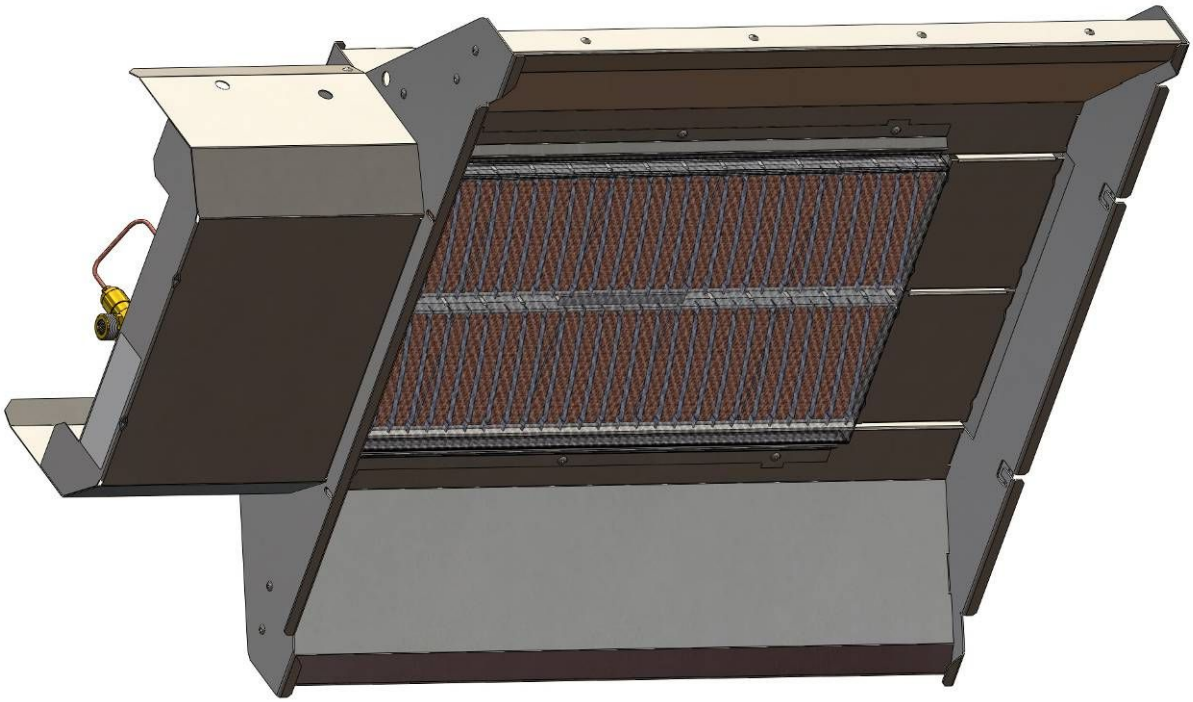
GB / IE

ECO' CERAMIC SYSTEM

XFR INSTALLER INSTRUCTIONS

N° 05000485/0



Hight radiant factor luminous heater
Stainless steel burners
Stainless steel body
Electronic ignition
Thermocouple flame control

Manufacturer :
SBM
3 cottages de la Norge
21490 CLENAY
France
http : //www.sbm-international.net

Agent :

CE 1312

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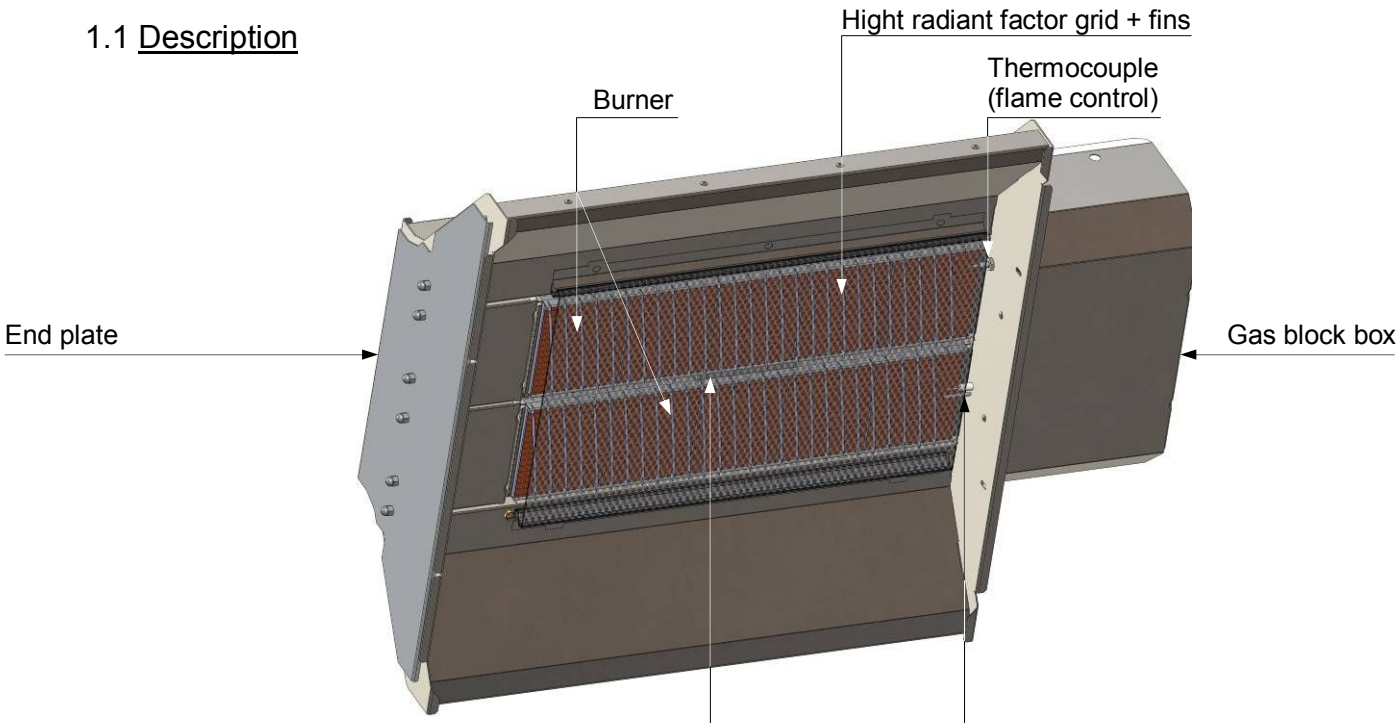
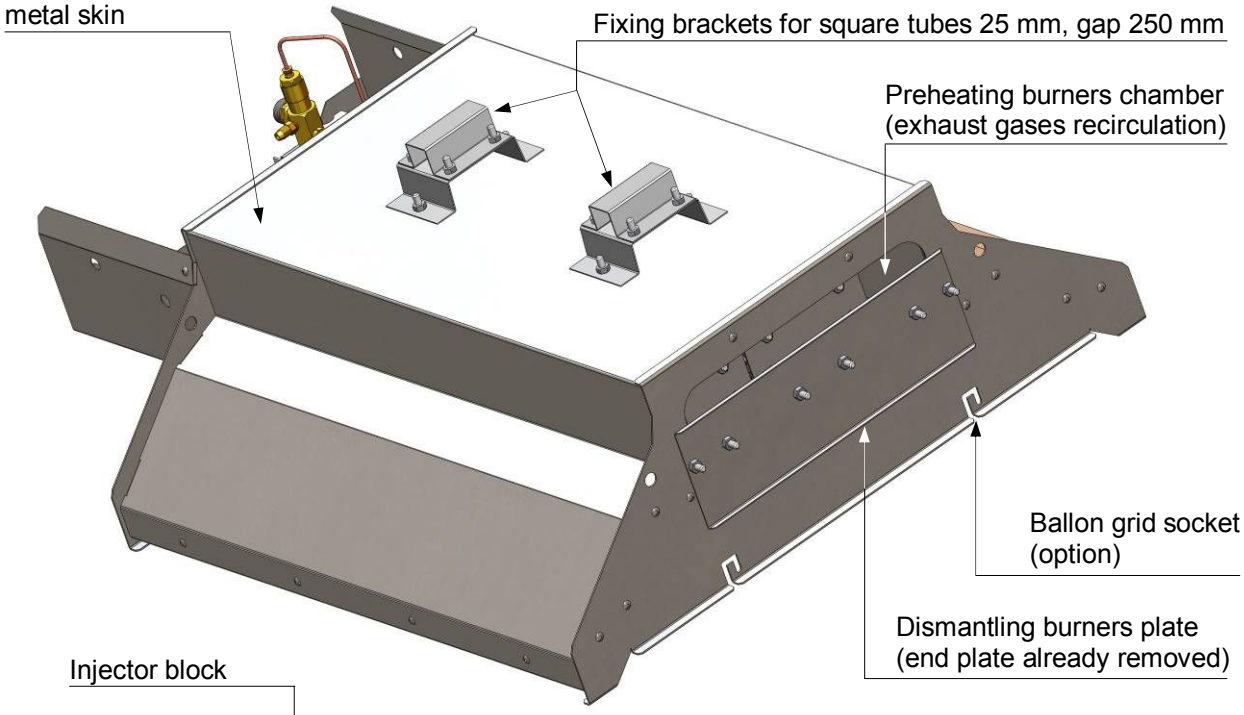
GENERAL

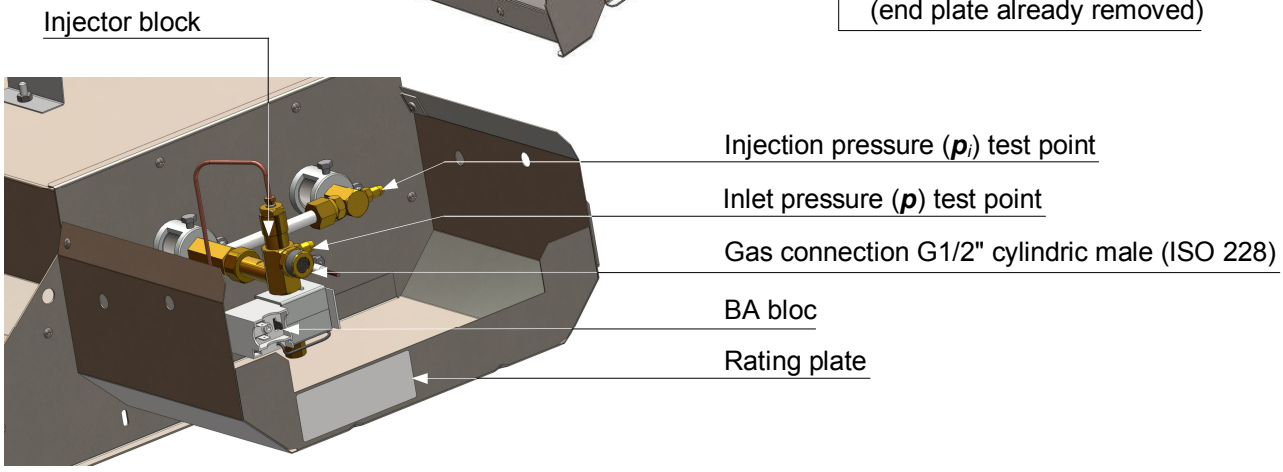
- ***In the process of continuous improvement, SBM products may be modified without notice.***

1. PRODUCT SPECIFICATION

1.1 Description







1.2 Technical specifications

GAS : G20 (Natural gas) - Category : I_{2H} GB/IE

MODEL			XFR 16	XFR 20	XFR 20-2	XFR 24	XFR 24-2	XFR 32	XFR 32-2	XFR 48-2	XFR 64-2
Certificat number CE			1312 CL 5522								
Class NOx			4								
Weight		(kg)	14.60	14.60	15.20	16.10	16.70	19.50	20.10	see page 10	
Nominal heat input :											
Net calorific value	ΣQn (Hi)	(kW)	5.80	6.65	6.65	8.00	8.00	10.30	10.30	2x 8.00	2x 10.30
Gross calorific value	ΣQn (Hs)	(kW)	6.44	7.38	7.38	8.88	8.88	11.44	11.44	2x 8.88	2x 11.44
GAS											
Nominale inlet pressure ***p***		(mbar)	20								
Injection pressure p_i		(mbar)	16	14	14	15	15	16	16	15	16
Volumetric flow rate		(m^3/h)	0.620	0.703	0.703	0.846	0.846	1.090	1.090	2x 0.846	2x 1.090
Orifice (injector)		(1/100 mm)	1x179	2x152	2x152	2x171	2x171	2x179	2x179	4x171	4x179
Primary orifice (restrictor)		(1/100 mm)	1x278	1x260	2x194	1x321	2x212	1x401	2x278	2x321	2x401
Gas input connection			Fitting G1/2" cylindrical (ISO 228-1)								
ELECTRICITY											
Power supply			230V (+10% -15%) – 50Hz Neutral mandatory								
Consumption		(VA)	28	28	2x 28	28	2x 28	28	2x 28	2x 28	2x 28
Individual fast acting fuse 5x20 (RP3 – RP32)			0.25A	0.25A	2x 0.25A	0.25A	2x 0.25A	0.25A	2x 0.25A	2x 0.25A	2x 0.25A
Ignition cycle length			45 seconds maxi								
VENTILATION											
Combustion air		(m^3/h)	6.01	6.82	6.82	8.20	8.20	10.57	10.57	2x 8.20	2x 10.57
Required air change		(m^3/h)	58.0	66.5	66.5	80.0	80.0	130.0	103.0	2x 80.0	2x 103.0

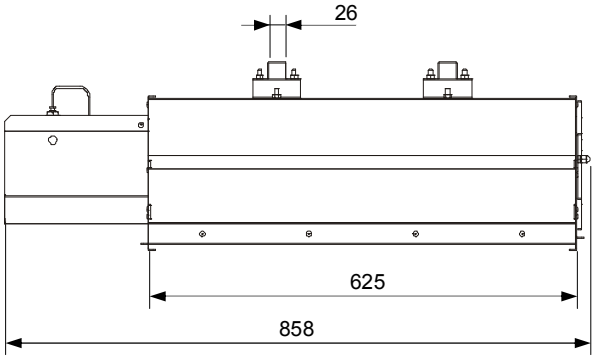
GAS : G31 (Propane) - Category : I_{3P} GB/IE

