

# INSTALLER AND USER INSTRUCTIONS

N° 05000705 / 0



**AM 12/19/29/39/48/58**

PLEASE READ CAREFULLY THIS DOCUMENT BEFORE STARTING THE INSTALLATION.  
THIS DOCUMENT SHALL BE LEAVED AT THE END-USER AFTER INSTALLATION.

Manufacturer:  
SBM  
3 cottages de la Norge  
21490 CLENAY  
FRANCE

Tel : 03.80.76.74.70  
Fax : 03.80.76.74.69  
e-mail : [sbm.com@sbm.fr](mailto:sbm.com@sbm.fr)  
<http://www.sbm-international.net>

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## ***GENERALITIES***

- *In order to improve the products, SBM is reserving the right to modify without warning, the specifications of the appliances.*

## 1. APPLICATION RESTRICTIONS



***The installation and maintenance of this air heater should be performed by an authorized competent installer and in accordance with this manual.***



***The appliance shall be CE marked.  
Respect the safety clearances with the inflammable materials.***



***This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.***



***In case where the air intake is done inside the room (type B connection), provide a sufficient ventilation by referring to the rules in force.***

### 1.1 Pre-check

Before unpacking and installation, please check (i.e. on the data badge) if the heater is in accordance with the order and if it is suitable for the local present provisions (gas type, gas pressure, electrical supply etc.)

The Installation must comply with all applicable local and national standards.

If this heater is drawing its combustion air from within the room in where it is located, the necessary combustion ventilation requirements must be followed for gas safety regulations.

Make sure that the warm air can be blown out freely. There should absolutely be (no possibility of) materials within 5m from the front of the heater.

The heaters have been tested in detail on safety and correct operating settings before leaving the factory. It has been adjusted for the type of gas that is stated on the data badge.  
If there is any doubt, please contact SBM.

### 1.2 Protection degree

The appliances have been designed for a use in a dry and not very dusty environment (protection degree **IP20**).

The heater should not be installed in areas containing any corrosive or explosive vapors, in high moisture or dust concentrations, at negative pressures or temperatures higher than 30°C; please consult SBM. The guarantee is then invalidated.

## 2. TECHNICAL SPECIFICATIONS

AM MODEL		12	19	29	39	48	58
Maximal heat input Hi (G20 & G31)	kW	14,0	22,8	32,0	44,0	55,0	66,0
Minimal heat input Hi (G20 & G31)	kW	9,0	14,8	20,5	26,4	33,0	39,6
Maximal heat output Hi (G20 & G31)	kW	12,8	20,8	29,2	40,2	49,9	60,5
Minimal heat output Hi (G20 & G31)	kW	8,3	13,8	19,1	24,4	30,8	37,0
Maximal heat input Hi (G25)	kW	12,1	19,4	26,6	36,5	45,7	54,8
Minimal heat input Hi (G25)	kW	7,9	12,6	17,0	21,9	27,4	32,9
Maximal heat output Hi (G25)	kW	10,8	17,3	23,9	32,9	41,1	49,3
Minimal heat output Hi (G25)	kW	7,0	11,2	15,3	19,7	24,7	29,6
Maximum hot air flow	m <sup>3</sup> /h	1150	2070	2600	4370	5150	6300
Horizontal throw	m	12	16	23	26	28	30
Vertical throw	m	5	5	6	7	7	8
Gas connection		Rp 1/2" (ISO 7)			G 3/4" (ISO 228)		
Electrical connection		230 VAC / 50-60 Hz					
Electric consumption	W	250	250	250	450	450	600
Maximum current consumption	A	1,1	1,1	1,1	2,0	2,0	2,6
Low voltage thermostat		Yes					
Sound level (average)	dBA	42	45	45	46	47	49
Minimal hanging height	m	1,7					
Maximal length of the duct	m	9					
Weight	kg	36	37	38	78	80	82

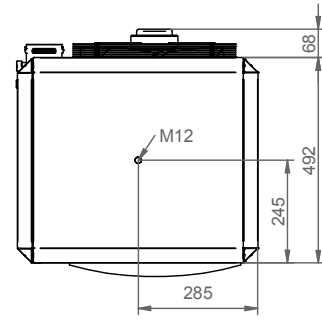
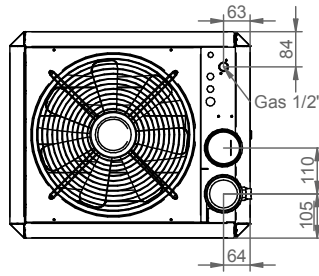
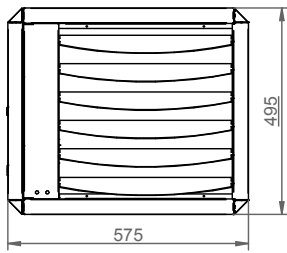
### Natural gas G20 and G25

Nominal supply gas pressure G20	mbar	20 (17 to 25)					
Nominal supply gas pressure G25	mbar	25 (20 to 30)					
Gas category	Cat.	II <sub>2E</sub> SI3P					
Class for combustion products discharge		B23, C13 or C33					
Maximum gas consumption G20	m <sup>3</sup> /h	1,5	2,4	3,4	4,7	5,8	7,0
Maximum gas consumption G25	m <sup>3</sup> /h	1,4	2,3	3,2	4,4	5,4	6,5
CO <sub>2</sub> at high speed level G20	%	9,0	9,0	9,0	9,0	9,0	8,9
CO <sub>2</sub> at low speed level G20	%	8,5	8,5	8,5	8,5	8,5	8,5
CO <sub>2</sub> at low speed level G25	%	7,6	7,6	7,6	7,6	7,6	7,6
NO <sub>x</sub> (at 0% of O <sub>2</sub> )	mg/kWh	37	36	35	43	41	42
NO <sub>x</sub> class		5					
CO (at 0% of O <sub>2</sub> )	mg/kWh	6	5	6	3	4	5
Maximum combustion products flow	kg/h	21,7	35,5	51,3	70,6	88,2	105,8

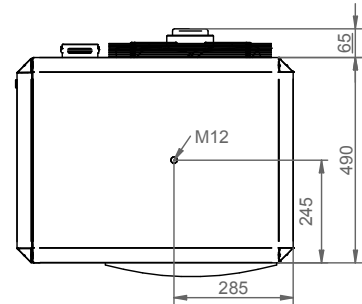
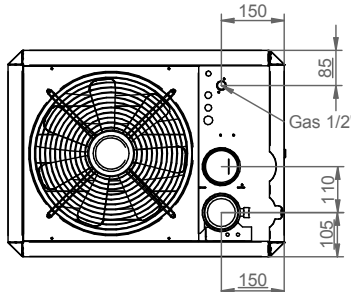
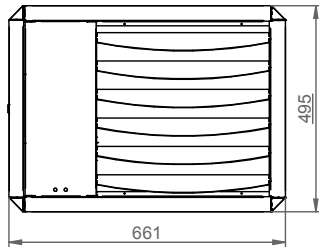
### Propane G31

Nominal supply gas pressure G31	mbar	30-50					
Supply gas pressure (min-max) G31	mbar	25-50					
Gas category	Cat.	II <sub>2E</sub> SI3P					
Class for combustion products discharge		B23, C13 or C33					
Maximum gas consumption G31	kg/h	1,1	1,8	2,5	3,5	4,4	5,3
CO <sub>2</sub> at high speed level G31	%	10,7	10,7	10,7	10,7	10,7	10,5
CO <sub>2</sub> at low speed level G31	%	10,0	10,0	10,0	10,0	10,0	10,0
NO <sub>x</sub> (at 0% of O <sub>2</sub> )	mg/kWh	37	36	35	43	41	42
NO <sub>x</sub> class		5					
CO (at 0% of O <sub>2</sub> )	mg/kWh	13	8	3	1	1	1
Maximum combustion products flow	kg/h	21,7	35,5	51,3	70,6	88,2	105,8

