

# The Fisher® POSI-SEAL® Package

The Fisher® POSI-SEAL® Package (PSP) (see figure 1) combines a Fisher A41 High Performance Butterfly Valve, a Fisher 1035/El-O-Matic Rack-and-Pinion Actuator, your choice of PMV Positioners (see table 3), TopWorx Limit Switches (see table 1), and a wide variety of Solenoid valves (see table 2). The combination of the POSI-SEAL

valves, actuator and accessories assures you of the performance, reliability and dependability that you have come to expect from Emerson Process Management. The PSP offers complete compatibility, a competitive price and the most flexible automated valve package in the industry.



W9255

*Figure 1. The Fisher® POSI-SEAL® Package*



## Specifications

### A41 Valve

#### Sizes and End Connection Styles

NPS ■ 2, ■ 3, ■ 4, ■ 6, ■ 8, ■ 10, and ■ 12 valves available in wafer or single flange style. NPS 2 is only available in wafer style. See figure 3 for typical valve dimensions.

#### Mating Flange Capabilities

All sizes compatible with appropriate CL150. NPS 2 also compatible with CL300 and 600 flanges (schedule 80 or lighter)

#### Valve Classification

Face-to-face dimensions of NPS 3 through 12 in CL150, and meets API 609 or MSS SP-68 standards for face-to-face dimensions of wafer style valves

#### Maximum Inlet Pressures<sup>(1)</sup>

**Carbon Steel and Stainless Steel Valve Bodies:** Consistent with CL150 pressure-temperature ratings per ASME B16.34 unless limited by material temperature capabilities. NPS 2 is also consistent with CL600.

#### Maximum Pressure Drops<sup>(1)</sup>

Consistent with CL150 and pressure/temperature ratings per ASME B16.34 except at some higher pressure/temperatures values. (See bulletin 21.1:A41)

#### Material Temperature Capabilities<sup>(1)</sup>

**PTFE Seal:** -46 to 232°C (-50 to 450°F)  
**NPS 2 Metal Seal:** -46 to 538°C (-50 to 1000°F)

#### Shutoff Classifications

**PTFE Seals:** No visible leakage for this bi-directional seal per MSS SP-61  
**NPS 2 Metal Seal:** Bidirectional shutoff. 0.001% of maximum valve capacity (1/10) of Class IV per ANSI/FCI 70-2 and IEC 60534-4. Pressure drop is 740 psig forward and 100 psig reverse.

#### Flow Coefficients

See the section titled Coefficients in this bulletin or Catalog 12.

### 1035/EI-O-Matic Actuator

#### Actuator Sizes

**Double Acting:** ■ EDA 25, ■ EDA 40, ■ EDA 65, ■ EDA 100, ■ EDA 200, ■ EDA 350, ■ EDA 600, and ■ EDA 950

**Spring Return :** ■ ESA 25, ■ ESA 40, ■ ESA 65, ■ ESA 100, ■ ESA 200, ■ ESA 350, ■ ESA 600, ■ ESA 950, and ■ ESA 1600

**Output Shaft:** Recessed double D output insert for A41 valves

**Dual Stop Adjustment:** E Series actuators are furnished with dual stop adjustments (DSA) as a standard feature

See figure 2 for dimensions with A41 valve.

#### Supply Pressure<sup>(1)</sup> (Operating Pressure)

**Double Acting and Spring Return:** 2.8 to 8.3 bar (40 to 120 psig)

#### Temperature Range<sup>(1)</sup>

**Standard:** -20 to 79°C (-4 to 175°F) with Nitrile O-rings

**Optional:** High temperature: -20 to 121°C (-4 to 250°F) with fluorocarbon O-rings

Low temperature: -40 to 79°C (-40 to 175°F) with EPDM and special lubricant

#### Actuator Orientation

**Standard:** Parallel to the pipeline, Code A.  
**Optional:** Code B, C and D (See bulletin 22.1:1035)

1. The pressure/temperature limits in this bulletin and any applicable standard or code limitation for valve should not be exceeded.

## Features

### The A41 High Performance Butterfly Valve provides...

- **Exceptional Shutoff**—Patented bidirectional soft seal ring with pressure-assisting action results in exceptional shutoff rates as shown in the specifications.
- **Shaft Retention**—Redundant shaft retention provides added protection. The packing follower and shaft step interact to hold the shaft securely in the valve body.
- **Easy Installation**—The valve body self-centers on the line flange bolts as a fast, accurate means of centering the valve in the pipeline.
- **Improved Environmental Capabilities**—The optional ENVIRO-SEAL® packing system is designed with improved sealing, guiding, and loading force transmission. The ENVIRO-SEAL packing system can control emissions to below the EPA (Environmental Protection Agency) limit of 100 ppm (parts per million) for valves.
- **Low Cost Maintenance**—Individual disc/shaft components can be replaced after disassembly due to taper pin and hollow pin connections in the NPS 3 through 12 sizes.