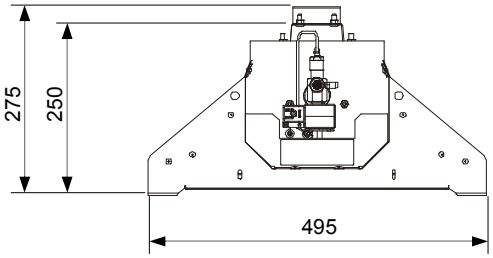
MODEL			XFR 16	XFR 20	XFR 20-2	XFR 24	XFR 24-2	XFR 32	XFR 32-2	XFR 48-2	XFR 64-2
Certificat number CE			1312 CL 5522								
Class NOx			4								
Weight		(kg)	14.60	14.60	15.20	16.10	16.70	19.50	20.10	see page 10	
Nominal heat input :											
Net calorific value	ΣQn (Hi)	(kW)	5.47	6.65	6.65	8.00	8.00	10.30	10.30	2x 8.00	2x 10.30
Gross calorific value	ΣQn (Hs)	(kW)	5.95	7.23	7.23	8.70	8.70	11.20	11.20	2x 8.70	2x 11.20
GAS											
Nominale inlet pressure ***p***		(mbar)	37								
Injection pressure p_i		(mbar)	34	28	30	32	32	32	34	32	32
Mass flow rate		(kg/h)	0.429	0.543	0.543	0.654	0.654	0.841	0.841	2x 0.654	2x 0.841
Orifice (injector)		(1/100 mm)	1x119	2x99	2x99	2x106	2x106	2x119	2x119	4x106	4x119
Primary orifice (restrictor)		(1/100 mm)	1x225	1x174	2x134	1x251	2x172	1x275	2x225	2x251	2x275
Gas input connection			Fitting G1/2" cylindrical (ISO 228-1)								
ELECTRICITY											
Power supply			230V (+10% -15%) – 50Hz Neutral mandatory								
Consumption		(VA)	28	28	2x 28	28	2x 28	28	2x 28	2x 28	2x 28
Individual fast acting fuse 5x20 (RP3 – RP32)			0.25A	0.25A	2x 0.25A	0.25A	2x 0.25A	0.25A	2x 0.25A	2x 0.25A	2x 0.25A
Ignition cycle length			45 seconds maxi								
VENTILATION											
Combustion air		(m^3/h)	5.09	6.44	6.44	7.76	7.76	9.98	9.98	2x 7.76	2x 9.98
Required air change		(m^3/h)	54.7	66.5	66.5	80.0	80.0	103.0	103.0	2x 80.0	2x 103.0

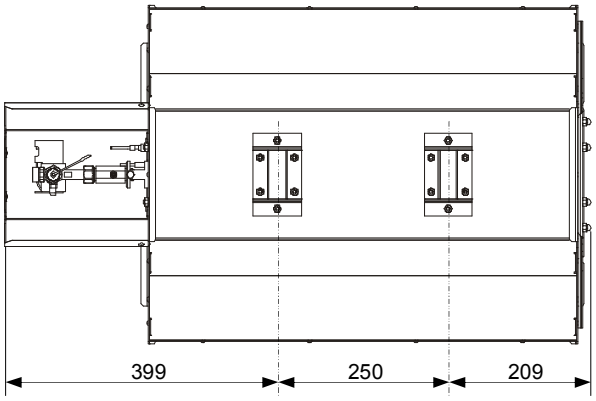
Hight radiant factor, up to 0.85 (EN 419-2)

1.3 XFR heater dimensions

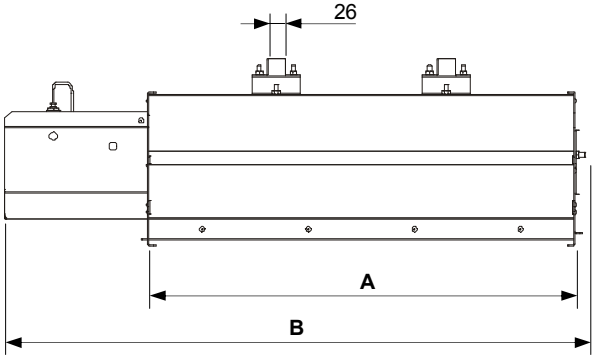
XFR 16

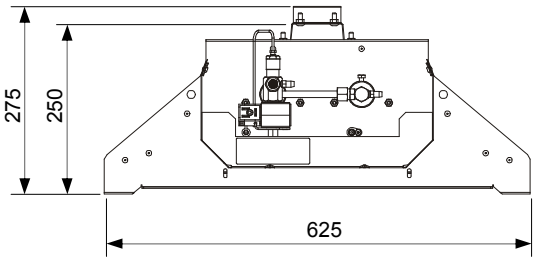


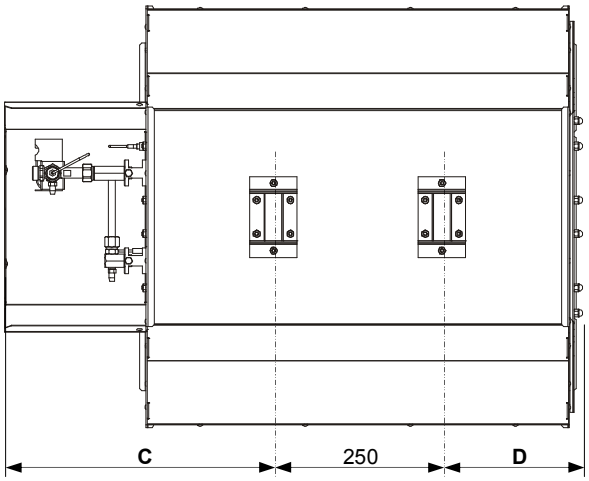




XFR 20, XFR 20-2, XFR 24, XFR 24-2, XFR 32, XFR 32-2, XFR 48-2 and XFR 64-2







MODEL	A (mm)	B (mm)	C (mm)	D (mm)
XFR 20	424	656	298	108
XFR 20-2	424	656	298	108
XFR 24	501	733	337	146
XFR 24-2	501	733	337	146
XFR 32	625	858	399	209
XFR 32-2	625	858	399	209
XFR 48-2	see page 10			
XFR 64-2				

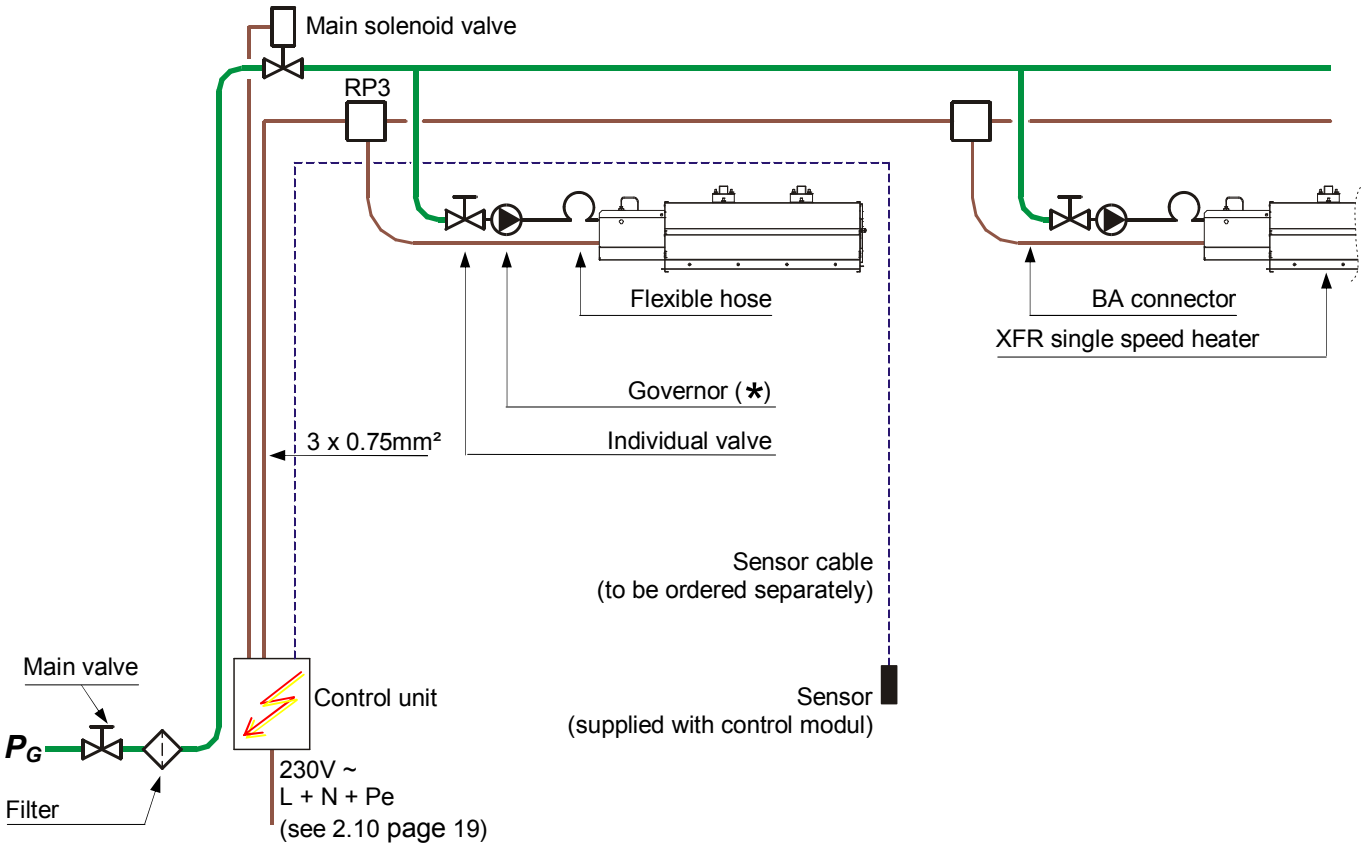
2. INSTALLATION

Before installation, check that the local conditions of supply, gas type / pressure and equipment settings are compatible.

2.1 Rules and regulations

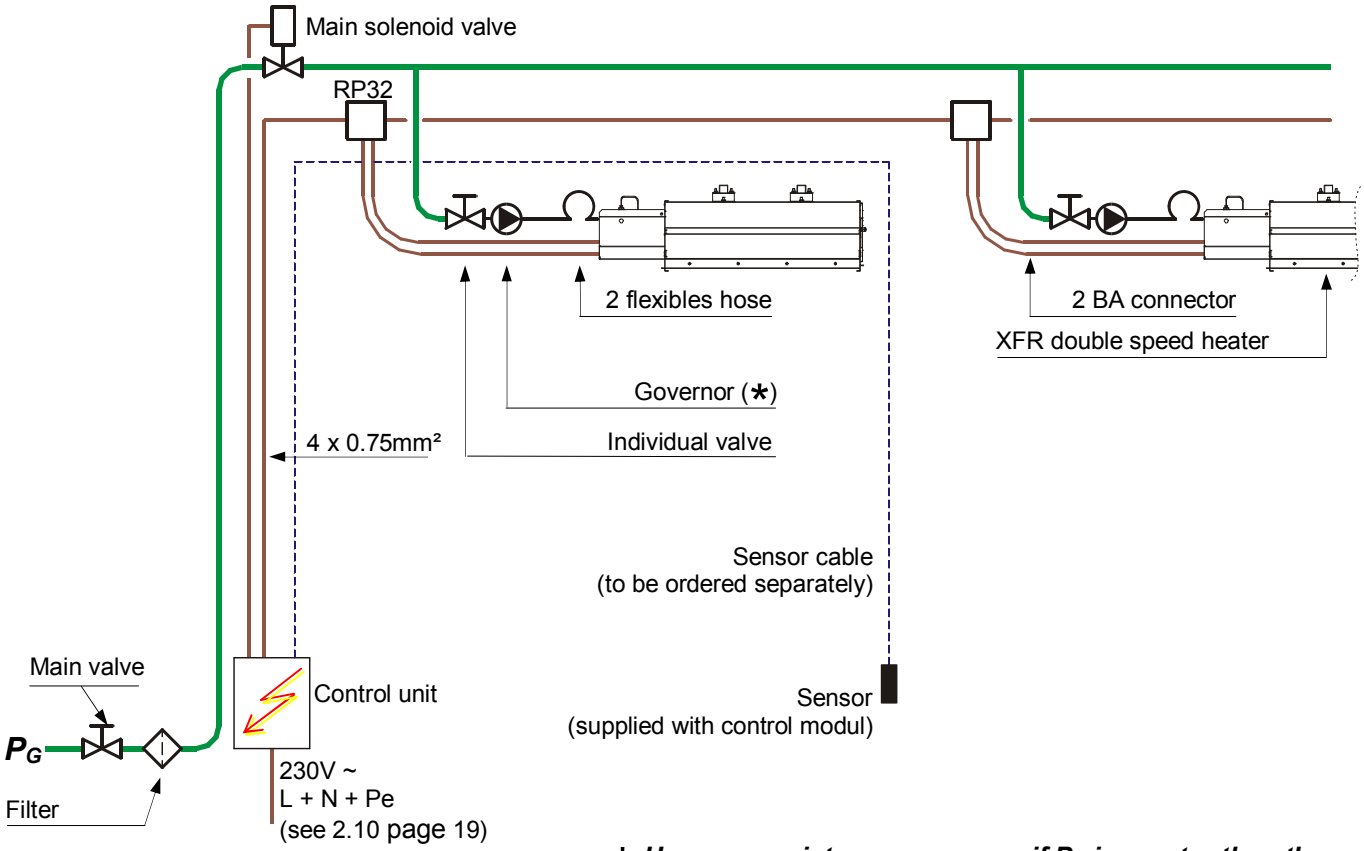
- SBM infrared heaters are CE approved.
- The premises must be ventilated in accordance with the norm EN13410.
- Building Standards (Scotland) (Consolidated) Regulations.
- Building regulations.
- Gas safety (Installations and Use) Regulations.
- Institute of Electrical Engineers (I.E.E.) Regulations.
- BS6896 Specification for Installation of Gas Fired Overhead Radiant Heaters for Industrial and Commercial Heating (2nd and 3rd family gases).
- Local British Gas Region Regulations.
- Local Authority Bylaws.
- Health and Safety at Work Act 1974
- Not for domestic use.

2.2 Diagram of a standard installation single speed.



***** *Use appropriate gas governor if P_G is greater than the nominal pressure P of the heaters.***

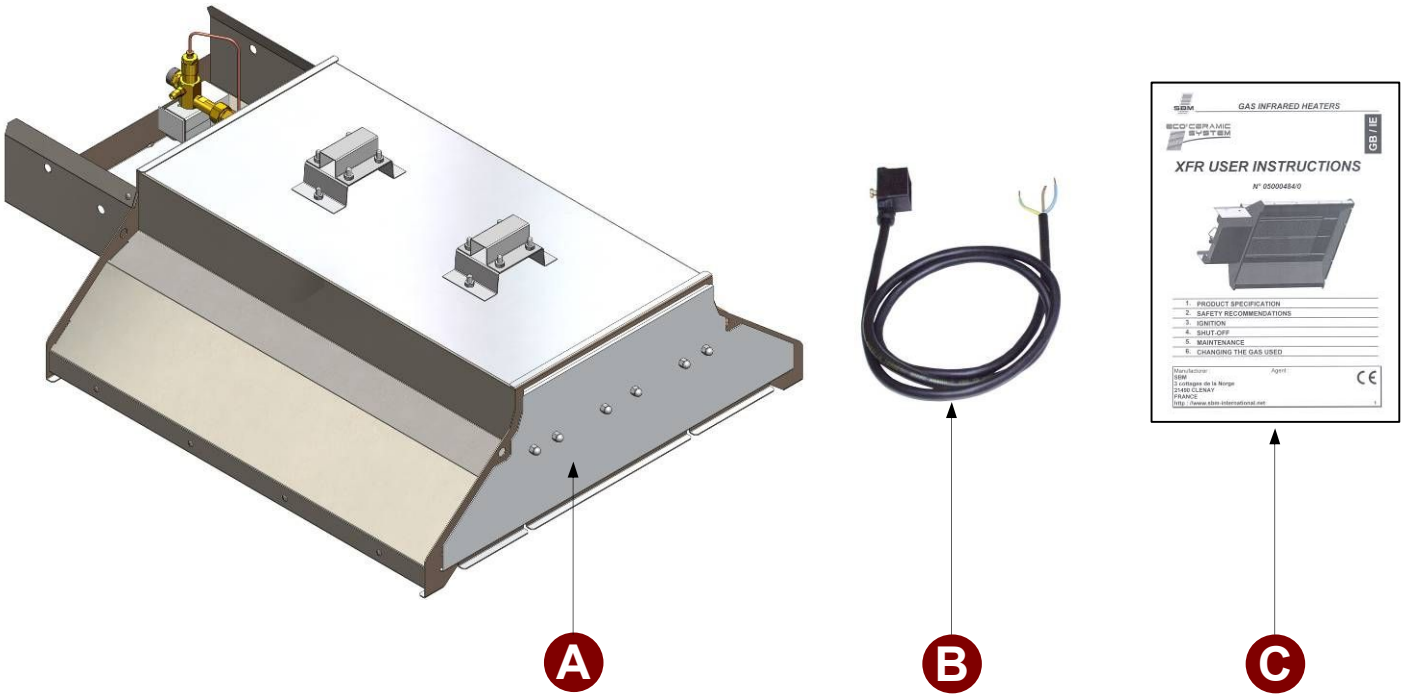
2.3 Diagram of a standard installation double speed



***** *Use appropriate gas governor if P_G is greater than the nominal pressure P of the heaters.***

2.4 Unpacking and checking of equipment

- ❒ Check the type and quantities of equipment against your order.
- ❒ Check that packing and equipment are intact.
  If this is not the case, register a complaint to this effect with the carrier.
- ❒ Check gas type and pressure to be used on heaters.
- ❒ Check box content.



