Product Bulletin
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Fisher® POSI-SEAL® A81 Rotary Valve

The Fisher® POSI-SEAL® A81 rotary valve with FieldQ® rack-and-pinion actuator (figure 1) offers automated on-off, quarter-turn performance. It is available in spring-return and double-acting piston designs.

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 A81 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.

Contents

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Figure 1. Fisher® A81 Valve with FieldQ® Actuator

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A81 Features

- **Quarter-turn performance—** The valve has a square shaft-to-actuator connection and offers automated on-off, quarter-turn performance.

- **Global Standards—** The valve meets API, ASME, and EN standards, making it suitable for use in all world areas. An optional mounting bracket provides ISO 5211 actuator mounting capability.

- **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.

- **Improved shaft-disk pinning—** The improved expansion pin system ensures there is a positive, durable connection between disk and shaft. This 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—** Depending on material selection, some 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. Contact your Emerson Process Management sales office for more information.

- **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 the 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).

A81 Valve Specifications and Materials of Construction

See tables 1 and 2.

Table 1. Fisher® A81 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)
		M35-1(1)	M35-1(1)
Disk Materials	PTFE Seal	EN 1.4409 stainless steel	CF3M stainless steel
		CW2M	CW2M
		M35-1	M35-1
	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 - No visible leakage per MSS SP-61	
		S31600 (316 SST) seal ring - 0.001% of maximum valve capacity [1/10 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		Approximately linear	
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 figure 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	S30200
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	UHMWPE or Metal
			Alloy 6	Metal
1.4409 & CF3M	S20910	1.4409 & CF3M	PEEK/PTFE	PTFE
		1.4409 & CF3M Chrome-Plated	PEEK/PTFE	UHMWPE or Metal
			Alloy 6	Metal
CW2M	N10276	CW2M	PEEK/PTFE	PTFE
M35-1	N05500	M35-1	PEEK/PTFE	PTFE

