

Fisher[®] Control-Disk[™] Rotary Valve

The Fisher Control-Disk rotary valve (figure 1) offers excellent throttling performance. An equal percentage flow characteristic provides an improved throttling range comparable to that of a segmented ball valve. This improved capability allows you to control closer to the target set point, regardless of process disturbances, which results in a reduction in process variability.

The valve body meets PN 10 through PN 40, CL150, and CL300 ratings. Face-to-face and raised-face dimensions meet EN 593, API 609, and MSS-SP68 standards. Line centering clips provide for versatility to mount and align the same wafer style valve body in different piping configurations (ASME and EN ratings).

The Control-Disk rotary valve features an eccentrically-mounted disk with either soft or metal seal, providing capability for enhanced shutoff. The interchangeable sealing technology allows for the same valve body to accept both soft and metal seals.

The actuator sizing and selection process is improved by simply reading a table for information.

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W9425

WAFER STYLE



W9418

SINGLE FLANGE STYLE

Figure 1. Fisher Control-Disk Valve with 2052 Actuator and FIELDVUE[®] DVC6000 Digital Valve Controller



Control-Disk Valve

Control-Disk Valve Features

- **Equal percentage flow characteristic**— An equal percentage flow characteristic provides an improved throttling range comparable to that of a segmented ball valve. This improved capability allows you to control closer to the target set point, regardless of process disturbances, which results in a reduction in process variability.

- **Global Standards**— The valve meets API, ASME, and EN standards, making it suitable for use in all world areas.

- **PEEK/PTFE bearing as standard**— The PTFE-lined PEEK bearing is a patented low friction, low wear bearing. It allows the valve to operate under high pressure drops for a high cycle life while maintaining low torque. The “drop-in” bearing design enables fast, easy maintenance.

- **Lower Operating Torques**— The equal percentage disk reduces operating torque at peak angles of disk opening.

- **Spline-ended Shaft**— The splined shaft with clamped lever and single-pivot linkage reduces lost motion between the actuator and the valve shaft.

- **Improved shaft-disk pinning**— The improved expansion pin system ensures there is a positive, durable connection between disk and shaft. This connection reduces backlash and wear in the drive system, optimizing long-term performance. It also makes disassembly for maintenance quick and simple with no need for special tools.

- **New Spring-Loaded Shaft**— The spring in the outboard shaft provides support to the drive train and disk, enabling the shaft to be installed in both horizontal and vertical orientations with no detriment to performance or cycle life. This complements the ability to mount the actuator on the left- or right-hand side, enabling access for any installation.

- **Excellent Emissions Capabilities**— The optional ENVIRO-SEAL® packing systems, are designed with very smooth shaft surfaces and live-loading to provide improved sealing, guiding, and loading force transmission. The seal of the ENVIRO-SEAL system can control emissions to below 100 ppm (parts per million).

- **Sour Service Capability**— Trim and bolting materials are available for applications involving sour liquids and gases. These constructions comply with

NACE MR0175-2002, MR0103, and MR0175 / ISO 15156.

- **Field-Reversible Valve Action**— The actuator/valve assembly action can be converted from push-down-to-open to push-down-to-close, or vice versa, without additional parts.

- **Easy Installation**— Line-centering clips engage the line flange bolts to simplify installation and provide for centering of wafer-style valves in the pipeline. End connections are compatible with EN and ASME standards.

- **Excellent Shutoff Regardless of Pressure Drop**— Both the S31600 (316 stainless steel) seal ring and bidirectional PTFE seal ring with pressure-assisting sealing action ensure shutoff regardless of flow direction.

- **Long Seal Life**— The opening and closing path of the eccentric disk minimizes disk contact with the seal ring, thereby reducing seal wear, undue friction, and seating torque requirements. See figure 3.

- **Reliable Flange Gasketing Surface**— The seal retainer screws and retention clips are outside the gasket surface of the seal retainer. Spiral-wound or flat-sheet gaskets can be installed between the uninterrupted seal retainer face and the pipeline flange.

- **Integral Shaft-to-Valve Body Bonding**— Standard valve construction includes conductive packing to provide electrical bonding for hazardous area applications.

- **Powder paint as standard**— The Emerson Process Management™ powder paint finish offers an excellent corrosion-resistant finish to all steel parts.

- **High Temperature Capability**— The valve will operate at elevated temperatures, with the appropriate trim components.

- **Shaft Retention**— Redundant shaft retention provides added protection. The packing follower, anti-blowout ring, and shaft groove interact to hold the shaft securely in the valve body (see figure 2).

- **Travel Indication**— Additional travel indication can be achieved by using the indication line on the shaft, along with the disk position markings on the packing follower (see figure 5).

Control-Disk Valve Specifications and Materials of Construction

See tables 1 and 2.

Table 1. Fisher Control-Disk Valve Specifications

Specifications		EN	ASME
Valve Body Size		DN 50, 80, 100, 150, 200, 250, and 300	NPS 2, 3, 4, 6, 8, 10, and 12
Pressure Rating		PN 10 to 40 per EN 12516-1	CL150 / 300 per ASME B16.34
Valve Body Materials		EN 1.0619 steel	WCC steel
		EN 1.4409 stainless steel	CF3M (316L) stainless steel
		CW2M ⁽¹⁾	CW2M ⁽¹⁾
		M35-2 ⁽¹⁾	M35-2 ⁽¹⁾
Disk Materials	PTFE Seal	EN 1.4409 stainless steel	CF3M stainless steel
		CW2M	CW2M
	Metal or UHMWPE Seal	Chrome-plated EN 1.4409 Stainless Steel	Chrome-plated CF3M Stainless Steel
End Connections		Mates with raised-face flanges per EN 1092-1	Mates with raised-face flanges per ASME B16.5
Valve Body Style		Wafer (flangeless) and single flange with tapped holes	
Face-to-Face Dimensions		Meets MSS SP68, API 609, and EN 558 standards	
Shutoff		PTFE or UHMWPE seal ring - Class VI per ANSI/FCI 70-2 and IEC 60534-4	
		S31600 (316 SST) seal ring - 1% of Class IV per ANSI/FCI 70-2 and IEC 60534-4	
Flow Direction		Standard (forward flow) is with the seal retainer facing upstream; reverse flow is permissible within specified pressure drop limitations	
Flow Characteristic		Equal percentage	
Disk Rotation		Counterclockwise to open (when viewed from actuator side of valve body) through 90 degrees of disk rotation	
Shaft Diameters and Approximate Weights		See table 7	
1. This material is not listed in EN 12516-1 or ASME B16.34. See figures 6 and 7 for pressure/temperature ratings.			

