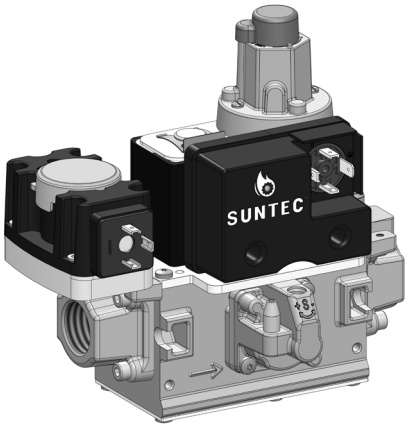
Installation and operating Instruction Multifunctional Gas Valve M*C

Multifunctional gas valve with 2 safety valves and constant pressure regulator for light commercial pressure jet burners.



Application

The use of the SUNTEC M*C multifunctional gas valve is recommended for all gaseous fuel appliances where safety shutoff and pressure control is required. It is suitable for use with 1st, 2nd and 3rd family gases, according to EN 437, for inlet pressure up to 360mbar (for M2 range) and to 160mbar (for M3 range).

M2 and M3 multifunctional gas valve are available with 2 options : fast opening (M*C**F) or slow opening (M*C**S).

Approvals

SUNTEC M*C multifunctional gas valve meets all the specifications of EN 13611, EN 126, EN 88-1 and EN 161 standards. It complies with requirements of gas regulation (EU) 2016/426 on appliances burning gaseous fuels (CE certificate : 1312CU6361).

SUNTEC INDUSTRIES FRANCE - 1, rue Lavoisier - CS 60102 - F-21603 LONGVIC Cedex
Tel. +33 (0) 3 80 70 60 70 - information@suntec.fr - http://www.suntec.fr

Technical specifications

General

Operation with	Air and gas of 1st, 2nd and 3rd families according to EN 437
Maximum operating pressure	• M2C : 360 mbar • M3C : 160 mbar
Pipe sizes	Inlet / outlet connection with straight flange : DN15 (Rp1/2'') or DN20 (Rp3/4''). Internal thread according to EN 10226-1
Torsion / Bending stress	M*C gas valve fulfill group 2 requirements, according to EN 13611
Housing	Aluminium
Ambiant temperature range	-20°C to +60°C
Weight	• M*C**F : 2.3 kg • M*C**S : 2.5 kg
Expected lifetime	Safety shut-off valves have been certified for 200 000 ON/OFF operations according to EN 161 standard.
Pressure taps	G1/8'' connections supplied in 3 locations on the multifunctional gas valve (see section ''Pressure tap / pressure plugs identification'', page 8), and on inlet/outlet flanges.
Seals and gaskets	All NBR compounds, B2H2 and B2H3 according to EN 549.
Inlet strainer	Fine square mesh : ⧄ 0.6 mm, AISI 304 steel Ø 0.14mm wire.
Minimum pressure switch (optional)	Factory mounted on inlet flange. When suitable configuration (see page 8), can be side-mounted («P3» tap).