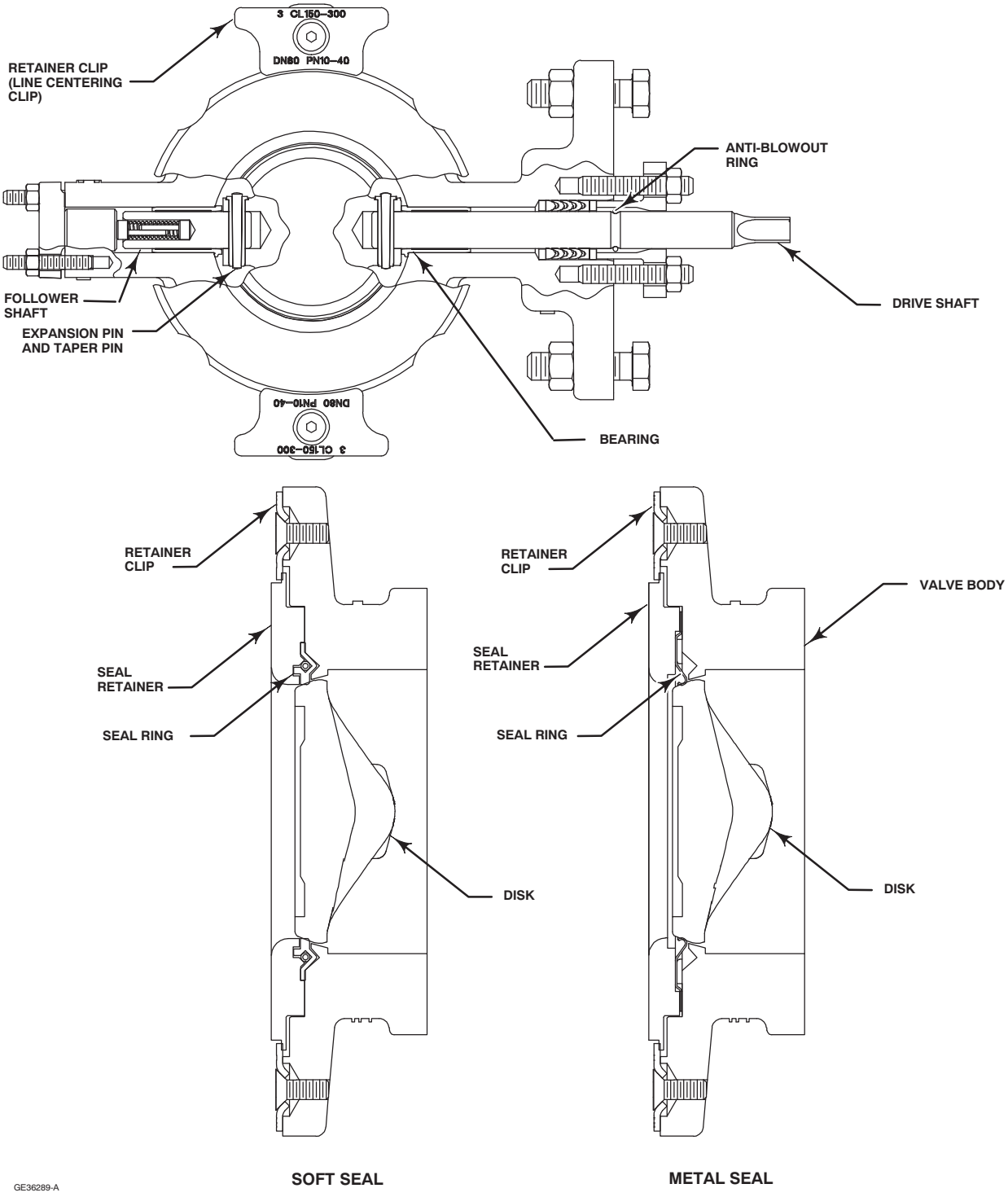


Figure 2. Typical Fisher® A81 Valve Construction Detail

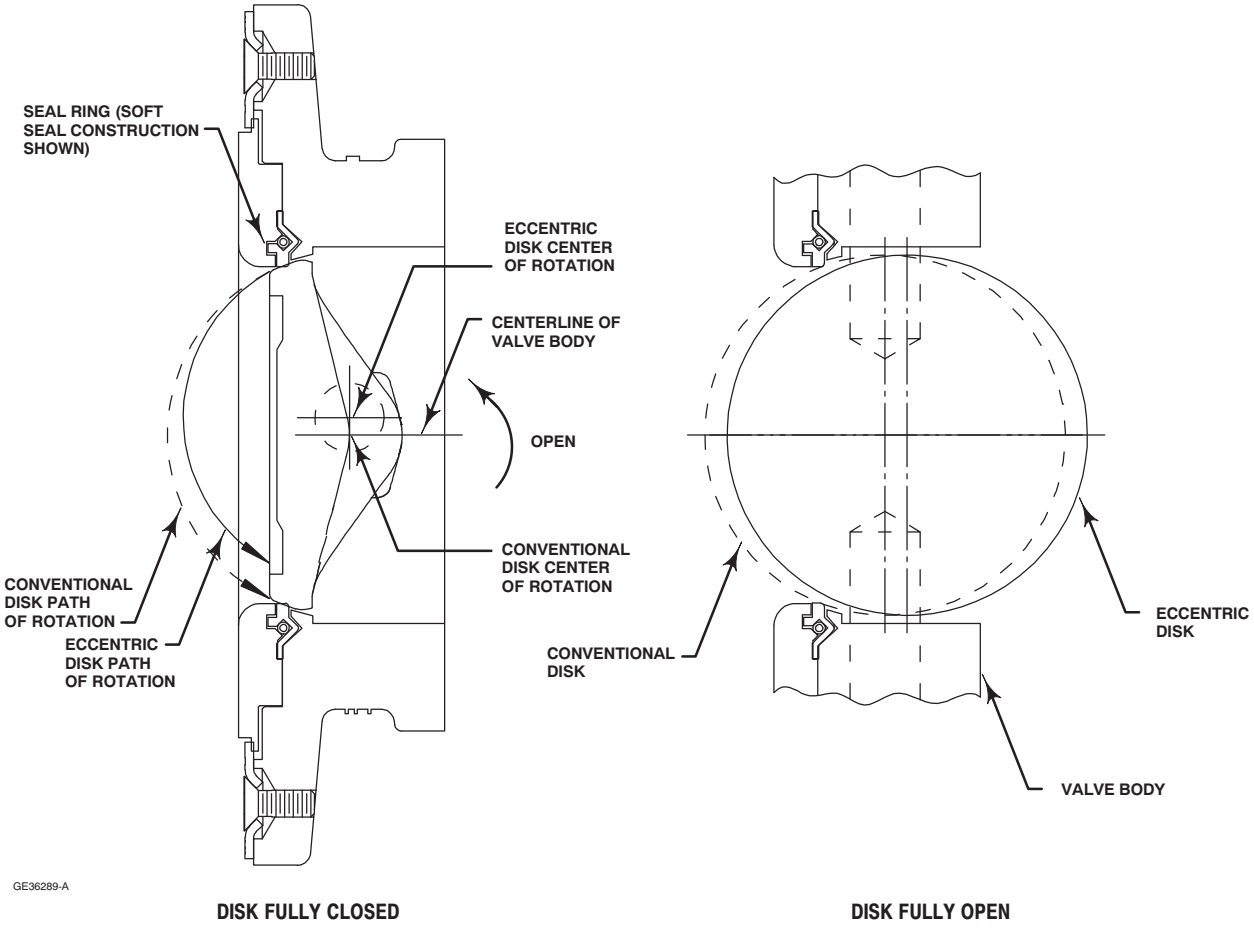


Figure 3. Comparison of Disk Action

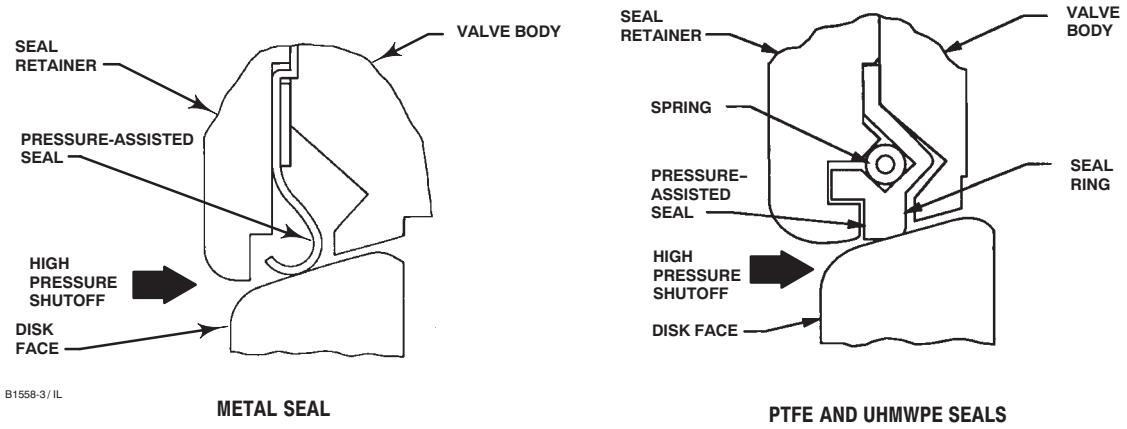


Figure 4. Available Seal Configuration

