

# Electric Control Valves Types 3222/5857, 3222/5824, 3222/5825

## Pneumatic Control Valves Types 3222/2780-1, 3222/2780-2

### Single-seated Globe Valve Type 3222



#### Application

Control valves for heating, ventilation, and air-conditioning systems

DN 15 to DN 50, G ½ to G 1 · PN 25 · Version up to 150 °C (for water, oil, and other liquids) · Version up to 200 °C (for water and steam)



The control valves consist of a single-seated Type 3222 Globe Valve and either a force-locking electric actuator or a pneumatic actuator.

#### Special features

- Single-seated globe valves partly available with balanced valve plugs
- Single-seated globe valves optionally available with welding ends, threaded ends, flanges or screwed ends with female thread as well as with flanged valve body
- Force-locking connection between valve and actuator

#### Versions

Electric control valves		
Type 3222/5857 · Fig. 1	PN 25	DN 15 to 25 G ½ to G 1
Type 3222/5824	PN 25	DN 15 to 50 G ½ to G 1
Type 3222/5825 <sup>1)</sup> · Fig. 2	PN 25	DN 15 to 50 G ½ to G 1
Pneumatic control valves		
Type 3222/2780-1 · Fig. 3	PN 25	DN 15 to 50 G ½ to G 1
Type 3222/2780-2 <sup>2)</sup> · Fig. 4	PN 25	DN 15 to 50 G ½ to G 1

<sup>1)</sup> Electric control valve with safety function: Type 5825

<sup>2)</sup> Pneumatic actuator suitable for integral positioner attachment

#### Register number

The valves mounted on Type 5725 Actuator for fail-safe action "Actuator stem extends" are type-tested according to DIN 32730 by the German technical inspectorate TÜV. The register number is available on request.

#### Also available:

- Single-seated Type 3222 Globe Valve mounted on controller with electric actuator (refer to Data Sheet T 5766 EN)
- Type 3222 N/5857 Electric Control Valve, suitable for local heat supply and large heating networks (refer to T 5867 EN)
- Type 3222 N/5757 Globe Valve/Controller with Electric Actuator, suitable for local heat supply and large heating networks (refer to T 5767 EN)

Fig. 1 · Type 3222/5857  
(version with  
welding ends)



Fig. 2 · Type 3222/5825  
(flanged body version)

Fig. 3 · Type 3222/2780-1  
(flanged body version)



Fig. 4 · Type 3222/2780-2  
with positioner  
(version with  
welding ends)

### Principle of operation (Figs. 5, 6 and 7)

The medium flows through the single-seated globe valve in the direction indicated by the arrow.

The position of the valve plug determines the cross-sectional area of flow released between the plug (3) and seat (2). The plug stem (4) with the plug is attached to the connecting rod of the actuator (10) over a force-locking connection. The valve is opened by the valve spring (5) when the actuator stem retracts.

A special version (Fig. 6) is required for water with temperatures above 150 °C and for steam. The plug is positioned by changes in the control signal which act on the actuator. This is a three-point stepping signal for Type 5824, Type 5825 and Type 5857 Electric Actuators or an analog signal of 0(4) to 20 mA or 0(2) to 10 V when an additional electric positioner is used.

The electric actuator with safety function (Type 5825) is equipped with a spring assembly and an electromagnet that can be connected to a safety interlock circuit. When the control circuit is interrupted or the power supply fails, the magnet disengages the gear from the self-locking motor and releases the spring assembly. Depending on the actuator version, the valve is either closed or opened. In version "Actuator stem extends", the actuator springs cause the valve to close, whereas they cause the valve to open in version "Actuator stem retracts".

A control signal between 0.4 and 1 bar is applied to the loading pressure connection of the Type 2780-1 Pneumatic Actuator and 0.4 to 2 bar in Type 2780-2 Pneumatic Actuator.

### Electric actuators

The electric actuators can be fitted with the additional accessories.

Refer to Data Sheet for details

Type 5857 → Data Sheet T 5857 EN

Type 5724/5725 → Data Sheet T 5724 EN

### Pneumatic actuators

Type 2780-1/-2 Pneumatic Actuators are available with the fail-safe action "Actuator stem extends" (FA) and "Actuator stem retracts" (FE). The Type 2780-2 Actuator can additionally be fitted with a Type 3760 Positioner.

