

# Flow Regulator with Electric Actuator Type 2488 N/5857



Fig. 1 · Type 2488 N/5857 Flow Regulator with Electric Actuator

## Mounting and Operating Instructions

**EB 3136 EN**

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Definitions of the signal words used in these instructions



**CAUTION!**

*indicates a hazardous situation which, if not avoided, could result in death or serious injury.  
Live parts are freely accessible!*

**NOTICE**

*indicates a property damage message.*

**Note:** *Supplementary explanations, information and tips*



### General safety instructions

- ▶ The flow regulator with electric actuator must be installed, started up and serviced only by skilled or semi-skilled staff in accordance with good engineering practice so that employees and third persons are not exposed to danger.

All safety instructions and warnings given in these mounting and operating instructions, particularly those concerning installation, start-up and maintenance, must be strictly observed.

- ▶ The regulator complies with the requirements of the European Pressure Equipment Directive 97/23/EC. The declaration of conformity issued for a valve bearing the CE marking includes information on the applied conformity assessment procedure and will be provided on request.
- ▶ To ensure appropriate use, only use the regulator in applications where the operating pressure and temperatures do not exceed the operating values specified in the order.

Note that the manufacturer does not assume any responsibility for damage caused by external forces or any other external factors.

Take appropriate safety precautions to prevent hazards that may be caused in the regulator by the process medium, operating pressure, signal pressure, or moving parts.

- ▶ Make sure the regulator is shipped and stored properly.
- ▶ Depending on the field of application, allow the regulator to cool down or warm up to reach ambient temperature prior to starting any work. Always depressurize the relevant section of the plant and, if necessary, also drain the pipeline prior to installing or servicing the regulator.



- ▶ The electric actuator has been designed for use in electrical power installations. Strictly observe the relevant safety regulations for wiring and maintenance work.

- ▶ Only use disconnect devices that are protected against accidental or unintentional reconnection.

Take special care when making adjustments on live parts.

Do not remove the covers under any circumstances.

## 1 Design and principle of operation

The device combines a Type 2488 N Flow Regulator and a Type 5857 Electric Actuator. The electric actuator is attached to the valve by means of the connecting piece and allows also the temperature to be controlled by changing the position of the restriction in response to the control signal received from an electric control device. The medium flows through the valve in the direction indicated by the arrow on the valve body. The flow rate depends on the flow passage defined by the valve plug (3) and the restriction (11). The integral positioning spring (5) determines the upper differential pressure (0.2 bar). The high pressure upstream of the restriction (11)

is transmitted to the high-pressure side of the diaphragm actuator through the control line (7). The low pressure downstream of the restriction acts on the low-pressure side of the operating diaphragm (9) via a bore in the valve plug. The differential pressure generated by the restriction (special differential pressure) is converted into a positioning force by the operating diaphragm. This force is used to position the valve plug against the force of the positioning spring (5). The flow rate can be adjusted by turning the set point screw (13).

