Series 240

Electric Control Valve Type 3241-4
Globe Valve Type 3241

Electric Control Valve Type 3244-4
Three-way Valve Type 3244

Application

Versatile control valves with globe or three-way valve for industrial applications as well as for heating, ventilation and air-conditioning systems

Nominal sizes DN 15 to DN 150 · Nominal pressures PN 16 to PN 40 · Temperatures from –196 °C to + 450 °C

Conversion of valve sizing coefficients:

C_V (in US gallons/min) = 1.17 · K_{VS} (in m^3/h)

K_{VS} (in m^3/h) = 0.86 · C_V (in US gallons/min)

Type 3244 Three-way Valve or Type 3241 Globe Valve with Type 3274 Electrohydraulic Actuator

Valve body made of

- Cast iron,
- Cast steel or
- Stainless cast steel,
- Type 3241 also of spheroidal graphite iron or forged steel.

Undivided valve bonnet

The Type 3274 Electrohydraulic Actuator is available in various versions (see Data Sheet T 8340 EN for details):

- With electric override,
- With mechanical override,
- With fail-safe action,
- With additional electrical equipment (limit switches, potentiometers, positioner).

Versions

Standard version for temperatures from –10 °C to +220 °C

- **Type 3241-4** (Fig. 1) · Type 3241 Valve with Type 3274 Electrohydraulic Actuator
- **Type 3244-4** (Fig. 2) · Type 3244 Valve with Type 3274 Electrohydraulic Actuator

Further versions with

- **Extension bonnet** · See Technical data
- **Metal bellows seal** with safety packing · See Technical data
- **Heating jacket** · See Technical data

Also available

- Typetested versions · See Data Sheet T 5871 EN

Ordering text

Electric Control Valve Type 3241-4/3244-4
DN …, body material …, PN …
Actuator Type 3274-..
Power supply … V, … Hz
Optionally, special version

Fig. 1 · Type 3241-4 Electric Control Valve with Type 3274 Electric Actuator

Fig. 2 · Type 3244-4 Electric Control Valve with Type 3274 Electric Actuator

Associated Information Sheet	**T 5800 EN**
Associated Information Sheet for electrohydraulic actuator	**T 8340 EN**

Edition September 1996

Data Sheet **T 5874 EN**

Principle of operation (Figs. 3 to 5)

The medium flows through the valve in the direction indicated by the arrow.

The Type 3244 Three-way Valve is available for either mixing service (Fig. 4) or diverting service (Fig. 5). The valves can be modified to suit the other service type as the plug is welded to the plug stem.

To achieve the maximum flow rate in diverting valves in size DN 65 and larger, port AB-A can be designed for higher K_{VS} values than port AB-B (see Table 4).

When mounted in the return flow pipe of a heating system, mixing valves can be applied for diverting service and diverting valves can be applied for mixing service.

Both valves can be equipped with a metal bellows seal or an extension bonnet to meet special requirements such as vacuum, aggressive media or high temperatures.

The Type 3274 Actuators come in different versions depending on the nominal thrusts they perform (see Table 6). Standard versions are equipped with either an electric or a mechanical override. The actuators are available with or without fail-safe action.

Sizing and selection of the control valve

1. Calculate appropriate K_V value according to DIN EN 60 534.
2. Select valve size and K_{VS} value from Tables 3 to 5.
3. Determine permissible differential pressure Δp from Tables 3 to 5.
4. Select suitable actuator from Table 6, taking into account the thrust, travel, and transit time.
5. Select materials, pressure and temperature from Tables 1 and 2, also taking into account the pressure-temperature diagram.
6. Optionally, select additional electrical equipment from Tables 1 to 3.

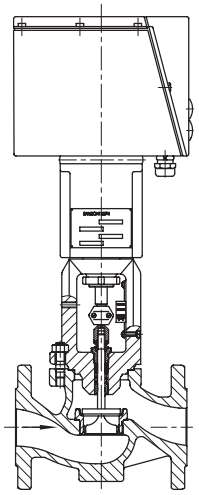


Fig. 3 · Type 3241-4 Electric Control Valve with Type 3274 Electric Actuator and Type 3241 Globe Valve

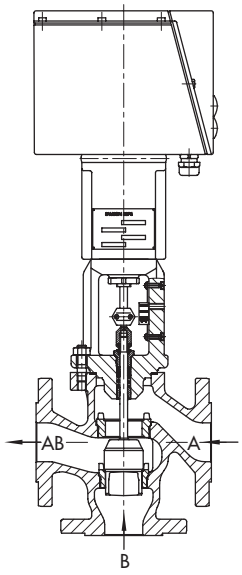


Fig. 4 · Type 3244-4 Electric Control Valve with Type 3274 Electric Actuator and Type 3244 Three-way Valve for mixing service