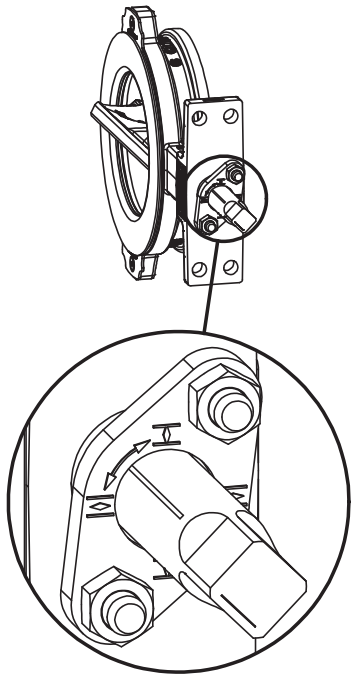
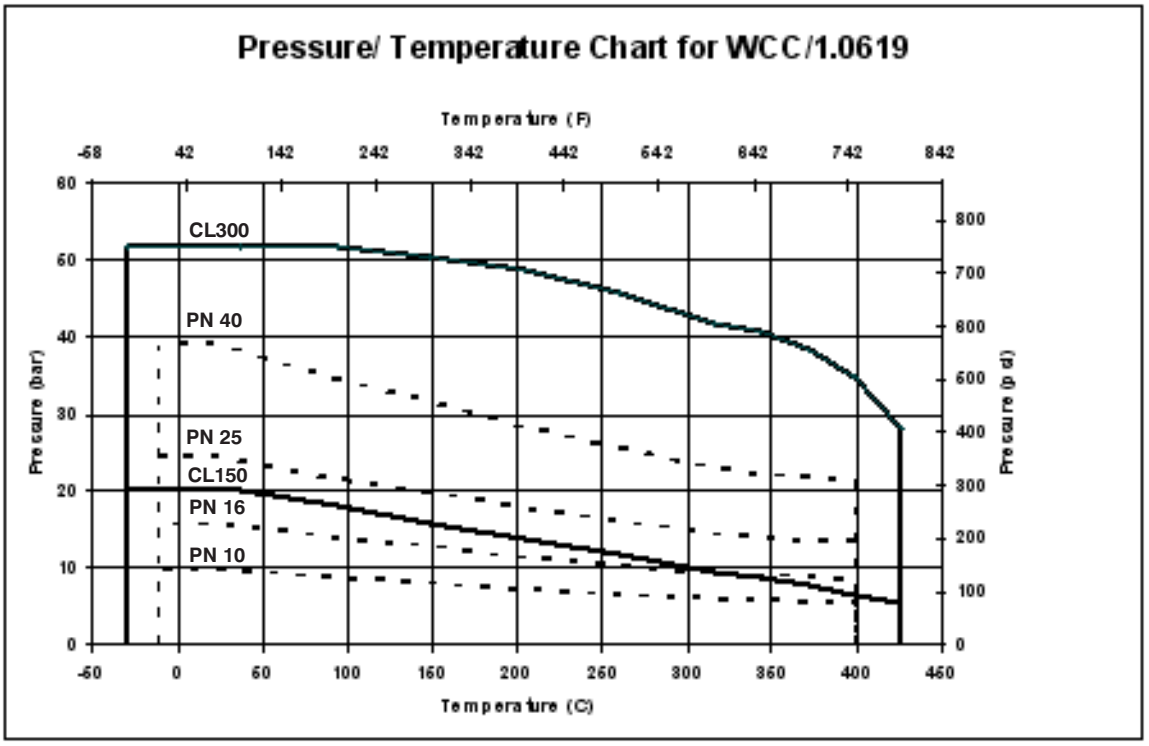


Figure 5. Travel Indication

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
M35-1	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
M35-1	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.