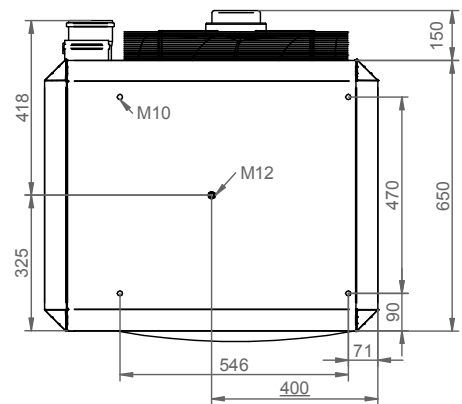
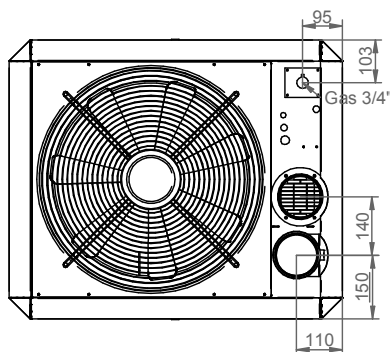
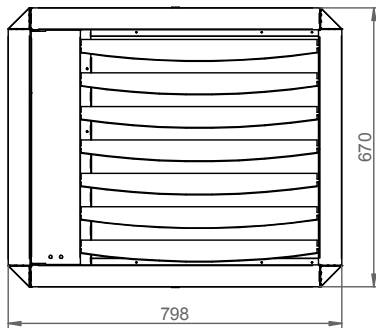
AM 12 and 19



AM 29



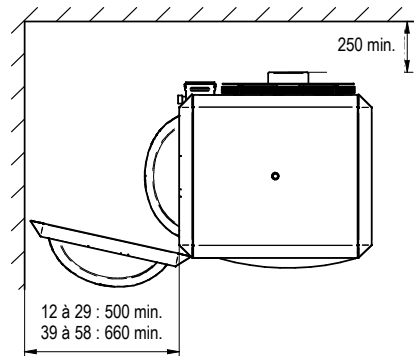
AM 39, 48 and 58



### 3. INSTALLATION

#### 3.1 Hanging and fixing

- Check that the support is solid enough.
- Make sure the airflow to and from the heater is unhindered. Any obstacles should be a minimum of 5 meters away from the front of the heater.
- Keep sufficient distance between the heater and any obstruction, in connection with safety and access for service and maintenance. Pay particular attention to any flammable materials. Please take into account the possibility to open the door of the heater for the necessary service and maintenance work.
- The heater can be installed horizontally or vertically :
  - The units are provided with pieces of M10 threaded sockets as fixing points
  - AM 12, 19 and 29 models have 2 pieces of M10 threaded sockets in their centre on the top and underneath the heater.
  - AM 39, 48 and 58 models have 2 pieces of M10 threaded sockets in their centre on the top and underneath then 4 additional pieces of M10 threaded sockets on the top of the heater.
  - See the dimensions diagram for the dimensions.
  - We recommend using the SBM suspension kits for a safe installation.
  - Be sure that there is no mechanical tension on the different connections after installation.
  - If the heater is installed with the air stream vertical downwards the maximum suspension height is 8 meters. Otherwise the warm air will not reach the floor

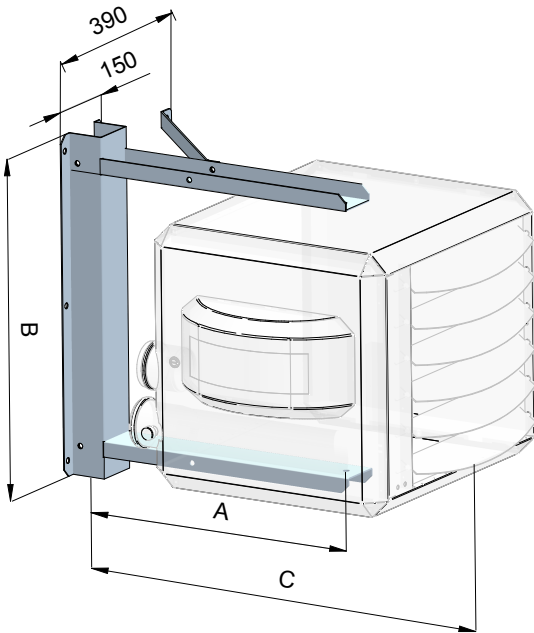


Consult the "APPLICATION RESTRICTION" chapter page 4.

☐ Positioning possibilities

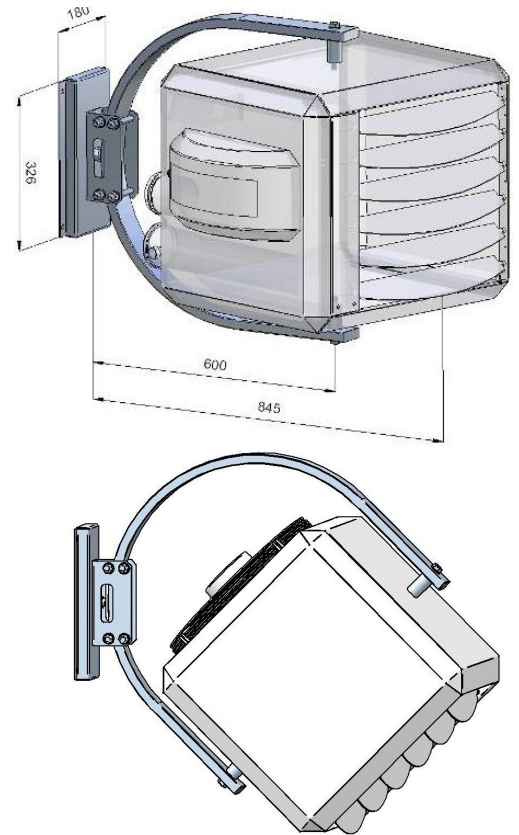
**Standard bracket for horizontal or vertical suspension**  
**All models**

Ref. SBM	Designation	A	B	C
5760007	WALL BRACKET AM12-29/AMC12-19	555	640	800
5760008	WALL BRACKET AM39-58/AMC29-39	665	815	990



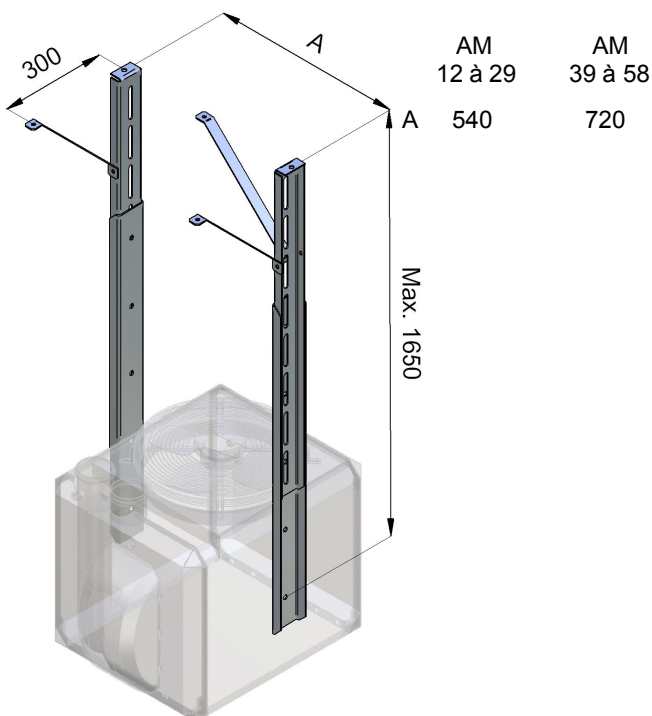
**Design bracket for horizontal or vertical orientable suspension**  
**AM 12, 19 and 29**

Ref. SBM	Designation
5760013	DESIGN BRACKETAM12-29/AMC12-19



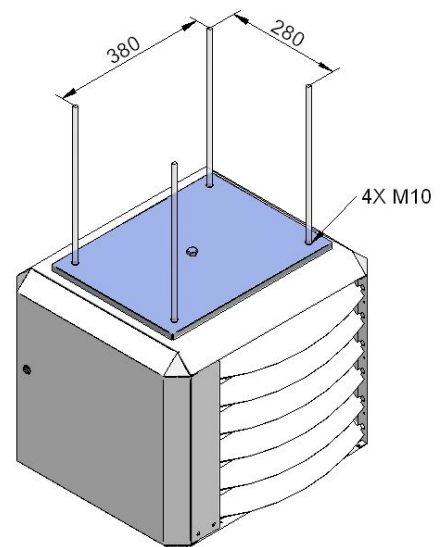
**Suspension kit vertical suspension, All models**

Ref. SBM	Designation
5760010	SUSPENSION VERTIC. 80-165cm AM



**Suspension adapter AM 12, 19 et 29 for M10 threaded bars suspension.**

Ref. SBM	Designation
5760012	ADAPT. THREADED BARS AM AMC



## 3.2 Gas connection

- The gas installation shall be done by a qualified worker. The rules of gas installation shall be respected.
- A manual isolation gas valve in the supply line must be placed within reach of the heater, and all gas lines must be mounted without any mechanical tension. The installation of a gas filter and the purge of gas pipes before the first start-up are strongly recommended.
- The sealing of the gas network have to be checked before the first start of the installation according to the rules in force.
- The dynamic gas pressure upstream the solenoid valve shall be at least 17 mbar for G20 and 20 mbar for G25.  
This dynamic pressure cannot be greater than 30 mbar.  
For G31, it shall be less than 37 mbar.
- It is eventually possible to change the gaz type (natural gas/propane).  
In this case, please contact your installer.



