

Electric Control Valves

Types 3260/5857, 3260/5824, 3260/5825, 3260/3374,
3260/3274 and 3260/5757, 3260/5724, 3260/5725

SAMSON

Pneumatic Control Valves

Type 3260/2780, 3260/3372, 3260-1, 3260-7



Type 3260/5857
Type 3260/5757



Type 3260/5824
Type 3260/5724



Type 3260/3374



Type 3260/3274



Type 3260-1



Type 3260/2780-2



Type 3260/3372

Fig. 1 · Control valves

Mounting and Operating Instructions

EB 5861 EN

Edition October 2010



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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.

2 Design and principle of operation

Fig. 2

The three-way valve is primarily used as a mixing valve. The media to be mixed enter the valve at ports A and B. The combined flow exits the valve at port AB.

Flow-diverting valves are also available on request. The medium enters the valve at port AB and the partial flows exit at ports A and B.

The position of the plug stem (6) determines the cross-sectional area of flow between the plug (3) and the seat (2). The plug is moved by changing the control signal acting on the actuator.

The valve (1) and actuator have a force-locking connection up to DN 50 and a form-fit connection for sizes DN 65 and larger.

Fail-safe position

For three-way valves mounted to an actuator with fail-safe action, the control valve has two different positions which become effective upon power supply failure:

Actuator stem extends

- ▶ Port B of the mixing valve closes upon power supply failure
- ▶ Port A of the diverting valve closes upon power supply failure

Actuator stem retracts

- ▶ Port A of the mixing valve closes upon power supply failure
- ▶ Port B of the diverting valve closes upon power supply failure

Electric actuators

The Types 5857, 5824, 5825 and 3374 Electric Actuators as well as the Type 3274 Electrohydraulic Actuator can either be controlled using a three-stepping point signal or, in the version with positioner, with continuous signals from 0(4) to 20 mA or 0(2) to 10 V. Various optional electric accessories can be mounted onto the control valve.

Types 5825, 3274-21 and 3274-22 Actuators are able to perform a fail-safe action. Refer to Table 4.

Controllers with electric actuators

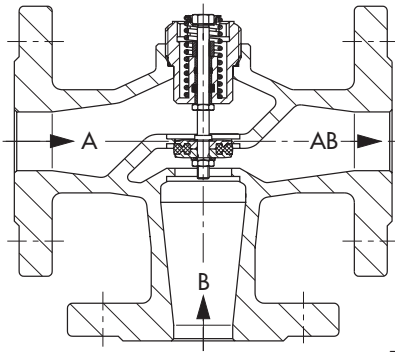
The actuator consists of a digital controller which is integrated into the electric actuator housing. The Types 5757-7 and 5725-7 Controllers with Electric Actuators are suited for heating and cooling applications. They are controlled by continuous signals which can be adjusted in ranges from 0 to 20 mA or 0 to 10 V.

Type 5725-7 is able to perform a fail-safe action. Refer to Table 4.

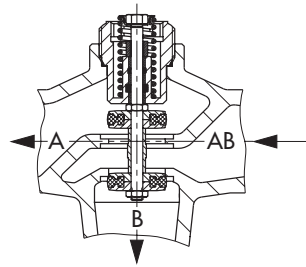
Pneumatic actuators

The Types 2780, 3271 and 3277 Pneumatic Actuators as well as the Type 3372 Electropneumatic Actuator work with various control signals. Types 2780, 3271 and 3277 Pneumatic Actuators require a supply pressure of at least 0.2 bar above the maximum bench range. A supply pressure of at least 3.7 bar is required for Type 3372.

All actuators are available for fail-safe action "Actuator stem extends (FA)" or "Actuator stem retracts (FE)".