REP	PART	QUANTITY								
		XFR 16	XFR 20	XFR 20-2	XFR 24	XFR 24-2	XFR 32	XFR 32-2	XFR 48-2	XFR 64-2
A	Heater	1	1	1	1	1	1	1	voir page 10	
B	BA connector 3m	1	1	2	1	2	1	2	2	2
C	User instructions	1								

2.5 Fixing of heaters

- ❒ Minimum recommended safety heights:

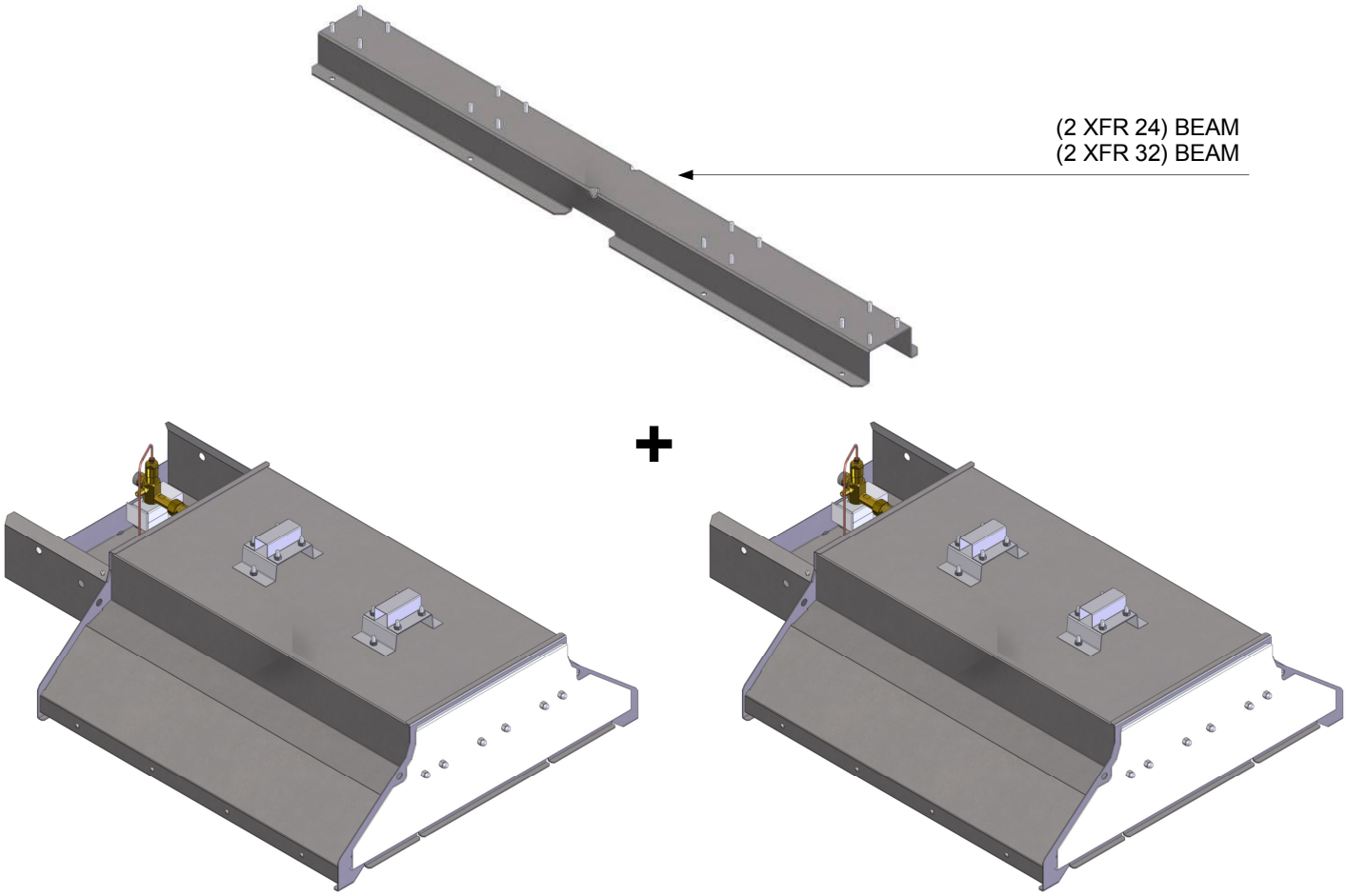
MODEL	MIN HEIGHT (m)
XFR 16	3.60
XFR 20 / XFR 20-2	3.80
XFR 24 / XFR 24-2	4.10
XFR 32 / XFR 32-2	4.50
XFR 48-2	5.00
XFR 64-2	5.50

- ❒ **MINIMUM COMFORT HEIGHTS :** refer to the specific SBM case study for each project.

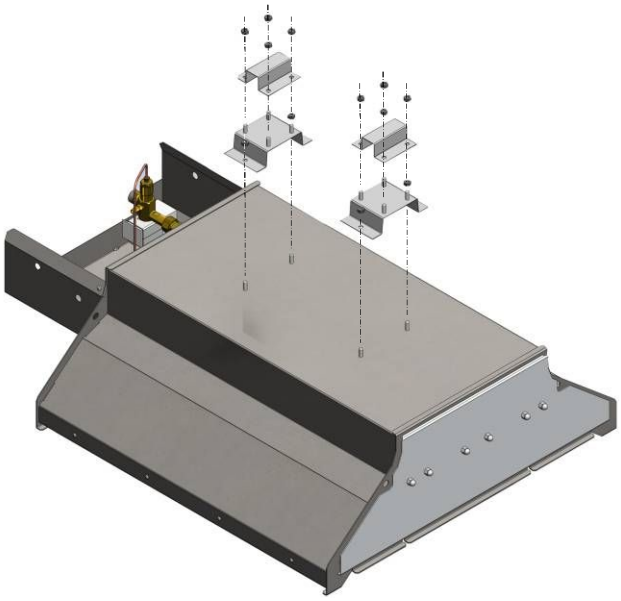
❒ Examples of fixtures to be supplied by the installer :

XFR 48-2 = XFR 24 + XFR 24 + (2 XFR 24) BEAM
XFR 64-2 = XFR 32 + XFR 32 + (2 XFR 32) BEAM

If heaters will be fit with ballon grids, grids must be mounted before the 2 heaters assembly. (see 2.6 page 14)



1



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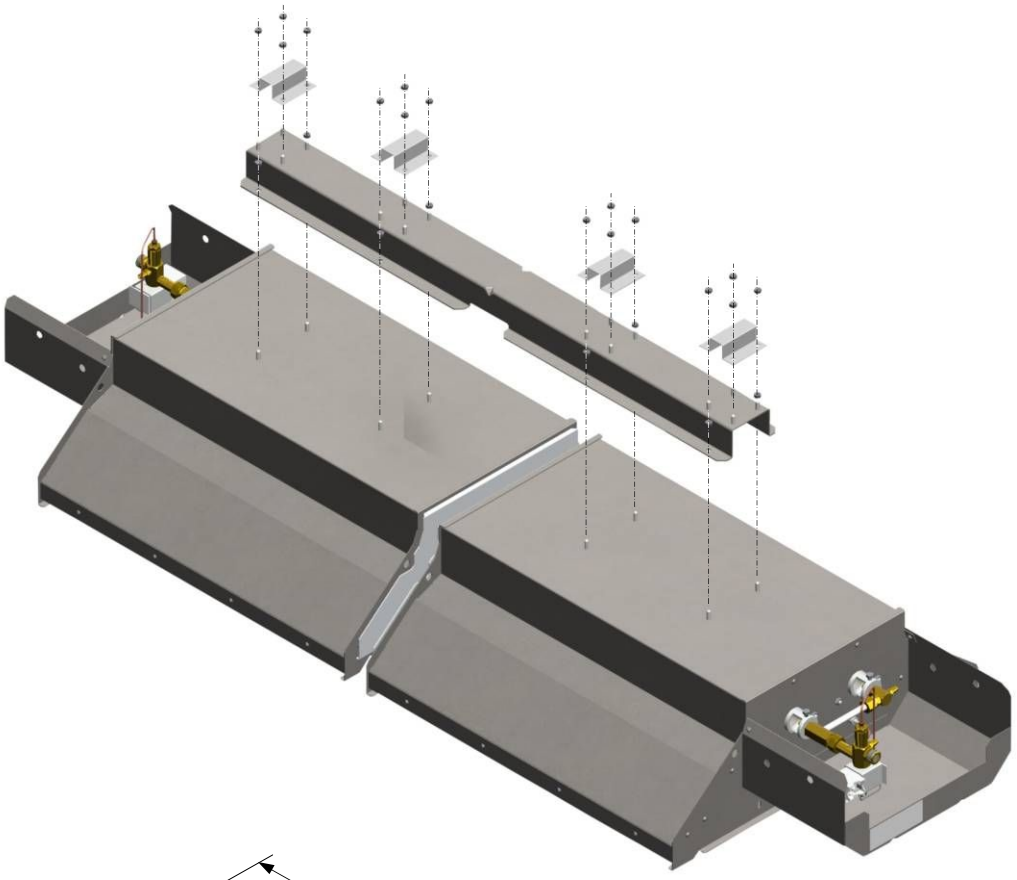

