Installation and maintenance manual
Manuel d'installation et de maintenance
Installations- und Wartungshandbuch
Manuale di installazione e di manutenzione
Manual de instalación y de mantenimiento

ROOFTECH
100 ÷ 160

English | Français | Deutsch | Italiano | Español

HFC 410A

Modul gas for ROOFTECH 100-120-140-160
Module gaz pour ROOFTECH 100-120-140-160
Gasmodul für ROOFTECH 100-120-140-160
Modulo gas per ROOFTECH 100-120-140-160
Módulo gas para ROOFTECH 100-120-140-160

IOM RT 03-N-4GB
Part number / Code / Teil Nummer / Codice / Código : **3990449GB**
Supersedes / Annule et remplace / Annulliert und ersetzt /
Annulla e sostituisce / Anula y sustituye : **IOM RT 03-N-3GB**

INSTALLATION INSTRUCTION English

NOTICE D'INSTALLATION Français

INSTALLATIONSHANDBUCH Deutsch

ISTRUZIONI INSTALLAZIONE Italiano

INSTRUCCIONES DE INSTALACIÓN Español

English

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BEFORE STARTING WORK IN THE ELECTRIC CONTROL BOX

GENERAL RECOMMENDATIONS

Please read the following safety precautions very carefully before installing the unit.

SAFETY DIRECTIONS

Follow the safety rules in forces when you are working on your appliance.

The installation, commissioning and maintenance of these units should be performed by qualified personnel having a good knowledge of standards and local regulations, as well as experience of this type of equipment.

The unit should be handled using lifting and handling equipment appropriate to the unit's size and weight.

Any wiring produced on site must comply with the corresponding national electrical regulations.

Make sure that the power supply and its frequency are adapted to the required electric current of operation, taking into account specific conditions of the location and the current required for any other appliance connected with the same circuit.

The unit must be EARTHED to avoid any risks caused by insulation defects.

It is forbidden to start any work on the electrical components if water or high humidity is present on the installation site.

WARNING

Cutoff power supply before starting to work on the appliance.

When making the hydraulic connections, ensure that no impurities are introduced into the pipe work.

The manufacturer declines any responsibility and the warranty becomes void if these instructions are not respected.

If you meet a problem, please call the Technical Department of your area.

If possible, assemble the compulsory or optional accessories before placing the appliance on its final location. (see instructions provided with each accessory).

In order to become fully familiar with the appliance, we suggest to read also our Technical Instructions.

-The informations contained in these Instructions are subject to modification without advance notice.

GENERAL WARNINGS

The manufacturer disclaims any liability (under contract provisions or otherwise) for damage to persons, animals, or objects resulting from wrong installation or misuse, and/or non compliance with the manufacturer's instructions.

This unit is intended only and exclusively for the use for which it has been built. Any different, wrong, or unreasonable use is to be considered improper and therefore dangerous.

For the installation, the operation and the maintenance of the unit, the user shall strictly follow the instructions stated in this manual.

Any installation, maintenance or servicing operations shall be performed only by authorised personnel,with specific technical skills in the heating field.

First start-up, conversion to another gas type and maintenance must be exclusively carried out by qualified personnel.

The manufacturer declares that the unit is workmanlike built in compliance with UNI, UNI-CIG 7129, and CEI technical regulations, and according to the relevant laws and to the Gas Directive 90/396/CEE.

SAFETY WARNINGS

This section describes the safety rules for operators.

GAS

Before starting the burner, check that:

- The grid of combustion air intake system is free from debris, leaves, etc.
- Gas supply specifications match those on the rating plate.
- Combustion air inlet pipes (if installed) and flue discharge pipes are exclusively those specified by the manufacturer.
- Internal and external sealing of the gas supply system is tested in compliance with the law.
- The heater's gas is the one specified for the burner.
- The unit is correctly sized to match required flow and includes all safety and control devices required by the law.
- Gas pipes and air distribution ducts for ducted heaters have been properly cleaned.
- Gas capacity adjustment matches equipment power rating.
- Gas supply pressure matches values on rating plate.

GAS LEAKS

If you smell gas:

- ➢ Do not operate electrical switches, telephone or any other object or device that can cause sparks.
- ➢ Immediately open doors and windows to vent the room.
- ➢ Close gas valves.
- ➢ Call for **qualified personnel**.

POWER SUPPLY

WARNING:

- ➢ Check the grounding system or have it checked by qualified personnel, if necessary.
- ➢ Make sure network wire gauge suits the unit rated input shown on rating plate.
- ➢ The system wire gauge in general, and cable section in particular, must suit the unit rated input shown on equipment data plate and in this Manual.
- ➢ Do not pull electrical wires and keep them far from heat sources.

Any installation or maintenance operation concerning the electrical system must be accomplished by qualified personnel.

USE

Users shall adopt the following precautions:

- ➢ Do not use gas pipes to ground electrical devices.
- ➢ Do not touch hot surfaces, such as flue pipes.
- ➢ Do not touch moving parts of the burner while it is working.

GENERAL FEATURES

The main characteristic of burners is modulation, which means that thermal power output, and therefore power input and fuel consumption, vary according to heat request.

When less heat is needed, the burner reduces gas consumption and increases efficiency up to 104% (efficiency upon Hi).

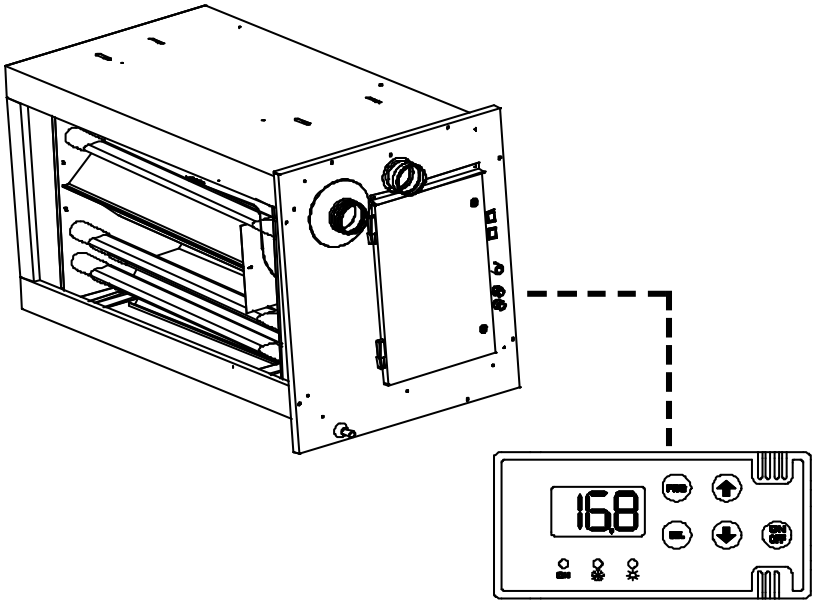
Air is heated by contact with the combustion chamber and heat exchanger surfaces.

The heat exchanger complies with production requirements for equipment where combustion gases produce condensation set by EN1196 regulations.

The combustion chamber is entirely built in AISI 430 stainless steel while surfaces of components, such as the heat exchanger or the hood for flue collection, where condensation can be found, are made of AISI 304L, in order to provide high resistance to condensation.

The leading-edge design of the combustion chamber and the heat exchanger, the balancing of pressure drops and the extended surface, guarantee optimum efficiency and durability.

Remote control allows you to control and display working phases and possible faults.



LOW POLLUTION

The ratio between the gas flow through the gas valve and the air flow always corresponds to the predefined setting. As opposed to the behaviour of atmospheric burners, here the CO2content remains steady throughout the hole working range of the heater.

If combustion air fails, the gas valve shuts up. If combustion airdecreases, the valve automatically reduces gas flow without compromising optimal working parameters

The pre-mix burner, coupled with the air/gas valve, allows "clean" combustion with very low polluting emissions.

TECHNICAL DATA

Rooftech size		RTC 100	RTC 120	RTC 140	RTC 160
Nominal airflow	m3/h	20 000	22500	27500	30000
Burner type		Modulating gas burner with condensation			
Gas		G20*			
Supply pressure	mbar	min:17 - max:25			
Minium capacity	kW	**42.4**			
Gas consumption	m3/h	**4.66**			
Maximum efficiency	%	**103.5**			
Maximum capacity	kW	**156.3**			
Gas consumption	m3/h	**16.4**			
Minimum efficiency	%	**93**			
Condensation produced	l/h	3.87			
Ø gas connection	in.	UNI ISO 7/1 - 1»M			
Ø Condensation drain	in.	20 mm			
Air Pressure drop	Pa	30	45	60	103
CE approuval		0694BM3433			

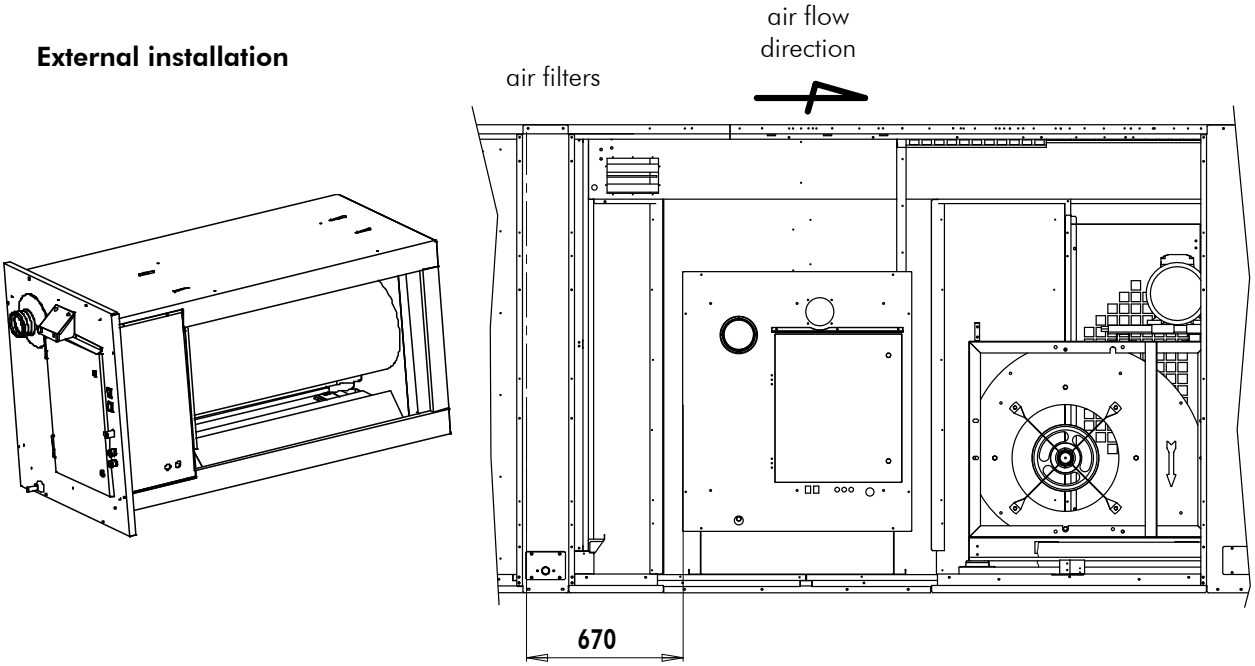
* G25 & G30 upon request

INSTRUCTIONS TO THE INSTALLER

Instructions for installing and setting the burner are intended for authorised personnel only.

Read safety rules first.

External installation



FLUE CONNECTIONS

Burner have sealed combustion circuits, and the fan is installed before the exchanger.

Flue system is type "combustion air taken in from outdoor".

Use gasketed tubes to avoid any condensation leaks. The gasket must be suited to flue temperature ranging from 30° to 160°C.

No need to insulate the chimney to prevent condensation from being produced in pipes. Condensation cannot damage the burner which has been designed to drain it. The only reason to insulate pipes is to protect people who might incidentally touch them.

CONDENSATION DRAIN SYSTEM

Special care is required by the condensation drain system. If this system is badly built, the unit may not work properly.

In building this system, make sure to prevent:

- Condensation water from accumulating into the exchanger.
- Condensation water from freezing in the pipes.
- Exhausting flue through the condensation drain system.

ACCUMULATION OF CONDENSATION WATER INTO THE EXCHANGER

During regular operation, condensation water must not accumulate into the exchanger.

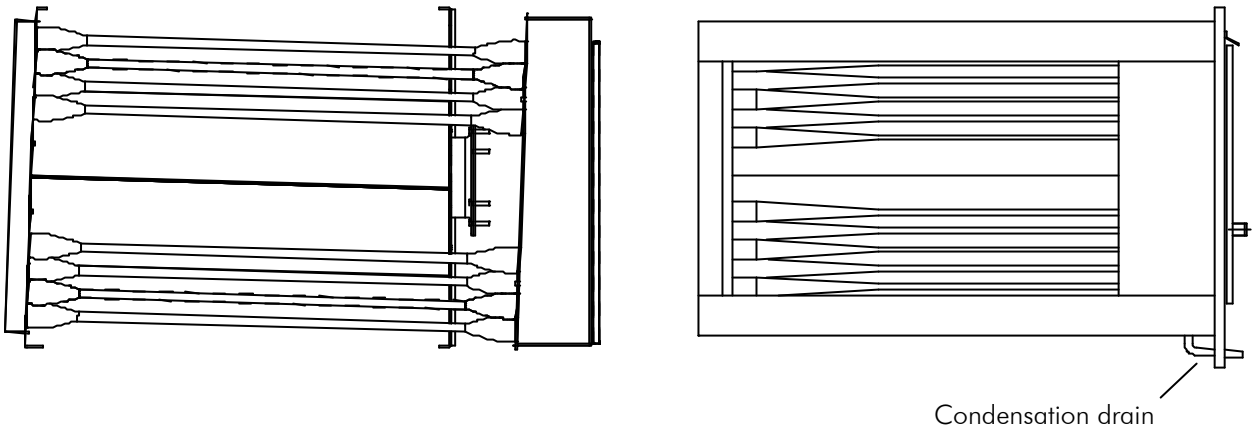
The flue pressure switch controls and locks the burner before the water reaches a dangerous level in the flue hood.

