# Outdoor gas generator for pigsty

heoss


SYSTEL®
Heating mastermind

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# FOREWORD

Thank you for purchasing a HEOSS gas generator.
Our French design and manufacturing equipment has been designed, assembled and rigorously controlled to bring you maximum satisfaction.
Systel develops a range of products and accessories for heat generation, lighting, energy savings, visit our website to discover these innovative products:
www.systel-international.com.
In order to improve its manufacturing, SYSTEL reserves the right to make, without notice, any modifications that it deems useful to the products described in this document.
This document contains sections in French and translated sections. In case of disputes, the sections in French shall be authentic.
Measurements are expressed in metric units. Correspondences to other measuring systems (particularly Anglo-Saxon) are given for information only.
The illustrations are not contractual.


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# I WARNING

The longevity of this device and its performance will be optimal if its use and maintenance are ensured according to the rules of the art and the regulations in force. It is therefore essential to read carefully the instructions contained in this notice.

Before installing the device, it is necessary to check that the local distribution conditions (type, voltage, power, type of gas, pressure, etc.) are compatible with the adjustment of the device.

Installation, adjustment and eventual conversion from one gas to another requires the intervention of a qualified installer.

It is necessary to consult the manufacturer before replacing parts other than those specified in the package leaflet.

It is the responsibility of the installer, after having installed and verified that the installation complies with the requirements of this instruction.

## I-1 To inform the user :

- That it cannot itself make changes to the design of the devices and to the realization of the installation; any modification (exchange, withdrawal, etc.) safety components or parts affecting the performance of the appliance shall systematically remove the appliance from the CE marking, removing the manufacturer's warranties.
- That it is essential to perform the prescribed cleaning and maintenance operations.

## I-2 Provide this notice to the user:

SYSTEL, with the agreement of the notifying body of the CE marking, reserves the right to update this technical notice. Only the instructions accompanying the product when it is shipped may be considered as contractual.
Please keep this manual and all accompanying documents at your fingertips so that they may be consulted when necessary.
We shall not be liable for any damage caused by failure to comply with the instructions in this document.

⚠ CAUTION: This device must not be used in a domestic room or a room receiving from the public.

⚠ CAUTION:it is necessary to provide a minimum additional ventilation of 500m3/h per generator installed.

⚠ CAUTION: before installing the device, it is necessary to check that the local conditions (gas type, pressure) are compatible with the adjustment of the device.


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## I-3 Requirements and safety

The HEOSS Hot Air Generator may be dangerous if not properly maintained and used. Read this manual carefully, especially the safety notes and instructions.
Failure to follow the safety instructions in this manual may result in your liability in the event of an accident.

The warnings and precautions contained in this manual cannot cover all risks associated with the use of the device.
In addition to the messages given, it is important to execute common sense and respect basic safety principles.

### I-3-a What to do if you smell gas?

- Do not turn on or off the light
- Do not operate an electrical switch.
- Do not use the telephone in the risk area.
- Do not light bright flames (for example, lighters or matches).
- Do not smoke.
- Turn off the gas valve.
- Open doors and windows.
- Warn other occupants of the space.
- Inform the gas company or your qualified professional.


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## I-4 **Requirements**

The following safety precautions and requirements must be followed:

• Do not use or store explosive or highly flammable materials (for example, gasoline, paint, etc…) in the room where the device is located.

• Do not use the device within one hour after cleaning the room.

• Do not disable or attempt to manipulate safety devices under any circumstances or cause malfunction.

Do not make changes:

- To the device
- The environment of the device.
- Air, gas and electricity lines.
- Never perform any maintenance or repair on the device yourself.
- Do not damage or remove seals on components. Only SYSTEL After-Sales Service professionals are allowed to make changes to sealed components.
- Do not alter the technical and architectural conditions in the vicinity of the device, as they may affect the safe operation of the device.
- To limit the accumulation of CO2 in the heated room, check that it is properly ventilated (500m3/h).
- It is essential to provide sufficient air flow for air renewal.



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# II DESCRIPTION AND OPERATION

The hot air generator heoss is a direct-heating and forced-convection furnace for the heating of livestock and mainly pigsty.

It is a progressive type with automatic ignition and operates on natural gas and propane (cf. page 9).

It is controlled gradually in 0/10Volts corresponding to powers from 1.5 KW to 10KW.
Design and construction according to standard EN 12669 (harmonised standard in May 2018 EN 12669 2000): Direct-heating hot air generator using gaseous fuels for horticultural applications and supplementary heating of premises for non-domestic use.

CE marking :

| |
|---|
| **CE 1312**<br>**1312BP3955** |

### II-1-a Device description

- AISI 304 stainless steel body
- 3 stainless steel refractory power burners.
- Fixed flow dilution turbine
- 3 gas solenoid valves controlled by an electronic board and a control box that manages the operating cycle of the heoss . The control box also controls the safety and ensures ignition. It is equipped with a reset device in case of defect.
- Electrical ignition via ignition electrode and flame control via ionization electrode.
- Thermal protection provided by an automatic overheating thermostat.
- Check that the fan is working properly with a pressure switch.

### II-1-b Instructions of use

- For the use, ordering and maintenance of this generator, please read the instructions in this booklet.
- Maintenance between each band is mandatory. It is also necessary to check regularly that there is no deformation of the device: hot chamber, burner, condition of injectors, various pipes.
- Check regularly that the air inlet of the device is not obstructed.
- Check that hot air can circulate normally in the building, and in particular that there are no obstacles in front of the aircraft blower and that the flaps are not in the closed position.

### II-1-c Operation

During a heat demand created by the room control of the building, the turbine starts then after about 20 seconds, the burner lights up thanks to the ignition electrode. Hot air, obtained by dilution of the combustion products, is then blown into the building.

When the set temperature is reached, ventilation continues to operate for approximately 60 seconds to cool the hot chamber. Then the appliance is stopped until the next heat demand.

### II-1-d Safety

The possible flame defect is detected by the ionization probe, the gas solenoid valves are immediately closed (not allowing the gas to pass through), causing the burner to stop and the device to be secured. After about 40 seconds the fan stops and the fault light lights up

The thermal protection of the device is provided by a thermostat of overheating, it protects against a too high elevation of the wall of the generator linked to an insufficient airflow.

A pressure switch is used to check that the turbine is operating properly.

### II-1-e Ignition

Please see 1.3 operation.

### II-1-f Cut-off

To shut down the generator for a short period of time, simply send a minimum instruction (i.e., a control voltage less than 1.7V).

For an extended shutdown, send a minimum instruction to the generator, wait about 40 seconds for the burner and turbine to shut down. The gas valve can then be closed and the power supply switched off at the on/off switch (diagram on page 14 and 22).

Return to service according to page 18.


