

# Combined Self-operated Regulators

## Flow Regulators with Additional Electric Actuator

### Type 2488 N/5857



#### Application

Self-operated regulator for flow rate control in heat supply networks, combined with an electric actuator to apply a control signal of an electric control device.

Especially suitable for local heat supply networks and large heating networks.



Globe valve in nominal size DN 15 · Nominal pressure PN 10 · Flow set point ranges from 0.3 to 1.0 m<sup>3</sup>/h or 0.1 to 0.5 m<sup>3</sup>/h with a differential pressure created at the restriction of 0.2 bar · For treated water up to 110 °C and non-flammable gases up to 80 °C.

The valve closes when the flow rate or the output signal of the electric control device increases.

The combined regulators consist of a valve with integrated diaphragm actuator and an additional Type 5857 Electric Actuator.

#### Special features

- Low-maintenance, medium-controlled flow regulators requiring no auxiliary energy
- Single-seated globe valve
- Optionally with threaded ends, welding ends or soldering ends
- Valve plug with soft sealing
- With adapter for the attachment of an electric actuator

#### Versions

##### Type 2488 N/5857 Flow Regulator

Type 2488 N Valve with connecting threads according to ISO 228/1-G 3/4 B on both sides for attachment of threaded ends G 1/2, welding ends or soldering ends · Type 5857 Electric Actuator

#### Accessories

- Threaded ends G 1/2, welding ends or soldering ends (inside diameter = 15 mm or 18 mm)
- Intermediate insulating piece

ANSI versions available on request

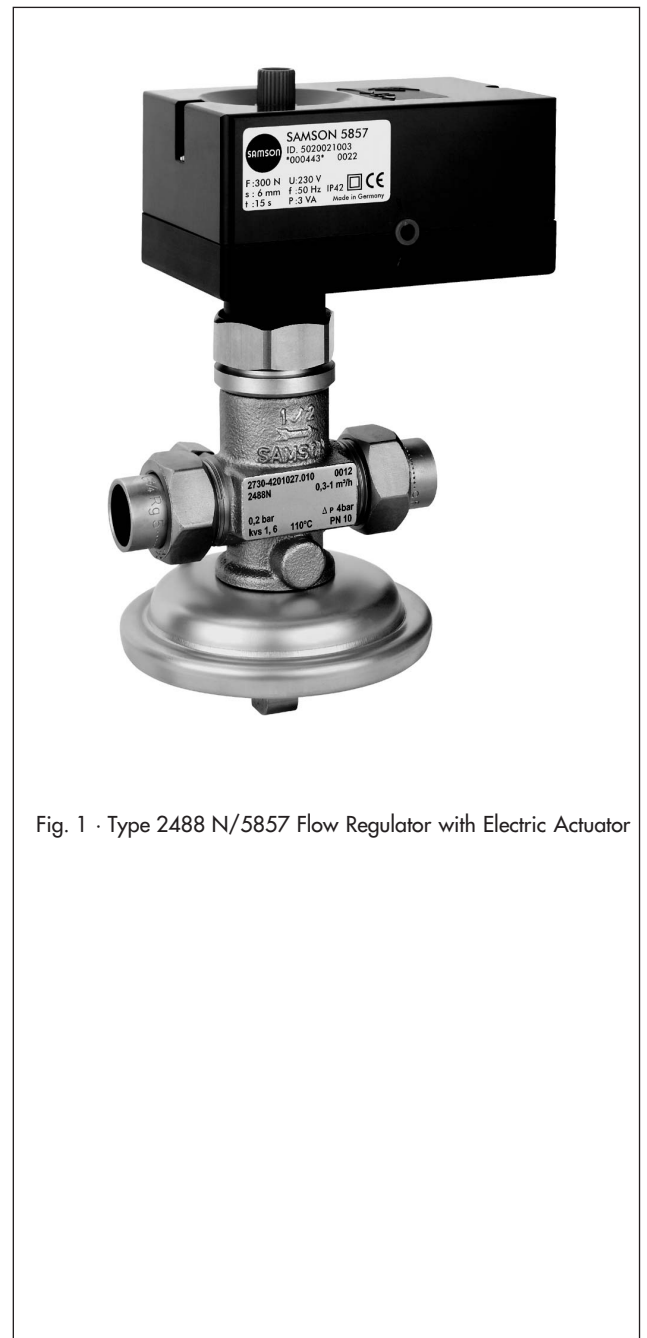


Fig. 1 · Type 2488 N/5857 Flow Regulator with Electric Actuator

### Principle of operation

The medium flows through the valve (1) in the direction indicated by the arrow on the body. The areas released by the restriction (11) and the valve plug (3) determine the flow rate.