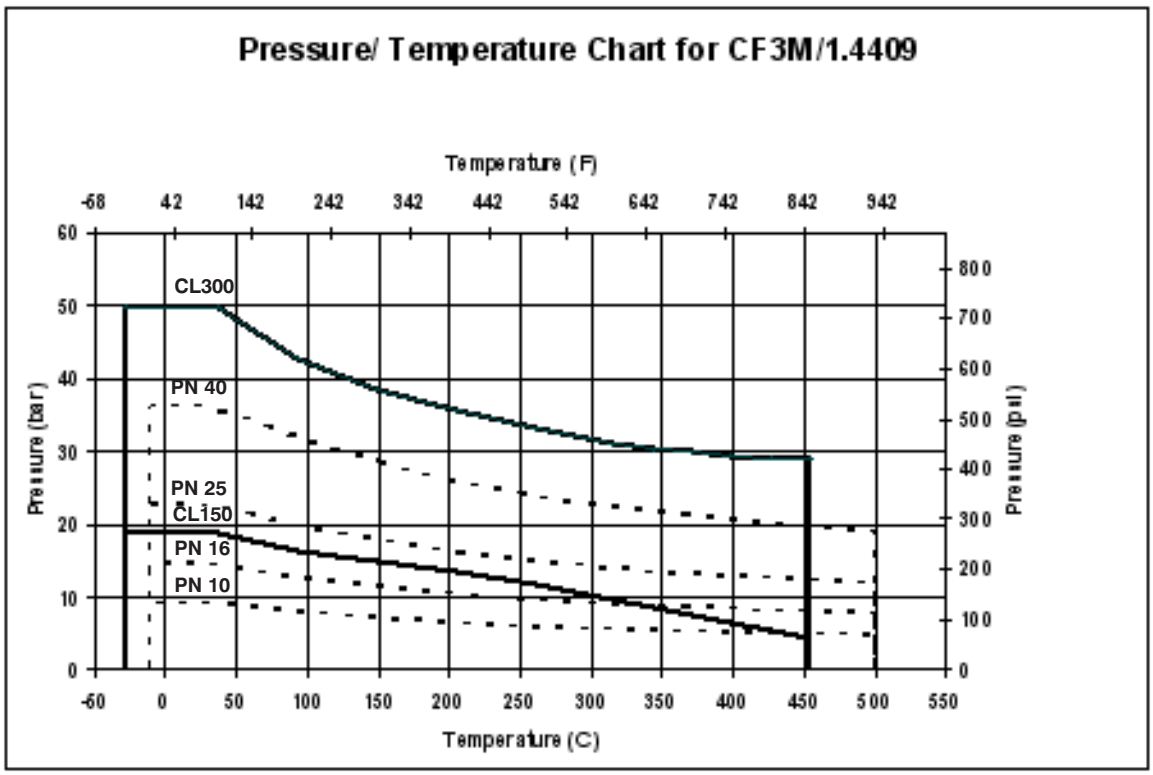
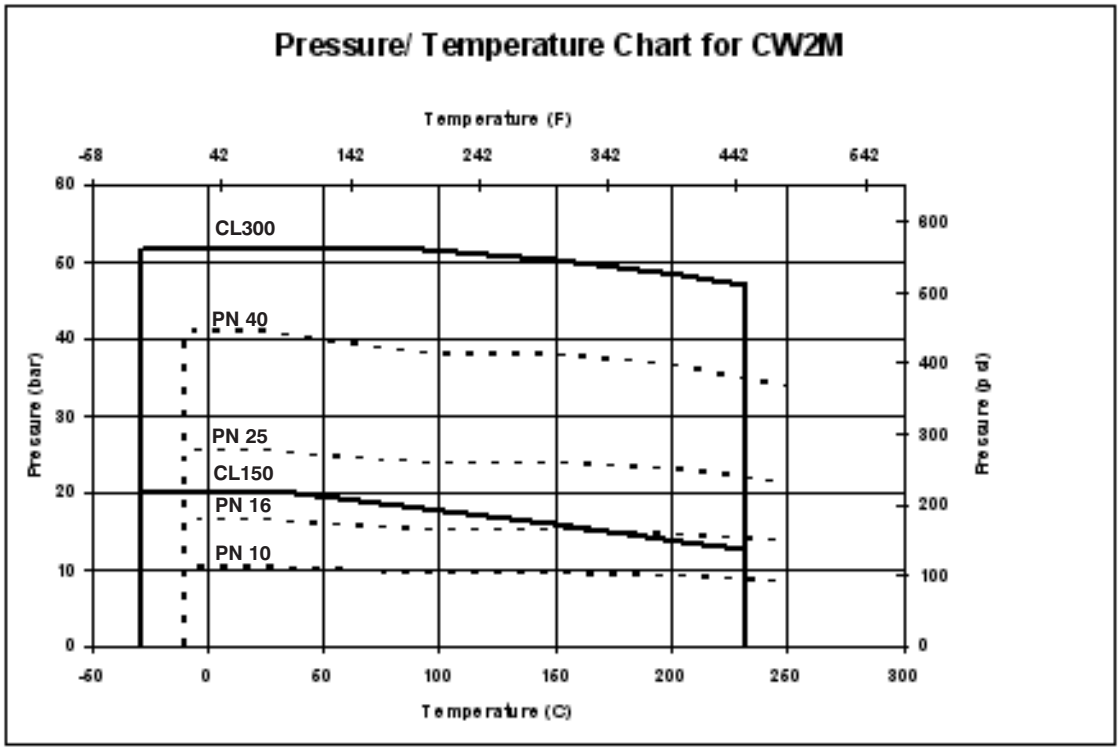
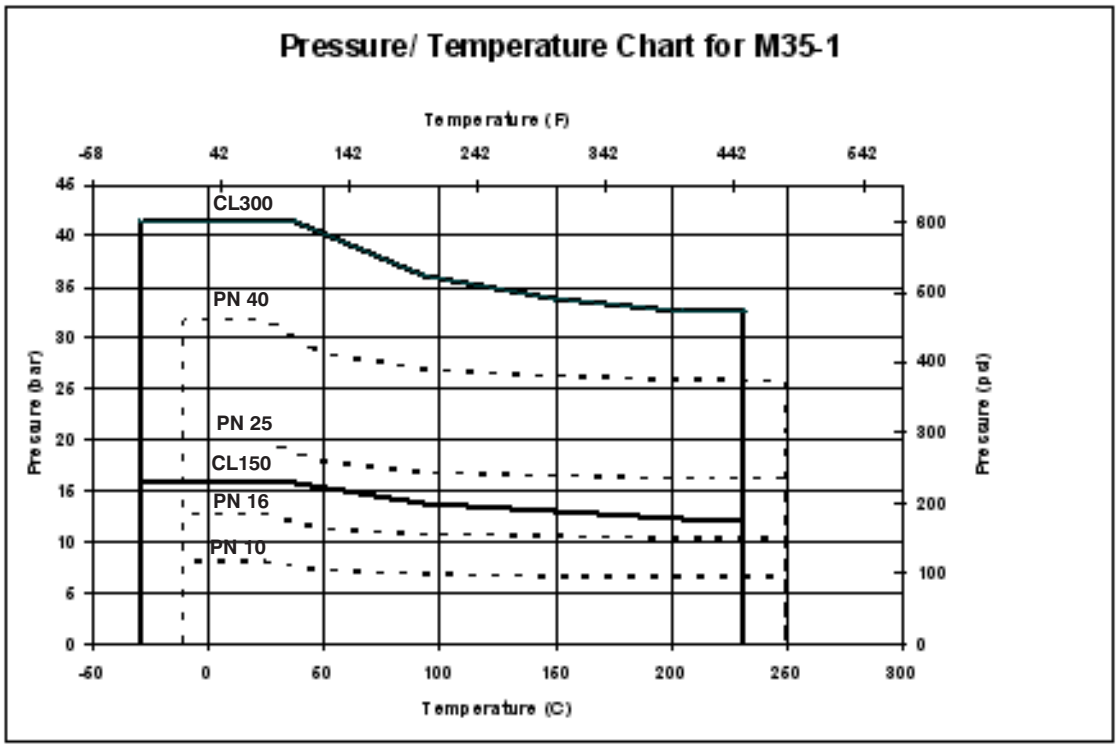


