1 Information and general warnings

1.1 Information about the instruction manual

1.1.1 Introduction

The instruction manual supplied with the gas train:

- is an integral and essential part of the product and must not be separated from it; it must therefore be kept carefully for any necessary consultation and must accompany the gas train even if it is transferred to another owner or user, or to another system.

If the manual is lost or damaged, another copy must be requested from the Technical Assistance Service of the area;

- is designed for use by qualified personnel;
- offers important indications and instructions relating to the installation safety, start-up, use and maintenance of the gas train.

1.2 Guarantee and responsibility

The manufacturer guarantees its new products from the date of installation, in accordance with the regulations in force and/or the sales contract. Ensure, upon activating it for the first time, that the gas train is undamaged and complete.

WARNING

Failure to observe the information given in this manual, operating negligence, incorrect installation and carrying out of non authorised modifications will result in the annulment by the manufacturer of the guarantee that it supplies with the gas train.

In particular, the rights to the guarantee and the responsibility will no longer be valid, in the event of damage to things or injury to people, if such damage/injury was due to any of the following causes:

- incorrect installation, start-up, use and maintenance of the gas train;
- improper, incorrect or unreasonable use of the gas train;
- intervention of unqualified personnel;
- carrying out of unauthorised modifications on the equipment;
- use of the gas train with safety devices that are faulty, incorrectly applied and/or not working;
- installation of untested supplementary components on the gas train;
- supplying the gas train with inappropriate fuel;
- faults in the fuel supply system;
- continuation of use of the gas train when a fault has occurred;
- repairs and/or overhauls incorrectly carried out;
- modification of the combustion chamber with inserts that prevent the regular development of the structurally established flame;
- insufficient and inappropriate surveillance and care of those gas train components most likely to be subject to wear and tear;
- use of non-original components, including spare parts, kits, accessories and optional;
- force majeure.

The manufacturer furthermore declines any and every responsibility for the failure to observe the contents of this manual.

2 Safety and prevention

2.1 Introduction

It is necessary, however, to bear in mind that the imprudent and clumsy use of the gas train may lead to situations of death risk for the user or third parties, as well as the damaging of the burner or other items. Inattention, thoughtlessness and excessive confidence often cause accidents; the same applies to tiredness and sleepiness.

It is a good idea to remember the following:

- ➤ the gas train must only be used as expressly described. Any other use should be considered improper and therefore dangerous.
- ➤ Modification of the gas train to alter its performance and destinations is not allowed.
- ➤ The gas train must be used in impeccably secure conditions. Any disturbances that could compromise safety must be quickly eliminated.
- ➤ It is not permissible to open or handle the components of the gas train, with the exclusive exception of parts necessary to maintenance.
- ➤ Only those parts envisaged by the manufacturer can be replaced.

WARNING

The manufacturer only guarantees the security of operations if all components of the gas train are undamaged and correctly positioned.

2.2 Personnel training

The user is the person, the body or the company that has purchased the gas train and that intends to use it for the purposes for which it was designed. They are responsible for the gas train and for training those who will operate it.

The user:

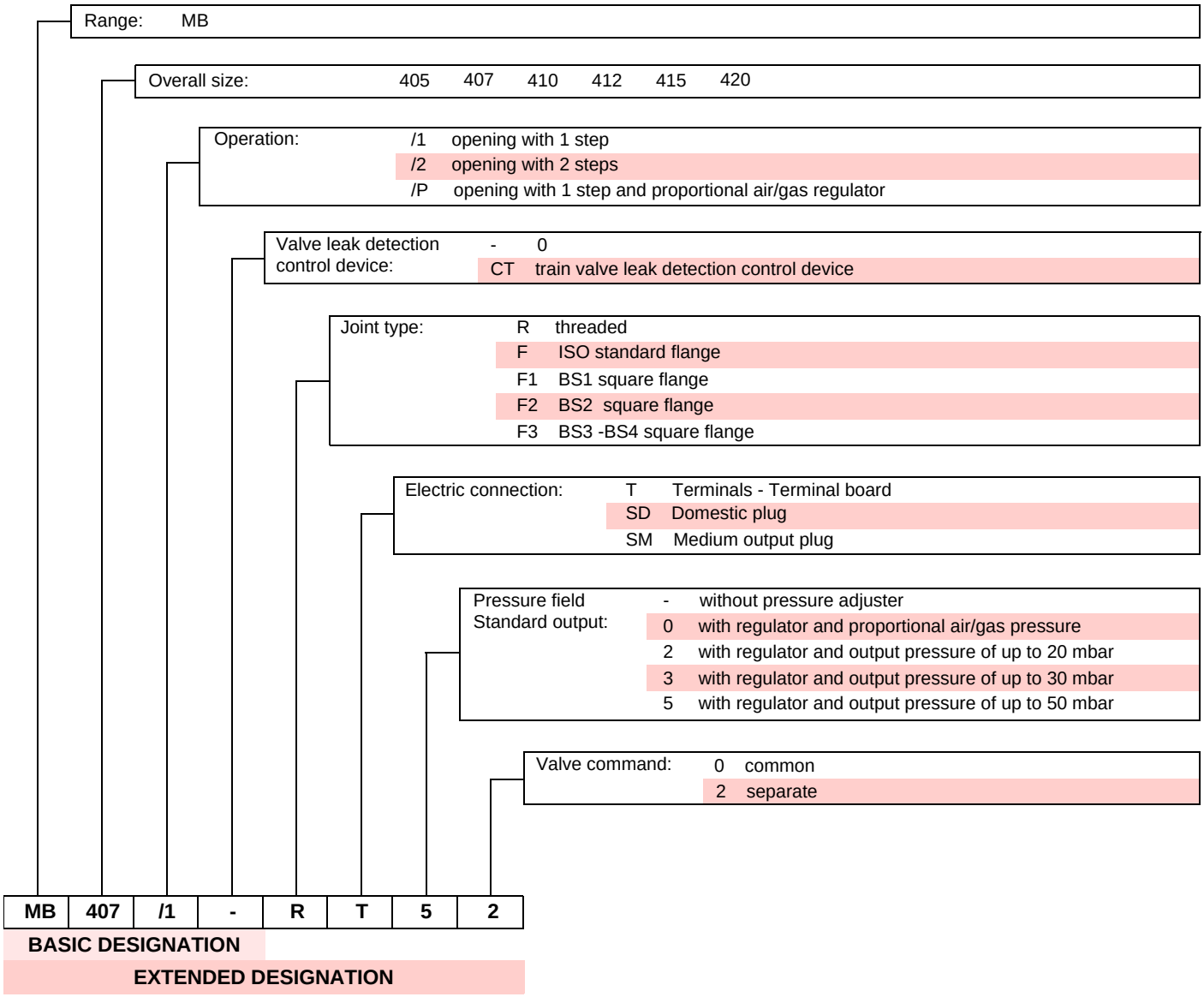
- ➤ undertakes to entrust the gas train only to personnel who are qualified and trained to use it;
- ➤ undertakes to inform his personnel in a suitable way about the application and observance of the safety instructions. With that aim, he undertakes to ensure that everyone knows the use and safety instructions for his own duties;
- ➤ Personnel must follow all the danger and caution indications shown on the gas train.
- ➤ Personnel must not carry out, on their own initiative, operations or interventions that are not within their province.
- ➤ Personnel are obliged to inform their superiors of every problem or dangerous situation that may arise.
- ➤ The assembly of parts of other makes, or any modifications, can alter the characteristics of the machine and hence compromise operating safety. The manufacturing company therefore accepts no responsibility whatsoever for any which may result from the use of non-original parts.

In addition:

- ➤ must take all the measures necessary to prevent unauthorised people gaining access to the gas train;
- ➤ the user must inform the manufacturer if faults or malfunctioning of the accident prevention systems are noticed, along with any presumed danger situation;
- ➤ personnel must always use the personal protective equipment envisaged by legislation and follow the indications given in this manual.