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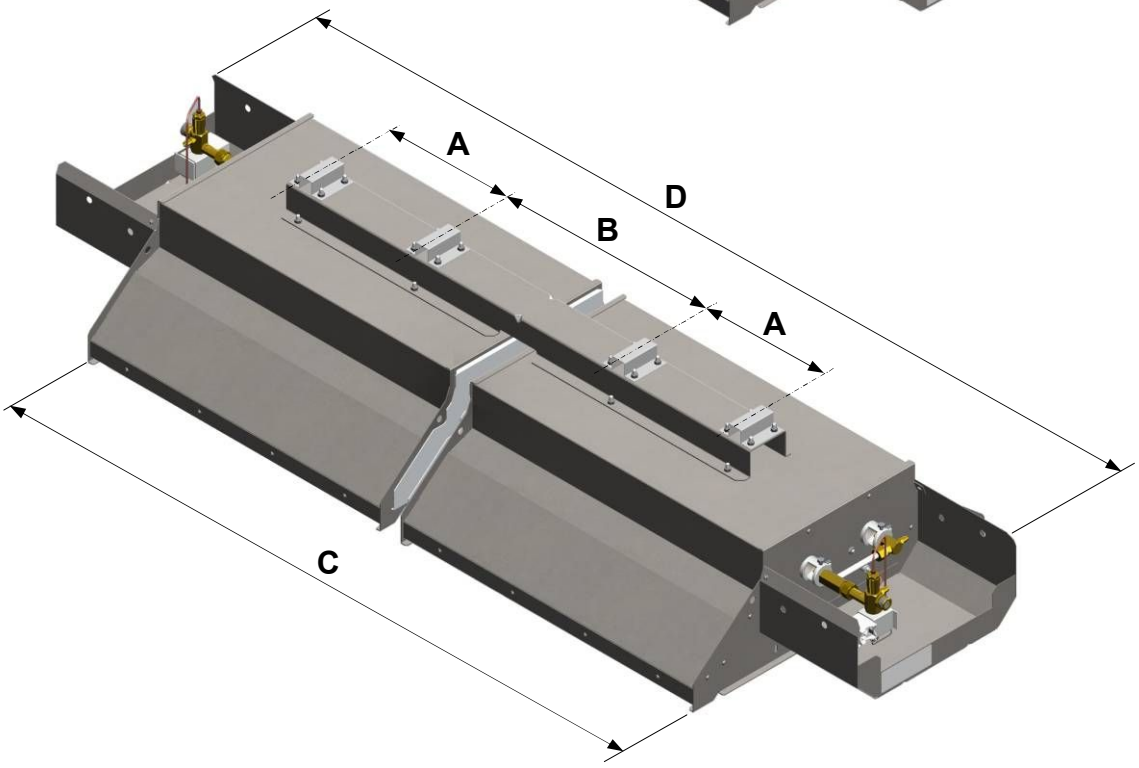
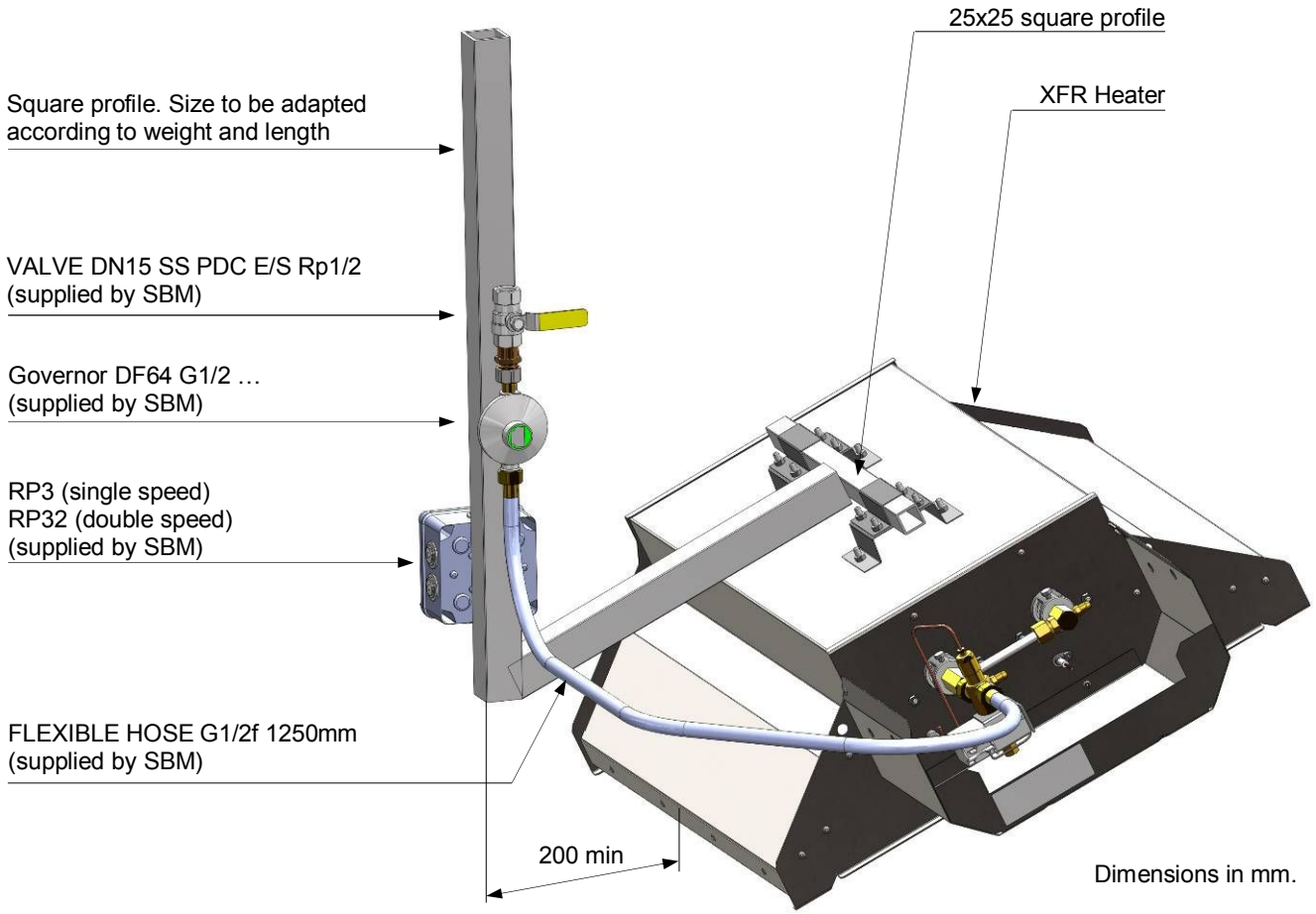
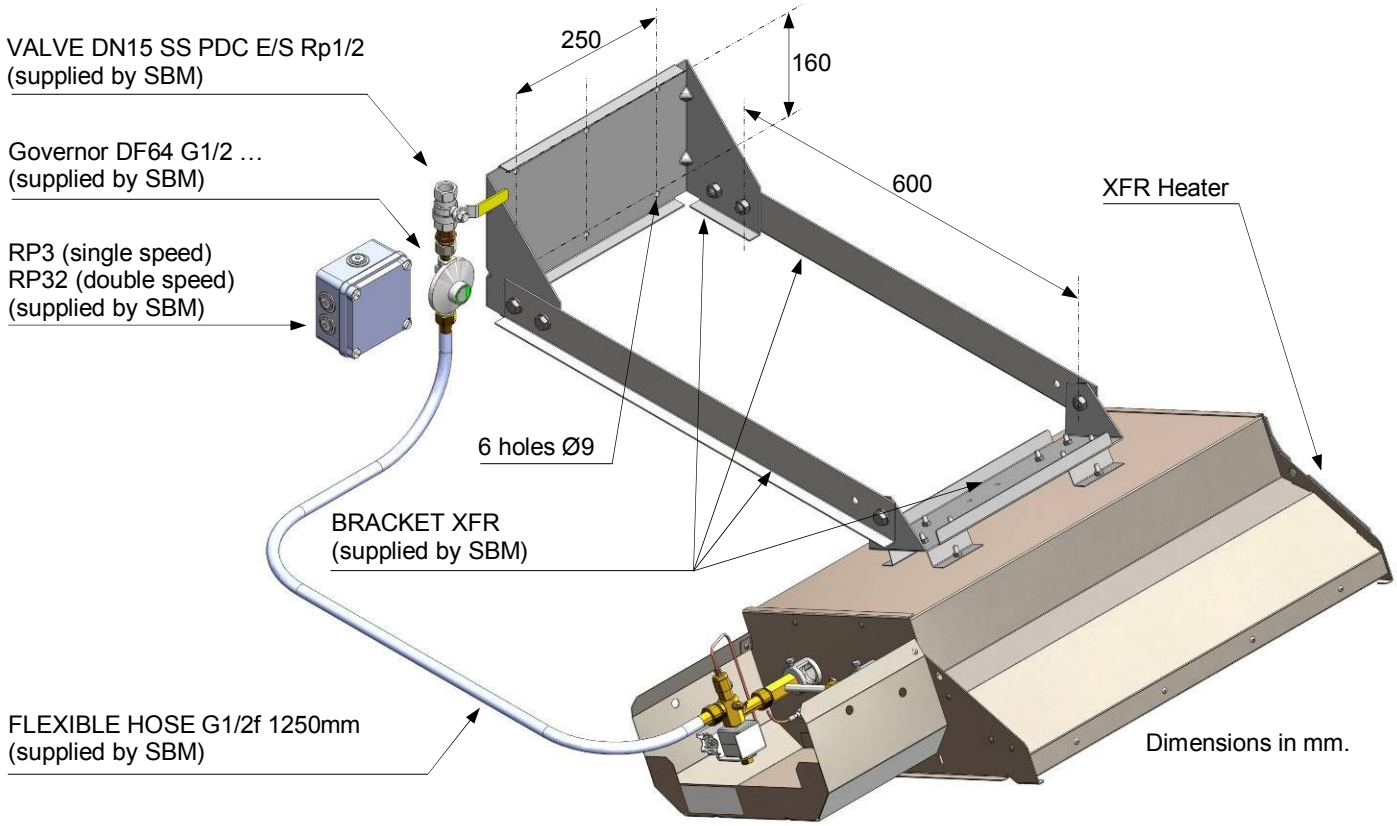


	XFR 48-2	XFR 64-2
A (mm)	250	250
B (mm)	298	422
C (mm)	1053	1300
D (mm)	1473	1720
Weight (kg)	35.10	42.30

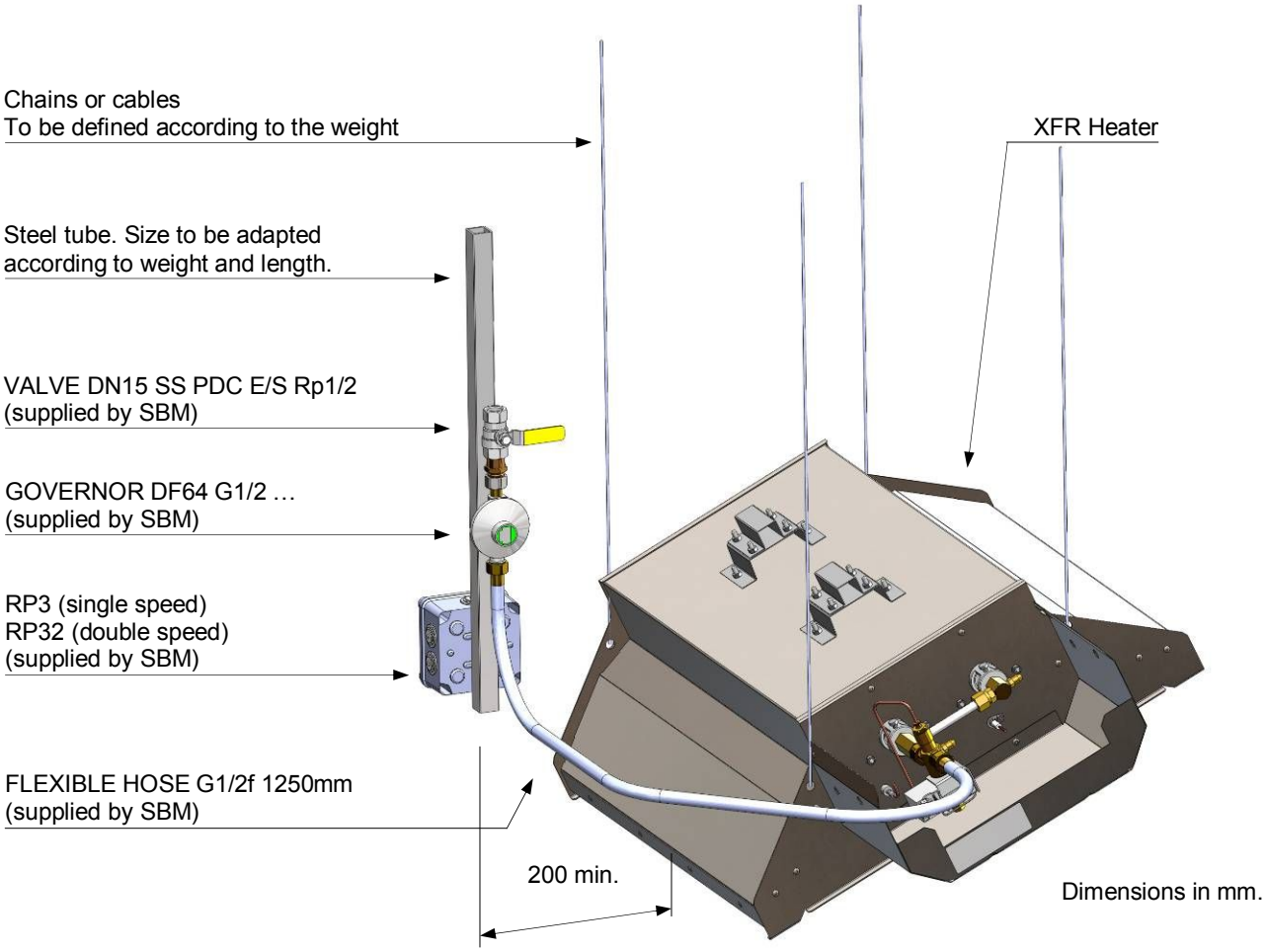
❒ Example of mounting bracket for **XFR 16** to **XFR 32-2**, to be supplied by the installer.



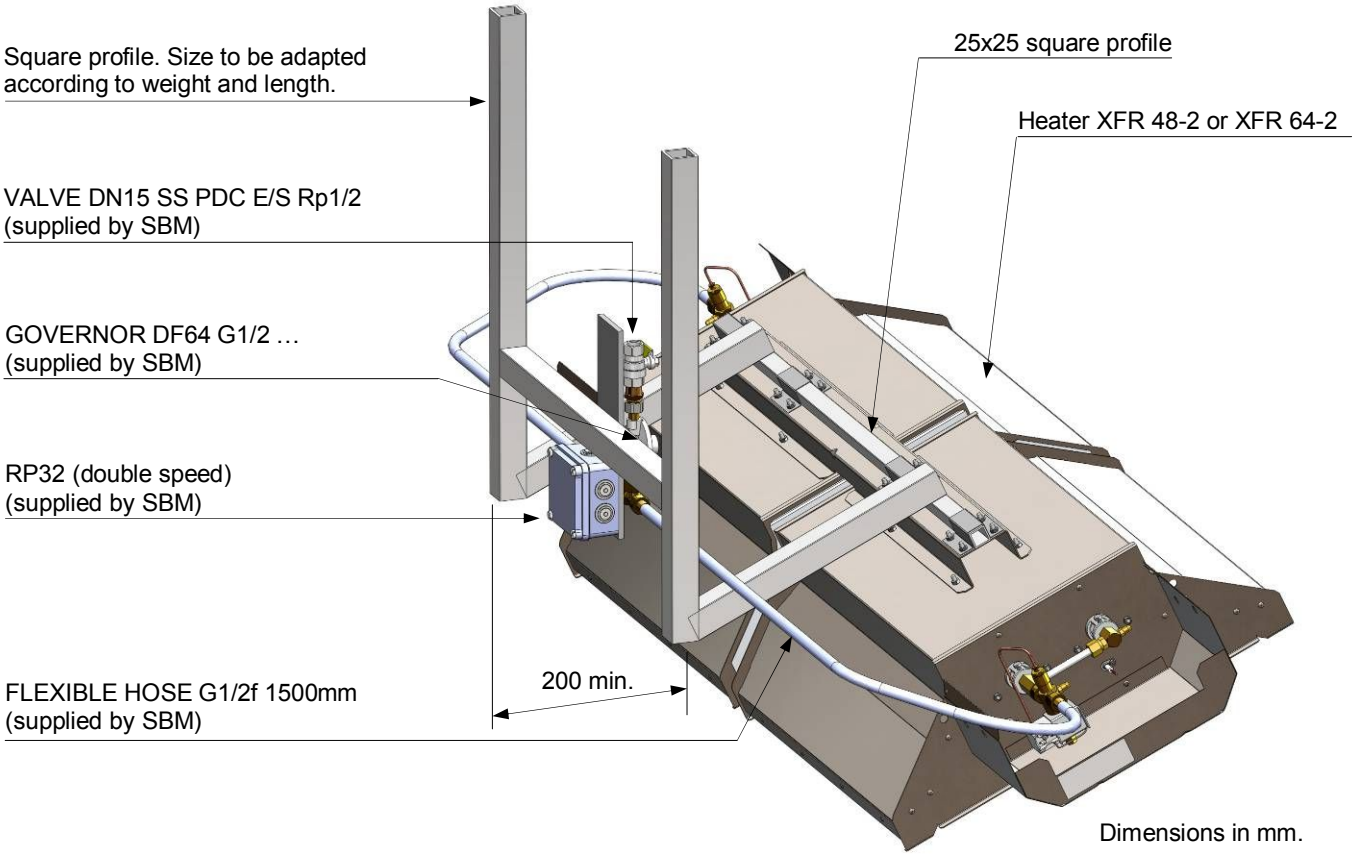
❒ Example of SBM multi-directional bracket for **XFR 16** to **XFR 32-2**