***These appliances were design to operate with natural gas G20 or G25.  
When operating with G25, the heat input will be lower than when operating in G20 (see the technical specifications in page 5).  
It is forbidden to turn the setting screws which are sealed by the manufacturer.***

## 3.3 Electrical connection

### 3.3.1 Electric supply 230 V

- The electrical installation shall satisfy the local/national rules in force. Be sure that the main supply is 230VAC with earth and a R.S.D (Residual Current Device) upstream the heater for the protection of people and installation. The polarity phase/neutral shall be absolutely respected.  
See the electrical diagram page 21.

### 3.3.2 Electrical supply interruption

- Never interrupt the power supply of the device accidentally. It could drive to an overheating of the heat exchanger and to the safety state of the overheated device.  
Be careful to the electric breaks of the network, it is possible that the temperature of the appliance is going up (overheating)



***Never turn off the power while the unit is warming up !***

### 3.3.3 Room Thermostat

- The warm air heaters AM can be driven only with the **MULTITHERM S** or **C** thermostat.  
They are not operating with simple ON/OFF thermostat.
- MULTITHERM** thermostats type:

**MULTITHERM S** (Ref SBM **5760000**): modulating numerical thermostat  
**without clock** able to regulate from 1 to 8 appliances AM 12 to 58.

**MULTITHERM S WITH CONTACT** (Ref SBM **5760004**): modulating numerical thermostat  
**without clock, with terminal for external contact**, able to regulate from 1 to 8 appliances.

**MULTITHERM C** (Ref SBM **5760001**): modulating numerical thermostat  
**with clock** able to regulate from 1 to 8 appliances AM 12 to 58.

**MULTITHERM C WITH CONTACT** (Ref SBM **5760005**): modulating numerical thermostat  
**with clock, with terminal for external contact**, able to regulate from 1 to 8 appliances.



❑ Recommendations for **MULTITHERM** installation :

- The connection between the **MULTITHERM** and the warm air heaters have to be done with a two-wires shielded and twisted cable 1 x 2 x 0.75 mm, with a maximum length of 200 m.
- Connect the earth shield of the cable only to the earth terminal in the warm air heater.
- The appliances should be disconnected from the electrical network during the connection.
- The installation and start-up of the room thermostat are described into the technical instructions delivered with the **MULTITHERM S** or **C**.
- The thermostat have to be installed in a dry place and moderately dusty.
- Place the thermostat in a place where the air can circulate freely.
- Take care of the risk of sun exposition or the presence of warm sources.
- Avoid installing it near to a cold wall or where there is air flow.



***Do never install the thermostat closed to the internal network communication antennas! These last are emitting a radiation which can conduct to a disturbance of the thermostat. It is always necessary to keep a distance of some meters.***

### 3.3.4 Fuses

- ❑ There are 2 fuses in the appliance, on the main print board: F1 and F2 are placed on the phase and neutral of the electric supply of the heater. In case of defective fuse, replace it with an identical fuse size 5x20 - 5A Temporized.

## 3.4 Air intake / combustion products discharge

Check for compliance with local / national regulations. Only the material mentioned above can be used. This applies for wall or roof terminals also for exhaust products connections in order to have a certified and approved installation.

In some cases, and according to the regulation, the terminal must exceed the rooftop by at least 0.5m.

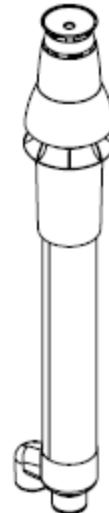
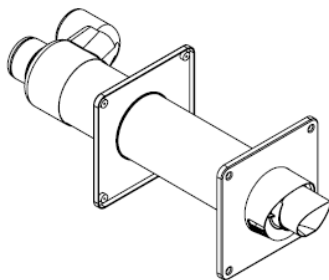
### 3.4.1 Flue materials

- ❑ It is allowed to use only the sealed and corrosion resistant flue pipes CE marked with a temperature class **at least T250**.  
These flue pipes are not supplied by SBM.  
Use only flue pipes with the same diameter.

### 3.4.2 Terminals

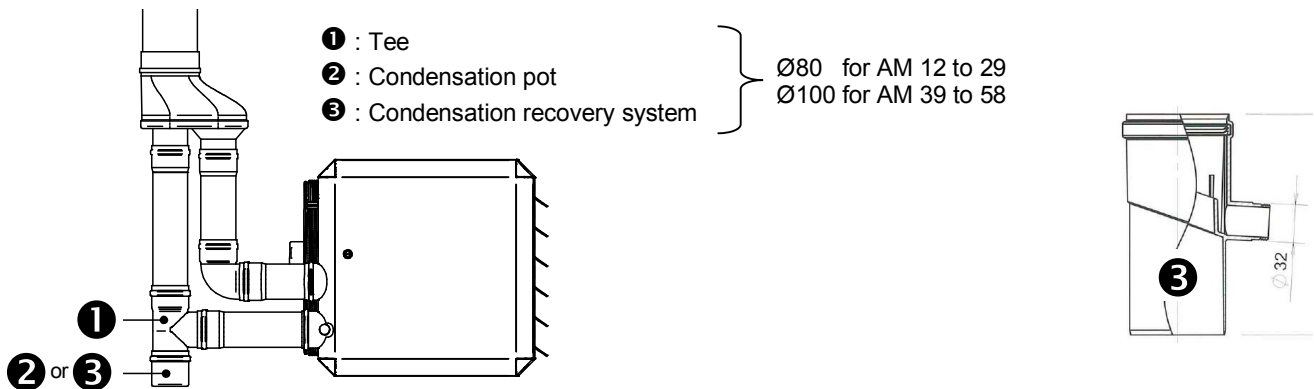
- ❑ Only the terminals supplied by SBM can be used.  
These terminals are certified with the warm air heaters.

Terminals		Roof flashings			
Ref. SBM	Designation	Ref. SBM	Designation	Ref. SBM	Designation
<b>5760021</b>	ROOF TERMINAL AM 80/125	<b>5760022</b>	FLAT ROOF FLASHING 80/130	<b>5760023</b>	ADJUSTABLE FLASHING 80/130
<b>5760026</b>	ROOF TERMINAL AM 100/150	<b>5760027</b>	FLAT ROOF FLASHING 100/160	<b>5760029</b>	ADJUSTABLE FLASHING 100/160
<b>5760030</b>	WALL TERMINAL AM 80/125				
<b>5760031</b>	WALL TERMINAL AM 100/150				



### 3.4.3 Condensation and flue pipes length

- During heating up, it is possible that condensation is formed in the discharge system. This however, will evaporate if the heater is operating for a longer period of time. If the straight length of the discharge flue is longer than 4 meters this condensation will not evaporate again and accumulate in the heater! Isolation of the discharge pipes or a condensation trap just at the heater is then absolutely necessary.



In the case of insulated flue pipes, the maximum flue length isolated is 9 meters (counting the bends) a 90° bend equal to 1.5 m linear and a 45° bend equal to 1 m linear.