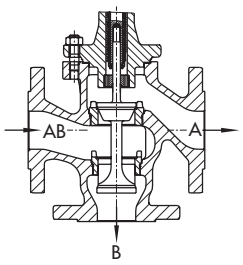


Fig. 5 · Type 3244 Three-way Valve for diverting service

Table 1 · Technical data for Types 3241 and 3244 Valves

Valve	**Type**		**3241**	**3244**
Nominal size	DN		15 to 150	
Nominal pressure	PN		16, 25 or 40 (DIN 2401)	
Type of connection			All flange forms as specified in DIN [1]	
Rangeability			50 : 1 in DN 15 to DN 50; 30 : 1 in DN 65 to DN 150	
Valve travel			15 mm in DN 15 to DN 80; 30 mm in DN 100 to DN 150	
Seat/plug seal			Metal, soft or lapped-in metal	Metal
Characteristic			Equal percentage/linear	Linear
Temperature ranges				
Valve body without extension bonnet			–10 to +220 °C	
Valve body with	Extension bonnet or bellows, short		–10 to +300 °C · Valve body made of EN-JL1040 (GG-25) –10 to +350 °C · Valve body made of EN-JS1049 (GGG-40.3) [2] –10 to +400 °C · Valve body made of 1.0619 (GS-C 25) –10 to +450 °C · Valve body made of 1.0460 (C22.8) [2] –50 to +450 °C · Valve body made of 1.4581	
	Extension bonnet or bellows, long [2]		–196 to +450 °C · Valve body made of 1.4571	
Valve plug	Standard	Metal sealing	–196 to +450 °C	
		Soft sealing	–196 to +220 °C	–
	Balanced	With PTFE ring	–196 to +220 °C	–
		With graphite ring	–220 to +450 °C	–
Leakage class according to DIN EN 60 534				
Valve plug	Standard	Metal sealing	IV	IV
		Soft sealing	VI	–
		Lapped-in metal	IV-S2, DN 100 and larger: IV-S1	–
	Balanced	Metal sealing	With PTFE ring: IV With graphite ring: III	–

[1] Type 3244 in DN 15: connections only according to DIN EN 1092-1 and DIN EN 1092-2

[2] Only Type 3241

Table 2 · Materials · Material numbers according to DIN EN

Standard version						
Nominal pressure PN	16	16/25	16/25/40			
Valve body	Cast iron EN-JL1040 (GG-25)	Spheroidal graphite iron [3] EN-JS1049 (GGG-40.3)	Cast steel 1.0619 (GS-C 25)	Stainless cast steel 1.4581	Forged steel 3) 1.0460 (C22.8)	Stainless forged steel [3] 1.4571
Valve bonnet	1.0460 (C22.8)			1.4571	1.0460 (C22.8)	1.4571
Seat [1]	1.4006				1.4006	
Plug [1]	1.4006					
Guide bushing	1.4104				1.4104	
Packing [2]	V-ring packing, PTFE with carbon; spring of 1.4310					
Body gasket	Metal graphite					
Extension bonnet	1.0460 (C22.8)			1.4571	1.0460 (C22.8)	1.4571
Metal bellows seal						
Extension bonnet	1.0460 (C22.8)			1.4571	1.0460 (C22.8)	1.4571
Metal bellows	1.4571					
Heating jacket 3)	1.4541					

[1] All seats and plugs also available with Stellite facing

[2] Other packings available on request

[3] Only Type 3241

Terms for control valve sizing according to DIN EN 60 534, parts 2-1 and 2-2: $F_L = 0.95$; $x_T = 0.75$

Table 3 · K_{VS} values and permissible differential pressures Δp
Type 3244-4 Control Valve with Type 3244 Mixing Valve

Type 3274 Actuator			-11, -15, -21	-13
Thrust [kN]			2.1/1.8	4.3
DN	K_{VS}	Seat ∅ [mm]	Δp at p_2 = 0 [bar]	
15	2 · 4	24	35.5	40
20	2 · 4 · 6.3			
25	2 · 4 · 6.3 · 10			
32 to 50	6.3 · 10 · 16	31	19	
40 and 50	25	38	12	32
50 to 80	25 [1] · 40	48	6.9	20
65 and 80	60	63	3.7	11
80	80	75	2.6	7.5
100	100	80	1.8	6.4
	160	100	1.1	4.0
125	140	90	1.4	5.0
	200	110	0.9	3.2
150	200	110	0.9	3.2
	300	130	0.6	2.2