Figure 6. Material Pressure/Temperature Curves





1. CW2M and M35-1 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).

Table 6. ISO 5211 F Sizes Available with Optional Mounting Bracket

VALVE SIZE		ISO 5211 F SIZES
DN	NPS	
50	2	F07, F10
80	3	F07, F10
100	4	F07, F10, F12, F14, F16
150	6	F07, F10, F12, F14, F16
200	8	F10, F12, F14, F16
250	10	F10, F12, F14, F16
300	12	F10, F12, F14, F16

Table 7. Dimensions and Weights

VALVE SIZE / PRESSURE RATING		A	C	D	E	F		G		K	R	S(1)	T	U	W	APPROX-IMATE WEIGHT(2)	
						(4)	(5)	(4)	(5)							(4)	(5)
		mm														kg	
DN50/ NPS 2	PN10-40/ CL150-300	43	9	15	74	150	- - -	109	- - -	125	102	12.7	117	- - -	14	4.7	6.7
DN80/ NPS 3	PN10-40/ CL150-300	47/ 48 (3)	11	15	76	196	196	133	133	130	134	15.9	117	- - -	14	7.5	11.2
DN100/ NPS 4	PN10-40/ CL150-300	53	14	19	103	222	226	122	147	172	162	19.1	152	32	14	12.5	17.6
DN150/ NPS 6	PN10-40/ CL150-300	57	19	25	108	270	300	147	182	205	218	25.4	152	32	14	15.7	26.5
DN200/ NPS 8	PN10-16/ CL150	61	22	30	107	327	342	225	225	258	271	31.8	235	46	18	30.2	40.2
	PN25-40/ CL300	73	22	30	107	358	364	225	225	258	285	31.8	235	46	18	33.9	46.0
DN250/ NPS 10	PN10-16/ CL150	69	22	30	109	390	395	218	250	270	324	31.8	235	46	18	38.9	50.5
	PN25-40/ CL300	83	22	30	109	400	450	265	265	270	345	31.8	235	46	18	51.8	79.2
DN300/ NPS 12	PN10-16/ CL150	78	27	35	114	381	467	309	309	304	381	38.1	235	46	18	68.7	98.3
	PN25-40/ CL300	92	27	35	114	410	512	309	309	304	410	38.1	235	46	18	76.6	105
		Inches														lbs	
DN50/ NPS 2	PN10-40/ CL150-300	1.69	0.35	0.59	2.91	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)	0.43	0.59	2.99	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	0.55	0.75	4.06	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	0.75	0.94	4.25	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	0.87	1.18	4.21	12.87	13.46	8.86	8.86	10.16	10.67	1.25	9.25	1.81	0.71	67	89
	PN25-40/ CL300	2.87	0.87	1.18	4.21	14.09	14.33	8.86	8.86	10.16	11.22	1.25	9.25	1.81	0.71	75	102
DN250/ NPS 10	PN10-16/ CL150	2.72	0.87	1.18	4.29	15.35	15.55	8.58	9.84	10.63	12.76	1.25	9.25	1.81	0.71	86	111
	PN25-40/ CL300	3.27	0.87	1.18	4.29	15.75	17.72	10.43	10.43	10.63	13.58	1.25	9.25	1.81	0.71	114	175
DN300/ NPS 12	PN10-16/ CL150	3.07	1.06	1.38	4.49	15.00	18.39	12.17	12.17	11.97	15.00	1.50	9.25	1.81	0.71	151	217
	PN25-40/ CL300	3.62	1.06	1.38	4.49	16.14	20.16	12.17	12.17	11.97	16.14	1.50	9.25	1.81	0.71	169	231