Mixing valve

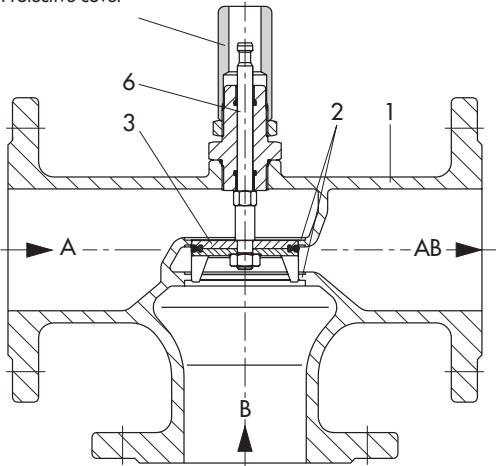


Flow-diverting valve

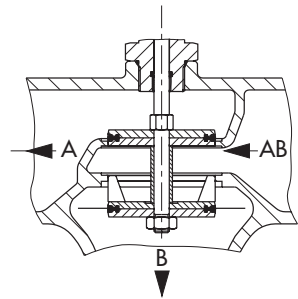
DN 15 to 50

- 1 Body
- 2 Seat
- 3 Plug
- 6 Plug stem

Protective cover



Mixing valve



Diverting valve

DN 65 to 150

Fig. 2 - Sectional drawings

Table 1 - Technical data: Type 3260 Three-way Valve

Nominal size	DN	15	20	25	32	40	50	65	80	100	125	150	
Nominal pressure	PN	16											
Permissible temperature range	°C	5 ¹⁾ to 150 ²⁾											
Seat/plug sealing		Soft sealing											
Rated travel	mm	6			12			15		30			
Mixing valve		•			•			•		•			
Diverting valve		•			•			•		•			
Leakage rate acc. to DIN EN 60534-4		Class IV (≤ 0.01 % of the K _{VS} coefficient)											

1) **Types 3260/5857, 3260/5824, 3260/5825, 3260/5757-7, 3260/5725-7:**

Use an intermediate insulating piece (1990-1712) for temperatures from -10 to +5 °C.

2) **Types 3260/5824, 3260/5825, 3260/5725-7:**

Use an intermediate insulating piece (1990-1712) for networks with constant media temperatures between 130 to 150 °C.

Types 3260/5857, 3260/5757-7:

Use an intermediate insulating piece (1990-1712) for networks with constant media temperatures between 120 to 150 °C.

Table 2 - Materials: Type 3260 Three-way Valve

Nominal size	DN	15	20	25	32	40	50	65	80	100	125	150	
Valve body and seat		Cast iron EN-JL1040 (GG-25)											
Plug		Brass · CuZn37Pb											
Plug stem		Stainless steel · 1.4305											
Seat/plug sealing		EPDM (standard) · FPM (special version)											
Stem sealing		EPDM seal ring											
Special version for oils		FPM seal											
Rod-type yoke		-							See actuator				

Table 3 - Nominal sizes, K_{VS} coefficients and seat diameters: Type 3260 Three-way Valve

Nominal size	DN	15				20	25	32	40	50	65	80	100	125	150
K _{VS} coefficient		1	1.6	2.5	4	6.3	10	16	25	40	60	80	160	250	320/ 250 ¹⁾
Seat ∅	mm	16	16	16	16	20	24	32	40	40	70	70	100	130	130
Rated travel	mm	6	6	6	6	6	6	12	12	12	15	15	30	30	30

1) Direction of flow

B -> AB with maximum K_{VS} coefficient

A -> AB with reduced K_{VS} coefficient

2.2 Possible combinations

Table 4 · Possible combinations: Type 3260 Three-way Valve/actuator													
Type	Fail-safe action: Actuator stem		Nominal size DN										
	extends	retracts	15	20	25	32	40	50	65	80	100	125	150
Electric actuators													
5857 ¹⁾	–	–	•	•	•								–
5824-10 ²⁾	–	–	•	•	•								–
5825-10 ²⁾	•	–	•	•	•								–
5825-15 ²⁾	–	•	•	•	•								–
5824-20 ²⁾	–	–				•	•	•					–
5825-20 ²⁾	•	–				•	•	•					–
5825-25 ²⁾	–	•				•	•	•					–
5824-30 ^{2) 4)}	–	–							•	•			–
3374-11	–	–							•	•			–
3374-10	–	–							•	•	•	•	•
3274-11 ³⁾	–	–							•	•	•	•	•
3274-15 ³⁾	–	–							•	•	•	•	•
3274-21 ³⁾	•	–							•	•	•	•	•
3274-22 ³⁾	–	•							•	•	•	•	•
Controller with electric actuator for heating and cooling applications													
5757-7 ¹⁾	–	–	•	•	•								–
5725-710	•	–	•	•	•								–
5725-715	–	•	•	•	•								–
5725-720	•	–				•	•	•					–
5725-725	–	•				•	•	•					–
Pneumatic actuators													
2780-1	•	•	•	•	•	•	•	•					–
2780-2	•	•	•	•	•	•	•	•					–