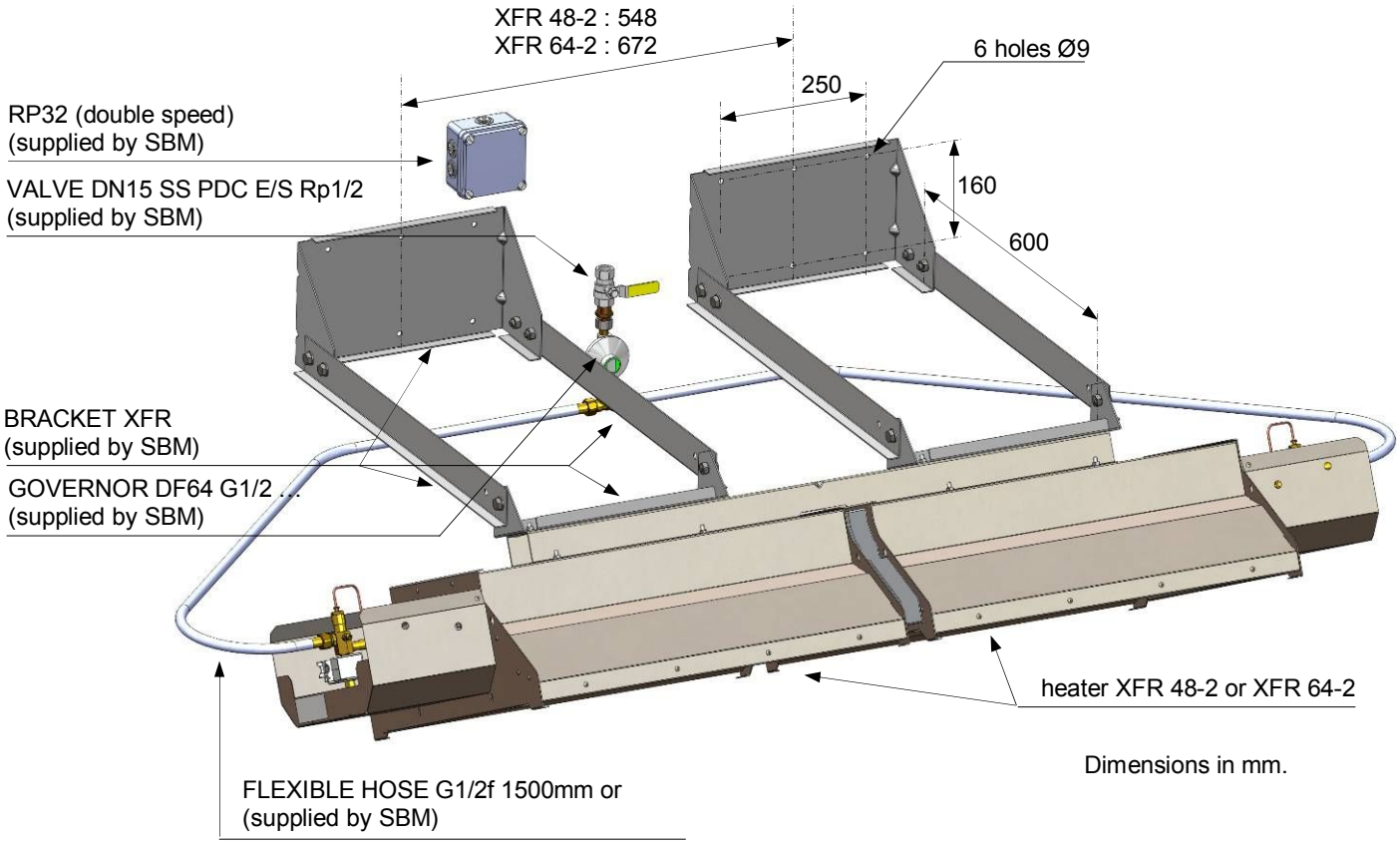
❒ Hanging exemple with chains or cables for **XFR 16** to **XFR 32-2**



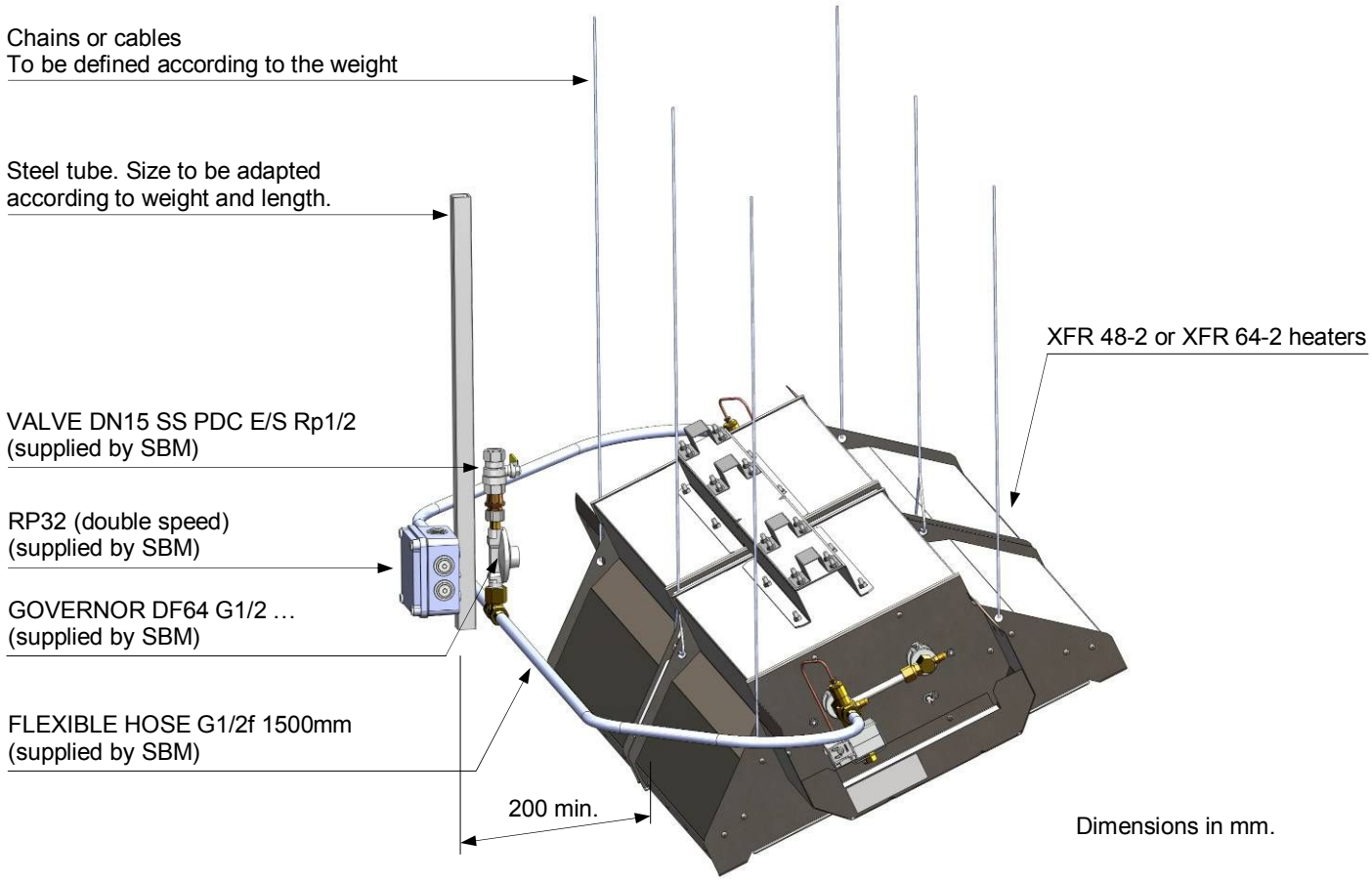
❒ Example of mounting bracket for **XFR 48-2** and **XFR 64-2**, to be supplied by the installer.



❒ Example of SBM multi-directional bracket for **XFR 48-2** and **XFR 64-2**

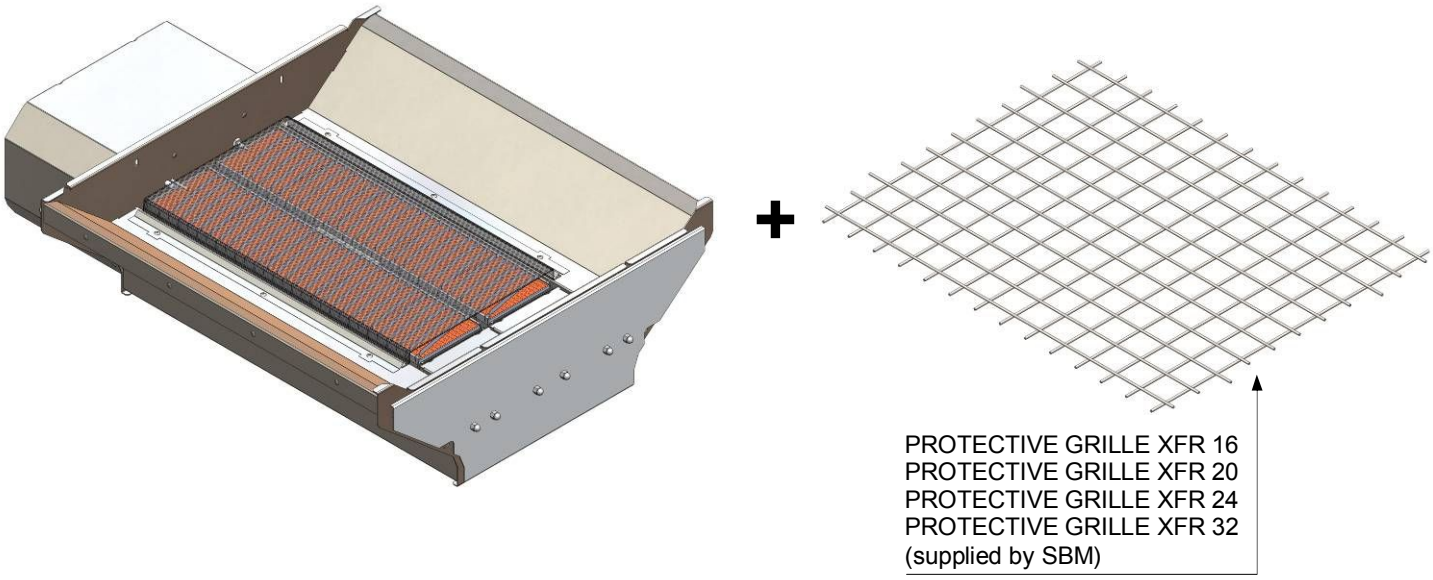


❒ Hanging exemple with chains or cables for **XFR 48-2** and **XFR 64-2**



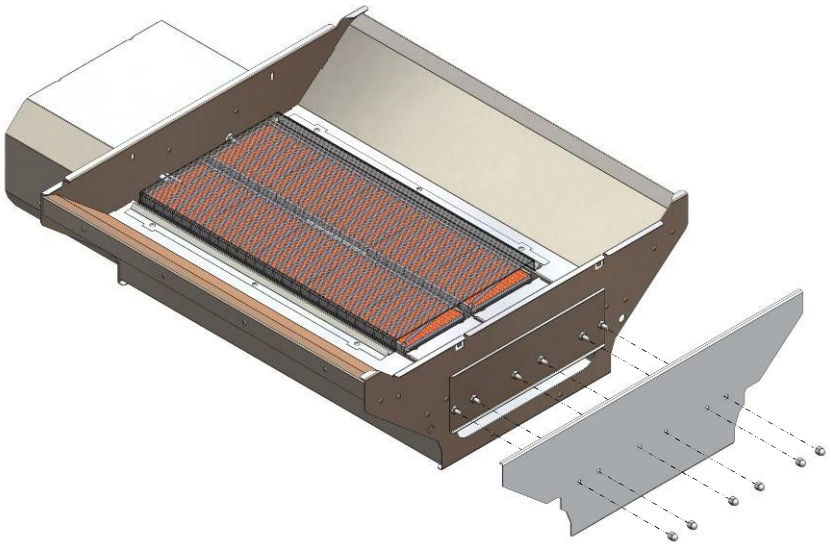
2.6 Accessories

- ❒ Grilles for protecting **XFR** heaters from balls and other flying objects



PROTECTIVE GRILLE XFR 16
PROTECTIVE GRILLE XFR 20
PROTECTIVE GRILLE XFR 24
PROTECTIVE GRILLE XFR 32
(supplied by SBM)

1



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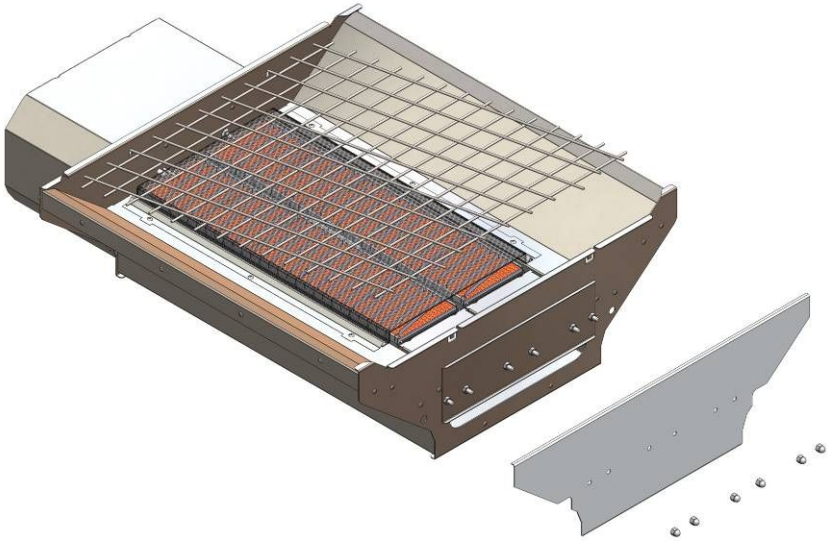

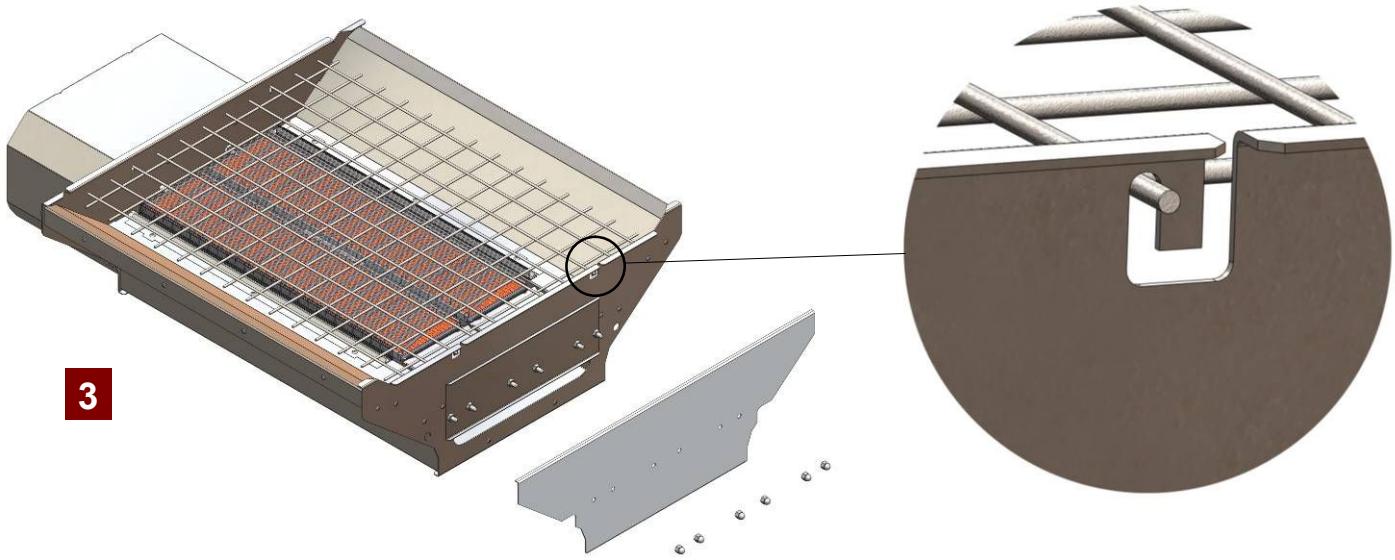

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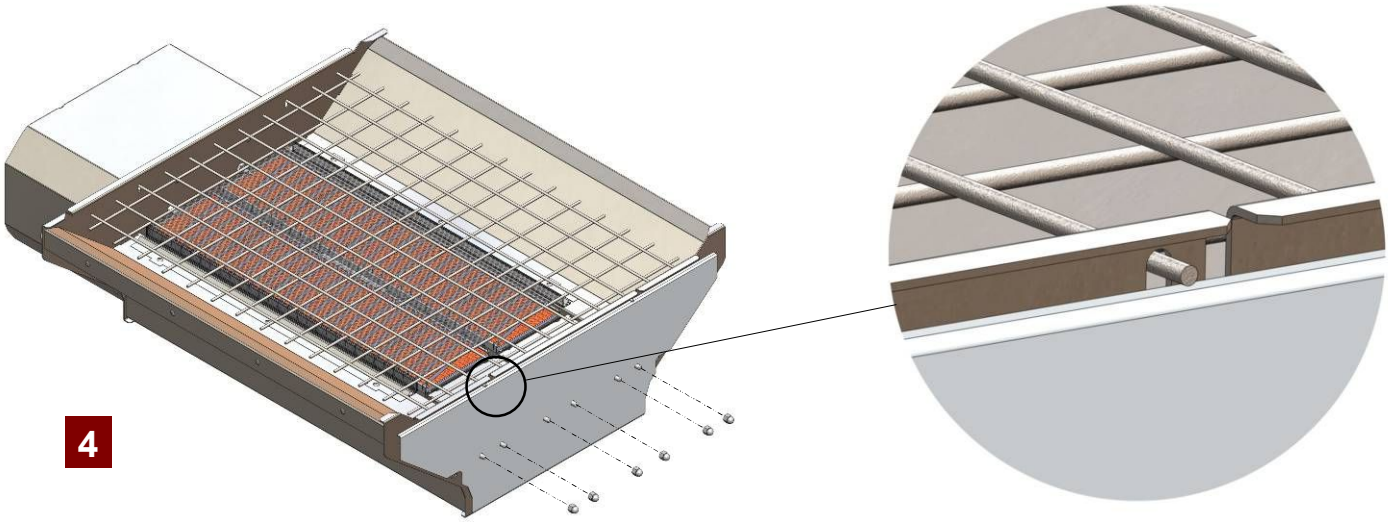