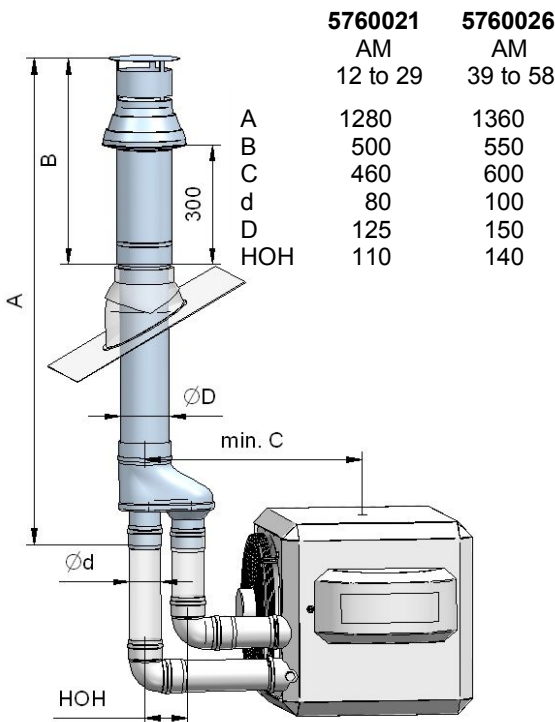
In case of roof terminal, the distance between the top of the terminal and the roof has to be at least 0.5 m. Take into account the presence of other ventilation systems or barriers close to the terminal outlet.

### 3.4.4 Assembly

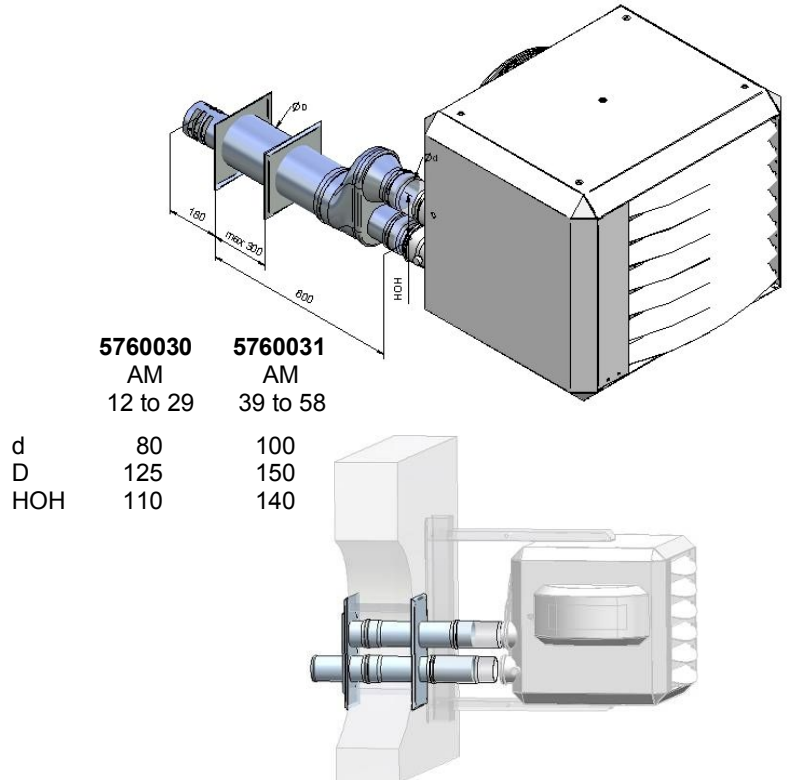


**Follow the assembly instruction of the air intake and combustion products discharge includes into the package of these systems. Always check the proper sealing of the flue systems.**

#### Vertical outlet



#### Horizontal outlet



In case where the air of combustion is taken inside the building (B23), we must place a 90° bend on the air intake to avoid the contact with the electrical components. Provide also a sufficient ventilation of the room according to the rules in force.

## 4. APPLIANCE OPERATION

### 4.1 Generality

The unit can heat as well as ventilate. By using the temperature-sensor on the unit and the one in the room-thermostat, the temperature-difference between the two in the room is monitored. Should the difference become higher than a set value, due to the fact that warm air has accumulated underneath the roof, the system-fan will start and push the warm air down, acting as a de-stratification fan.

### 4.2 Heat demand

If the thermostat indicates heat demand, the following cycle will start:

- 1) **Pre-purge** :  
The electronic circuit board acknowledges the heat-demand and the premix burner fan will start running for 30 seconds.  
The display of the control print board indicates **1**.
- 2) **Ignition** :  
After 30 seconds of pre purge the electrode will spark for max. 5 seconds, the gas valve is opened and the gas-air mixture will ignite.  
The display of the control print board indicates **2**.  
If the air/gas mix is not lighted or if there is no flame detected, the control print board start a second ignition attempt before be in security state.  
In this case, the display of the control print board indicates alternatively **A** and **1**.
- 3) **Heating** :  
Once the flame is detected, the unit will modulate to the desired load after 15 seconds.  
The display of the control print board indicates **b**.  
Depending on the given load, the system fan will start modulating (step-less) as well. The air heater will always burn for a minimum of 4 minutes. This is to evaporate eventual condensation in the discharge system
- 4) **End of heat demand** :  
When the heat demand ends, the burner will switch off and the system fan will continue to run for around 3 minutes in order to cool the unit down  
The display of the control print board indicates **P**.

The unit will try to ignite twice before lockout on flame fault. In the case of flame failure during operation, the heater will attempt one restart.  
When the heater is in lockout you see in the display intermittent an **A** and **1**. On the display of the **MULTITHERM** you will see failure **1**.

### 4.3 Delta-T regulation (de-stratification fan mode)

When the difference of temperatures between the sensor on the unit (the NTC) and the sensor in the **MULTITHERM** is bigger than the set value (factory setting standard 8°C), the burner is turning off and only the main fan will operate at a regulated speed depending on the differential temperature difference. This operation ensures an even temperature distribution throughout the building, thus acting as a fully automatic variable de-stratification fan.  
The Delta-T mode is working only in combination with the **MULTITERM** thermostat.

If you don't desire to use the Delta-T regulation, it is possible to disable it in the parameters menu of the **MULTITHERM**. See the technical instructions of the **MULTITHERM**.

### 4.4 Summer ventilation

It is possible to ventilate the ambient air with the AM unit independently from the heat demand through the summer ventilation function of the **MULTITHERM S** or **C**. The summer ventilation can be set on 3 different speeds, see the technical instructions of the **MULTITHERM**.

## 4.5 Thermal protection of the exchanger

The thermal protection of the exchanger is done by 2 CTN temperature probes set on the exchanger of the unit.

In case of overheating of the exchanger, in a first time, the speed of the main fan will increase and in a second time, the capacity of the burner will be limited at its minimum.

In case of abnormal overheating, the electric supply of the premix system will be closed. When the exchanger is cold enough, the heat cycle restart (the display shows alternatively **E** and **1**).

If the overheating continue (defective electrical supply cutting), the control board is going to a safety state (the display on the board shows alternatively **A** and **2** and the **MULTITHERM** shows the code **2**).

After controlling and fixing, the control board shall be reset directly by pressing the button on the control board or by the menu of the **MULTITHERM** (see the technical instructions).

## 4.6 Pressure switch

The appliance is equipped with a pressure switch in order to control the combustion air flow through the heat exchanger.

During the pre-ventilation step, the difference of pressure between inside and outside the exchanger is measured.

