

Pneumatic Rotary Control Valve Type 3310/3278 and Type 3310/AT Rotary Control Valve Type 3310



Application

Rotary control valve for industrial applications, especially for processes requiring high valve capacity with minimum pressure drop and/or tight shutoff with fibrous media.

Nominal sizes 1" to 10" (25 to 250 mm)

Pressure ratings ANSI Class 150 and 300

Temperatures -20 °F to +430 °F (-29 °C to +220 °C)

These valves comply with ANSI, ASME and ASTM standards

The control valves consist of a body with "v-notch" characterized ball segment and a pneumatic spring-and-diaphragm actuator (single-acting) Type 3278 or a rack-and-pinion actuator (single-acting Type SRP or double-acting Type DAP).

Features

- Highest flow coefficients (Cv values) per nominal size
- Dual characteristic v-notch (equal percent and linear)
- Soft seat or optional metal seat
- Short face-to-face dimension, per ISA-S75.04
- Installation raised-face flanged according to ANSI B16.5
- Reversible flow direction, e.g. for highly erosive applications
- Live-loaded, self-adjusting PTFE V-ring stuffing box
- Actuator mounting to valve according to ISO 5211 or DIN 3337
- Control accessory mounting for actuator Type AT-SRP/DAP according to VDI/VDE 3845
- Direct mounting of SAMSON control accessories to actuator Type 3278

Standard version

- Body material ASTM A 216 WCB or A 351 CF8M
- Nominal valve sizes 1" to 10" (25 to 250 mm)
- Temperatures from -20 to +430 °F (-29 to +220 °C)
- Soft seat of PTFE with metal backing ring

Options

- **Metal seat** for shearing action with fibers or large particulates
- **Valve shaft** with keyed or square splined end
- **Hand-operated override** for pneumatic actuators
- **Hand-operated actuator**, where automation not required
- **Special versions** (e.g. end connections, packings) on request

Actuator combinations

Type 3310/3278 (Fig.1) · With single-acting pneumatic spring-and-diaphragm actuator Type 3278 (see Technical Data Sheet T 8321).

Type 3310/AT-SRP (Fig.2) · With single-acting, spring-return pneumatic rack-and-pinion actuator, Type SRP

Type 3310/AT-DAP · With double-acting, pneumatic rack-and-pinion actuator, Type DAP (requires double-acting control positioner)



Fig.1 · Type 3310/3278 showing equal percent side of the ball, with Type 3767 electropneumatic positioner

Fig.2 · Type 3310/AT-SRP sectional view, showing linear side of the ball, with Type 3767 electropneumatic positioner

Principle of operation (Fig. 3)

The medium flows into the ball segment valve against the convex side of the ball. When the valve is closed, the pressure acts on the convex side of the ball. The flow coefficient (Cv) value is determined by the opening angle of the ball.

Depending on the direction the ball is opened, the inherent characteristic of the ball can be selected as either equal percentage or linear. This is accomplished by the mounting position, turning direction and setting of the mechanical travel stops of the actuator.

The seal ring (2.1) and seat retainer (2) are held in place by the force of the pipeline flanges. The ball segment (3) is guided by the rotating counter shaft (5), which is sealed by the bottom flange (4) and gasket (17). The counter shaft has a square splined end, which is locked to the ball segment by the position of a ball bearing as dictated by a threaded pin, located within the counter shaft. The ball segment is secured to the actuated shaft by a spring clip (3.1).

The packing (15) is retained by a flange (8), secured by two bolts (9), which requires no adjustment in the field. The packing V-rings increase the shaft sealing force with increasing fluid pressure. The packing spring (11) provides the optimum loading force for the packing throughout the entire pressure range of the valve.

Fail-safe action

With the actuator Type 3278 and Type AT-SRP, the control valve has two fail-safe positions, that when pressurizing the piston or diaphragm as well as with loss of air supply are possible:

"Valve Fail Closed", with loss of supply pressure, the actuator springs force the valve to close

"Valve Fail Open", with loss of supply pressure, the actuator springs force the valve to open.

