Electric Control Valve
Types 3222 N/5857, 3222 N/5757, 3222 N/5757-7

Fig. 1 · Type 3222 N/5857 Electric Control Valve

Mounting and Operating Instructions

EB 5867 EN

Edition October 2010

Contents

Definitions of the signal words used in these instructions

WARNING!
indicates a hazardous situation which, if not avoided, could result in death or serious injury.

NOTICE
indicates a property damage message.

Note: *Supplementary explanations, information and tips*

1 General safety instructions

For your own safety, follow these instructions concerning the mounting, start up and operation of the control valve:

- The control valves must be installed, started up and serviced by fully trained and qualified personnel only, observing the accepted industry codes and practices.
  Make sure employees or third persons are not exposed to any danger.
  All safety instructions and warnings in these mounting and operating instructions, particularly those concerning installation, start-up and maintenance, must be observed.
- For appropriate operation, make sure that the control valve is only used in applications where the operating pressure and temperatures do not exceed the operating values based on the sizing data submitted in the order.
  Note that the manufacturer does not assume any responsibility for damage caused by external forces or any other external factors.
  Any hazards which could be caused in the control valve by the process medium or operating pressure are to be prevented by means of appropriate measures.
- For installation and maintenance, make sure the relevant section of the pipeline is depressurized and, depending on the process medium, drained as well. If necessary, allow the control valve to cool down or warm up to reach ambient temperature prior to starting any work on it.
- The actuators are designed for use in low voltage installations.
  For wiring and maintenance, you are required to observe the relevant safety regulations.
- Take necessary measures to ensure that the power supply cannot be reconnected inadvertently.
- Take care while performing adjustment work on live parts. Never remove any covers!

To avoid damage to any equipment, the following also applies:

- Proper shipping and appropriate storage are assumed.

Note: *The control valves fulfill the requirements of the European Pressure Equipment Directive 97/23/EC. Valves with a CE marking have a declaration of conformity which includes information about the applied conformity assessment procedure.*
The declaration of conformity is available on request.

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2 Design and principle of operation

Fig. 2

The medium flows through the single-seated globe valve in the direction indicated by the arrow. The position of the plug (3) determines the flow rate across the area released between plug and valve seat (2).

The linear actuating force is transmitted directly over the actuator stem (7) to the plug stem (5). When the actuator stem extends, the valve plug (3) moves in the closing direction. The plug stem follows the actuator stem owing to the force of the valve spring (4) as the actuator stem retracts, causing the valve to open.

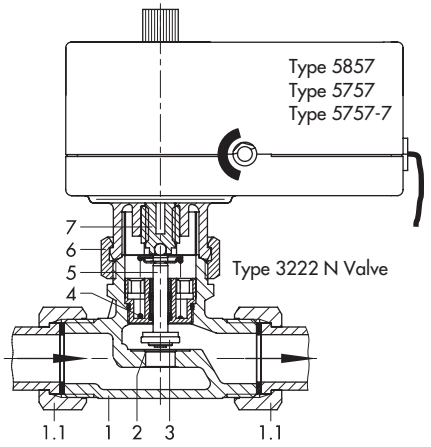
The valve (1) and actuator have a force-locking connection. An intermediate insulating piece can be used for insulated pipelines.

Electric actuator

The Type 5857 Electric Actuator can either be controlled using a three-stepping point signal or, in the version with positioner, with continuous signals which can be adjusted in ranges from 0 to 20 mA or 0 to 10 V.

Controllers with electric actuators

The actuator consists of a digital controller which is integrated into the electric actuator housing. Type 5757 is suitable for domestic hot water heating, whereas Type 5757-7 is suited for heating and cooling applications. They are controlled by continuous signals which can be adjusted in ranges from 0 to 20 mA or 0 to 10 V.



1 Valve body
1.1 Connection nut with gasket and welding ends (accessories)
2 Seat
3 Plug
4 Valve spring
5 Plug stem
6 Coupling nut
7 Actuator stem

Fig. 2 · Functional diagram

2.1 Technical data

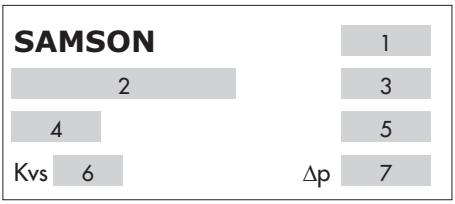
Table 1 · Technical data: Type 3222 N Globe Valve		
Nominal size		
Connection		ISO 228/1-G ¾ B
Type of end connections (optional)		Threaded ends G ½ · Welding ends · Soldering ends
Nominal pressure		PN 16
K_{VS} coefficient	Standard	2.5
	Special version	0.25 · 0.4 · 0.63 · 1 · 1.6
Valve travel		6 mm
Characteristic		Equal percentage
Pressure balancing		None
Max. perm. differential pressure Δp		6 bar
Type of sealing	$K_{VS} \leq 1$	Metal sealing
	K_{VS} = 1.6, 2.5	Soft sealing
Leakage rate acc. to DIN EN 60534-4		Class I (0.05 % of the K_{VS} coefficient)
Max. permissible temperature		120 °C
Max. permissible medium temperature	Treated water	120 °C
	Non-flammable gases	80 °C
z value		0.43

