DATA SHEET

T 5863 EN

Type 3226 Three-way Valve

Types 3226/5857, 3226/5827, 3226/5757-7, 3226/5724-8, 3226/5725-8 Electric Control Valves

Type 3226/2780 Pneumatic Control Valve

Application

Control valves available as mixing or diverting valves for use in heating, ventilation and air-conditioning systems

DN 15 to 50, G ½ to 1 · PN 25 · Up to 150 °C

(water and non-flammable gases)



Fig. 1: *Type 3226/5827 · Version with male thread connections*



Fig. 2: *Type 3226/2780-1 · Version with male thread connections and welding ends*

Special features

- Type 3226 Three-way Valve designed as a **mixing valve** with male thread connections and welding ends or threaded ends (DN 15 to 50) or with female thread (G ½ to G 1)
- Type 3226 Three-way Valve designed as a **diverting valve** with male thread connections and welding ends or threaded ends (DN 15 to 50)
- Type 3226 Three-way Valve combined with Type 5857 and TROVIS 5757-7 Actuator (with special spring)
- Force-locking connection between valve and actuator
- Type 3226 Three-way Valve available as a mixing or diverting valve in special DVGW-tested version
- Valves to protect panel heating according to DIN 4747 can also be combined with electric actuators with fail-safe action

Versions

Electric control valves		
Type 3226/5857	PN 25	DN 15 to 25 · G ½ to 1
Type 3260/5827[1)]	PN 25	DN 15 to 50 · G ½ to 1
Electric control valves with electric actuator with process controller for heating and cooling applications		
Type 3226/5757-7	PN 25	DN 15 to 25 · G ½ to 1
Type 3226/5724-8	PN 25	DN 15 to 50 · G ½ to 1
Type 3226/5725-8[1)]	PN 25	DN 15 to 50 · G ½ to 1

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Pneumatic control valves		
Type 3226/2780-1	PN 25	DN 15 to 50 · G ½ to 1
Type 3226/2780-2[2)]	PN 25	DN 15 to 50 · G ½ to 1

[1)] Electric actuators also with fail-safe action

[2)] Pneumatic actuator suitable for integral positioner attachment

Also available:

– Type 3260 Three-way Valve with flanges (see Data Sheet ▶ T 5861)

Principle of operation

The three-way valve in the version with male thread connections is designed as either a mixing or diverting valve. These valves vary in the plug arrangement and must be installed accordingly.

The version with female thread is only available as a mixing valve.

The process medium flows through the three-way valve in the direction indicated by the arrow. The position of the plug (3) determines the cross-sectional area of flow between the plug and the seat (2). The plug (3) follows the actuator stem, which is changed by the control signal acting on the actuator (8), owing to the force of the valve spring (5).

The valve (1) and actuator (8) have a force-locking connection.

An intermediate insulating piece is available for insulated pipes.