The actuator Type AT-DAP is configured without springs. A defined end position is not attained with loss of supply pressure. Control accessories, such as a volume tank, can be specified, in the case where a fail-safe position is still required by the application.

Installation

The valve is provided with two screws (2.3), which retain the seat retainer (2) during shipment. These screws are to be removed before installation into the pipeline. Appropriate torques are required for the valve flange bolting in order to assure sealing with the flange gasket and tight shutoff of the seat with the ball segment. Note: Flange bolting and gaskets are not provided with the valve, and are to be ordered separately.

In order to reduce erosion of the body with abrasive media, the flow direction can be reversed. The angle of rotation is decreased from 90° to 70° in such cases, by the adjustment of the mechanical travel stop setting of the actuator.

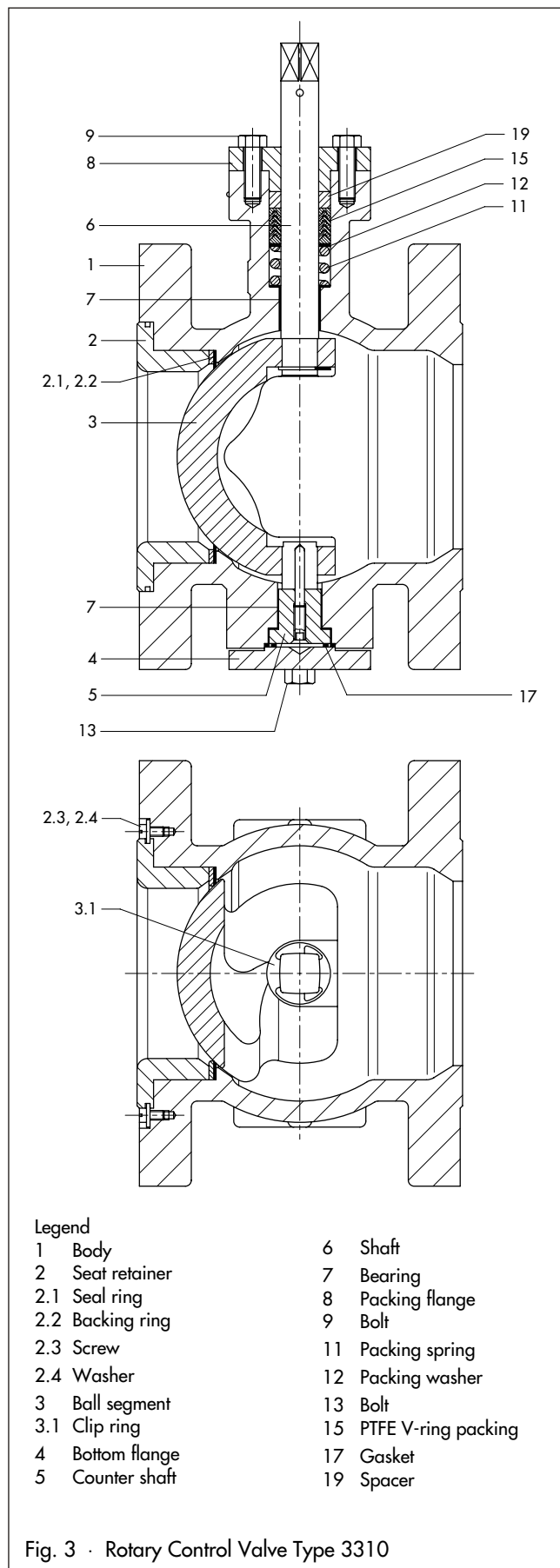


Fig. 3 · Rotary Control Valve Type 3310

Table 1 · Technical Data

Nominal valve size	1" to 10" (25 to 250 mm)
Pressure rating	Class 150/300, according to ASME/ANSI B16.34
Temperature range	-20 to +430 °F (-29 to +220 °C)
Maximum differential pressure	According to ASME/ANSI B16.34, except: with Temperatures >300 °F (150 °C) and PTFE-seal: $\Delta p_{max} = 145$ psi (10 bar)
End connections	Raised-face flanges, according to ASME/ANSI B16.5
Installation length (face-to-face)	According to ISA-S75.04 (short version)
Flow direction (normal)	Against the convex side of the ball segment
Nominal opening angle	90° (with reversed flow direction for control: 70°)
Inherent flow characteristic	Equal percentage or linear
Rangeability	> 100 : 1, according to ANSI/ISA-S75.11
Terms for control valve sizing, according to ISA-S75.02	C_v , K_{vs} , F_L , X_T - see Tables 3 and 4
Stuffing box design	V-ring, spring-loaded, self-adjusting
Sealing versions	Soft-seat: PTFE, reinforced Metal-seat: Stainless steel, hardened
Leakage rate class, according to ANSI/FCI 70-2 and IEC 534 Part 4	
Soft-seated	Class VI
Metal-seated	Class IV

Table 2 · Materials

Body	ASTM A 216 WCB	ASTM A 351 CF8M