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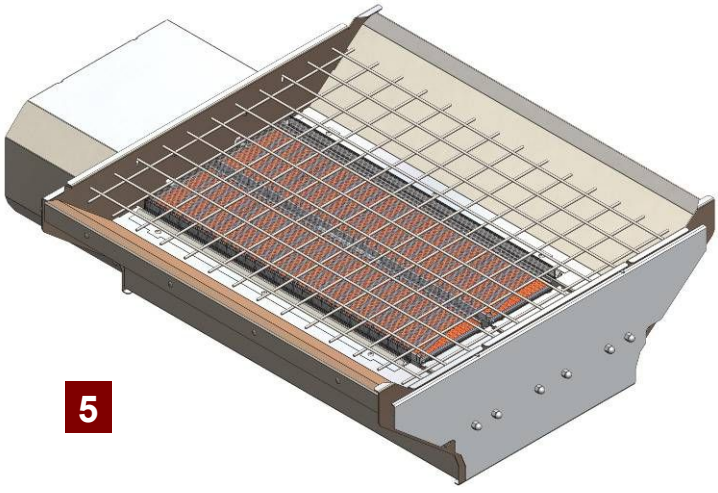
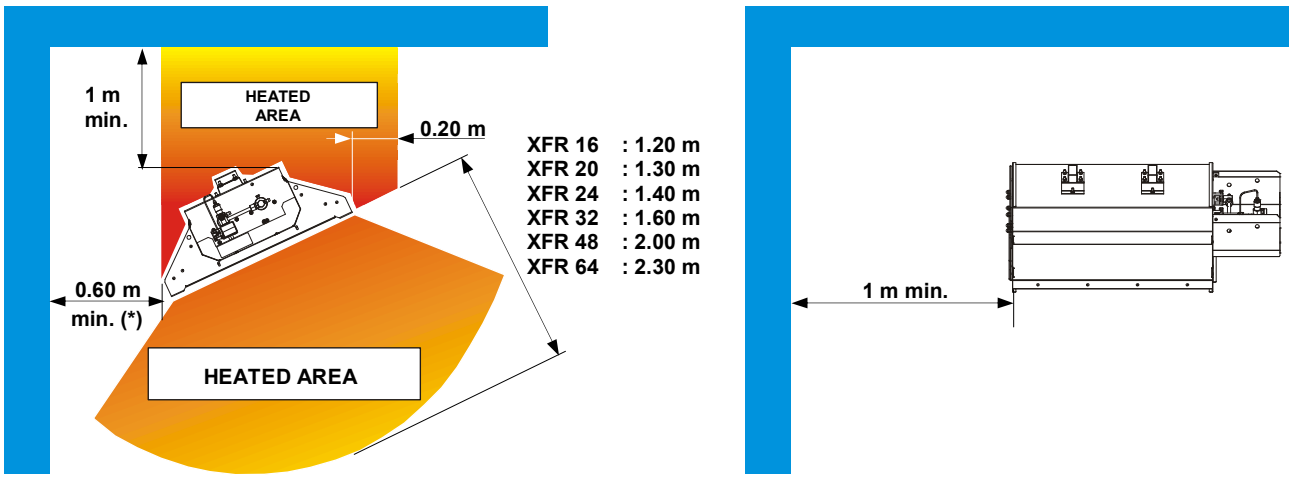


5

XFR 48-2 : 2 x PROTECTIVE GRILLE XFR 24
XFR 64-2 : 2 x PROTECTIVE GRILLE XFR 32

2.7 Minimum safety clearances



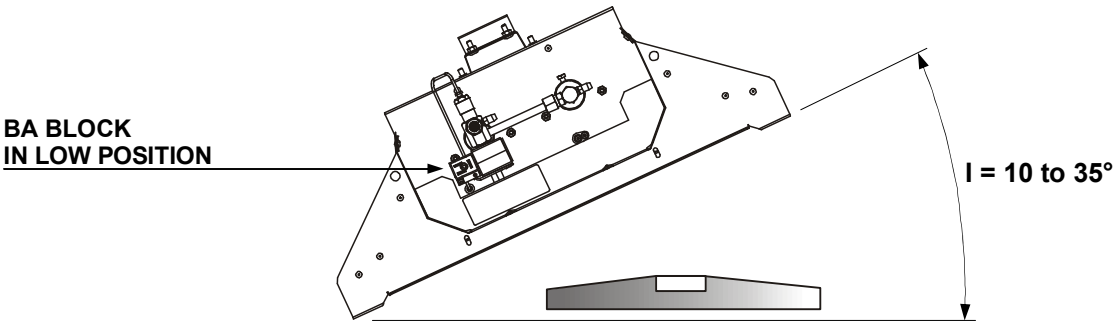
(*) For minimum 20° inclination

Do not locate in heated areas, inflammable materials (θmax = 70°C), gas piping and electrical wiring.

Where safety clearances cannot be respected, heat-protection must be provided above the heaters.

2.8 Inclination of heaters

❒ Inclination "**I**" = ***at least 10°*** *(check SBM survey)*



❒ For double speed heaters

Always light the top burner first

2.9 Gas connection

BEFORE INSTALLATION, CHECK THAT LOCAL CONDITIONS OF SUPPLY, GAS TYPE / PRESSURE AND EQUIPMENT SETTINGS ARE COMPATIBLE.

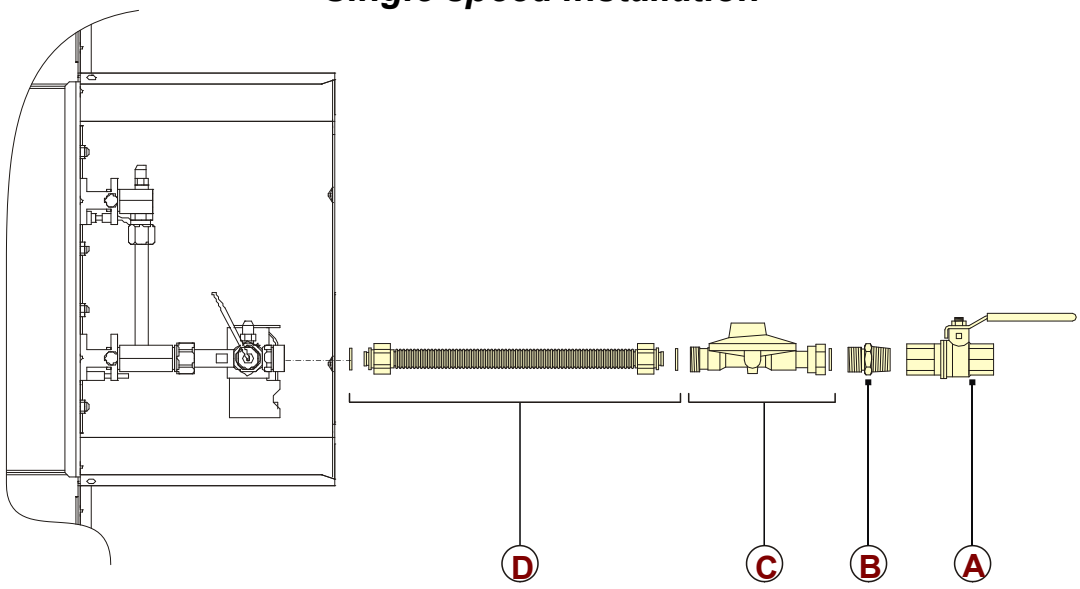
- ❒ Gas supply piping must not produce any stress on the injector block
  (Use preferably a metalic flex 12 Gf)

- ❒ MEDIUM PRESSURE GAS SUPPLY

  Gas supply pressure P_G greater than heater nominal inlet pressure
  (see tables on page 4).

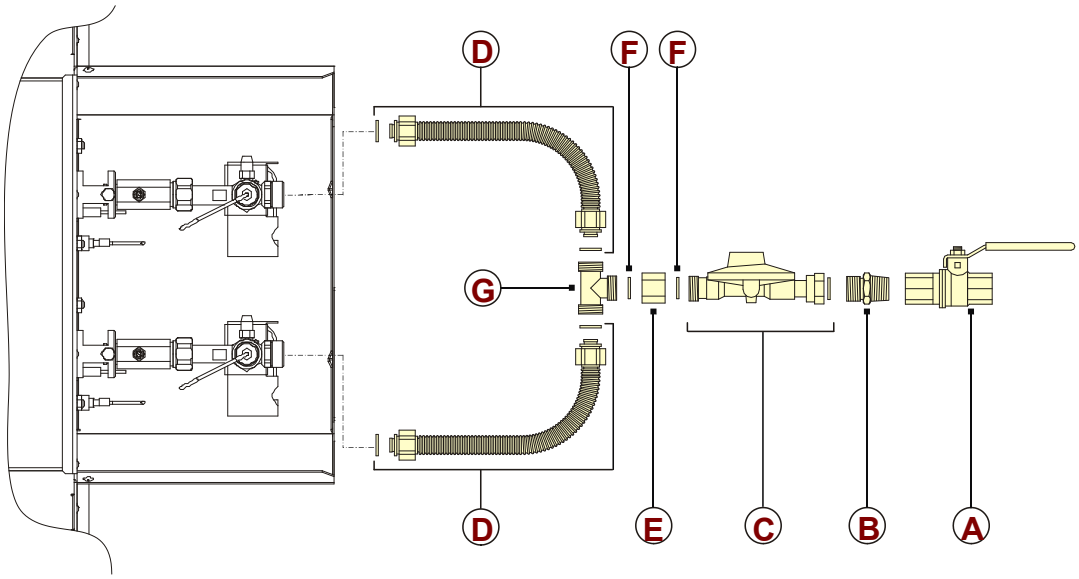
GAS	GAS SUPPLY PRESSURE
G20	200 mbar to 1.5 bar maxi
G31	500 mbar to 1.5 bar maxi

Single speed installation



A	VALVE DN15 SS PDC E/S Rp1/2
B	UNION FITTING R1/2m-G1/2m
C	DF64 G1/2 G31-37 4KG/H
	DF64 G1/2 G20-20 3M3/H
D	FLEXIBLE HOSE G1/2f 1250mm

Double speed installation



A	VALVE DN15 SS PDC E/S Rp1/2
B	UNION FITTING R1/2m-G1/2m
C	DF64 G1/2 G31-37 4KG/H DF64 G1/2 G20-20 3M3/H
D	FLEXIBLE HOSE G1/2f 1250mm
E	SLEEVE F/F G1/2
F	VITON WASHER G1/2
G	T FITTING MALE G1/2

1500mm flexible hoses available for XFR 48-2 and XFR 64-2.

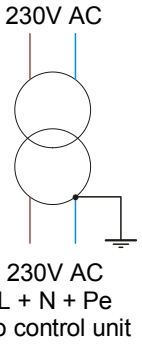
❒ LOW PRESSURE GAS SUPPLY

Gas supply pressure P_G identical to heater nominal inlet pressure (see tables on page 4).

GAS	GAS SUPPLY PRESSURE
G20	20 mbar
G31	37 mbar

Same accessories then medium pressure
except regulator (C) , not required.

2.10 Electrical connections

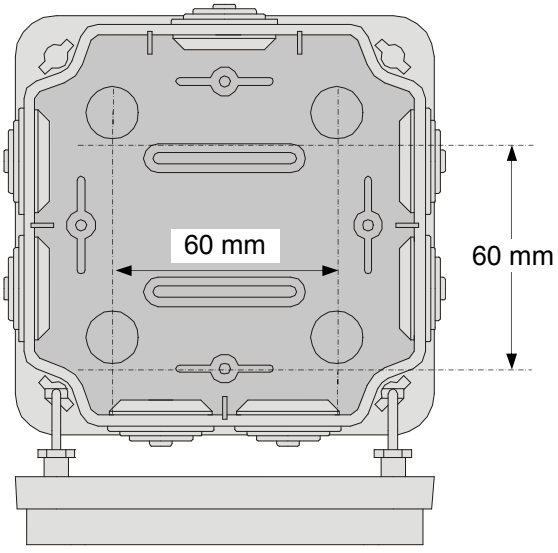


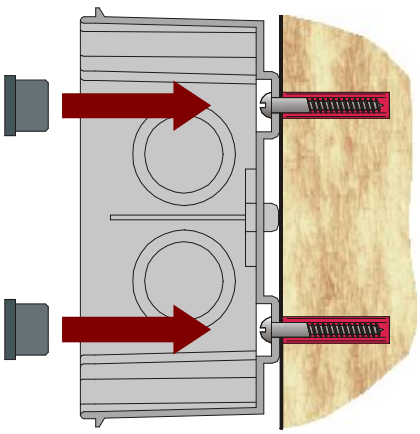
See diagram of a standard installation. (§2.2 and 2.3, page 7)

- ❒ Electrical connections must comply with I.E.E. Regulations.
- ❒ **No tension, even momentary between NEUTRAL conductor and GROUNDED CONDUCTOR**
  In case of installation without Neutral (or neutral of bad quality), use an isolation transformer in order to create an artificial neutral. For that, connect one outlet socket to the ground.
- ❒ All heaters must be **GROUNDED**.
- ❒ Control : **XFR** heaters are controlled by **VisioLon Ind-T** programmable controller. Refer to the technical instructions.
- ❒ Electric cables and the electrical junction box must not be positioned in the heated area around a heater.(see §2.7 page 16)
- ❒ Types of connection cable

LINK	TYPE OF CABLE
Control unit to RP3 (and RP3 to RP3)	3-core 0.75mm^2 85°C temperature rated PVC sheathed cable to BS6500 Table 9.
Control unit to RP32 (and RP32 to RP32)	4-core 0.75mm^2 85°C temperature rated PVC sheathed cable to BS6500 Table 9.
RP3 or RP32 to heater	Use the BA connector supplied with the heater green/yellow wire: EARTH blue wire: NEUTRAL brown wire: LIVE
Control unit to sensor	Use the coaxial cable supplied by SBM. (in 20m, 60m or 300m roles)

- ❒ Number of RP3 and RP32 units : 1 RP3 per type XFR 16, XFR 20, XFR 24 and XFR 32.
  1 RP32 per type XFR 20-2, XFR 24-2 and XFR 32-2 XFR 48-2 and XFR 64-2.
- ❒ Fixing RP3 and RP32 units : see instructions supplied in box.