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# III TECHNICAL CHARATERISTICS

| COUNTRY OF DESTINATION | PRESURE | OVERVIEW |
|---|---|---|
| FR-BE | 20/25 ; 37 | 12E+ ; 13P |
| LU | 20 | 12E |
| DE | 20 ; 37 | 12E ; I3P |
| AT-CH-ES-IE-GR-GB-PT-CZ | 20 ;37 | I2H ; 13P |
| SE-FI-DK | 20 | 12H |
| NL | 25 ;37 | I2L ; I3P |
| IT | 37 | 13P |

| GAS CONNECTION | HEOSS 10 1/2" | HEOSS 20 1/2" |
|---|---|---|
| ELECTRIC CONNECTION | 230V 50HZ | 230V 50HZ |
| NET WEIGHT IN KG | 15 | 15 |
| NOMINAL POWER KW PCI | 10 | 20 |
| NOMINAL POWER KW PCS | 11 | 22 |
| BURNER POWER 1 KW PCI | 1.4 | 2.8 |
| BURNER POWER 2 KW PCI | 2.9 | 5.8 |
| BURNER POWER 3 KW PCI | 5.7 | 11.4 |
| MINI GAS FLOW G31 g/h | 110 | 220 |
| MAXI GAS FLOW G31 g/h | 781 | 1562 |
| MINI GAS FLOW G20 l/h | 128 | 256 |
| MAXI GAS FLOW G20 l/h | 910 | 1820 |
| ELEVATION OF TEMPERATURE (air at 10°C) | 58 | 82 |
| G31 INJECTOR MARKING BURNER 1-2-3 | 60/88/125 | 94/128/210 |
| G20 INJECTOR MARKING BURNER 1-2-3 | 88/137/155 | 124/180/260 |
| AIR FLOW M3/H | 360 OU 500 | 715 |
| BLOW RANGE | 15 | 18 |
| SOUND PRESSURE LEVEL Db | 59 | 74 |
| POWER ABSORBS FAN WATT | 62 | 87 |
| TOTAL POWER ABSORBS | 100 | 125 |


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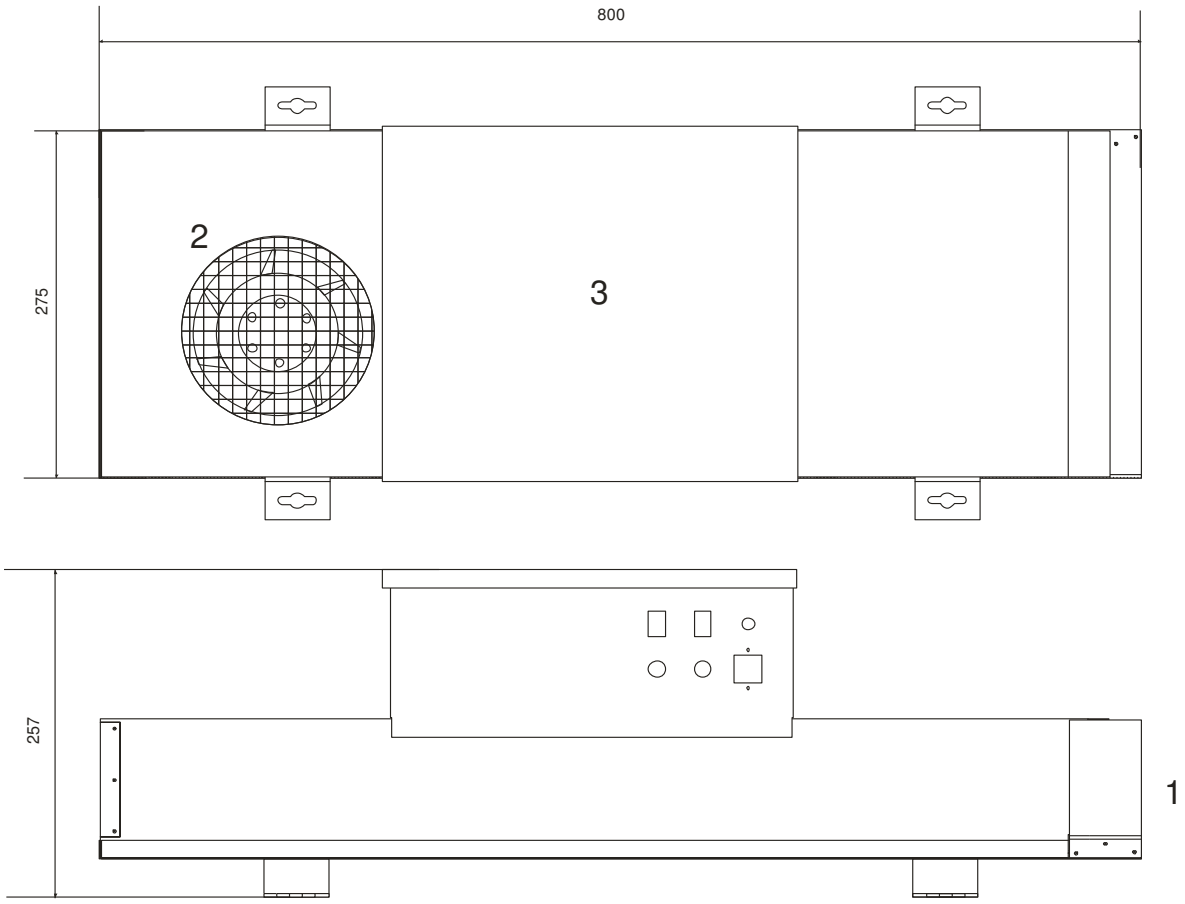
# IV DIMENTIONAL CHARACTERISTICS

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# V REGULATIONS

## V-1 Regulations, standards, directives

When the appliance is installed and put into operation, the orders, directives, technical rules, standards and provisions must be complied with in their current version.
It is also the installer's responsibility to comply with the regulations specific to the type of rooms.

## V-2 Recycling

The device consists largely of recyclable materials.
The packaging, the device and the contents of the package must not be disposed of with the household waste but must be disposed of in accordance with the regulations in force.

## V-3 Installation

heoss is designed to operate outdoors (building corridor) or indoors.

## V-4 Position of the device :

The device can be mounted horizontally or vertically (diagram p12).

There must be no obstacles in front of the air inlet or in front of the air outlet.

Minimum distances from the walls: Care must be taken to maintain a minimum clearance around the aircraft to allow for good air intake and maintenance.
See diagram p13.


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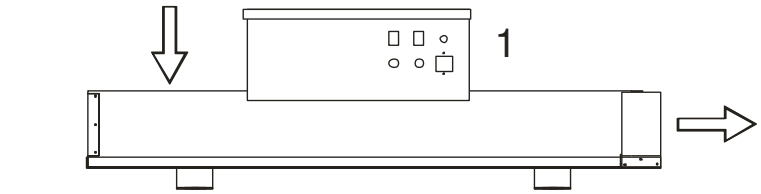
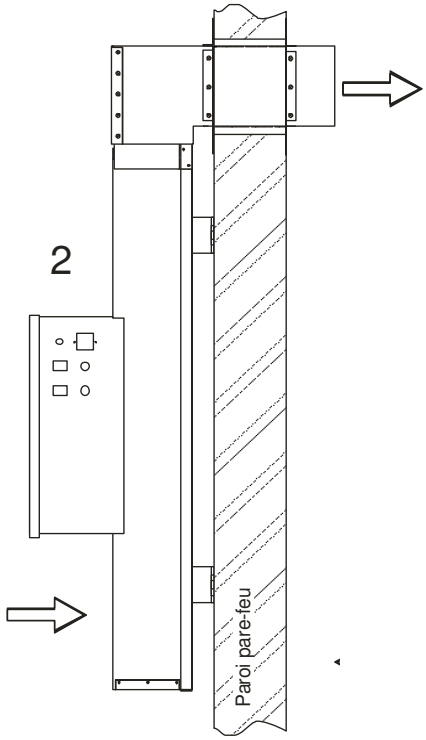
Example of device location: outside (building corridor) of Room #2 or inside Room #1.



