



SITGroup

SIT 849 SIGMA LH



MULTIFUNCTIONAL CONTROL FOR GAS BURNING APPLIANCE

Application

Domestic gas appliances:
central heating boilers, combi
boilers, instantaneous water
heaters, space heaters with
automatic ignition system.

Main Features

- Two automatic shut-off valves
- Electrical delta pressure control
- Servo pressure regulator

Normative reference

EN 126.
Multifunctional devices for gas
burning appliances.
EN 12067-2. Gas/air ratio
controls for gas burners and gas
burning appliances. Electronic
types



GENERAL DATA

CONSTRUCTION CHARACTERISTICS

- Aluminium body
- Two shut-off gas valves
- Inlet filter
- Inlet and outlet pressure test point
- Two mounting holes
- Torsion and bending resistance group 2 according to EN 126

USE SPECIFICATIONS

- Mounting position: any position
- Gas families: 1st, 2nd and 3rd
- Ambient temperature: -15...60 °C
- Maximum inlet pressure: 60 mbar

MECHANICAL CONNECTIONS

- Gas inlet and outlet: G 3/4 ISO 228
- Pressure test point: ø 9 mm

ELECTRICAL CONNECTIONS

- Automatic shut-off valves: Male contact 3003 Molex compatible, suitable for female Molex series 3001
- Electrical modulator: male fast-on connector 2.8 x 0.8 mm

ELECTRICAL DATA

Automatic shut -off valves

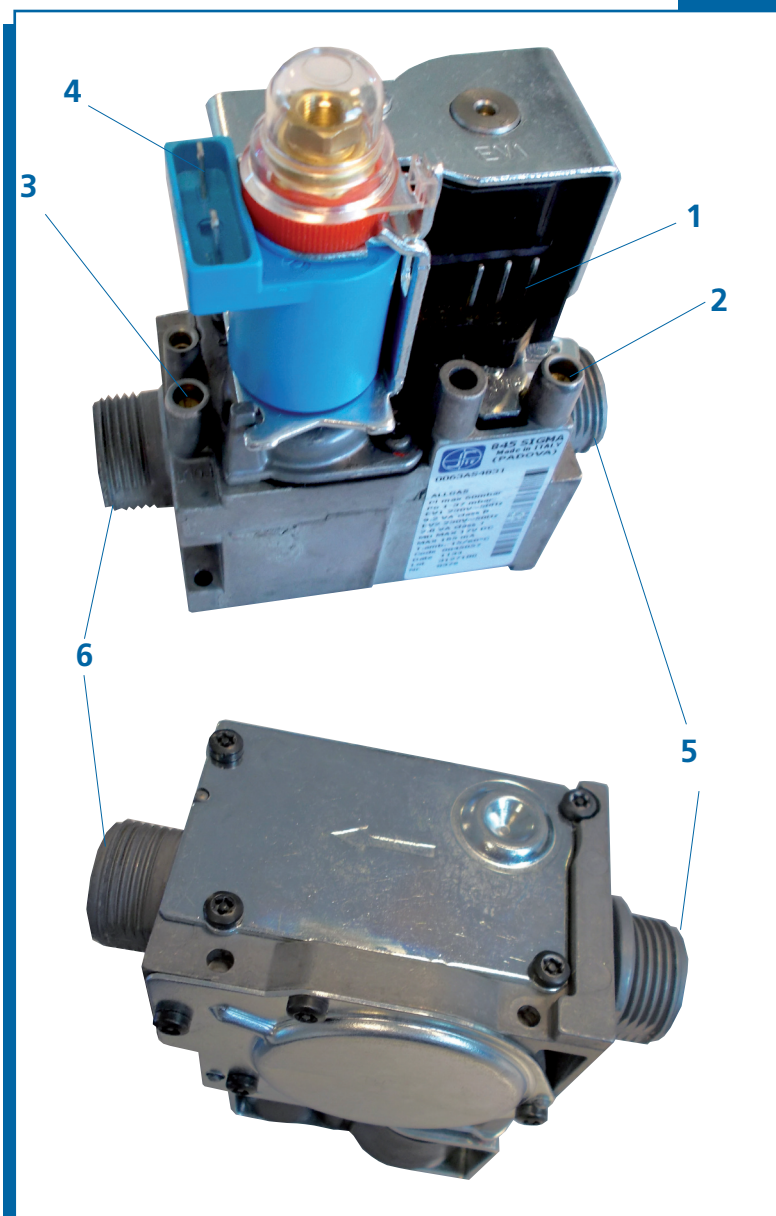
Nominal Supply Voltage	Current @nominal voltage [mA]		Power @nominal voltage [W]		Coils colour
	EV1	EV2	EV1	EV2	
230 V - 50 Hz	40	12	4.3	2.0	Black