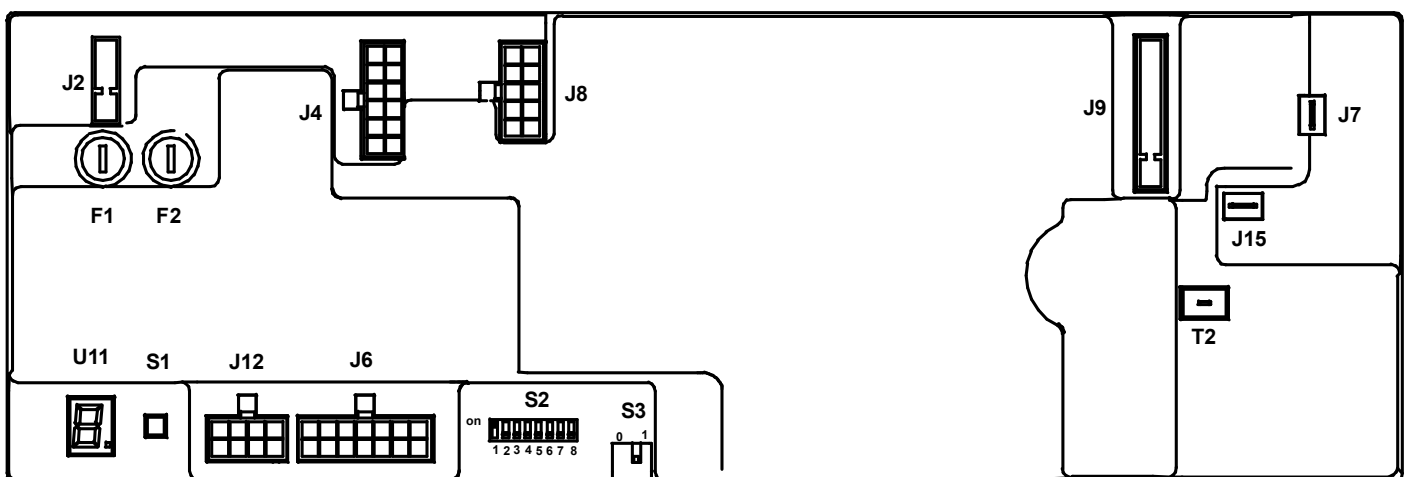
If the difference of pressures is too weak, the display on the control board shows alternatively **A** and **9** which means a pressure drop in the heat exchanger which have to be checked.

## 4.7 Description of the control board

The control board controls all the functions of the AM heater and communicates with the thermostat **MULTITHERM**. The control board integrates the following functions:

- ModBus communication system with the **MULTITHERM**
- Ignition of the burner by sparks
- Flame detection by ionisation
- Modulation of the gas valve opening
- Modulation of the premix fan with information return
- Modulation of the main fan
- Heat protection of the exchanger (2 CTN sensors)
- Control of the ambient temperature (CTN sensor)
- LED signals of the heater: heat demand (green LED) and safety state (red LED)
- Display of the heater state on the 8 segments screen
- Reset button
- Service mode function

### View of the control board inside the heater



**J2** : connection for electric supply 230VAC

**J4** : Connection for main fan and gas valve

**J6** : Connection for **MULTITHERM** thermostat, red and green lamps, pressure switch and identification of the appliance (2 resistances)

**J7** : Earth pin of the board

**J12** : Connection of the 2 CTN probes

**J15** : Connection of the ionisation probe

**F1** and **F2**: Fuses size 5x20 - 5A temporized.

**U11** : 8 segment display.

**S1** : reset button.

**S2** : micro switch for use of the **MULTITHERM** thermostat with several heaters.  
(factory setting of the micro switch 1 on ON position).

**S3** : Micro switch for the electrical supply of the **MULTITHERM**.

**T2** : connection of the ignition transformer

## 5. STARTING AND SETTING

### 5.1 Generality

The AM heater was fully controlled and tested in factory before shipment. The combustion products were measured in order to optimize the air/gas mix. Once installed, no setting is necessary. Only the proper operation has to be checked.



**Never turn the setting screw of the gas valve! (sealed).**

Once the installation done according to these instructions, the warm air heater can be turning on. Be sure that the gas pipe is clean, tight and purged. Set the appliance under electrical tension, open the rear door to watch the first start and be familiar with the operation of the heater.

Ask for a heat demand, the warm air heater operates in heating mode during 4 minutes at least. Even if there is an interruption of the heat demand.

If the mix air/gas is not lighted or if the flame is not detected, the control board tries a second ignition before going in safety state if there is no flame.



**Do not forget to inform the end-user about the following points:**

- **The way to use the appliance and the thermostat and particularly on the possibility to reset the system**
- **The possibility to disconnect the appliance in case of failure (gas valve, switch button)**
- **A regular maintenance is necessary**

### 5.2 Start by using the service button

By pressing the **S1** button (reset / start) while around 10 seconds, the appliance will start a heating cycle, the display of the control board will show alternatively **L** (Low) and the operation code:

- 1** = 30 sec of pre-ventilation
- 2** = 5 sec of ignition of the burner
- b** = 15 sec of flame stabilization
- b** = heating at low power

By pressing a second time on the **S1** button, the appliance will operate at its full power, the display will indicate alternatively **H** (High) and the operation code as described above.

By pressing a third time the **S1** button, the appliance will operation under normal condition which means according to the **MULTITHERM** heat demand.

5 minutes after the last impulsion on the **S1** button, the service mode will be automatically deactivated.

### 5.3 Start by using the MULTITHERM thermostat

Create a heat demand on the **MULTITHERM** by setting a comfort temperature greater than the measured temperature. The heating cycle will start :  
pre-purge (30 sec), ignition (5 sec), flame stabilization (15 sec) and heating mode.  
A heating cycle last at least 4 minutes.

## 5.4 Flame default simulation and restart

After shutting the gas valve, the unit shall go in safety state :

- ❶ Post-ventilation (**P**)
- ❷ Pre-purge (**1**)
- ❸ Ignition (**2**)
- ❹ Post-ventilation (**P**)
- ❺ The display on the control board and the **MULTITHERM** show **A 1**.
- ❻ The red lamp of the unit is lighting.

Check, by opening the gas valve and pressing the **S1 button** that the heating cycle restarts.

## 5.5 Control board display

Table of the operation codes of the warm air heater:

Display	State	Description
<b>0</b>	Stand-by	The unit is ready to start
<b>1</b>	Pre-purge	The control board measure the difference of pressure into the exchanger and activate the pre-ventilation while 30 seconds.
<b>2</b>	Ignition	Sparkling for 5 secondes, gas valve opening. Flame detection while 5 seconds.
<b>b</b>	Heating	After 15 seconds of flame statilization, the warm air heater operates at the asked capacity. The appliance operates for 4 minutes at least.
<b>P</b>	Post-ventilation	After stop of the burner, the exchange is cooled for 3 minutes at small speed. Le pre-mix fan is still turning while 1 minute.
<b>F</b>	Summer ventilation	Only the main fan is operating during the summer ventilation mode (activation using MULTITHERM thermostat)
<b>F</b> blinking	Destratification fan mode	The main fan is operating at its low speed during the destratification fan mode.
Alternatively <b>L</b> and <b>1</b> (or <b>2</b> or <b>b</b> )	Low speed mode	Heating in low speed by pressing the <b>S1</b> button of the control board.
Alternatively <b>H</b> and <b>1</b> (or <b>2</b> or <b>b</b> )	High speed mode	Heating in high speed by pressing the <b>S1</b> button of the control board.

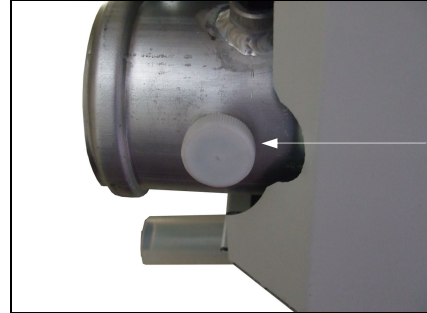
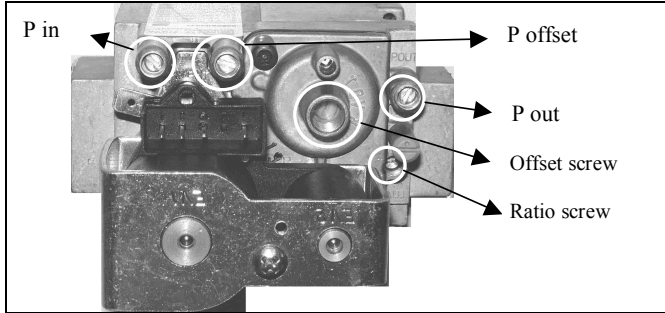
## 6. ADJUSTEMENT OF TH GAS VALVE

After starting the system, it is not necessary to set the gas valve, it was already done in the factory.



***In case of replacement, only a qualified person is allowed to set the new gas valve. An inappropriate setting can cause an overheating, a non-ignition of the burner or the emission of carbon monoxide.***

***Use a calibrated combustion analyser and place the probe in the provided hole.***



In order to set the gas valve, there are 2 setting screws:

- Ratio screw: for the operation at low capacity
- Offset screw: for the operation at high capacity

Turning on the appliance at its high speed by pressing the servicing button **S1** for 10 seconds then press it again. The display shows alternatively H and b.