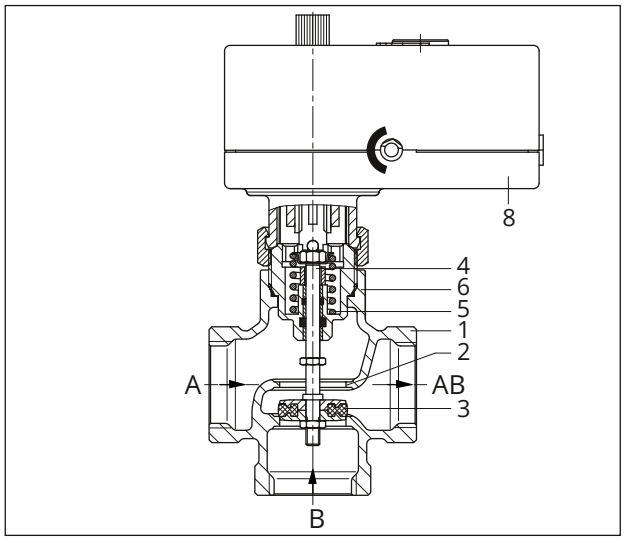


Fig. 3: *Type 3226/5857 · Mixing valve*

1	Valve body	5	Valve spring
2	Seat	6	Adapter
3	Plug	8	Actuator
4	Plug stem		

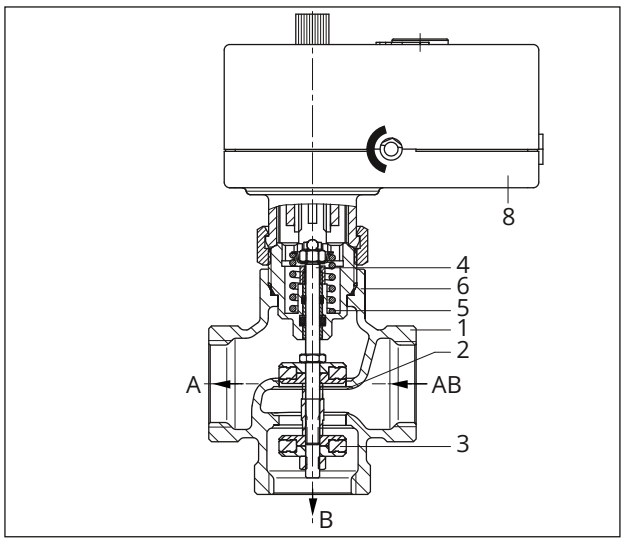


Fig. 4: *Type 3226/5857 · Diverting valve*

1	Valve body	5	Valve spring
2	Seat	6	Adapter
3	Plug	8	Actuator
4	Plug stem		

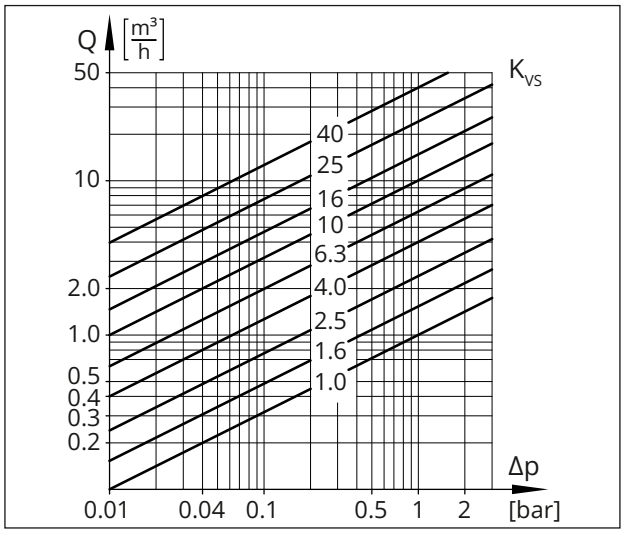


Fig. 5: *Flow rate diagram for water*

Fail-safe positions

When the valve is combined with a pneumatic actuator with integrated springs or an electric actuator with fail-safe action, the control valve has two different fail-safe positions that become effective when the supply air or control signal fails:

– **Actuator stem extends:**
When the signal pressure is reduced or the air supply fails, the springs move the actuator stem downward. Port **B** in mixing valves is closed and port **A** in diverting valves is closed.
– **Actuator stem retracts:**
When the signal pressure is reduced or the air supply fails, the springs move the actuator stem upward. Port **B** in mixing valves is opened and port **A** in diverting valves is opened.

Electric actuators

The Type 5857 and Type 5827 Electric Actuators can be controlled by three-step signals or, in the version with positioner, with signals from 0/4 to 20 mA or 0/2 to 10 V. Various electrical accessories can be optionally installed.

Types 5827-A and 5827-E Actuators are able to perform a fail-safe action (see Table 5).

Refer to the data sheets for more details on the electric actuators:

- ▶ **T 5857:** Type 5857 Electric Actuator
- ▶ **T 5827:** Type 5827 Electric Actuator

Electric actuators with process controller

Electric actuators with process controller are a combination of an electric actuator and a digital process controller. The TROVIS 5757-7, TROVIS 5724-8 and TROVIS 5725-8 Actuators are suitable for heating and cooling applications.

TROVIS 5724-8 and TROVIS 5725-8 have two PID control modules and are ready-wired.

TROVIS 5725-8 is able to perform a fail-safe action (see Table 5).