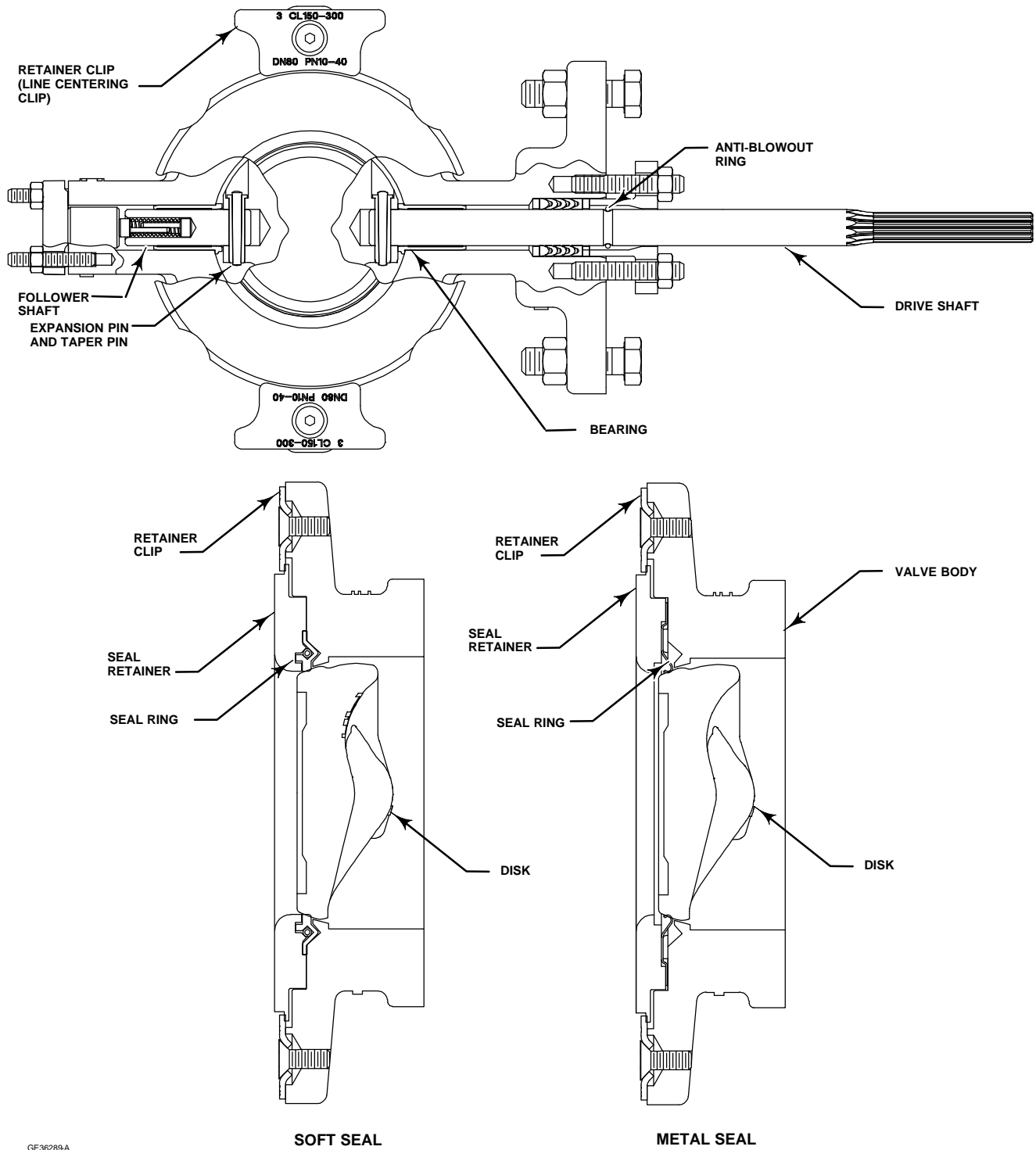
Table 2. Materials (Other Valve Components)

Component	Material
Shafts and Pins	S17400 (17-4PH) stainless steel, S20910 (XM-19) stainless steel, N10276, N05500
Anti-blowout Ring	N07718
Seal	PTFE or UHMWPE with S31600 (316 stainless steel) or R30003 spring. Metal seal is 316 stainless steel with graphite gaskets
Bearings	PEEK/PTFE, R30006 (Alloy 6)
Packing	PTFE/carbon-filled PTFE (standard), graphite die-molded ribbon, ENVIRO-SEAL PTFE packing, ENVIRO-SEAL graphite packing
Follower Spring	N07718 with carbon-filled PEEK or S31600 spring seats
Bolting	B8M Class 2, B7M, N05500, N07718
Nuts	8M, 2HM, N04400, N10276

Table 3. Trim Combinations with Standard Construction Materials

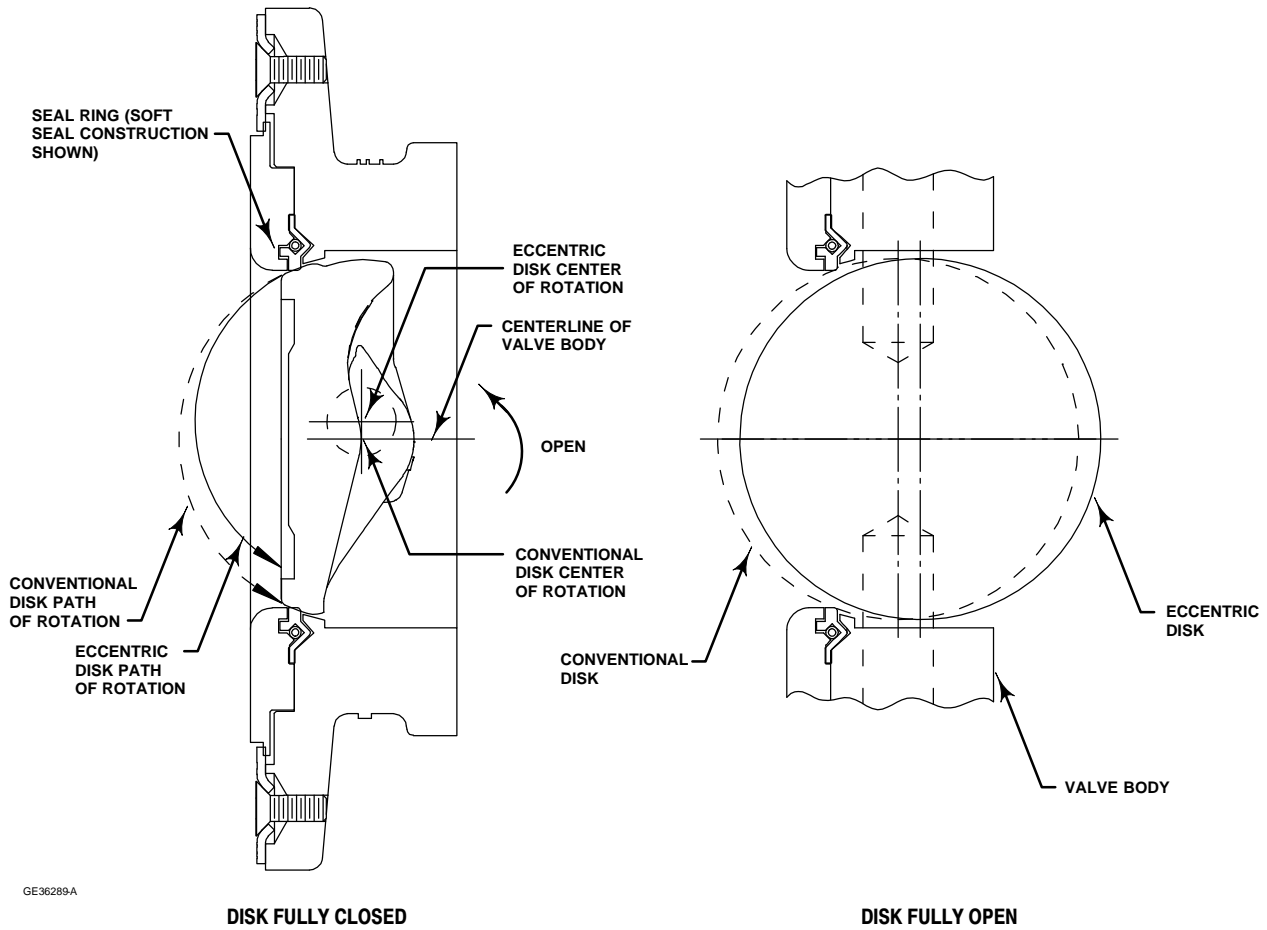
Valve Body Material	Shaft Material	Disk Material	Bearings	Seal Material
1.0619 & WCC	S17400 H1075	1.4409 & CF3M	PEEK/PTFE	PTFE
		1.4409 & CF3M Chrome-Plated	PEEK/PTFE Alloy 6	UHMWPE or Metal Metal
1.4409 & CF3M	S20910	1.4409 & CF3M	PEEK/PTFE	PTFE
		1.4409 & CF3M Chrome-Plated	PEEK/PTFE Alloy 6	UHMWPE or Metal Metal
CW2M	N10276	CW2M	PEEK/PTFE	PTFE
M35-2	N05500	M35-2	PEEK/PTFE	PTFE