Research the appropriate CO<sub>2</sub> values in the technical specifications of the table 5.

- ❑ 1) Check the CO<sub>2</sub> at high speed (High mode).  
Decrease the CO<sub>2</sub> by turning the Ratio screw in clockwise (less gas).  
Increase the CO<sub>2</sub> by turning the Ratio screw in anticlockwise (more gas).
- ❑ 2) Then check the CO<sub>2</sub> at low speed (Low mode) by pressing twice the **S1** button, then press it for 10 seconds.  
The CO<sub>2</sub> level at low speed shall be lower than the CO<sub>2</sub> level at high speed.  
Decrease the CO<sub>2</sub> by turning the Offset screw in clockwise.  
Increase the CO<sub>2</sub> by turning the Offset screw in anticlockwise.

After have set the CO<sub>2</sub> at low speed, go back to high speed and readjust the CO<sub>2</sub> level. Then go back to low speed to eventually readjust the CO<sub>2</sub> level.

Repeat these steps until the 2 values are correct.



***Do never forget to check the CO level (carbon monoxyde) of the appliance !!! Too much CO means mainly that the mix air/gas is to rich. The CO value has to be always lower than 100 ppm.***

## 7. TROUBLESHOOTING

### 7.1 Generality

In order to facilitate the fault detection, the display on the control board indicates a code which corresponds to a diagnosis. On the **MULTITHERM** screen will appear a code too.  
(See the diagnosis list below).

Take care of the reaction time of the heater (do not react too quickly!) as well as the warning LED.

#### **Cause of default conducting to a safety state of the appliance and requiring rearming.**

Display	Default	Cause / Solution
Alternatively <b>A</b> and <b>0</b>	Internal default	Defective control board, replace it
Alternatively <b>A</b> and <b>1</b>	Ignition default	While 5 seconds, presence of flame then the flame disappears : <b>Cause 1</b> No flame : <b>Cause 2</b>
Alternatively <b>A</b> and <b>2</b>	Overheating of the exchanger	Overheating default state of the heat exchanger: <b>Cause 3</b>
Alternatively <b>A</b> and <b>3</b>	Default of the overheating probe	The overheating probe of the exchanger go to a default state: <b>Cause 4</b>
Alternatively <b>A</b> and <b>4</b>	Flame default	Flame default in repetition during the operation: <b>Causes 1</b> or <b>5</b>
Alternatively <b>A</b> and <b>5</b>	Internal default	Defective control board, replace it
Alternatively <b>A</b> and <b>6</b>	Default of the overheating probe	Default of the electric connection: <b>Cause 10</b>
Alternatively <b>A</b> and <b>7</b>	Flame detection	Ionisation without presence of flame : check the electrode and the cable
Alternatively <b>A</b> and <b>8</b>	Pre-mix default	The premix is not starting: <b>Cause 6</b> The premix is operating: <b>Cause 7</b>
Alternatively <b>A</b> and <b>9</b>	Pressure switch default	The burner fan is not working: <b>Cause 6</b> The burner fan is working: <b>Cause 7</b> The combustion air through the heat exchange is not sufficient: <b>Cause 11</b>

#### **Cause of default conducting to a safety state.**

**After removing the defective part, the appliance will work again.**

Display	Default	Cause / Solution
Alternatively <b>E</b> and <b>0</b>	Internal default	Defective control board, replace it
Alternatively <b>E</b> and <b>1</b>	1 <sup>st</sup> overheating probe	Overheating of the exchanger, after cooling, the appliance will restart: <b>Cause 3</b>
Alternatively <b>E</b> and <b>2</b>	Appliance identification default	The identification of the appliance is not correct: <b>Cause 8</b>
Alternatively <b>E</b> and <b>3</b>	Appliance identification default	The identification of the device is not correct: <b>Cause 8</b>
Alternatively <b>E</b> and <b>9</b>	Problème lors du réarmement	Repetition of the rearms in a short time: <b>Cause 9</b>

#### **Cause 1 : While 5 seconds, presence of flame then the flame disappears.**

- The flame is not detected. Check the ionisation probe and the cable.  
(electrical resistance shall be around 1 kΩ)
- Bad earth connection, hence a too weak ionisation current.
- The control board is defective, replace it

#### **Cause 2 : No flame.**

- No gas or gas pressure too weak. Check the gas pressure upstream the gas valve.
- The mix air/gas is not correct. Check the setting of the gas valve (page 15).
- The gas valve is not opening. Check, while sparking that the electric supply of the gas valve is 230V.
- Check if there is sparks. Remove if necessary the ionisation probe or cable.

#### **Cause 3 : Overheating of the exchanger.**

- Overheating of the exchanger: check if the main fan is operating normally.
- Check the setting of the gas valve (page 15)



**Cause 4 : the overheating probe of the exchanger go to a default state.**

- The probe is compound of 2 resistances. Measure the resistance of each element. The resistance values shall be 20k $\Omega$  at 25° and 25k $\Omega$  at 20°.
- If they are varying too much, or if the difference between the 2 resistances is too big, replace the probe.
- Do a rotation of a quarter turn of the probe (on its axis) in order to modify the surface of contact where the temperature is measured.

**Cause 5 : Flame default in repetition during the operation.**

- Bad earth connection of the heater.
- The setting of the gas valve is not correct. Modify the setting (page 15).
- The combustion products duct is obstructed

**Cause 6 : The premix is not starting.**

- The premix is blocked: check the burner fan.
- The premix is under tension: check the wiring

**Cause 7 : The premix is operating but not the appropriate speed.**

- Check if the premix is not dirty.
- Check if the premix can turn freely.
- Check the electric wiring. (see the scheme at page 21)

**Cause 8 : The identification of the appliance is not correct**

- Check if the identification resistances are well connected on the control board. If necessary, replace the identification resistances.

**Cause 9 : Trouble when rearming the appliance.**

- If in a short time, the rearming button was pressed to often, this default will disappear after some time. By cutting the electric supply, this problem will be solved.

**Cause 10 : The control board is not reacting.**

- The J4 connector is not well engaged or there is a bad electrical connection between the terminals 5 and 11 of this connector.
- The control board is defective, replace it
- One of the 2 fuses is defective, replace it

**Cause 11 : The combustion air through the heat exchange is not sufficient**

- Check if there is no air leak inside the exchanger.
- Check the connection of the pressure switch and its operation.

**The warm air heater is working but there are other troubles**

**There is a detonated ignition of the burner.**

- Check the gas valve setting: a proper CO<sub>2</sub> level in the combustion products at high and low speed is important for a good ignition.
- Check the ignition cable.
- Check the position of the ignition electrode, sparkling shall take place between the 2 electrodes and not between an electrode and the burner.

**Insufficient output of the heater.**

- The heat provided by the appliance will be not sufficient if the pressure drops in the duct are too high. In good conditions, the pressure drops of the exhaust gases are not greater than 30 Pa.

**The main fan is not working or the rotation speed is not varying.**

- Check the operation of the main fan by connecting it directly to the 230V. If the fan is working properly, it means that the problem is coming from the control board because it sets the rotation speed of the main fan between 800 and 1300 tr/mn. Replace the control board.

## 8. MAINTENANCE

The heater shall be controlled and if necessary cleaned regularly (at least one or two times a year) by a qualified installer. This is especially important if the appliance is used in hard conditions such as: dusty or wet area or used with a high intensity.

### 8.1 Main inspection of the appliance

- Check the main state of the installation. Inspect the heater, the thermostat, the wires, the gas pipe and the combustion products duct.
- Control the CO<sub>2</sub> and CO level into the combustion products, as well at high speed that at low speed (see chapter 6, page 15).

### 8.2 Appliance servicing



**Before begin the servicing, shut the electric and gas supplies.**

- Disassemble the burner/premix by unscrewing the 8 hex bolts.
- Check inside the exchanger that it is not dirty or damaged
- Check the state of the burner, if necessary, clean up the electrode helps to fine sandpaper. Take care to not twist the electrode.
- Check the duct.
- Eventually clean inside the appliance with a vacuum cleaner.
- Clean outside the exchanger, the blades of the main fan with compressed air or a cloth or a smooth brush. Do never use a metallic brush!
- Reassemble the burner (use new seals).