Electrical modulator

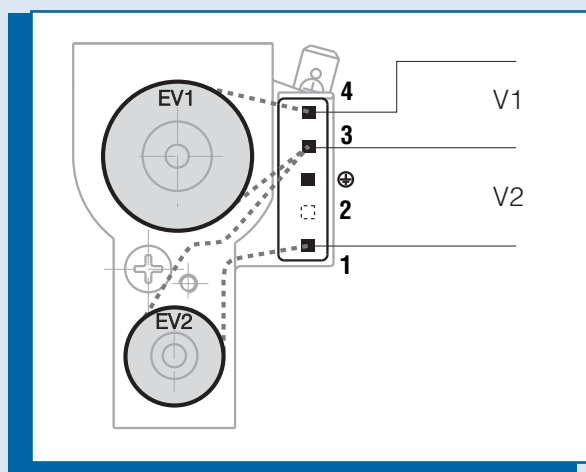
Maximum supply current	Maximum voltage	Coil colour
165 mA	17 V	Light blue

DESCRIPTION

- 1 Automatic shut-off valves EV1 and EV2 terminals
- 2 Inlet pressure test point
- 3 Outlet pressure test point
- 4 Gas outlet pressure modulator terminal
- 5 Main gas inlet
- 6 Main gas outlet



CONNECTION DIAGRAM





FUNCTIONS

SHUT-OFF

- First automatic shut-off valve (EV1) class B according to EN 126
- Second automatic shut-off valve (EV2) class C or J according to EN 126

PRESSURE REGULATION

- Servo pressure regulator class B according to EN 126

MODULATION

- Continuous outlet pressure electrical modulation
- Modulating range 5 - 2,500 Pa (modulator axis horizontal)
- Modulator maximum supply current (voltage)
 - o 165 mA (17 Vdc) light blue coil

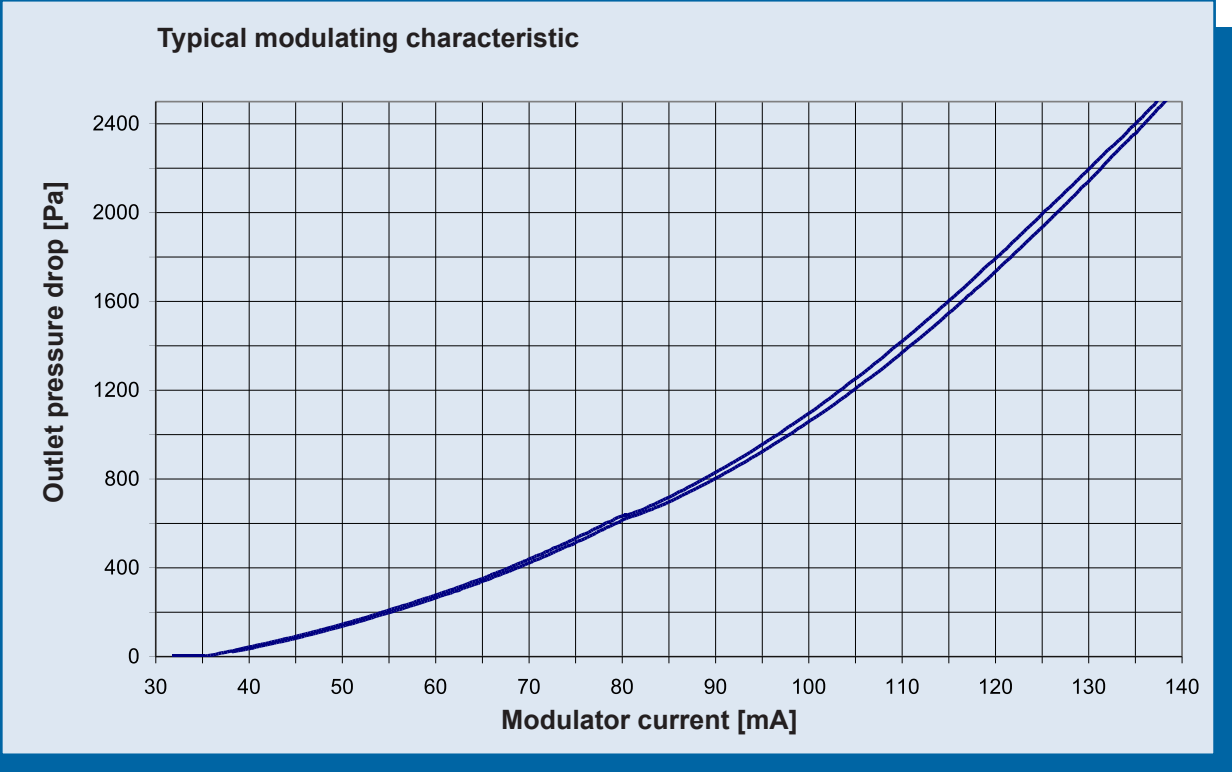
The smooth and low hysteresis modulation curve of Sigma 849 LH is based on PWM modulation, varying the switching frequency as function of the mean modulator current. The PWM frequency vs. mean current relation is linear and given by the following formulas:

$$f(I) = 180 \text{ for } I \leq 80 \text{ mA}$$
$$f(I) = 12 I - 780 \text{ for } I > 80 \text{ mA}$$

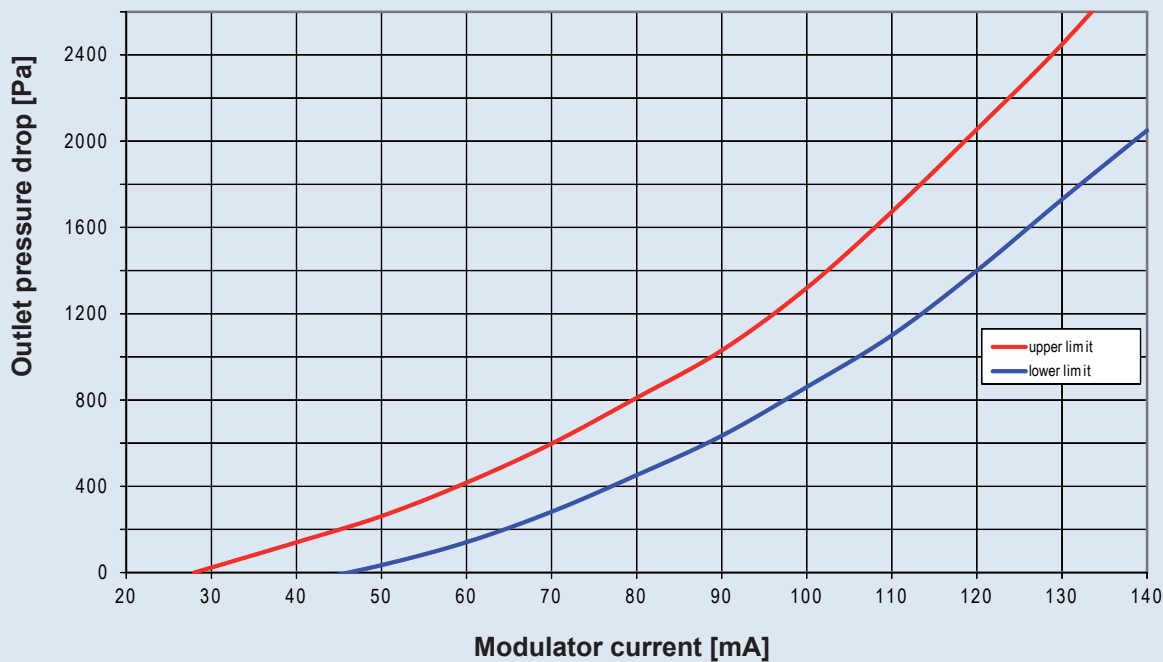
PWM square wave of 24 V \pm 5% peak to peak

where f is the PWM switching frequency expressed in Hz and I is the mean modulator current expressed in mA. See for reference the following graph.

The typical modulating characteristic is shown below. The result of using the explained specific algorithm is very precise modulating curves as well as a negligible hysteresis in whole range of gas pressure to main burner.