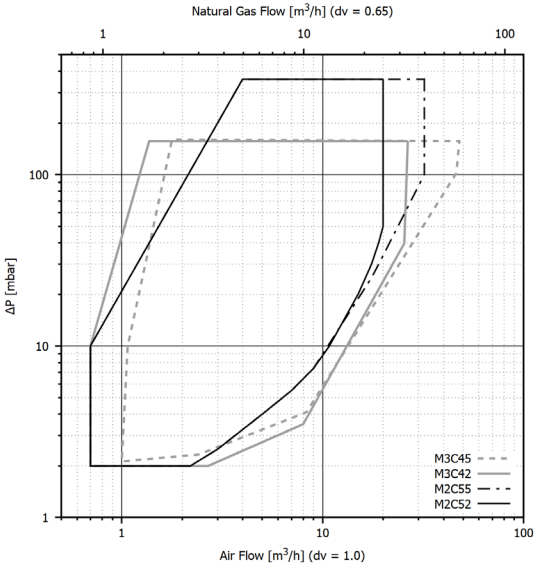
Safety valves

Safety Valves (V1 and V2)	• M2C : Class A+A, according to EN 161. • M3C : Class B+B, according to EN 161.
Seat size	• M2C : Ø 17mm • M3C : Ø 23mm
Opening time (EN 161)	• M*C**F : < 0.5 s • M*C**S : < 10 s
Closing time (EN 161)	• M*C**F : < 0.2 s • M*C**S : < 0.2 s
Supply voltage	230Vac +10% -15%, 50/60Hz (other voltage on request)
Power consumption	34 VA, steady operation
IP rating	IP54 (with suitable connector) according to EN 60529
Electrical connections	DIN 43650 form A plug connector (not supplied)
Safety valves type of supply	Independant

Pressure regulator

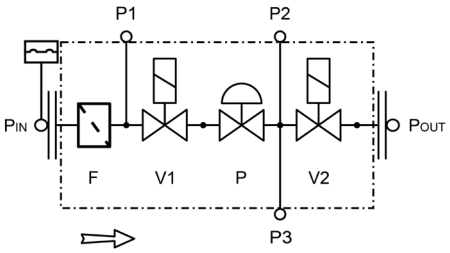
Pressure regulator class	Class B according to EN 88-1.
Pressure regulating range	• 4 to 20 mbar (M*C*2F/M*C*2S) • 4 to 50 mbar (M*C*5F/M*C*5S)
Factory presetting	• Pressure regulator : outlet pressure = 10 mbar • Slow opening : 80% of Qmax after 4s. • Fast opening : Qmax below 1s.

Flow curves



P burner = 3 mbar
Flange = Rp3/4''
Maximum flow can be reduced when other flanges are connected with.

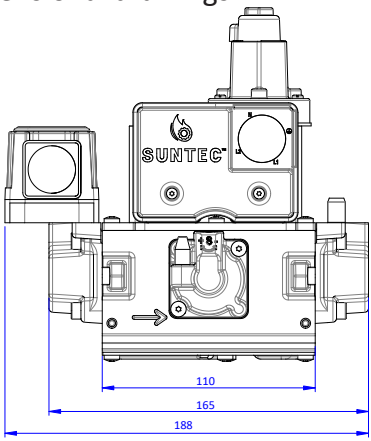
Operating principle

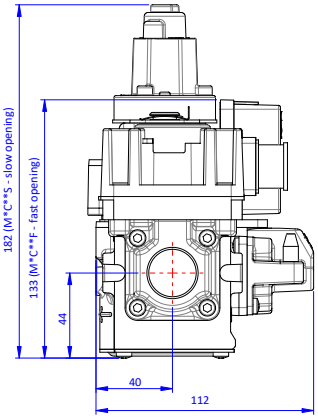


P IN : Inlet pressure
P1 : Strainer pressure
P2 / P3 : Regulated pressure
P OUT : Outlet pressure
F : Strainer
P : Pressure regulator
V1 : Safety shut-off valve 1
V2 : Safety shut-off valve 2

- with flow limiter (for M*C**F)
- with hydraulic damper (for M*C**S)

Dimensional drawings





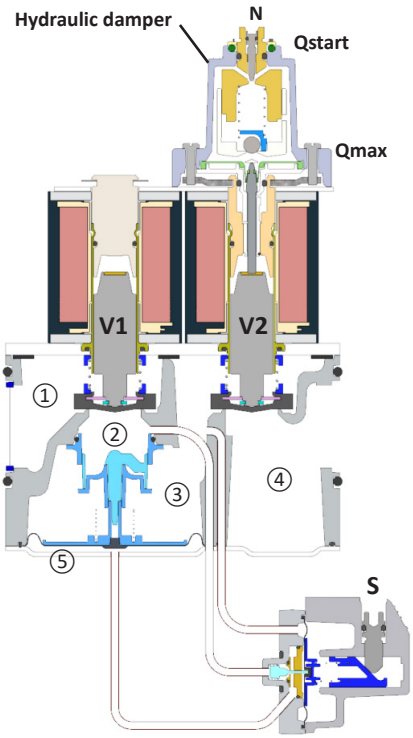
Safety valve

M*C multifunctional gas valve comprises two automatic shut-off valves, electrically operated.