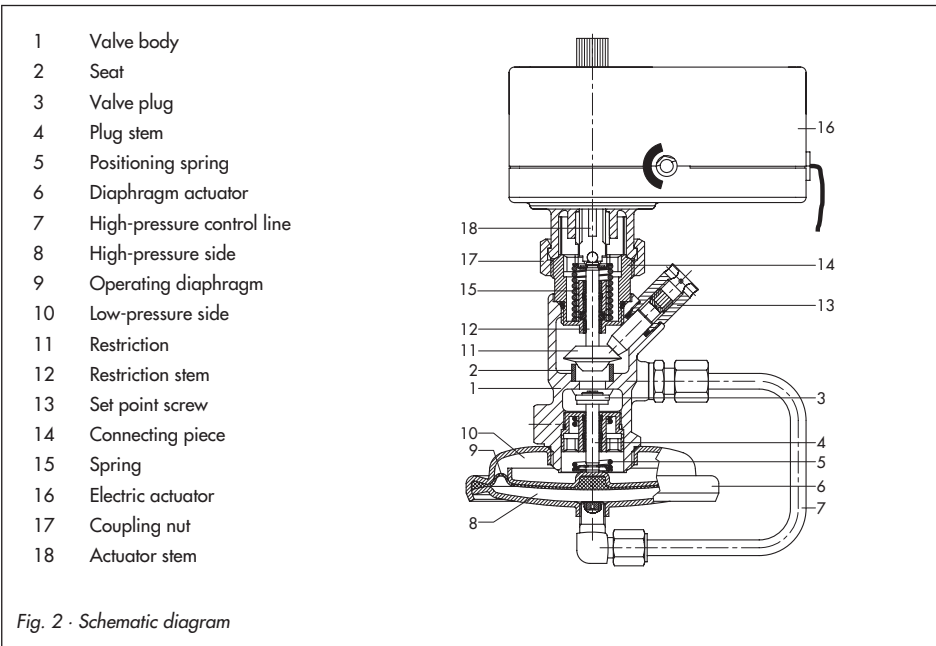


Fig. 2 · Schematic diagram

## 2 Installation

### 2.1 Mounting position

- ▶ Install the flow regulator in a horizontal pipeline with its diaphragm actuator suspended downward.
- ▶ Make sure that the electric actuator is above the valve body.
- ▶ Make sure that the medium flows through the regulator in the direction indicated by the arrow on the valve body.

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#### **NOTICE**

*Choose a point of installation which will provide easy access to the regulator after completion of the plant.*

*Flush the pipeline thoroughly before installation.*

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Make sure the permissible ambient temperature will not be exceeded. If the valve is to be insulated, do not insulate the actuator and the coupling nut. If necessary, use an extension piece (order no. 1690-6975). The valve should not be insulated more than approx. 25 mm above the top edge of its body.

### 2.2 Strainer

Install a strainer (SAMSON Type 1 NI) upstream of the regulator to prevent sealing particles, weld spatter, pipe scale, and other impurities carried along by the process medium from impairing the proper operation, especially the tight shut-off of the valve.

- ▶ Make sure that the medium flows through the strainer in the direction indicated by the arrow on the strainer body.
- ▶ Install the strainer with the filter element vertically suspended. Ensure that ample space is available to remove the filter.

### 2.3 Shut-off valves, pressure gauges

We recommend installing hand-operated shut-off valves both upstream of the strainer and downstream of the flow regulator. This allows the plant to be shut down (depressurized) for cleaning and maintenance routines, or when it is not operated for long periods of time.

To monitor the pressures prevailing in the plant, install pressure gauges both upstream and downstream of the flow regulator.

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#### **NOTICE**

*When carrying out a pressure test on the section of the plant equipped with a pressure regulator, prevent the diaphragm actuator from being damaged by the test pressure by using a test pressure which does not exceed the maximum permissible pressure  $\Delta p$  of the actuator.*

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### 2.4 Mounting the actuator

See Fig. 2 on page 4.

Place the actuator (16) onto the valve connection and manually fasten it using the coupling nut (17).

### 3 Electrical connection

See Figs. 2 and 3.



**CAUTION!**

When laying electric lines, strictly observe the regulations governing the erection of power installations defined by DIN VDE 0100 as well as the regulations specified by your local power supply company. Use a suitable power supply which guarantees that no dangerous voltages will reach the device in standard operation or in case of a fault in the system or any system parts.

Always switch off the power supply first prior to connecting the actuator to the electrical network. Make sure the power cannot be switched on unintentionally.

The supply voltage is 230 V ( $\pm 10\%$ ) or 24 V ( $\pm 10\%$ ), 50 Hz. Refer to EB 5857 EN for more details.

Use the three-wire connecting cable attached to the actuator to establish the electrical connection (Fig. 3).