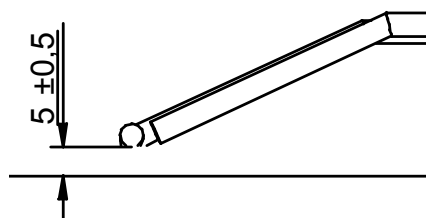
Once the servicing done, open the electric and gas supplies.

- Check once again the levels of CO<sub>2</sub> and CO of the combustion products.
- Check the proper operation of the heater.

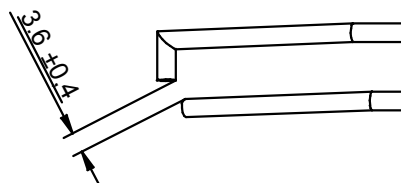
### 8.3 Ignition electrode

In order to obtain a proper ignition of the burner, it is important that the electrode is set correctly.

- The distance between the electrode and the burner have to be of  $5.0 \pm 0.5$  mm.



- The distance between the 2 electrodes have to be of  $3.6 \pm 0.4$  mm

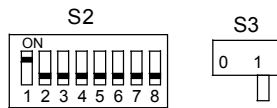


- It is important that the sparking take place between the 2 electrodes and not between one electrode and the burner. It can conduct to a detonated ignition of the heater.

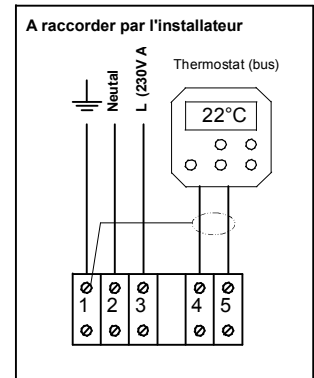
## 9. REGULATION EXAMPLE OF AM HEATERS

### 9.1 Individual regulation with MULTITHERM C or S (only one unit of AM 12 to 58)

- Connect the thermostat to the terminals **4** and **5** according to the scheme shown beside
- Check the setting of the micro switches **S2** and **S3**.



The modification of the position of micro switches shall be done with the power supply off. If it is not the case, the modification will not be taken into account by the appliance.



### 9.2 Centralized regulation with MULTITHERM C or S (many warm air heaters AM 12 to 58)

The thermostat can regulate from **1** to **8** heaters AM 12 to 58.

The modification of the position of micro switches shall be done with the power supply off. If it is not the case, the modification will not be taken into account by the appliance.

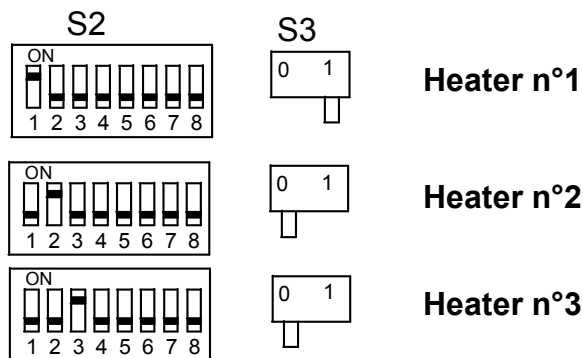
Proceed as following :

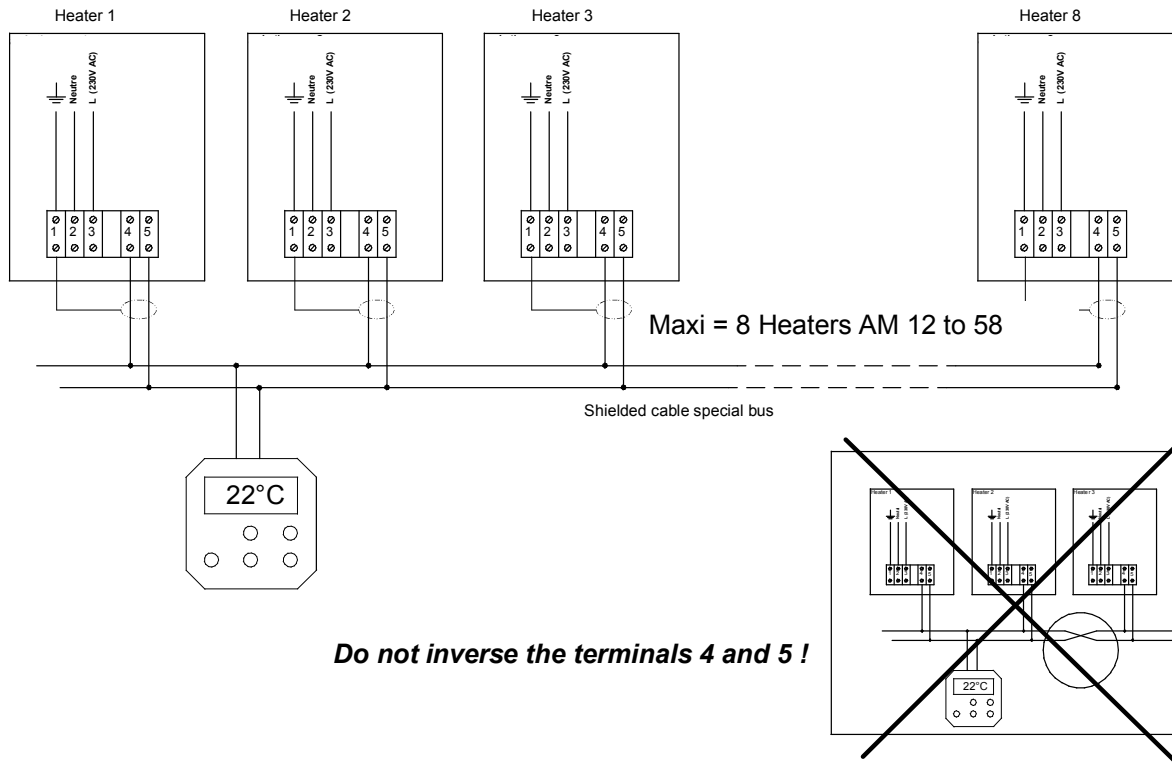
- Connect the thermostat to the terminals **4** and **5** of the heaters (in parallel).
- Assign to each unit a proper number from **1** to **8** by switching the micro switch on ON (to set with **S2** on the control board)
- On the appliance where it is assigned the number **1**, the micro switch **S3** shall be on position **1**.  
On the **other heaters**, the **S3** switch will be on position **0**.

**If the micro switch S3 of the MULTITHERM supply is in position 1 in several warm air heaters, the system will not work.**



The operation of the **MULTITHERM** stay the same that in the case of centralized regulation.