Table 4 · Possible combinations: Type 3260 Three-way Valve/actuator

Type	Fail-safe action: Actuator stem		Nominal size DN										
	extends	retracts	15	20	25	32	40	50	65	80	100	125	150
3372	•	•				–							•
3271 ³⁾	•	•				–							•
3277 ³⁾	•	•				–							•

1) Type 3260/5857 Control Valve requires a Type 3260 Valve (with special spring)

2) Version with half transit time on request

3) Type 3260 Three-way Valve in combination with these actuators with rod-type yoke:
DN 65 to 80: Order no. 1890-8696; for Types 3271/3277 with 240 cm² diaphragm area additionally order no. 0250-1450
DN 100 to 150: Order no. 1400-8822

4) Type 3260 Three-way Valve in combination with this actuator with rod-type yoke: Order no. 1400-7414

2.3 Permissible differential pressure

The specified differential pressure may be restricted by the pressure-temperature diagram. All pressures in bar

Table 5.1 · Electric Control Valves Type 3260/...

Type	5857	5824, 5825	3374		3274
	5757-7	5725-7	-11	-10	-11/-15/-21/-22
K_{VS} coefficients	Δp when $p_2 = 0$ bar				
1 · 1.6 · 2.5 · 4	4	4	–		
6.3	2.6	4	–		
10	1.8	4	–		
16	–	1.7	–		
25	–	1.1	–		
40	–	1.1	–		
60	–	1.3 ¹⁾	4	4	4
80	–	1.3 ¹⁾	4	4	4
160	–		2.8		1.9
250	–		1.7		1.1
320	–		1.7		1.1

1) Only with Type 5824-30 Electric Actuator

Table 5.2 · Pneumatic Control Valves Type 3260/...

Type		2780-1	2780-2	3372		3271 and 3277				
Effective diaphragm area	cm ²	120	120	120	120	240	240	350	350	700
Bench range	min. bar	0.4	0.4	1.4	2.1	0.4	0.6	0.4	0.6	0.4
	max. bar	1.0	2.0	2.3	3.3	2.0	3.0	2.0	3.0	2.0
Maximum supply pressure	bar	1.4 ¹⁾	2.4 ¹⁾	4	5	2.5	3.7	2.5	3.7	2.4
K _{vs} coefficient		Δp when p ₂ = 0 bar								
1 · 1.6 · 2.5 · 4		4	4	-						
6.3		4	4	-						
10		4	4	-						
16		1.7	1.7	-						
25		1.1	1.1	-						
40		1.1	1.1	-						
60		-	-	3.8	4	1.9	3.1	3	4	-
80		-	-	3.8	4	1.9	3.1	3	4	-
160		-								3.1
250		-								1.8
320		-								1.8

¹⁾ Only with spring-to-open, max. 4 bar with spring-to-close

2.4 Nameplate

SAMSON	1
2	3
kvs 4	7
PN 5	6

- 1 Type designation
- 2 Configuration ID (Var.-ID)
- 3 Date of manufacture
- 4 K_{vs} coefficient
- 5 Nominal pressure
- 6 Version
- Mixing valve Diverting valve
- 7 Max. perm. temperature

2.5 Customer inquiries

Please submit the following details:

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

3 Installation

3.1 Mounting position

The control valves can be mounted in any position. However, the electric actuators and the controllers with electric actuators must not be suspended downwards.

The valves are supplied as either mixing or diverting valves. They can be used for both mixing as well as diverting service (Fig. 3).

