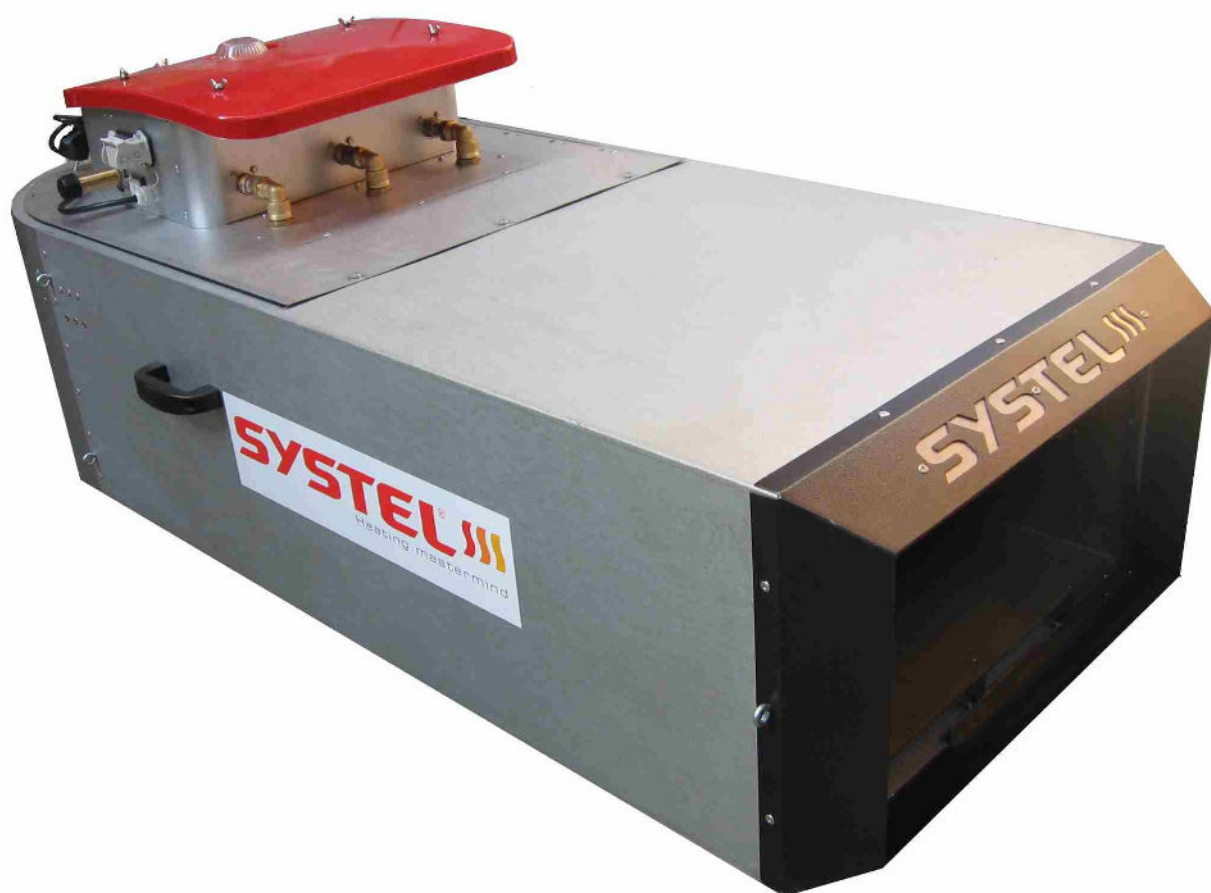


GAS HEATER

heoss



TECHNICAL NOTICE AND USER'S GUIDE

SYSTEMEL 
Heating mastermind

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WARNING

Read these instructions carefully!

The life of this apparatus and its efficiency will be optimal if its use and maintenance is carried out according to the current norms and instructions.

Before installing the apparatus verify that the local gas distribution (type of gas, pressure, regulator, etc.) is compatible with the **hEOSS** requirements.

The installation, regulation and conversion to another gas, requires the intervention of an authorized technician.

The Systel factory must be consulted before substituting parts not listed in this manual.

It is responsibility of the installer to: verify that the installation is in accordance with the following norms and to give the user the current user's manual

notice to user:

- Any modifications to the heater or its installation, even the most minimum modification, change or elimination of security components or pieces that influence the efficiency or the proper combustion, will result in the loss of the CE certification and the voiding of Systel's guarantee.
- is imperative to perform the cleaning and periodic maintenance.

Systel in coordination with the CE Certification Organisation reserve the right to modify the current manual. Only the manual included with each heater can be considered as contractual.



ATTENTION: this apparatus should not be used in domestic buildings nor in establishments for public use.



ATTENTION: it is necessary to add a complementary ventilation depending on the model.

I - DESCRIPTION AND OPERATION

The purpose of this **heoss** hot air generator is the raising of farm animals and heating of agricultural use warehouses.

It is a progressive heater with automatic ignition. It works with propane gas and it should be placed outside the farm buildings. A Natural Gas model is available.

It is regulated progressively with 0-10V input that corresponds to the power range of the heater.

This direct combustion heater has a burner whose combustion air always comes from the outside (clean air, without dust).

The combustion air and ventilation air must be obtained from the outside part of the room (corridor) or the outside part of the farm or must be used inside the farm if necessary.

Design and manufacture are in accordance with IN 12669 rules: gas direct combustion hot air heater with forced convection to be used in agricultural buildings and non domestic use building.

CE Certified heater : **CE : CE B12
B12BP3955**

I.1. Description of the heater:

- AISI 304 Stainless steel chassis Distribution fan with fixed flow
- 3 different power burners in stainless steel.
- Fan operation is controlled by 1 pressure switch.
- Three gas electro valves controlled by an electronic circuit card and programmer with control the operation cycle of the **heoss** . Simultaneously controlling the security system and guarantying ignition. The programmer can be controlled remotely. It is controlled by a programmer that controls the operation cycle of the generator, the safety controls and assures ignition. This programmer can be equipped with a remote reset in case of a fault.
- Electronic ignition is produced by an ignition electrode and a device which controls the flame through an ionization system.
- Thermal protection an overheating thermostats.
- Fan operation is controlled by 1 pressure switch.

I.2. Instructions for Use:

- Maintain this heater in accordance with these instructions.
- Maintenance is necessary after each brood is raised. It is also necessary to regularly verify that there are not any problems in the heater, the combustion chamber and conduits.
- Regularly verify that the air inlets are not blocked.
- Verify that the hot air can circulate normally inside the farm, that no obstructions are blocking the air outlets, and that the baffles are not closed.

I.3. Operation:

- When the heater is turned on from the farm switchboard, the fan starts and after 20 seconds, the three burners are lit at the same time by the ignition electrode. The hot air, obtained by the combustion is then blown into the farm. After those 20 seconds and depending on the temperature requirements one by one or two by tow or the three at the same time of the burners will still lighted.
- When the desired temperature is reached, the gas valve closes and the small burner continues to burn and the fan to ventilate for an additional 60 seconds, in order to cool the combustion chamber.