[1] Only DN 65 and DN 80 (Tables 3 and 4)

Table 4 · K_{VS} values and permissible differential pressures Δp
Type 3244-4 Control Valve with Type 3244 Diverting Valve

Type 3274 Actuator			-11, -15, -21	-13
Thrust [kN]			2/1.8	4.3
DN	K_{VS}	Seat ∅ [mm]	Δp at p_2 = 0 [bar]	
15	2 · 4	24	35.5	40
20	2 · 4 · 6.3			
25	2 · 4 · 6.3 · 10			
32 to 50	6.3 · 10 · 16	31	19	
40 and 50	25	38	12	32
50 to 80	25 [1] · 40	48	6.9	20
65	60/40	63/48	3.7	11
80	60	63	3.7	11
	80/60	75/63	2.6	7.5
100	100	80	1.8	6.4
	160/100	100/80	1.1	4.0
125	140	90	1.4	5.0
	200/130	110/90	0.9	3.2
150	200	110	0.9	3.2
	300/200	130/110	0.6	2.2

Table 5 · K_{VS} values and permissible differential pressures Type 3241-4 Control Valve

Type 3241 Valve			Unbalanced				Balanced			
			With and without metal bellows				Without metal bellows		With metal bellows	
							Plug with metal sealing			
Type 3274 Actuator			-11	-12	-13	-14	-11	-13	-11	-13
			-15	-16	-17	-18	-15	-17	-15	-17
			-21 [1] [2]	-23	–	–	-21 [1] [2]	–	-21 [1] [2]	–
DN	K_{VS}	Seat ∅ [mm]	Δp in bar at p_2 = 0							
15 to 25	0.1 · 0.16 · 0.25	3	40	–			–			
15 to 50	0.4 · 0.63 · 1.0	6								
	1.6 · 2.5 · 4.0	12								
20 to 50	6.3	24	35	40	40	–				
25 to 50	10									
32 to 50	16	31	20	37	40	–				
40 to 80	25	38	13.5	24.5	31.5	40	40 [3]			
50 to 80	35	48	8.1	15	19.5	36			38 [3]	40 [3]
65, 80	60	63	4.4	8.5	11	21	40 [3]		34.5	
80	80	80	2.5	5	6.7	12.8			29.8	
100 and 150	63	63	3.7	7.2	11	19.8	40 [4]		9.3 [4]	31 [4]
100 to 150	100	80	2.1	4.3	6.6	12	40 [5]		7.7 [5]	29.8 [4]
100 to 150	160	100	1.2	2.6	4.1	7.5	30.5	40	5.9	28
125	200	110	–	2.1	3.3	6.2	25.8		5.0	27
150	260	130	–	1.4	2.3	4.3	16.4		3.2	25

[1] Permissible differential pressure for application as typetested control valves, see Data Sheet T 5871 EN

[2] Type 3274-21 Actuator with fail-safe action "Actuator stem retracts" (fail-close); use Type 3274-22 for reverse action

[3] Balanced plug in DN 65 and larger

[4] Only DN 100

[5] Not DN 150

Table 6 · Technical data for electrohydraulic actuators

Type 3274 Actuator	-11	-12	-13	-14	-15	-16	-17	-18	-21	-22	-23
Version with	Electric override				Mechanical override				Electric override		
With fail-safe action	Without								Extends	Retracts	Extends
Power supply	24, 110 or 230 V, 50 Hz and 60 Hz										
Power consumption of the motor	90 VA										
Permissible ambient temperature	–10 to + 60 °C										
Nominal thrust Extends kN	1.8	3.0	4.3	7.3	1.8	3.0	4.3	7.3	1.8	2.1	3.0
Nominal thrust Retracts kN	2.1	0.5	4.3	0.5	2.1	0.5	4.3	0.5	2.1	1.8	0.5
Rated travel	DN 15 to DN 80: 15 mm				DN 100 to DN 150: 30 mm						
Transit time Approx. sec	60 at 15 mm, 120 at 30 mm								15 at 15 mm, 30 at 30 mm [1]		
Additional electrical equipment											
Electric or inductive limit switch	Max. 3										
Potentiometer	Max. 2										
Positioner	1										

[1] Transit time for fail-safe action, shorter transit times on request

For further details see Data Sheet T 8340 EN.