Each operator consists of a plunger connected to a rubber seal. A closing spring presses the seal against the seat, and thus ensures the tightness of the valve.

At rest, both safety valves are closed; thus gas cannot flow beyond chamber ①.

When energized independently, the coils generate a magnetic field which moves up the plunger, and releases the gas flow from chamber ① to chamber ② for valve **V1** (from ③ to ④ for **V2**). A power-on indicator on the plastic cover lights up as valve **V1** is energized. When de-energized, each safety valve closes within 0.2 second.



Pressure regulator

The M*C multifunctional gas valve pressure regulator is normally closed type, pneumatically operated by a servo system. The servo system controls the main regulator valve opening to equilibrate – through a diaphragm – the downstream pressure ③ to a setpoint adjusted by the screw **S**. A small valve in the servo system supplies the main diaphragm chamber ⑤ with upstream pressure picked from chamber ②. When regulated pressure falls below the setpoint, the servo diaphragm moves down opening the servo valve. This results in a pressure increase of the main diaphragm chamber which opens the main regulator valve, and thus increases the regulated pressure. In return, when the regulated pressure exceeds setpoint, the servo valve closes. A calibrated orifice, which creates a permanent leakage between the main diaphragm chamber and the regulated pressure chamber, allows for the pressure to decrease, and thus the main regulating valve to close.

This design allows for excellent precision when regulating the downstream pressure, regardless to upstream pressure variation or downstream flow changes.

Flow adjustment

An adjustment system allows the opening stroke of the safety valve **V2** to be set. It can be used to finely adjust the maximum gas flow.

Slow opening (M*C**S)

A hydraulic damper slows down the opening stroke of the safety valve **V2** and thus apply a progressive gas flow in the combustion chamber during the starting phase. The presence of a bypass allows to keep a fast opening of the safety valve **V2**, adjustable (**Qstart**) up to **80%** of the maximum flow.

Cautionary statements

Please read carefully these instructions before installing, commissioning or using the product ! Hazardous situation or damaging the product may result from their non-observance.

Herein specified ratings and product markings must be checked to ensure compatibility with the appliance.

The installation must only be carried out by a qualified technician.

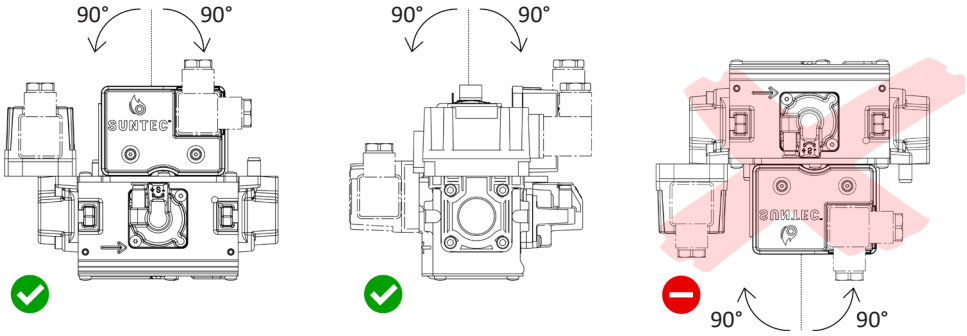
A complete check of the installation must be carried out prior any start off.

Caution

- Turn off gas supply before installation.
- Disconnect power supply to the product before servicing to prevent any electrical shock and damage to the product
- The multifunctional gas valve must be installed so that the gas flows in the same direction of the arrows. Reverse mounting may render valve inoperative.
- A complete check of the installation must be carried out prior any start off.

Mounting position

Any mounting position is allowed, as long as the safety valve axis do not point downwards as shown below.



Gas connection

To prevent dirt from entering the gas valve during installation, inlet/outlet protective stickers should only be removed at the last moment.