I.4. Security:

- Loss of flame is detected by the ionization probe and the gas electrical vanes are immediately closed, this stops the burner and sets it in security mode. The ventilation fan stops 40 seconds later.
- Thermal protection of the heater is assured by an overheat thermostat.

- Ventilation fan operation is controlled by 1 pressure switch.

I.5. Ignition: To turn on the heater, please read the ignition instructions carefully (page 13)

I.6. TURN OFF:

- To stop the heater for a short period of time it is sufficient to turn down the desired temperature via the switchboard or microprocessor (must send under 1,7 volts).

- For a longer stop, turn down the desired temperature via the switchboard or microprocessor, wait for the burner and the fan to stop after 40 seconds.

You can then close the gas valve and cut the electrical feed at the on-off switch.

Only cut the gas and electricity in case of emergency or to turn off the heater for long periods of time.

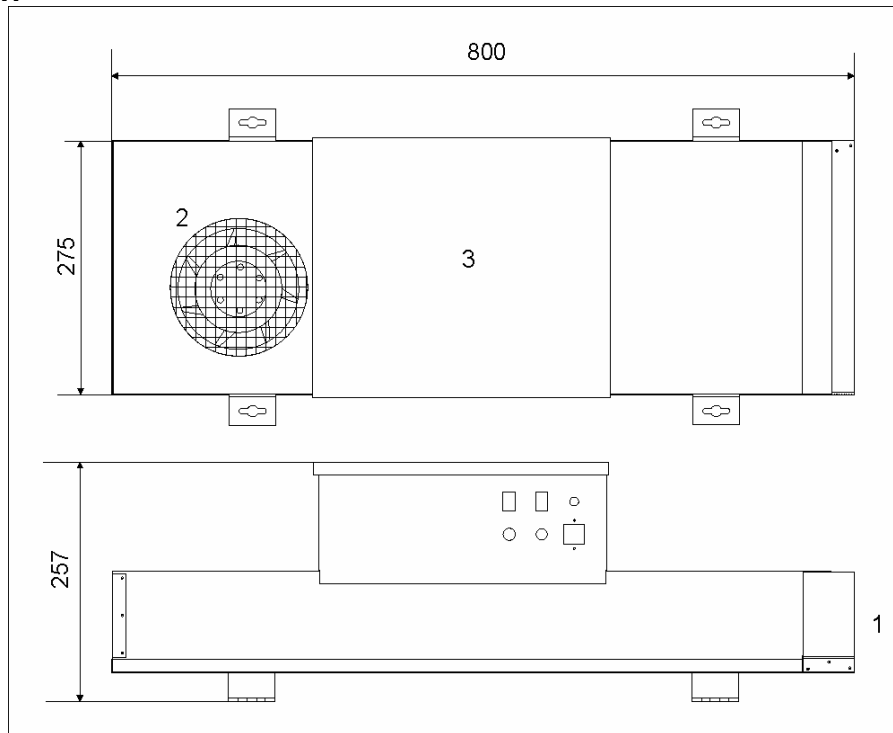
II – TECHNICAL CHARACTERISTICS MODELS 10 KW/20 KW

CONCERNED COUNTRIES	PRESSURE	Kind of gas
FR-BE	20/25 ; 37	I2E+ ; I3P
LU	20	I2E
DE	20 ; 37	I2E ; I3P
AT-CH-ES-IE-GR-GB-PT-CZ	20 ; 37	I2H ; I3P
SE-FI-DK	20	I2H
NL	25 ; 37	I2L ; I3P
IT	37	I3P

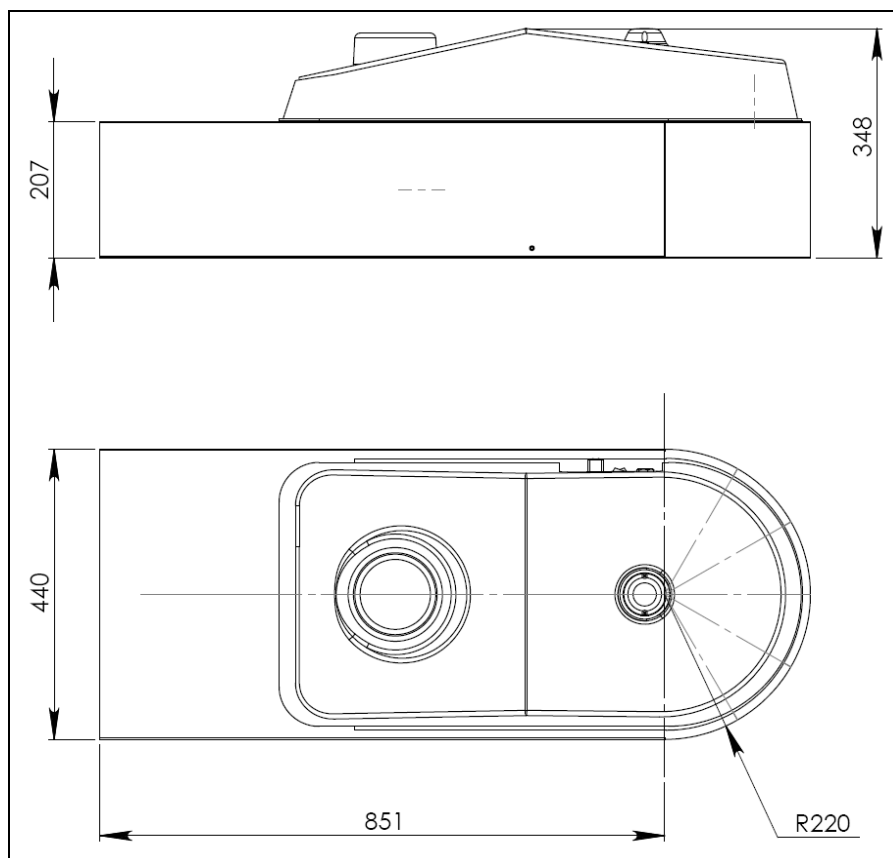
		HEOSS 10	HEOSS 20	HEOSS 55	HEOSS 90	HEOSS 120
GAS CONNECTION		1/2"				
ELECTRIC CONNECTION		230 V – 50 Hz				
NET WEIGHT	Kg.	15	15			
NOMINAL POWER	KW. PCI	10	20	50	80	110
	KW PCS	11	22	55	87	120
BURNER 1 POWER	KW. PCI	1,4	2,8	7	11.2	15.4
BURNER 2 POWER	KW. PCI	2,9	5,8	14.5	23.2	31.9
BURNER 3 POWER	KW. PCI	5,7	11,4	28.5	45.6	62.7
MINIMUM GAS FLOW G31 (0°C / 1013mbar)	g/h	110	220	550	880	1210
MAXIMUM GAS FLOW G31 (0°C / 1013mbar)	g/h	781	1562	3905	6248	8591
MINIMUM GAS FLOW G20 (0°C / 1013mbar)	l/h	128	256	640	1024	1408
MAXIMUM GAS FLOW G20 (0°C / 1013mbar)	l/h	910	1820	4550	7280	10010
INCREASE OF TEMPERATURE (+/- 1)	90 °C (10° C air)	58	82	98	110	107
INJECTOR DATA G31 BURNERS 1 / 2 / 3		60 / 88 / 125	94 / 128 / 210	140/210/350	210/350/-	-/-/350
INJECTOR DATA G20 BURNERS 1 / 2 / 3		88 / 137 / 155	124 / 180 / 260	210/350/-	350/-/-	-/-/350
AIR FLOW	M3/h	360 ó 500	715	1500	2100	3000
AIR FLOW DISTANCE	m	15	18	30	40	45
ACOUSTIC LEVEL	dB (A)	59	74	78	70	78
FAN ELEC. ABSORBED POWER	W	62	87	216	230	540
TOTAL ABSORBED ELEC. POWER	W	100	125	250	280	590