### The 1035 Rack and Pinion Actuator provides...

- **Three Point Suspension System**—Three carbon filled PTFE guide bands provide a low friction bearing surface for piston alignment and rack support.
- **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.
- **Dual Piston Design**—Air pressure applies a balanced force across the common pinion gear.
- **Multiple Constructions**—Conversion from double acting to spring return, or vice versa, is simple and safe, thus reducing spare part requirements.
- **Dual Stop Adjustment**—This adjustment is standard on all E Series double acting and spring return actuators.

Emerson Process Management has assembled the accessories to the PSP based on their compatibility to the other items in the package, their quality level, and customer preference.

The PSP is available with several different PMV Positioners: P4, P5, and EP5. The solenoid valves available are all made by ASCO® (see table 2). The PSP can be ordered with an Airset (67AFR-601 pressure filter regulator) that attaches onto the mounting bracket, if required.

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Table 1. GO® Switches as compared to competitors<sup>(1)</sup>

Features	TopWorx Switchpak	StoneL Quartz	Westlock Accutrak
Enclosure	Diecast aluminum with epoxy coating	Diecast aluminum with epoxy coating	Diecast aluminum with epoxy coating
Switches	<p><b>Model DXP-M21GNEB</b> 2 SPDT mechanical limit switches rated 15 amps @ 125VAC, .5 amp @ 125VAC</p> <p><b>Model DXP-L21GNEB</b> 2 SPDT GO Leverless Limit Switches with hermetically sealed snap action contacts rated 4 amps @ 120VAC, 3 amps @ 24VDC</p>	<p><b>Model QX2VE02SRA</b> 2 SPDT mechanical limit switches rated 10 amps @ 125VAC, .5 amp @ 120VDC</p> <p><b>Model QX2HE02SRA</b> 2 SPST reed switches with hermetically sealed contacts rated .15 amp @120VAC, .15 amp @ 30VDC</p>	<p><b>Model 2007N</b> 2 SPDT mechanical limit switches rated 10 amps @ 125VAC, .5 amp @ 120VDC</p> <p><b>Model 9479N</b> 2 SPST Magnum reed switches with hermetically sealed contacts rated 3 amps @ 120VAC, 2 amps @ 24VDC</p>
Visual Indication	Polycarbonate GO Dome	Polycarbonate indicator skirt	Polycarbonate Beacon, yellow and black visual indication
Namur Shaft	Yes	Yes	Yes
Approval	<p><b>UL/CSA/ ATEX Approval</b> Class I, Div. 1 &amp; 2, Groups C &amp; D; Class I, Div. 2, Groups A, B, C, &amp; D (Groups A &amp; B must be hermetically sealed) Zone 1 (ATEX/IECEX) Ex/Eex d IIB &amp; H2 II2G IP67; type 4, 4x, 7</p>	<p><b>UL/CSA Approval</b> FM (C and US) Approved Class 1 Division 1 Groups B, D, D Class 2 Division 1 Groups E, F, G</p>	<p><b>UL/CSA Approval</b> UL listed, CSA certified Class 1 Division 1 &amp; 2 Groups C &amp; D, Class 2 Division 1 &amp; 2 Groups E, F, G</p>
NEMA Rating	Nema 4, 4X, 7, and 9, explosion proof	Nema 4, 4X, 6, 7 and 9, explosion proof	Nema 4, 4X explosion proof

1. Information in this table obtained from General Equipment and Mfg. Co., Inc.

Table 2. Solenoid Valves Available

Solenoid Models	NEMA 4, 4X	NEMA 4, 4X, 7, 9	Tubing Req'd <sup>(1)</sup>	NAMUR Mounted	Nipple or Switch Mounted
<b>3-Way Spring Return</b>					
85515G478	X			X	
EF8551G478		X		X	
8320G174	X		X		X
EF8320G174		X	X		X
<b>4-Way Double Acting</b>					
8551G487	X			X	
EF8551G487		X		X	
8345G-1	X		X		X
EF8345G-1		X	X		X

1. 8551G478, EF8551G478, 8551G487, and EF8551G487 may also require tubing, consult your Emerson Process Management sales office.

