5.2.2.2 LPG gas

 Figure 5.3 p. 29.

1. Check that the adjusting screw (B) is tightened, otherwise tighten it completely. In this way the pressure at the burner is directly related to the pressure in the network.
2. Make sure to have a network pressure of 30 mbar (G30) or 37 mbar (G31).
3. The reduction of the pressure in the network is possible with suitable pressure reducers as indicated in the Paragraph 3.2.6 p. 19.
4. Then adjust the slow opening pressure (Paragraph 5.2.2.3 p. 29).

5.2.2.3 Adjusting the slow opening pressure

 Figure 5.3 p. 29.

1. Cut-out the SMD coil supply (D). This will make the heater attain the soft opening pressure.
2. While holding the nut (B) in place, use the screw (A) to adjust the slow opening pressure to the value indicated in the 5.1 p. 28 Table; use a screwdriver for the operation.

3. Replace the plastic cover C.
4. Restore the SMD coil connection D

5.3 GAS CHANGEOVER

 Paragraph reserved exclusively to TACs.

 The following instructions apply to both the conversion from natural gas (G20) to any other gas and vice versa.

 After the gas change operation, carry out the procedure to adjust the gas pressure to the burner, as described in Paragraph 5.2 p. 27.

 Check that the gas supply line is suitable for the new fuel type used to supply the unit.

The following Table shows the nozzle diameter and code for the different M gas unit heater models, depending on the gas type.

Table 5.2 Nozzle data

		M20	M20 C	M25	M30	M30 C	M35	M36	M40	M50	M60	M60 C	
Installation data													
Nozzle	number of nozzles	2						4					
	Diameter (Ø)	G20	mm	2,80	3,30	4,00	4,50	4,00	3,30	3,45	4,00		
		G25	mm	2,80	3,30	4,00	4,50	-(1)	3,30	3,45	4,00		
		G2.350	mm	4,00	4,80	5,20	5,50	-(1)	4,80	5,20	-(1)		
		G27	mm	3,45	4,00	4,50	4,80	-(1)	3,70	4,00	4,50		
		G30	mm	1,60/1,80	2,00	2,20	2,40	2,30	1,70/1,95	1,85/2,15	2,20/2,30		
		G31	mm	1,60/1,80	2,00	2,20	2,40	2,30	1,70/1,95	1,85/2,15	2,20/2,30		
		LPG	mm	1,60/1,80	2,00	2,20	2,40	2,30	1,70/1,95	1,85/2,15	2,20/2,30		

(1) The gas unit heater cannot operate with this type of gas.



How to change gas

1. Cut off electric power and gas supply.
2. Replace the nozzles on the nozzle manifold of the burner with those of a diameter suitable for the type of gas to be used (Table 5.2 p. 29). Remember to also mount the copper washers located between the

nozzle and the manifold.

3. Adjust the gas pressure to the burner as indicated in the 5.2 p. 27 Section.
4. Replace the sticker indicating the gas type on the appliance with the sticker for the new gas type.

6 NORMAL OPERATION



This section is for the end user.

6.1 WARNINGS



General warnings

Prior to using the appliance carefully read the warnings in Chapter III.1 p. 4, providing important information on regulations and on safety.



First startup by TAC

First start-up may exclusively be carried out by a Robur TAC (Chapter 5 p. 27).



Never power the appliance off while it is running

NEVER power the appliance off while it is running (except in the event of danger, Chapter III.1 p. 4), since the appliance or system might be damaged.

6.2 SWITCH ON AND OFF



Routine switching on/off

The appliance may exclusively be switched on/off by means of the suitably provided control device.



Do not switch on/off with the power supply switch

Do not switch the appliance on/off with the power supply switch. This may be harmful and dangerous for the appliance and for the system.



Checks before switching on

- Before switching on the appliance, ensure that:
- gas valve open
 - appliance electrical power supply (main switch ON)
 - connection and any necessary power supply of the control device



After a long period of unit inactivity or at the first start-up, it may be necessary to repeat the ignition operation due to the presence of air in the gas

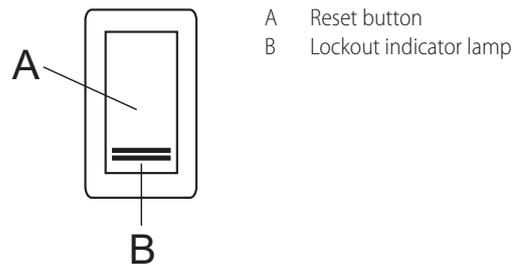
piping.