The flow rate is controlled either by the connected Type 5857 Actuator or the diaphragm actuator (6).

The Type 5857 Electric Actuator reacts to the control signal of an electric control device. As a result, the position of the restriction (11) and the flow rate are changed.

The continuously adjustable restriction (11) is installed above the valve seat (2) as an orifice plate assembly and set point adjuster. Use the adjusting screw (13) to limit the cross section of the restriction and the flow rate as well.

The valve plug (3) is located beneath the valve seat. The plug is connected directly to the diaphragm actuator (6). The operating diaphragm (9) and the positioning spring (5) determine the special differential pressure of 0.2 bar at the restriction.

The pressure upstream of the valve is transmitted to the high-pressure side (8) of the operating diaphragm (9) through an external control line (7). The low pressure directly downstream of the restriction is transmitted to the low-pressure side (10) of the diaphragm through a hole in the valve plug. If the pressure difference across the operating diaphragm exceeds the adjusted special differential pressure set point of 0.2 bar, the diaphragm moves the plug stem (4) and the flow cross-section of the valve is reduced in proportion to the differential pressure.

The actuator (6) adjusts the valve plug until the pressure drop across created at the restriction in the valve and the fixed differential pressure are identical.

### Differential pressure across the valve

The minimum required differential pressure  $\Delta p_{\min}$  across the valve is calculated from:

$$\Delta p_{\min} = \Delta p_{\text{restriction}} + \left( \frac{\dot{V}}{K_{VS}} \right)^2$$

$\Delta p_{\min}$  Minimum differential pressure across the valve in bar

$\Delta p_{\text{restriction}}$  Special differential pressure specially created at the restriction to measure the flow rate

$\dot{V}$  Fixed flow rate in m<sup>3</sup>/h

$K_{VS}$  Valve flow coefficient in m<sup>3</sup>/h

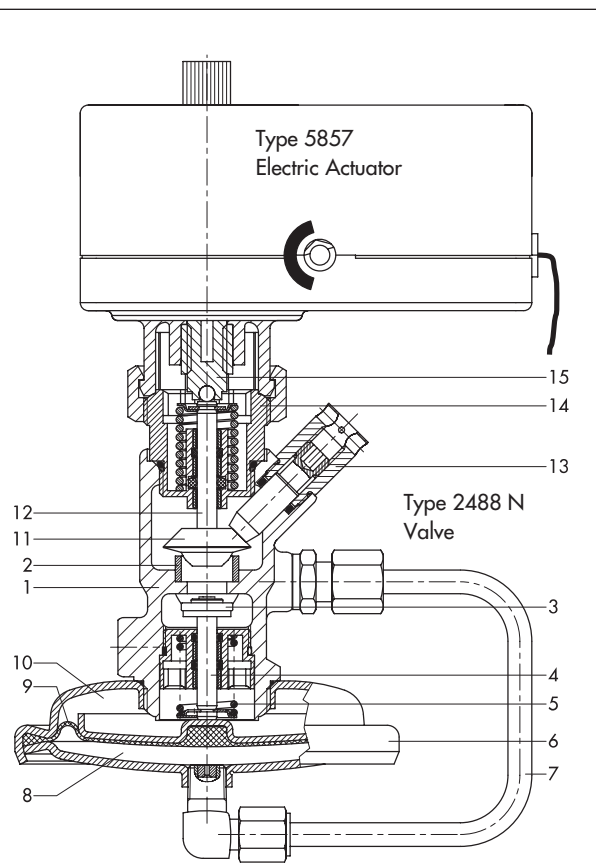


Fig. 2 · Sectional diagram

- 1 Valve body
- 2 Valve seat
- 3 Plug
- 4 Plug stem
- 5 Positioning spring
- 6 Actuator
- 7 Control line for high-pressure
- 8 High-pressure side
- 9 Operating diaphragm
- 10 Low-pressure side
- 11 Restriction (orifice plate)
- 12 Restriction stem
- 13 Flow limiter (adjusting screw)
- 14 Adapter
- 15 Actuator stem