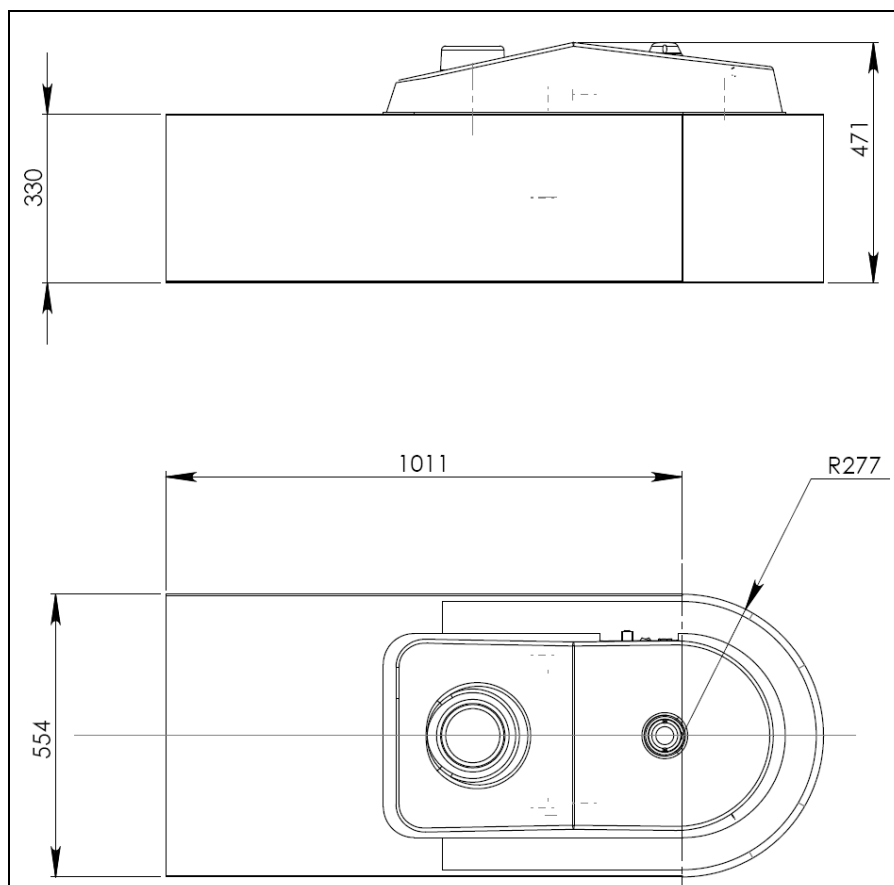
III – DIMENSIONS

HEOSS 10 AND 20 KW



HEOSS 55





IV-RULES

The installation must be in accordance with the current legal and regulatory requirements and must be carried out according to the manufacture's prescriptions and instructions.

It is also the responsibility of the installer to respect the current prescriptions and regulations with reference to the type of farm building.

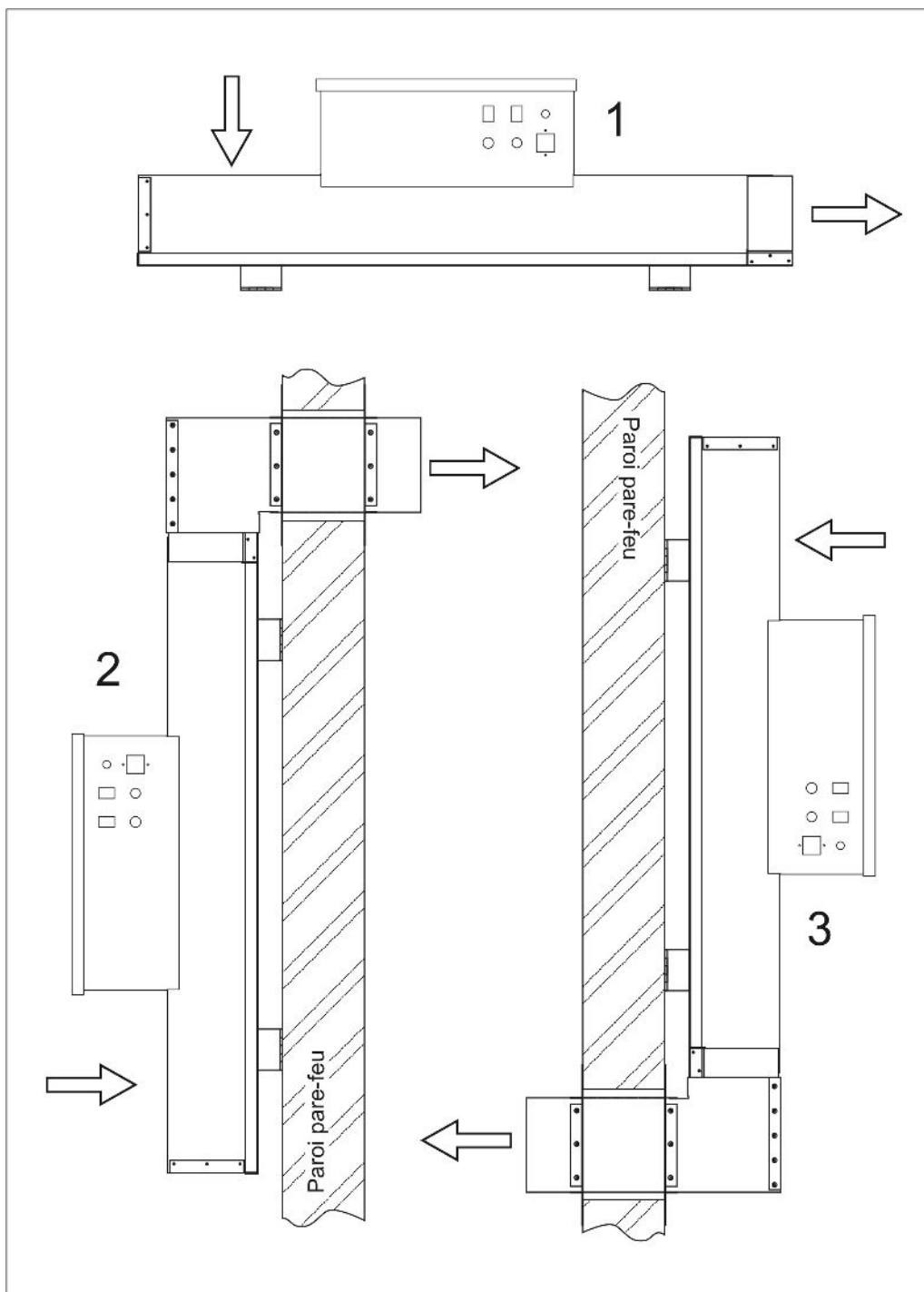
V – INSTALATION

HEOSS is ready to work inside or outside the pig and poultry buildings and corridors.