- Apply thread sealant, sealing yarn or PTFE tape to the pipe threads. Type and amount should meet the vendor specifications.
- Screw the flanges onto the pipes.
- Check that the flanges are aligned and that spacing is sufficient to insert the valve between the flanges without damaging the O-ring seals.
- Remove inlet / outlet protective stickers and insert the 2 O-rings into their grooves. If necessary, small amount of grease can be used to hold them on.
- Fasten the valve to the flanges using the M5x20 screws supplied with the flanges. Make sure that the O-rings remain in place during this operation.
- Perform the electrical connection according to ‘‘Electrical connection’’ section page 6.

Leak proof test

Check for gas leaks of all pipe connections with a gas leak detection spray. To ensure an effective leak test of all connections, the multifunctional gas valve must be energized (through the complete appliance) to raise pressure all over the valve.

In case of leak detection, gas supply must be shut off upstream and connection tightness redone.

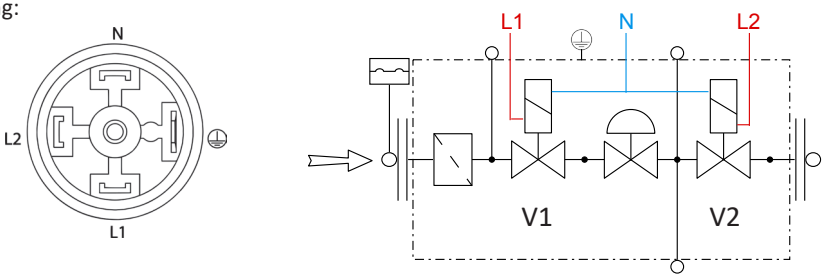
Electrical connections

Caution

- All wiring must be executed in accordance with local codes and regulations.
- Lead wire should be selected to withstand maximum ambient and coil temperature.

Gas valve electrical connection must be done with DIN 43650 form A connector (not supplied).

Gas valve wiring is shown below. Please refer to the appliance manufacturer instructions for proper wiring:



When the multifunctional gas valve is powered, a green lamp lights up on the plastic cover. Please note that it is supplied in parallel of valve **V1**, therefore it will not light up when only valve **V2** is powered.

For pressure switch electrical connection, please refer to pressure switch instructions.

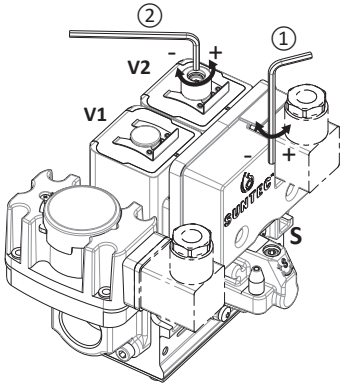
Gas valve adjustments

Regulating pressure adjustment (M*C**F and M*C**S)

Regulating pressure can be adjusted through the screw **S** located on the servo regulator ① as shown aside. Using a 3 mm hex key to screw will increase the outlet pressure, whereas unscrew will decrease the pressure. While adjusting the pressure, pressure measurement can be performed through the available pressure taps.

Caution

Every setting shall not be fully screwed, the valve seal may be pressed against the seat. Do not apply **excessive torque** to avoid damaging the seal.



Flow adjustment (M*C**F - fast opening)

Flow can be adjusted by the screw located on the top of the safety valve **V2** with the help of a 3 mm hex key ②. Unscrew to increase the flow, screw gently to decrease.

Flow adjustment (M*C**S - slow opening)

The main flow rate can be adjusted by unscrewing the two screws on the base of the hydraulic damper with a 3.5mm flat screwdriver.

Adjust the desired flow rate by rotating the body ③.

Tighten the two screws.

Tightening torque of the hydraulic damper: 0.4 N.m

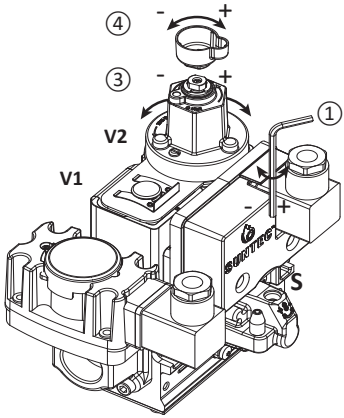
Caution

For slow opening models, a minimum rest time of 25 seconds must be observed between 2 safety valve **V2** openings.