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.
4. Wafer
5. Single Flange

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

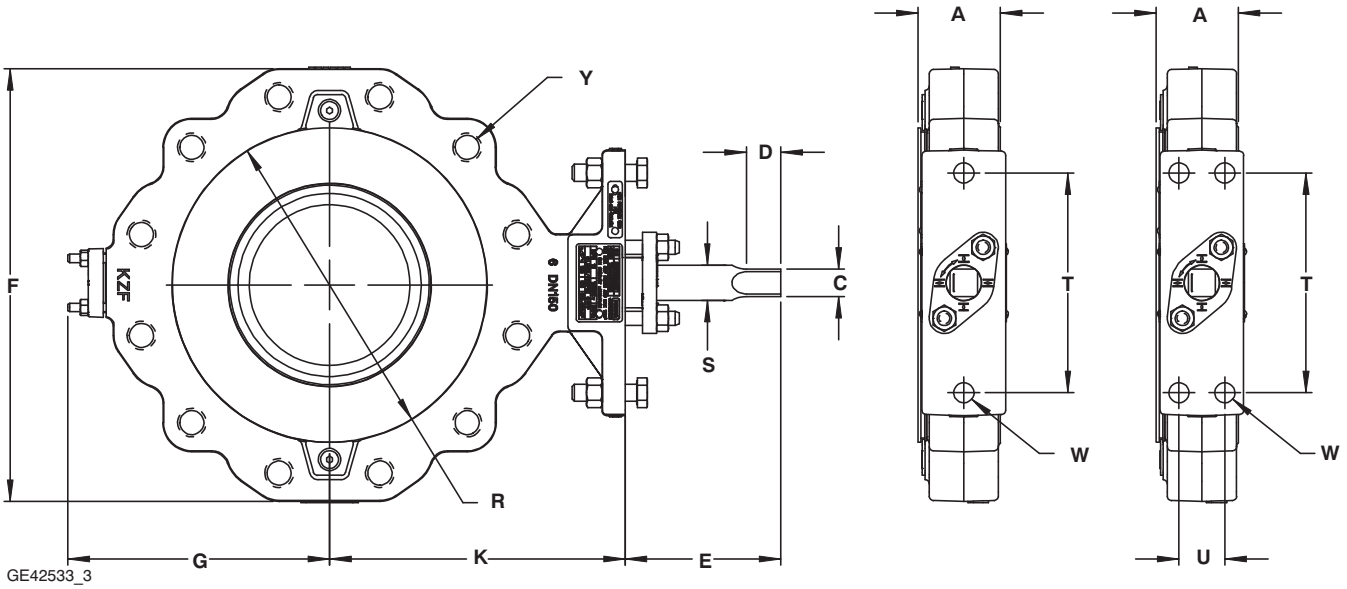


Figure 8. Dimensions for Fisher® A81, Single Flange Valve

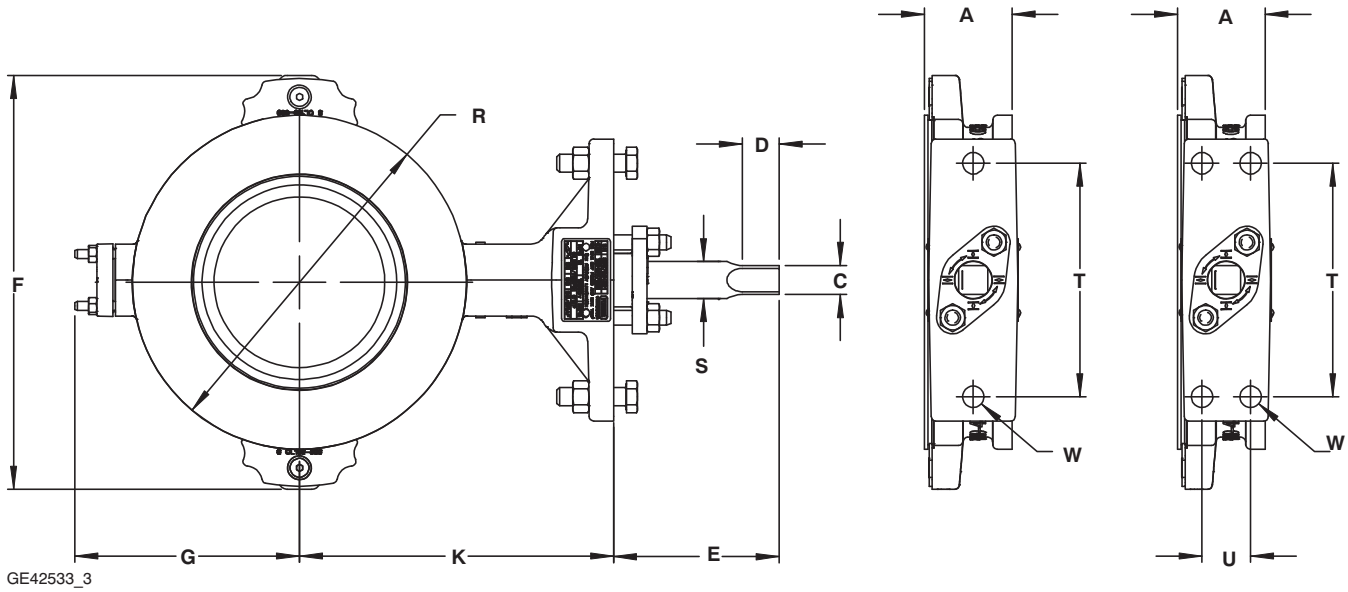
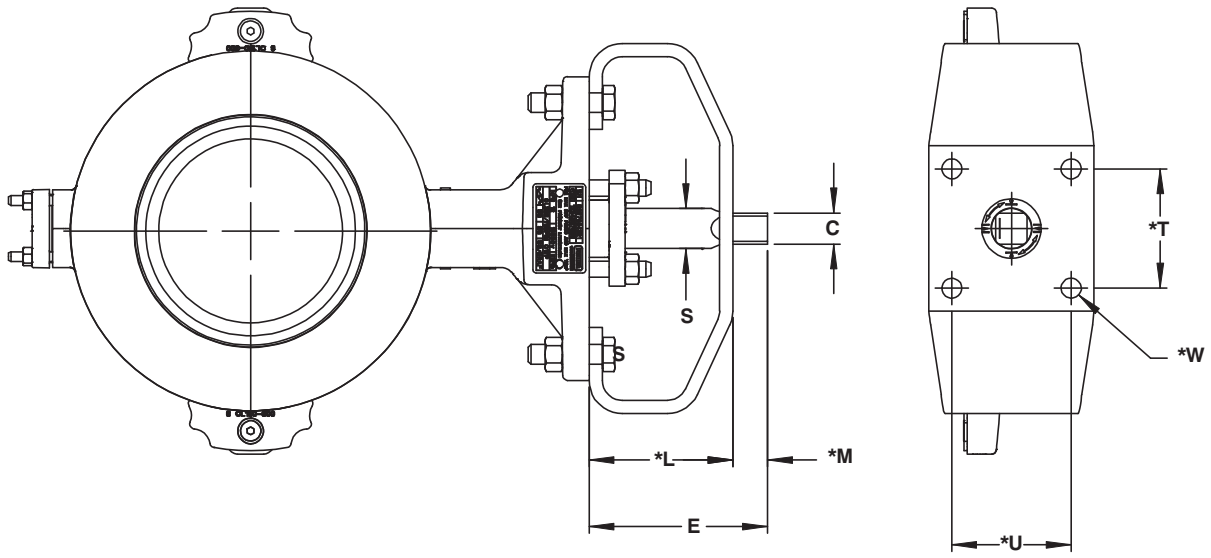