Ball segment	AISI 316 L, hardened	
Clip ring	AISI 316 L	
Seat	Soft-sealed version: PTFE with stainless steel backing ring Metal-sealed version: Stainless steel	
Seat retainer	Stainless steel	
Shaft	AISI 316 Ti	
Bearing (sleeve-type)	AISI 304 / PTFE-coated	
Stuffing box packing	1" to 6" :V-Ring-Packing PTFE with Carbon compound · Spring: AISI 301	
	8" to 10" :Braided cord rings, PTFE-Univerdit/Alchem compound · Spring: AISI 301	
Bottom flange	Forged carbon steel ASTM A 105	AISI 316 L

Coefficients for flow and noise calculations

F_L and x_T according to ISA-S75.02 and IEC 60 534-2-3
 z according to VDMA 24422

Table 3a · Modified equal percentage characteristic

Opening angle	5°	10°	20°	30°	40°	50°	55°	60°	70°	80°	90°
F_L	0.95	0.95	0.95	0.95	0.95	0.90	0.86	0.82	0.75	0.66	0.57
x_T	0.78	0.78	0.78	0.78	0.78	0.69	0.62	0.58	0.49	0.38	0.27
z	0.44	0.39	0.33	0.29	0.24	0.21	0.19	0.18	0.15	0.12	0.09

Table 3b · Modified linear characteristic

Opening angle	5°	10°	20°	30°	40°	50°	55°	60°	70°	80°	90°
F_L	0.95	0.95	0.95	0.94	0.87	0.81	0.77	0.73	0.65	0.59	0.57
x_T	0.78	0.78	0.78	0.76	0.65	0.56	0.51	0.46	0.36	0.30	0.27
z	0.39	0.35	0.28	0.23	0.20	0.17	0.16	0.14	0.12	0.10	0.09

Opening angles and associated flow coefficients (Cv and Kvs)

Table 4a · Cv values for modified equal percentage characteristic

Size \ Angle	5°	10°	20°	30°	40°	50°	55°	60°	70°	80°	90°
1"	0.08	0.16	1.3	3.3	6.3	10.7	14	16.3	23	32	40
1½"	0.25	0.5	4	10	19	32	42	49	69	95	120
2"	0.3	0.6	5	13	25	42	56	65	92	126	160
3"	0.8	1.6	12	32	62	106	140	162	231	316	400
4"	1.4	2.8	22	56	109	186	245	284	405	553	700
6"	2.8	5.6	43	112	218	371	490	567	809	1106	1400
8"	4.0	8.0	62	160	312	530	700	810	1156	1580	2000
10"	6.2	12	96	248	484	822	1085	1256	1792	2449	3100

Table 4b · Cv values for modified linear characteristic

Size \ Angle	5°	10°	20°	30°	40°	50°	55°	60°	70°	80°	90°
1"	0.35	1	3.4	7	11.5	17.3	20	24.5	32.3	38	40
1½"	1	3	10	21	35	52	60	74	97	114	120
2"	1.4	4	13.6	28	46	69	80	98	129	152	160
3"	3.6	10	34	70	115	173	200	245	323	381	400
4"	6.3	18	60	123	201	302	350	429	565	666	700
6"	13	35	119	245	402	605	700	858	1130	1333	1400
8"	18	50	170	350	574	864	1000	1226	1614	1904	2000
10"	28	78	264	543	890	1339	1550	1900	2502	2951	3100