V.1. Heater location:

- The heater can be mounted horizontally and vertically.
- Keep the air inlet and air outlet free of obstructions.
- It is necessary to have a minimum space around the heater in order to have good air flow and sufficient space for maintenance and repair.
- The model, number and placement of the heaters depends on the size of the farm.

- Installation examples :



V.2. Installation:

- Verify that the structure of the farm building is strong enough to support the heater and its accessories.
- It is necessary to have a minimum space around the heater in order to have good air flow and sufficient space for maintenance and repair.
- The heater has to be mounted rigidly to avoid tension on the gas and electrical connections.
- If outside installation, we also recommend protecting the heater from rain, snow, ice and humidity with an optional roof and verifying the electrical box is properly closed.

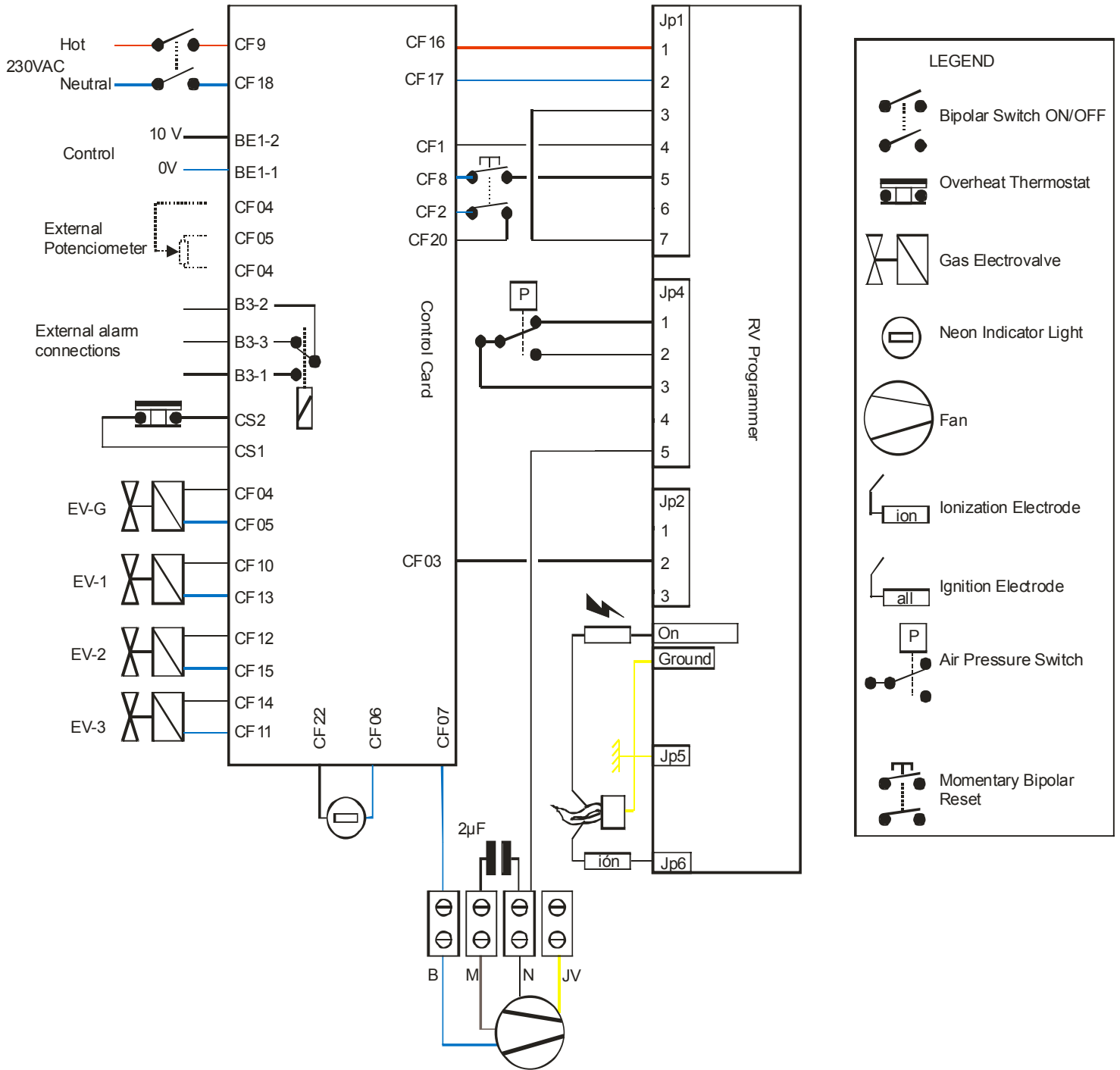
VI – GAS CONECTIONS

- The gas connection is made via a male rapid disconnect ½”
- Give the correct kind of gas and correct pressure of gas, according to the **hEOSS** gas heater indications
- Systel ships the heater with the gas regulator, the gas tap and a gas filter. They must be mounted to the wall, close to the gas heater entrance.
- Before starting the heater, it is mandatory to test for gas leaks.
- Once the gas connection has been made and before starting the heater for the first time, it is mandatory:
 - to purge the gas conduits
 - to adjust the gas conduit distribution pressure and the heater’s feed pressure.
- At the beginning of gas ducts a filter is recommended.