If a voltage is applied between the white and the green cable, the motor will retract the actuator stem (18) into the actuator. The restriction stem will be pushed upward by the spring (15) and the flow rate will increase.

If, however, a control signal is applied to the white and the brown cable, the actuator stem extends. The restriction stem will be pushed downward and the flow rate will decrease.

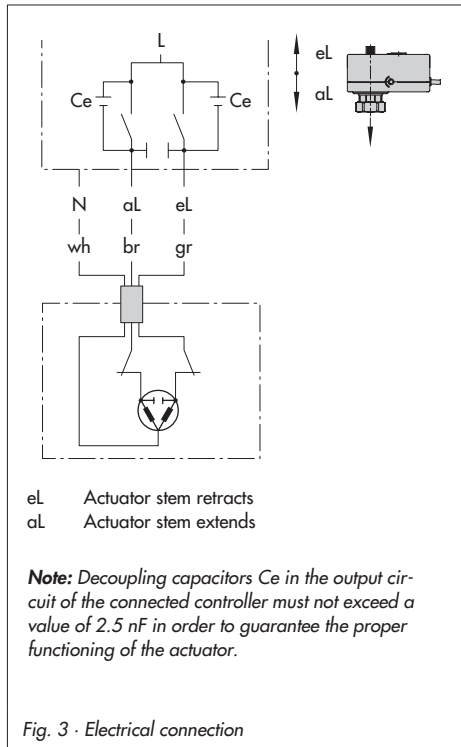


Fig. 3 · Electrical connection

## 4 Operation · Set point adjustment

See Fig. 2 on page 4.

The flow rate can be adjusted, both with and without the electric actuator mounted. Prior to adjusting the flow rate on a regulator with the electric actuator mounted, make sure the actuator stem (18) is retracted.

**Note:** Prior to starting up or pressurizing the regulator, make sure that the restriction for limiting the flow is open.

To adjust or alter the flow set point, proceed as follows:

The set point adjustment is always based on a closed restriction.

### NOTICE

Use the SAMSON manual adjustment (1790-8169) to close the restriction. Do not use the set point screw (13). Remove the manual adjustment again and use an Allen key (4 mm) at the set point screw (13) at the side to adjust the flow set point.

- ▶ Determine the number of turns required to set the desired flow rate from the diagram (Fig. 4).
- ▶ Turn set point screw (13) counterclockwise the required number of turns.

For exact adjustment, check the set value using a flow meter.

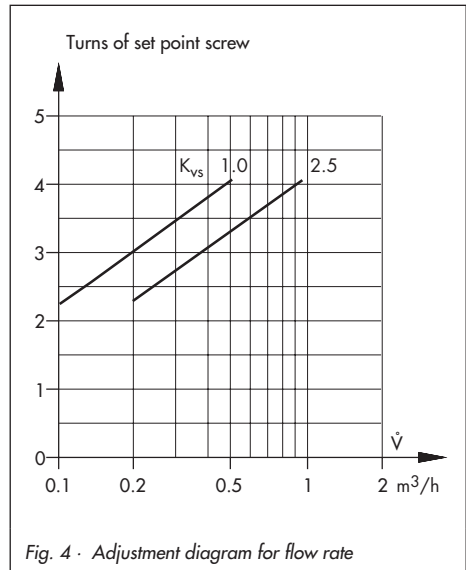


Fig. 4 · Adjustment diagram for flow rate

- ▶ Turn the set point screw (13) clockwise to close the restriction and decrease the flow rate.
- ▶ Turn the set point screw counterclockwise to open the restriction and increase the flow rate.

## 5 Troubleshooting

If the flow rate deviates considerably from the adjusted set point, first check the control line for any blockages.

If the valve does not seal properly, this may be because tight shut-off is prevented by dirt between the seat and plug or due to natural wear. Check the regulator for leaks and replace it, if necessary.