Figure 9. Dimensions for Fisher® A81, Wafer Style Valve

Table 9. Dimensions and Weights, Optional Mounting Bracket

VALVE SIZE / PRESSURE RATING		S(1)		C		E		L		M		T		U		W		ISO 5211
		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
DN50/ NPS 2	PN10-40/ CL150-300	12.7	0.50	9	0.35	74	2.91	64	2.52	10	0.39	49.50	1.95	49.50	1.95	10	0.39	F07
												72.12	2.84	72.12	2.84	12	0.47	F10
DN80/ NPS 3	PN10-40/ CL150-300	15.9	0.63	11	0.43	76	2.99	64	2.52	12	0.47	49.50	1.95	49.50	1.95	10	0.39	F07
												72.12	2.84	72.12	2.84	12	0.47	F10
DN100/ NPS 4	PN10-40/ CL150-300	19.1	0.75	14	0.55	103	4.06	87	3.43	16	0.63	49.50	1.95	49.50	1.95	10	0.39	F07
												72.12	2.84	72.12	2.84	12	0.47	F10
												88.39	3.48	88..39	3.48	14	0.55	F12
DN150/ NPS 6	PN10-40/ CL150-300	25.4	1.00	19	0.75	108	4.25	87	3.43	21	0.82	49.50	1.95	49.50	1.95	10	0.39	F07
												72.12	2.84	72.12	2.84	12	0.47	F10
												88.39	3.48	88.39	3.48	14	0.55	F12
												99.00	3.90	99.00	3.90	18	0.71	F14
												116.67	4.59	116.67	4.59	22	0.87	F16
DN200/ NPS 8	PN10-16/ CL150	31.8	1.25	22	0.87	107	4.21	85	3.35	22	0.87	72.12	2.84	72.12	2.84	12	0.47	F10
												88.39	3.48	88.39	3.48	14	0.55	F12
	PN25-40/ CL300	31.8	1.25	22	0.87	107	4.21	85	3.35	22	0.87	99.00	3.90	99.00	3.90	18	0.71	F14
												116.67	4.59	116.67	4.59	22	0.87	F16
DN250/ NPS 10	PN10-16/ CL150	31.8	1.25	22	0.87	109	4.29	85	3.35	24	0.94	72.12	2.84	72.12	2.84	12	0.47	F10
												88.39	3.48	88.39	3.48	14	0.55	F12
	PN25-40/ CL300	31.8	1.25	22	0.87	109	4.29	85	3.35	24	0.94	99.00	3.90	99.00	3.90	18	0.71	F14
												116.67	4.59	116.67	4.59	22	0.87	F16
DN300/ NPS 12	PN10-16/ CL150	38.1	1.50	27	1.06	114	4.49	85	3.35	29	1.14	72.12	2.84	72.12	2.84	12	0.47	F10
												88.39	3.48	88.39	3.48	14	0.55	F12
	PN25-40/ CL300	38.1	1.50	27	1.06	114	4.49	85	3.35	29	1.14	99.00	3.90	99.00	3.90	18	0.71	F14
												116.67	4.59	116.67	4.59	22	0.87	F16

1. This nominal valve shaft diameter is the shaft diameter through the packing box. Use this diameter when selecting Fisher actuators.



