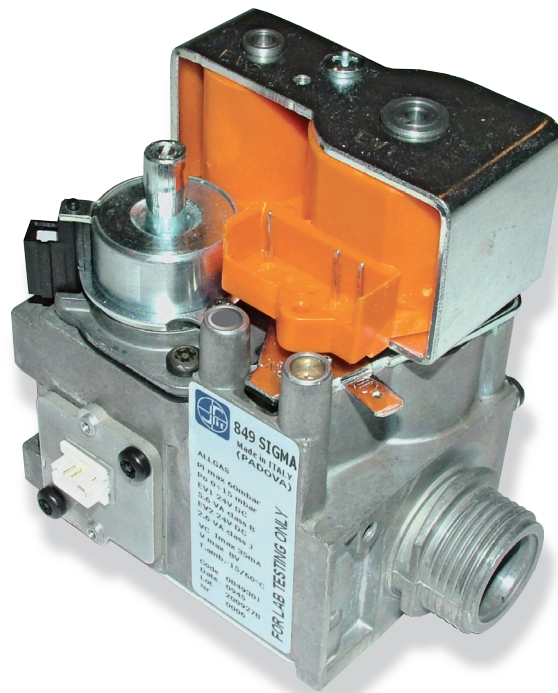




SITGroup

NEW

849 SIGMA μ CHP S



MULTIFUNCTIONAL CONTROL FOR GAS APPLIANCES

Application

Cogeneration appliances using fuel Cell.

Main features

Two automatic shut off valves.
Servo controlled pressure regulator.
Current controlled modulating device.
Gas flow sensor.

Normative Reference

EN 126 -
Multifunctional controls for gas burning appliances.



VALVE DESCRIPTION

It consists of two automatic shut-off valves in series in the main gas path, a pressure regulator, a current controlled modulating device and a gas flow sensor. The location for the gas orifice (restrictor) is on the outlet of the multifunctional gas control.

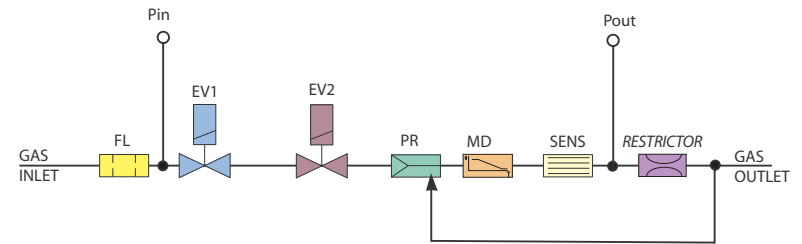


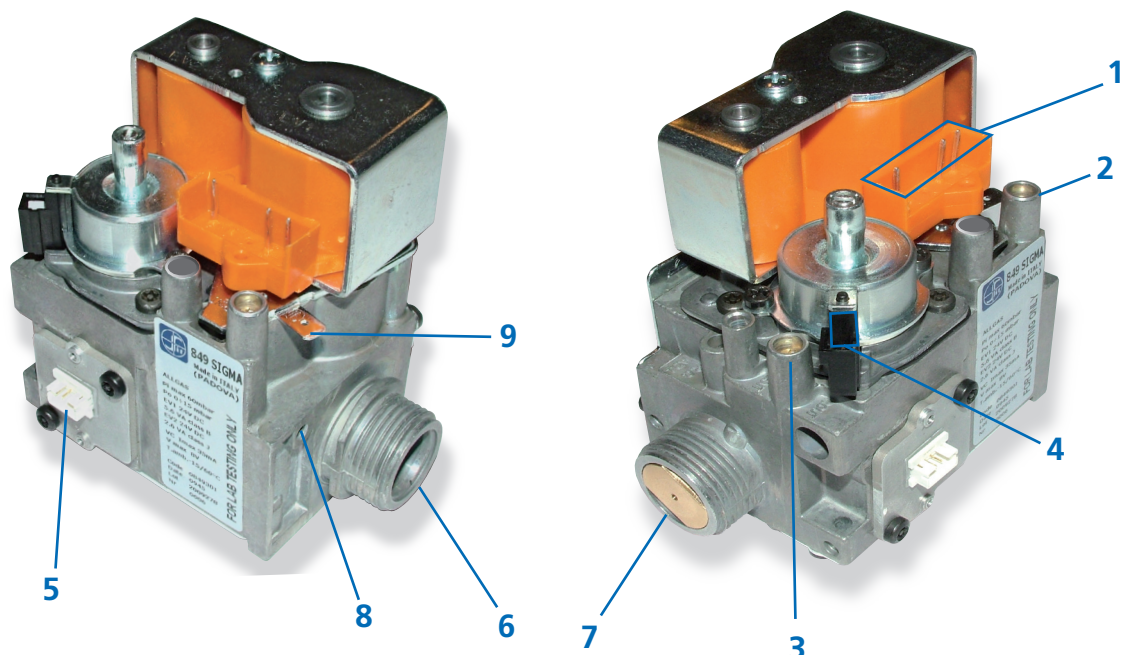
Fig. 1: 849 schematic block diagram.