Control-Disk Valve



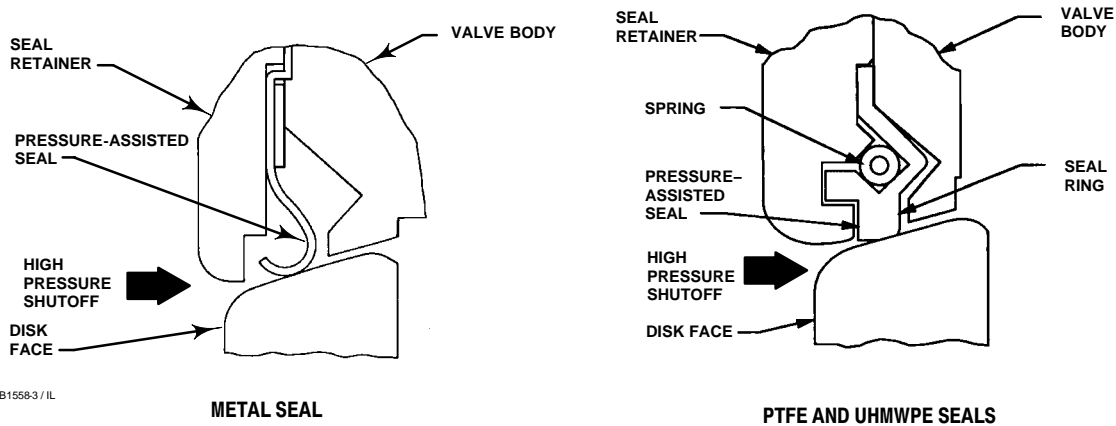
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Figure 2. Typical Fisher Control-Disk Valve Construction Detail



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Figure 3. Comparison of Disk Action



B1558-3/IL

Figure 4. Available Seal Configuration

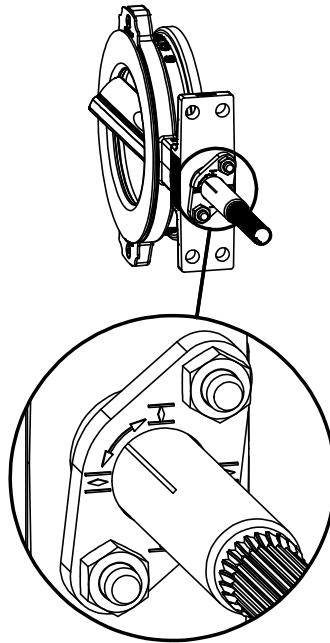


Figure 5. Travel Indication

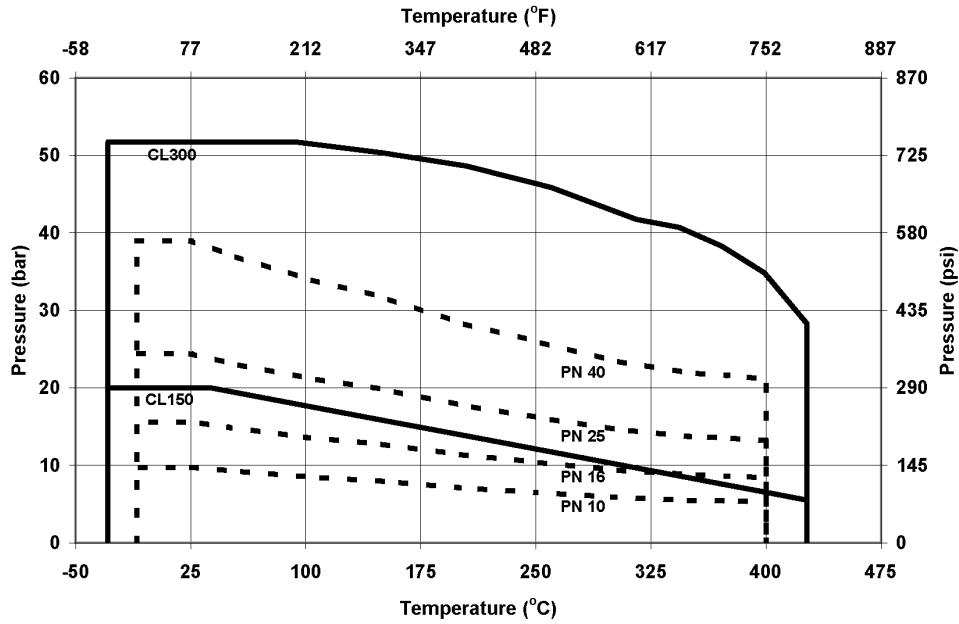
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Table 4. Material Temperature Capabilities