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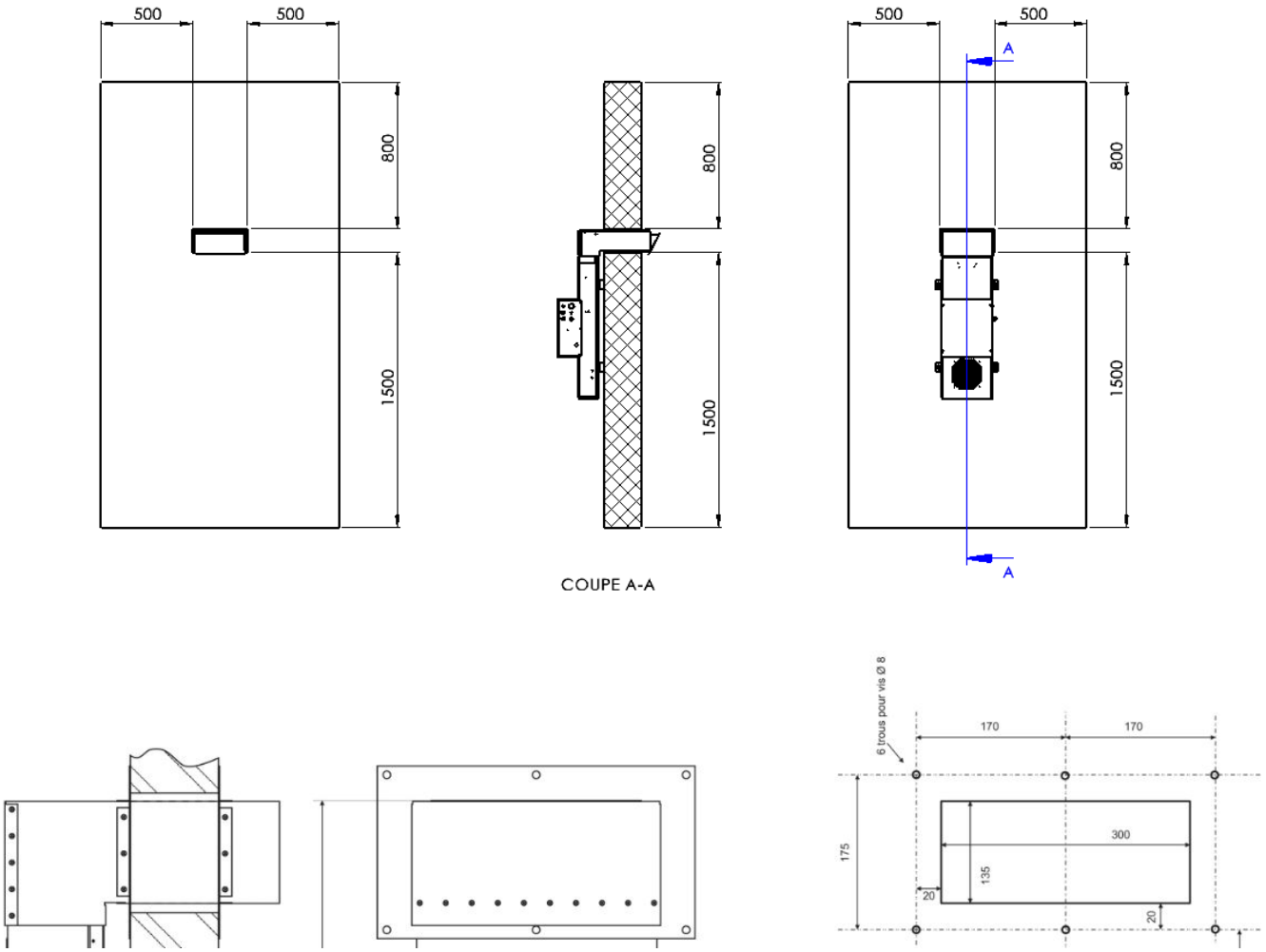
## V-5 Installation of the generator :

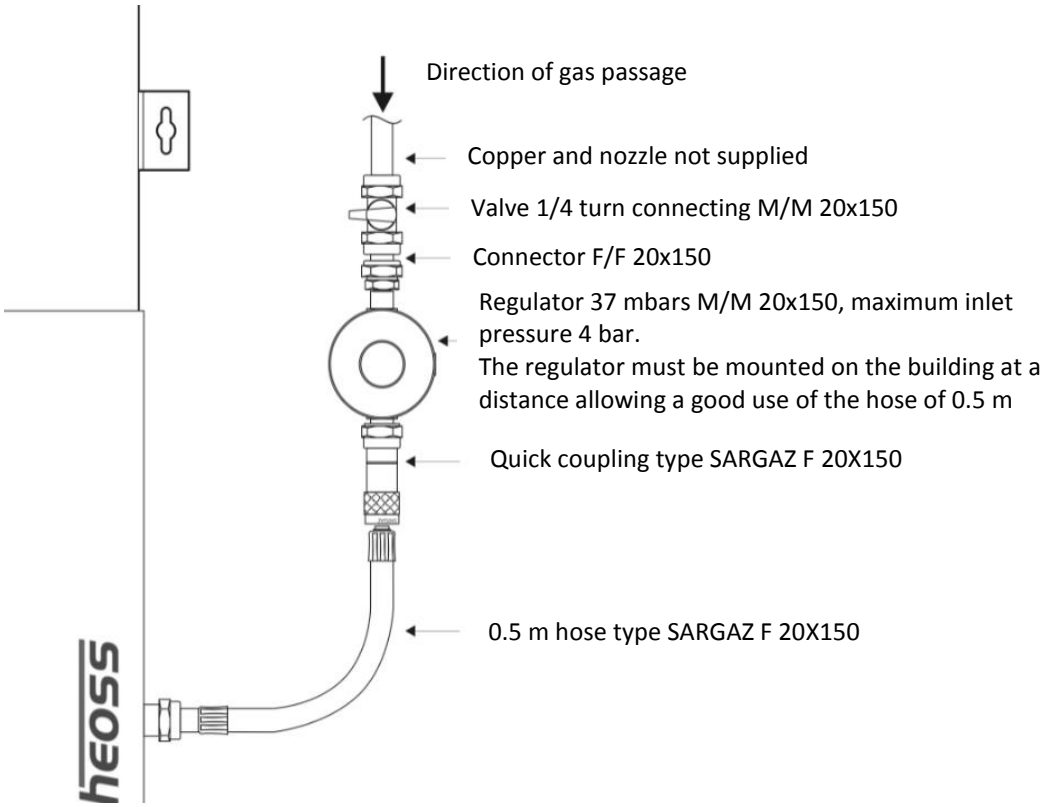
Ensure that the structural elements of the building are well suited to support the device and accessories.
The space provided for the installation of the device must have sufficient space around it to allow maintenance and to respect safety distances.
The appliance must be installed or suspended on a rigid support to avoid voltages on gas and electricity connections.
It is mandatory to install the device in the shelter of the elements (rain, snow, frost) and to check the closing of the electric cover and the stuffed presses.