Table 4c · Kvs values for modified equal percentage characteristic

Size \ Angle	5°	10°	20°	30°	40°	50°	55°	60°	70°	80°	90°
1"	0.07	0.14	1.1	2.8	5.4	9.2	12.0	14.0	19.7	27	34
1½"	0.21	0.43	3.4	8.6	16.3	27	36	42	59	81	103
2"	0.26	0.51	4.3	11.1	21	36	48	56	79	108	137
3"	0.69	1.4	10.3	27	53	91	120	139	198	271	343
4"	1.2	2.4	18.9	48	93	159	210	243	347	474	600
6"	2.4	4.8	37	96	187	318	420	486	693	948	1200
8"	3.4	6.9	53	137	267	454	600	694	991	1354	1714
10"	5.3	10.3	82	213	415	704	930	1076	1536	2099	2657

Table 4d · Kvs values for modified linear characteristic

Size \ Angle	5°	10°	20°	30°	40°	50°	55°	60°	70°	80°	90°
1"	0.30	0.86	2.9	6.0	9.9	14.8	17.1	21	28	33	34
1½"	0.86	2.6	8.6	18.0	30	45	51	63	83	98	103
2"	1.2	3.4	11.7	24	39	59	69	84	111	130	137
3"	3.1	8.6	29	60	99	148	171	210	277	327	343
4"	5.4	15.4	51	105	172	259	300	368	484	571	600
6"	11.1	30	102	210	345	518	600	735	968	1142	1200
8"	15.4	43	146	300	492	740	857	1051	1383	1632	1714
10"	24	67	226	465	763	1148	1328	1628	2144	2529	2657

Permissible differential pressures for Rotary Control Valve Type 3310

Table 5a · Permissible differential pressures for both fail-safe positions with actuator Type SRP · all pressures in psi

Size	C _v	Shaft-∅ (inch)	Actuator Type SRP size	Number of springs	Required supply pressure psi	Max. supply pressure with temperature		Δp with PTFE or metal seat		
						70 °F	430 °F	Standard flow direction	Reverse flow direction ¹⁾	
1"	40	0.63"	60	2/3	36	87	87	217	145	
				4	58			290	290	
				30	80			246	174	
1½"	120	0.63"	100	2/3	36	65	58	290	246	
				60	4	58	87	87	290	275
					5/6	80			290	290
2"	160	0.63"	150	2/3	36	80	72	290	290	
				100	4	58	87	87	290	290
					60	80			290	290
3"	400	0.63"	220	2/3	36	55	51	290	290	
				150	4	58	87	87	290	290
					100	80			290	261
4"	700	0.98"	450	2/3	36	87	87	246	217	
				300	4			58	261	232
					220			80	290	275
6"	1400	0.98"	600	3	44	80	72	174	145	
				4	58	87	87	290	290	
			450	5/6	80			87	87	290
						300	72			-
8"	2000	1.42"	1200	2/3	36	72	65	145	72	
				4	58	80	72	290	290	
			900	5/6	80	87	87	290	290	
10"	3100	1.42"	1200	4	58	80	72	145	87	
				900	5/6	80	87	87	275	232
			101						72	

Table 5b · Permissible differential pressures for both fail-safe positions with actuator Type 3278 · all pressures in psi

Size	C _v	Shaft-∅ (inch)	Diaphragm area		Signal pressure range ²⁾	Required supply pressure	Max. supply pressure with temperature		Δp with PTFE or metal seat	
			in ²	cm ²			70 °F	430 °F	Standard flow direction	Reverse flow direction ¹⁾
1"	40	0.63"	24.8	160	7 ... 15	22	36	29	246	174
					12 ... 24	35	44	38	290	290
1½"	120	0.63"	24.8	160	7 ... 15	22	36	29	145	-
					12 ... 24	35	44	38	290	290
2"	160	0.63"	24.8	160	12 ... 24	36	65	59	290	290
3"	400	0.63"	24.8	160	12 ... 24	54	75	68	101	-
					25 ... 50	74	84	78	290	290
4"	700	0.98"	49.6	320	12 ... 24	35	70	64	130	58
					18 ... 36	52	78	73	290	290
6"	1400	0.98"	49.6	320	25 ... 50	74	87	81	174	145

¹⁾ With reverse flow direction, the opening angle is reduced to 70°.