6.2.1 OCDS012 1-key basic control

Space heating activation

1. Ensure that contact 1-3 is closed by the factory installed temporary jumper. If a summer/winter selector switch (Paragraph 4.4.2.2 p. 25) has been installed, ensure that the selector switch is in the "winter" position (contact 1-3 closed).
2. Close contact Z9 using the control device provided (thermostat, chronothermostat or voltage-free contact).
3. After the purge time (around 40 seconds), the gas solenoid valve opens and the burner ignites.
4. When the flame is detected, the control box keeps the gas valve open.
5. Otherwise, the control unit will try the ignition again 3 times, after the appropriate purge time. If the flame does not ignite anyway, the control unit locks the unit and light the locking state indicator lamp (B) on the control (Figure 6.1 p. 30).
6. In case of flame locking, press the reset button (A).

Figure 6.1 1-key basic control



Space heating shutdown

1. Switch off space heating request by opening Z9 contact using the provided control device (thermostat, chronothermostat or voltage-free contact).
2. The burner will shut down, while the fans will continue to operate until the appliance has cooled down completely.



In case of prolonged periods of inactivity, see Paragraph 7.4 p. 32.

Ventilation activation (summer mode)

1. Close the gas valve and check power supply availability

to the unit.

- Using a suitable summer/winter selector switch (Paragraph 4.4.2.2 p. 25), select summer mode (contact 1-3 open, contact 1-2 closed). This way the fan only will start.
- To stop the fan press again the selector switch on winter position (contact 1-2 open).



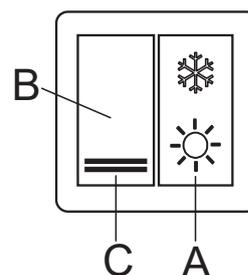
It is recommended that the heating request is deactivated during the summer season by opening contact Z9 by means of the provided control device (thermostat, chronothermostat or voltage-free contact).

6.2.2 OCTR000 2-key basic control

Space heating activation

- Set the summer/winter selector switch (A) in the winter position ❄️ (Figure 6.2 p. 31).
- Close contact Z9 using the control device provided (thermostat, chronothermostat or voltage-free contact).
- After the purge time (around 40 seconds), the gas solenoid valve opens and the burner ignites.
- When the flame is detected, the control box keeps the gas valve open.
- Otherwise, the control unit will try the ignition again 3 times, after the appropriate purge time. If the flame does not ignite anyway, the control unit locks the unit and light the locking state indicator lamp (C) on the control (Figure 6.2 p. 31).
- In case of flame locking, press the reset button (B).

Figure 6.2 2-keys basic control



- A Summer/winter selector switch (❄️space heating operating mode; ☀️summer operating mode, ventilation only)
 B Reset button
 C Lockout indicator lamp

Space heating shutdown

- Switch off space heating request by opening Z9 contact using the provided control device (thermostat, chronothermostat or voltage-free contact).
- The burner will shut down, while the fans will continue to operate until the appliance has cooled down completely.



In case of prolonged periods of inactivity, see Paragraph 7.4 p. 32.

Ventilation activation (summer mode)

- Close the gas valve and check power supply availability to the unit.
- Set the summer/winter selector switch (A) in the summer position ☀️ (Figure 6.2 p. 31). This way the fan only will start.
- To stop the fan press again the selector switch on winter position ❄️.



It is recommended that the heating request is deactivated during the summer season by opening contact Z9 by means of the provided control device (thermostat, chronothermostat or voltage-free contact).

7 MAINTENANCE

7.1 WARNINGS



Correct maintenance prevents problems, assures efficiency and keeps running costs low.



Maintenance operations described herein may exclusively be performed by the TAC or skilled maintenance technician.



Any operation on internal components may

exclusively be performed by the TAC.



Before performing any operation, switch off the appliance by means of the control device and wait for the end of the shutdown cycle, then disconnect power and gas supply, by acting on the electrical disconnect and gas valve.



The efficiency checks and every other "check and maintenance operation" (see Table 7.1 p. 32) must be performed with a frequency according to

current regulations or, if more restrictive, according to the provisions set forth by the manufacturer, installer or TAC.