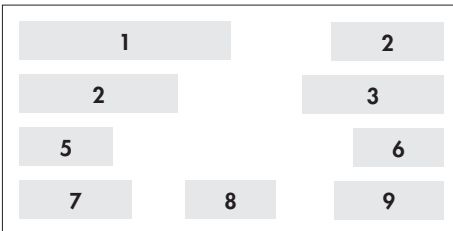


## NOTICE

Prior to starting any work on the regulator or removing it from the pipeline, allow the relevant section of the plant to cool down to working temperature if high temperatures prevail and make sure that the pipeline concerned is depressurized and drained.

## 6 Nameplates

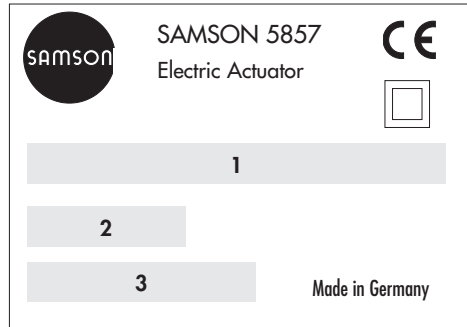
### Nameplate of Type 2488 N Valve



#### Description of the nameplate:

- 1 Model number with index
- 2 Year of manufacture
- 3 Type
- 4 Flow set point range in m<sup>3</sup>/h
- 5 Upper differential pressure in bar
- 6 Max. perm. differential pressure in bar
- 7 Flow coefficient K<sub>vS</sub>
- 8 Max. perm. temperature in °C
- 9 Nominal pressure PN

### Nameplate of Type 5857 Electric Actuator



#### Description of the nameplate:

- 1 Nominal thrust, rated travel actuating time, electrical connection
- 2 Configuration ID
- 3 Serial number