All dimensions are in mm



## VI GAS CONNECTION :

The heoss is connected to the gas network via a ½male connector.
The pressure and nature of the device supply gas must be the same as indicated by the device rating plate (a regulator or pressure regulator may be required to obtain the device operating pressure).
Upstream of the installation it is important to provide a gas filter.
The gas line must be adapted to the maximum flow rate necessary for the proper functioning of all devices (via a plan, Systel, can provide you with a sizing of your line).
Once the gas connection is completed and before the first commissioning, it is imperative:
To purge the network and to check for possible leaks on this network.
To control the distribution pressure of the network as well as the supply pressure of the generator.




| Product | Reference Systel |
|---|---|
| Valve ¼ turn 20x150 | VANMM20X150N |
| Female double connector 20x150 | RACDBLEF20X150 |
| Regulator 37 mbars | DTD37 |
| Quick coupling female sargaz 20x150 | RAFERA20X150 |
| 0.5m male sargaz hose female screw 1/2 | FLSARG50 |

# VII ELECTRICAL CONNEXION

The delivered device is fully wired according to the electrical schematics on the following pages. The appliance must be connected to a control cabinet with a 0/10Volts output, or to a temperature thermostat according to the diagrams on the following pages.
The electrical connection must be made according to the standards in force (conductor section, ground connection, disconnector, protection etc.) and in accordance with the electrical diagrams given in the following pages. Respect for the position of the neutral and the phase is not important.

## VII-1 Supply voltage :

The supply voltage is 230 volt single phase.
For the dilution turbine, verify that the direction of rotation corresponds to the direction indicated by the arrow on the fan support.
A warning light (mark 14 on page 23) indicates the possible safety of the device.

## VII-2 Safety signal report :

The information can be reported remotely for audible light information or alarm via a dry contact (see connections on the electrical drawing on page 16).

**EARTH CONNECTION IS VIA THE 230V RECEPTACLE OF THE DEVICE TO BE CONNECTED TO A POWER RECEPTACLE WITH A GROUND TERMINAL.**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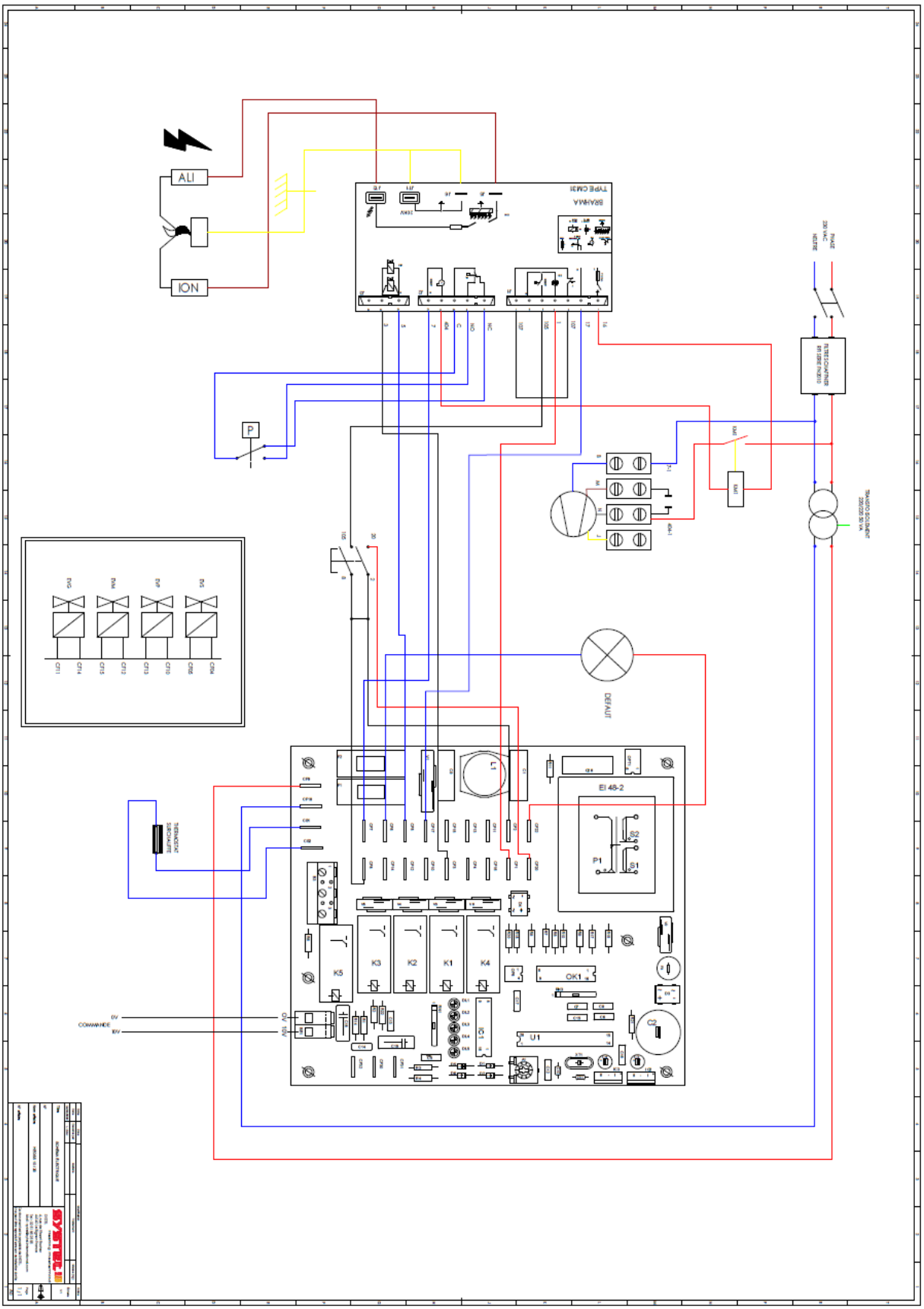
Electrical diagram :