Refer to Data Sheet for details

Type 2780-1/-2 → Data Sheet T 5840 EN

### Legend

- |   |              |    |                   |
|---|--------------|----|-------------------|
| 1 | Valve body   | 6  | Guide nipple      |
| 2 | Seat         | 7  | Balancing bellows |
| 3 | Plug         | 8  | Balancing piston  |
| 4 | Plug stem    | 10 | Actuator          |
| 5 | Valve spring |    |                   |

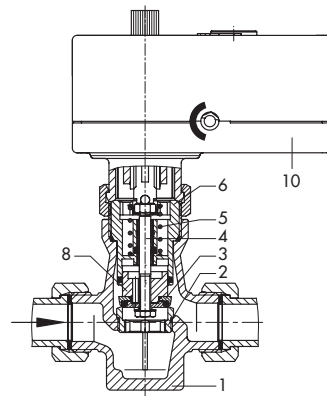


Fig. 5 · Functional diagram of Type 3222/5857

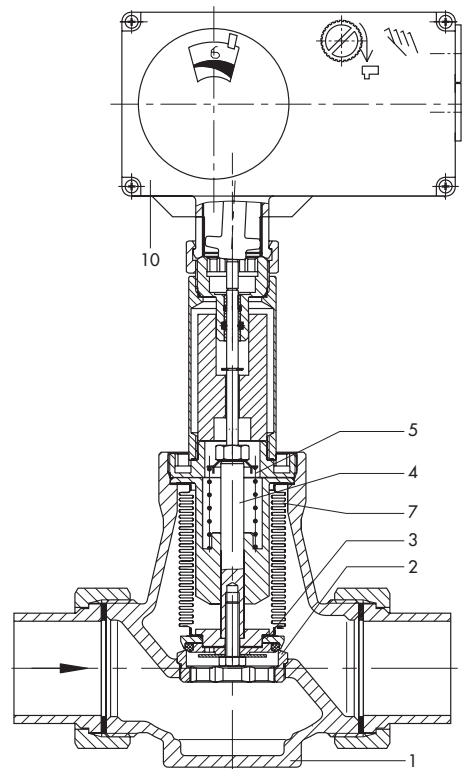


Fig. 6 · Functional diagram of Type 3222/5824

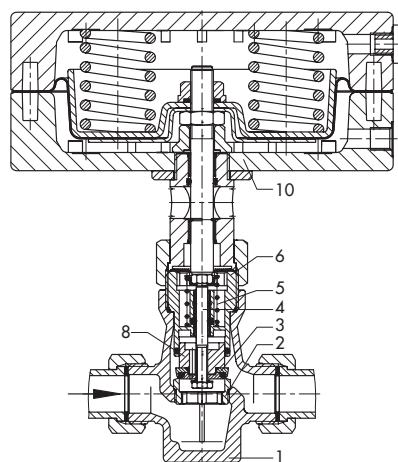


Fig. 7 · Functional diagram of Type 3222/2780-1

## Installation

The control valve can be mounted in any desired position for applications with liquids up to 150 °C; however, the actuator must not be suspended downwards. The special version for steam must only be installed with the actuator in the upright position.

In case the valve is to be insulated, the actuator and coupling nut to connect the stems should not be insulated as well. In addition, check whether the permissible ambient temperature cannot be exceeded. If necessary, an intermediate insulating piece must be used; it should only be insulated up to 25 mm.

## Ordering text

- Electric Control Valve · Type 3222/5824, Type 3222/5825 or Type 3222/5857  
Power supply 24/230 V, 50 Hz  
Optional additional accessories
- Pneumatic Control Valve  
Type 3222/2780-1 or Type 3222/2780-2  
Fail-safe position: Actuator stem extends/retracts  
Type 2780-1: Loading pressure connection G 1/8"/1/8" NPT
- DN ..., G ..., K<sub>VS</sub> ...
- Version up to 150 °C/200 °C
- With/without intermediate insulating piece (version for water, oil and other liquids only)
- Welding ends, threaded ends, flanges, screwed ends with female thread or flanged valve body

**Table 1 · Technical data**

Nominal size	DN	15	20	25	32	40	50
Version with threaded ends		•	•	•	•	•	•
Version with flanges		•	•	•	•	•	•
Flanged valve body version		•	•	•	•	•	•
Thread size	G	1/2	3/4	1	–	–	–
Version with female thread		•	•	•	–	–	–
Nominal pressure	PN	25					
Seat/plug sealing		Metal sealing for K <sub>VS</sub> ≤ 2.5 · Soft sealing for K <sub>VS</sub> ≥ 3.6					
Rated travel	mm	6			12		
Rangeability		50 : 1					
Leakage class acc. to DIN EN 1349		Class I (< 0.05 % of K <sub>VS</sub> )					
<b>Version for water, oil, and other liquids</b>							
Max. permissible temperature		150 °C <sup>1, 2)</sup>					
Max. permissible differential pressure Δp in bar							
Types 5824 and 5825		20	20	20	12	12	12
Type 5857		20	20	20	–	–	–
<b>Versions for water above 150 °C and steam</b>							
Max. permissible temperature		200 °C					
Max. permissible differential pressure Δp in bar							
Types 5824 and 5825		20 · 10 for 3.6 ≤ K <sub>VS</sub> ≤ 8			8	8	8
Type 5857		20 <sup>3)</sup> · 5 <sup>4)</sup>	5	5	–	–	–