Refer to the data sheets for more details on the electric actuators with process controller:

- ▶ **T 5757-7:** TROVIS 5757-7 Electric Actuator with Process Controller for heating and cooling applications
- ▶ **T 5724-8:** TROVIS 5724-8 Electric Actuator with Process Controller without fail-safe action and TROVIS 5725-8 with fail-safe action for heating and cooling applications

Pneumatic actuators

The Type 2780-1 Pneumatic Actuator uses a control signal from 0.4 to 1 bar and Type 2780-2 uses a control signal from 0.4 to 2 bar which is applied to the signal pressure connection. The pneumatic actuators require a supply pressure of at least 0.2 bar above the maximum bench range.

The actuators are available for fail-safe action “actuator stem extends (FA)” or “actuator stem retracts (FE)”.

The Type 2780-2 Pneumatic Actuator is suitable for integral positioner attachment.

Refer to the data sheets for more details on the pneumatic actuators:

- ▶ **T 5840:** Type 2780-1 and Type 2780-2 Pneumatic Actuators

Installation of the control valve

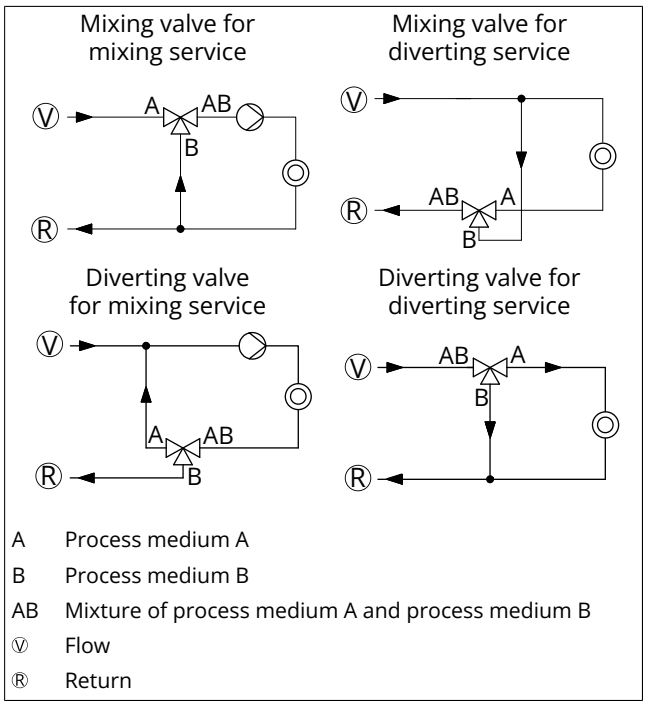
The control valves can be mounted in any position. However, the electric actuators (with process controller) must not be suspended downwards.

The actuator mounted on the valve bonnet is designed for a maximum ambient temperature of 50 °C. This limit must not be exceeded. Make sure that the inlet and outlet flows of the plant are correctly assigned to ports A, B and AB. Table 1 shows a few examples.

Install strainers (e.g. Type 1 N) upstream of the inlets of valves mounted on actuators with fail-safe action.

If the control valve is to be insulated, the actuator and the coupling nut must not be insulated as well. Make sure the permissible ambient temperature is not exceeded. If necessary, an intermediate insulating piece must be used. Do not insulate it over 25 mm.

Table 1: *Typical installations*



A	Process medium A
B	Process medium B
AB	Mixture of process medium A and process medium B
Ⓥ	Flow
Ⓡ	Return

Ordering text

Type … Control Valve:

❑ 3226/5857, ❑ 3226/5827-…, ❑ 3226/5757-7,
❑ 3226/5724-8, ❑ 3226/5725-8, ❑ 3226/2780-1,
❑ 3226/2780-2

- Valve type: ❑ mixing valve, ❑ diverting valve
- End connections:
  ❑ male thread connections and welding ends
  DN …
  ❑ male thread connections and threaded ends
  DN …
  ❑ female thread G …
- K_{VS} coefficient: …
- Medium temperature: …
- DVGW version: ❑ yes, ❑ no

Further specifications on the electric actuator

- Control: ❑ three-step signal, ❑ positioner
- Supply voltage …
- Electric additional equipment …

Further specifications on the pneumatic actuator

- Signal pressure connection for Type 2780-1:
  ❑ G ⅛, ❑ ⅛ NPT
- Fail-safe action: ❑ stem extends (FA), ❑ stem retracts (FE)