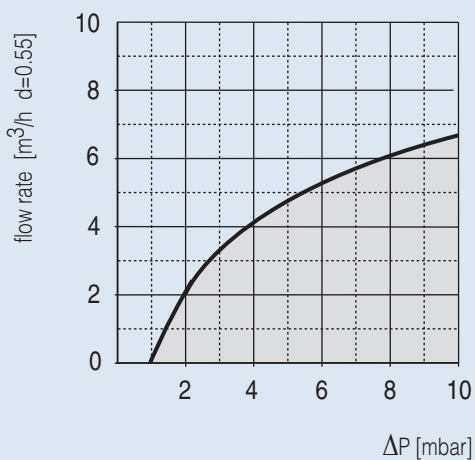
Typical tolerance band including lifetime drift with thermal cycles



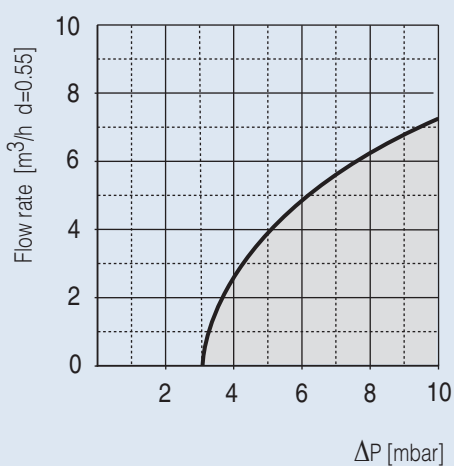
CAPACITY

FLOW RATE AS FUNCTION OF PRESSURE DROP

valves class B+J



valves class B+C



flowrate at $\Delta p = 5$ mbar

gas family	B+J	B+C
1st d=0.41	5.2 m³/h	4.4 m³/h
2nd d=0.55	4.5 m³/h	3.8 m³/h
3rd d=1.55	2.6 m³/h	2.3 m³/h



REGULATED FLOW RATE Q IN ACCORDANCE WITH EN 126

valves class B+J



valves class B+C

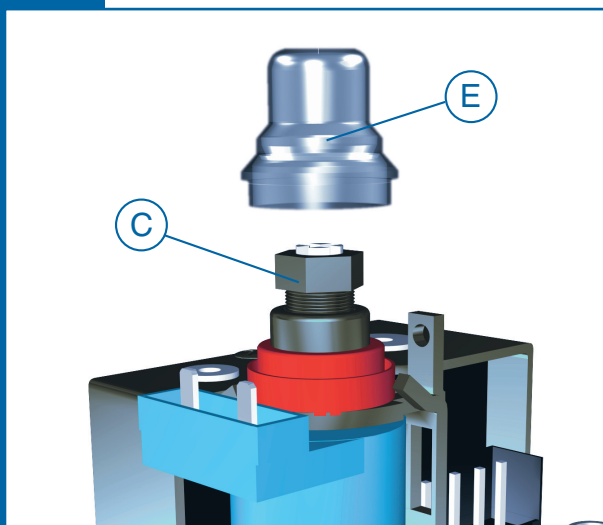


Second Family Group H, E and L

	Inlet pressure range (mbar)			
	Nominal	Max	Min	Relative Density
H-E	20	25	17	0.555
L	25	30	20	0.612

Minimum flowrate 0.15 m³/h d=0.55

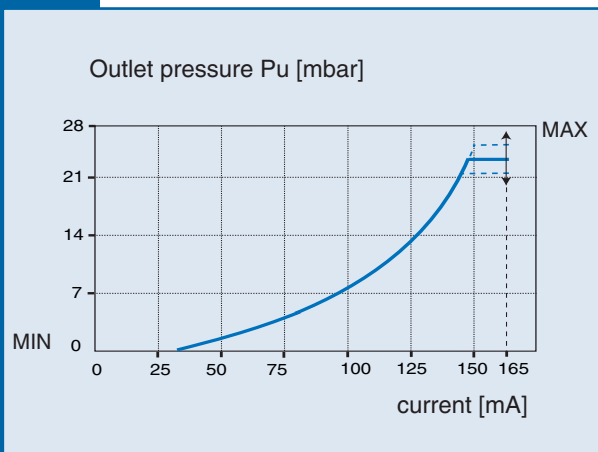
OUTLET PRESSURE ADJUSTMENT



All adjustments must be made on the basis of the specific characteristics of the appliance. Check inlet and outlet pressure using the pressure test points provided. After testing, carefully seal test points with the provided screws. Recommended torque: 1.0 Nm.