With reference to the schematic block diagram in Fig. 1:

- FL is the inlet filter.
- EV1 is the direct acting automatic shut-off valve.
- EV2 is the servo acting automatic shut-off valve.
- PR is a servo pressure regulator.
- MD is the current controlled modulating device.
- SENS is the differential pressure sensor.

- 1 On-Off solenoid valves EV1 and EV2 terminals
- 2 Inlet pressure test point P_{in}
- 3 Outlet pressure test point P_{out}
- 4 Modulating device terminals
- 5 Differential pressure sensor terminals

- 6 Gas inlet
- 7 Gas outlet
- 8 Mounting holes
- 9 Connection for earth



GENERAL DATA

CONSTRUCTION CHARACTERISTICS

- Aluminium alloy body
- Inlet filter
- Inlet and outlet pressure test points
- Two mounting holes
- Modulator with frictionless electrical device

PERFORMANCE CHARACTERISTICS

- | | |
|----------------------------------|--|
| • Inlet filter | 195 µm mesh |
| • Mounting position | Multipoise (see PRESSURE REGULATION pag. 5) |
| • Gas families | II and III |
| • Ambient temperature range | 0 to 60 °C |
| • Maximum inlet pressure | 60 mbar |
| • Bending and torsion resistance | Group 2 |

MECHANICAL CONNECTIONS

- | | |
|------------------------|--|
| • Gas inlet and outlet | suitable for nut compliant with male G 3/4 B ISO 228 |
| • Pressure test point | ø9 mm |
| • Two mounting holes | M4 depth 6.5 mm |

ELECTRICAL DATA

- | | | |
|--|---|-------------------------------------|
| Automatic shut-off valves supply voltage available versions: | - | 22 Vdc (pick & hold) |
| | - | 230 V, 50 Hz - black coil |
| | - | 24 V, 50 Hz - grey coil |
| | - | 230 Vrac - white coil |
| | - | 24 Vrac - blue coil |
| | - | 24 Vdc- violet coil |
| | - | Other versions available on request |
| Modulating device resistance @20°C: | | 176 Ω ±6% |

FUNCTIONS

AUTOMATIC SHUT-OFF

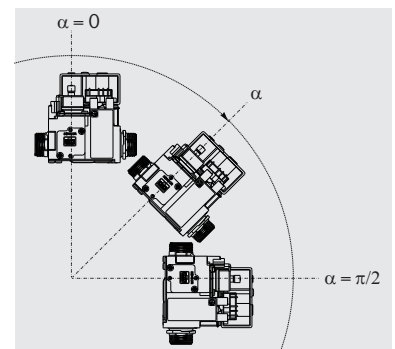
- Automatic shut-off valves closing time less than 1 second
- Automatic shut-off valves opening time less than 2 seconds
- Automatic shut-off valve EV1 Class B
- Automatic shut-off valve EV2 Class C

PRESSURE REGULATION

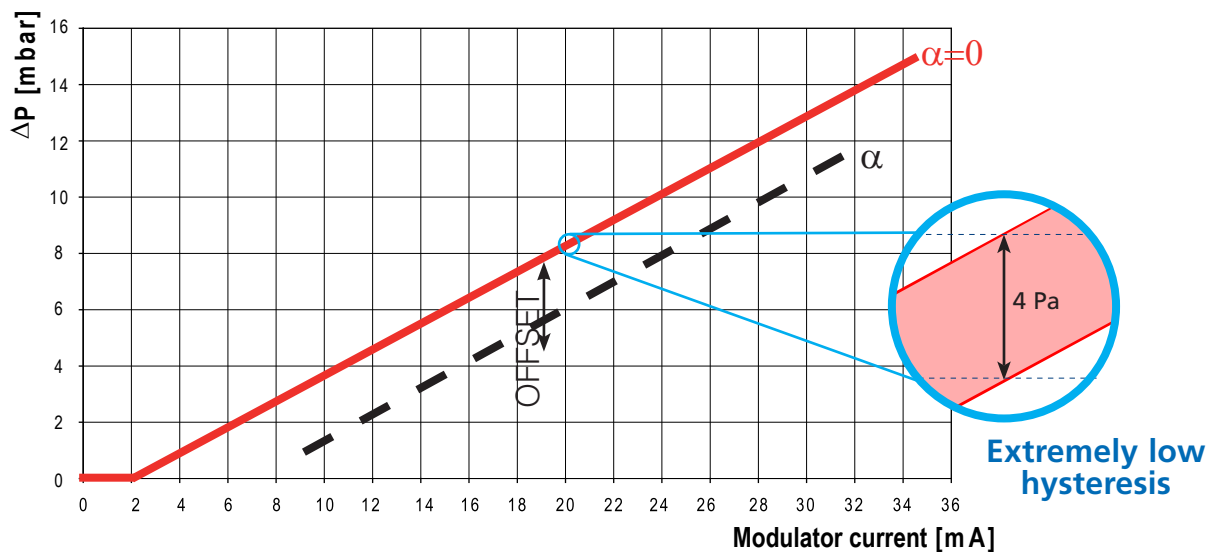
Servo pressure regulator class B (with reference to EN126)