Exchanger tubes are slightly inclined to force condensation water to flow into the hood without accumulating, in compliance with the law.

When installing the ROOFTECH on the floor, make sure that is perfectly leveled. This assures the tube bundle will keep the correct inclination.

The system can drain condensation water in the following ways:

- Free drainage
- Using a siphon
- Into a water pipe



PRECAUTIONS

Materials to be used for the condensation drainage system:

- for hot pipes (i.e. flue pipes),

  aluminum, stainless steel, silicone tube, or Viton;
- for cold pipes (water pipes), PVC and any materials suitable for hot pipes.

Do not use copper nor galvanised iron pipes.

FREE DRAINAGE

If the temperatures are never too cold, you can choose not to connect the water drain tube to any piping. You only need to make sure the water doesn't stagnate by the ROOFTECH.

If a collecting hose is to be installed, do not seal it directly to the outlet drain tube (see drawing below). In fact, if water freezes into the tube, ice will block the drain and condensation water will accumulate into the exchanger.

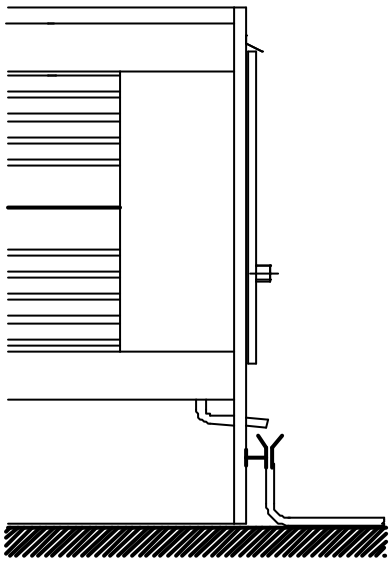
When the heater works at maximum power, the heat of the flue will cause the ice in the tube to melt, freeing the drain outlet.

DRAINING INTO WATER PIPES

A good solution to protect the system from ice is to build the drainage within a heated room, connecting it to a water-drain pipe or collecting tank where the condensation water can be handled using basic solutions.

This solution requires installing a siphon to prevent flue exhaust through the condensation drain system. The siphon can also be installed far from the ROOFTECH.

In this latter case, the connecting pipe shall not run outdoor. The first part of the connecting piping (2-3 meters) will be made of metallic or silicone hose that can resist high flue temperatures, and shall never be exposed to low temperatures, whether it runs into the unit or into a heated room



CONVERSION TO G25 - G25.1 GAS

Conversion from G20 into G25 is only allowed for Countries in Cat. 2ELL [Germany] and in Cat. 2HS [Hungary].

In Countries in Cat. "2L" [Holland], the unit is supplied set and tested for G25.

For Cat. 2E Countries [France, Belgium and Luxembourg], where conversion from G20 to G25 is not allowed, the appliance is supplied already set to use both G20 and G25 gases. Therefore, conversion is not needed.

Conversion to G25 and/or G25.1 gases, where possible, requires:

- (any models) replacement of pilot nozzle.
- Diaphragm mounting is only allowed in Germany, Holland, and Hungary while it is forbidden in other Countries.

After completing the conversion, turn the burner on and:

- Check that the inlet pressure to the gas valve matches the one required for the available gas
- Check that CO 2 value at max and min thermal output does not exceed the accepted range for gas type. If it does, change it by turning the Venturi adjustment screw: turn it clockwise to decrease the value and counterclockwise to increase it.
- Stick the label "Appliance converted into G25 gas" over the previous label "Appliance set for ... ".

Note: Pay attention to CO2 value for G25.1 gas.

Gas type according country		G20 GAS	G25 GAS	G30 GAS		G31 GAS		
Supply Pressure	mbar	20	25	30	50	30	37	50
Supply Pressure (min.)	mbar	17	20	25	42.5	25	25	42.5
Supply Pressure (max.)	mbar	25	30	35	57.5	35	45	57.5
Ø of pilot nozzle	mm	0.6	0.65	0.51		0.51		
Carbon dioxide CO_2	%	8,7 ± 0,2	8,7 ± 0,2	9,6 ± 0,2		9,4 ± 0,2		
Gas consumption (min capacity)		4.66	5.41	2.83		2.79		
Gas consumption (max. capacity)		16.4	19.07	9.97		9.83		

GAS SUPPLY SYSTEM

For this system, use CE-approved and certified components only.

Modules are supplied with a double gas valve and a gas filter and stabiliser already installed.

All components are assembled into the burner housing.

To complete installation in compliance with the law, the following components have to be installed:

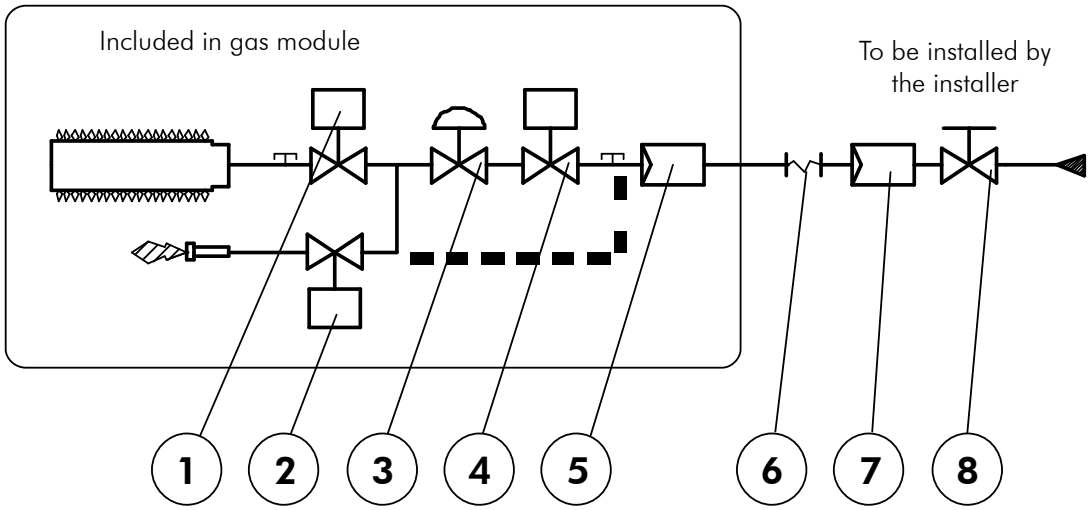
- Vibration damping joint
- Gas cock

We recommend installing a gas filter with a high flow rate and no pressure stabiliser. In fact, the standard filter installed before the gas valve has a limited surface.

To assure efficient maintenance, use a gasket and a swivel joint to connect the module.

Do not directly use threaded joints on gas fitting.

The law allows a maximum pressure of 40 mbar. Higher pressure values shall be reduced before the ROOFTECH.



LEGEND

1. Main burner gas solenoid valve
2. Pilot burner gas solenoid valve valve
3. Pressure stabiliser
4. Safety solenoid valve
5. Gas filter (small section)
6. Vibration damping joint
7. Gas filter (large section)
8. Gas cock

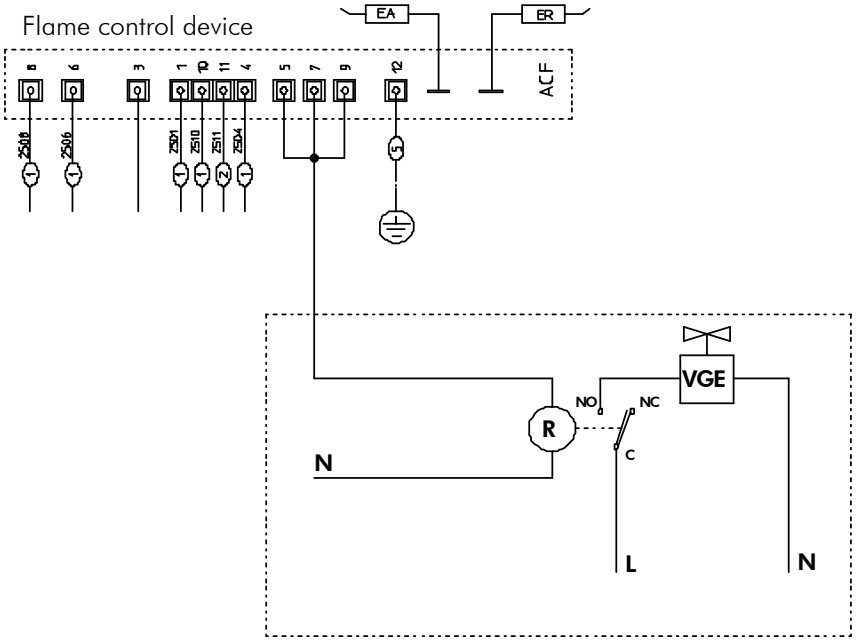
EXTERNAL GAS VALVE

For LPG-fuelled equipment, laws in some European countries require that a gas valve is installed outside the room where the appliance is located.

This valve must open and close simultaneously when the equipment starts up and turns off.

The diagram below shows how to wire the gas valve control. The installation of a relay is recommended since the outlet of the flame control device has a limited voltage.

How to Connect an External Gas Valve



Legend:

L : Line

N : Neutral

R : Relay coil

VGE : External Gas Valve

Connections:

1. Cut the bridge between terminals 5, 7, and 9 of the flame control device connector, leaving wires long.
2. Use the terminal to reconnect bridge wires adding another wire that will be connected to the relay coil.
3. Wire the neutral to the relay bobbin and to the gas valve.
4. Wire the line cable to the common terminal on the relay
5. Wire the NO (normally open) contact to the gas valve.

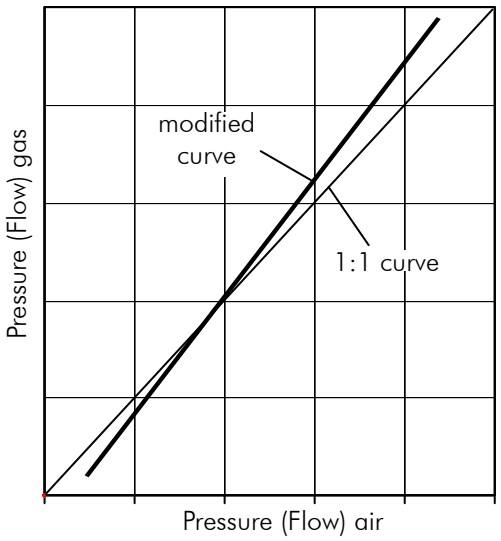
WORKING CYCLE

AIR/GAS PREMIXING OPERATION AND SETTING

Air and gas are mixed inside the blades of the fan motor assembly.

Air is taken in through a calibrated Venturi pipe where gas is drawn by air vacuum.

The air / gas pressure ratio is 1:1 and this ratio can be adjusted by turning the offset screw on the gas valve. The offset is already set and the screw is sealed. The burner can also be regulated by adjusting the screw on the Venturi which sets the value of maximum gas flow rate and therefore determines the carbon dioxide content (CO2) in the flue (change in the offset curve). This setting is a factory default but the screw is not sealed in order to allow switching to another gas. To know how to regulate the offset value an the CO2 content, see the "Assistance by the Service Centre" section. The modulation card regulates the motor's revolution speed (in DC) according to the required thermal power output. When motor revolution speed changes, air and gas flows change accordingly. The minimum and maximum fan speed values are set in the card and cannot be changed by the user and/or the installer.

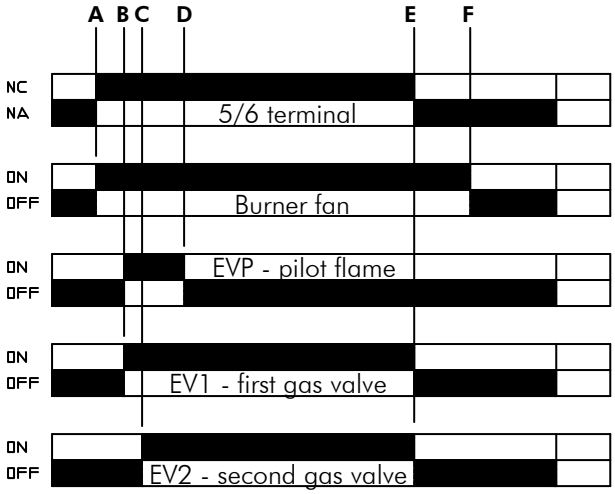


BURNER OPERATION

When heating is required, the 0-10 Vdc signal exceeds minimum startup threshold (see Electrical Wiring section):

➢ The flame control device starts the burner fan [A], beginning to pre-wash the combustion chamber for a default period (20s).
Red diode lit

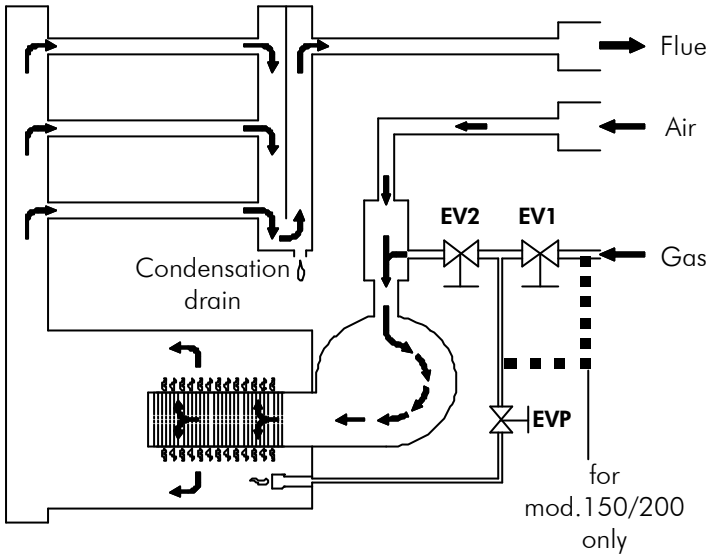
➢ Once this phase is over, the start-up cycle is initialised: the EV1 electrical valve opens simultaneously with the EVP valve, feeding the pilot burner [B].