Remove the modulator plastic cap E.

- Maximum pressure: power the modulator in the maximum condition. Screw in the nut C to increase the outlet pressure and screw it out to decrease it. Use a 10 mm spanner.



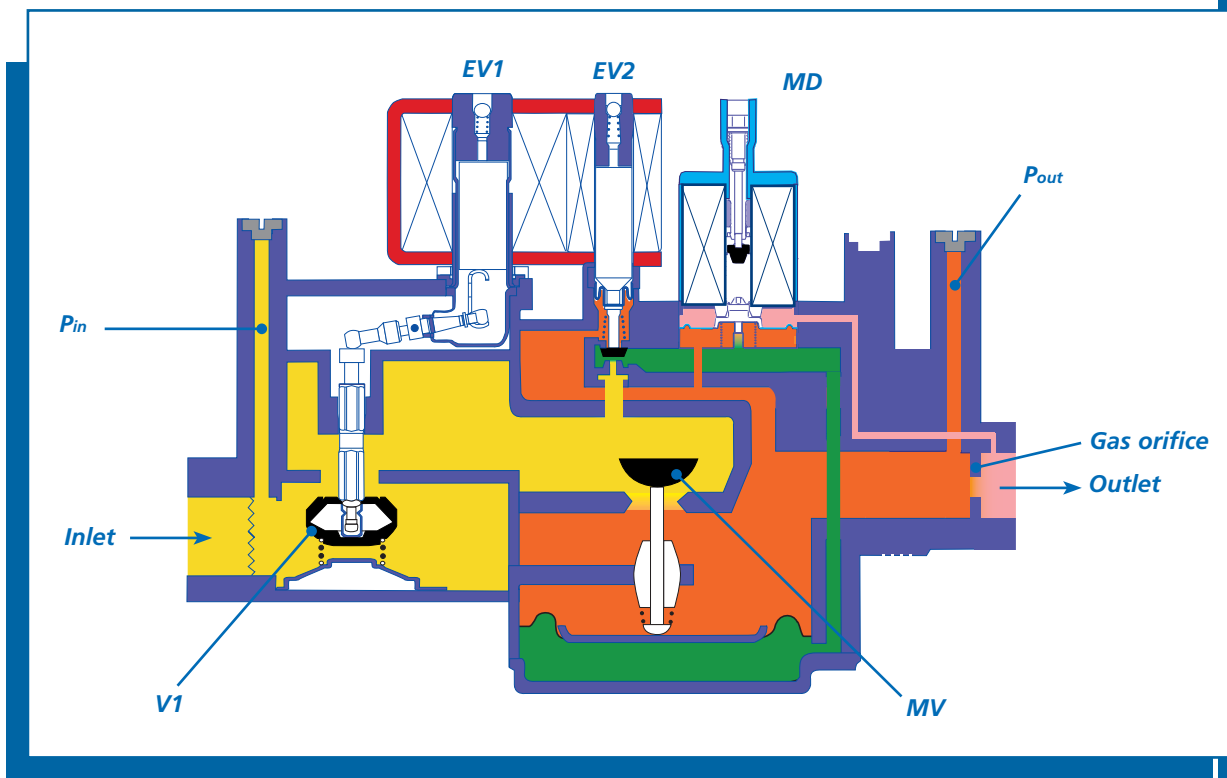
FUNCTIONAL DESCRIPTION

849 SIGMA LH is a multifunctional gas control with a direct acting automatic shut-off valve, a servo controlled automatic shut-off valve and a servo pressure controlled modulating device with electrical command. The location for gas orifice is on the outlet of the multifunctional control.

When the shut-off valves are de-energised, it is only possible to measure the inlet pressure on the inlet pressure test point (P_{in}).

When the solenoid EV1 is energised the first gas valve (V1) opens. Energising the second solenoid EV2, the second servo valve opens and allows the gas to flow through the servo circuit. The pressure behind the main diaphragm increases and consequently the main valve (MV) opens. The outlet pressure can be measured on the outlet pressure test point (P_{out}).

The opening of the main valve is function of the electrical command (current) applied to the coil of the modulating device (MD) that has the pressure downstream the gas orifice as reference therefore the gas flow through the valve is function of the current applied to the modulating device.