PRESSURE MODULATION

- Offset [mbar], see graph below $4.35 * (\cos \alpha - 1)$
- Pressure drop across the gas orifice vs. modulator current ($\alpha=0$) see graph below
- Characteristic hysteresis, see enlarged view below $< 4 \text{ Pa}$



Modulating characteristic with vertical modulator axis ($\alpha=0$)



GAS FLOW SENSOR

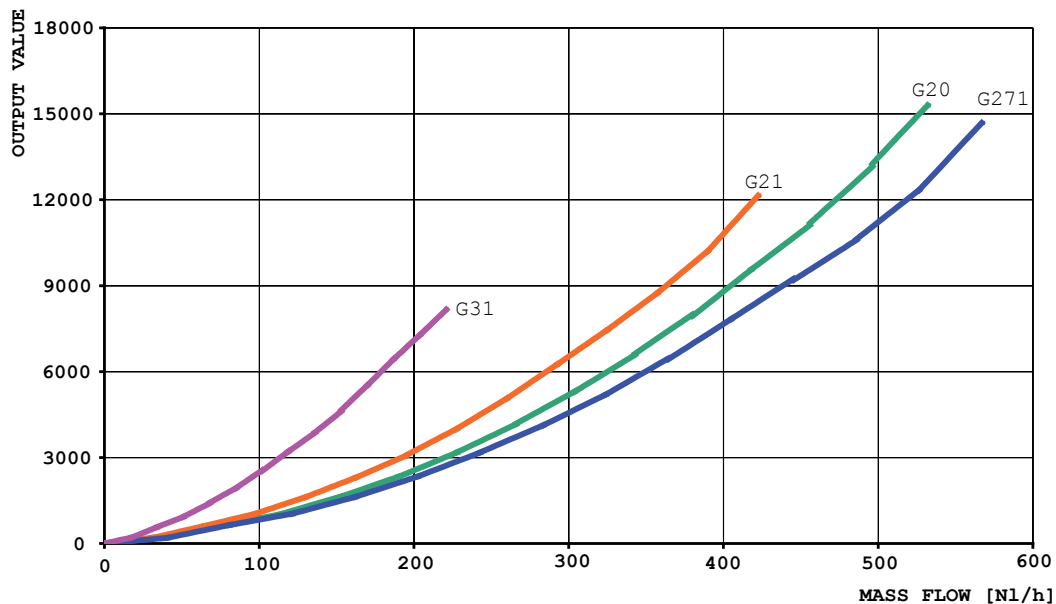
Supply voltage

3.3 Vdc

Output