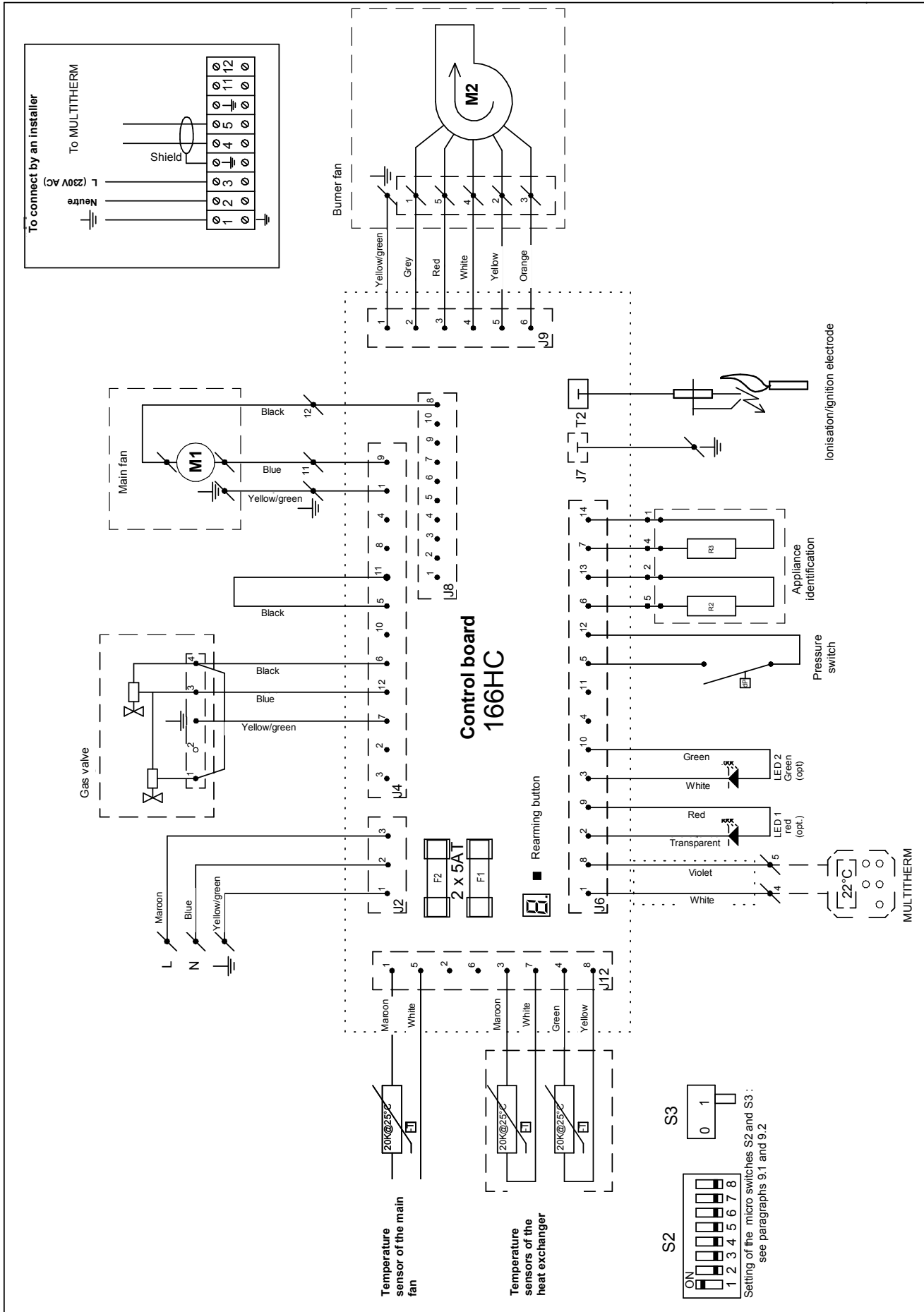


### 9.3 Regulation from a Building Management System (BMS)

The **Interface Board** (option) allow regulating warm air heaters AM helps to a Building Management System (BMS) using 0-10V signal (Ref SBM: **5760003** INTERFACE BOARD MULTITHERM-BMS). For the supply of the interface, please contact SBM.

# 10. INTERNAL ELECTRIC DIAGRAM

## 10.1 AM 12 to 58 warm air heaters

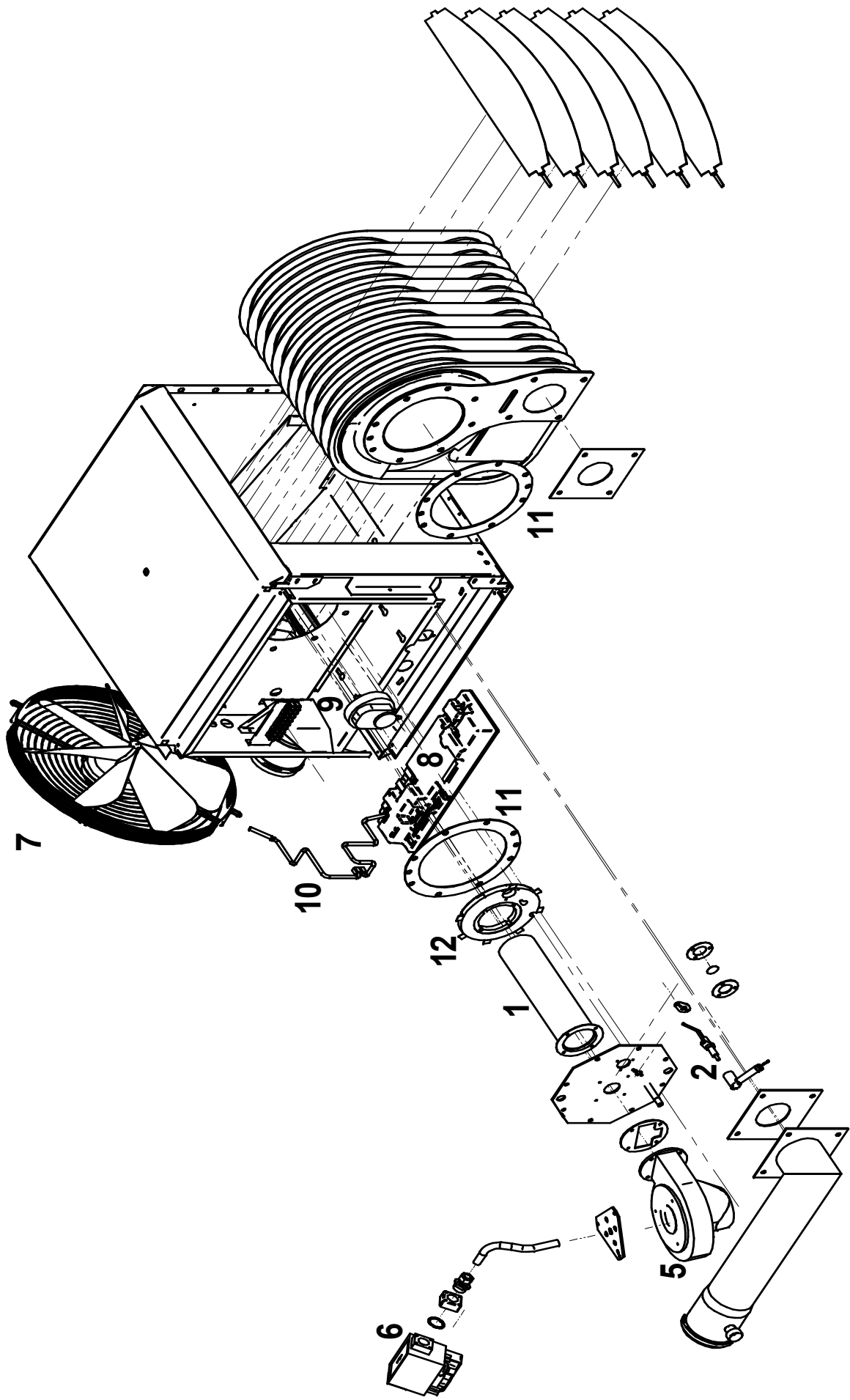


# 11. SPARE PARTS

## 11.1 Spare parts

Rep.	Designation	AM 12	AM 19	AM 29	AM 39	AM 48	AM 58
1	NG BURNER AM/AMC (For natural gas G20-G25)	5850000	5850001	5850002	5850002	5850003	5850004
1	PROPANE BURNER AM (For propane G31)	5850005	5850006	5850007	5850007	5850008	5850009
2	IGNITION/IONI. PROBE AM/AMC	5850019	5850019	5850019	5850019	5850019	5850019
5	PREMIX FAN AM/AMC (Premix fan)	5850020	5850020	5850020	5850020	5850020	5850020
6	SIGMA VALVE 848 AM/AMC (Gas valve SIT SIGMA 848)	5850021	5850021	5850021	5850021	5850021	5850021
7	MAIN FAN AM/AMC (Helicoidally fan)	5850022	5850022	5850022	5850023	5850023	5850035
8	CONTROL BOARD AM/AMC (Control board Argus 0166-HC)	5850025	5850025	5850025	5850025	5850025	5850025
9	PRESSURE SWITCH AM/AMC (Pressure switch)	5850026	5850026	5850026	5850026	5850026	5850026
10	OVERHEATING PROBE AM (Overheating probe CTN)	5850027	5850027	5850027	5850027	5850027	5850027
11	GASKET BURNER/EXCH. AM (Set of gasket inlet and outlet of heat exchanger, premix, rear panel)	5850029	5850029	5850029	5850037	5850037	5850037
12	INS. BURN. AM (Insulation of the burner + flange)	5850032	5850032	5850032	5850033	5850033	5850033

11.2 Exploded view of AM 12 to 29



11.3 Exploded view of AM 39 to 58