Table 2: *Technical data for Type 3226*

Nominal size	**Mixing or diverting valve with male thread connections**	**DN**	**15**	**20**	**25**	**32**	**40**	**50**
Thread size	**Mixing valve with female thread**	**G**	**½**	**¾**	**1**	**–**	**–**	**–**
Pressure rating		PN	25					
DVGW version		PN	10					
Permissible temperature range		°C	+5 (-15) to +150[1)]					
DVGW version		°C	+5 to +90 °C					
Permissible differential pressure for actuators								
Type 5857, TROVIS 5757-7		bar	4	2.6	1.8	–	–	–
Type 5827, TROVIS 5724-8, TROVIS 5725-7, TROVIS 5725-8, Type 2780		bar	4	4	4	1.7	1.1	1.1
Rated travel		mm	6	6	6	12	12	12
Seat-plug seal			Soft seal					
Leakage class according to DIN EN 60534-4			IV (≤0.01 % of K_{VS})					
Conformity			CE					

1) Use an intermediate insulating piece (1990-1712):
- For medium temperatures between -15 and +5 °C (actuators according to Table 5)
- In networks with a constant medium temperature >135 °C (TROVIS 5724-8, TROVIS 5725-8 and Type 5827 Actuators)
- For liquids >120 °C (TROVIS 5757-7 and Type 5857 Actuators)

Table 3: *Materials for Type 3226*

Valve body	CC499K (CuSn5Zn5Pb2-C)
Plug	CW617N (CuZn40Pb2zh) with EPDM
Packing	O-rings made of EPDM
Welding ends	1.0460
Threaded ends	Red brass

Table 4: *Nominal sizes and K_{VS} coefficients for Type 3226*

Nominal size	**Mixing or diverting valve with male thread connections**	**DN**	**15**				**20**	**25**	**32**	**40**	**50**
Thread size	**Mixing valve with female thread**	**G**	**½**				**¾**	**1**	**–**	**–**	**–**
K_{VS} coefficient			1.0	1.6	2.5	4	6.3	10	16	25	40
Rated travel		mm	6	6	6	6	6	6	12	12	12

Table 5: *Available versions and possible combinations (valve/actuator)*

Type 3226 Three-way Valve/actuator													
Type/ TROVIS	Fail-safe action: actuator stem		Details in	Nominal size DN						Thread size G		
	Extends	Retracts		15	20	25	32	40	50	½	¾	1
Electric actuators												
5857[1)]	–	–	▶ T 5857	•	•	•	–	–	–	•	•	•
5827-N1	–	–	▶ T 5827	•	•	•	–	–	–	•	•	•
5827-A1	•	–	▶ T 5827	•	•	•	–	–	–	•	•	•
5827-E1	–	•	▶ T 5857	•	•	•	–	–	–	•	•	•
5827-N2	–	–	▶ T 5827	–	–	–	•	•	•	–	–	–
5827-A2	•	–	▶ T 5827	–	–	–	•	•	•	–	–	–
5827-E2	–	•	▶ T 5827	–	–	–	•	•	•	–	–	–
Electric actuators with process controller for heating and cooling applications												
5757-7[1)]	–	–	▶ T 5757-7	•	•	•	–	–	–	•	•	•
5724-810	–	–	▶ T 5724-8	•	•	•	–	–	–	•	•	•
5724-820	–	–	▶ T 5724-8	–	–	–	•	•	•	–	–	–
5725-810	•	–	▶ T 5724-8	•	•	•	–	–	–	•	•	•
5725-820	•	–	▶ T 5724-8	–	–	–	•	•	•	–	–	–
Pneumatic actuators												
2780-1	•	•	▶ T 5840	•	•	•	•	•	•	•	•	•
2780-2	•	•	▶ T 5840	•	•	•	•	•	•	•	•	•

[1)] The valve spring in the Type 3226 Valve intended for mounting on the Types 5857 and TROVIS 5757-7 Actuators is different from that of the Type 3226 intended for mounting on other actuators. Basically, actuators with a larger nominal thrust (e.g. Type 5827) may also be combined with valves for Type 5857 and TROVIS 5757-7 Actuators, however, not vice versa.