3 Technical description

3.1 Gas train designation



3.2 Models available

Code	Model
3970500	MB 405/1 - RT 20
3970530	MB 405/1 - RSD 20
3970546	MB 405/1 - F1SD 20
3970547	MB 405/1 - F2SD 20
3970531	MB 407/1 - RSD 20
3970544	MB 407/1 - F2SD 20
3970548	MB 407/1 - F3SD 20
3970553	MB 407/1 - RT 20
3970599	MB 407/1 - RT 52
3970258	MB 410/1 - RT 52
3970532	MB 410/1 - RSD 20
3970549	MB 410/1 - F3SD 20
3970554	MB 410/1 - RT 20

Code	Model
3970600	MB 410/1 - RT 52
3970550	MB 412/1 - F3SD 20
3970558	MB 415/1 - F3SD 30

Tab. A

3.3 Technical data

Model	MB 405 - 407	MB 410 - 412	MB 415
Max. power supply pressure	360 mbar (36 kPa)		
Protection level	IP 54 “RT ..” version - IP 4X “SD ..” version (*)		
Ambient temperature	-15°C up to + 70 °C		
Electromagnetic valve	DIN EN 161, class A, group 2		
Voltage/frequency	~ (AC) 50-60 Hz, 230 V - 15 % + 10 %		
Output/absorption: - output pressure up to 30 mbar - output pressure up to 50 mbar	 28 VA ~(AC) 230 V, 20 °C 46 VA ~(AC) 230 V, 20 °C	 50 VA ~(AC) 230 V, 20 °C 96 VA ~(AC) 230 V, 20 °C	
Anti-dust device (MB 410-412-415)	Filter	Filter with 0.8 mm mesh; it is possible to change the filter without needing to dismantle the train	

Tab. B

(*) Protection level “IP54” can be achieved by removing the 6-pole plug.

3.4 Components

The Multibloc consists of:

Filter . . . . . No. 1
Gas pressure switch. . . . . No. 1
Pressure stabiliser . . . . . No. 1
Quick opening safety valve . . . . . No. 1
Slow opening adjustment valve . . . . . No. 1

3.5 Description

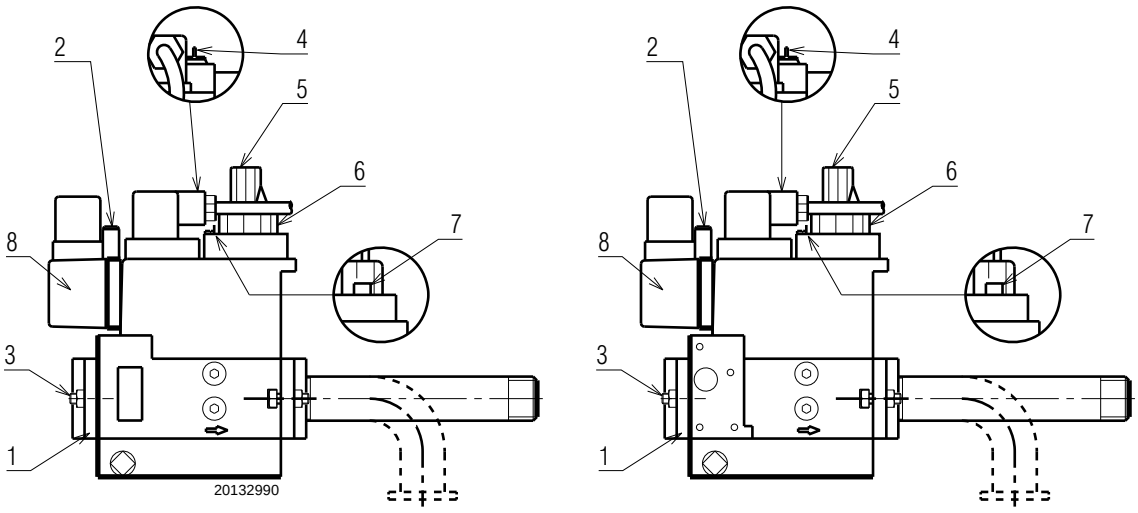


Fig. 1

1 Flange
2 Pressure test point
3 Flange fastening screws
4 Stabiliser adjustment
5 Brake adjustment
6 Ring nut output adjustment
7 Ring nut locking screws (not sealed)
8 Minimum gas pressure switch

3.6 Maximum dimensions

The maximum dimensions of the train are given in Fig. 2.