➢ After detecting the pilot flame, the device causes the EV2 main gas valve [C] to open and feed the main burner.

➢ Pilot and main burner work together for a short period (5s), then the modulation card closes the EVP electrical valve, turning pilot burner [D] off.

A single electrode assures flame detection both for pilot and main burner.



The start-up cycle turns the burner on at intermediate capacity (about 50% of max. capacity). Two minutes after start-up, burner shifts to minimum capacity, then it starts modulating and can reach maximum capacity, if necessary, in the default time set in modulation card program.

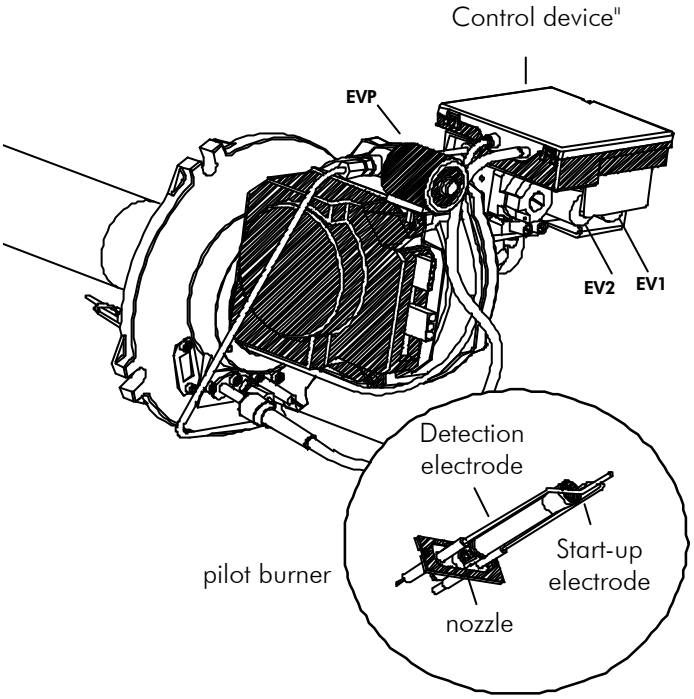
During operation, the modulation card will regulate burner thermal power output according to 0-10Vdc voltage value from IATC.

TURNING OFF THE BURNER

When heat request stops, 7/9 terminals of CN6 board open and the card turns off the burner [E], no matter what the 0-10Vdc voltage value is. The fan keeps cooling down the combustion chamber (post-washing) for the default time [F].

Red diode flashing.

BURNER GROUP

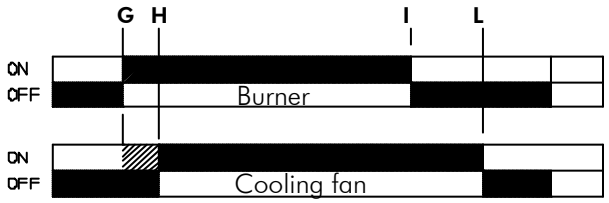


COOLING FANS

Before start the main burner, the cooling fan will start during a default time of 60 s to pre-wash the combustion chamber.

After main burner switch off, cooling fan continue to run for 180 s to cool down the combustion chamber.

TURN OFF/START UP



SAFETY THERMOSTATS

Two safety thermostats with manual reset and positive safety are installed one before and one after the burner. The breaking of the sensible element causes a safety state.

The thermostats are wired in series.

When the thermostat triggers, the flame detection device locks, turning the burner off.

This lock is displayed on the remote control (F2) and transmitted to the IATC (alarm burner) on entry ID1.

An air pressure switch controlling possible obstructions of flue and/or air intake pipes. This pressure switch is wired in series to the safety thermostats and operates identically, thereby causing the F2 lock on the remote control and an "alarm burner" of the IATC.

USER'S INSTRUCTIONS

Read General and Safety Warnings. User's operations on the heater are limited to regulating remote control options.

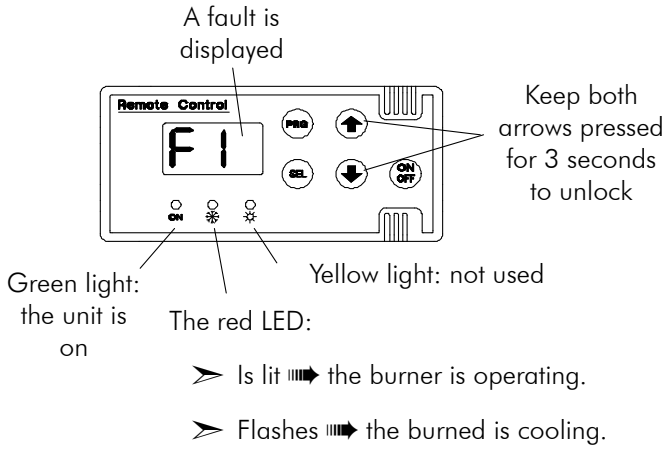
BURNER OPERATION

Heating request causes the unit to start when the following conditions are met:

- Remote control is ON (green light on). Use ON/OFF button to switch on or off the remote control. Regular operation is indicated by green light.
- Closed contact for 7/9 terminals of CN6 board on modulation card (screw 9-pole CN6 board).
- 0-10 Vdc voltage is higher than Von threshold [Axx parameter], if configured.

When heating is required and the burner turns on, a red light is lit beside the green one.

During regular operation, the 0-10 Vdc voltage value of 1/2 terminals on CN6 board is displayed on the remote control.



FX ALARM BURNER

The modulation card can detect eight different types of failures:

F1 - device lock caused by lack of flame.

F2 - safety thermostat (or pressure switch) lock

F3 - lock caused by the burner motor

F4,F5,F6 - not used

F7 - data transfer failure between CPU and remote control

F8 - Failure of flame control device

F1 and F2 locks are caused by safety items and are therefore non-volatile, i.e. they require manual reset and cannot be removed by cutting and then turning on again power supply.

F3 and F8 locks, though they are not safety locks, are non-volatile, too.

F4 to F7 locks are automatically removed when their cause is removed.

To reset F1 and F2 locks, read the relevant paragraph in the "User's Instructions" section.

RESETTING

Modulation and control card automatically runs a set of re-start attempts (4 reset attempts max, A 17 parameter).

During startup cycle, an ignition failure of the burner causes the unit to lock up and the F1 fault to be displayed on remote control screen. Only after completion of the automatic restart set, the external lockup lamp lights up (red light) on the module and an output signal is issued on the digital line.

If, during heater operation, one safety thermostat or control pressure switch is engaged, the unit immediately locks up, the F2 alarm is displayed on remote control screen, a red lamp light up on the module, and the digital output signal is issued. F1 and/or F2 alarms, as well as F3 and F8, can only be manually reset.

To unlock the unit, press simultaneously the two arrow buttons for at least 3 seconds.

REMARK: only 15 seconds after burner motor stops, the unit can be reset.

WARNING: Besides storing all possible alarm conditions (F1 to F8), the modulation card runs an further partial count for F1 and F2 errors: after 5 manual reset operations, the microprocessor itself must be reset in order to continue.

To reset the microprocessor, use the Reset switch on the card or turn power off and on by using 0/1 main switch.

NOTE: another microprocessor is installed on the control card. It independently checks maximum number of flame control unlocks. If this number exceeds maximum value allowed, this microprocessor prevents flame control unlock and indicates the fault by turning on a red led on the card.

To restart the system, reset the microprocessor by means of the Reset switch on the card or turn power off by using 0/1 main switch.

REGULATION

MODULATING THERMAL POWER OUTPUT

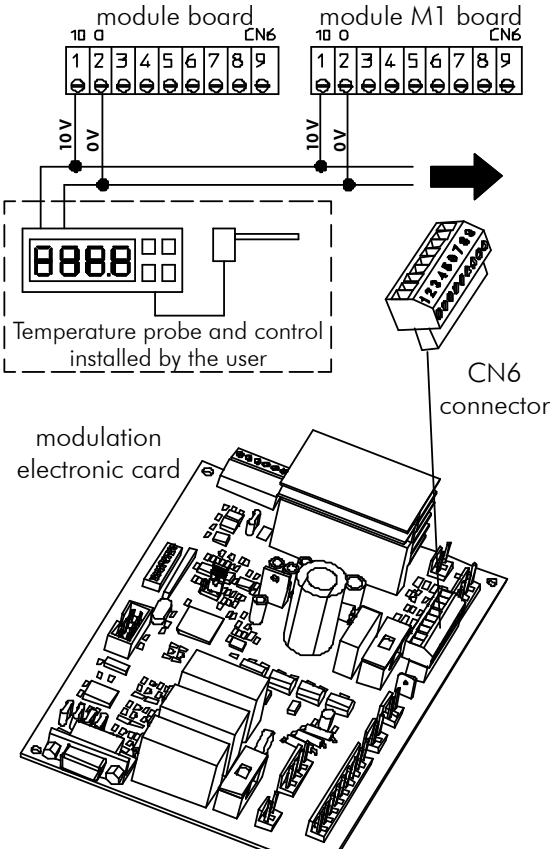
Thermal power output modulates according to the 0-10 Vdc signal.

[C2=0], the 0-10 Vdc signal is essential and its value must exceed Von value (see further in this Manual).

Modulation is linear in between Von value and 10V: Von value indicates minimum power while at 10V the burner runs at maximum power.

Safety contact on 7/9 terminals [CN9 board]. When this contact opens, the burner turns off. This input overrides any 0-10 Vdc input.

0-10 Vdc Signal Wiring



SAFETY CONTACT FOR BURNER ON/OFF

The check-out sequence must include control devices that lock the burner when the following faults occur:

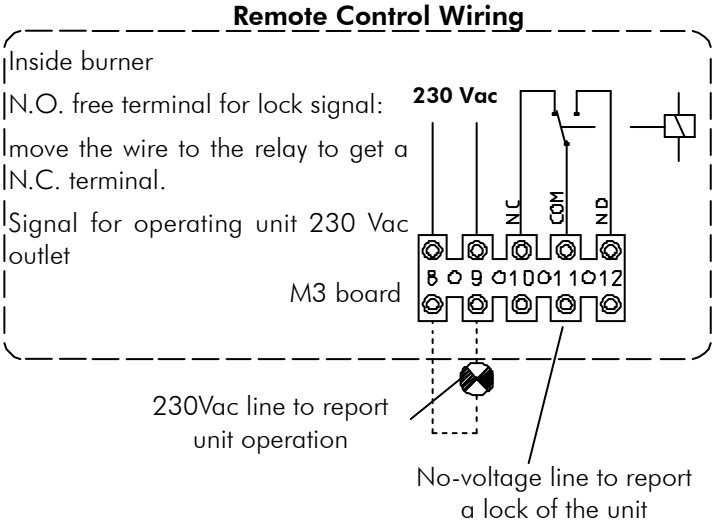
- Closed contact of the fan motor thermal cutout.
- Contact of air flow switch or fan motor contactor (if fans start before or together with the burner).
- Firewall (if installed) or smoke detector.
- Filter control pressure switch.
- Emergency buttons (if installed).

REMOTE SIGNALS

The following signals can be remotely obtained from burners:

- Locked unit
- Burner on

Remote Control Wiring



LOCKED UNIT

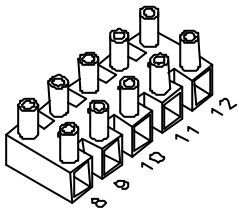
If a fault occurs, a free contact (NC or NO) is available. It is used to report a fault to a remote console.

Use the remote control to unlock the unit.

To remotely unlock the appliance, remote control must be remotely controlled.

BURNER ON

A 230Vac line is available on 8-9 terminals, to report to a remote console a signal for burner on.



OPERATION OF CPU-PLUS CARD

This paragraph contains information on how the CPU-PLUS card works.

The setup of this card is extremely easy and the user can perform it using the remote control and passwords to adapt each parameter to his specific needs.

Three levels of password are available:

1. User
2. Operation
3. Manufacturer

USER

It allows read-only access to modulation values, percentage of thermal power output for instant operation, and error log.

It is up to the manufacturer to choose whether the setup option of set point and "ST" & "P" parameters should be passwordprotected or not.

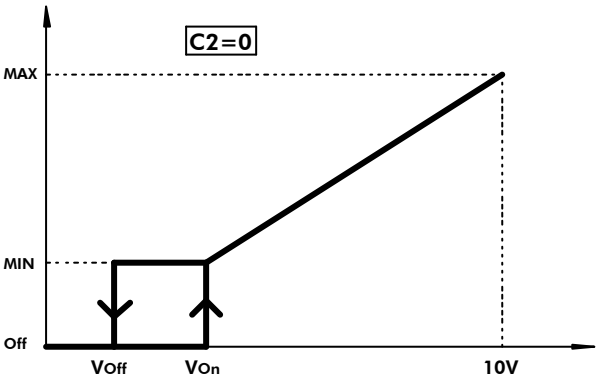
Since operation of modules does not require using "ST" & "P" parameters, they can be password-protected [A32 parameter=1].

OPERATION

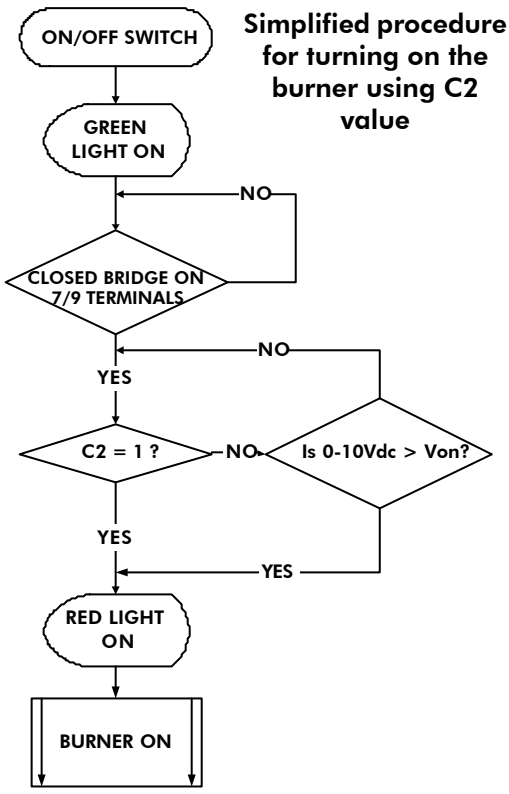
It allows to choose the operative mode required. Basic parameters start with "C".