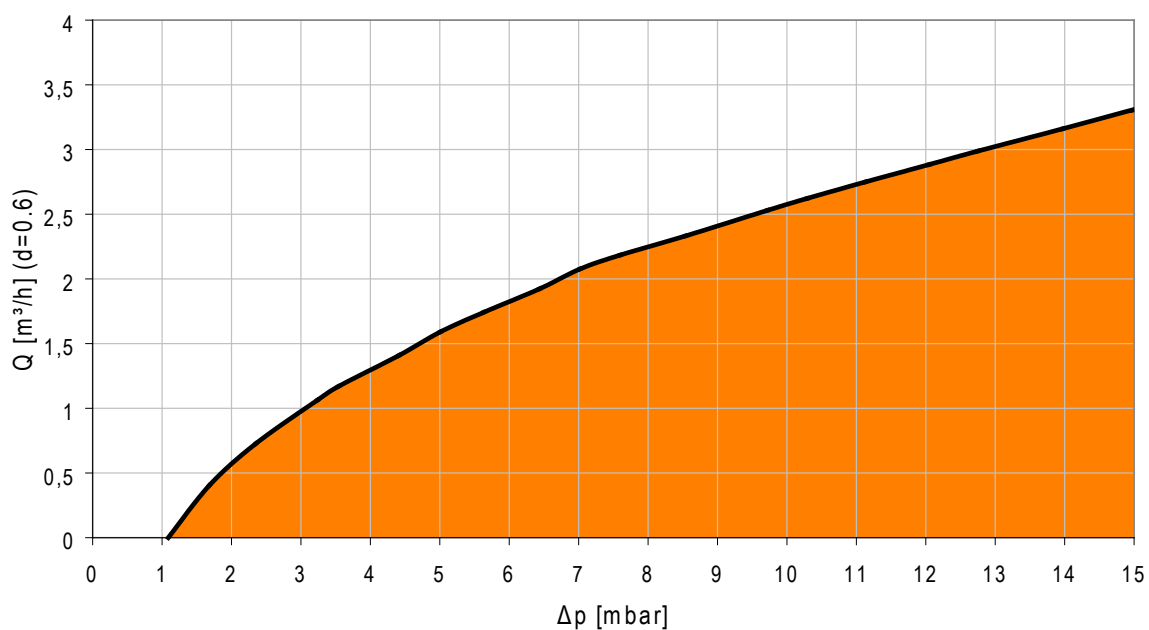
I²C protocol

Gas flow sensor diagram
Output sensor [reading as decimal fixed point].



CAPACITY

Pressure drop versus gas flow



FUNCTIONAL DESCRIPTION

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

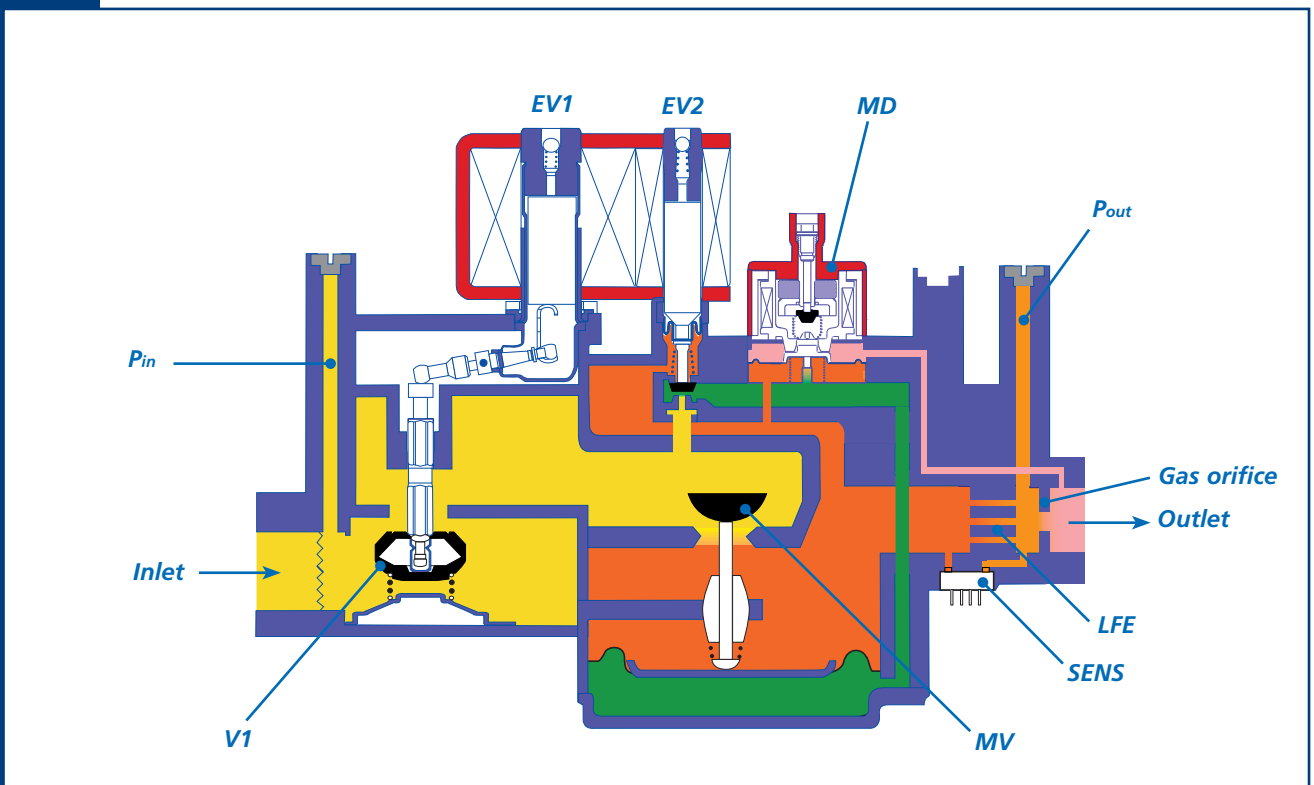
When the shut-off valves are de-energised, it is only possible to measure the inlet pressure on the inlet pressure test point.