1) For temperatures above 130 °C, use an intermediate insulating piece to protect the actuator

2) DN 15 to 25 with Type 5757 Actuator for liquids up to 120 °C

3) Differential pressure with K<sub>VS</sub> = 1 and 1.6

4) Differential pressure with K<sub>VS</sub> = 2.5 and 4

**Table 2 · Materials**

Nominal size	DN	15	20	25	32	40	50
Thread size	G	½	¾	1	–	–	–
Valve body		Red brass CC491K (G-CuSn5ZnPb)					
Flanged valve body version		EN-JS1049 (GGG-40.3)					
Seat		Stainless steel 1.4104					
Plug		1.4104/CW509L (CuZn40) with soft sealing · 1.4104 with $0.1 \leq K_{VS} \leq 2.5$					
Valve spring		Stainless steel 1.4310 K					
Packing		EPDM/FPM (FKM) · Oil-resistant version: FPM					
Welding ends		St 37					
Threaded ends		CC491K (red brass)					
Screwed-on flanges		St 37.2					

**Table 3 · Overview: Nominal sizes and  $K_{VS}$  coefficients**

Nominal size	DN	15	20	25	32	40	50
Thread size	G	½	¾	1	–	–	–
$K_{VS}$ coefficients		4 <sup>1)</sup> · 3.6 <sup>2)</sup>	6.3 <sup>1)</sup> · 5.7 <sup>2)</sup>	8 <sup>1)</sup> · 7.2 <sup>2)</sup>	16 <sup>1)</sup>	20 <sup>1)</sup>	25 <sup>1)</sup>
Reduced $K_{VS}$ coefficients		0.1 · 0.16 · 0.25 · 0.4 · 0.63 · 1.0 · 1.6 · 2.5	1.0 · 1.6 · 2.5 · 4 <sup>1)</sup> · 3.6 <sup>2)</sup>		–	–	–
Rated travel	mm	6			12		

1) Version with male thread or flanged valve body version

2) Version with female thread

**Table 4 · Possible combinations for Type 3222 Globe Valves/actuators**

Actuator	Type	Refer to Data Sheet	Nominal size DN					
			15	20	25	32	40	50
Electric, <b>without</b> safety function	5857	T 5857 EN	•	•	•	–	–	–
	5824-10	T 5824 EN	•	•	•	–	–	–
	5824-13		•	•	•	–	–	–
	5824-20		–	–	–	•	•	•
	5824-23		–	–	–	•	•	•
Electric, <b>with</b> safety function <sup>1)</sup>	5825-15	T 5824 EN	•	•	•	–	–	–
	5825-25		–	–	–	•	•	•
Electric, <b>with</b> safety function, <b>typetested</b> <sup>2)</sup>	5825-10	T 5824 EN	•	•	•	–	–	–
	5825-13		•	•	•	–	–	–
	5825-20		–	–	–	•	•	•
	5825-23		–	–	–	•	•	•
Pneumatic	2780-1	T 5840 EN	•	•	•	•	•	•
	2780-2		•	•	•	•	•	•

1) Fail-safe position: Actuator stem retracts

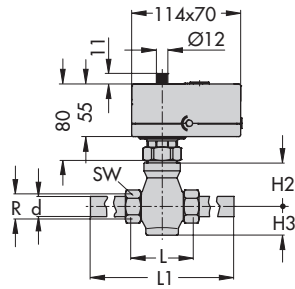
2) Fail-safe position: Actuator stem extends