MATERIAL					TEMPERATURE LIMITS ⁽¹⁾	
EN Materials						
Valve Body	Shaft	Bearing Lining and Jacket	Seal	Packing	°C	°F
1.0619 Steel	S17400 or S20910	PEEK / PTFE	PTFE	PTFE or Graphite	-10 to 232	14 to 450
			UHMWPE	PTFE or Graphite	-10 to 93	14 to 200
			Metal	PTFE	-10 to 232	14 to 450
				Graphite	-10 to 260	14 to 500
		R30006 (Alloy 6)	Metal	Graphite	-10 to 400 ⁽²⁾	14 to 752 ⁽²⁾
1.4409 Stainless Steel	S20910	PEEK / PTFE	PTFE	PTFE or Graphite	-10 to 232	14 to 450
			UHMWPE	PTFE or Graphite	-10 to 93	14 to 200
			Metal	PTFE	-10 to 232	14 to 450
				Graphite	-10 to 260	14 to 500
		R30006 (Alloy 6)	Metal	Graphite	-10 to 500 ⁽²⁾	14 to 932 ⁽²⁾
CW2M	N10276	PEEK / PTFE	PTFE	PTFE	-10 to 232	14 to 450
M35-2	N05500	PEEK / PTFE	PTFE	PTFE	-10 to 232	14 to 450
ASME Materials						
Valve Body	Shaft	Bearing Lining and Jacket	Seal	Packing	°C	°F
WCC steel	S17400 or S20910	PEEK / PTFE	PTFE	PTFE or Graphite	-29 to 232	-20 to 450
			UHMWPE	PTFE or Graphite	-18 to 93	0 to 200
			Metal	PTFE	-29 to 232	-20 to 450
				Graphite	-29 to 260	-20 to 500
		R30006 (Alloy 6)	Metal	Graphite	-29 to 427 ⁽²⁾	-20 to 800 ⁽²⁾
CF3M Stainless Steel	S20910	PEEK / PTFE	PTFE	PTFE or Graphite	-46 to 232	-50 to 450
			UHMWPE	PTFE or Graphite	-18 to 93	0 to 200
			Metal	PTFE	-29 to 232	-20 to 450
				Graphite	-129 to 260	-200 to 500
		R30006 (Alloy 6)	Metal	Graphite	-129 to 454 ⁽²⁾	-200 to 850 ⁽²⁾
CW2M	N10276	PEEK / PTFE	PTFE	PTFE	-46 to 232	-50 to 450
M35-2	N05500	PEEK / PTFE	PTFE	PTFE	-46 to 232	-50 to 450

1. Minimum allowable temperature for PN series flanges is -10°C (14°F). See requirements of EN 13445-2 Annex B for applications below -10°C (14°F) with PN series flanges.
2. For applications exceeding 316°C (600°F), consult your Emerson Process Management sales office for appropriate disk material selection.

Pressure-Temperature Chart for WCC/1.0619



Pressure-Temperature Chart for CF3M/1.4409

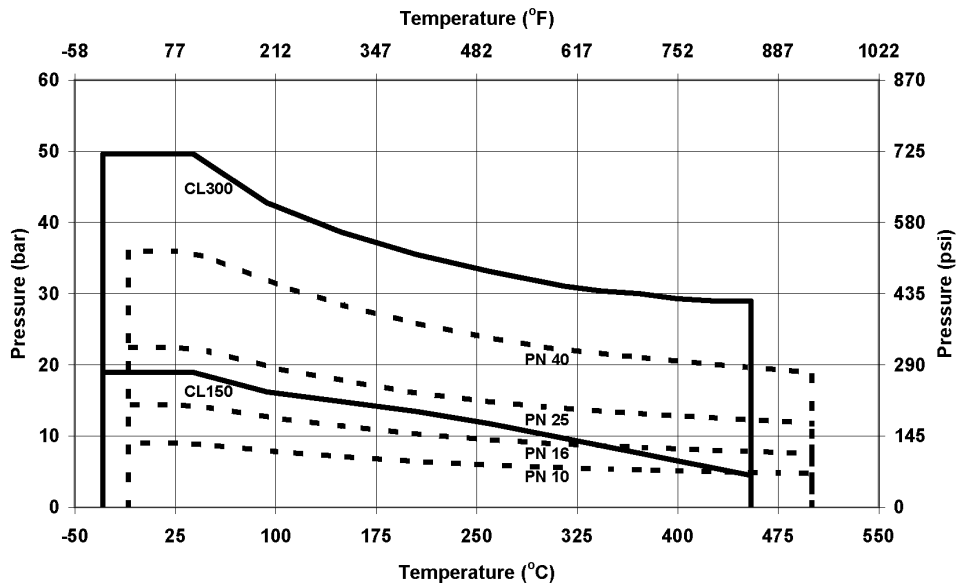
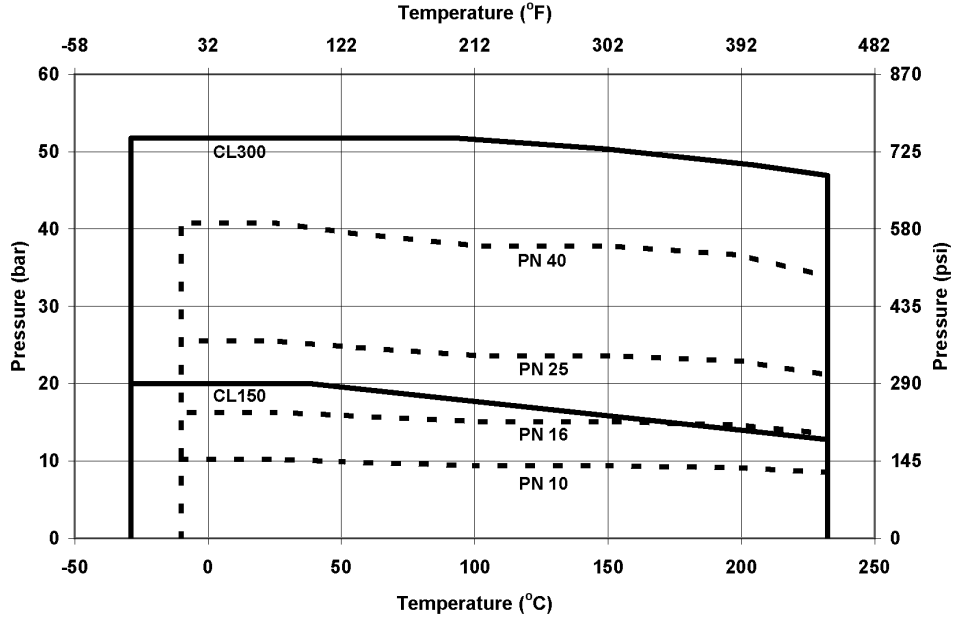
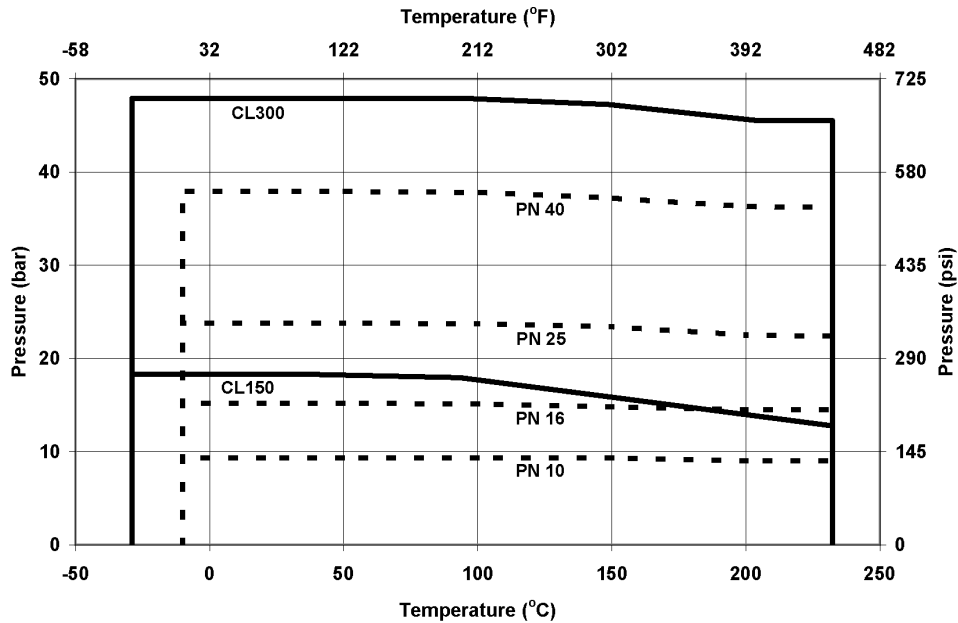


Figure 6. Material Pressure/Temperature Curves

Pressure-Temperature Chart for CW2M



Pressure-Temperature Chart for M35-2



1. CW2M and M35-2 are not listed in EN 12516-1 or ASME B16.34. The PN and CL designations are used only to indicate relative pressure-retaining capabilities.