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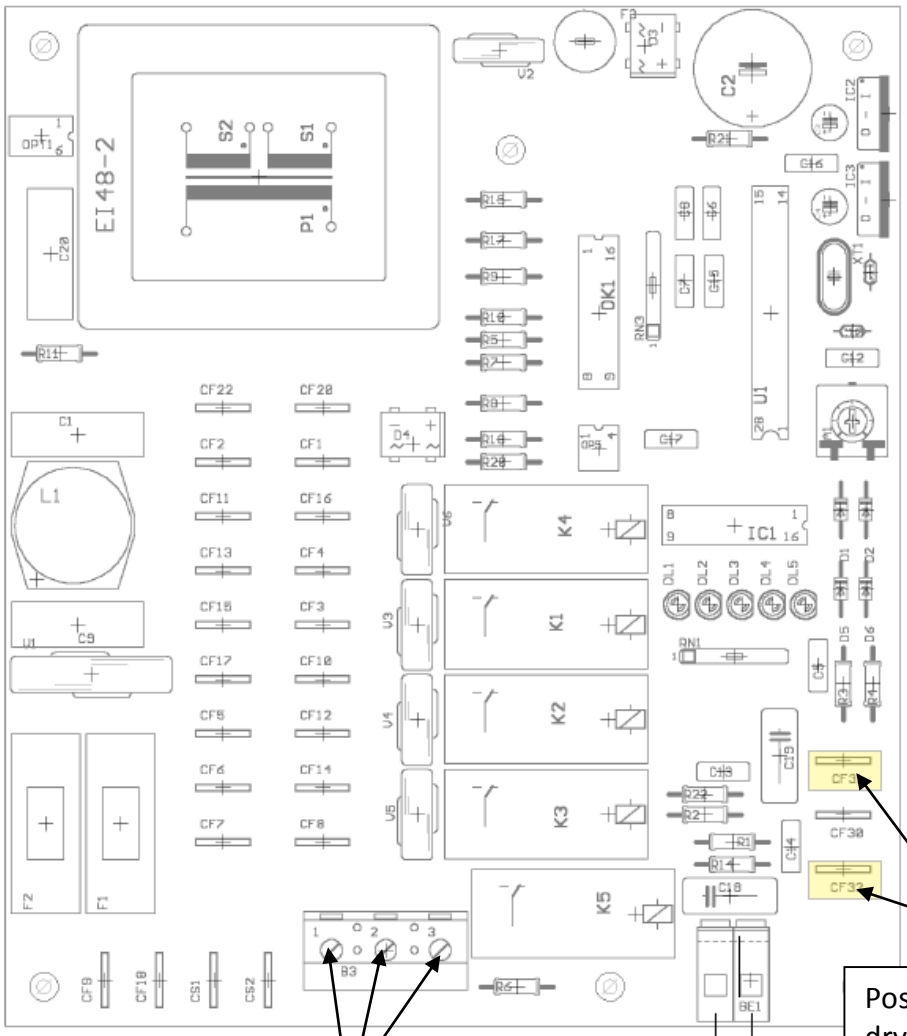
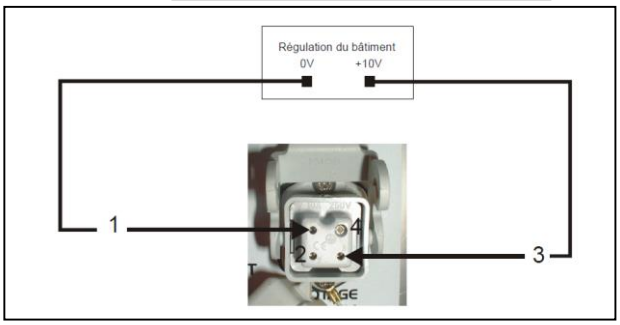
Connection at the expense of the installer:




LEDS colour code:
LED 1 on: solenoid valve small open gait
LED 2 on: open medium-speed solenoid valve.
LED 3 on: solenoid valve wide open
LED 4 on: heating request
LED 5 on: the device is not safe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# VIII COMMISSIONING-OPERATION

The heoss generator was fully controled and tested in the factory before delivery. Before any commissioning, it is imperative to check that the installation has been carried out in accordance with the instructions.

## VIII-1 Ignition

Ensure that nothing prevents hot air from exiting, and that the opening part of the appliance is closed.
Open the gas valve.
Close the circuit (on/off button).
Putting the barn's control system into heat demand
Press the reset button if necessary
Generator should turn on in less than 2 minutes
For a first commissioning, it is sometimes necessary to proceed with 3 successive commissioning in order to purge the pipes.

## VIII-2 Operation :

The building control sends the generator a heating demand in the form of a 0-10V signal, the dilution turbine starts at a prefixed threshold of plus or minus 2 Volts.

When the pressure difference is stabilized a pre-purge of plus or minus 20 seconds to degas the combustion chamber is carried out.

The ignition is carried out directly on the burner by an ignition electrode, sparks occur and the gas valves open.

If, after 5 seconds, the burner has not reigniting or if the flame is not correct, the device goes to safety. The fault light on the generator lights up. This defect can be cleared after a waiting time of a few seconds by pressing the reset push button (mark 15 page 20).
Once the burner is turned on the ionization probe controls the burner flame.

If the oxidizing air is in insufficient quantity, the burner goes out and a new cycle takes effect. If the operating conditions are again correct, the device restarts, otherwise it goes to safety, it is then necessary to perform a reset for the restart after the operating conditions necessary for the proper operation of the aircraft have been restored.

Same remark for a problem at the turbine, or for a stop of the burner for some reason.
In case of overheating, an overheating thermostat shuts off the burner power:
This thermostat limits too high a wall temperature. It must be reset via the device reset button after cooling the exchanger.

When the set temperature is reached, the barn control sends a stop request to the generator. However, the furnace burners shut off the dilution fan for about 60 seconds. The goal is to cool the hot room.

To shut down the generator for a short period of time, adjust the barn control to the minimum set point.

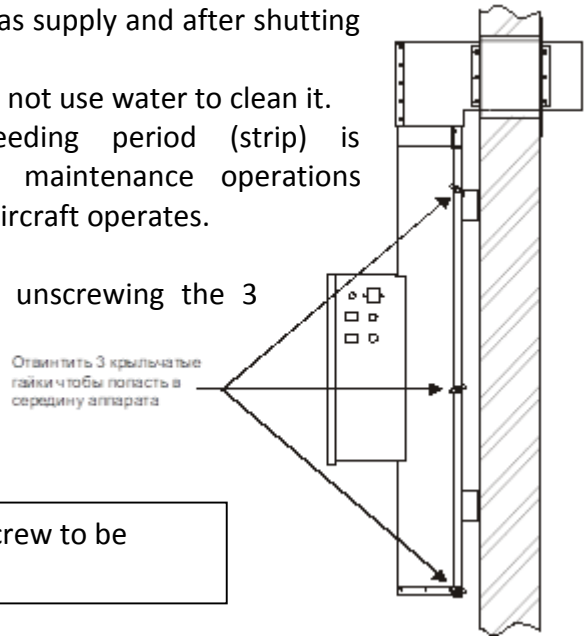
For an extended shutdown, adjust the barn control to the minimum set point, wait for the fan to stop, close the gas valve and then turn off the power,

## IX ONGOING VERIFICATION

- Verify for safety that the hot air outlet duct is not obstructed.
- Check for safety, quality and strength of suspension elements.
- Check that the oxidizing air inlets of each burner remain clean and functional.
- Check the condition of the three burners.
- Check the condition of the three injectors.