When the solenoid EV1 is energised the first gas valve 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 opens.

The opening of the main valve is function of the electrical command (current) applied to the coil of the modulating device 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.

The modulating device is realized with a frictionless electromagnetic linear actuator supplied at low dc voltage and current, the resulting modulating characteristic (ΔP vs. current) is therefore linear and with a reduced hysteresis (few Pascals).

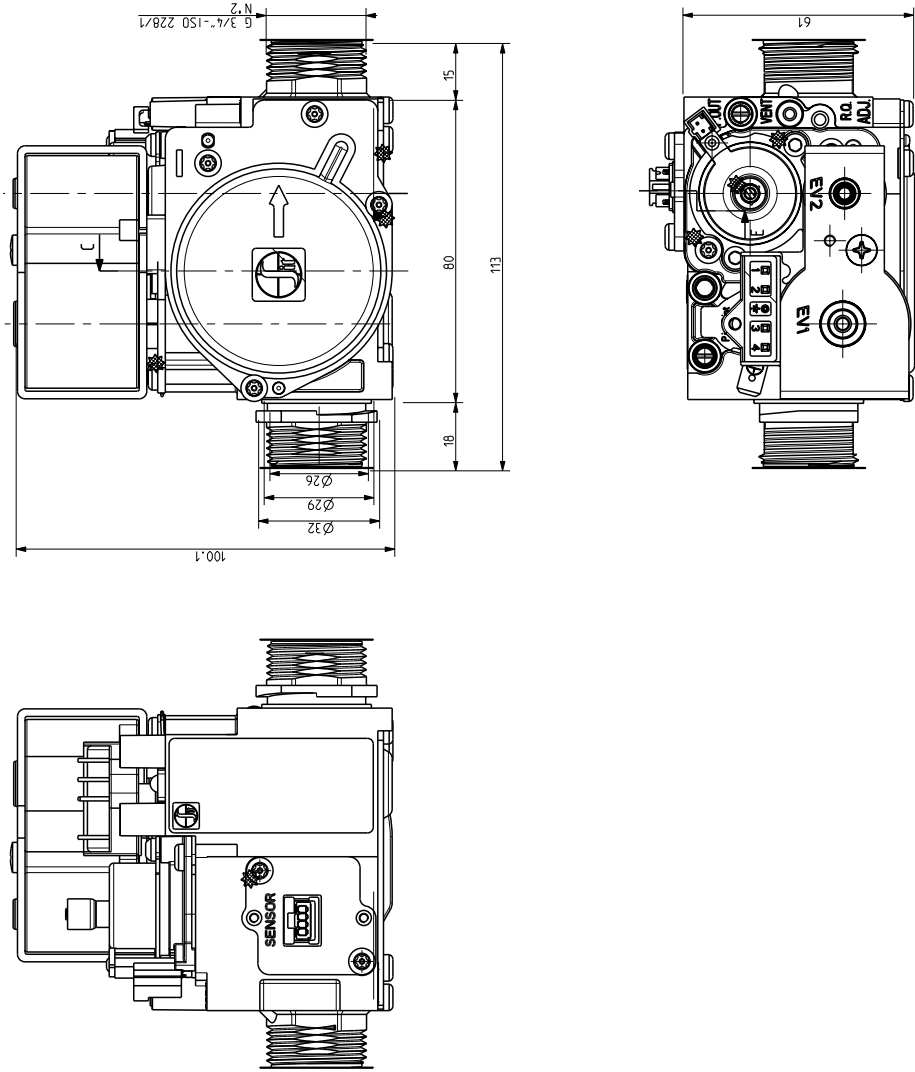
The gas flow sensor is realized measuring the differential pressure across a laminar flow element located in the main gas passage inside the valve. The differential pressure sensor provides a digital output according to I²C protocol.



NOMENCLATURE

Pin – inlet pressure test point	MD – current controlled modulating device
EV1 – solenoid of the first automatic shut-off valve	SENS – differential pressure sensor
V1 – first valve	LFE – laminar flow element
EV2 – solenoid of the second servo valve	Pout – outlet pressure test point
MV – main valve	

DIMENSIONAL DRAWING



NOTE: All the dimensions are expressed in millimeters.



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