Fast stroke ajustment (M*C**S - slow opening)

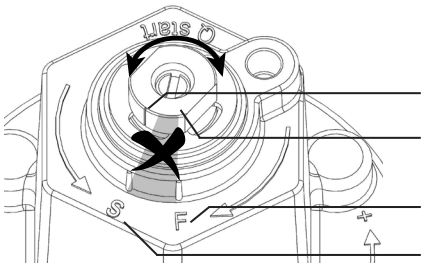
To set the fast stroke remove the cap, reverse it upside down and use it as a tool to rotate the adjustement sleeve ④ between position **F** (fast to 80%) and **S** (slow opening for all stroke).

Refer to the position indicator on the top of the hydraulic damper.



Caution

Do not make any settings in the banned area (in grey on the diagram below).



Position indicator

Adjustement sleeve

Fast

Slow

Caution

Opening time (M*CS - slow opening)**

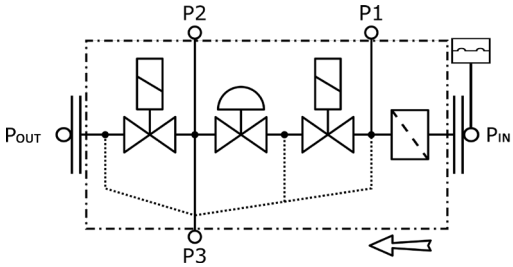
The opening time is factory preset and does not need to be modified (sealing varnish on the needle screw).

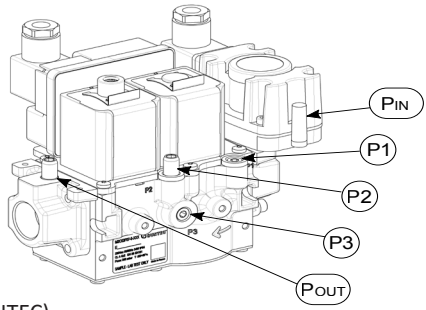
With the factory setting, the opening time can be adjusted up to 10 seconds by adjusting the adjustment sleeve.

If necessary, contact SUNTEC for specific adjustment.

Pressure taps / pressure plugs identification

Default configuration for **M*C** gas valve consists of 2 pressure taps (**P2** and **P OUT**), and 2 plugs (**P1** and **P3**) as shown below.





P3 pressure tap can be modified upon demand (consult SUNTEC).

Following pressure signal can be selected :

- Valve **V1** upstream pressure, after strainer,
- Pressure between Valve **V1** and pressure regulator,
- Regulated pressure (default configuration),
- Valve **V2** downstream pressure.

Caution

- To avoid any damage to the needle screw head, the use of an appropriate screwdriver is strongly recommended.
- To ensure the pressure tap tightness :
  tightening torque must be 1 to 1.5 N.m for the needle screw of the pressure tap
  tightening torque must be 3.5 N.m for the pressure tap.
- G1/8 Pressure taps can be removed using a 5 mm hex key.
- Perform a leak proof test after a modification.

Codification

M2 C 5 2 F 0 7 - 2 - XXXX

Gas valve size (Body / Seat)

Pressure regulator type
C = Constant pressure regulator

Maximum inlet pressure / Valve class
4 = 160 mbar - B + B (for M3 range)
5 = 360 mbar - A + A (for M2 range)

Regulator pressure range
2 = 4-20 mbar
5 = 4-50 mbar

2nd safety valve opening
F = Fast opening
S = Slow opening

Safety valves type of supply
0 = Independent

Coils voltage
7 = 230V AC

Revision

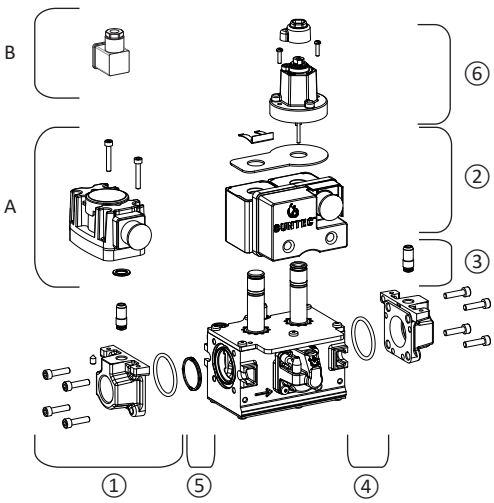
Customization code

Maintenance

Only the following items can be replaced during maintenance operation :