## X PERIODIC MAINTENANCE

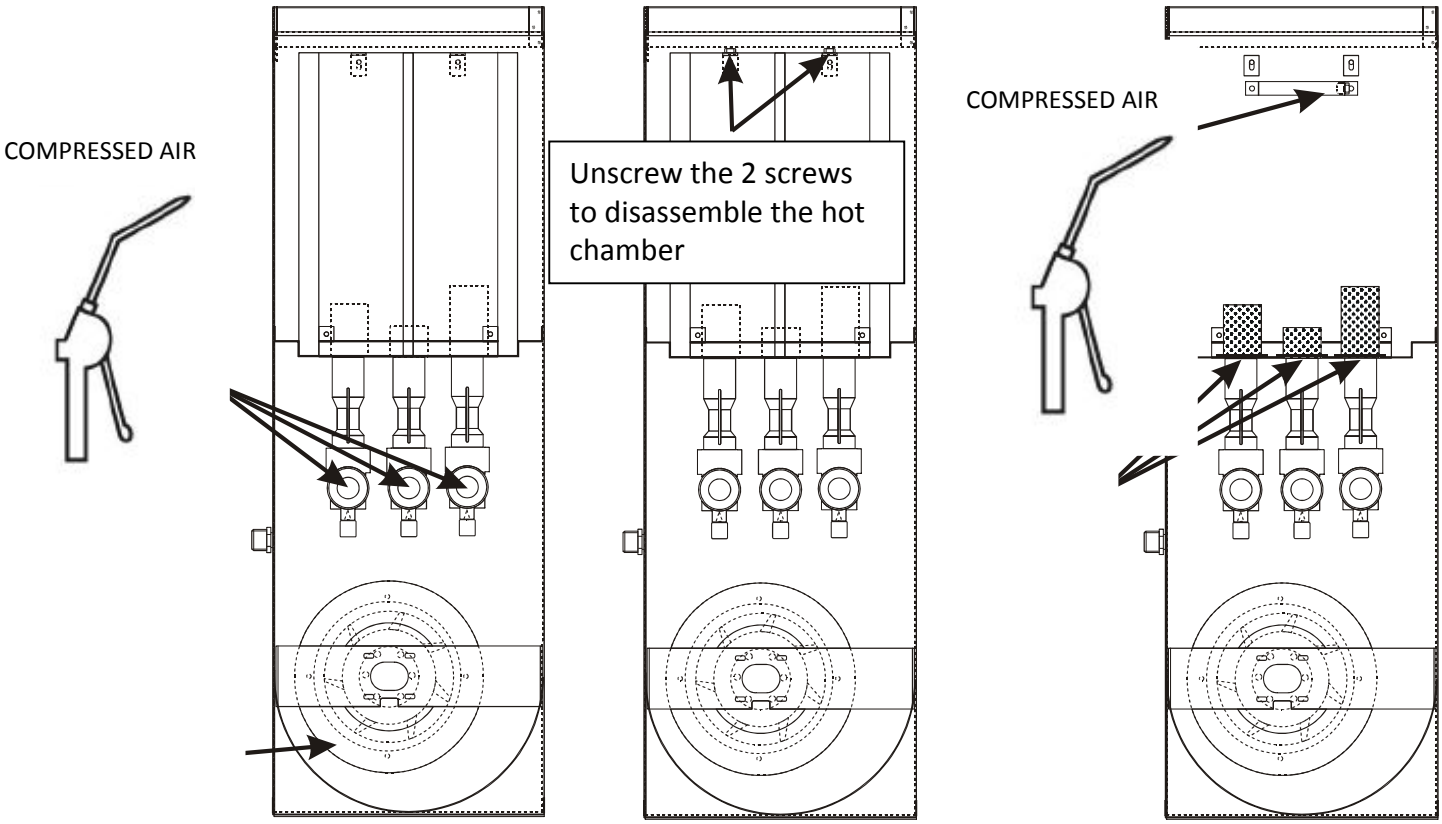
- Before starting maintenance, turn off the gas supply and after shutting down the turbine, turn off the power.
- Maintenance should be performed cold. Do not use water to clean it.
- Maintenance at least once per breeding period (strip) is mandatory. However, the frequency of maintenance operations depends on the environment in which the aircraft operates.
- Regular inspection is required.
- Open the moving part of the device by unscrewing the 3 butterfly screws.




Butterfly screw to be removed

## X-1 CLEANING OF THE DEVICE :

1. Open the moving part of the device by unscrewing the 3 butterfly screws.
2. Clean the air intake grille outside the unit with compressed air.
3. Clean the inside of the device with compressed air: turbine; hot chamber perimeter; inlet air of the burners.
4. Unscrew the 2 screws on the hot chamber
5. Air clean the 3 burners and clean the thermostat from overheating.




After cleaning correctly replace the hot chamber with the two screws, then close the appliance with the three butterfly screws.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# XI OPERATING ANOMALIES

## XI-1 The Burner Assembly does not light up during a start-up.

- The unit is not powered: turn the ON/OFF button to position 1.
- The barn control sends a heating instruction too low.
- Electronic board fuse is out of order (page 17).
- Device is safe, fault light is on (locator 14 page 23)
- During a start-up, the burner does not illuminate and the turbine operates continuously without safe operation of the device. Check the pressure switch and its hoses.
- Control box is disconnected or out of order
- Solenoid valves are disconnected or OFF.

## XI-2 Automatic switch off.

**THE DEFAULT LIGHT IS LIT CONTINUOUSLY**

- Air in gas piping: purge.
- Gas filter of the installation clogged
- Gas valve not open
- Ionisation probe fault (mark 27 page22) check the status and connections of the ionisation probe.
- Ignition default check ignition electrode
- Turbine is disconnected or damaged.
- Over-temperature thermostat default calibrates temperature plus or minus 90°C.

**DEFAULT LIGHT FLASHES QUICKLY**

- Overheat thermostat default (mark 4 page22); overheat thermostat out of order or cleaning of device to be performed (page 19-20); insufficient airflow (turbine malfunction); air outlet is blocked; Operation in excess output regulator out of order or gas pressure not suitable for the device.

## XI-3 The pressure switch cuts the burner

- Check turbine operation
- Check condition of turbine inlet grille
- Check the pressure switch, its wiring, its pipes.

## XI-4 The device does not give its power

- Check gas pressures
- Gas filter of the installation clogged
- Plugged injector(s) (page 20).
- 5.Turbine not operating
- No voltage on turbine terminals (diagram on page 16).
- Motor or capacitor defect.