²⁾ Valid only for standard flow direction.

Notes:

- Depending on the valve conditions (cavitation, vaporisation, gas formation), the differential pressure should be limited.
- Maximum exit velocity for liquids is 13 ft/s. If cavitation exists, the maximum exit velocity should not exceed 6.5 ft/s.
- Maximum exit velocity for gases is Mach 0.3.

Permissible differential pressures for Rotary Control Valve Type 3310

Table 5c · Permissible differential pressures for both fail-safe positions with actuator Type SRP · all pressures in bar

Size	C _v	Shaft-∅ in mm	Actuator Type SRP size	Number of springs	Required supply pressure	Max. supply pressure with temperature		Δp with PTFE or metal seat	
						20 °C	220 °C	Standard flow direction	Reverse flow direction ¹⁾
1"	40	16	60	2/3	5	6	5.5	15	10
				4	4		6	20	20
			30	5/6	5.5		6	17	12
1½"	120	16	100	2/3	2.5	4.5	4	20	17
			60	4	4	6	6	20	19
				5/6	5.5			20	20
2"	160	16	150	2/3	2.5	5.5	5	20	20
			100	4	4	6	6	20	20
			60	5/6	5.5			20	20
3"	400	16	220	2/3	2.5	3.8	3.5	20	20
			150	4	4	6	5.5	20	20
			100	5/6	5.5		6	20	18
4"	700	25	450	2/3	2.5	6	6	17	15
			300	4	4			18	16
			220	5/6	5.5			20	19
6"	1400	25	600	3	3	5.5	5	12	10
				4	4	6	5.5	20	20
			450	5/6	5.5		6	6	20
						300			5
8"	2000	36	1200	2/3	2.5	5	4.5	10	5
				4	4	5.5	5	20	20
			900	5/6	5.5	6	6	20	20
10"	3100	36	1200	4	4	5.5	5	10	6
				900	5/6	5.5	6	5.5	19
			6					6	7

Table 5d · Permissible differential pressures for both fail-safe positions with actuator Type 3278 · all pressures in bar

Size	C _v	Shaft-∅ in mm	Diaphragm area in cm ²	Signal pressure range ²⁾	Required supply pressure	Max. supply pressure with temperature		Δp with PTFE or metal seat	
						20 °C	220 °C	Standard flow direction	Reverse flow direction ¹⁾
1"	40	16	160	0.5 ... 1.0	1.5	2.5	2	17	12
				0.8 ... 1.6	2.4	3	2.6	20	20
1½"	120	16	160	0.5 ... 1.0	1.5	2.5	2	10	–
				0.8 ... 1.6	2.4	3	2.6	20	20
2"	160	16	160	0.8 ... 1.6	2.5	4.5	4.1	20	20
3"	400	16	160	1.2 ... 2.4	3.7	5.2	4.7	7	–
				1.7 ... 3.4	5.1	5.8	5.4	20	20
4"	700	25	320	0.8 ... 1.6	2.4	4.8	4.4	9	4
				1.2 ... 2.4	3.6	5.4	5	20	20
6"	1400	25	320	1.7 ... 3.4	5.1	6	5.6	12	10

¹⁾ With reverse flow direction, the opening angle is reduced to 70°.

²⁾ Valid only for standard flow direction.

Notes:

- Depending on the valve conditions (cavitation, vaporisation, gas formation), the differential pressure should be limited.
- Maximum exit velocity for liquids is 4 m/s. If cavitation exists, the maximum exit velocity should not exceed 2 m/s.
- Maximum exit velocity for gases is Mach 0.3.