Table 6: *Dimensions and weights for Type 3226 Three-way Valve*

Valves with male thread connections							
Nominal size	**DN**	**15**	**20**	**25**	**32**	**40**	**50**
Length L	mm	65	70	75	100	110	130
Height H2	mm	41.5	41.5	41.5	52	52	52
Height H3	mm	40	40	40	60	65	65
... with welding ends							
Thread size R	G	¾	1	1¼	1¾	2	2½
Pipe Ød	mm	21.3	26.8	33.7	42	48	60
Width across flats (SW)		30	37	46	60	65	82
Length L2	mm	210	234	244	268	294	330
Height H4	mm	112	122	124	144	157	165
Weight without actuator	kg (approx.)	3.2	3.6	4.0	6.1	7.0	8.0
... with threaded ends							
Male thread A	G	½	¾	1	1¼	1½	2
Width across flats (SW)		30	37	46	60	65	82
Length L3	mm	129	144	159	192	206	228
Height H5	mm	72	77	82	106	113	114
Weight without actuator	kg (approx.)	3.2	3.6	4.0	6.1	7.0	8.0
Valves with female thread							
Thread size R1	**G**	**½**	**¾**	**1**	–		
Length L1	mm	65	75	90	–		
Height H1	mm	40	40	40			
Height H2	mm	41.5	41.5	41.5			
SW1		27	34	46			
Weight without actuator	kg (approx.)	0.9	1.1	1.3			

Table 7: *Weights for electric actuators*

	Type	**5857**	**5827-N**	**5827-A/-E**
Weight	kg (approx.)	0.7	0.75	1.0

Table 8: *Weights for electric actuators with process controller*

	TROVIS	**5757-7**	**5724-8**	**5725-8**
Weight	kg (approx.)	0.7	1.1	1.3

Table 9: *Weights for pneumatic actuators*

	Type	**2780-1**	**2780-2**
Weight	kg (approx.)	2	3.2

Dimensional drawings

Dimensions in mm

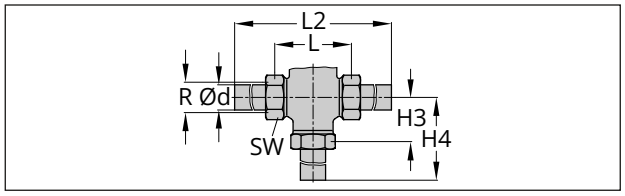


Fig. 6: *Type 3226 Three-way Valve with male thread connections and welding ends*

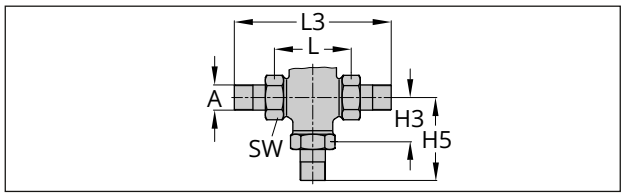


Fig. 7: *Type 3226 Three-way Valve with male thread connections and threaded ends*

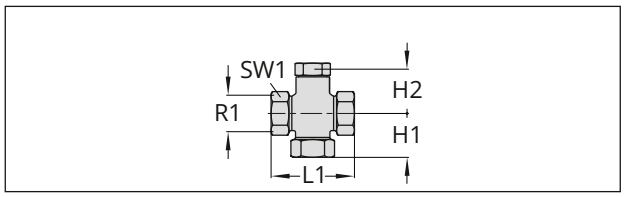


Fig. 8: *Type 3226 Three-way Valve with female thread*

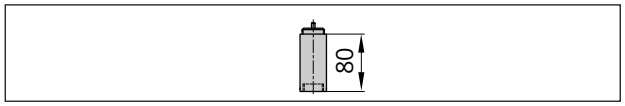


Fig. 9: *Intermediate insulating piece · Material number 1990-1712*

Electric control valves

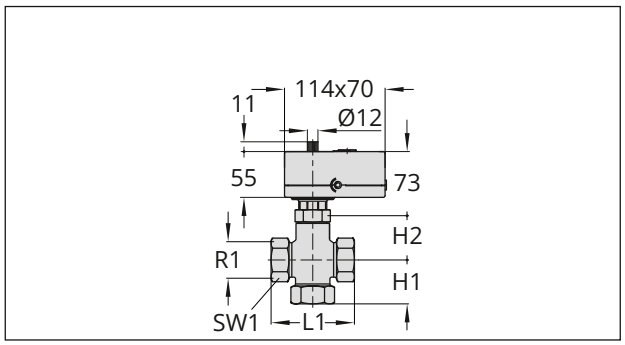


Fig. 10: *Type 3226/5857 Electric Control Valve:*
DN 15 to 25
Type 3226/5757-7: DN 15 to 25