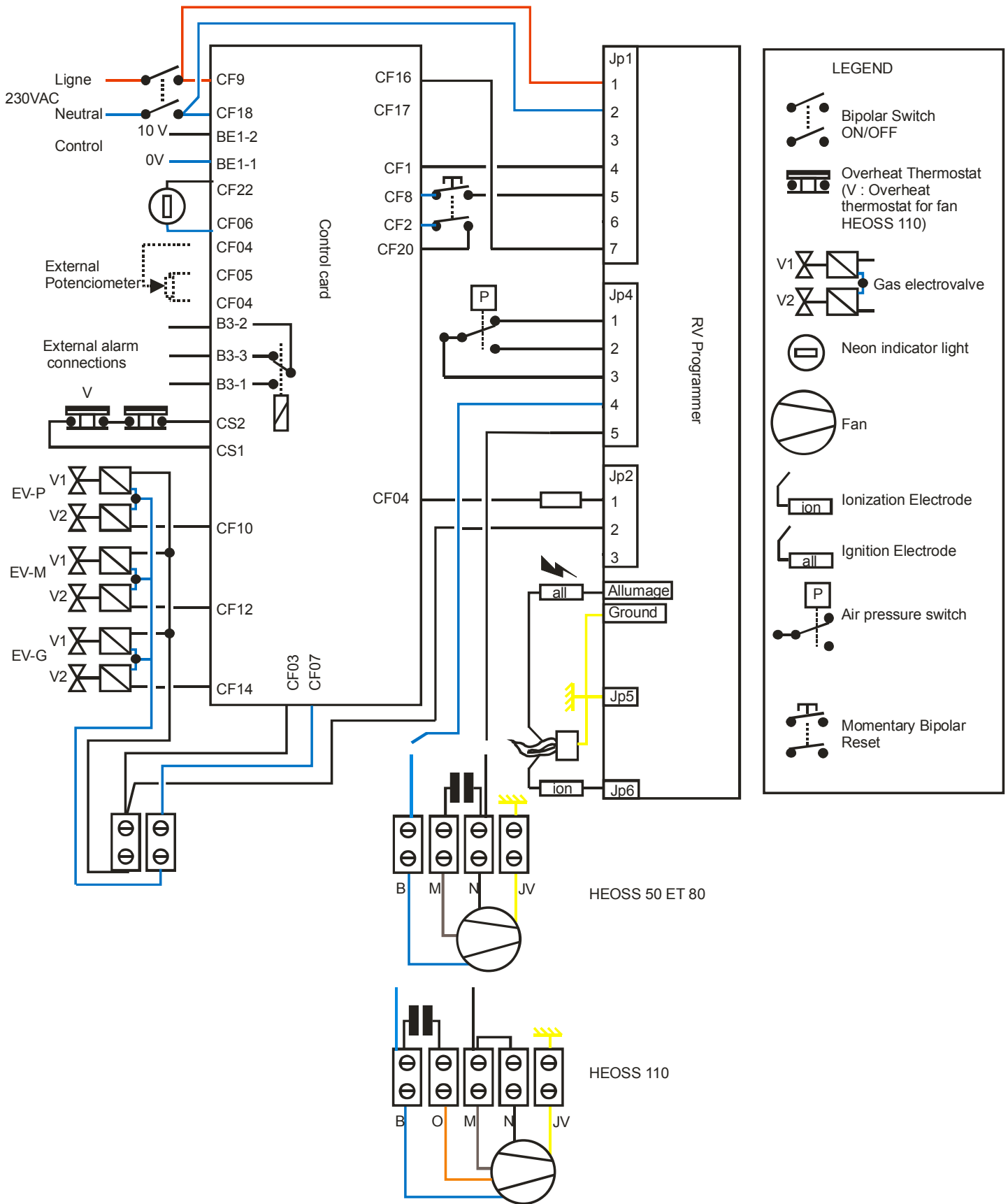
VII - ELECTRICAL CONNECTIONS

- The heater is shipped wired according to the electric schematics on the following pages.
- The heater should be connected to a switchboard that has a 0 / 10V output to allow it to work progressively. You can also connect the **hEOSS** directly to a thermostat, in which case it will not work progressively.
- The electrical connection must be made according to the current regulations (gauge of the conductors, earth, etc.) and according to the electrical schematics in the following pages. It is not necessary to respect the position of the neutral and the phase.
- The input voltage is single phase 230 V.
- Verify that the direction of rotation corresponds to the direction indicated on the fan.
- A red luminous indicator, beside the electronic box of the heater (next to the switches), indicates when the heater is in the security mode.
- If remote luminous and/or audible security indicators are necessary, the connections are optionally available (see page 12).
- If a remote reset is necessary, the connection is also optionally available.

- **Electrical details HEOSS 10 and 20:**

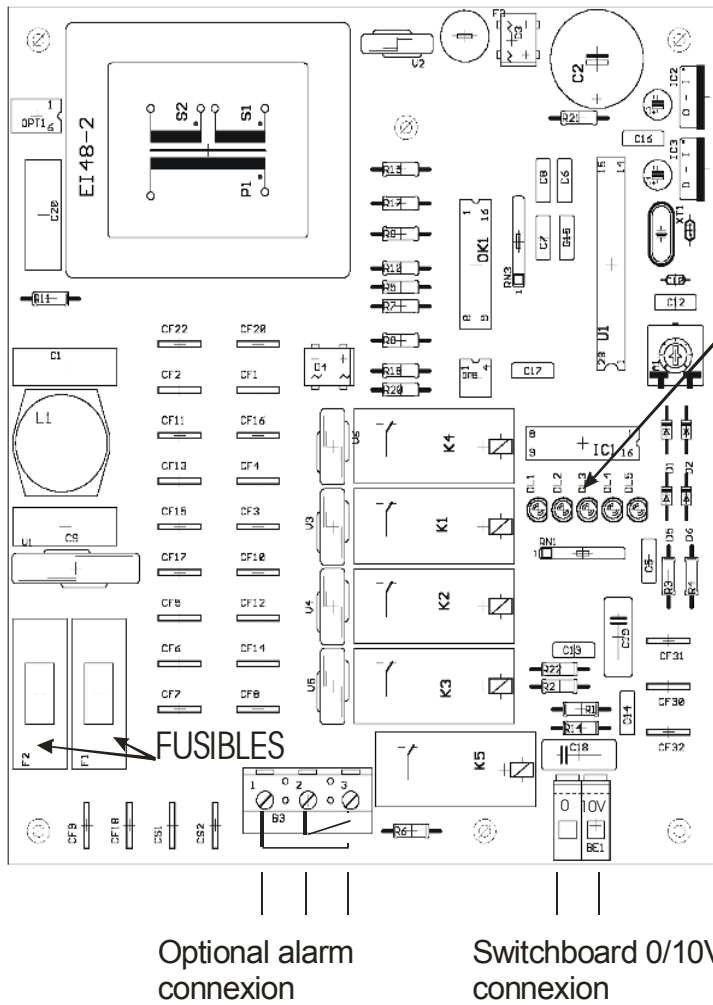


- **Electrical details HEOSS 55, 90 and 120:**



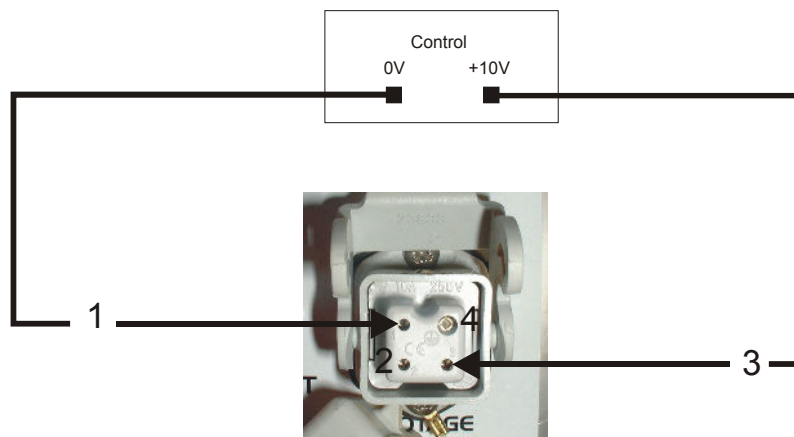
- Electrical connections mandatory done by an electrician

The installation must be provided with a ground connection **as** shown on the electrical schematics.