**Table 1 · Technical data**

Type 2488 N Valve	
Nominal size	DN 15
Connection	ISO 228/1- G 3/4 B
Type of connection	Threaded ends G 1/2 · Welding ends · Soldering ends
Kvs value	Standard version
	Special version
Nominal pressure	PN 10
Max. perm. diff. pressure $\Delta p$	4 bar
Max. perm. temperature	Treated water
	Non-flammable gases
z value	0.43
Upper differential pressure	0.2 bar
Flow set point range/limit for water at upper differential pressure of 0.2 bar	Standard version
	Special version
Type 5857 Electric Actuator	
Power supply Supply voltage	230 V/24 V $\pm 10\%$ , 50 Hz
Power consumption	Approx. 3 VA
Rated travel	6 mm
Transit time per rated travel	20 s
Nominal thrust	300 N
Perm. ambient temperature range	0 to 50 °C
Perm. temperature range at the actuator stem	0 to 110 °C
Storage temperature range	-20 to 70 °C
Degree of protection (installed upright) <sup>1)</sup>	IP 42
Noise immunity	EN 61000-6-2
Noise emission	EN 61000-6-3
Weight, approx.	0.7 kg
Additional electrical equipment	
Positioner (for 24 V AC only)	
Input signal	0 (2) to 10 V
Position feedback	0 to 10 V

<sup>1)</sup> Actuator mounted above the valve

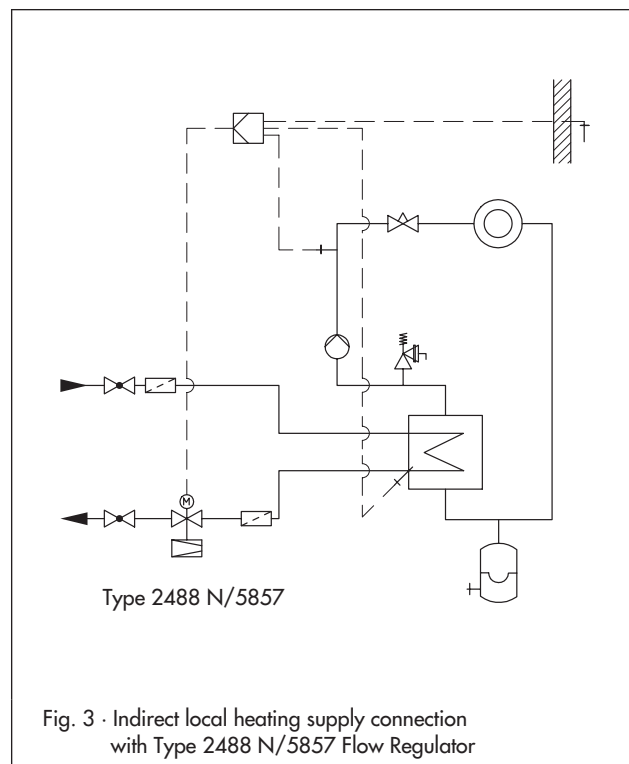
### Installation

- The regulator is especially suitable for installation in horizontal pipelines.
- Direction of flow must match the direction indicated by the arrow on the body.
- The electric actuator must be mounted above the valve body.
- Prior to mounting the actuator on the valve: Retract the actuator stem.