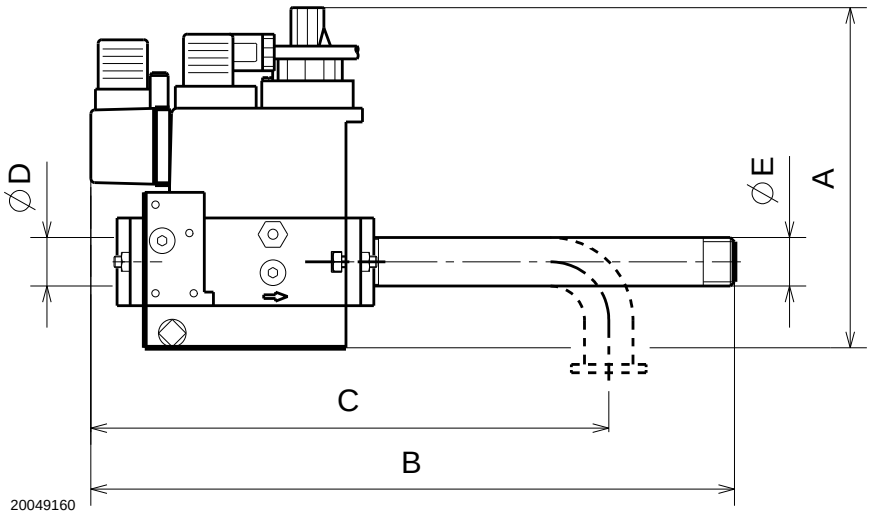


Fig. 2

Code	Model	A	B	C	ØD (Network)	ØE (Burner)
3970500	MB 405/1 - RT 20	186	371	–	Rp 3/4	Rp 3/4
3970530	MB 405/1 - RSD 20	186	321	–	Rp 1/2	Rp 1/2*
3970546	MB 405/1 - F1SD 20	186	–	246	Rp 1/2	Flange 1
3970547	MB 405/1 - F2SD 20	186	–	236	Rp 3/4	Flange 2
3970531	MB 407/1 - RSD 20	186	371	–	Rp 3/4	Rp 3/4
3970544	MB 407/1 - F2SD 20	186	–	236	Rp 3/4	Flange 2
3970548	MB 407/1 - F3SD 20	186	–	236	Rp 3/4	Flange 3
3970553	MB 407/1 - RT 20	186	371	–	Rp 3/4	Rp 3/4
3970599	MB 407/1 - RT 52	186	371	–	Rp 3/4	Rp 3/4
3970258	MB 410/1 - RT 52	221	433	–	Rp 1” 1/4	Rp 1” 1/4
3970532	MB 410/1 - RSD 20	221	405	–	Rp 1”	Rp 3/4
3970549	MB 410/1 - F3SD 20	221	–	259	Rp 1” 1/4	Flange 3
3970554	MB 410/1 - RT 20	221	405	–	Rp 1”	Rp 3/4
3970600	MB 410/1 - RT 52	221	405	–	Rp 1”	Rp 3/4
3970550	MB 412/1 - F3SD 20	221	–	259	Rp 1” 1/4	Flange 3
3970558	MB 415/1 - F3SD 30	250	–	330	Rp 1” 1/2	Flange 3

Tab. C

* Rp 1/2 – Rp 3/4 adaptor (supplied with the train).

4 Installation

4.1 Notes on safety for the installation

After carefully cleaning all around the area where the train will be installed, and arranging the correct lighting of the environment, proceed with the installation operations.

DANGER

All the installation, maintenance and disassembly operations must be carried out with the electricity supply disconnected..

WARNING

Train installation must be carried out by qualified personnel, as indicated in this manual and in compliance with the standards and regulations of the laws in force.

4.2 Handling

WARNING

The handling operations for the train can be highly dangerous if not carried out with the greatest attention: keep any unauthorised people at a distance; check the integrity and suitableness of the available means of handling.
Check also that the area in which you are working is empty and that there is an adequate escape area (i.e. a free, safe area to which you can quickly move if the train should fall).

CAUTION

Before proceeding with the installation operations, carefully clean all around the area where the train will be installed.

4.3 Preliminary checks

Checking the consignment

CAUTION

After removing all the packaging, check the integrity of the contents. If in doubt, do not use the gas train; contact the supplier.

The packaging elements (cardboard box, nails, clips, plastic bags, etc.) must not be abandoned as they are potential sources of danger and pollution; they should be collected and disposed of in the appropriate places.

4.4 Assembly position

The train is exclusively intended for operation in the positions shown in Fig. 3.

WARNING

Any other position could compromise the correct operation of the train.