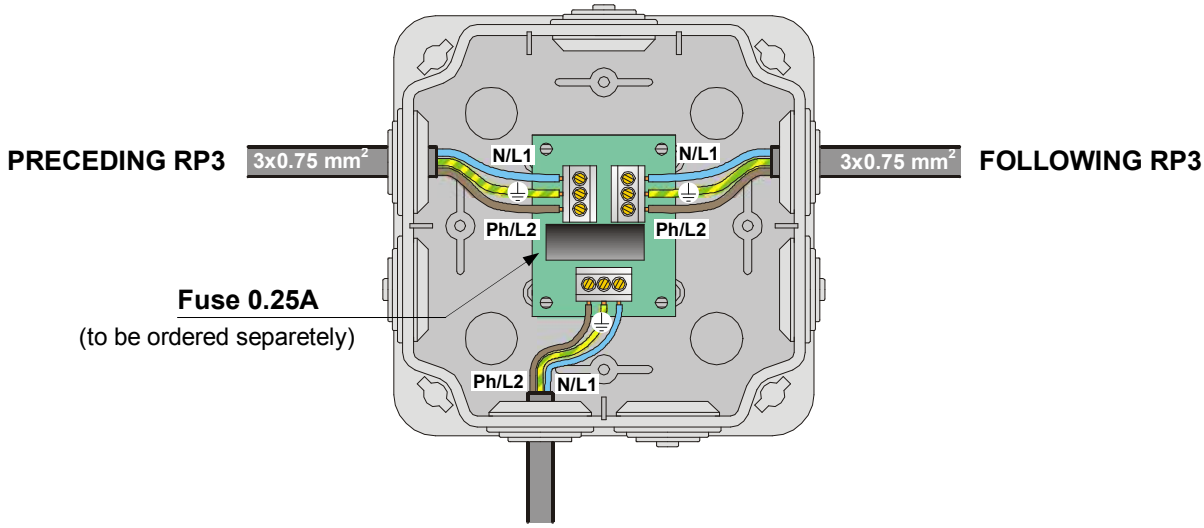




Always place the plastic cover back on the top of the screw head.

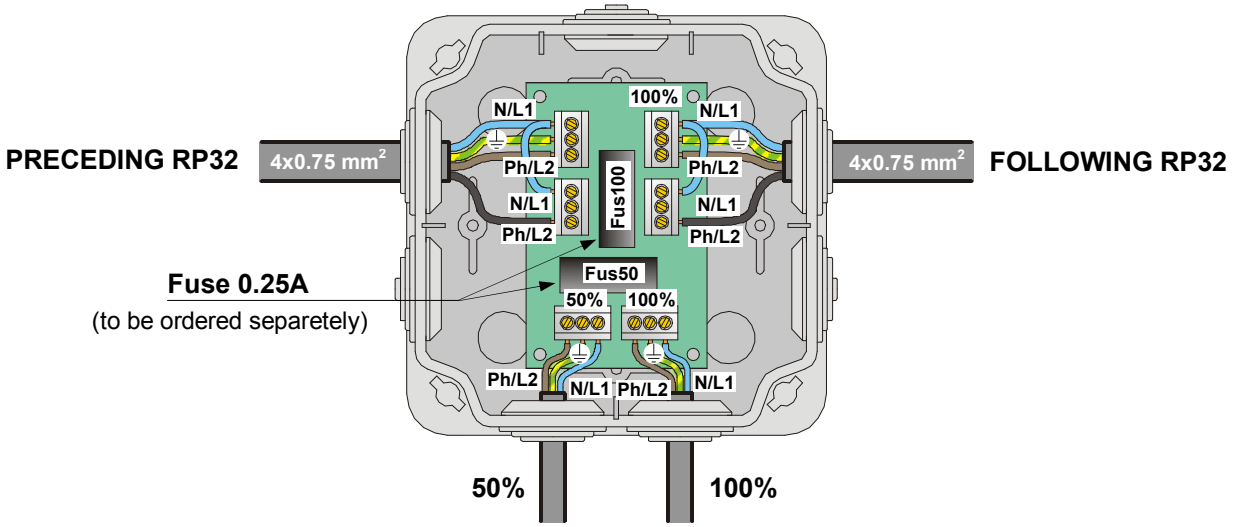
The RP3 or RP32 box must be located no more than 3 meters away from the ignition block (BA block) of the heater, as the prewired plug is 3 m long.
It must not be located in the heated area around the heater (see §2.7 page 16)

❒ Wire RP3's as shown in the diagram below.



XFR HEATER single speed

❒ Wire RP32's as shown in the diagram below.



2 XFR HEATER double speed

2.11 Start-up

❑ Clean out

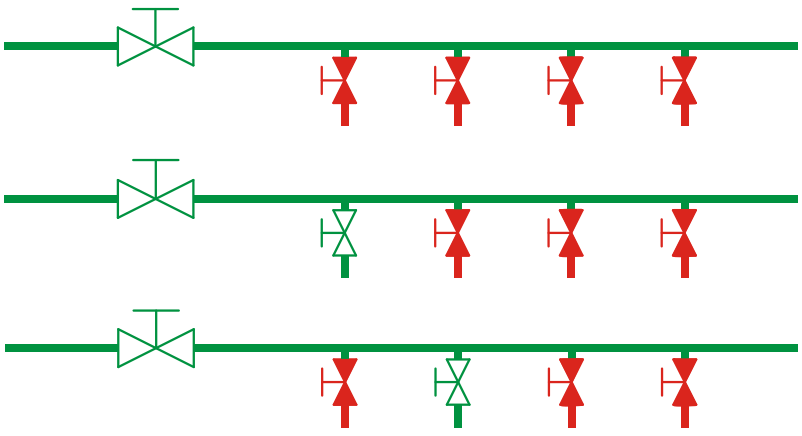
Objective : flush out impurities in the gas piping

Principe : clean out gas piping with dry air, or even better with nitrogen, **AFTER DISCONNECTING ALL ACCESSORIES.**

1 Pressure on

2 Flush out outlet Nr. 1

3 Flush out outlet Nr. 2



= open

= close

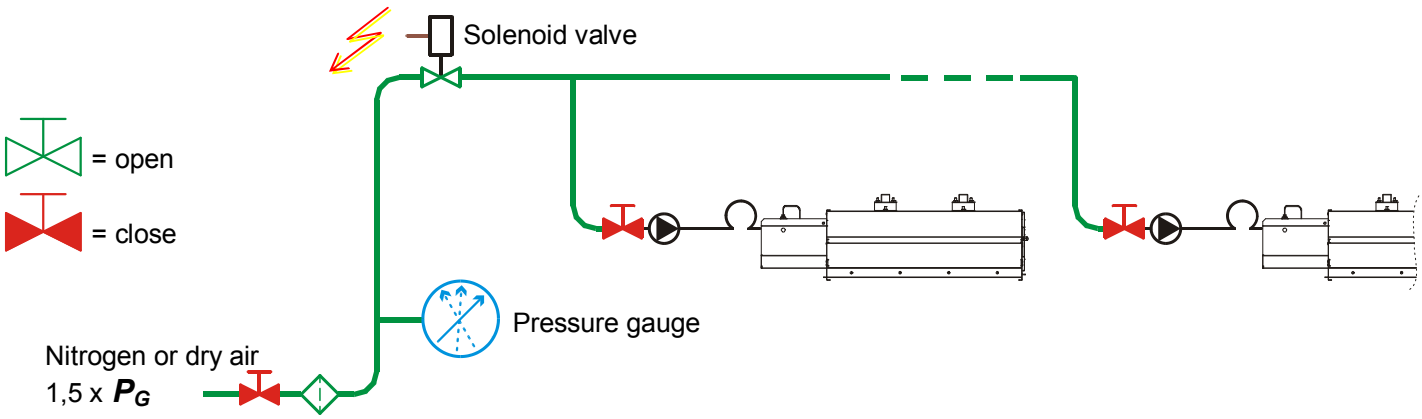
❑ Gas-tightness test :

a) Nitrogen or dry air at 1.5 times more pressure than gas operating pressure P_G

b) Turn off the nitrogen or dry air supply and wait 15 minutes.

c) Check the pressure gauge after 2 hours (must stay fixed).

d) If not, detect leaks with a foaming product, fix them and repeat the operation



Local regulation may apply.

❑ First start-up

a) Preliminary checks :

* check calibration of control unit fuses.

* ground fault breaker operation ("TEST" button).

b) Initial settings :

* main valve closed.

* heaters valves open.

* ground fault breaker set to "ON".

* thermostat or programmable controller set to correct temperature setting (see the technical instruction of the heating control module).

c) Ignition

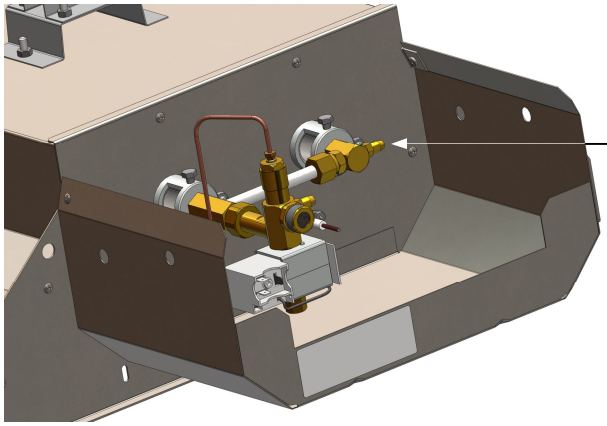
* open the main gas valve.

* Put the ignition switch on "I / ON"

* run a full sensor heating cycle and check :
. ignition cycle length (45 seconds maximum).
. ignition and shut-down of heaters according to temperature settings.

d) Injection pressure p_i check

* The injection pressure of each heater p_i must be set to the value indicated in the corresponding tables §1.2 page 4.



* Procedure :
  - . Unscrew the pressure test point screw (2 or 3 turns)
  - . Connect a pressure gauge (adapted to the value to be measured) to the pressure test point.
  - . If value differs than the theorical value from table check the supply pressure and the cleanness of the gas filters.
  - . Remove the pressure gauge.
  - . Re-tighten the pressure test point screw.

Do not forget to re-tighten the pressure test point screw.

Injection pressures must be set while all the heaters are running.

e) Tightness of heater connection

* for each heater, check gas tightness with a foaming product, from the output of the individual valve to the injector.

3. RECEIPT OF INSTALLATION

❑ **TO BE PERFORMED BY THE FITTER IN THE PRESENCE OF THE CUSTOMER.**

- ❑ Check that **the gas type and pressure comply with** the type of heater installed (see rating plate)
- ❑ Check that an **individual valve** is installed prior to each heater.
- ❑ Check that the "**XFR USER GUIDE**" is displayed next to the control unit, after being **stamped by the installer**.
- ❑ Provide the customer with **a copy of each XFR USER INSTRUCTIONS** supplied in the product boxes.
- ❑ Indicate to the customer the **locations** of:

  - valves.

  - electric switches.

  - control units.

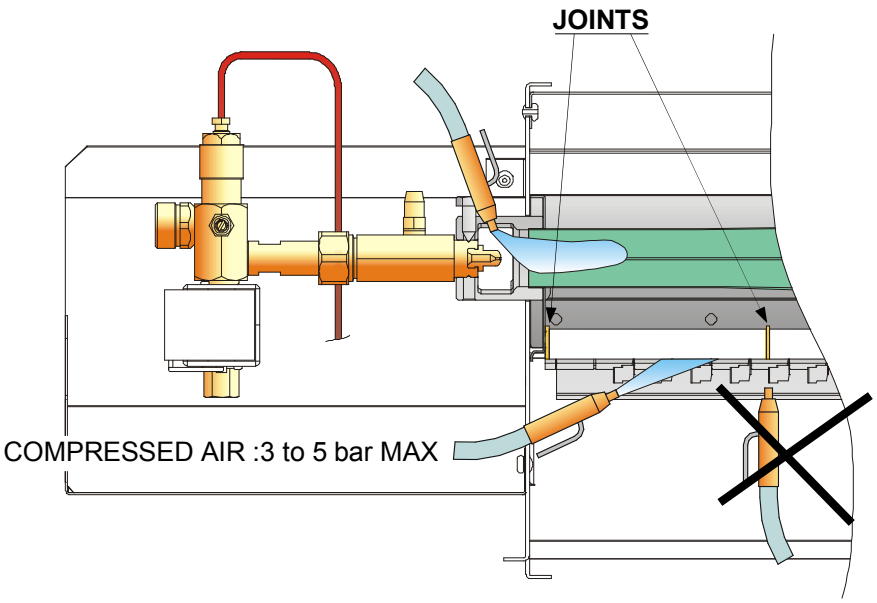
- ❑ **Explain** to the customer how all **control units operate**.
- ❑ Plan the **initial maintenance visit** (**1 year** after start-up).

4. MAINTENANCE

LIST OF OPERATIONS TO BE PERFORMED DURING THE ANNUAL MAINTENANCE VISIT.

- ❑ Removal of dust from heaters

  - on site, without disassembly, heaters off and cold.



DO NOT BLOW AIMING AT JOINTS BETWEEN CERAMIC PLATES (risk of damaging the burner)

- ❑ Check condition of ceramic plates (**visual** inspection).
- ❑ Check heater fixture.
- ❑ Check tightness of gaz accessories.
- ❑ Check heater operation.

  Switch on all heaters, check ignition and combustion. A combustion temperature of approximately 900°C (uniform orange red colour) ensures heater cleanliness and correct gas supply pressure.

- ❑ Check operation of solenoid valves.

  Check that all solenoid valves properly close (heaters switched off).

- ❑ Check controls.
- ❑ Check all settings.

5. REPAIRS

❒ Problem on a single heater.

First, check compatibility of heaters with the gas type and pressure.