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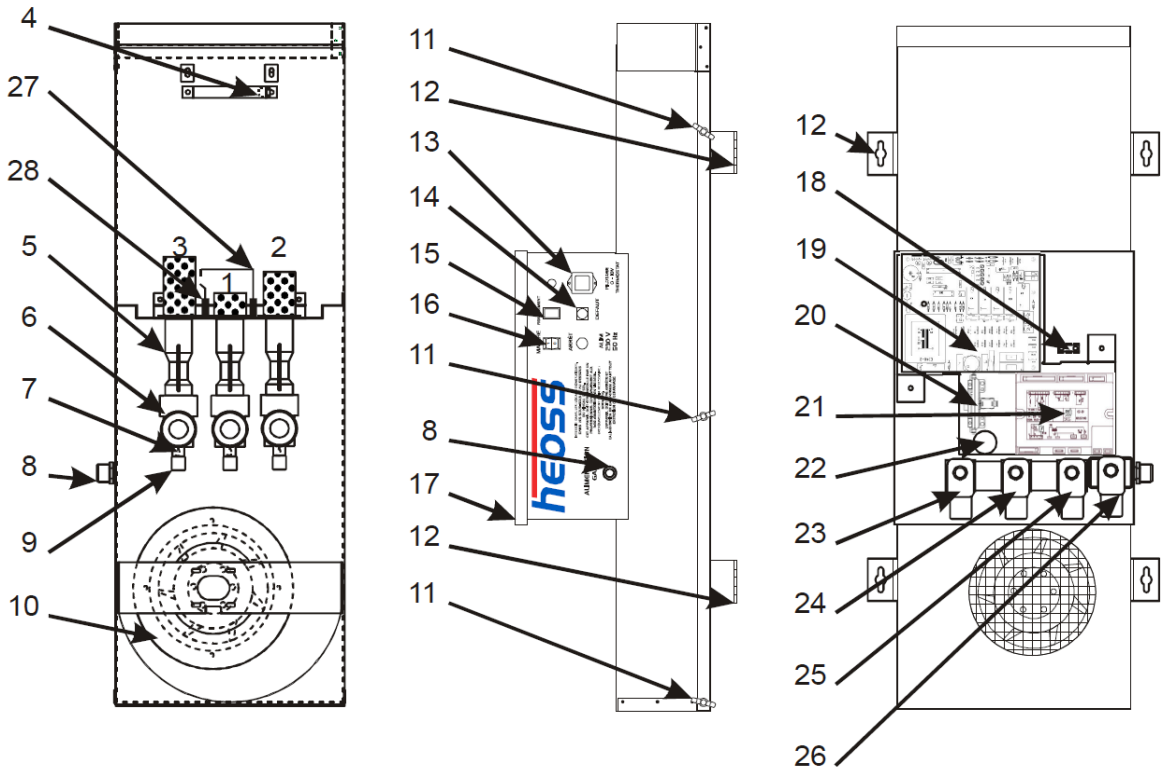
## XII DESCRIPTIVE DIAGRAM OF HEOSS 10 AND 20 :




| MARK | DESIGNATION | HEOSS 10 PROPANE | HEOSS 10 NATURAL GAS | HEOSS 20 PROPANE | HEOSS 20 NATURAL GAS |
|---|---|---|---|---|---|
| 1 | Small power burner | PBRLCIHE10 | PBRLCIHE10 | MBRLCPINVHE10 | MBRLCPINVHE10 |
| 2 | Medium power burner | MBRLCPINVHE10 | MBRLCPINVHE10 | GBRL5CIHE | GBRL5CIHE |
| 3 | Big power burner | GBRL5CIHE | GBRL5CIHE | BRL65CI | BRL65CI |
| 4 | Duct overheat switch | CLKC | CLKC | CLKC | CLKC |
| 5 | Venturi tube | TBVTUR | TBVTUR | TBVTUR | TBVTUR |
| 6 | Oxidizing air inlet tee | PRTFILT | PRTFILT | PRTFILT | PRTFILT |
| 7 | Injector | INJEIREP60<br>INJEIREP88<br>INJEIREP125 | INJEIRE88<br>INJEIREP124<br>INJEIREP210 | INJEIREP94<br>INJEIREP128<br>INJEIREP210 | INJEIREP124<br>INJEIREP180<br>INJEIREP260 |
| 8 | Gas inlet connection 1/2 | MAMR2113 | MAMR2113 | MAMR2113 | BB1521X50M |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| | | | | | |
|---|---|---|---|---|---|
| 9 | Injector support elbow | PRTINJENU | PRTINJENU | PRTINJENU | PRTINJENU |
| 10 | Blower | MTTUHE10C | MTTUHE10C | MTTUHE20C | MTTUHE20C |
| 11 | Screws for opening the device | VISIPPM4X12 | VISIPPM4X12 | VISIPPM4X12 | VISIPPM4X12 |
| 13 | Plug for quick connection 0/10V or thermostat | | | | |
| 14 | LED light for indication of a defect | NEON | NEON | NEON | NEON |
| 15 | Push button for rearmament in case of switch off | INTEONOFF | INTEONOFF | INTEONOFF | INTEONOFF |
| 16 | On/off switch | INTEBIPO | INTEBIPO | INTEBIPO | INTEBIPO |
| 17 | Device cover | COBOHE1020 | COBOHE1020 | COBOHE1020 | COBOHE1020 |
| 18 | Ground terminal box | BART6P | BART6P | BART6P | BART6P |
| 19 | Electronic card Without micro | CRTELTCSM | CRTELTCSM | CRTELTCSM | CRTELTCSM |
| 20 | Pressure switch | PRESHUC | PRESHUC | PRESHUC | PRESHUC |
| 21 | Control box | BTCTBRLT | BTCTBRLT | BTCTRLBLT | BTCTRLBLT |
| 22 | Condenser | | | | |
| 23 | Electrovalve body of the medium burner | PEVDN320 | PEVDN320 | PEVDN320 | PEVJOUC |
| 24 | Electrovalve body of the small burner | PEVDN320 | PEVDN320 | PEVDN320 | PEVJOUC |
| 25 | Electrovalve body of the big burner | PEVDN320 | PEVDN320 | PEVDN320 | PEVJOUC |
| 26 | Secondary solenoid valve | EVPRINCI | EVPRINCI | EVPRINCI | GEVHE20G |


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| | | | | | |
|---|---|---|---|---|---|
| 27 | Ionization electrode | SDIONIHE10 | SDIONIHE10 | SDIONIHE20 | SDIONIHE20 |
| 28 | Ignition electrode | SDALUMHE | SDALUMHE | SDALUMHE | SDALUMHE |


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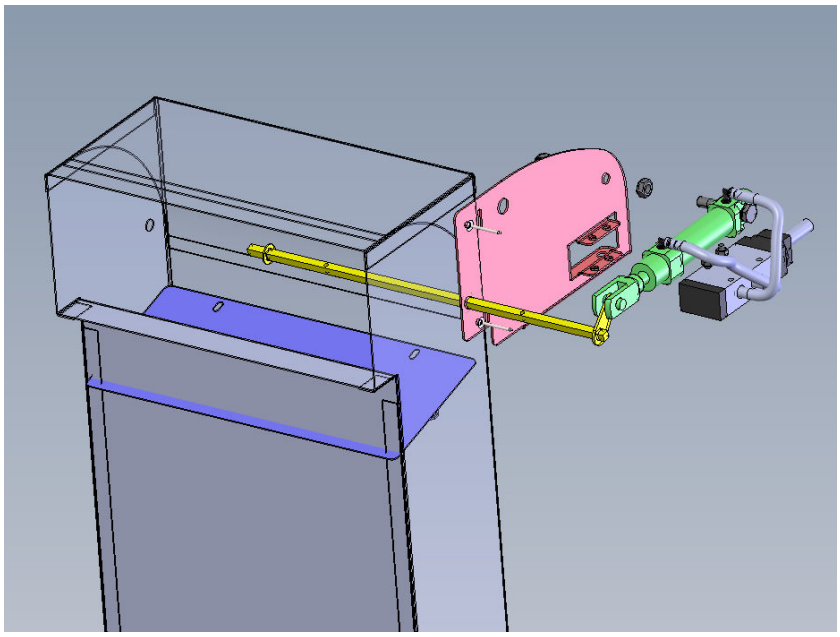
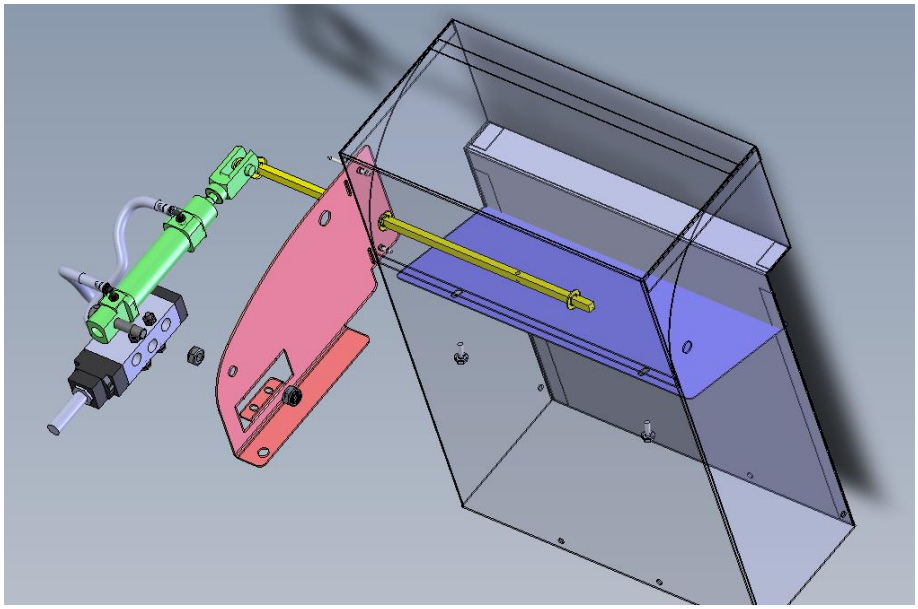
# XIII OPTION