Permissible shaft and opening torques

Table 6a · Shaft end with square spline (e.g. Type SRP/DAP) · all pressures in psi and torques in lb_f-inches

Size	Permissible shaft torque in lb _f -in		Opening torque in lb _f -in for PTFE or metal sealing with differential pressure							
			Standard flow at Δp				Reverse flow ¹⁾ at Δp			
			70 °F	430 °F	72 psi	145 psi	217 psi	290 psi	72 psi	145 psi
1"	620	478	80	80	97	115	89	97	115	133
1½"	620	478	106	106	124	142	115	124	142	159
2"	1106	974	124	124	142	159	133	142	159	177
3"	1106	974	257	274	292	310	283	301	319	336
4"	4426	3894	531	575	673	770	575	620	717	814
6"	4426	3894	1018	1106	1283	1460	1106	1195	1372	1549
8"	7612	6638	1682	1859	2257	2655	1859	2036	2434	2832
10"	7612	6638	2655	3009	3629	4248	2921	3275	3894	4514

Table 6b · Shaft end with key (e.g. Type 3278) · all pressures in psi and torques in lb_f-inches

Size	Permissible shaft torque in lb _f -in		Opening torque in lb _f -in for PTFE or metal sealing with differential pressure							
			Standard flow at Δp				Reverse flow ¹⁾ at Δp			
			70 °F	430 °F	72 psi	145 psi	217 psi	290 psi	72 psi	145 psi
1"	620	478	80	80	97	115	89	97	115	133
1½"	620	478	106	106	124	142	115	124	142	159
2"	1106	974	124	124	142	159	133	142	159	177
3"	1106	974	257	274	292	310	283	301	319	336
4"	4426	3894	531	575	673	770	575	620	717	814
6"	4426	3894	1018	1106	1283	1460	1106	1195	1372	1549

Table 6c · Shaft end with square spline (e.g. Type SRP/DAP) · all pressures in bar and torques in N·m

Size	Permissible shaft torque in N·m		Opening torque in N·m for PTFE or metal sealing with differential pressure							
			Standard flow at Δp				Reverse flow ¹⁾ at Δp			
			20 °C	220 °C	5 bar	10 bar	15 bar	20 bar	5 bar	10 bar
1"	70	54	9	9	11	13	10	11	13	15
1½"	70	54	12	12	14	16	13	14	16	18
2"	125	110	14	14	16	18	15	16	18	20
3"	125	110	29	31	33	35	32	34	36	38
4"	500	440	60	65	76	87	65	70	81	92
6"	500	440	115	125	145	165	125	135	155	175
8"	860	750	190	210	255	300	210	230	275	320
10"	860	750	300	340	410	480	330	370	440	510

Table 6d · Shaft end with key (e.g. Type 3278) · all pressures in bar and torques in N·m

Size	Permissible shaft torque in N·m		Opening torque in N·m for PTFE or metal sealing with differential pressure							
			Standard flow at Δp				Reverse flow ¹⁾ at Δp			
			20 °C	220 °C	5 bar	10 bar	15 bar	20 bar	5 bar	10 bar
1"	70	54	9	9	11	13	10	11	13	15
1½"	70	54	12	12	14	16	13	14	16	18
2"	125	110	14	14	16	18	15	16	18	20
3"	125	110	29	31	33	35	32	34	36	38
4"	500	440	60	65	76	87	65	70	81	92
6"	500	440	115	125	145	165	125	135	155	175

¹⁾ With reversed flow direction, the maximum angle of rotation in control applications is reduced to 70°.