- Flange,
- Electronic block (This set is composed of 2 coils and an electronic board, do not disassemble),
- Pressure tap,
- Inlet strainer,
- O ring,
- Hydraulic damper (only for slow opening version M*C**S).

For any disassembly, refer to the instructions of the kits.



Caution

- The components listed must be SUNTEC parts.
- Any disassembly other than mentioned above is strictly forbidden.
- After replacing any of the above items and before operating the gas valve, check for gas leaks of all pipes connections with a leak detection.
- After any violent shock, such as an accidental dropping, the gas valve shall not be used anymore ; Internal and external tightness cannot be guaranteed.

Spare parts

Pos.	Part identification	Reference
①	Inlet/outlet Flange 3/4'' with pressure tap	995001
①	Inlet/outlet Flange 1/2'' with pressure tap	995002
②	Electronic block M*N/M*C	995003
③	Pressure tap	995004
④	Strainer	995005
⑤	O ring	995006
⑥	Hydraulic damper*	995007

*Only for slow opening version (M*C**S).

Accessories list

Pos.	Pressure switch	Range	Reference
A	DMG 010	2.0 - 10.0 mbar	8161002010
A	DMG 050	2.5 - 50.0 mbar	8161006050
A	DMG 150	5.0 - 150.0 mbar	8161004150
B	Electric plug	/	ENC00_G

*SUNTEC provides another range of pressure switches adapted for direct threading on the pipelines (the F range).

ISO 9001 : 2015 Certification
AFAQ N° 1993/1573
Certificate of testing
We certify that all delivered products have been fully tested in accordance with SUNTEC INDUSTRIES France Quality Management System.

CE

Declaration of Conformity

According to Regulation (EU) 2016/426.

Manufacturer's name:	SUNTEC INDUSTRIES FRANCE
Manufacturer's address :	1 rue Lavoisier, CS 60102, F-21603 LONGVIC Cedex, France
Product description :	Multifunctional gas control
Type :	M2 and M3

SUNTEC INDUSTIES FRANCE certifies that type M*N/M*C gas valves comply with the essential requirements of Regulation (EU) 2016/426 «Gas Appliances».

Certificate number :	1312CU6361
Type of products :	**Model M2 :** M2C55S07-2, M2C52S07-2, M2N50S07-2, M2C55F07-2, M2C52F07-2, M2N50F07-2 M2C55F07-1, M2C52F07-1, M2N50F07-1 **Model M3 :** M3C45S07-2, M3C42S07-2, M3N40S07-2, M3N40F07-2, M3C45F07-2, M3C42F07-2

The products are in compliance with the following directives, regulations and standards :

Regulation :	**2016/426/EU :** Gas appliances
Directives :	**2014/30/EU :** Electromagnetic Compatibility **2014/35/EU :** Low voltage
Standards :	**EN 13611 :** Safety and control devices for burners **EN 161 :** Automatic shut-off valves for gas appliances **EN 60730-1 :** Automatic electrical controls **EN 126 :** Multifunctional controls for gas burning appliances **EN 88-1 :** Pressure regulators for inlet pressures up to 50 kPa

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Notified body :	Certigaz
Address :	Immeuble Le Linéa, 1, rue du Général Leclerc, CS 60254, 92800 PUTEAUX CEDEX, FRANCE
Conformity process :	Modul B+D

Longvic, october 7th 2021,
G. NOBLET
Q&E Manager

Notes

SUNTEC INDUSTRIES FRANCE
1, rue Lavoisier - CS 60102 - F-21603 LONGVIC Cedex
Tel. +33 (0) 3 80 70 60 70 - www.suntec.fr