**Table 2 · Materials · Material number acc. to DIN EN**

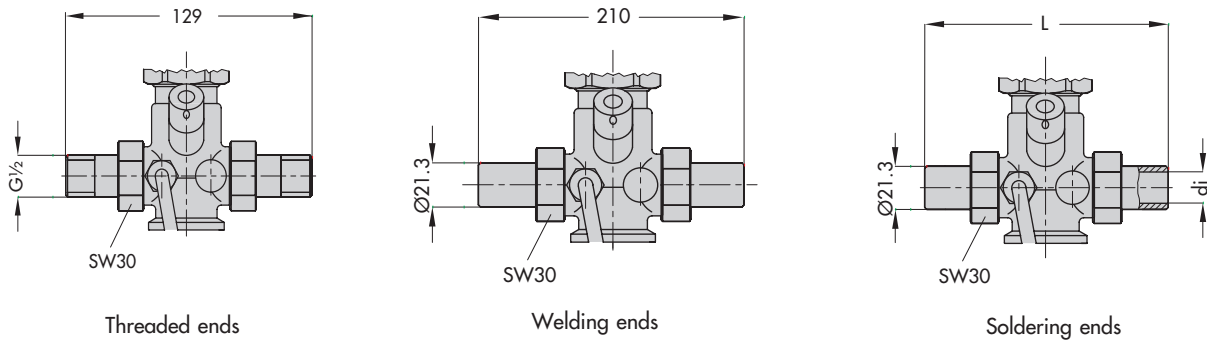
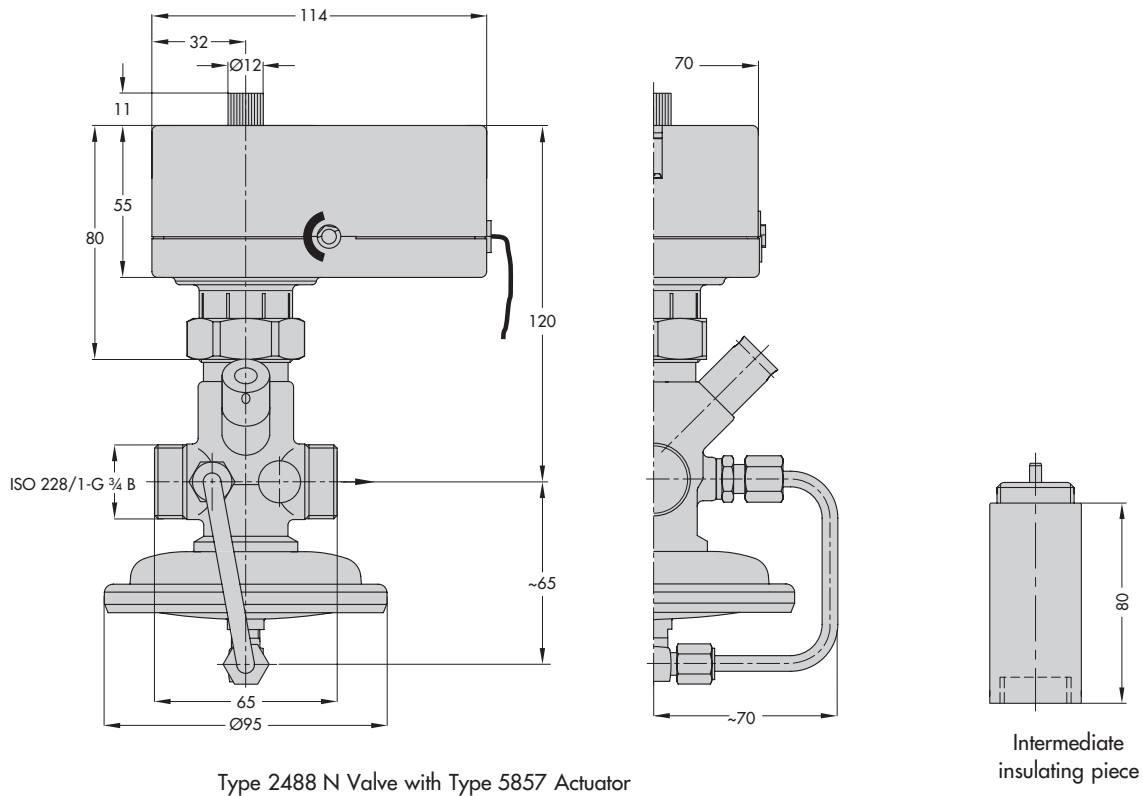
Type 2488 N Valve	
Valve body	CC491K (red brass, Rg 5)
Plug	1.4301 with EPDM sealing
Restriction	Brass, resistant to dezincification
Plug stem	1.4305
Seat	CC491K (red brass, Rg 5)
Valve spring	1.4310 K
Diaphragm	EPDM without fabric reinforcement
Threaded ends	CW617N (brass)
Soldering ends	CC491K (red brass, Rg 5)
Welding ends	1.0037 (St 37)
Intermediate insulating piece	1.4306, CW617N (brass), PTFE, EPDM, FPM
Type 5857 Electric Actuator	
Housing	Plastic (PPO)
Coupling nut	Brass

### Typical application



- If the control device is insulated, do **not insulate** actuator and coupling nut.
- Observe permissible temperature ranges! Use an intermediate insulating piece if the permissible temperature at the actuator stem is exceeded.

## Dimensions



**Soldering ends** · Dimensions in mm

Inside Ø di	15	18
Length L	107	103

Fig. 4 · Dimensions in mm

### Ordering text

Flow Regulator Type 2488 N/5857

With Type 2488 N Valve and Type 5857 Actuator

Flow set point range with an upper differential pressure of 0.2 bar:

0.3 to 1.0 m<sup>3</sup>/h (standard version) or 0.1 to 0.5 m<sup>3</sup>/h (special version)

### Accessories

Threaded ends G 1/2, welding ends or soldering ends (inside diameter di = 15 mm or 18 mm)

Intermediate insulating piece

Specifications subject to change without notice.



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