Table 2 · Materials: Type 3222 N Valve		
Valve body		CW602N (brass)
Plug	Up to K_{VS} = 1	1.4305
	K_{VS} = 1.6, 2.5	1.4305 with EPDM sealing ring
Plug stem		1.4305
Seat	Up to K_{VS} = 1	1.4305
	K_{VS} = 1.6, 2.5	CW602N (brass)
Valve spring		1.4310 K
Welding ends		1.0254 (St 37)
Threaded ends		Brass
Soldering ends		CC491K (red casting brass, Rg 5)
Intermediate insulating piece (1990-1712)		1.4305, CW617N (brass), PTFE, EPDM, FPM

2.2 Possible combinations

Type 3222 N Globe Valve/actuator		
Type	Fail-safe action	Nominal size
Electric actuator		
5857	Without	DN 15
Controller with electric actuator for domestic hot water heating		
5757	Without	DN 15
Controller with electric actuator for heating and cooling applications		
5757-7	Without	DN 15

2.3 Nameplate



1 Type designation
2 Configuration ID (Var.-ID)
3 Date of manufacture
4 Model number
5 Max. permissible temperature
6 K_{VS} coefficient
7 Max. permissible differential pressure

2.4 Customer inquiries

Please submit the following details:

- Type designation
- Configuration ID (Var.-ID)
- Date of manufacture

3 Installation

If the valve and actuator are delivered separately, first install the valve in the pipeline and then mount the actuator.

3.1 Mounting position

- Choose the place of installation where the ambient temperature does not exceed or fall below the permissible limits specified for the actuator and that allows you to freely access the control valve even after the entire plant has been completed.
- Flush the pipeline thoroughly before installation.
- Never install the valve with the actuator suspended downwards.
- Install a strainer (SAMSON Type 2 NI) upstream of the control valve to prevent any sealing parts, weld spatter or other foreign matter carried along by the process medium from impairing the proper functioning of the valve, in particular, the tight shut-off.
- The valve must be installed free of stress. If necessary, support the piping near the connections.

3.2 Strainer

- Install the strainer with the filter element facing downwards upstream of the valve inlet.
- Choose the place of installation to allow enough space to remove the filter.
- Install the strainer with the flow direction as indicated by the arrow on the body.

3.3 Additional installation instructions

We recommend to install a hand-operated shut-off valve both upstream of the strainer and downstream of the control valve to be able to shut down the plant for cleaning and maintenance, and when the plant is not used for longer periods of time.

4 Mounting, connecting and configuring the actuator

NOTICE
The instructions to mount the valve onto the actuator, to perform electrical connections as well as to configure the actuator are described in detail in the Mounting and Operating Instructions (EB) of the actuator:
- *Refer to EB 5857 EN for Type 5857 Electric Actuator*
- *Refer to EB 5757 EN for Type 5757 Controller with Electric Actuator*
- *Refer to EB 5757-7 EN for Type 5757-7 Controller with Electric Actuator*

It is essential to read the Mounting and Operating Instructions of the corresponding actuator.

4.1 Mounting

Mount the actuator onto the valve connection/intermediate insulating piece as described in the corresponding Mounting and Operating Instructions.

4.2 Connection

Perform the electrical connection of the actuator as described in the corresponding Mounting and Operating Instructions.

4.3 Configuration

The electric actuator versions with positioner and the controllers with electric actuator can be adapted to the control task.

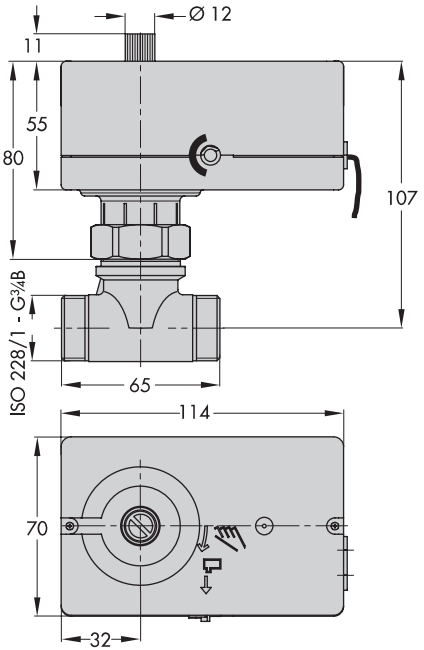
Configure the actuator as described in the corresponding Mounting and Operating Instructions.

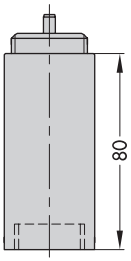
5 Maintenance

WARNING!
For maintenance work on the valve, make sure the relevant section of the pipeline is depressurized and, depending on the process medium, drained as well.
For high medium temperatures, allow the section of the pipeline to cool down before you start.
Make sure the control signal for the actuator is switched off.

The control valve is subject to natural wear. Depending on the conditions the valve is operated in, it needs to be checked at regular intervals.
If leakage to the atmosphere occurs, disassemble the valve and replace the damaged parts.

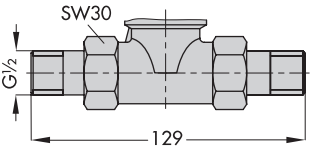
6 Dimensions and weights



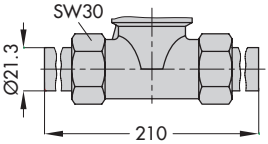


Intermediate insulating piece

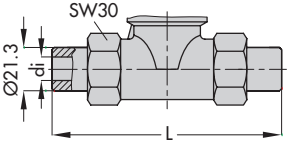
Type 3222 N/5857 (basic version)
Type 3222 N Valve with Type 5857 Actuator



Version with threaded ends



Version with welding ends



Version with soldering ends

Weights:

Valve without actuator: Approx. 0.3 kg
Valve with actuator: Approx. 1.0 kg

Inside ∅ di	15	18
Length L	107	103

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