5 LIGHT EMITTING DIODES
 INDICATION RELAY FUNCTION:
 DL1 ON : Low power burner electrovalve open
 DL2 ON : Medium power burner electrovalve open
 DL3 ON : High power burner electrovalve open
 DL4 ON : Heat request
 DL5 ON : The heater is not in security mode

Optional external potentiometer
 or extra connection



VIII-TURNING ON AND OPERATION

The **heoss** heater is completely inspected and tested at the factory before shipment. Before turning on, it is mandatory to verify that the installation was carried out in accordance with these instructions.

VIII.1. Ignition:

- Make sure that the hot air outlet shutters are open, and that the heater is closed.
- Open the gas valve.
- Turn the switch on.
- Set the switchboard for the desired temperature.
- Reset if necessary (when turning on the first time or after long period of inactivity it is sometimes necessary to reset a number of times in order to purge the gas pipes.
- After two minutes the heater will turn on.

VIII.2. OPERATION

- The switchboard of the farm sends the heater a heating command in form of a 0 - 10 V signal. The heater starts at a preset point of 2.1 Volts.
- When the difference of pressure is stabilized, the carburant fan starts, and a 40 second pre-purge of the combustion chamber is made.
- Ignition is directly made in the three burners at the same time by an ignition electrode. Sparks are produced and the gas valves are opened.
- If, after 5 seconds, the burners doesn't start up or if the flame is not correct, the flame detector puts the heater in security mode after three attempts. The security indicator lights (the luminous indicator at the farm control also lights if installed). This fault can be reset (remote reset if installed) after a few second by pressing the heater or remote reset.
- Once the burner is lit, the Ionisation probe controls the burner's flame.
- If the amount of combustion air is insufficient, the burners turn off and a new cycle is started. If the operating conditions are correct the heater starts, if they are not, the heater goes into security mode.
- In case of overheating, an overheating thermostat cut the gas feed to the burner:

A one minute cooling time is necessary before resetting the thermostat.

- When the desired temperature is reached and detected by the switchboard, the switchboard sends a stop signal to the heater. Dilution fan continues for 60 seconds to cool the combustion chamber.

- To stop the heater for a short period of time it is sufficient to turn down the desired temperature via the switchboard or microprocessor.

- For a longer stop, turn down the desired temperature via the switchboard or microprocessor, wait for the burner and the fan to stop.

You can then close the gas valve and cut the electrical feed at the on-off switch.

- To turn the heater on, follow the ignition instructions.

Only cut the gas and electricity in case of emergency or to turn off the heater for long periods of time.

IX - PERMANENT VERIFICATIONS

- Verify that air outlet and inlet are not covered.
- Verify the quality and the strength of the supports.
- Verify that the dilution fan protection grill is not deteriorated or covered.
- Verify that the air carburant entrance of each burners are clean and functional.

X - PERIODIC MAINTENANCE

- Before beginning maintenance, cut the gas input and after the dilution fan stops cut the electrical feed.
- Periodic maintenance is necessary after each brood is raised. The frequency of maintenance depends on the environmental conditions of the farm in which the heater is installed. (dust in the air, type of animals, vegetation).

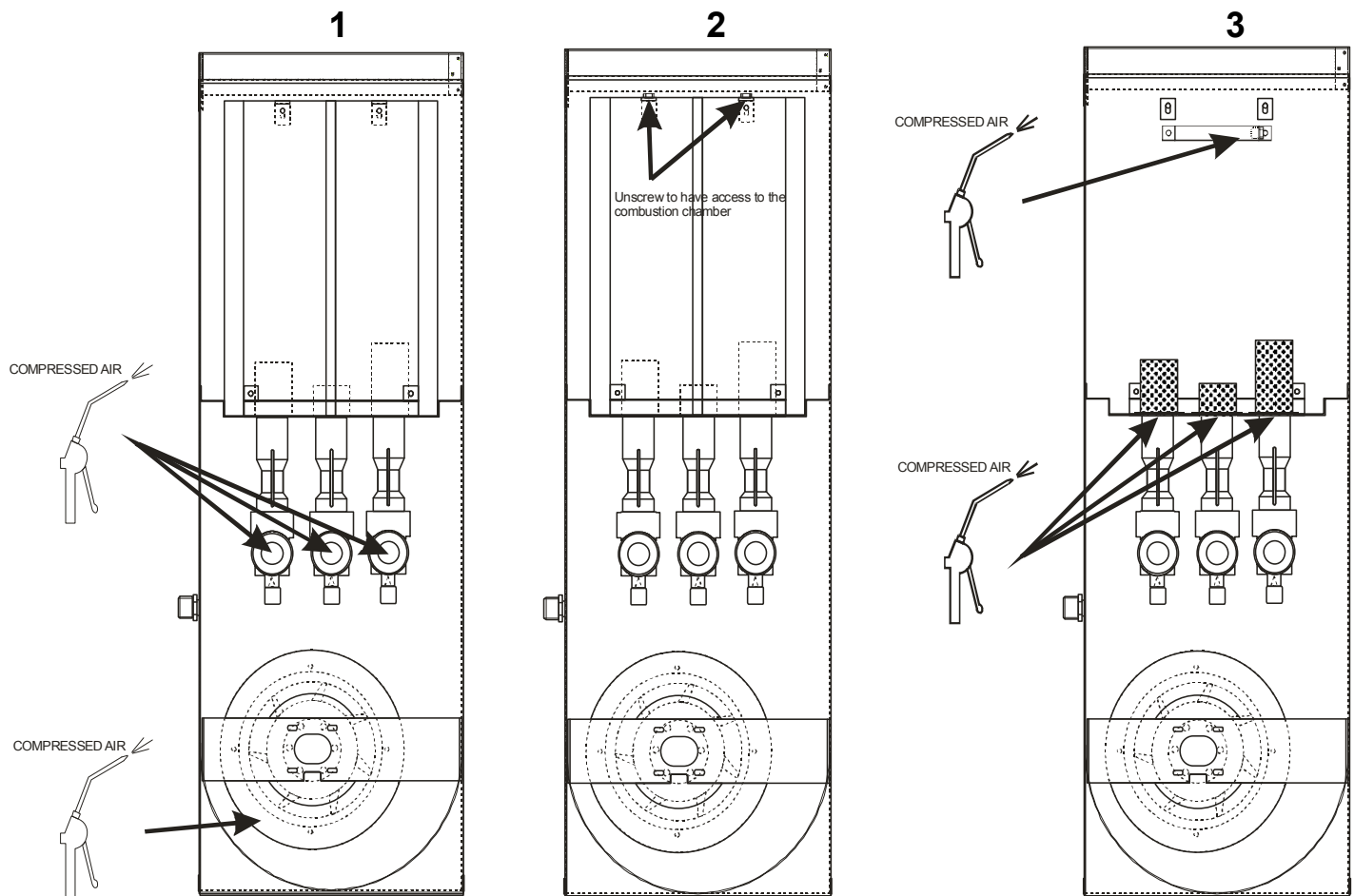
Cleaning: To open the mobile part remove the 3 screws

1 - To clean inside the heater; the dilution turbine and the contour of the combustion chamber with compressed air:

2 - To remove the 2 combustion chamber screws.