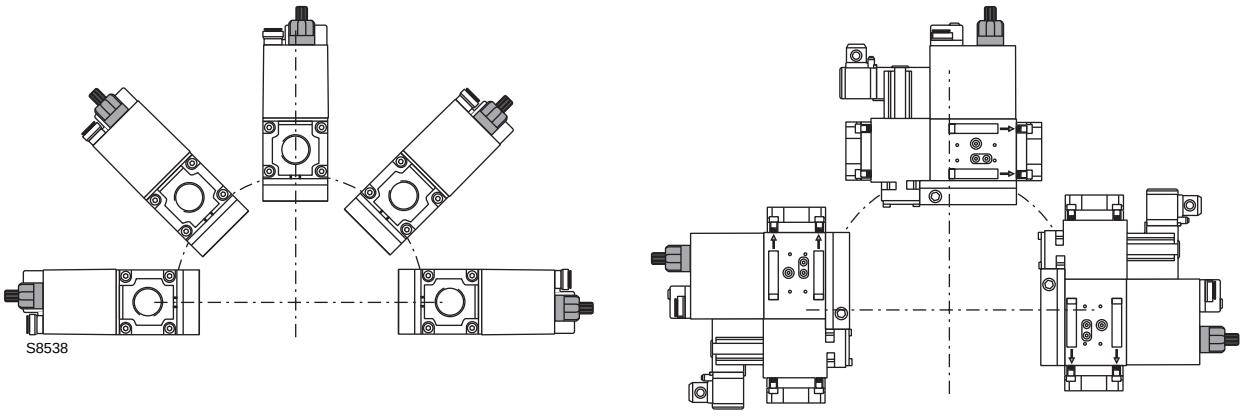


Fig. 3

4.5 Gas train installation

Check that there are no gas leaks.

Pay attention when handling the train: danger of crushing of limbs.

Explosion danger due to fuel leaks in the presence of a flammable source.

Precautions: avoid knocking, attrition, sparks and heat.

Make sure that the fuel interception tap is closed before performing any operation.

The operator must use the required equipment during installation.

The connection between the gas feeding line and the train is created using the flange 1), supplied with the system, by fastening it to the unit with nuts 3).

CAUTION

It is best to tighten screws in a criss-cross pattern.

DANGER

Do not, under any circumstances, install the valve with the coil facing down.

Once installation is complete, you must check for leaks and make sure the gas train is working properly.

4.6 Electrical wiring

Notes on safety for the electrical wiring

DANGER

- ➤ The electrical wiring must be carried out with the electrical supply disconnected.
- ➤ Electrical wiring must be carried out by qualified personnel and in compliance with the regulations currently in force in the country of destination.
- ➤ The manufacturer declines all responsibility for modifications or connections different from those shown in the wiring diagrams.
- ➤ Check that the electrical supply of the train corresponds to that shown on the identification label and in this manual.
- ➤ The electrical safety of the device is obtained only when it is correctly connected to an efficient earthing system, made according to current standards. It is necessary to check this fundamental safety requirement. In the event of doubt, have the electrical system checked by qualified personnel. Do not use the gas tubes as an earthing system for electrical devices.
- ➤ Do not touch the device with wet or damp body parts and/or in bare feet.
- ➤ Do not pull the electric cables.

4.6.1 Electrical wirings on burners with 6 pin plug-socket

The gas trains shown in Tab. D are prepared in the factory to be connected in accordance with the electrical diagram shown in Fig. 4.

Code	Model
3970530	MB 405/1 - RSD 20
3970546	MB 405/1 - F1SD 20
3970547	MB 405/1 - F2SD 20
3970531	MB 407/1 - RSD 20
3970544	MB 407/1 - F2SD 20
3970548	MB 407/1 - F3SD 20
3970532	MB 410/1 - RSD 20
3970549	MB 410/1 - F3SD 20
3970550	MB 412/1 - F3SD 20
3970558	MB 415/1 - F3SD 30

Tab. D

For RS, RLS, RS/M model burners, it is necessary to remove the 6 pole plug from the train connection and replace it with the 6 pole plug supplied with the burner, in accordance with the electrical diagram shown in the burner instruction manual.

4.6.2 Connections for burners with terminal board

The gas trains shown in Tab. E are prepared in the factory to be connected in accordance with the electrical diagram shown in Fig. 5.