Figure 7. Material Pressure/Temperature Curves

Table 5. Maximum Allowable Shutoff Pressure Drops based on Trim (Seal, Shaft, and Bearings)

Note: Do not exceed the EN or ASME pressure/temperature rating of the valve or mating flanges.

TRIM	TEMPERATURE, °C	DN						
		50	80	100	150	200	250	300
		Bar						
PTFE Seal PEEK/PTFE Bearings	-45 to 65	51.7	51.7	51.7	51.7	51.7	35.2	41.4
	93	48.5	48.5	48.5	48.5	48.5	35.0	41.4
	121	38.6	38.6	38.6	38.6	38.6	33.8	38.6
	149	28.7	28.7	28.7	28.7	28.7	28.7	28.7
	191	13.8	13.8	13.8	13.8	13.8	13.8	13.8
	204	10.3	10.3	10.3	10.3	10.3	10.3	10.3
	232	3.4	3.4	3.4	3.4	3.4	3.4	3.4
UHMWPE Seal PEEK/PTFE Bearings	-17 to 37	51.7	51.7	51.7	51.7	51.7	35.2	41.4
	66	38.6	38.6	38.6	38.6	38.6	35.1	38.6
	93	25.9	25.9	25.9	25.9	25.9	25.9	25.9
Metal Seal ⁽¹⁾ Metal Bearings	-28 to 93	18.5	16.5	13.9	12.8	11.0	6.8	7.0
	149	16.9	16.5	13.9	12.8	11.0	6.8	7.0
	204	15.8	16.5	13.9	12.8	11.0	6.8	7.0
	260	14.5	16.5	13.9	12.8	11.0	6.8	7.0
	316	13.8	16.5	13.9	12.8	11.0	6.8	7.0
	371	13.2	16.5	13.9	12.8	11.0	6.8	6.9
	427	12.5	16.5	13.9	12.8	11.0	6.8	6.6
	454	12.1	16.5	13.9	12.8	11.0	6.8	6.5
Metal Seal ⁽¹⁾ PEEK/PTFE Bearings	-46 to 93	51.7	51.7	51.7	51.7	31.0	17.2	17.2
	121	51.0	51.0	51.0	51.0	31.0	17.2	17.2
	149	50.3	50.3	50.3	50.3	31.0	17.2	17.2
	191	49.0	49.0	49.0	49.0	31.0	17.2	17.2
	204	48.6	48.6	48.6	48.6	31.0	17.2	17.2
	232	47.2	47.2	47.2	47.2	31.0	17.2	17.2
	260	45.9	45.9	45.9	45.9	31.0	17.2	17.2
TRIM	TEMPERATURE, °F	NPS						
		2	3	4	6	8	10	12
		Psi						
PTFE Seal PEEK/PTFE Bearings	-50 to 150	750	750	750	750	750	511	600
	200	704	704	704	704	704	508	600
	250	560	560	560	560	560	490	560
	300	416	416	416	416	416	416	416
	375	200	200	200	200	200	200	200
	400	150	150	150	150	150	150	150
	450	50	50	50	50	50	50	50
UHMWPE Seal PEEK/PTFE Bearings	0 to 100	750	750	750	750	750	511	600
	150	560	560	560	560	560	509	560
	200	375	375	375	375	375	375	375
Metal Seal ⁽¹⁾ Metal Bearings	-20 to 200	268	239	202	185	159	99	102
	300	246	239	202	185	159	99	102
	400	230	239	202	185	159	99	102
	500	211	239	202	185	159	99	102
	600	200	239	202	185	159	99	102
	700	192	239	202	185	159	99	99
	800	181	239	202	185	159	99	96
	850	176	239	202	185	159	99	94
Metal Seal ⁽¹⁾ PEEK/PTFE Bearings	-50 to 200	750	750	750	750	450	250	250
	250	740	740	740	740	450	250	250
	300	730	730	730	730	450	250	250
	375	711	711	711	711	450	250	250
	400	705	705	705	705	450	250	250
	450	685	685	685	685	450	250	250
	500	665	665	665	665	450	250	250

1. Pressure drops shown for metal seals are for forward flow only. For reverse flow with metal seal, limit pressure drop to 7 bar (100 psi).

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Table 6. Maximum Shutoff Pressure Drops with PTFE Seal and PEEK/PTFE Bearings and Fisher 2052 Actuator

VALVE SIZE		ACTUATOR SIZE	MAXIMUM SHUTOFF PRESSURE DROP, BAR	
DN	2 bar Supply		4 bar Supply	
50	1	13	52	
80		3.7	35	
100		---	9.2	
80	2	52	52	
100		38	52	
150		6.7	30	
200		---	10	
100	3	52	52	
150		42	52	
200		16	47	
250		4.1	24	
300		---	13	
VALVE SIZE		ACTUATOR SIZE	MAXIMUM SHUTOFF PRESSURE DROP, PSIG	
NPS	30 psig Supply		60 psig Supply	
2	1	185	750	
3		54	514	
4		---	133	
3	2	750	750	
4		555	750	
6		97	427	
8		---	140	
4	3	750	750	
6		609	750	
8		229	674	
10		60	343	
12		---	184	

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Table 7. Dimensions and Weights