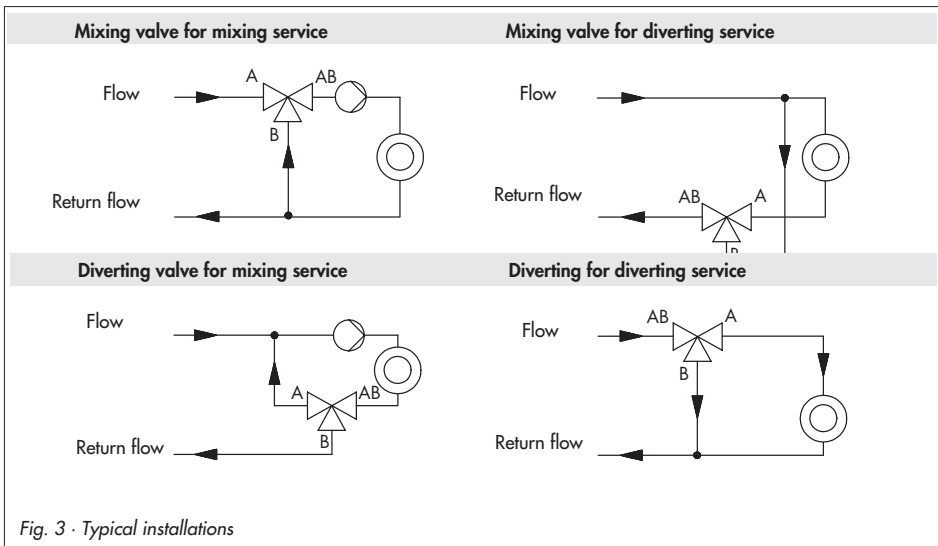
Make sure that the system-related arrangement of inlet and outlet located at the ports **A**, **B** and **AB** comply with the symbols on the body nameplate.

NOTICE

Install the valve free of stress and with the least amount of vibrations as possible.

Pipeline routing

To allow the control valve to work properly, the pipeline upstream and downstream of the valve must be straight and free of obstructions for a length of at least 6 times the pipe diameter (DN). Contact SAMSON if this length cannot be met during installation. Clean out the pipeline thoroughly prior to installing the valve.



Make sure you choose a place of installation that allows you to freely access the control valve even after the entire plant has been completed.

Thoroughly flush the pipelines prior to installation. Install a strainer (e.g. SAMSON Type 2 NI) at the respective valve inlet to prevent that any sealing parts, weld spatter and other impurities carried along by the process medium impair the proper functioning of the valve, above all the tight shut-off.

The valve must be installed free of stress. If necessary, support the piping near the connections.

3.2 Strainer

- ▶ Install a strainer upstream of the valve inlet with the filter element vertically suspended.
- ▶ Remember to leave enough space to remove the filter element.
- ▶ Install the strainer such that the direction of flow corresponds to the arrow.

3.3 Additional mounting instructions

We recommend to install a hand-operated shut-off valve 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 or pneumatic 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 5824-1 EN for Type 5824 Electric Actuator (three-stepping point signal) or EB 5824-2 EN for Type 5824 Electric Actuator (version with positioner)
- Refer to EB 5824-1 EN for Type 5825 Electric Actuator (three-stepping point signal) or EB 5824-2 EN for Type 5825 Electric Actuator (version with positioner)
- Refer to EB 8331 EN for Type 3374 Electric Actuator
- Refer to EB 8340 EN for Type 3274 Electrohydraulic Actuator
- Refer to EB 5757-7 EN for Type 5757-7 Controller with Electric Actuator
- Refer to EB 5725-7 EN for Type 5725-7 Controller with Electric Actuator
- Refer to EB 5840 EN for Type 2780 Pneumatic Actuator
- Refer to EB 8310 EN for Type 3271 Pneumatic Actuator
- Refer to EB 8311 EN for Type 3277 Pneumatic Actuator

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

4.1 Attachment

Note: Three-way valves in sizes DN 65 and larger are protected by a protective cover on the neck of the valve. Remove this cover before mounting the valve.

The Types 5857, 5824, 5825, 3374, 5757-7, 5725-7, 2780 and 3372 Actuators are mounted according to the Mounting and Operating Instructions of the actuators and using the mounting parts listed in Table 6, if applicable.

The Types 3274, 3271 and 3277 Actuators are mounted using the mounting parts listed in Table 6 according to the following description.