## XIII-1 Heoss output motorized hatch (Jack System) :

### XIII-1-a Assembly







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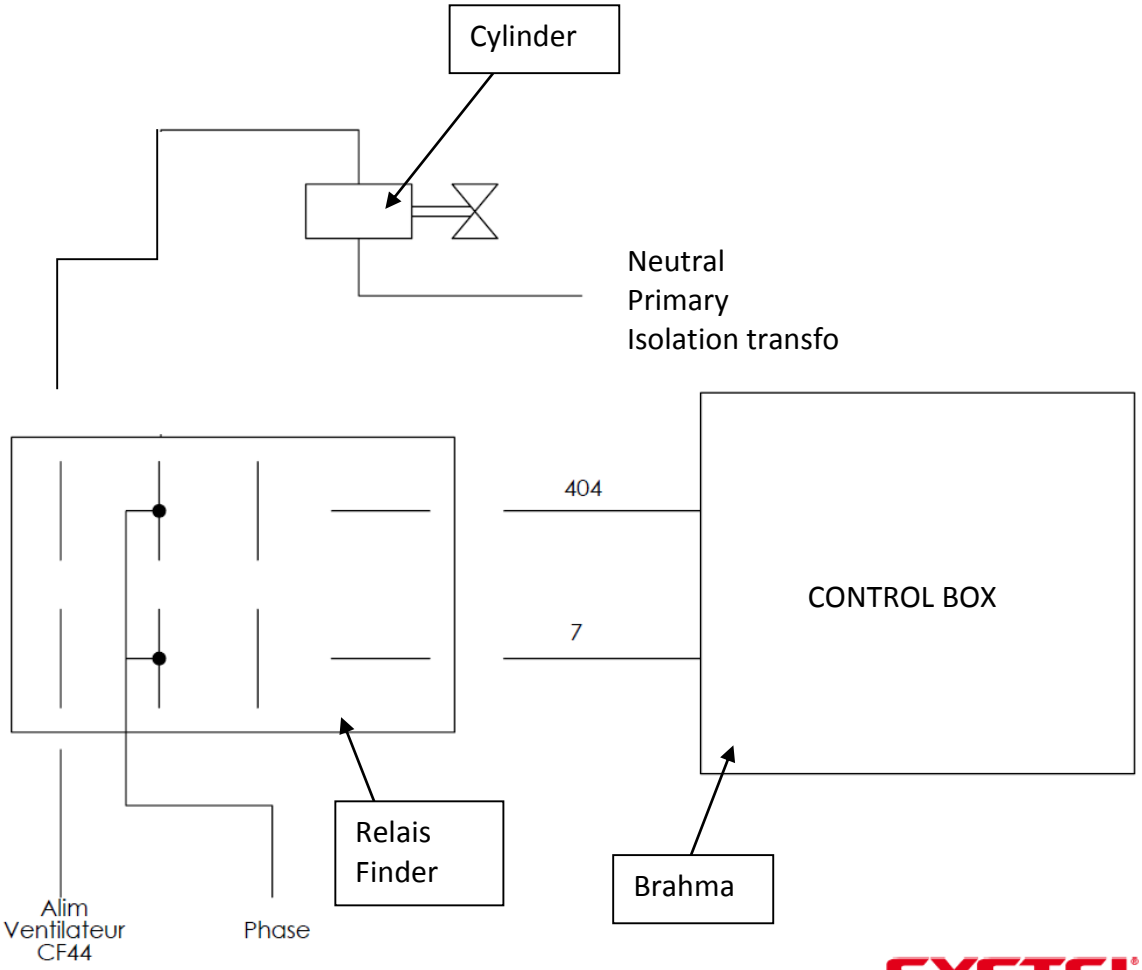
## XIII-1-b Cabling



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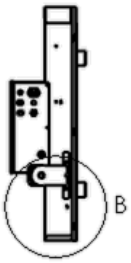
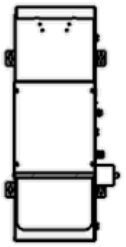
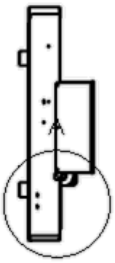
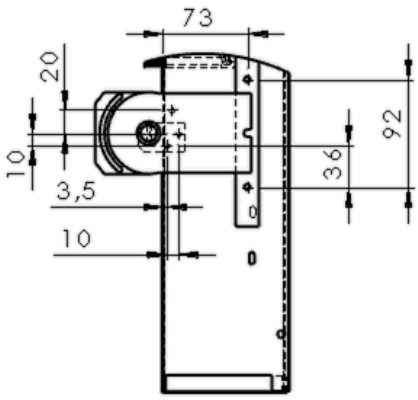
## XIII-2 Motorized hatch in heoss inlet (system with sauter motor) :

### XIII-2-a Assembly :

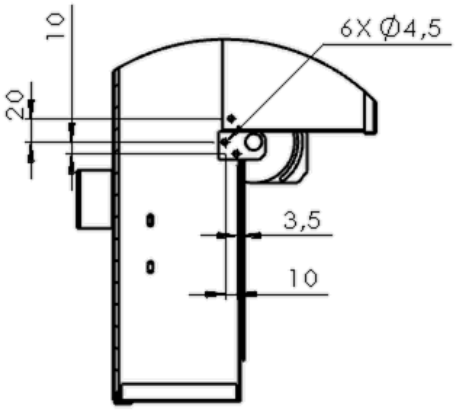





DETAIL B
SCALE 1 : 5




DETAIL A
SCALE 1 : 5



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## XIII-2-b Cabling