VALVE SIZE, PRESSURE RATING		A	E	F		G		K	R	S ⁽¹⁾	T	U	W	APPROXIMATE WEIGHT ⁽²⁾	
				Wafer	Single Flange	Wafer	Single Flange							Wafer	Single Flange
mm														kg	
DN50/ NPS 2	PN10-40/ CL150- 300	43	187.5	150	---	109	---	125	102	12.7	117	---	14	4.7	6.7
DN80/ NPS 3	PN10-40/ CL150- 300	47/48 (3)	187.5	196	196	133	133	130	134	15.9	117	---	14	7.5	11.2
DN100/ NPS 4	PN10-40/ CL150- 300	53	214.4	222	226	122	147	172	162	19.1	152	32	14	12.5	17.6
DN150/ NPS 6	PN10-40/ CL150- 300	57	214.4	270	300	147	182	205	218	25.4	152	32	14	15.7	26.5
DN200/ NPS 8	PN10-16/ CL150	61	208	327	342	225	225	258	271	31.8	235	46	18	30.2	40.2
	PN25-40	61	208	358	364	225	225	258	285	31.8	235	46	18	33.9	46.0
	CL300	73													
DN250/ NPS 10	PN10-16/ CL150	69	208	390	395	218	250	270	324	31.8	235	46	18	38.9	50.5
	PN25-40	69	208	400	450	265	265	270	345	31.8	235	46	18	51.8	79.2
	CL300	83													
DN300/ NPS 12	PN10-16/ CL150	78	208	381	467	309	309	304	381	38.1	235	46	18	68.7	98.3
	PN25-40	78	208	410	512	309	309	304	410	38.1	235	46	18	76.6	104.6
	CL300	92													
Inches														lbs	
DN50/ NPS 2	PN10-40/ CL150- 300	1.69	7.38	5.91	---	4.29	---	4.92	4.02	0.50	4.62	---	0.55	10	15
DN80/ NPS 3	PN10-40/ CL150- 300	1.85/ 1.89 (3)	7.38	7.72	7.72	5.24	5.24	5.12	5.28	0.63	4.62	---	0.55	17	25
DN100/ NPS 4	PN10-40/ CL150- 300	2.09	8.44	8.74	8.90	4.80	5.79	6.77	6.38	0.75	6.00	1.25	0.55	28	39
DN150/ NPS 6	PN10-40/ CL150- 300	2.24	8.44	10.63	11.81	5.79	7.17	8.07	8.58	1.00	6.00	1.25	0.55	35	58
DN200/ NPS 8	PN10-16/ CL150	2.40	8.19	12.87	13.46	8.86	8.86	10.16	10.67	1.25	9.25	1.81	0.71	67	89
	PN25-40	2.40	8.19	14.09	14.33	8.86	8.86	10.16	11.22	1.25	9.25	1.81	0.71	75	102
	CL300	2.87													
DN250/ NPS 10	PN10-16/ CL150	2.72	8.19	15.35	15.55	8.58	9.84	10.63	12.76	1.25	9.25	1.81	0.71	86	111
	PN25-40	2.72	8.19	15.75	17.72	10.43	10.43	10.63	13.58	1.25	9.25	1.81	0.71	114	175
	CL300	3.27													
DN300/ NPS 12	PN10-16/ CL150	3.07	8.19	15.00	18.39	12.17	12.17	11.97	15.00	1.50	9.25	1.81	0.71	151	217
	PN25-40	3.07	8.19	16.14	20.16	12.17	12.17	11.97	16.14	1.50	9.25	1.81	0.71	169	231
	CL300	3.62													

1. This nominal valve shaft diameter is the shaft diameter through the packing box. Use this diameter when selecting Fisher actuators.
 2. Valve assembly only.
 3. 48 mm for CL150 and CL300 single flange only.

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Table 8. Line Bolting Dimensions

VALVE SIZE	Y					
	Pressure Rating					
	CL150	CL300	PN10	PN16	PN25	PN40
DN80 / NPS 3	4X 5/8-11	8X 3/4-10	8X M20X2.5			
DN100 / NPS 4	8X 5/8-11	8X 3/4-10	8X M16X2		8X M20X2.5	
DN150 / NPS 6	8X 3/4-10	12X 3/4-10	8X M20X2.5			8X M24X3
DN200 / NPS 8	8X 3/4-10	12X 7/8-9	8X M20X2.5	12X M20X2.5	12X M24X3	12X M27X3
DN250 / NPS 10	12X 7/8-9	16X 1-8	12X M20X2.5	12X M24X3	12X M27X3	12X M30X3.5
DN300 / NPS 12	12X 7/8-9	16X 1-1/8-8	12X M20X2.5	12X M24X3	16X M27X3	16X M30X3.5