Essential parameters for models are:

- **C0** - it depends on the type of modulation signal required. The unit must be idle (i.e. green light on and red light off) to change this parameter.
- **C2** - if set to zero (Ø), it turns the burner off when signal is below Voff value and turns it on when signal exceeds Von value. If set to 1, 0-10 VDC signal is used for modulation only (see related flow chart).
- **C6** - It's the timeout between a turning off and the following turning on (OFF-TIMER). It is useful to avoid multiple start-up sequences. It can be set to 1 (1 second), if necessary.



Simplified procedure for turning on the burner using C2 value



FIRST START-UP

The burner is set and tested in factory for using the type of gas as noted on the rating plate. Before starting the heater, go through the following checklist:

- ➢ Make sure the available gas matches corresponds to that indicated on the burner
- ➢ Using the "IN" pressure tap on the gas valve, verify that the inlet pressure to the valve matches the value required for the type of gas used.
- ➢ Power the unit on
- ➢ Check that the remote control displays 0-10 Vdc voltage value at the module's inlet.

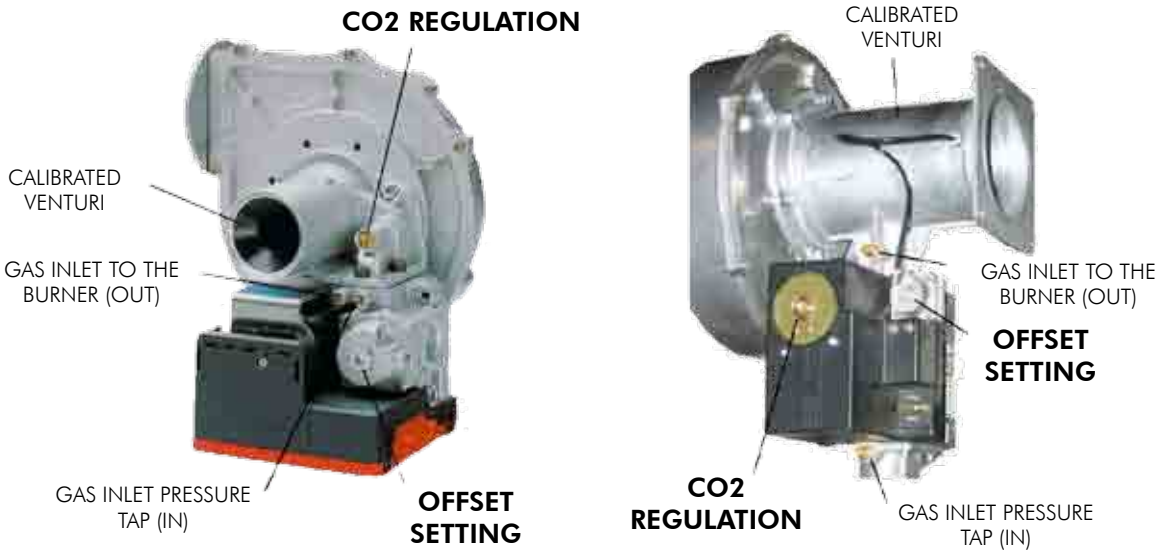
To turn on, do the following:

1. Press the ON-OFF button
2. Check that the green light on the remote control is on. If heating is required, the red light must turn on, too.
3. If the red light doesn't turn on, check a 0-10 Vdc signal, check that incoming value (displayed) exceeds Von value. Wait at least for the period set in A9 parameter.

When the red light turns on, the burner launches the start-up cycle.

At this stage, the pilot burner is not likely to start because of the presence of air in gas pipes and the heater locks up.

To unlock the burner, repeat the procedure until the burner lights up.



COMBUSTION ANALYSIS

1. Wait until the burner reaches maximum capacity.
2. Check again that the inlet pressure to the valve matches the one required by the gas type. If it doesn't, adjust it.
3. Analyse the combustion, verifying that the CO2 value matches the one shown in the "GAS DATA" table.
4. Should the measured value be different, adjust the screw on the Venturi tube: unscrew to increase the CO2 value, screw to decrease it.

   Run the burner at minimum rate and check if CO2 value is the same or slightly lower than CO2 value measured at maximum capacity (up to -0.3%). If the two values do not match, regulate OFFSET screw: screw to increase or unscrew to decrease CO2 content.

ASSISTANCE BY SERVICE CENTRE

During first start up, the combustion efficiency must be analyzed.

This appliance is certified for EC and Extra-EC countries for gas categories listed in the table below.

COUNTRY TABLE - GAS CATEGORY

County	Category	Gas	Pressure	Gas	Pressure
AT	II2H3B/P	G20	20mbar	G30/G31	50mbar
BE <70kW	I2E(S)B,I3P	G20/G25	20/25mbar	G31	37mbar
BE >70kW	I2E(R)B,I3P	G20/G25	20/25mbar	G31	37mbar
CH	II2H3B/P	G20	20mbar	G30/G31	50mbar
DE	II2ELL3B/P	G20/G25	20mbar	G30/G31	50mbar
DK, FI, GR, SE	II2H3B/P	G20	20mbar	G30/G31	30mbar
ES, GB, IE, PT	II2H3P	G20	20mbar	G31	37mbar
IT	II2H3B/P	G20	20mbar	G30/G31	30mbar
FR	II2Esi3P	G20/G25	20/25mbar	G31	37mbar
LU	II2E3P	G20/G25	20mbar	G31	37/50mbar
NL	II2L3B/P	G25	25mbar	G30/G31	30mbar
NO	II2H3B/P	G20	20mbar	G30/G31	30mbar
HU	II2HS3B/P	G20/G25.1	25mbar	G30/G31	30mbar
CZ	II2H3B/P	G20	20mbar	G30/G31	30mbar
CY, MT	I3B/P			G30/G31	30mbar
EE, LT, LV	II2H3B/P	G20	20mbar	G30/G31	30mbar
IS	I3P			G31	37mbar
SK	II2H3B/P	G20	20mbar	G30/G31	30mbar
SI	II2H3B/P	G20	20mbar	G30/G31	30mbar
BG, RO, TR	II2H3B/P	G20	20mbar	G30/G31	30mbar
PL	II2E3B/P	G20/GZ350	20/13mbar	G30/G31	36mbar

On the label the following information are clearly marked: Target country, Gas category and Unit code.

The code shows the factory setting for the unit.

Codes without extension:

- PCHISOIT No extension means that the unit has been prepared and tested for [G20] natural gas.

Codes with extension:

- the fourth letter identifies the gas for which the unit has been set:
- PCHISOFR-xxx**0** 0 indicates the unit has been set and tested for [G20] natural gas.
- PCHISOMT-xxx**1** 1 indicates the unit has been set and tested for [G31] Liquid Propane.
- PCHISONL-xxx**2** 2 indicates the unit has been set and tested for [G25] natural gas.
- PCHISOHU-xxx**3** 3 indicates the unit has been set and tested for [G25.1] natural gas.
- PCHISOPL-xxx**4** 4 indicates the unit has been set and tested for [GZ350] gas.

Another label on the burner, placed near fuel supply, clearly states which gas type and supply pressure the unit has been set and tested for.

MAINTENANCE

Maintenance and combustion control operations shall be carried out in compliance with existing regulations and laws. Before running any servicing or cleaning, disconnect power and gas supply by means of main ON/OFF switch.

In case of failure and/or improper operation, switch off and do not attempt to repair it directly. Contact the authorised Service Centre.

Use only original spare parts for repairs. Failure to follow above instructions could compromise the unit safety and shall avoid the warranty.

If the burner is not used for long periods, shut the gas off using gas cocks and disconnect the unit from power supply.

If the unit is to be definitively decommissioned, in addition to above suggestions, any potential source of hazard shall have to be made inoffensive.

It is mandatory that the inlet of the Venturi tube on the burnerfan assembly is kept free from any debris or obstructions. In case it is not, a backfire from the pre-mix burner might occur.

INLET OF THE VENTURI TUBE

To keep the unit perfectly efficient and guarantee its durability,

we recommend to go through the following checklist every year before restarting the burner:

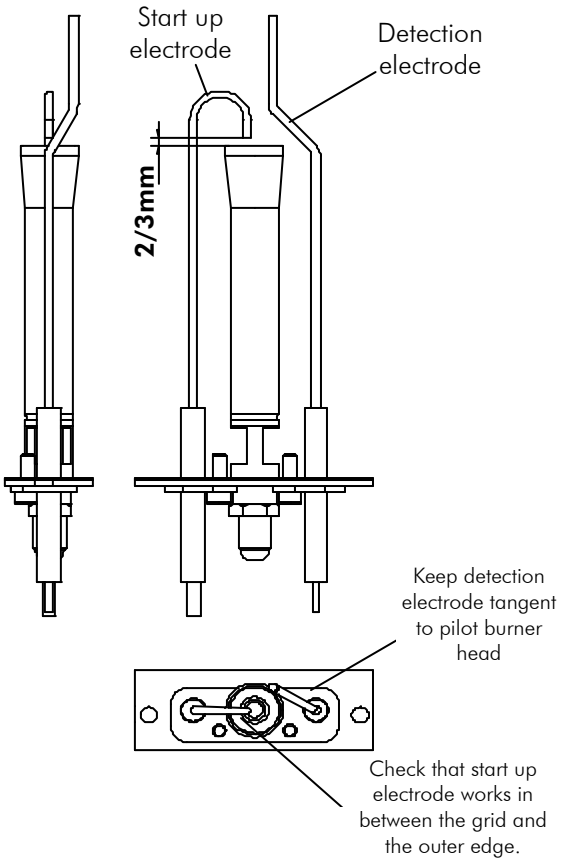
1. Check start-up, flame detection and pilot flame electrodes.
2. Check exhaust and air intake terminals and ducts.
3. Check the Venturi.
4. Check that the heat exchanger is clean.
5. Check that the siphon for condensation drainage is clean.
6. Check the inlet pressure of the gas valve.
7. Check the operation of flame control device and air pressure switch.
8. Check the safety thermostat/s.
9. Check ionisation current.

Note: Checks in steps 1, 2, 3, 4, and 5 must be carried out after power and gas supplies have been cut off.

Checks in steps 6, 7, 8, and 9 must be carried out while the heater is running.

ELECTRODES

Remove the pilot burner assembly and clean the steel grid and the nozzle with a compressed air jet. Check the integrity of the ceramic and use emery paper to remove any oxidation on metal parts of the electrodes. Check that electrodes are correctly placed (see drawing below). Verify that the detection electrode is installed tangent to burner head, not into it. The start-up electrode must discharge over the grid of pilot burner.



FLUE EXHAUST AND AIR INLET TERMINALS

Check duct status looking into them or using suitable tools.

Remove dust from air intake terminal.

THE VENTURI

If necessary, use a brush to remove dust on the Venturi inlet, taking care not to let it drop inside.

EXCHANGER

Optimal combustion efficiency in burners prevents residual combustion products. However, in time, some dirt could settle inside exchanger pipes, due to the fine dust drawn through the combustion air duct. It is not possible to schedule a precise timetable for cleaning the heat exchanger. A sensible decrease in gas flow could indicate there is dirt inside the heat exchanger.

SIPHON FOR CONDENSATION DRAINAGE (IF INSTALLED)

Clean the siphon every year, checking its joints. Make sure no metallic residue is found. In case it is, clean the siphon more frequently.

After emptying the siphon, remember to fill it with water and close it with its plug before restarting the heater.

INLET GAS PRESSURE

Check that the inlet pressure to the valve corresponds to the one required for the available gas.

This check is to be carried out while the burner is running.

FLAME CONTROL DEVICE

While the burner is running, close the gas tap and verify that the unit locks and that F1 is displayed on the remote control. Reopen gas tap, reset, and wait for the burner to restart.

SAFETY THERMOSTAT/S AND AIR PRESSURE SWITCH

This operation is to be carried out while the burner is on.

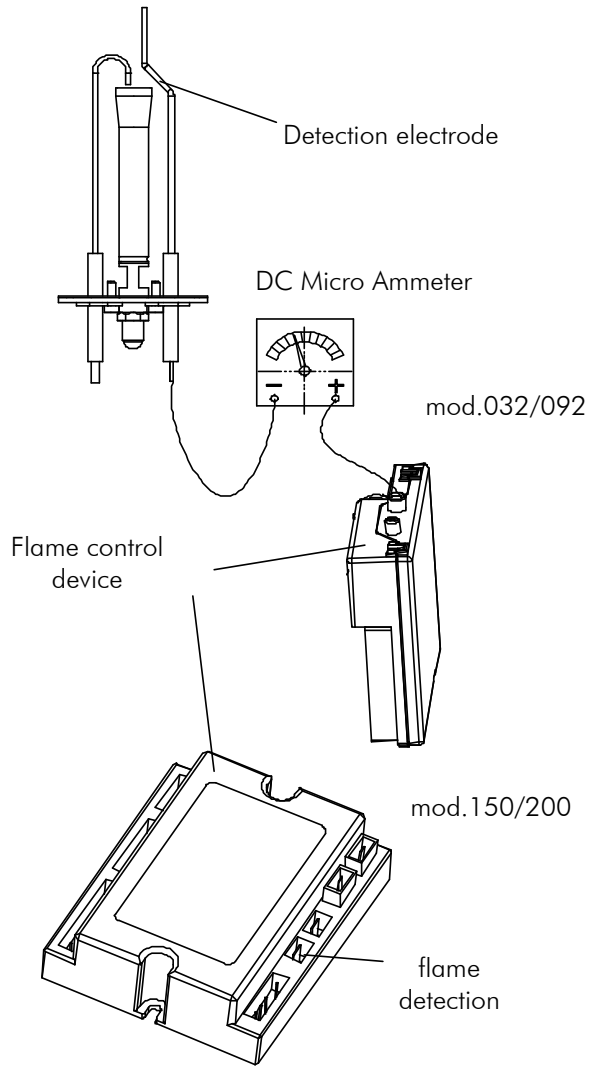
Open the thermostat series (230V) using an isolated tool. Disconnect fast-on from air pressure switch or safety thermostat, wait until [F2] lock is displayed on the remote control. lose back the thermostat series and unlock.