## 7 Dimensions

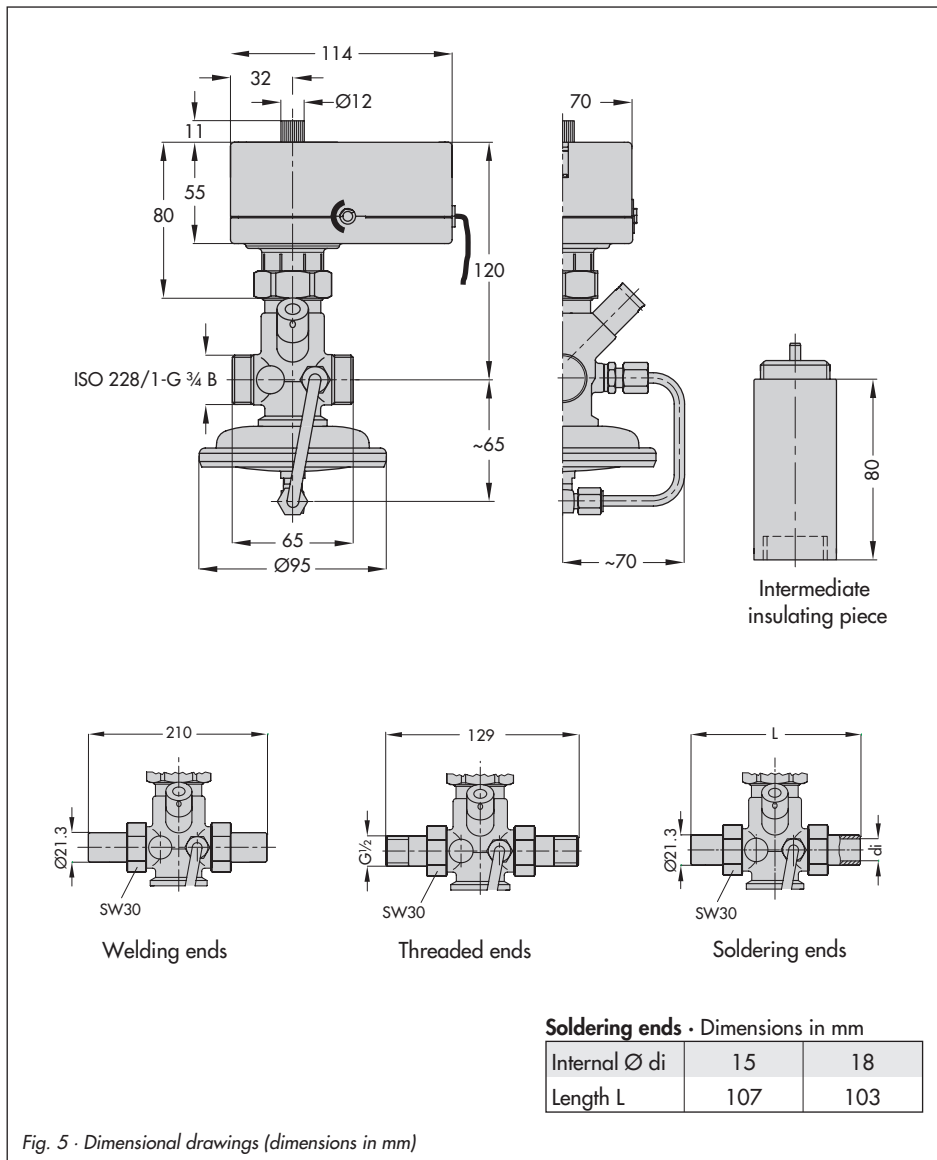


Fig. 5 - Dimensional drawings (dimensions in mm)

## 8 Technical data

<b>Type 5857 Actuator</b>	
Rated travel	6 mm
Actuating time for rated travel	20 s
Nominal thrust	300 N
Supply voltage	230 V/24 V ( $\pm 10\%$ ) 50 Hz
Power consumption	Approx. 3 VA
Perm. ambient temperature	0 to 50 °C
Perm. storage temperature	-20 to 70 °C
Degree of protection	IP 42
Noise immunity	EN 61000-6-2
Noise emission	EN 61000-6-3
Weight	Approx. 0.7 kg
<b>Materials</b>	
Body	CC491K
Plug	1.4301 with EPDM sealing ring
Restriction	Brass resistant to dezincification
Diaphragm	EPDM without fabric

<b>Type 2488 N Valve</b>	
Nominal size	DN 15
Nominal pressure	PN 10
Max. perm. diff. pressure $\Delta p$	4 bar
Flow coefficient $K_{vs}$	
Standard version	2.5
Special version	1.0
Max. perm. temperature	
Treated water	110 °C
Non-flammable gases	80 °C
Flow set point range / flow limitation for water at upper differential pressure of 0.2 bar	
Standard version	0.3 to 1 m <sup>3</sup> /h
Special version	0.1 to 0.5 m <sup>3</sup> /h
Upper differential pressure	0.2 bar
<b>Materials</b>	
Body	Plastic PPO
Coupling nut	Brass
Intermediate insulating piece	1.4306, CW617N, PTFE, EPDM, FPM

## 9 Customer inquiries

Should any malfunctions or any defect occur, SAMSON's After-Sales Service is prepared to help you on site.

You can also send the defective regulator directly to your local SAMSON representative for repair. Addresses of SAMSON subsidiaries, agencies and service centers are listed in the product catalogs and in the Internet at [www.samson.de](http://www.samson.de).

To allow SAMSON to find the fault and to have an idea of the installation situation, specify the following details (see nameplate):

- ▶ Type and nominal size of the regulator
- ▶ Model number with index
- ▶ Var.-ID and serial number of actuator
- ▶ Upstream and downstream pressure
- ▶ Process medium and its temperature
- ▶ Minimum and maximum flow rate in  $\text{m}^3/\text{h}$
- ▶ Has a strainer been installed?
- ▶ Installation drawing



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