Code	Model
3970500	MB 405/1 - RT 20
3970553	MB 407/1 - RT 20
3970554	MB 410/1 - RT 20

Tab. E

The gas trains shown in Tab. F are prepared in the factory to be connected in accordance with the electrical diagram shown in Fig. 6.

Code	Model
3970599	MB 407/1 - RT 52
3970258	MB 410/1 - RT 52
3970600	MB 410/1 - RT 52

Tab. F

Key
PG Min gas pressure switch
V Valve group V1 - V2
X6 6 pole socket
BN Brown
BU Blue
BK Black
YE Yellow

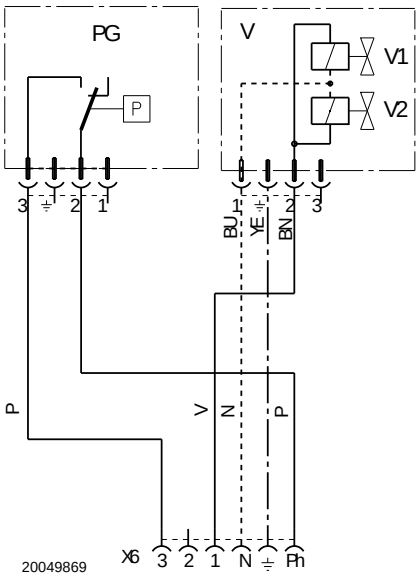


Fig. 4

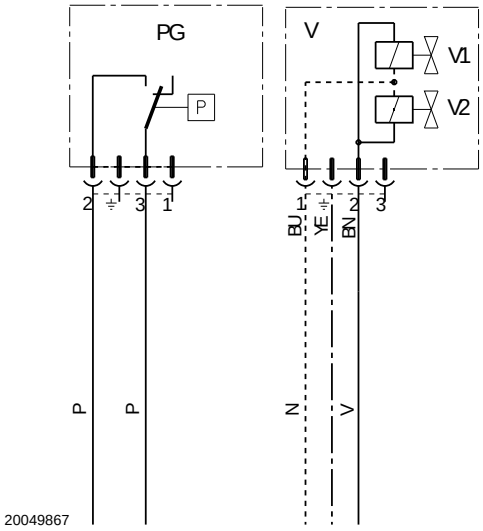


Fig. 5

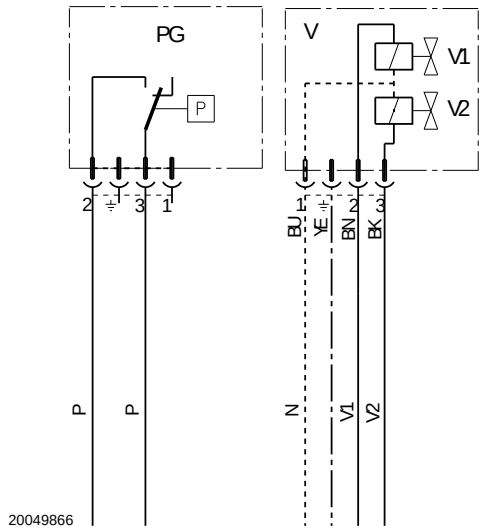


Fig. 6

5 Activation, calibration and functioning

5.1 Notes on safety for the first start-up


WARNING

The first start-up of the burner must be carried out by qualified personnel, as indicated in this manual and in compliance with the standards and regulations of the laws in force.


WARNING

Check the correct working of the adjustment, command and safety devices.

5.2 Factory presetting

The valve leaves the factory with the pressure adjuster regulated to minimum.

Normally this calibration allows the burner to ignite, it is then adjusted as indicated in successive chapters. For the pressure value to set, refer to the manual “burner train combination” supplied with the burner.

If the burner goes into lockout without the formation of a flame when started, check:

➤ the pilot light on the valve comes on

➤ connect a pressure gauge to the pressure test point (between the valve and the combustion head) and check the pressure during the lockout, if the pressure is too low, turn the adjustment screw of the stabiliser clockwise (4, Fig. 1, page 4) by 1 turn and repeat the firing attempt.

5.3 Adjustment of the pressure stabiliser

Calibrate the pressure adjuster by rotating the adjustment screw using a screwdriver: by rotating clockwise there is an increase in output pressure, by rotating anticlockwise there is a decrease in pressure.

When the nominal desired pressure value has been reached, close the cover and seal the extremities of the wire leaving the passing ring short.