IONISATION CURRENT

Carry out this operation using a device capable of testing direct current microAmperes. Do the following:

- ➢ Disconnect the unit from power supply.
- ➢ Disconnect flame control device cable and connect it to the negative pole of the tester.
- ➢ Use a wire to connect the positive pole of the tester and the flame control device of the unit.
- ➢ Power on the device and wait for the burner to start up.
- ➢ Check ionisation value.

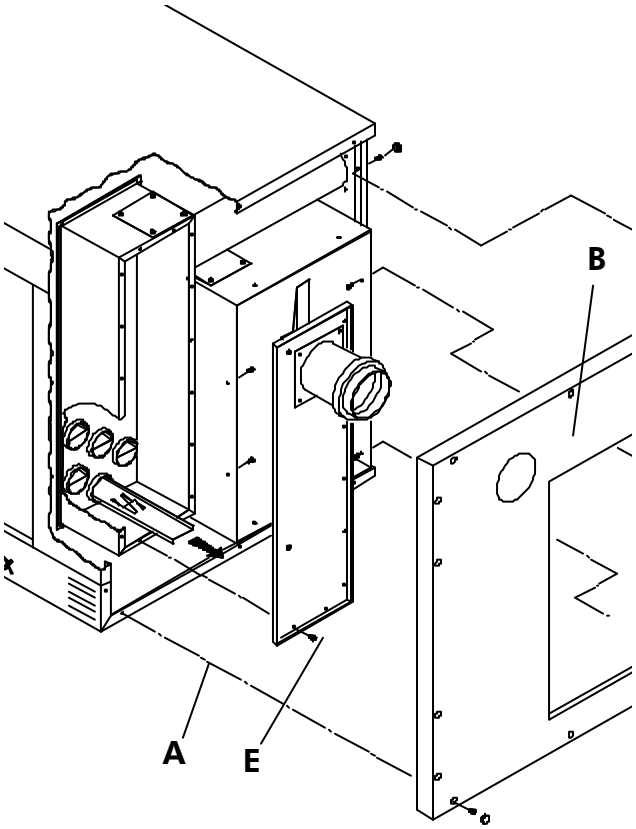
  This value must not be lower than 2 micro Amperes. Lower values would indicate that the detection electrode is misplaced, oxidised or it is going to break down.



CLEANING THE EXCHANGER

The following operations must be carried out when the burner is cold and disconnected from power supply:

- Remove the door.
- Unscrew the "A" screws that hold the control board to the right side panel "B" (where the door is fixed).
- Disconnect gas pipe, power supply and flue evacuation system.
- Remove external panel "B".
- Unscrew "E" screws fixing the exhaust hood cover.
- Use a suitable brush to clean pipes all along their length, pushing dirt towards the outlet to collect it.
- Check that condensation drain joint is clean.
- Reassemble all the parts, making sure seals are correctly installed.



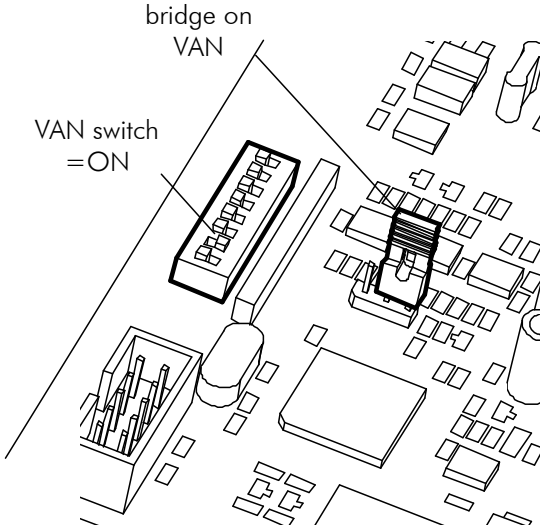
REPLACING THE MODULATION CARD

When replacing the card, some checks have to be carried out and some parameters have to be set using the remote control. Parameter setup is mandatory in some units while in others it depends on the operative mode chosen by the manufacturer.

Modules use a default list of values. Please update this list each time a change is made so that replacement cards can be precisely configured, if necessary.

VERIFYING CONFIGURATION OF THE CARD

It is necessary to build a NTC/VAN bridge on VAN and that VAN switch is ON as shown in figure below. This configuration is required to use 0-10V signal input.



SETTING UP PARAMETERS

Parameters whose setup is mandatory are: C0, A1, A2, A7, and A31

- C0, Chooses type of operation. Set five (5) for all models with 0-10 Vdc inlet..
- A1, A2 & A3 They determine thermal output power of the burner. For replacement card: A1 and A2 are set to zero (0), A3 to 70.

  burner PCH092 parameters: A1 ➡ 22 A2 ➡ 100 A3 ➡ 70

  burner PCH150 parameters: A1 ➡ 18 A2 ➡ 100 A3 ➡ 50

  burnerr PCH200 parameters: A1 ➡ 15 A2 ➡ 91 A3 ➡ 50
- A7 sets the length of pilot operation. Its default value is 10.

  burner PCH092 parameter: A7 ➡ 10

  burner PCH150 parameter: A7 ➡ 5

  burnerr PCH200 parameter : A7 ➡ 5
- A31 defaults to 2. This value must be changed for models 150-200.

  burner PCH092 parameter: A31 ➡ 2

  burner PCH150 parameter: A31 ➡ 3

  burnerr PCH200 parameter: A31 ➡ 3

To access setup mode, do the following:

- Power the unit on
- Turn it off using ON/OFF switch (green light off).
- Wait until red light, if on, stops flashing (end of the burner shutdown phase).
- Press together PRG and SEL keys until "000" appears.
- Use arrows to change flashing zero (0).
- Press SEL key to confirm. The next digit will automatically start flashing.

- Keep using arrow and SEL keys to change and confirm digits to form correct password.
- Press PRG. C0 will appear on the display.
- Press SEL to select the required parameter, change its value using arrows and press SEL to confirm.
- Press arrows to navigate through parameters.

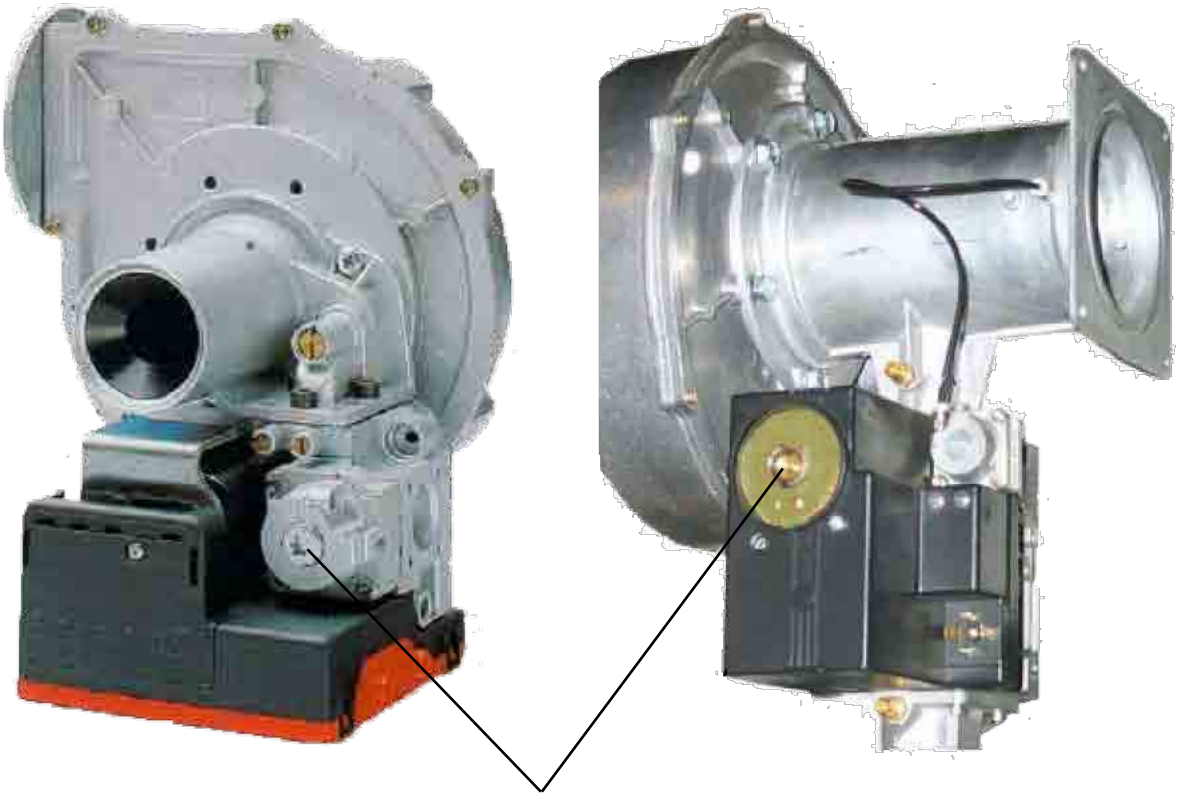
Press PRG to exit setup menu.

Ask the manufacturer for the password.

REPLACING THE GAS VALVE ANDSETTING THE OFFSET

If the gas valve is to be replaced, the CO2 content must be checked and adjusted, if necessary, regulating the offset.

Refer to paragraph "**COMBUSTION ANALYSIS**" for adjustment procedure.