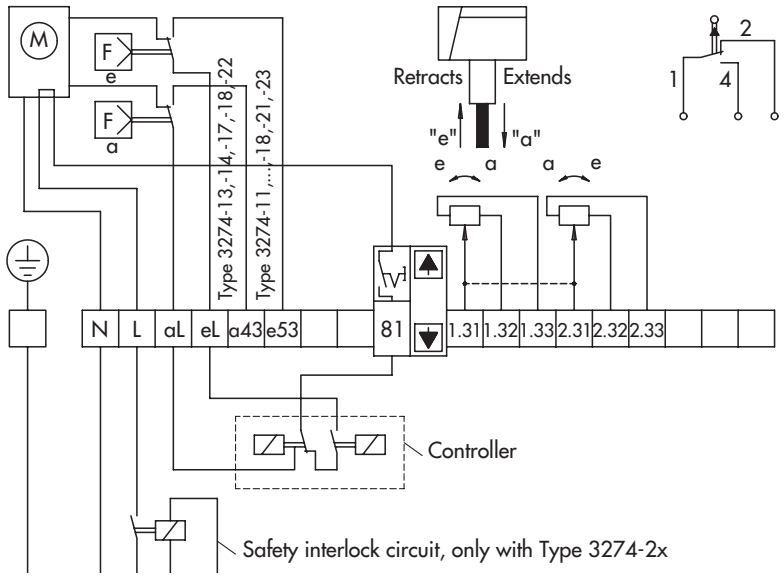


Fig. 6 · Connection diagram for actuators without positioner

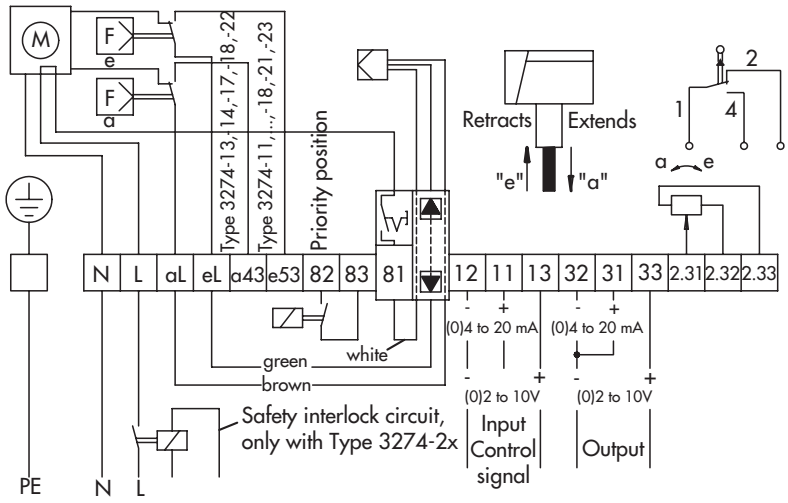


Fig. 7 · Connection diagram for actuators with positioner

The adjacent figures illustrate the various options of connection, depending on how the version is equipped. The electric limit switches have screw terminals and are not connected over the terminal block.

Table 7 · Dimensions in mm and weights of Type 3241-4 Control Valve

Type 3241 Valve, standard version (without actuator)

Nominal size DN	15	20	25	32	40	50	65	80	100	125	150
Length L	130	150	160	180	200	230	290	310	350	400	480
H1	H2 + H										
H2	220						260		350	360	390
										380 [2]	415 [2]
H3	61								75		
H4, valve closed	75								90		
H5	40			72			98		118	144	175
Weight of the valve without actuator, approx. kg	5	6	7	11	12	15	24	30	42	80	120

Type 3241 Valve with extension bonnet/with metal bellows (without actuator)

Nominal size DN		15	20	25	32	40	50	65	80	100	125	150
Height H9	Short/with bellows	405			395			435		635	625	655
											645 [1]	680 [1]
	Long/long w. bellows	710			700			740		875	865	895
Weight, approx. kg	Short/with bellows	8	9	10	17	18	21	32	38	60	105	150
	Long/long w. bellows	12	13	14	21	22	25	36	42	68	113	158

[1] For valve bodies made of EN-JL1040 (GG-25)

