

Flow Regulator Type 45-9 N

Application

Flow regulator for local heat supply and large heating networks
Flow set points **0.02 to 1 m³/h** · Differential pressure at restriction fixed at **Δp = 0.2 bar** · Nominal pressure **PN 10** · Valve size **DN 15** · Suitable for treated water up to **110 °C** and non-flammable gases up to **80 °C**

The valve closes when flow rate increases

The Type 45-9 Flow Regulators are self-operated proportional regulators for heating systems. They control the flow rate to the set point adjustable at the restriction.

The regulators consist of a valve with adjustable restriction (orifice) and an integrated actuator.

Special features

- Self-operated proportional regulators requiring little maintenance
- Suitable for water and non-flammable gases
- Wide set point range adjustable at the restriction according to a diagram
- Single-seated valve with soft-seated, unbalanced plug
- Especially suitable for local heat supply networks
- Low-noise, low-maintenance and reliable
- No external control line required

Versions

Flow regulator suitable for installation in the flow or return flow pipe of a local heat supply station

Valve in DN 15 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 · Restriction for adjustment of the flow set point at a differential pressure at the restriction of 0.2 bar

Accessories

- Threaded ends G 1/2, welding ends or soldering ends

ANSI version available on request



Fig. 1 · Type 45-9 N Flow Regulator, version with soldering ends

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.

To control the flow rate, the high pressure upstream of the restriction is transmitted to the high-pressure side (8) of the diaphragm through an external control line (7). The low pressure downstream of the restriction is transmitted to the low-pressure side (10) of the operating diaphragm (9) through a hole in the valve plug. As soon as the flow rate in the section of the pipeline increases, e.g. because a consumer has been activated, the pressure on the low-pressure side of the diaphragm decreases. If the pressure difference exceeds the adjusted set point, the valve plug connected to the diaphragm over the plug stem (4) is closed.

The adjustable restriction determines the flow rate. The integrated set point spring (5) determines the differential pressure at the restriction of 0.2 bar.

Differential pressure across the valve

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

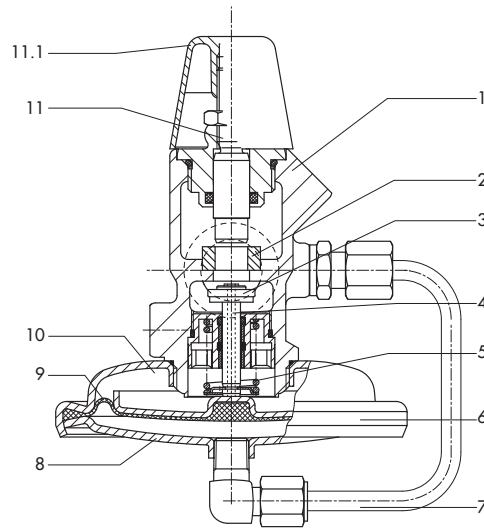
$$\Delta p_{\min} = \Delta p_{\text{restriction}} + \left(\frac{\dot{V}}{K_{VS}} \right)^2$$

Δp_{\min} Pressure drop of the plant or minimum differential pressure between flow and return flow pipes in bar

$\Delta p_{\text{restriction}}$ Differential pressure specially created across the restriction to measure the flow rate in bar

\dot{V} Adjusted flow rate in m³/h

K_{VS} Valve flow coefficient in m³/h



- 1 Valve body
- 2 Seat
- 3 Plug with hole
- 4 Plug stem with hole
- 5 Set point spring
- 6 Actuator
- 7 Control line for high pressure
- 8 High-pressure side
- 9 Operating diaphragm
- 10 Low-pressure side
- 11 Adjustment of flow set point (restriction)
- 11.1 Cover cap for set point adjuster