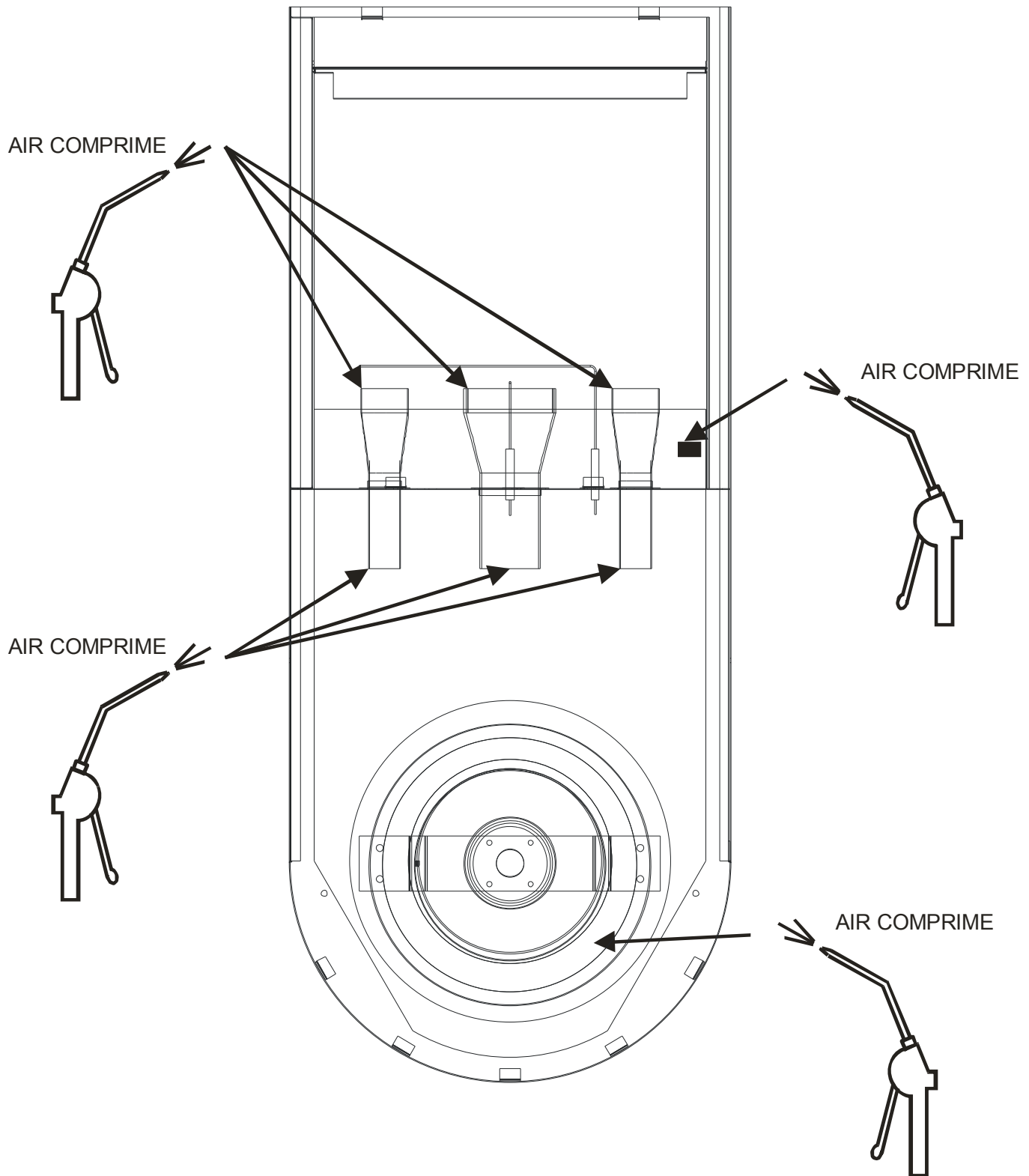
3 - To clean inside the heater; the three burners and the overheat thermostat with compressed air.

MODEL 10 and 20 KW.



- After cleaning, replace the 2 combustion chamber screws and close the mobile part, replacing the three screws.

MODEL 55, 90 and 120 KW.



XI - ANOMALIES OF OPERATION

1 - the burners doesn't light:

- 1.1 the heater doesn't have an electrical feed: put the on-off switch in the "1" position.
- 1.2 the switchboard of the farm sends a heating command lower than the ambient temperature: the heater is not turned on.
- 1.3 the fuse is burnt (see the electronic schematic on page 12).
- 1.4 The heater is in security mode and was not reset after it stopped.
- 1.5 Pressure switch defect (faulty pressure switch or unplugged tube, fan operate continuously)
- 1.6 The switchboard is broken or doesn't have an electrical feed.
- 1.7 the gas valves are broken or disconnected.

2 – Security Mode

LUMINUS SIGNAL IS LIGHTING CONTINUUSLY

- 2.1 air inside the gas pipes: purge.
- 2.2 Installation gas filter full.
- 2.3 gas valve close.
- 2.4 ionization bore malfunction
- 2.5 the ignition electrode is broken or disconnected
- 2.6 the fan is broken or disconnected.
- 2.7 overheating thermostat was activated (more than 90° raised)

LUMINUS SIGNAL IS LIGHTING WITH FAST INTERMITANCE

- 2.8 overheating thermostat is broken : Verify that the thermostat is clean or that air outlet and inlet are not covered, that the dilution fan protection grill is not deteriorated or covered.

LUMINUS SIGNAL IS LIGHTING WITH SLOW INTERMITANCE

- 2.9 overheating thermostat was activated (more than 90° raised) and reset but still too hot. Just wait for some minutes to let it cool.

3 - burner pressure switch

- 3.1 Verify the operation of the fan and of the air intake fan
- 3.2 Verify the state of the air intake filter.
- 3.3 verify pressure switch cables and its conduits.