Mounting Type 3274 Actuator (Fig. 4)

1. Place yoke (9) on valve and fasten tight using hex nut (min. 100 Nm).
2. Fasten adapter (10) to the plug stem using the two stem connector clamps (7).
3. Place actuator on yoke (9) and fasten tight using hex nut (5).
4. Pull adapter up to reach the actuator stem. Position the two stem connector parts (11) and fasten tight.

Table 6 · Required mounting parts

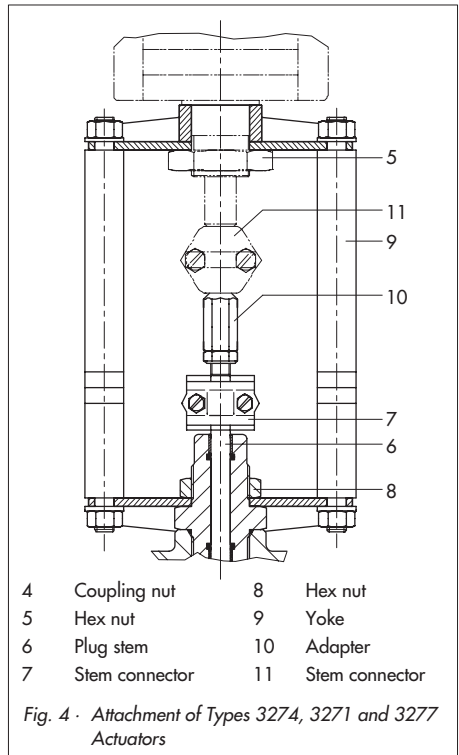
Actuator	DN 15 to 25	DN 32 to 50	DN 65 and 80	DN 100 to 150
5857	None	–	–	–
5824-10/-20	None		–	–
5824-30	–	–	Yoke 1400-7414	–
5825-10/-15/-20/-25	None			
3374-10/11	–	–	None	
3274-11/-15/-21/-22	–	–	Yoke 1890-8696	Yoke 1400-8822
5757-7	None	–	–	–
5724-710/-715/-720/-725	None		–	–
3372	–	–	None	–
2780-1/-2	None		–	–
3372	None		–	–
3271, 240 cm ²	–	–	Yoke 1890-8696 and nut 0250-1450	Yoke 1400-8822 and nut 0250-1450
3271, >240 cm ²	–	–	Yoke 1890-8696	Yoke 1400-8822
3277, 240 cm ²	–	–	Yoke 1890-8696 and nut 0250-1450	Yoke 1400-8822 and nut 0250-1450
3277, >240 cm ²	–	–	Yoke 1890-8696	Yoke 1400-8822

Mounting Types 3271 and 3277 Actuators
(Fig. 4)

1. Place yoke (9) on valve and fasten tight using hex nut (min. 100 Nm).
2. Type 3271 and Type 3277 Actuators with 350 and 700 cm²:
 - Fasten adapter (10) to the plug stem using the two stem connector clamps (7).
 Type 3271 and Type 3277 Actuators with 240 cm²:
 - Thread nut (0250-1450) onto plug stem (6).
 - Fasten adapter (10) to the nut (0250-1450) using the two stem connector clamps (7).
3. For actuators with fail-safe action "Actuator stem extends", apply air pressure slightly higher than the final value of the bench range to the loading pressure connection.
4. Place actuator on yoke (9) and fasten tight using hex nut (5).
5. Position the two stem connector parts (11) and fasten tight.

4.2 Connection

Perform the electrical or pneumatic connections 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.