Responsibility for efficiency checks, to be carried out for the aims of restricting energy consumption, lies with the system manager.

7.2 SCHEDULED ROUTINE MAINTENANCE

Perform the operations in the following Table 7.1 p. 32 on an annual basis.

Table 7.1 Scheduled routine maintenance

		Next-R	G	K	M
Ordinary scheduled maintenance					
Check of the unit	clean the burner	√	√	√	√
	clean the ignition and flame sensor electrodes	√	√	√	√
	clean the fan	√	√	√	√
	clean the blower/exhaust fan	√	√	√	√
	check the % value of CO ₂	√	√	√	√
	check the unit safety devices	√	√	√	√
	check that the condensate discharge is clean	-	√	-	-

7.3 RESETTING THE TEMPERATURE LIMIT THERMOSTAT

The temperature limit thermostat stops the burner in case of appliance overheating.

The reset of the heater in block by intervention of the limit thermostat is manual by accessing the electrical panel of the appliance.



Resetting of the temperature limit thermostat should be carried out by qualified service personnel, after removing the cause of overheating.



The intervention of the temperature limit thermostat ALWAYS indicates an abnormal condition. Before resetting, it is therefore advisable to search for the reasons that led to the unit overheating. If frequent stops occur, contact Robur TAC.

7.4 PERIODS OF INACTIVITY

Should you foresee to leave the appliance inactive for a long period of time, disconnect it from the electrical and gas mains.



How to deactivate the appliance for long periods of time

1. Switch the appliance off (Paragraph 6.2 p. 30).
2. Only when the unit is completely switched off, disconnect the power supply using the main switch/disconnector (Figure 4.1 p. 24).
3. Close the gas valve.



How to reactivate the appliance after long periods of inactivity

Before reactivating the appliance, the operator/maintenance technician of the system must first of all:

- Check whether any maintenance operations are required (contact the TAC; see Paragraph 7.2 p. 32).
- Ensure that the flue gas exhaust duct and the air intake are not obstructed.
After completing the above checks:
 1. Open the gas valve and ensure there are no leaks; should gas smell be noticed, close the gas valve again, do not switch any electrical devices on and request intervention by qualified personnel.
 2. Provide electrical current with the main power switch (Figure 4.1 p. 24).
 3. Switch on the appliance by means of the provided control device (Paragraph 6.2 p. 30).

7.5 TROUBLESHOOTING

In case of a failure, call a qualified service engineer.

If the gas unit heater does not start in heating mode nor in ventilation, follow the steps below to identify the most likely cause of the fault:

1. Disconnect electrical power supply to the gas unit heater.
2. Check the fuse on the electrical terminal block. If it is broken, replace it with a suitable one (see electrical data in Table 1.2 p. 14).
3. Restore the electrical power supply.
4. Check that the power supply is correct (230 V 1-N 50 Hz).
5. Check static gas supply pressure with respect to values in Table 3.1 p. 18.
6. Set the summer/winter selector switch to winter position, or close contact 1-3 on the terminal block.
7. Switch on Z9 contact using the provided control device (thermostat, chronothermostat or voltage-free contact) or by closing Z9 contact on the terminal block.
8. Check that the extractor fan starts. If the extractor fan does not start:
 - Check that the limit thermostat has not been triggered. If this is the case, check the overheating cause, remove it, and reset the limit thermostat

(procedure Paragraph 7.3 p. 32).

- Check the extractor fan for voltage. If the voltage is present but the extractor fan does not start, replace the condenser of the extractor fan. If this does not solve the problem, replace the extractor fan itself.
9. After 40 seconds from extractor fan start, check the electrodes for sparks. If the electrodes do not spark:
- Check its position and the connection cable.
 - Check the ignition box fuse. If it is broken, replace it.
 - If the fuse is intact but the electrodes do not spark, replace the ignition transformer.
10. If the burner starts but stops immediately after sparking:
- Check that the phase and the neutral of the power supply are not reversed.
 - Check the position and integrity of the detection electrode and, if necessary, replace it.
 - If the electrode and power supply are ok, replace the ignition transformer.
11. If the burner does not start or no gas flows from it:
- Check gas supply.
- If gas is present, check for voltage at the gas valve during scintillation. If voltage is present and the extractor fan is running, check that the nozzle is not obstructed. If the nozzle is free, replace the gas valve.
 - If the gas is still being supplied, but no voltage is supplied to the gas valve, check the electrical connections to the control board and, if correct, replace the control board.
12. After the burner ignition, check gas supply pressure, both static and dynamic, with respect to values in Table 3.1 p. 18.
13. Check that the fan starts (within 120 seconds from the ignition of the burner):
- If it does not start, check the correct operation of the heat exchanger probe and, if necessary, replace it.
 - Check the fan motor condenser and, if necessary, replace it.
 - If this does still not solve the problem, replace the fan motor.