Table 7a · Dimensions in inches and weights in lbs

Valve	Size	1"	1½"	2"	3"	4"	6"	8"	10"
L - acc. to ISA-S75.04	in	4.00	4.50	4.88	6.50	7.62	9.00	9.56	11.69
d - shaft-Ø	in	0.63			0.98		1.42		
A	in	4.21	4.61	4.96	5.71	6.69	8.11	10.0	11.1
B	in	2.83	3.23	3.94	4.72	5.51	6.89	8.07	9.06
Connection ("yoke")		see actuators							
SW (std shaft)	in	0.47			0.75		1.06		
Keyed shaft for Actuator Type 3278	Ø in	0.63			0.98		-		
Weight	lb	11	15	35	62	93	154	243	331
Actuator Type 3278		Size 160			Size 320				
Effective area	in ²	24.8			49.6				
E	in	4.65			6.38				
C	in	1.97			2.17 ¹⁾		3.15		
H1	in	10.2			16.6				
H2	in	2.83			3.74				
D	in	8.86			11.6				
Connection ISO 5211		F07			F12				
Weight	lb	35			110				

Type SRP /DAP ²⁾		30	60	100	150	220	300	450	600	900	1200	
Actuator Types SRP/DAP mounted to valve		1 ½"										
		2"		4"						10"		
		1"		3"		6"			8"			
C	in	2.0	2.0	2.0	2.0	2.0 ²⁾	2.2	2.2	2.2	3.1	3.1	
H3	in	6.3	8.3	9.8	10.6	12.4	13.6	16.1	17.2	19.2	21.4	
E	in	3.3	4.0	4.5	5.0	5.7	6.2	7.0	7.7	8.7	9.6	
Connection DIN 3337		F05	F05	F07	F07	F10	F10	F12	F12	F14	F14	
SW	in	0.55	0.55	0.67	0.67	0.87	0.87	1.06	1.06	1.42	1.42	
Weight, Type SRP	lb	3.7	7.1	9.7	14.6	20.9	27.8	39.9	52.9	69.7	99.4	
Weight, Type DAP	lb	3.3	6.0	8.6	11.9	18.5	22.5	32.0	43.7	55.1	78.3	

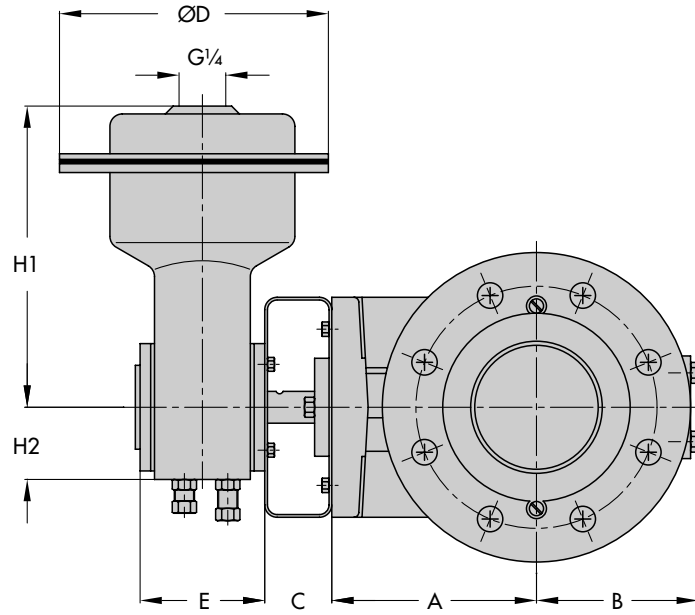
Table 7b · Dimensions in mm and weights in kg

Valve	Size	1"	1½"	2"	3"	4"	6"	8"	10"
L - acc. to ISA-S75.04	mm	102	114	124	165	194	229	243	297
d - shaft-Ø	mm	16			25		36		
A	mm	107	117	126	145	170	206	254	281
B	mm	72	82	100	120	140	175	205	230
Connection ("yoke")		see actuators							
SW (std shaft)	mm	12			19		27		
Keyed shaft for Actuator Type 3278	Ø mm	16			25		-		
Weight	kg	5	7	16	28	42	70	110	150
Actuator Type 3278		Size 160			Size 320				
Effective area	cm ²	160			320				
E	mm	118			162				
C	mm	50			55 ¹⁾		80		
H1	mm	260			421				
H2	mm	72			95				
D	mm	225			295				
Connection ISO 5211		F07			F12				
Weight	kg	16			50				