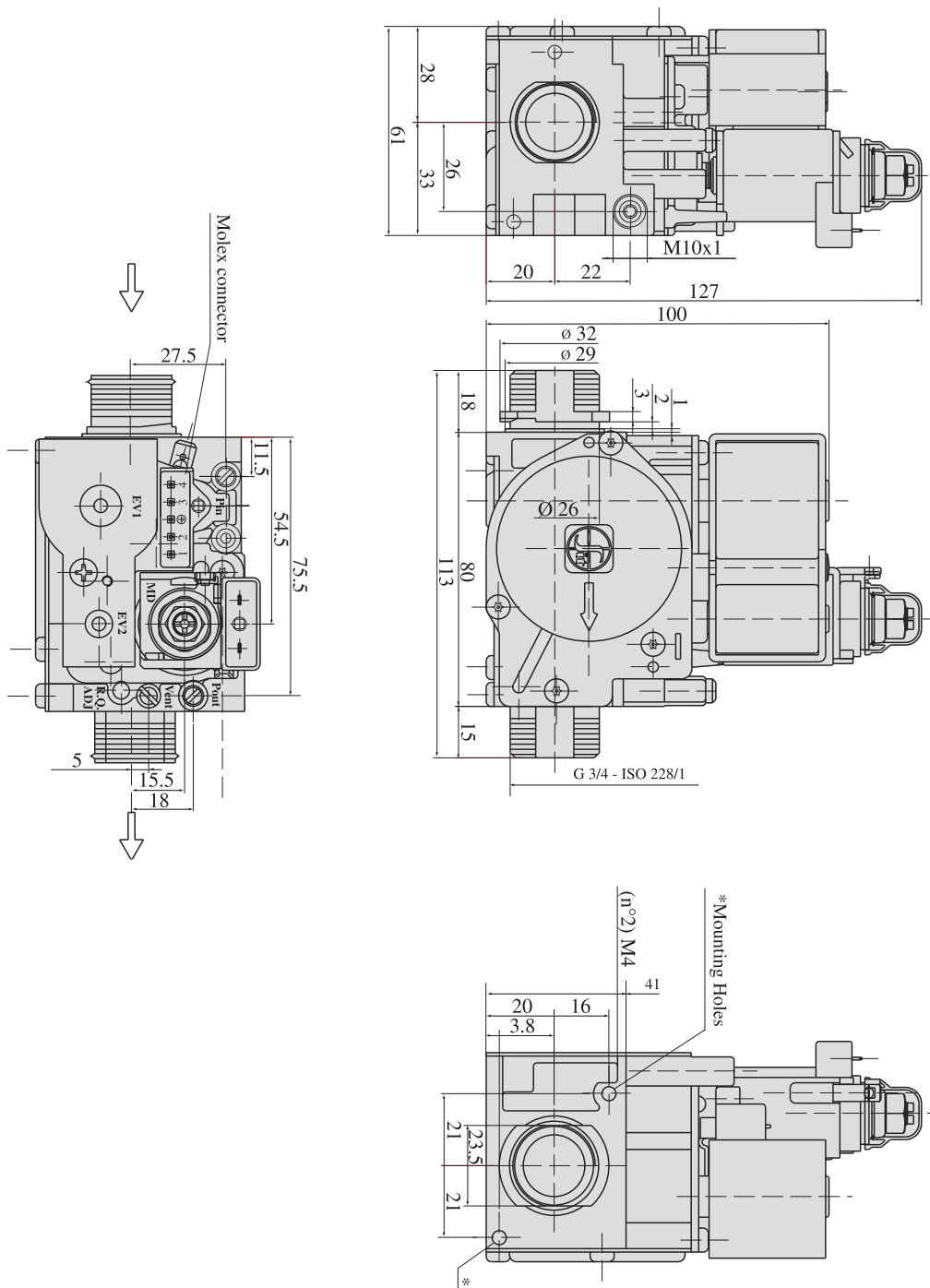


DESCRIPTION

- | | |
|--|---|
| P_{in} – inlet pressure test point | MD – current controlled modulating device |
| EV1 – solenoid of the first automatic shut-off valve | P_{out} – outlet pressure test point |
| V1 – first valve | |
| EV2 – solenoid of the second servo valve | |
| MV – main valve | |



DIMENSIONS



SITGroup

SIT S.p.A.

Viale dell'Industria 31-33

35129 PADOVA - ITALY

Tel. +39/049.829.31.11, Fax +39/049.807.00.93

www.sitgroup.it - e-mail: mkt@sitgroup.it