4 - the heater doesn't provide full power

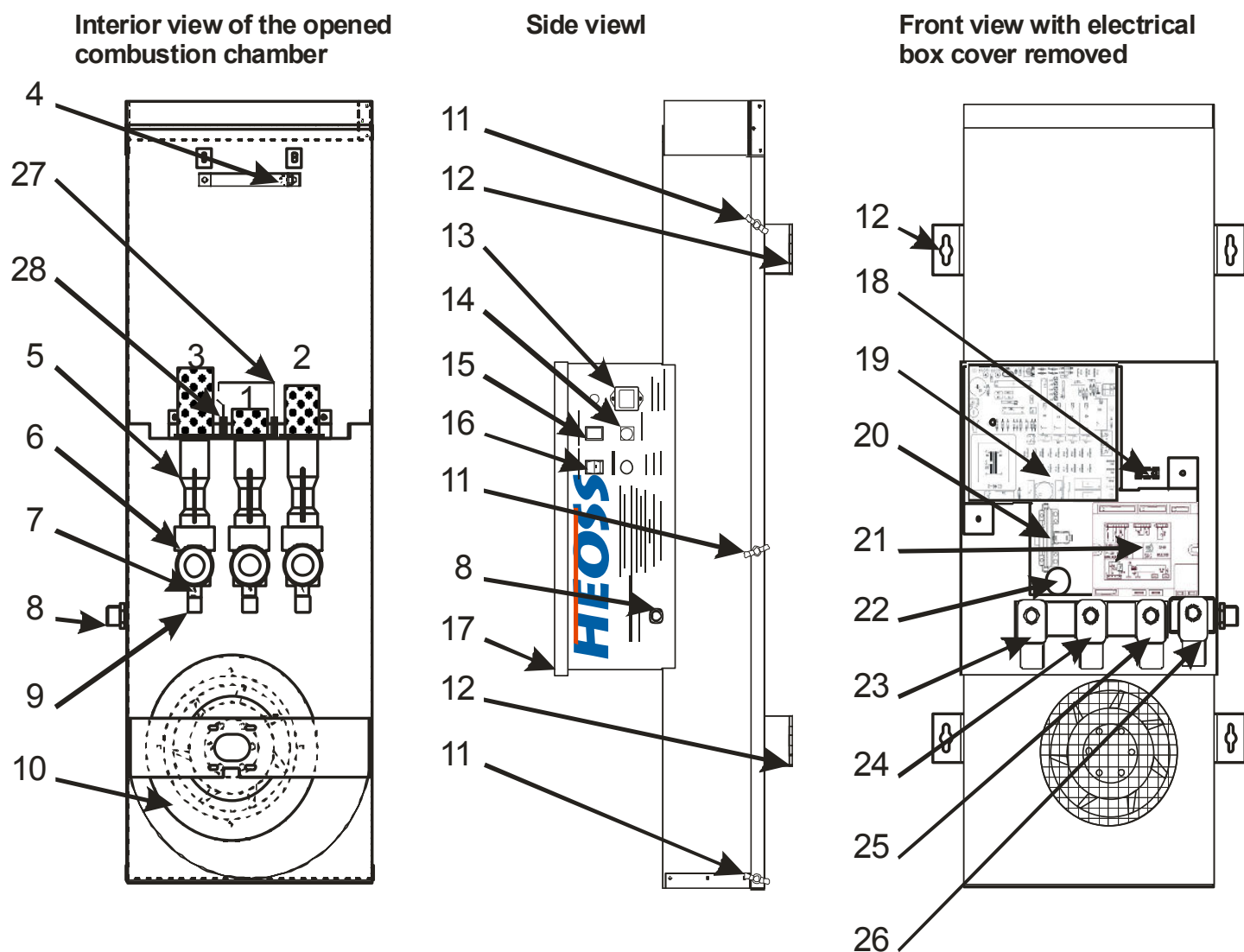
- 4.1 verify the pressure of the gas at the input.
- 4.2 gas filter clogged or worn-out
- 4.2 verify the injectors

5- The fan doesn't work

- 5.1 No electricity to the fan electrical terminals.
- 5.2 Problem in the condenser or the motor

XII – HOUSING DIAGRAM

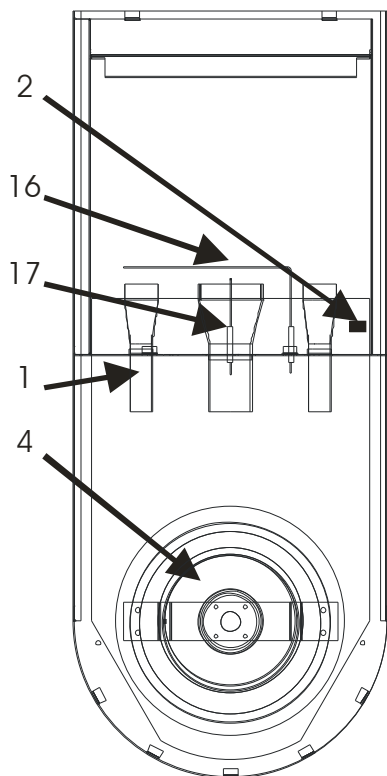
MODELS 10 and 20 KW.



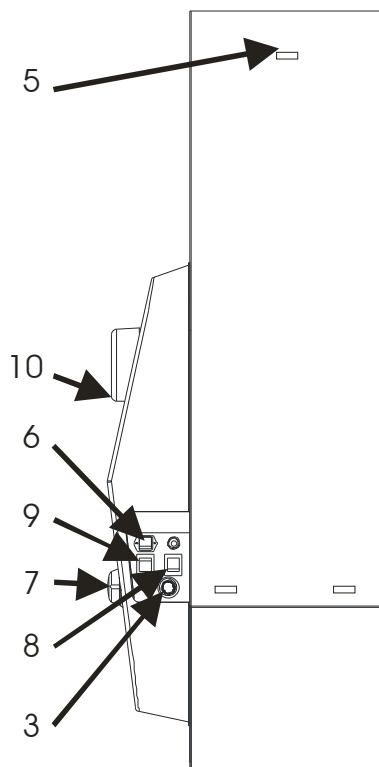
1.	Low power burner	16.	Switch off / on
2.	Medium power burner	17.	Electronic Box Top
3.	High power burner	18.	Ground connection
4.	Overheat thermostat	19.	Circuit card
5.	Venturi Tube	20.	Pressure switch
6.	Combustion air «T » entrance	21.	Programmer
7.	Injector	22.	Fan condenser
8.	1/2" intake gas coil	23.	Medium p. burner valve body
9.	Elbo injector mount	24.	Low p. burner valve body
10.	Fan	25.	High p. burner valve body
11.	Opening screw	26.	Secondary valve.
12.	Mounting location	27.	Ionization electrode
13.	0/10V rapid disconnect or thermostat connection.	28.	Ignition electrode
14.	Security mode indicator light		
15.	Push button reset switch		

MODELS 55, 90 and 120 KW.

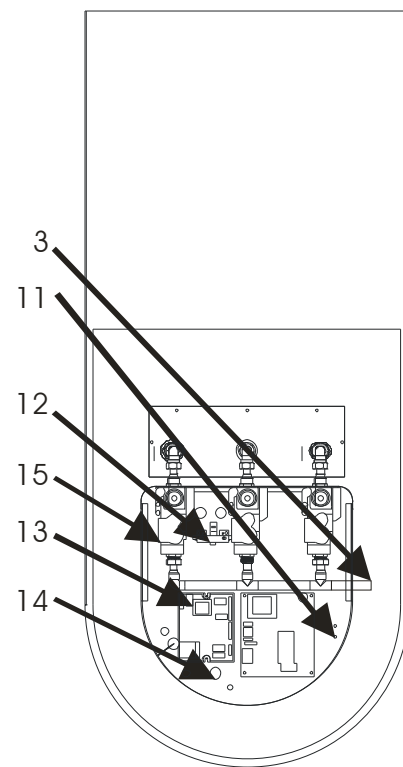
Interior view of the opened combustion chamber



Side view



Front view with electrical box cover removed



1. Burner(s)
2. Overheat thermostat
3. 1/2" intake gas coil
4. Fan
5. Mounting location
6. 0/10V rapid disconnect or thermostat connection.
7. Security mode indicator light
8. Push button reset switch
9. Switch off / on
10. Electronic Box Top
11. Ground connection
12. Pressure switch
13. Circuit card

14. Fan condenser
15. burner valve body
16. Ionization electrode
17. Ignition electrode