Type SRP /DAP ²⁾		30	60	100	150	220	300	450	600	900	1200	
Actuator Types SRP/DAP mounted to valve		1 ½"										
		2"		4"						10"		
		1"		3"		6"			8"			
C	mm	50	50	50	50	50 ²⁾	55	55	55	80	80	
H3	mm	159	211	248	269	315	345	409	438	487	543	
E	mm	85	102	115	127	145	157	177	196	221	245	
Connection DIN 3337		F05	F05	F07	F07	F10	F10	F12	F12	F14	F14	
SW	mm	14	14	17	17	22	22	27	27	36	36	
Weight, Type SRP	kg	1.7	3.2	4.4	6.6	9.5	12.6	18.1	24	31.6	45.1	
Weight, Type DAP	kg	1.5	2.7	3.9	5.4	8.4	10.2	14.5	19.8	25	35.5	

¹⁾ C = 2.17" (55 mm) with 4" valve size

Type 3310 with Actuator Type 3278



Type 3310 with Actuator Type SRP/DAP

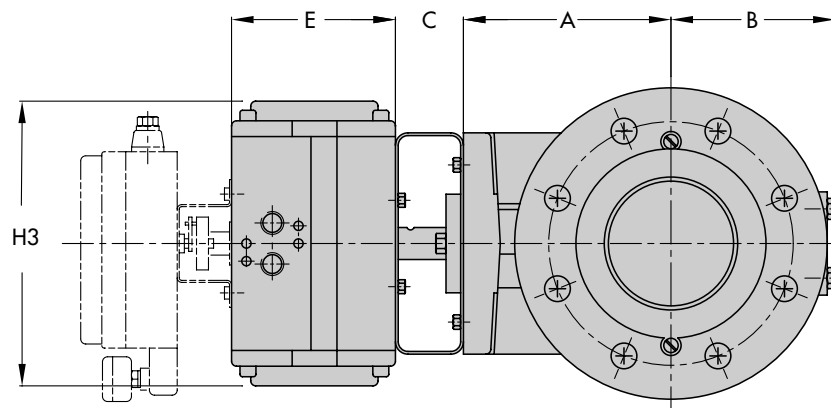


Fig. 4 · Dimensions

Ordering information

Rotary Control Valve Type 3310:

Nominal valve size ¹⁾ ...

Body material ASTM ...

Pressure rating ANSI Class ...

Seat ... Flow direction ...

Cv/Kvs value ¹⁾ ...

Characteristic ...

Options/Special version ...

Special testing/preparation ...

Actuator:

Type ... Ordering information ⁵⁾ ...

Fail-safe position ...

Operating conditions ²⁾:

Process fluid ³⁾ ... Flow rate ⁴⁾ ...

Inlet pressure ... Outlet pressure ⁴⁾ ...

Temperature ...

Maximum shutoff Δp for actuator sizing ...

Air/power supply available for actuator, max./min. ...

Accessories:

Positioner, Switches, Transmitter, Solenoid valve,

Filter/regulator,

Bypass, Volume/pressure amplifier, Lockup relay ...

Type ... Ordering information ⁵⁾ ...

Tubing and fittings type/material ...

Other instrumentation:

Controllers, Sensors, Transmitters, Transducers, Converters ...

Type ... Ordering information ⁵⁾ ...

Notes:

¹⁾ If nominal size or Cv/Kvs value unknown, specify operating conditions

²⁾ Specify system of units, pressures: specify gauge or absolute. Provide minimum, normal, and maximum values, where applicable. Gases, vapors: specify flow rate under standard or actual conditions

³⁾ Non-standard process fluids, specify additionally:
Density, Specific gravity, or Molecular weight ...
Liquids: Vapor pressure, Critical pressure, Viscosity ...
Gases, Vapors: Ratio of specific heats, Compressibility factor

⁴⁾ Or, specify required valve flow coefficient Cv, Kvs ...

⁵⁾ Ordering information per the applicable Technical Data Sheet.



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