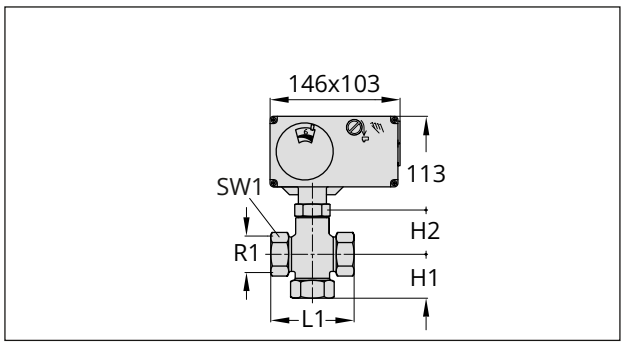


Fig. 11: *Type 3226/5724-8 Electric Control Valve:*
DN 15 to 50
Type 3226/5725-8: DN 15 to 50

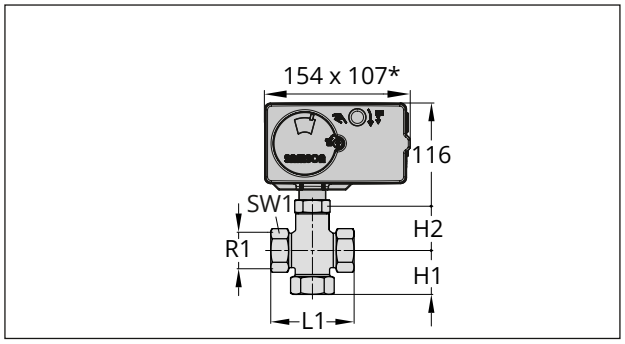


Fig. 12: *Type 3226/5827 Electric Control Valve:*
DN 15 to 50

* Dimensions for actuators with double stroking speed: 154x140

Pneumatic control valves

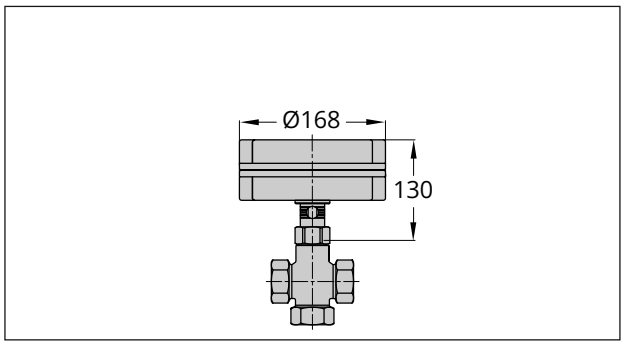


Fig. 13: *Type 3226/2780-1 Pneumatic Control Valve:*
DN 15 to 50

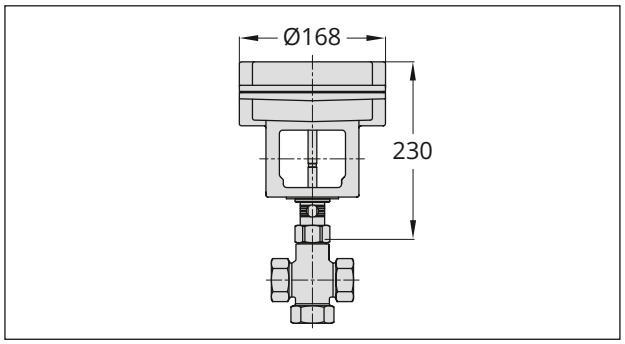


Fig. 14: *Type 3226/2780-2 Pneumatic Control Valve:*
DN 15 to 50