OFFSET SETTING

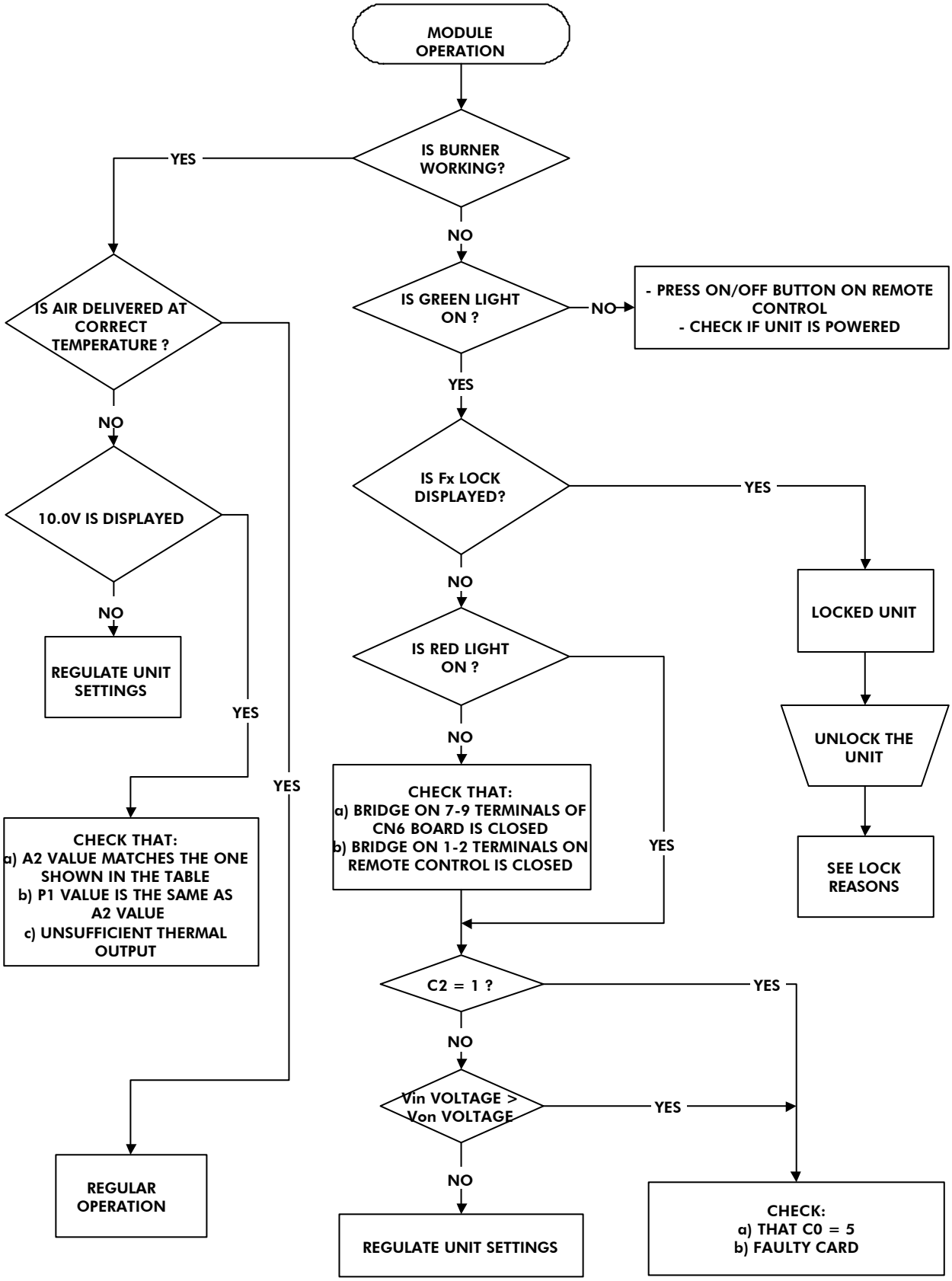
DEMOLITION

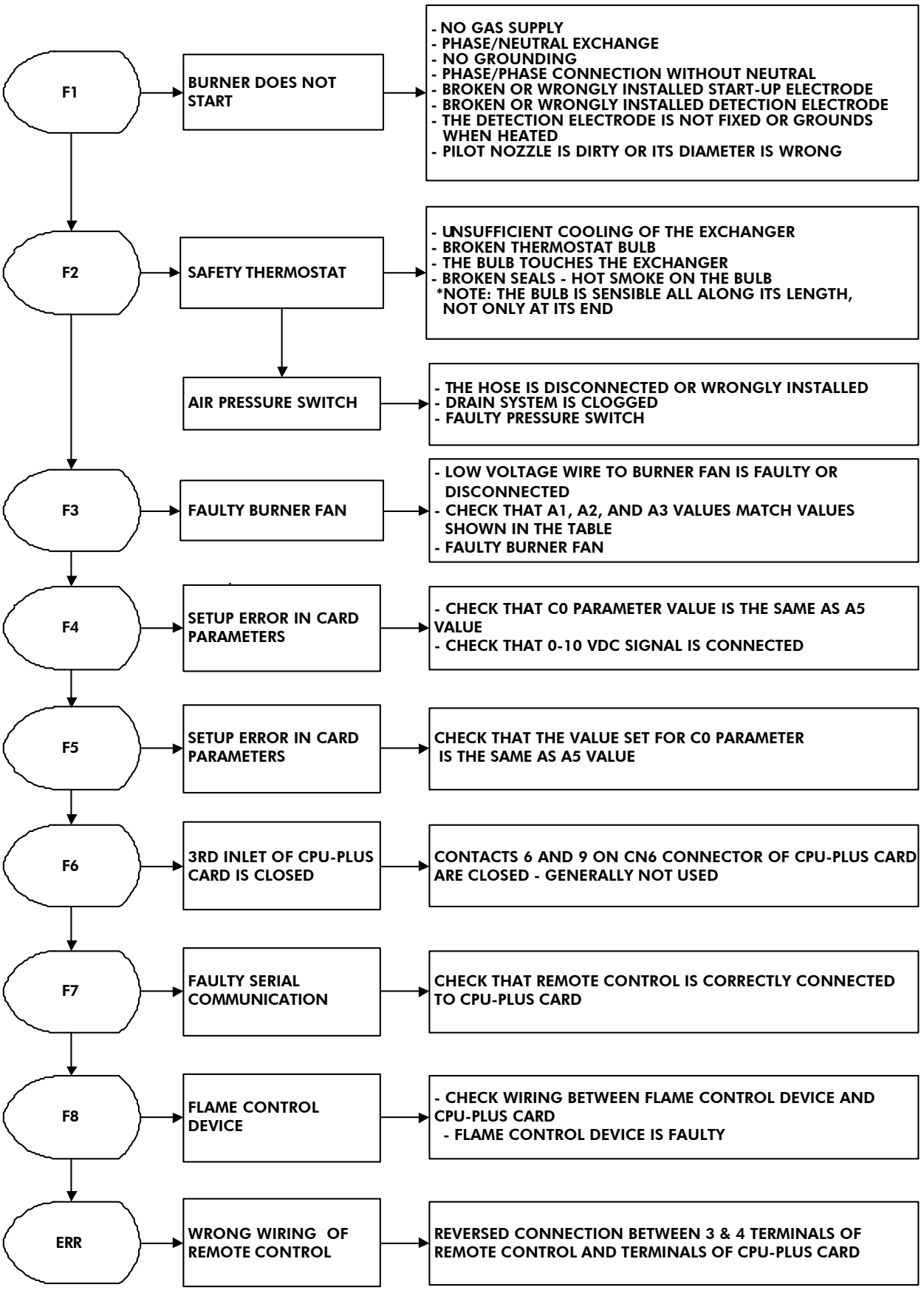
Should the burner be dismantled or demolished, please take care to:

- remove cables;
- remove all plastic components.

REMARK: Any recovered material shall be treated and disposed of according to existing regulations and/or rules given in safety technical sheets accompanying chemical products.

TROUBLESHOOTING




F1
BURNER DOES NOT START
- NO GAS SUPPLY
- PHASE/NEUTRAL EXCHANGE
- NO GROUNDING
- PHASE/PHASE CONNECTION WITHOUT NEUTRAL
- BROKEN OR WRONGLY INSTALLED START-UP ELECTRODE
- BROKEN OR WRONGLY INSTALLED DETECTION ELECTRODE
- THE DETECTION ELECTRODE IS NOT FIXED OR GROUNDS WHEN HEATED
- PILOT NOZZLE IS DIRTY OR ITS DIAMETER IS WRONG
F2
SAFETY THERMOSTAT
- UNSUFFICIENT COOLING OF THE EXCHANGER
- BROKEN THERMOSTAT BULB
- THE BULB TOUCHES THE EXCHANGER
- BROKEN SEALS - HOT SMOKE ON THE BULB
*NOTE: THE BULB IS SENSIBLE ALL ALONG ITS LENGTH, NOT ONLY AT ITS END
AIR PRESSURE SWITCH
- THE HOSE IS DISCONNECTED OR WRONGLY INSTALLED
- DRAIN SYSTEM IS CLOGGED
- FAULTY PRESSURE SWITCH
F3
FAULTY BURNER FAN
- LOW VOLTAGE WIRE TO BURNER FAN IS FAULTY OR DISCONNECTED
- CHECK THAT A1, A2, AND A3 VALUES MATCH VALUES SHOWN IN THE TABLE
- FAULTY BURNER FAN
F4
SETUP ERROR IN CARD PARAMETERS
- CHECK THAT C0 PARAMETER VALUE IS THE SAME AS A5 VALUE
- CHECK THAT 0-10 VDC SIGNAL IS CONNECTED
F5
SETUP ERROR IN CARD PARAMETERS
CHECK THAT THE VALUE SET FOR C0 PARAMETER IS THE SAME AS A5 VALUE
F6
3RD INLET OF CPU-PLUS CARD IS CLOSED
CONTACTS 6 AND 9 ON CN6 CONNECTOR OF CPU-PLUS CARD ARE CLOSED - GENERALLY NOT USED
F7
FAULTY SERIAL COMMUNICATION
CHECK THAT REMOTE CONTROL IS CORRECTLY CONNECTED TO CPU-PLUS CARD
F8
FLAME CONTROL DEVICE
- CHECK WIRING BETWEEN FLAME CONTROL DEVICE AND CPU-PLUS CARD
- FLAME CONTROL DEVICE IS FAULTY
ERR
WRONG WIRING OF REMOTE CONTROL
REVERSED CONNECTION BETWEEN 3 & 4 TERMINALS OF REMOTE CONTROL AND TERMINALS OF CPU-PLUS CARD

APPENDIX
ANNEXE
ANLAGE
ALLEGATO
ANEXO

APPENDIX

ANNEXE

ANLAGE

ALLEGATO

ANEXO

DIMENSIONS

DIMENSIONS

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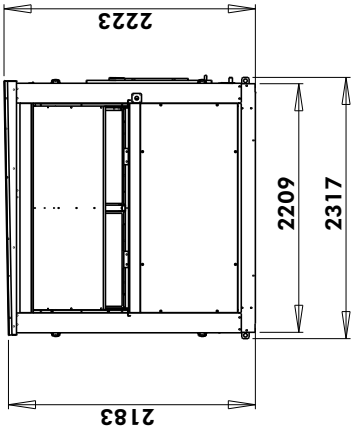
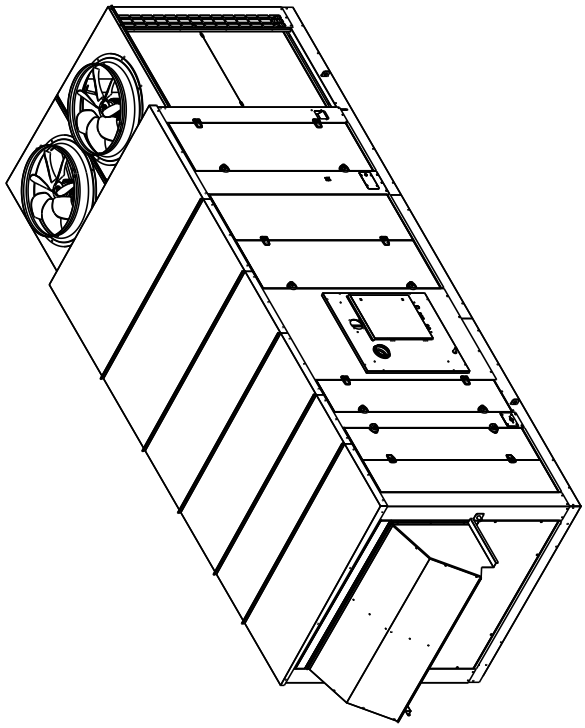
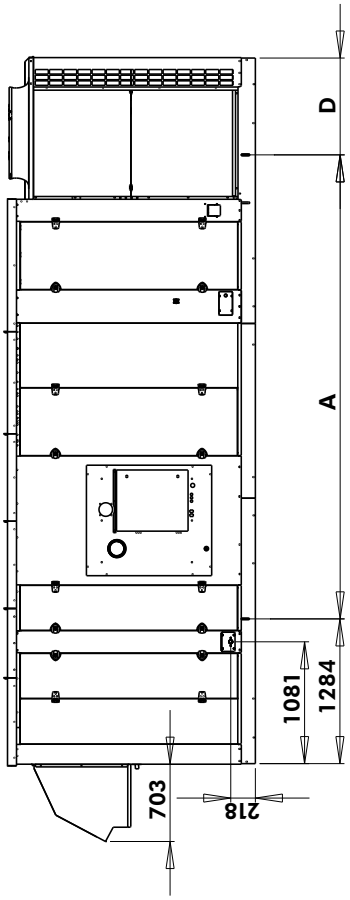
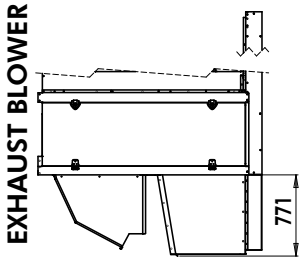
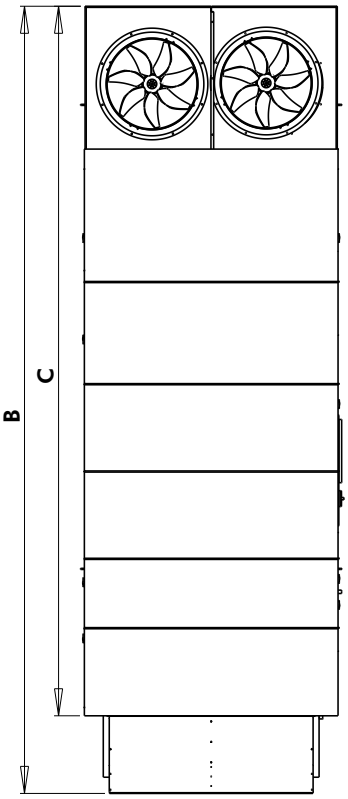
DIMENSIONES