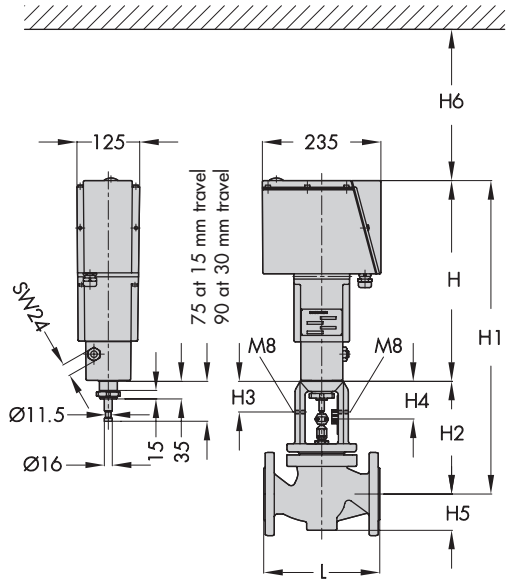
Version with heating jacket
Not for valves with bodies made of cast iron EN-JL1040 (GG-25) and spheroidal graphite iron EN-JS1049 (GGG-40.3)

Nennweite DN	25	50	80	100
a	110	140	180	200
b	15	20	35	50
c	140	170	215	250

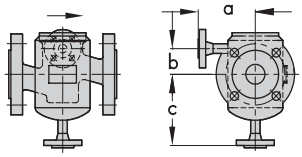
Type 3274 Actuator

Type 3274 Actuator	**-11** to -**14**/-**21** to **-23**	**-15** to -**18**
Height H	320	412
Height H6 [1]	150	150
Weight, approx. kg	11	13

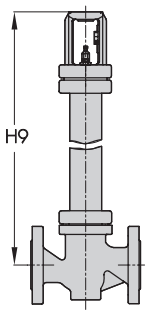
[1] Minimum clearance required to disassemble the actuator



Type 3241-4, Type 3274 Actuator with mechanical override



Type 3241 with heating jacket,
flange sizes DN 15 or 25, PN 40, DIN 2635



Type 3241 with extension bonnet or metal bellows

Table 8 · Dimensions in mm and weights of Type 3244-4 Control Valve

Type 3244 Valve, standard version (without actuator)

Nominal size DN	15	20	25	32	40	50	65	80	100	125	150
Length L	130	150	160	180	200	230	290	310	350	400	480
L1	70	80	85	100	105	120	130	140	150	200	210
H1	H2 + H										
H2	235						260		350	335	355
H3	61								75		
H4, valve closed	75								90		
Weight of the valve without actuator, approx. kg	6	7	8	14	15	17	31	37	49	93	135

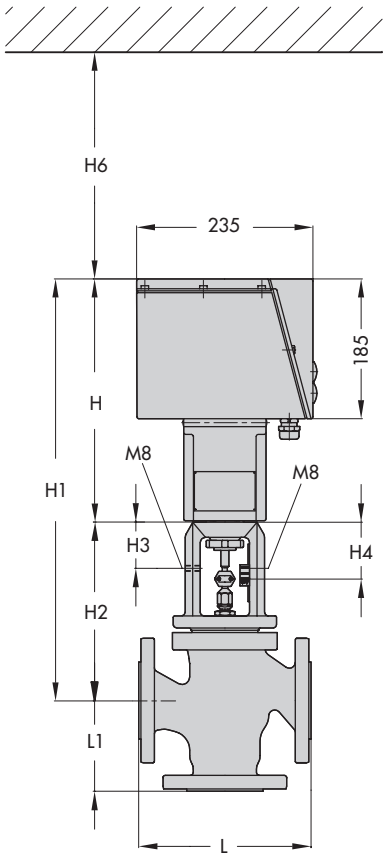
Type 3241 Valve with extension bonnet/with metal bellows (without actuator)

Nominal size DN		15	20	25	32	40	50	65	80	100	125	150
Height H9	Short/with bellows	420			410			435		635	600	615
	Long/long w. bellows	725			715			740		875	840	855
Weight, approx. kg	Short/with bellows	9	10	11	20	21	23	39	45	67	118	165
	Long/long w. bellows	12	14	16	24	25	27	43	49	95	126	173

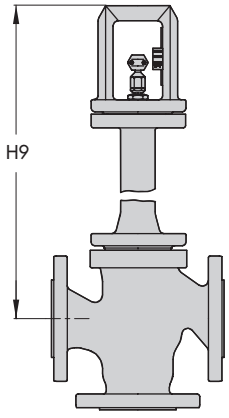
Type 3274 Actuator

Type 3274 Actuator	**-11** to **-14**/**-21** to **-23**	**-15** to **-18**
Height H	320	412
Height H6 [1]	150	150
Weight, approx. kg	11	13

[1] Minimum clearance required to disassemble the actuator



Type 3244-4



Type 3244 with extension bonnet or metal bellows

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