ONE HEATER DOES NOT LIGHT

- No spark
  - Check RP3 or RP32
  - Check screw tightness of prewired plug
  - Check igniter :
    - wire
    - ceramic
    - distance between earth-pin and igniter (5 mm)
    - connection to BA block
  - Replace BA block
- Spark
  - Check individual valve opening
  - Check gas flow throught the injector block ("click" ?)
    - "Click"
      - Check cleanness :
        - regulator/governor gas inlet filter
        - heater gas inlet filter
        - injector(s)
    - "No click"
      - Replace BA blocka and/(or) injector block

ONE HEATER LIGHTS AND GOES OUT AFTER 45 seconds

- Check thermocouple properly tightened on injector block
- Replace thermocouple
- Replace injector block

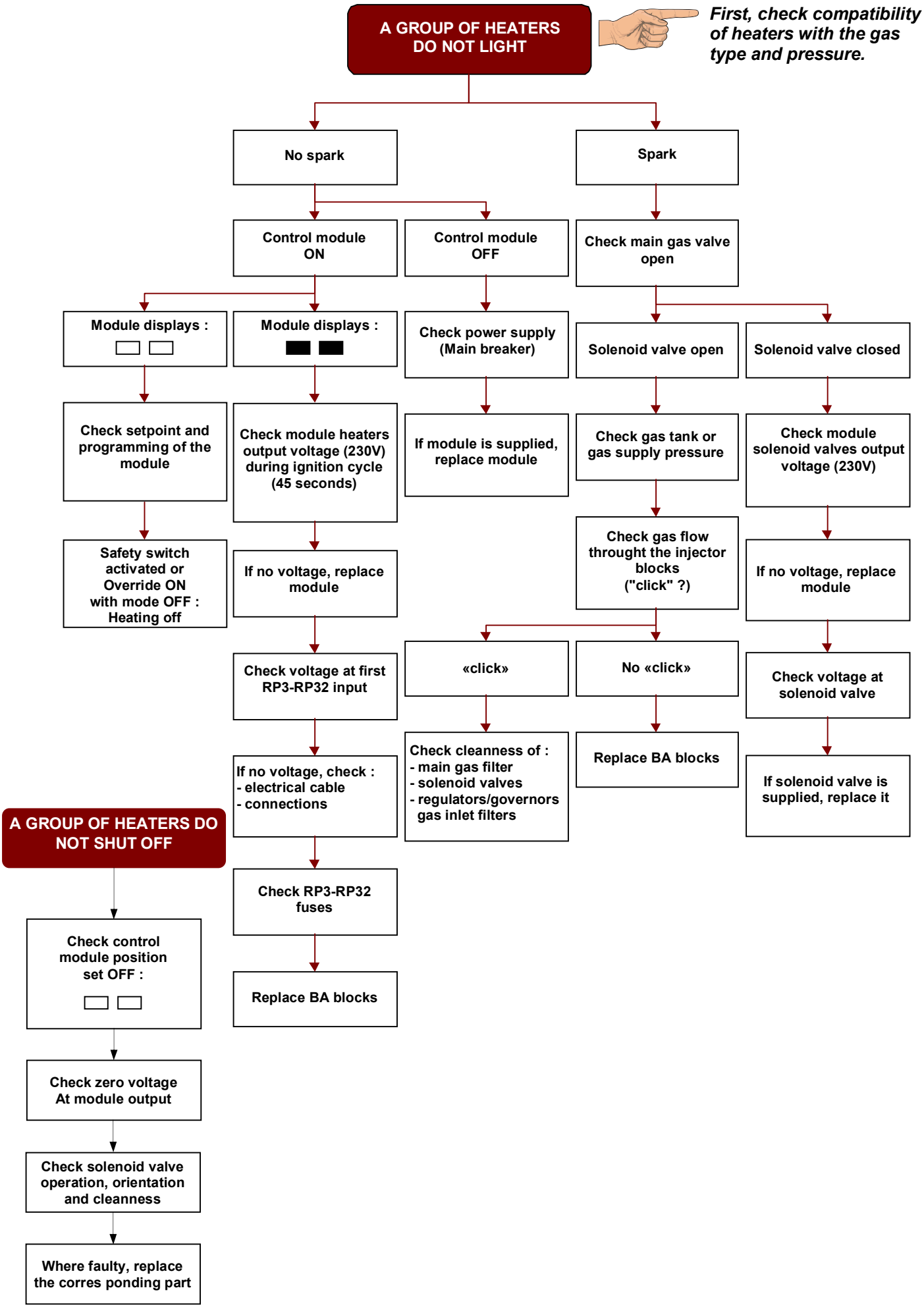
A HEATER IS TO HOT (>950°C)

- Check injection pressure (see 2.11)
- Inlet pressure excessive, check the gas supply pressure
- If gas supply pressure excessive, replace the regulator/governor

A HEATER IS NOT HOT ENOUGHT (<850°C) (or stuttering flame)

- Check cleaness of :
  - regulator/governor gas inlet filter
  - heater gas inlet filter
  - injector(s)
  - heater
- Check injection pressure (see 2.11)
- If injection pressure insufficient, replace governor

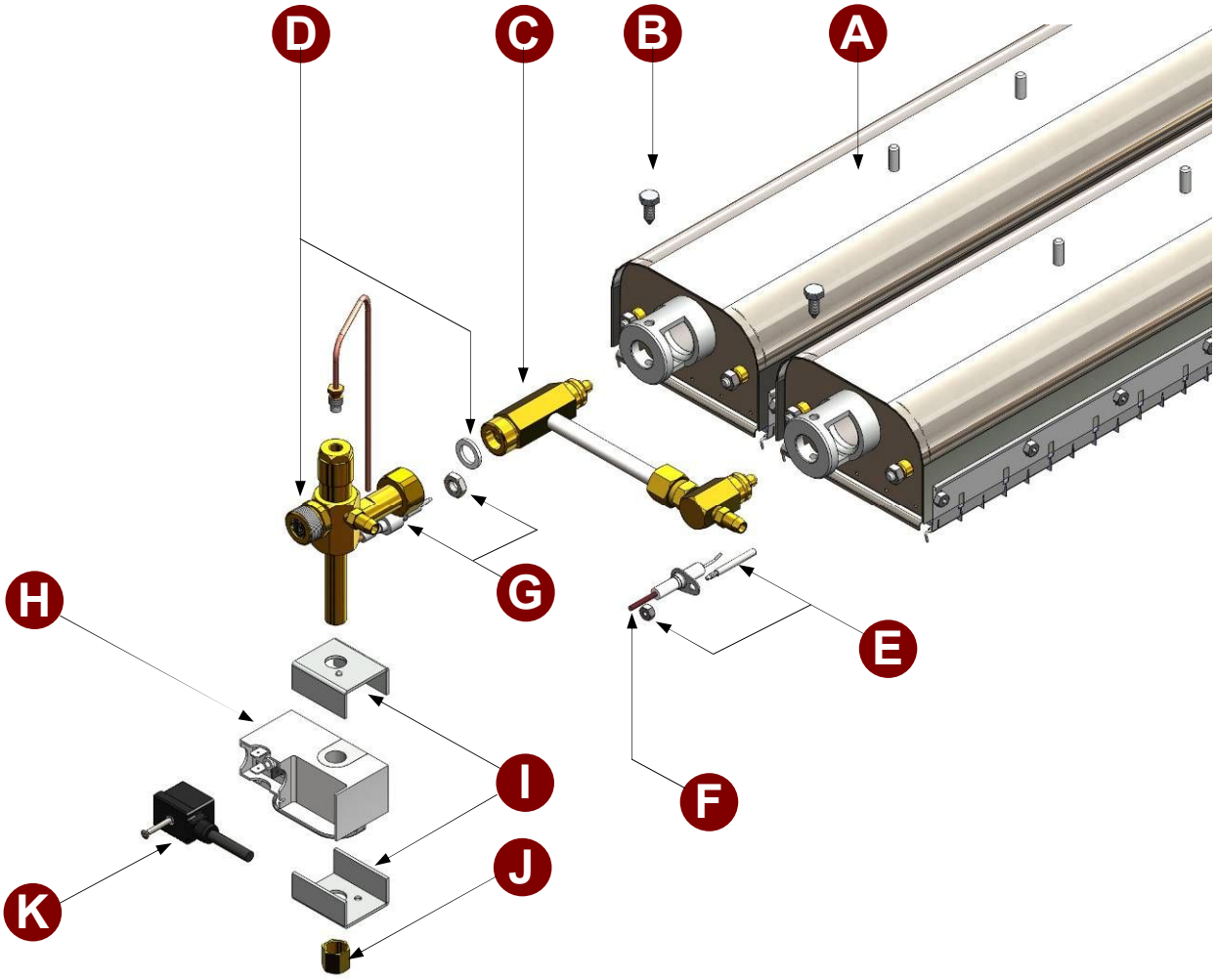
❒ Problems on a group of heaters.



❑ XFR heater spare parts.

WITH ALL SPARE PART ORDERS, PLEASE INDICATE :
(see rating plate) :

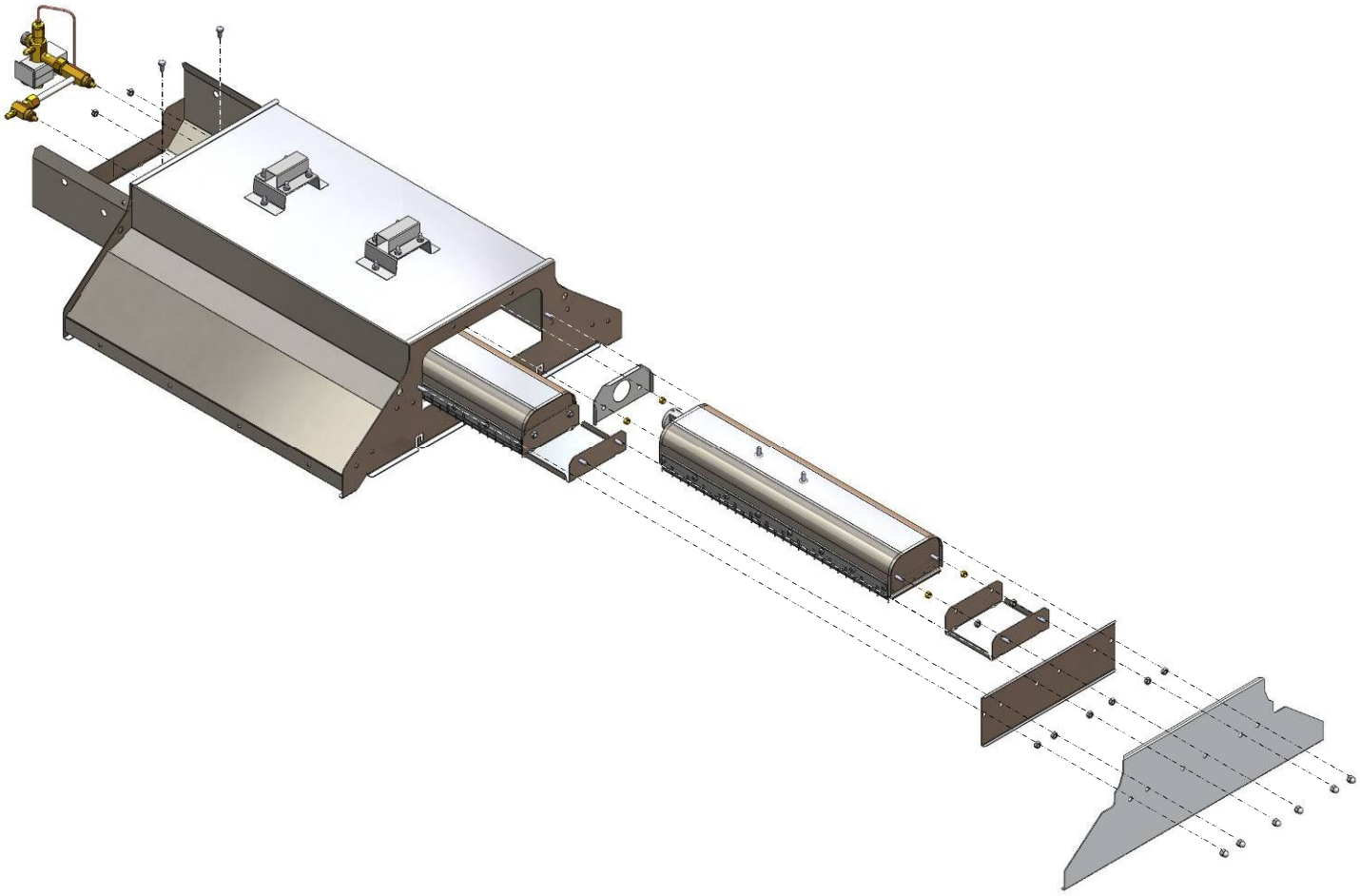
- Type / serial number of the heater.
- Gas type.
- Operating pressure.



REP	SPARE PARTS	
A	BR 10 XFR 96	(burner for XFR 20 and XFR 20-2)
	BR 12 XFR 96	(burner for XFR 24, XFR 24-2 and XFR 48-2)
	BR 16 XFR 96	(burner for XFR 16, XFR 32, XFR 32-2 and XFR 64-2)
B	10 LOCKING SCREW 6X100/16	(supplied by 10)
C	BLOCK U-0-XXX-XXX-PP-A-12G	(supplied with its injectors mounted for XFR 16, 20-2, 24-2 and 32-2)
	BLOCK D-0-XXX-XXX-PP-A-12G	(supplied with its injectors mounted for XFR 20, 24, 32, 48-2 and 64-2)
D	SAFETY BLOCK XFR G1/2	(supplied with washer)
E	EARTH PIN L3-NUT	(supplied with a nut)
F	IGNITER	(ignition electrode 250 mm clip 2.8x0.8)
G	THERMOCOUPLE FA	(supplied with a nut)
H	BA BLOCK	
I	BA BRACKETS (2)	(supplied by 2)
J	BA NUT	
K	PREWIRED PLUG 3M/10FT	(built-in gasket and captive screw)

- ❑ Burners dismantling.

For XFR 48-2 and XFR 64-2, separate the 2 heaters, before burners dismantling.



6. CHANGING THE GAS USED (must be down by a skilled technician)

- ❒ Gas and pressure.

FAMILY	GAS	OPERATING PRESSURE
I_{2H}	G20	20 mbar
I_{3P}	G31	37 mbar

- ❑ Change of gas

  For any further information please contact your SBM agent.

COMMISSION REGULATION (EU) 2015/1188

Requirements for product information applicable to commercial local space heaters

Luminous heaters XFR

Model identifier	**XFR 16**	**XFR 20**	**XFR 20-2**	**XFR 24**	**XFR 24-2**	**XFR 32**	**XFR 32-2**	**XFR 48-2**	**XFR 64-2**
Type of heating	Luminous heaters								
Fuel	Gaseous								
Space heating emissions									
NO_x emissions (mg/kWh $_{PCS}$)	< 50								
Heat input									
Nominal heat input (kW $_{PCS}$)	6,4	7,4	7,4	8,9	8,9	11,4	11,4	17,8	22,9
Minimum heat input (kW $_{PCS}$)	n.d	n.d	3,7	n.d	4,45	n.d	5,7	8,9	11,45
Minimum heat input (% of P_{nom})	n.d	n.d	50	n.d	50	n.d	50	50	50
Radiant factor									
Radiant factor at nominal heat output	0,77	0,85	0,85	0,82	0,82	0,77	0,77	0,82	0,77
Radiant factor at minimum heat output	0,77	0,85	0,85	0,82	0,82	0,77	0,77	0,82	0,77
Auxiliary electricity consumption									
At nominal heat input (kW)	0	0	0	0	0	0	0	0	0
At minimum heat input (kW)	0	0	0	0	0	0	0	0	0
In standby mode (kW)	0	0	0	0	0	0	0	0	0
Heat output control type									
Single stage	Yes	Yes	No	Yes	No	Yes	No	No	No
Two stages	No	No	Yes	No	Yes	No	Yes	Yes	Yes
Modulating	No	No	No	No	No	No	No	No	No
Seasonnal efficiency									
Seasonnal space heating efficiency	92,3 %	95,7 %	98,2 %	94,4 %	96,9 %	92,3 %	94,8 %	96,9 %	94,8 %