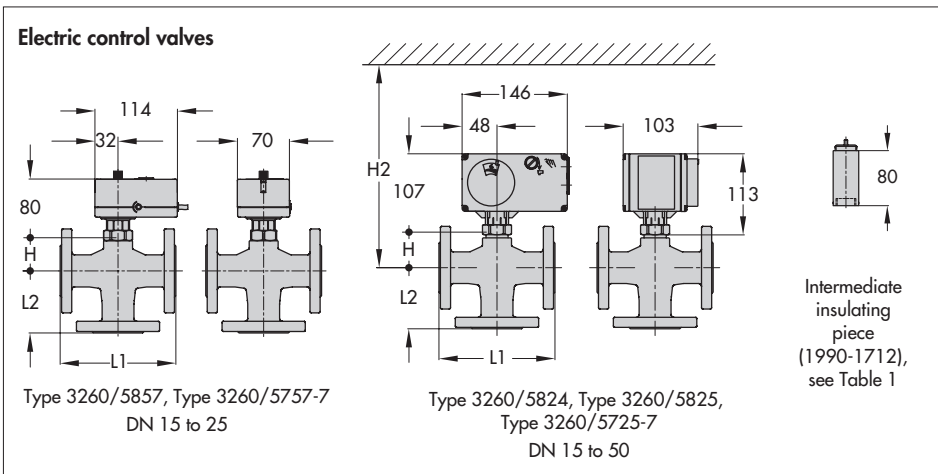
5 Dimensions and weights

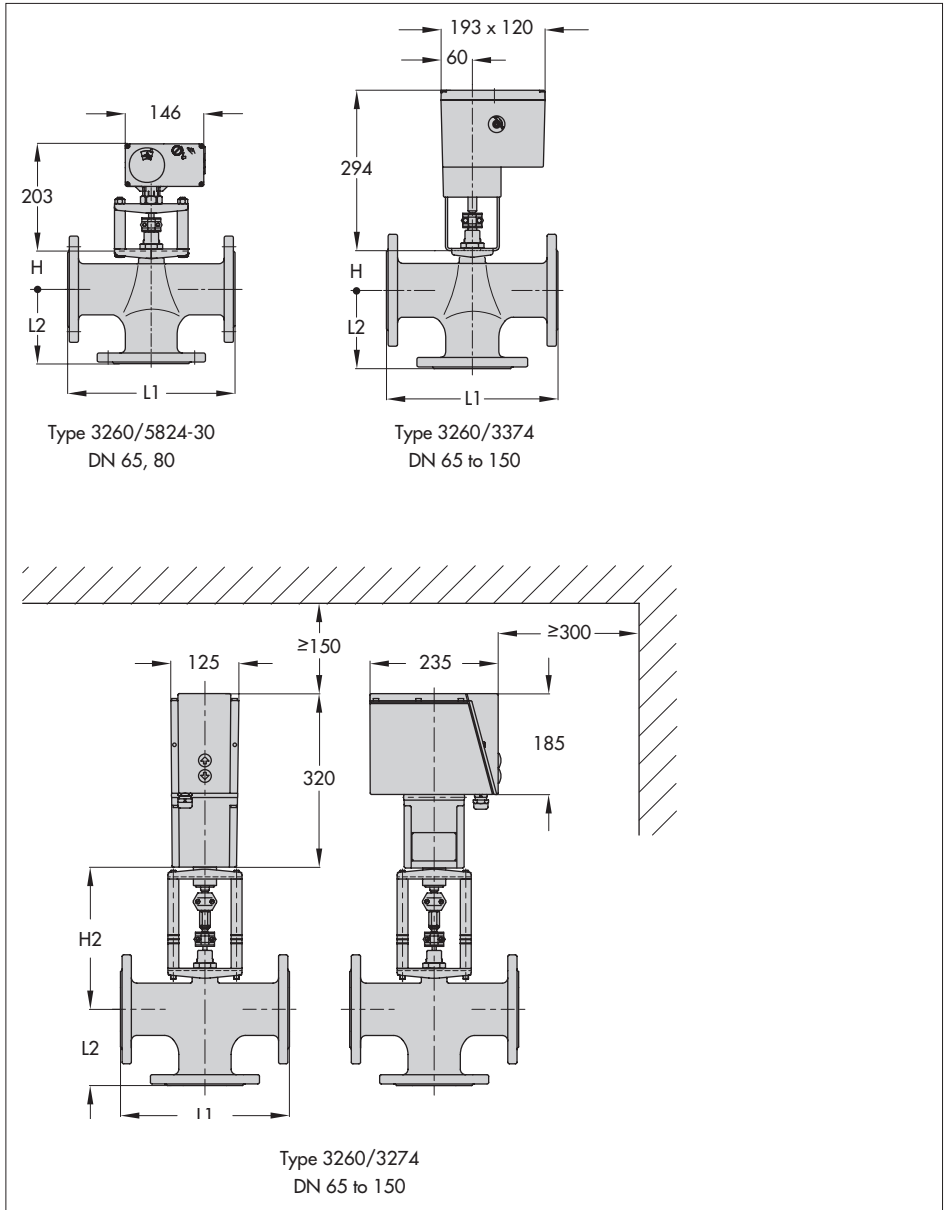
Nominal size	DN	15	20	25	32	40	50	65	80	100	125	150
Length L1		130	150	160	180	200	230	290	310	350	400	480
Length L2		70	80	85	100	105	120	130	140	150	200	210
Height H		51	51	51	61	61	61	71	71	112	112	112
Height H2		158	158	158	168	168	168	265	265	306	306	306
Weight without actuator	kg	4	5	5.5	8.5	10	12	20	23	38	50	65