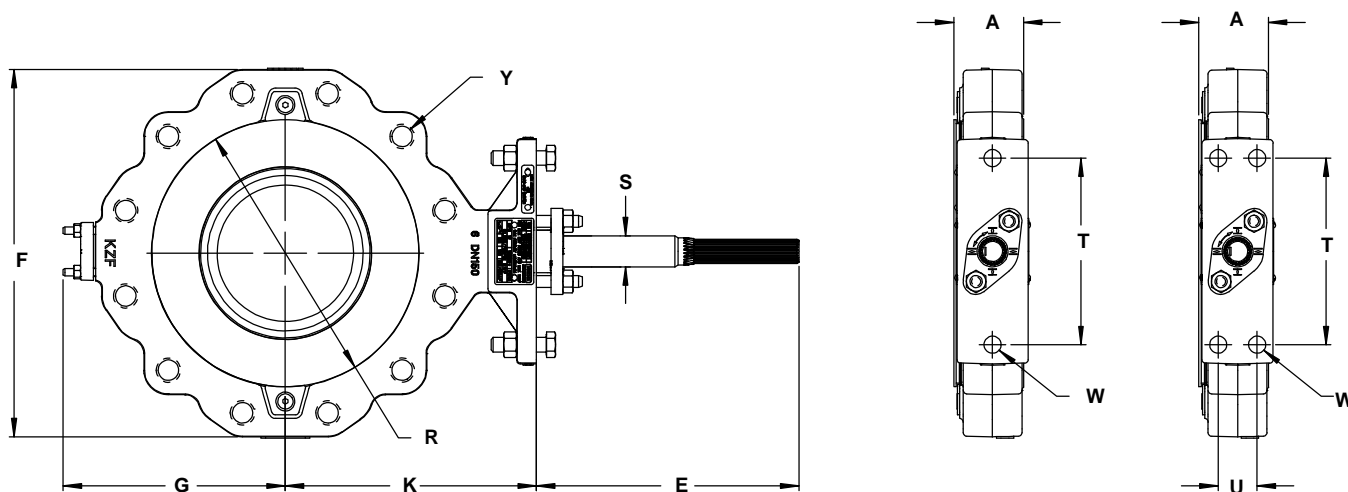


Figure 8. Dimensions for Fisher Control-Disk Valve, Single Flange

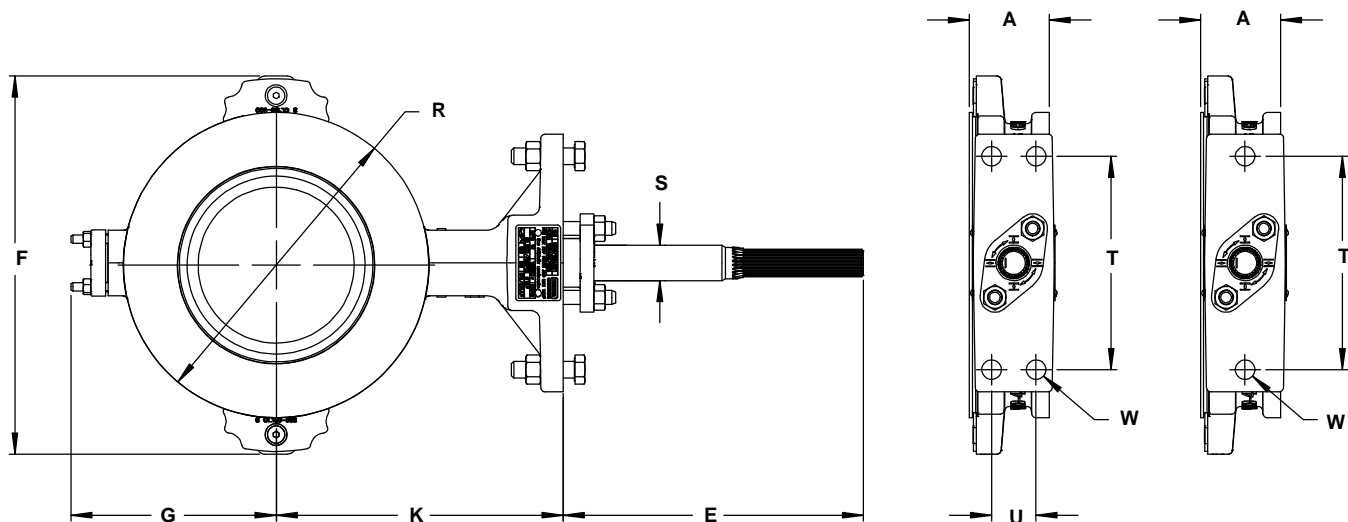


Figure 9. Dimensions for Fisher Control-Disk Valve, Wafer Style

Coefficients

Table 9. Fisher Control Disk Valve

Valve Size		Coefficients	Valve Rotation, Degrees								
DN	NPS		10	20	30	40	50	60	70	80	90
50	2	C _v	1.52	5.20	9.68	13.2	19.8	25.2	33.1	44.5	60.7
		K _v	1.31	4.49	8.36	11.4	17.1	21.8	28.6	38.4	52.4
		F _d	0.14	0.10	0.13	0.14	0.19	0.21	0.25	0.27	0.33
		F _L	---	0.78	0.77	0.75	0.74	0.75	0.77	0.75	0.71
		X _T	0.30	0.29	0.32	0.32	0.36	0.50	0.54	0.52	0.44
80	3	C _v	4.60	11.0	17.0	28.3	48.4	71.6	107	162	227
		K _v	3.97	9.50	14.7	24.5	41.8	61.9	92.4	140	196
		F _d	0.09	0.11	0.12	0.16	0.21	0.27	0.34	0.46	0.52
		F _L	0.67	0.73	0.65	0.73	0.76	0.76	0.74	0.70	0.66
		X _T	0.41	0.44	0.39	0.47	0.51	0.50	0.53	0.45	0.31
100	4	C _v	9.99	25.3	33.5	51.4	79.4	124	190	282	391
		K _v	8.63	21.9	28.9	44.4	68.6	107	164	244	338
		F _d	0.09	0.11	0.12	0.16	0.21	0.28	0.35	0.43	0.49
		F _L	0.85	0.86	0.82	0.80	0.78	0.75	0.73	0.68	0.60
		X _T	0.50	0.46	0.45	0.45	0.43	0.41	0.36	0.30	0.27
150	6	C _v	25.8	61.0	86.6	134	207	320	509	749	883
		K _v	22.3	52.7	74.8	116	179	276	440	647	763
		F _d	0.10	0.12	0.13	0.18	0.25	0.32	0.39	0.45	0.50
		F _L	0.76	0.76	0.70	0.70	0.74	0.74	0.68	0.64	0.59
		X _T	0.71	0.42	0.38	0.40	0.45	0.46	0.38	0.31	0.24
200	8	C _v	56.8	104	147	214	361	589	906	1390	1930
		K _v	49.1	89.9	127	185	312	509	783	1201	1668
		F _d	0.11	0.11	0.13	0.19	0.26	0.33	0.39	0.46	0.54
		F _L	0.8	0.76	0.71	0.77	0.76	0.74	0.71	0.63	0.56
		X _T	0.30	0.35	0.32	0.41	0.39	0.46	0.38	0.32	0.21
250	10	C _v	76.0	183	275	409	669	1070	1650	2540	3270
		K _v	65.7	158	238	353	578	924	1426	2195	2825
		F _d	0.11	0.13	0.16	0.22	0.29	0.35	0.41	0.48	0.55
		F _L	0.81	0.75	0.71	0.80	0.79	0.73	0.67	0.61	0.54
		X _T	0.44	0.41	0.37	0.45	0.45	0.39	0.34	0.25	0.19
300	12	C _v	108	188	272	515	925	1450	2230	3080	4530
		K _v	93.3	162	235	445	799	1253	1927	2661	3914
		F _d	0.09	0.11	0.14	0.21	0.28	0.34	0.40	0.47	0.54
		F _L	0.77	0.71	0.78	0.80	0.78	0.74	0.68	0.68	0.54
		X _T	0.26	0.37	0.48	0.47	0.45	0.47	0.37	0.34	0.19

Control-Disk Valve

2052 Actuator Specifications and Materials of Construction

See tables 10 and 11.

Table 10. Fisher 2052 Actuator Specifications

Specifications	
Actuator Mounting Connections	Splined shaft connection, ISO 5211 actuator-to-bracket connection Size 1: F07, Size 2: F10, Size 3: F14
Actuator Sizes	See bulletin 61.1:2052
Pressure Connection	See bulletin 61.1:2052
Operating Pressure ⁽¹⁾	See bulletin 61.1:2052
Torque Output	Size 1: 50.8 N•m (450 lbf•in) Size 2: 209.0 N•m (1850 lbf•in) Size 3: 565.0 N•m (5000 lbf•in)
	Torque varies no more than 10 percent between PDTO (push-down-to-open) and PDTC (push-down-to-close)
Cycle Life	Actuator spring is tested for fatigue life over 300,000 cycles up to the maximum safe load and to 100,000 at 80°C (176°F)
	1,000,000 full-stroke cycles to meet PSA requirement
Actuator Temperature Capabilities ⁽¹⁾	-45 to 80°C (-50 to 176°F)
Operation	Field reversible between PDTC and PDTO; right- and left-hand mounting, any angle of orientation
Weight	Size 1: 22.2 kg (49 lb) Size 2: 71.1 kg (157 lb) Size 3: 105.7 kg (233 lb)
Controller/Positioners Available	DVC2000, DVC6000, 3620
Accessories Available	Fisher 846, 646, 2625, and 67C Series, switches
Handwheel	Top-mounted handwheel: Optional on Size 1 and 2 actuators only Declutchable handwheel: Optional on Size 1, 2, and 3 actuators
Operational Lockout	Available for customer-supplied padlock to lock the actuator in the spring-fail position
1. The pressure/temperature limits in this bulletin and any applicable standard or code limitation for valve should not be exceeded.	