5.4 Valve adjustment

The **slow ignition delivery** (valve opening phase) should be adjusted, after having unscrewed the cover 5) (Fig. 1, page 4), by rotating the screw below in the correct direction +/-; the cover itself may be used as a tool by turning it upside down.

The **steady state output** is progressively reached starting from the ignition delivery following the action of the hydraulic brake; the steady state delivery may be adjusted by rotating the ring nut 6) in the appropriate direction + / – (Fig. 1, page 4) after having loosened the non sealed screw 7).

5.5 Delivery optimisation

Optimal Multibloc functionality is achieved by first using the opening of the valve and then adjusting the stabiliser to achieve the required delivery.

If this is not obtained, repeat the operation described above.

5.6 Low gas pressure switch adjustment

Calibrate the gas pressure switch 8)(Fig. 1, page 4) by adjusting the cog of the graduated scale, after having performed all other burner adjustment with the pressure switch regulated to the start of the scale.

Let the burner work at the required output.

Close slowly the gate valve until the pressure, measured on the pressure switch gauge, comes down of 5 - 6 mbar with regard to the operation value.

Rotate slowly the pressure switch handle until the operation of the same pressure switch and the resultant burner shut-down. Open the gate valve completely.

5.7 Pressure loss

The gas train pressure loss Δp is provided from the diagram (Fig. 7); the scales of the volumetric output $\dot{V}$ are valid respectively for:

a air,
n natural gas (G20),
p propane (G30),
c town gas (G140), only for applications not covered by the Gas Appliances Directive (2009/142/EC).

The values, provided from the diagram, can be different according to the pressure regulator calibration.

The minimum necessary pressure in the network can be obtained by adding the pressure of the diagram to the burner pressure losses (see burner manual) and the back pressure of the combustion chamber (see heat generator manual).

Gas train	
3970546	A
3970547 - 3970500 - 3970530	B
3970548 - 3970544 - 3970531 3970553 - 3970599	C
3970549 - 3970258 - 3970600	D
3970532 - 3970554	E
3970550	F
3970558	G