**Table 5 · Dimensions and weights**

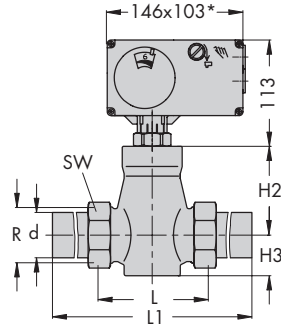
<b>Table 5.1 · Single-seated Type 3222 Globe Valve</b>							
<b>Nominal size</b>	DN	<b>15</b>	<b>20</b>	<b>25</b>	<b>32</b>	<b>40</b>	<b>50</b>
<b>Thread size</b>	G	½	¾	1	–	–	–
Pipe Ød	mm	21.3	26.8	33.7	42	48	60
Thread size R		G ¾	G 1	G 1¼	G 1¾	G 2	G 2½
Width across flats SW		30	36	46	59	65	82
Length	L	65	70	75	100	110	130
Length with welding ends L1	mm	210	234	244	268	294	330
Height H2	mm	45.5			94		
Versions for temp. up to 200 °C and intermediate insulating piece		140			185		
Height H3	mm	30			55		
Weight without actuator	kg	1.4	1.8	2.3	4.0	4.4	6.8
Versions for temp. up to 200 °C and intermediate insulating piece		1.9	2.3	2.8	4.5	4.9	7.3
<b>Version with threaded ends (male thread)</b>							
Length L2	mm	129	144	159	180	196	228
Male thread A		G ½	G ¾	G 1	G 1¼	G 1½	G 2
Weight without actuator	kg	1.4	1.8	2.3	4.0	4.4	6.8
Versions for temp. up to 200 °C and intermediate insulating piece		1.9	2.3	2.8	4.5	4.9	7.3
<b>Version with flanges</b>							
Length L3	mm	130	150	160	180	200	230
Weight without actuator	kg	2.5	3.4	4.1	6.9	7.7	10.7
Versions for temp. up to 200 °C and intermediate insulating piece		3.0	3.9	4.6	7.4	8.2	11.2
<b>Version with female thread</b>							
Length L4	mm	65	75	90		–	
Female thread	G	G ½	G ¾	G 1		–	
Weight without actuator	kg	1.2	1.4	1.5		–	
Versions for temp. up to 200 °C and intermediate insulating piece		1.7	1.9	2.0		–	
<b>Flanged valve body version</b>							
Height H2	mm	45.5			94		
Length L3	mm	130	150	160	180	200	230
Weight without actuator	kg	2.5	3.4	4.1	6.9	8.4	11.6
Versions for temp. up to 200 °C and intermediate insulating piece		3.0	3.9	4.6	7.4	8.9	12.1
<b>Table 5.2 · Actuators</b>							
	<b>Type</b>	<b>5824</b>	<b>5825</b>	<b>5857</b>	<b>2780-1</b>	<b>2780-2</b>	
Weight without valve, approx. kg		0.75	0.75	0.7	2.0	3.2	

Dimensions in mm

Electric control valves

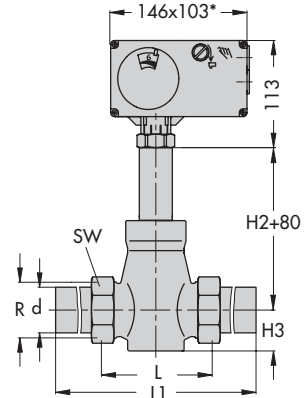


Type 3222/5757: DN 15 to 25  
Version with welding ends



Type 3222/5824-xx: DN 15 to 50  
Type 3222/5825-xx: DN 15 to 50  
Version with welding ends

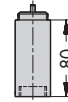
\* Dimensions for Type 582x-x3: Actuators  
146 x 136



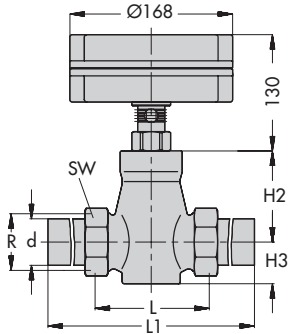
Version for water above 150 °C and steam  
Type 3222/5824-xx: DN 15 to 50  
Type 3222/5825-xx: DN 15 to 50  
Version with welding ends

\* Dimensions for Type 582x-x3: Actuators  
146 x 136

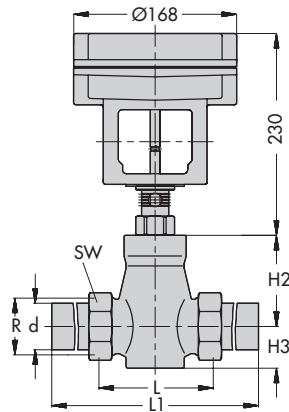
Pneumatic control valves



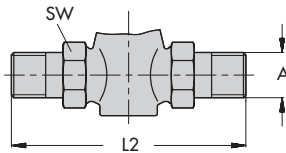
Intermediate  
insulating piece



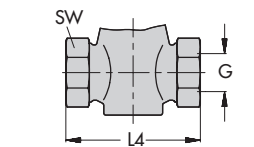
Type 3222/2780-1: DN 15 to 50  
Version with welding ends



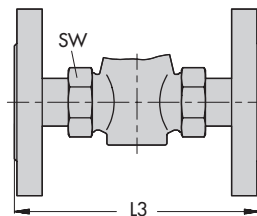
Type 3222/2780-2: DN 15 to 50  
Version with welding ends



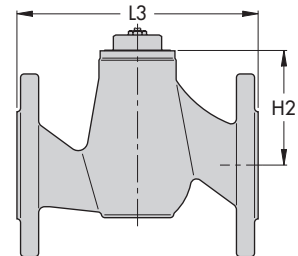
Version with threaded ends



Version with female thread



Version with flanges



Flanged valve body version

Specifications subject to change without notice.