Table 11. Materials (Other Actuator Components)

Component	Material
Upper Casing	Steel
Housing	Cast Iron
Diaphragm	Nitrile and nylon standard
Lever	Ductile iron
Diaphragm Plate	Cast iron

Table 12. Fisher Control-Disk Valve Breakout Torque Requirements

TRIM CONFIGURATION: SOFT SEAL WITH PEEK/PTFE BEARINGS										
VALVE SIZE	SHAFT DIA	TORQUE, N•m								
		Shutoff ΔP_{max}								
DN	mm	3 bar	7 bar	10 bar	15 bar	20 bar	25 bar	35 bar	45 bar	50 bar
50	12.7	21.4	23.7	25.3	28.1	30.9	33.7	39.3	44.9	47.6
80	15.9	23.4	27.5	30.5	35.6	40.7	45.7	55.9	66.1	71.1
100	19.1	32.7	40.9	47.0	57.3	67.5	77.8	98.3	119	129
150	25.4	67.9	86.9	101	125	149	172	220	268	291
200	31.8	112	150	179	226	274	321	416	511	559
250	31.8	203	270	319	402	485	568	733	---	---
300	38.1	353	431	490	589	687	785	982	1179	---
TRIM CONFIGURATION: METAL SEAL WITH METAL BEARINGS										
VALVE SIZE	SHAFT DIA	TORQUE, Lbf•in								
		Shutoff ΔP_{max}								
NPS	Inch	50 psid	100 psid	150 psid	200 psid	300 psid	400 psid	500 psid	600 psid	750 psid
2	1/2	192	209	226	243	277	311	345	379	430
3	5/8	211	242	273	304	366	428	490	552	645
4	3/4	298	360	423	485	610	735	860	985	1173
6	1	620	765	910	1055	1345	1635	1925	2215	2650
8	1-1/4	1030	1320	1610	1900	2480	3060	3640	4220	5090
10	1-1/4	1865	2370	2875	3380	4390	5400	6410	---	---
12	1-1/2	3200	3800	4400	5000	6200	7400	8600	9800	---
TRIM CONFIGURATION: METAL SEAL WITH METAL BEARINGS										
VALVE SIZE	SHAFT DIA	TORQUE, N•m								
		Shutoff ΔP_{max}								
DN	mm	3 bar	7 bar	10 bar	15 bar	20 bar	25 bar	35 bar	45 bar	50 bar
50	12.7	37.3	42.4	46.2	52.5	---	---	---	---	---
80	15.9	62.9	73.5	81.5	94.7	108	121	---	---	---
100	19.1	103	124	140	167	193	220	---	---	---
150	25.4	204	262	306	378	450	---	---	---	---
200	31.8	373	501	596	755	914	---	---	---	---
250	31.8	579	782	935	---	---	---	---	---	---
300	38.1	850	1184	---	---	---	---	---	---	---
TRIM CONFIGURATION: METAL SEAL WITH METAL BEARINGS										
VALVE SIZE	SHAFT DIA	TORQUE, Lbf•in								
		Shutoff ΔP_{max}								
NPS	Inch	50 psid	100 psid	150 psid	200 psid	300 psid	400 psid	500 psid	600 psid	750 psid
2	1/2	336	374	413	451	---	---	---	---	---
3	5/8	567	648	729	810	972	1134	---	---	---
4	3/4	935	1096	1258	1419	1742	2065	---	---	---
6	1	1866	2307	2748	3189	4071	---	---	---	---
8	1-1/4	3430	4400	5370	6340	8280	---	---	---	---
10	1-1/4	5325	6875	8425	---	---	---	---	---	---
12	1-1/2	7850	10400	---	---	---	---	---	---	---

Control-Disk Valve

Table 13. Fisher 2052 Preferred Actuator Based On Actuator Torque Output

TRIM CONFIGURATION: SOFT SEAL WITH PEEK/PTFE BEARINGS											
VALVE SIZE	SHAFT DIA	ΔP_{max}									
DN	mm	3 bar	7 bar	10 bar	15 bar	20 bar	25 bar	35 bar	45 bar	50 bar	
50	12.7	Size 1									
80	15.9	Size 1					Size 2				
100	19.1	Size 1			Size 2						
150	25.4	Size 2						Size 3			
200	31.8	Size 2			Size 3					NA	
250	31.8	Size 3					NA				
300	38.1	Size 3				NA					
VALVE SIZE	SHAFT DIA	ΔP_{max}									
NPS	Inch	50 psid	100 psid	150 psid	200 psid	300 psid	400 psid	500 psid	600 psid	750 psid	
2	1/2	Size 1									
3	5/8	Size 1					Size 2				
4	3/4	Size 1			Size 2						
6	1	Size 2						Size 3			
8	1-1/4	Size 2			Size 3					NA	
10	1-1/4	Size 3					NA				
12	1-1/2	Size 3				NA					
TRIM CONFIGURATION: METAL SEAL WITH METAL BEARINGS											
VALVE SIZE	SHAFT DIA	ΔP_{max}									
DN	mm	3 bar	7 bar	10 bar	15 bar	20 bar	25 bar	35 bar	45 bar	50 bar	
50	12.7	Size 1			Size 2		NA				
80	15.9	Size 2					NA				
100	19.1	Size 2				NA					
150	25.4	Size 3			NA						
200	31.8	Size 3			NA						
250	31.8	NA									
300	38.1	NA									
VALVE SIZE	SHAFT DIA	ΔP_{max}									
NPS	Inch	50 psid	100 psid	150 psid	200 psid	300 psid	400 psid	500 psid	600 psid	750 psid	
2	1/2	Size 1			Size 2		NA				
3	5/8	Size 2					NA				
4	3/4	Size 2				NA					
6	1	Size 3			NA						
8	1-1/4	Size 3			NA						
10	1-1/4	NA									
12	1-1/2	NA									

2052 Actuator Features

- **Compact design, smaller actuators—**

Ensures reduced valve/actuator envelope dimensions leading to greater mounting versatility for both skids and smaller process plants, where space is at a premium.

- **Compatible with DVC2000 and DVC6000 digital valve controllers and Fisher 3620 positioner—**

The new actuator allows linkage-less feedback, via a contact-less magnetic array, from the lever to the end-mounted DVC2000. The DVC6000 and 3620 are side-mounted, with feedback through the cam and feedback arm.

- **Clamped lever to reduce lost motion—** The clamped lever coupled with the single-pivot linkage and splined-shaft valve reduce lost motion between the actuator and the valve. The typical cumulative deadband for a Fisher rotary control valve assembly results in 0.5% or less variability.

- **No bench set required—** The new nested spring design requires no bench set. This also simplifies the actuator selection process, see table 13.

- **ISO 5211 mounting with optional insert—** The actuator can now be mounted directly onto non-spline shafts, such as Square and Double D. This allows the actuator, with its enhanced control, to mount on a wider range of valves.

- **Adjustable travel stops standard with optional lockout feature—** Provides the ability to adjust or change the travel range without removing the actuator or the addition of extra parts. The optional lockout feature locks the lever in the spring-fail position.

- **Fail-safe mechanism contains no aluminum—** All steel parts in this mechanism helps to ensure the actuator maintains integrity in the event of a fire.

- **Powder paint as standard—** The Emerson Process Management powder paint finish offers an excellent corrosion-resistant finish to all external steel parts.

- **NAMUR VDE/VDI 3845 for accessory mounting—** Meeting the Global standard ensures compatibility for most accessories, enabling quick and easy mounting.

- **Field reversible, right- or left-hand mounting—** The actuator/valve assembly action can be converted from push-down-to-open to push-down-to-close, or vice-versa, without additional parts.

- **Declutchable and top-mounted handwheels—** Available (except top-mounted not available for size 3 actuator).

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