Figure 7.1

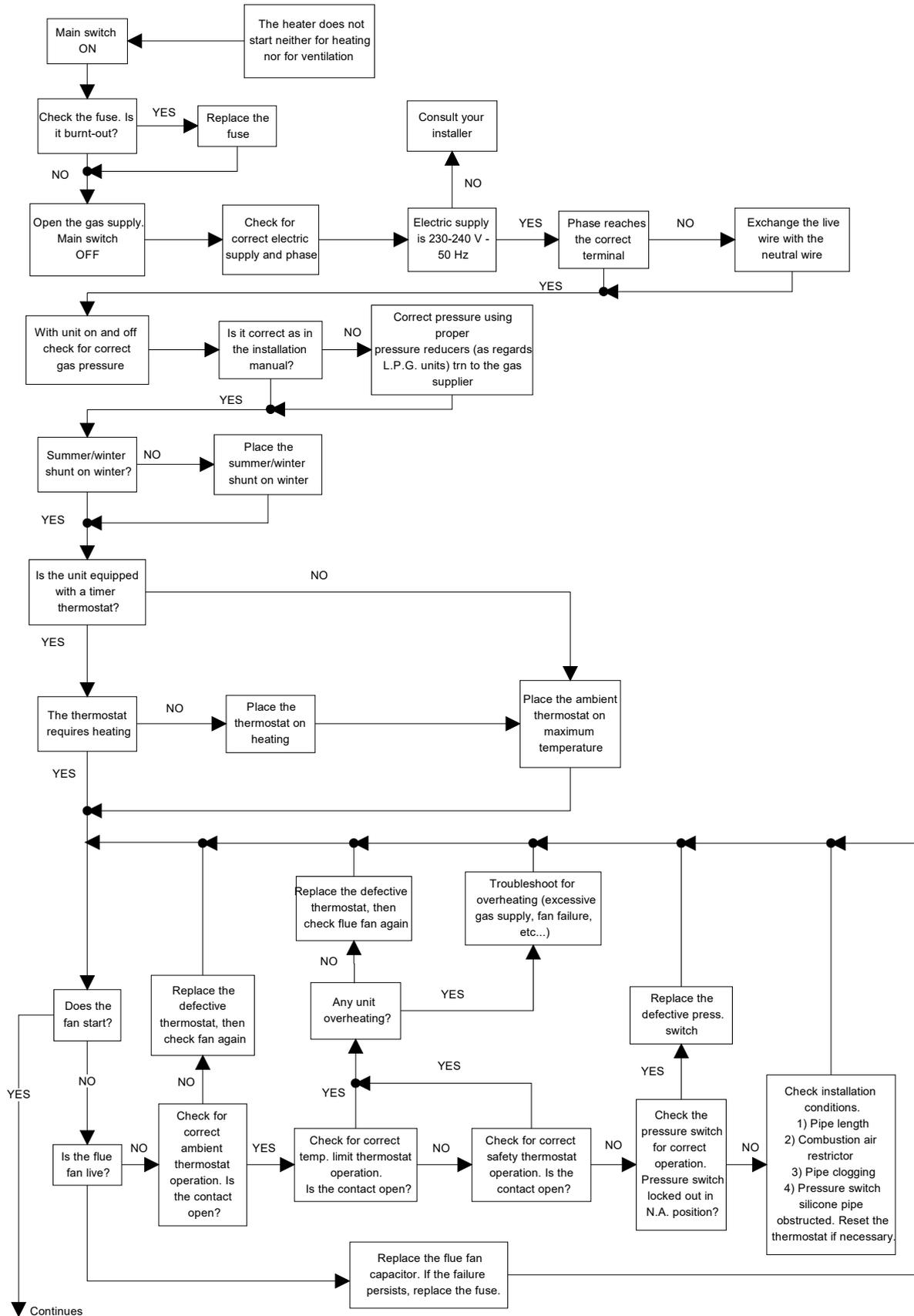
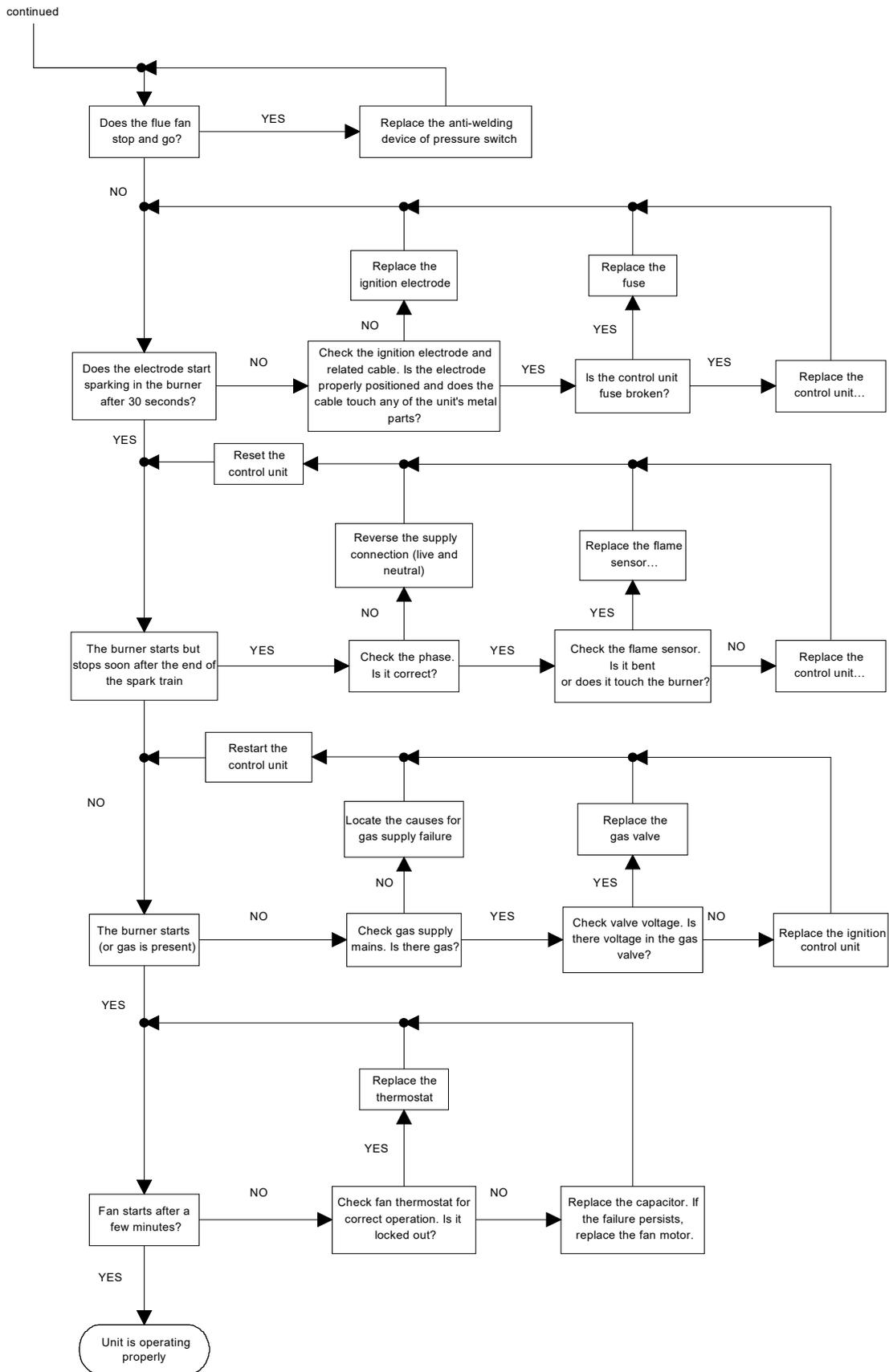


Figure 7.2



Robur mission

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.



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