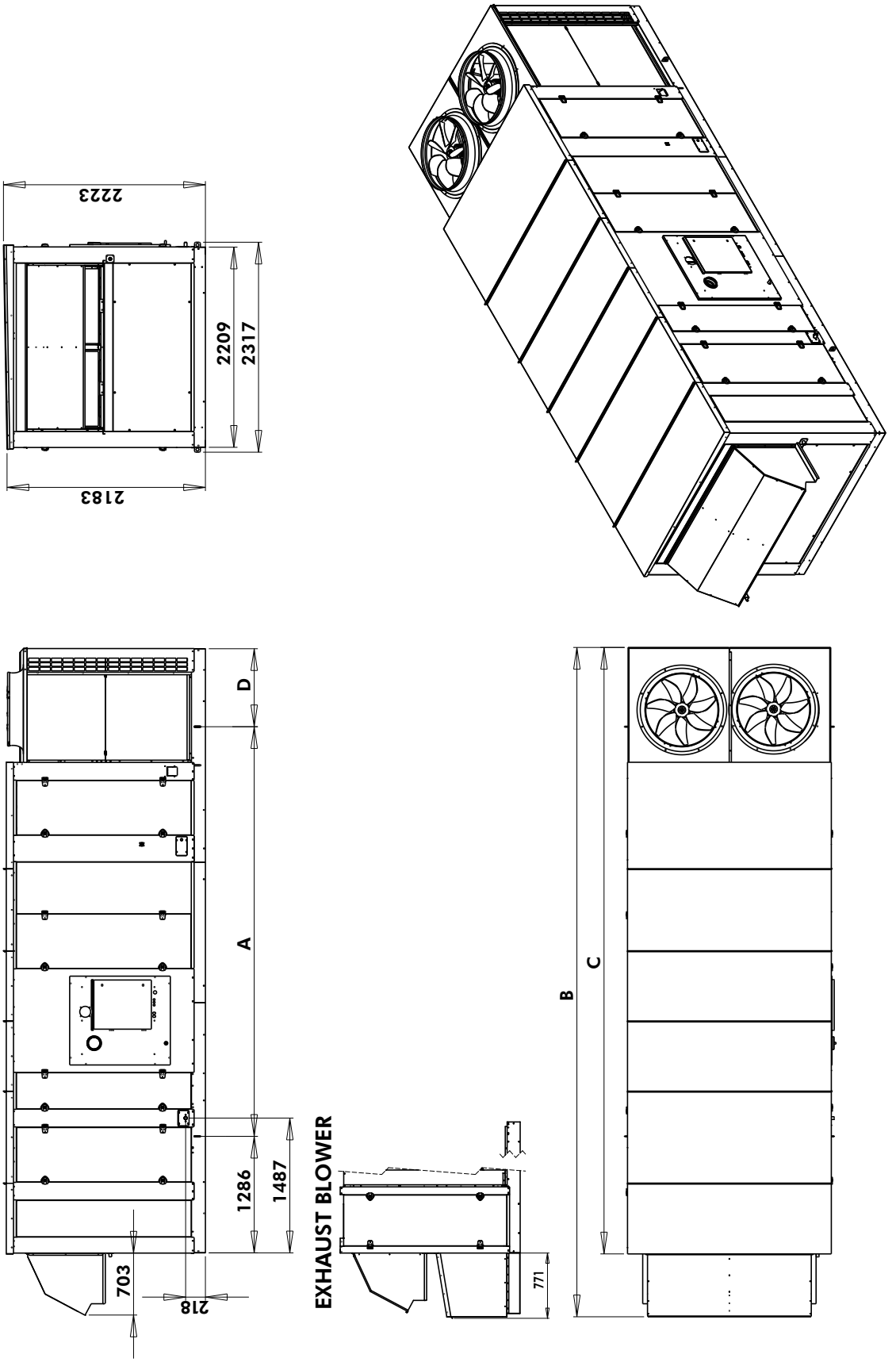




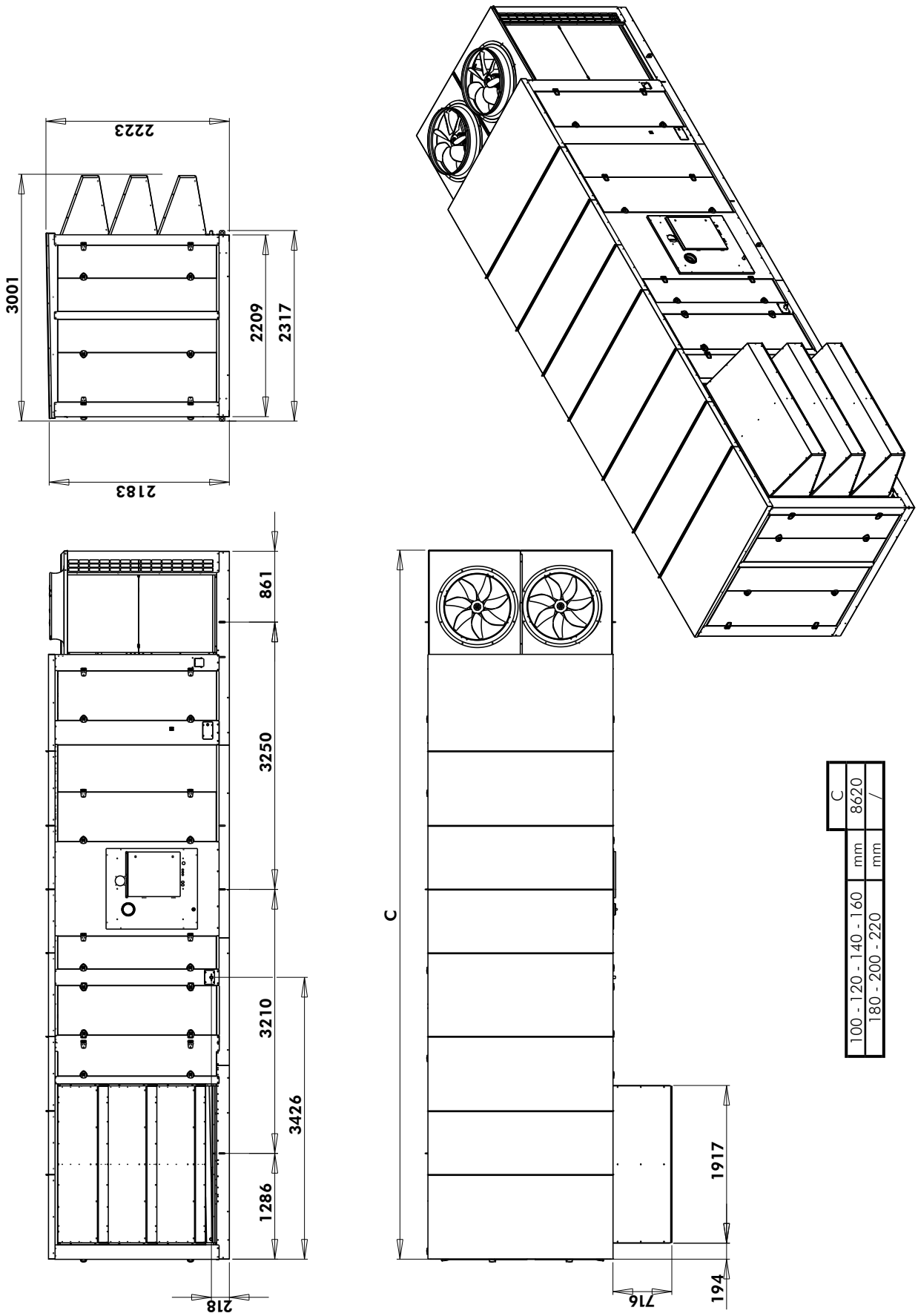




		A	B	C
100 - 120 - 140 - 160	mm	4116	6982	6293
180 - 200 - 220	mm	/	/	/



	A	B	C
100 - 120 - 140 - 160	4520	7386	6692
180 - 200 - 220	/	/	/
mm	/	/	/
mm			



C	
100 - 120 - 140 - 160	8620 mm
180 - 200 - 220	/ mm

WIRING DIAGRAM

SCHEMAS ELECTRIQUES

STROMLAUFPLANS

SCHEMA ELETRICO

ESQUEMA ELECTRICO

TAKE CARE!

These wiring diagrams are correct at the time of publication. Manufacturing changes can lead to modifications. Always refer to the diagram supplied with the product.

ATTENTION

Ces schémas sont corrects au moment de la publication. Les variantes en fabrication peuvent entraîner des modifications. Reportez-vous toujours au schéma livré avec le produit.

ACHTUNG!

Diese Stromlaufplans sind zum Zeitpunkt der Veröffentlichung gültig. In Herstellung befindliche Varianten können Änderungen mit sich bringen. In jedem Fall den mit dem Produkt gelieferten Stromlaufplan hinzuziehen.

ATTENZIONE !

Questi schemi sono corretti al momento della pubblicazione. Le varianti apportate nel corso della fabbricazione possono comportare modifiche. Far sempre riferimento allo schema fornito con il prodotto.

ATENCIÓN !

Esto esquemas son correctos en el momento de la publicación. Pero las variantes en la fabricación pueden ser motivo de modificaciones. Remítase siempre al esquema entregado con el producto.

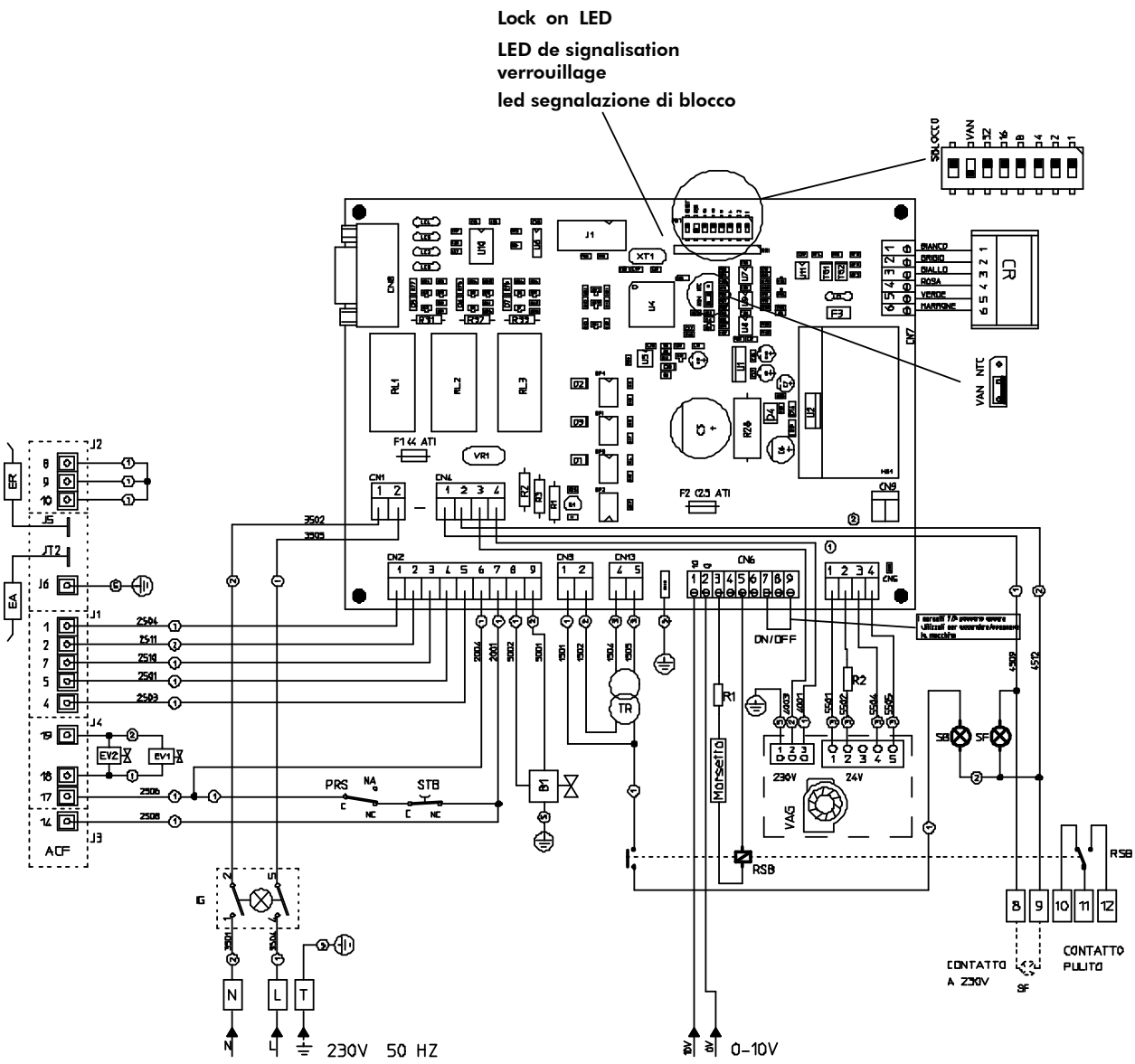
POWER SUPPLY MUST BE SWITCHED OFF BEFORE STARTING TO WORK IN THE ELECTRIC CONTROL BOXES!

MISE HORS TENSION OBLIGATOIRE AVANT TOUTE INTERVENTION DANS LES BOITIERS ELECTRIQUES.

VOR JEDEM EINGRIFF AN DEN ANSCHLUßKÄSTEN UNBEDINGT DAS GERÄT ABSCHALTEN!

PRIMA DI OGNI INTERVENTO SULLE CASSETTE ELETTRICHE ESCLUDERE TASSATIVAMENTE L'ALIMENTAZIONE !

PUESTA FUERA DE TNESIÓN OBLIGATORIA ANTES DE CUALQUIER INTERVENCIÓN EN LAS CAJAS ELÉCTRICAS!