Type	5857	5824	5825	3374	3274
Weight approx. kg	0.7	0.75	1.0	3.2	1)

1) Types 3274-11/-21/-22: 12 kg · Type 3274-15: 15 kg

Type	5757-7	5725-7
Weight approx. kg	0.7	1.3



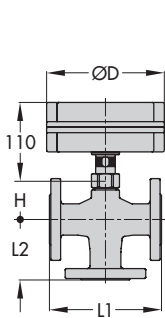


Dimensions and weights

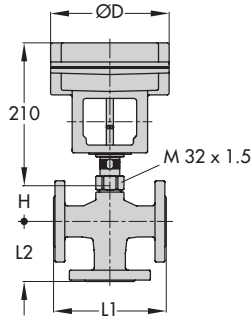
Nominal size DN		15	20	25	32	40	50	65	80	100	125	150
Length L1	mm	130	150	160	180	200	230	290	310	350	400	480
Length L2	mm	70	80	85	100	105	120	130	140	150	200	210
Height H	mm	51	51	51	61	61	61	71	71	112	112	112
Height H2	mm	168	168	168	178	178	178	265	265	306	306	306
Weight approx.	kg	4.0	5.0	5.5	8.5	10	12	20	23	38	50	65

	Type	2780	3372	3271			3277		
Effective area	cm ²	120	120	240	350	700	240	350	700
Height H1	mm	–	–	65	80	199	65	65	199
Diaphragm ØD	mm	170	168	240	280	390	240	240	390
Loading pressure connection a		G 1/8	G 3/8	G 1/4	G 3/8	G 3/8	G 1/4	G 3/8	G 3/8
Weight	approx. kg	2	3.7	5	8	22	9	12	26

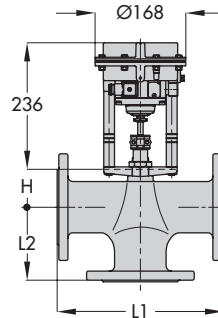
Pneumatic control valves



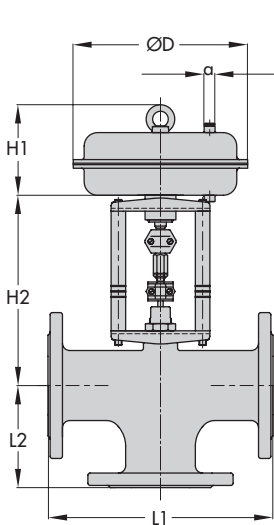
Type 3260/2780-1
DN 15 to 50



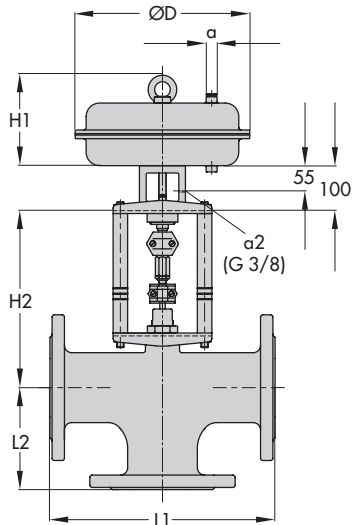
Type 3260/2780-2
DN 15 to 50



Type 3260/3372
DN 65, 80



Type 3260-1
DN 65 to 150



Type 3260-7
DN 65 to 150



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