Fig. 1 · Sectional diagram

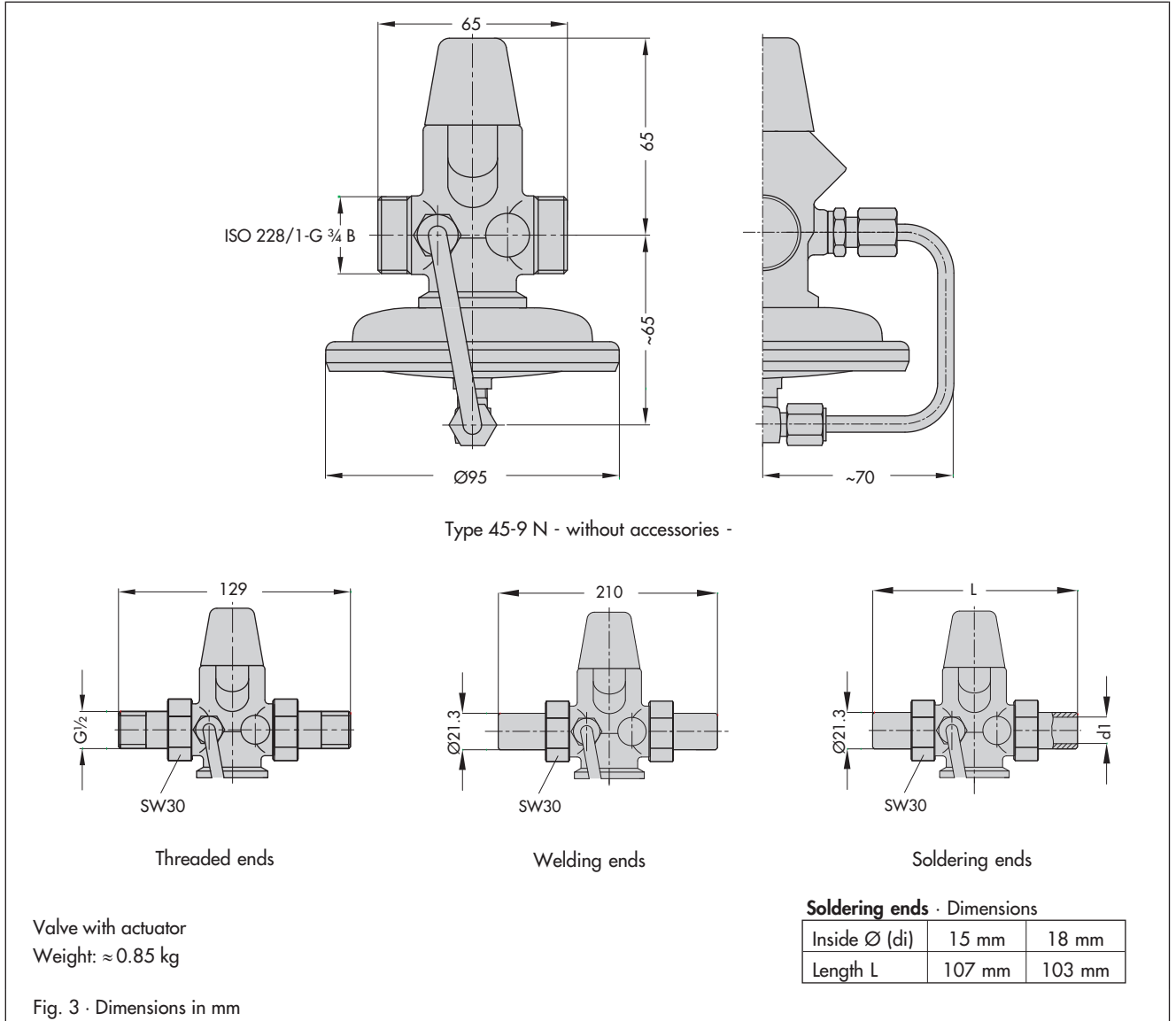
Table 1 · Technical data

Nominal size	DN 15
Connection	ISO 228/1 - G 3/4 B
Type of end connection	Threaded ends G 1/2 · Welding ends · Soldering ends
K_{VS} coefficient	
Standard version	2.5
Special version	1.0
Nominal pressure	PN 10
Max. perm. diff. pressure Δp	4 bar
Max. perm. temperature	
Treated water	110 °C
Non-flammable gases	80 °C
x_{FZ} value	0.43
Differential pressure at restriction	0.2 bar
Flow set point range for water with differential pressure at restriction of 0.2 bar	
Standard version	0.05 to 1 m ³ /h
Special version	0.02 to 0.5 m ³ /h

Table 2 · Materials · Material number according to DIN EN

Body	CC491K/CC499K (Rg 5)
Actuator	1.4301 h
Plug	1.4301 with EPDM seal
Restriction	Brass, resistant to dezincification
Plug stem	1.4305
Seat	CC491K/CC499K (Rg 5)
Valve spring	1.4310 K
Diaphragm	EPDM without fabric reinforcement
Threaded ends	Brass
Soldering ends	Red brass (Rg 5)
Welding ends	1.0037 (St 37)

Dimensions



Installation

Regulator for

- Installation in horizontal pipelines
- Direction of flow as indicated by the arrow on the body
- Actuator suspended downwards

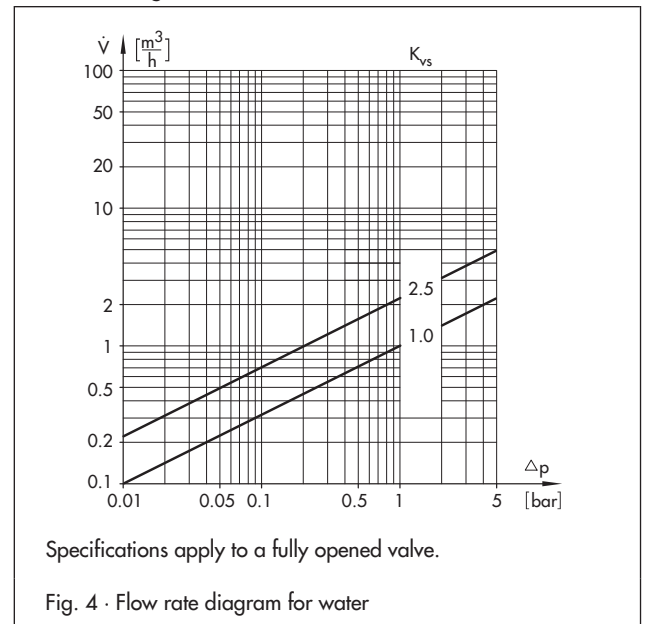
Ordering text

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Accessories

$G \frac{3}{4}$ connecting thread on both sides for attachment with threaded ends $G \frac{1}{2}$ /welding ends/soldering ends (inside $\varnothing = 15$ mm/18 mm)

Flow rate diagram for water



Specifications subject to change without notice



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