CABLE COLOUR

1.	BLACK	PHASE 230V
2.	BLUE	NEUTRAL 230V
3.	RED	24V
4.	YELLOW/GREEN	GROUND

KABEL-FARBE

1.	SCHWARZ	PHASE 230V
2.	BLAU	NULLEITER 230V
3.	ROT	24V
4.	GELB-GRÜN	ERDE

COLOR DE LOS CABLES

1.	NEGRO	FASE 230V
2.	AZUL	NEUTRO 230V
3.	ROJO	24V
4.	AMARILLO-VERDE	TERRA

COULEUR DES CÂBLES

1.	NOIR	PHASE 230V
2.	BLEU	NEUTRE 230V
3.	ROUGE	24V
4.	JAUNE-VERT	MIS A LA TERRE

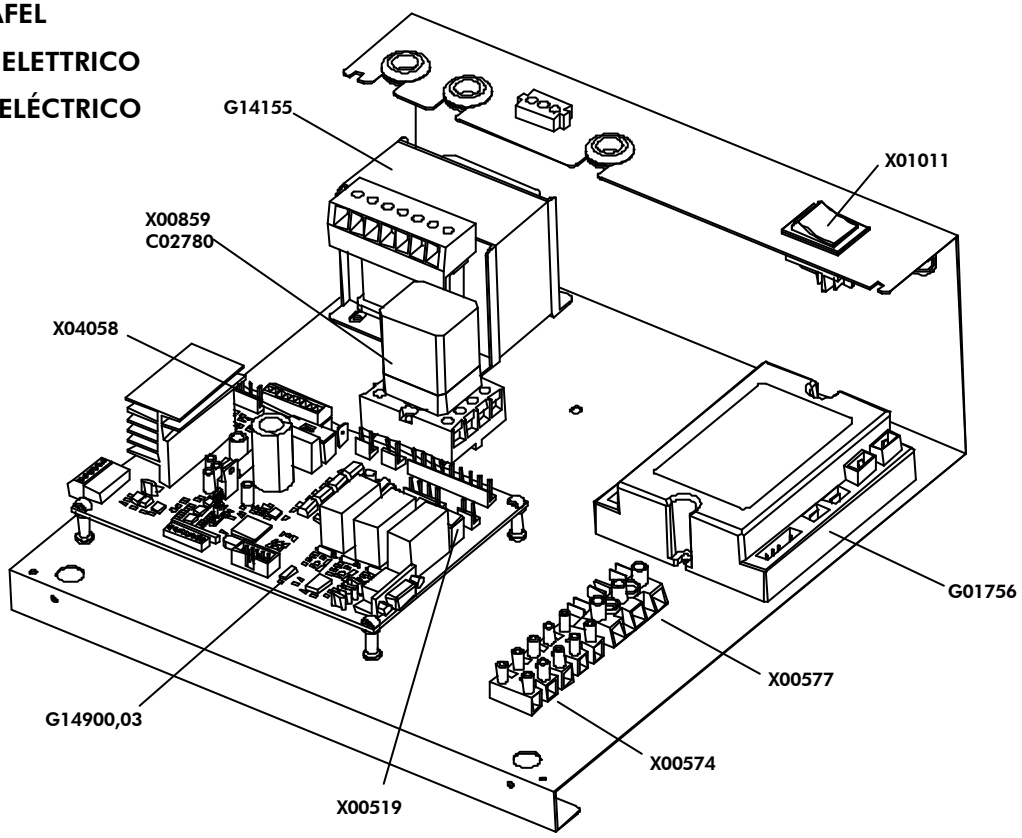
COLORE DEI CAVI

1.	NERO	FASE 230V
2.	BLU	NEUTRO 230V
3.	ROSSO	24V
4.	GIALLOVERDE	TERRA

APPENDIX / ANNEXE / ANLAGE / ALLEGATO / ANEXO

SPARE PART LIST
LISTE DES PIÈCES DE RECHANGE
ERSATZTEILLISTE
LISTA RICAMBI
LISTA DE LAS PIEZAS DE RECAMBIO

CONTROL PANEL PARTS
TABLEAU ÉLECTRIQUE
SCHALTTAFEL
QUADRO ELETTRICO
CUADRO ELÉCTRICO



REP.	GB	F	D	I	E
G14155	230V / 24V transformer	transformateur 230V / 24V	Transformator 230V / 24V	trasformatore 230V / 24V	transformador 230 V / 24 V
X00859	"R" relay	relay "R"	Relais "R"	relè "R"	relé "R"
C02780	base	support	Halterung	zoccolo	soporte
X04058	F2 - 2.5A fuse	F2 - fusible 2,5A	F2 – Sicherung 2,5A	F2 - fusibile 2,5A	F2 - fusible 2,5 A
G14900.03	modulation electronic card	carte électronique de modulation	Elektronische Modulationskarte	scheda elettronica di modulazione	tarjeta electrónica de modulación
X00519	F1 - 4A fuse	F1 - fusible 4A	F1 – Sicherung 4A	F1 - fusibile 4A	F1 - fusible 4 A
X00574	external connection terminal board (SF,SB)	plaque à bornes connexions externes (SF,SB)	Klemmenplatte externe Verbindungen (SF,SB)	morsettiera collegamenti esterni (SF,SB)	placa de bornes conexiones externas (SF, SB)
X00577	supply	plaque à bornes alimentation	Klemmenplatte Stromversorgung	morsettiera alimentazione	placa de bornes alimentación
G01756	Flame control device (for 150/200 models only)	boîte de contrôle flamme (seulement pour les modèles 150/200)	Flammenkontrollkasten (nur für Modelle 150/200)	apparecchiatura controllo fiamma (solo per i modelli 150/200)	caja de control llama (únicamente para los modelos 150/200)
X01011	main switch	interrupteur général	Hauptschalter	interruttore generale	interruptor general

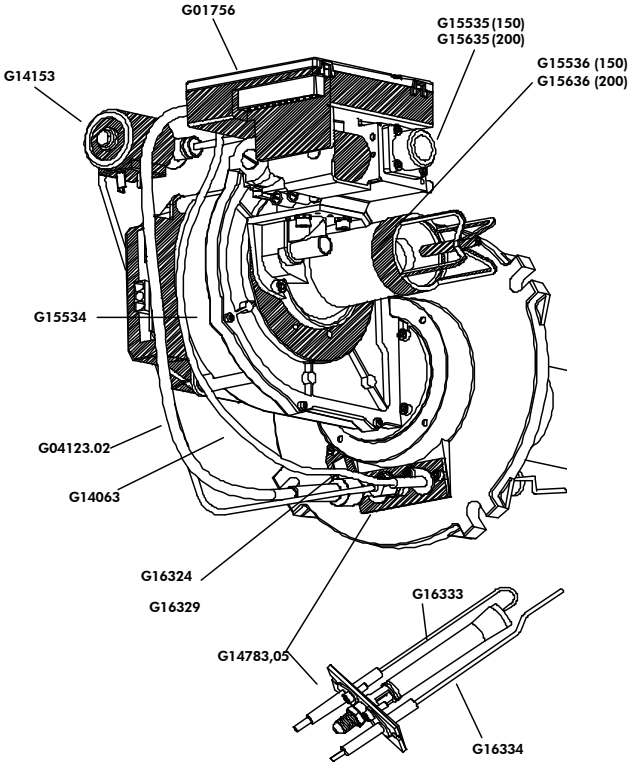
BURNER GROUP

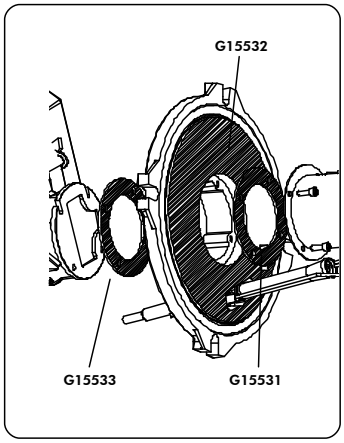
GROUPE BRÛLEUR

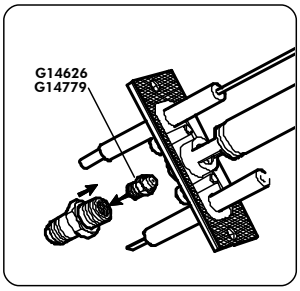
BRENNERGRUPPE

GRUPPO BRUCIATORE

GRUPO QUEMADOR







REP.	GB	F	D	I	E
G01756	flame control device	boîte de contrôle flamme	Flammenkontrollkasten	apparecchiatura controllo fiamma	caja de control llama
G14153	pilot solenoid valve	électrovanne veilleuse	Magnetventil Wachflamme	elettrovalvola pilota	electroválvula piloto
G15534	air/gas fan	Ventilateur air/gaz	Ventilator Luft/Gas	Ventilatore aria/gas	Ventilador aire/gas
G04123.02	start-up wire	câble d'allumage	Zündkabel	cavo accensione	cable de encendido
G14063	detection wire	câble de détection	Erfassungskabel	cavo rilevazione	cable de detección
G16324	glass	verre voyant flamme	Glas Flammenanzeigelampe	vetrino spia fiamma	vidrio de inspección llama
G16329	glass gasket	garniture du verre	Dichtung Glas	guarnizione vetrino	guarnición del vidrio
G14783.05	pilot flame group	groupe veilleuse	Wachflammenaggregat	gruppo fiamma pilota	grupo piloto
G16333	start-up electrode	électrode d'allumage	Zündelektrode	elettrodo accensione	electrodo de encendido
G16334	detection electrode	électrode de détection	Erfassungselektrode	elettrodo rilevazione	electrodo de detección
G15535 (150) G15635 (200)	Gas valve	vanne du gaz	Gasventil	valvola ga	válvula de gas
G15536 (150) G15636 (200)	gas valve venturi	venturi vanne du gaz	Venturi Gasventil	venturi valvola gas	venturi válvula de gas
G15531	torch gasket	Garniture torche	Dichtung Fackel	Guanizione torcia	guarnición torcha
G15532	gasket for burner flange	garniture bride du brûleur	Dichtung Brennerflansch	guarnizione flangia bruciatore	guarnición brida del quemador
G15533	fan gasket	Garniture ventilateur	Dichtung Ventilator	Guanizione ventilatore	guarnición ventilador
G14626	pilot nozzle (natural gas)	injecteur veilleuse (gaz naturel)	Einspritzdüse Wachflamme (Erdgas)	ugello pilota (metano)	inyector piloto (gas natural)
G14779	pilot nozzle (LPG)	injecteur veilleuse (gaz propane)	Einspritzdüse Wachflamme (Propangas)	ugello pilota (gpl)	inyector piloto (gas propano)

APPENDIX / ANNEXE / ANLAGE / ALLEGATO / ANEXO

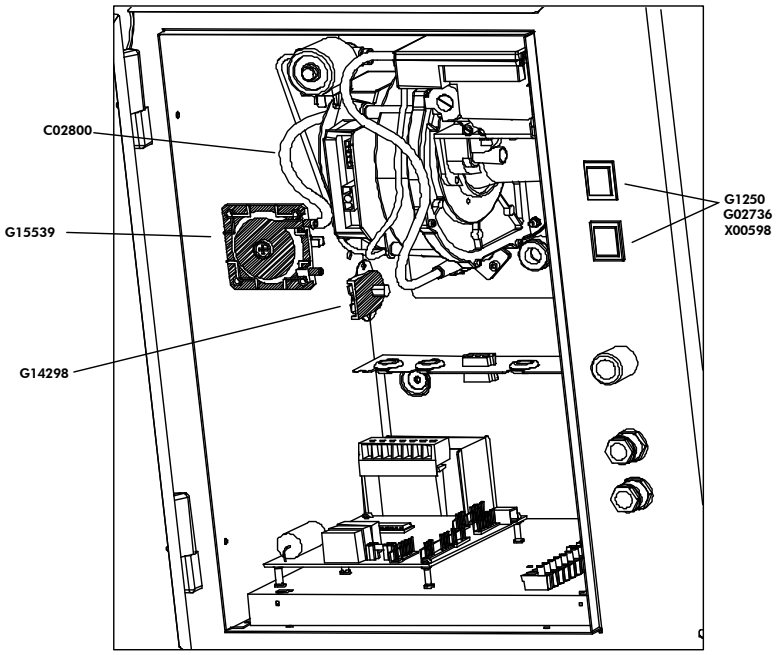
MORE PARTS AVAILABLE

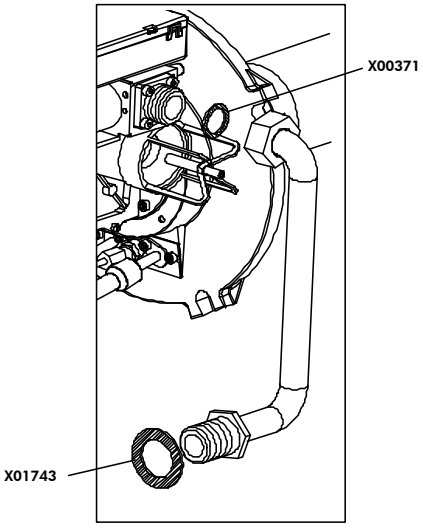
AUTRES RECHANGES DISPONIBLES

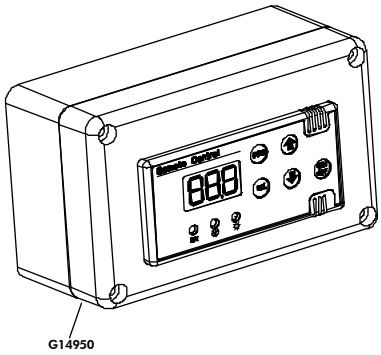
ANDERE LIEFERBARE AUSTAUSCHELEMENTE

ALTRI RICAMBI DISPONIBILI

OTROS RECAMBIOS DISPONIBLES







REP.	GB	F	D	I	E
C02800	silicone hose Ø5x8 (meters)	Tube en silicone Ø5x8 (mètres)	Silikonrohr Ø5x8 (Meter)	Tubo in silicone Ø5x8 (in metri)	tubo de silicona Ø 5x8 (metros)
G15539	air pressure switch	pressostat	Druckregler	pressostato	presostato
G14298	110°C thermostat	Thermostat 110°C	Thermostat 110°C	Termostato 110°C	termostato 110°C
G1250	red light	Lampe rouge	Rote Lampe	Lampada Rossa	lámpara roja
G02736	white light	Lampe blanche	Weiße Lampe	Lampada Bianca	lámpara blanca
X00598	gasket	Garniture	Dichtung	Guarnizione di tenuta	guarnición
X00371	valve/gas hose gasket	garniture tuyau gaz/ vanne	Dichtung Gasleitung/ Ventil	guarnizione tubo gas/valvola	protección tubo gas/ compuerta
X01743	panel/gas hose gasket	garniture tuyau gaz/ panneau	Dichtung Gasleitung/ Tafel	guarnizione tubo gas/pannello	protección tubo gas/ panel
G14950	remote control	contrôle à distance	Fernsteuerung	controllo remoto	control a distancia

CERTIFICATO

Nr. contratto / *Contract no.* **I 3700**

CE 0694

GASTEC Italia certifica che i **generatori d'aria calda a condensazione**, tipi
GASTEC Italia hereby declares that the ***condensing gas-fired air heaters****, types*

PC032XX
PCH032XX
PC035XX
PCH035XX
PC043XX
PCH043XX
PC054XX
PCH054XX
PC072XX
PCH072XX
PC092XX
PCH092XX
PCH150XX
PCH200XX

XX = PAESE EUROPEO DI DESTINAZIONE / *XX = EUROPEAN COUNTRY OF DESTINATION*

costruiti da
made by

Apen Group S.p.A.,

di / *in*

Pessano con Bornago (MI), Italia

soddisfano i requisiti riportati nella
meet the essential requirements as described in the
Direttiva Apparecchi a Gas (90/396/CEE)
Directive on appliances burning gaseous fuels (90/396/EEC)

NIP / *PIN*	:	0694BM3433
Rapporto / *report*	:	163433
Tipi di apparecchi / *appliance type*	:	C_{13}, C_{33}, C_{43}, C_{53}, C_{63}, B_{23}

I suddetti prodotti sono stati approvati per
Mentioned products have been approved for

BE	$I_{2E(R)}$, I_{3P} (Qnom ≤ 70 kW) I_{2ELL}, I_{3P} (Qnom > 70 kW)						
AT	$II_{2H3B/P}$	CH	$II_{2L3B/P}$, II_{2H3P}	HU	$II_{2H3B/P}$	CZ	II_{2H3P}
DE	$II_{2ELL3B/P}$	DK	II_{2H3P}	IS	I_{3P}	CY	I_{3P}
ES	II_{2H3P}	FI	$II_{2H3B/P}$	EE	II_{2H3P}	LT	II_{2H3P}
FR	II_{2E+3+}	GB	II_{2H3P}	LV	II_{2H3P}	MT	I_{3P}
GR	$II_{2H3B/P}$	IE	II_{2H3P}	PL	II_{2H3P}	SK	II_{2H3P}
IT	$II_{2H3B/P}$	LU	II_{2E3P}	SI	II_{2H3P}	BG	II_{2H3P}
PT	II_{2H3P}	SE	$II_{2H3B/P}$	TR	$II_{2H3B/P}$	RO	II_{2H3P}
NL	$II_{2L3B/P}$, II_{2E3P}	NO	II_{2H3P}				

San Vendemiano, **15 Dicembre 2004**
San Vendemiano, 15 December 2004

Daniel Vangheluwe,
vice presidente.
vice president

GASTEC

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