Tab. G

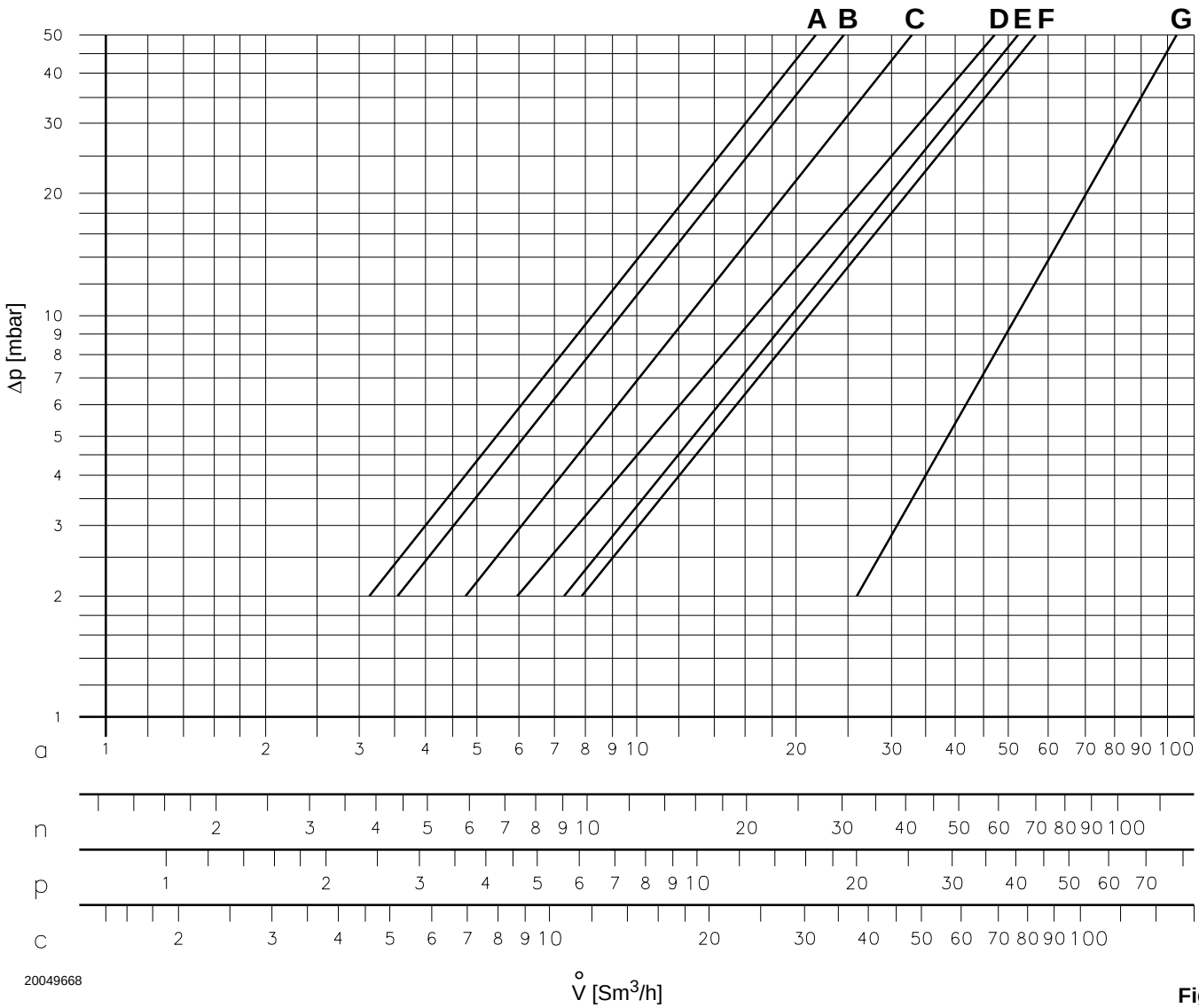


Fig. 7

6 Maintenance

6.1 Notes on safety for the maintenance

The periodic maintenance is essential for the good operation, safety, yield and duration of the gas train.

It allows you to reduce consumption and polluting emissions and to keep the product in a reliable state over time.


DANGER

The maintenance interventions and the calibration must only be carried out by qualified, authorised personnel, in accordance with the contents of this manual and in compliance with the standards and regulations of current laws.

Before carrying out any maintenance, cleaning or checking operations:


DANGER

Disconnect the electrical power using the main switch.


DANGER

Close the fuel interception tap.

Wait for the components in contact with heat sources to cool down completely.

6.2 Maintenance programme

6.2.1 Maintenance frequency

The gas combustion system should be checked at least once a year by a representative of the manufacturer or another specialised technician.

6.2.2 Checking and cleaning

The operator must use the required equipment during maintenance.

6.2.3 Filter maintenance (PREVIOUS VERSION)


WARNING

Check the filter at least once a year!

The filter may be changed without dismantling the structure.

Where the filter is being replaced regularly it is advisable to replace the fixing screws.

For maintenance operations, proceed as follows:

- ➤ Interrupt the gas flow by closing the gate.
- ➤ Unscrew the screws and remove the filter cover.
- ➤ Remove the filter and replace it with a new one.
- ➤ Replace the cover, re-screw the screws and tighten them without force.
- ➤ Test the functionality and seal.

6.2.4 Filter maintenance (NEW VERSION)

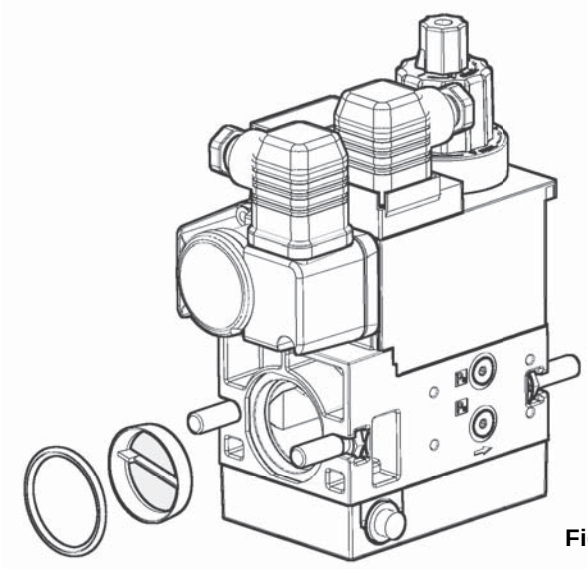


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Fig. 8