GE42533_3

Figure 10. Dimensions for Fisher® A81, Wafer Style Valve with Optional Mounting Bracket

Coefficients

Table 10. Fisher® A81 Valve

Valve Size		Coefficients	Valve Rotation, Degrees								
DN	NPS		10	20	30	40	50	60	70	80	90
50	2	C_v	2.28	7.7	21.5	35.5	51	58.9	62.4	78.3	83.7
		K_v	*1.97*	*6.7*	*18.6*	*30.7*	*44.1*	*50.9*	*53.9*	*67.7*	*72.3*
		F_d	0.16	0.21	0.21	0.25	0.29	0.32	0.36	0.37	0.39
		F_L	- - -	0.91	0.84	0.76	0.73	0.78	0.80	0.68	0.66
		X_T	- - -	0.76	0.53	0.39	0.39	0.52	0.54	0.39	0.35
80	3	C_v	3.50	22.1	46.3	73.1	120	147	181	239	275
		K_v	*3.02*	*19.1*	*40.0*	*63.2*	*103.7*	*127*	*156*	*206*	*238*
		F_d	0.10	0.17	0.23	0.27	0.32	0.33	0.41	0.47	0.51
		F_L	0.77	0.81	0.79	0.79	0.69	0.70	0.67	0.62	0.58
		X_T	0.46	0.60	0.54	0.55	0.40	0.37	0.35	0.29	0.23
100	4	C_v	9.40	48.8	90.6	137	171	224	297	397	484
		K_v	*8.12*	*42.2*	*78.3*	*118*	*148*	*194*	*257*	*343*	*418*
		F_d	0.10	0.18	0.23	0.28	0.33	0.38	0.43	0.50	0.53
		F_L	0.9	0.83	0.80	0.77	0.77	0.74	0.68	0.62	0.58
		X_T	0.48	0.47	0.48	0.48	0.46	0.39	0.32	0.26	0.22
150	6	C_v	26.2	99.1	181	283	401	543	717	951	1000
		K_v	*22.6*	*85.6*	*156*	*245*	*346*	*469*	*619*	*822*	*864*
		F_d	0.10	0.18	0.26	0.31	0.36	0.40	0.43	0.47	0.49
		F_L	0.82	0.79	0.77	0.74	0.72	0.68	0.66	0.61	0.58
		X_T	0.44	0.48	0.52	0.48	0.42	0.36	0.32	0.26	0.22
200	8	C_v	44.6	138	285	457	698	994	1390	2190	2550
		K_v	*38.5*	*119*	*246*	*395*	*603*	*859*	*1201*	*1892*	*2203*
		F_d	0.13	0.20	0.25	0.31	0.37	0.43	0.47	0.51	0.55
		F_L	0.86	0.94	0.82	0.71	0.68	0.67	0.61	0.54	0.47
		X_T	0.49	0.43	0.54	0.52	0.45	0.36	0.31	0.18	0.14
250	10	C_v	72.0	225	423	729	1150	1720	2440	3370	3720
		K_v	*62.2*	*194*	*365*	*630*	*994*	*1486*	*2108*	*2912*	*3214*
		F_d	0.12	0.18	0.23	0.26	0.36	0.41	0.45	0.57	0.54
		F_L	0.89	0.78	0.82	0.75	0.70	0.66	0.60	0.55	0.50
		X_T	0.53	0.42	0.57	0.49	0.41	0.32	0.23	0.18	0.16
300	12	C_v	128	401	733	1220	1800	2490	3380	4470	5080
		K_v	*111*	*346*	*633*	*1054*	*1555*	*2151*	*2920*	*3862*	*4389*
		F_d	0.13	0.19	0.25	0.31	0.38	0.44	0.47	0.50	0.53
		F_L	0.83	0.73	0.74	0.70	0.69	0.66	0.61	0.51	0.50
		X_T	0.41	0.34	0.46	0.42	0.36	0.30	0.24	0.18	0.16

Table 11. Fisher® A81 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	- - -
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	- - -	- - -	- - -	- - -	- - -	- - -	- - -
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	- - -	- - -	- - -	- - -	- - -	- - -	- - -

A81 Valve

FieldQ® Actuator Features

- **Simple, modular construction—** Makes operation and maintenance easier. The basic actuator module includes the pistons, rack and pinion gear, springs (for spring-return actuators), housing, and position indicator. Pneumatic operation is accomplished with an ASCO 8551 solenoid valve. The solenoid is activated by a 120 VAC 60 Hz or 110 VAC 50 Hz signal. It is pad mounted and does not require a bracket. The basic actuator features built-in visual position indication, travel stops for both directions, a balanced pinion design, and mechanical position feedback system.

- **Three Point Suspension System—**Three carbon-filled PTFE guide bands provide a low friction bearing surface for piston alignment and rack support. Elimination of metal-to-metal contact between pistons and cylinder wall reduces friction for outstanding cycle life, smooth piston travel, and maximum power.

- **Balanced Piston Design—**As part of the design, three equally spaced bearing surfaces are cast into each piston. The rack and pinion construction results in even distribution of bearing loads, optimum gear engagement, and reduced piston tilt. Equal spring force applied to each piston enhances actuator life.

- **Multiple Constructions—**Conversion from double acting to spring return, or vice versa, is simple and safe, thus reducing spare part requirements. Valve/actuator action is also field reversible.

- **Dual Stop Adjustment—** This adjustment is standard on all E Series actuators. The P Series actuators are supplied with a limit plate adjustment feature.

- **Dual Piston Design—**Air pressure applies a balanced force across the common pinion gear. Symmetrically balanced center mount construction eliminates undue stress on the valve stem, bearings, and disk.

For further information, refer to:
http://www.emersonprocess.com/valveautomation/fieldq/index.html

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