Table 3. Positioners Available

Characteristics	PMV <sup>(1)</sup>		
	P4	P5	EP5, EP5IS, EP5EX <sup>(3)</sup>
Input Signal	3-15/20-100 psi/kPa	3-15/20-100 psi/kPa	4-20 mA
Air Supply psi/bar	150/10	150/10	150/10
Air Connections	1/4 NPT	1/4 NPT	1/4 NPT
Linearity <sup>(2)</sup>	±0.7	≤0.5	≤0.5
Repeatability <sup>(2)</sup>	0.5	≤0.5	≤0.5
Hysteresis + Deadband <sup>(2)</sup>	0.8	- - -	- - -
Hysteresis	- - -	≤0.75	≤0.5
Gain Factor ISA 75.13	20	66	66
Temperature Range	-20°C to 85°C (-4°F to 185°F)	-20°C to 85°C (-4°F to 185°F)	-20°C to 85°C (-4°F to 185°F)

1. Information in this table obtained from PMV Palmstiernas.

2. Percentage of full scale.

3. EP5 contains a I/P converter, the EP5IS is Intrinsically Safe, and the EP5EX is Explosion Proof.

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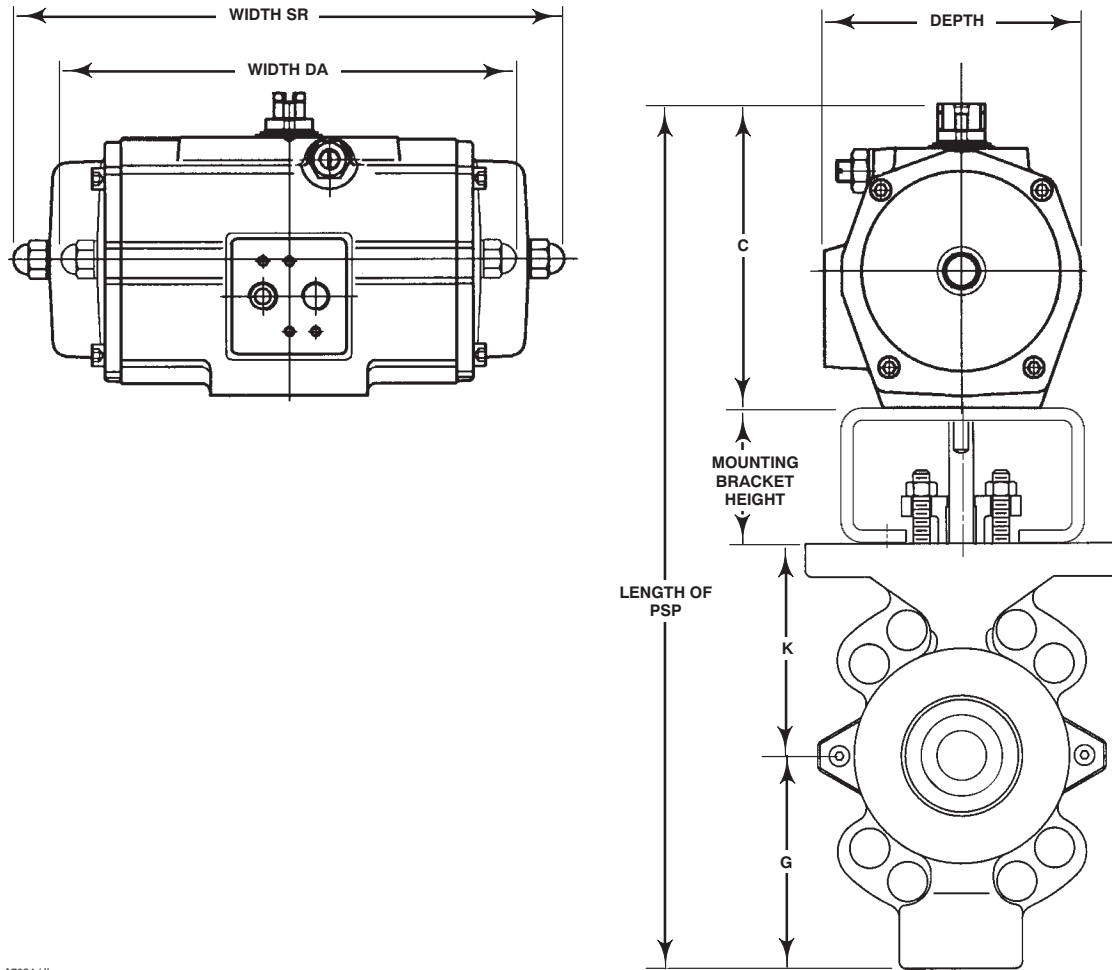
Table 4. Weights of Actuator and Mounting Bracket<sup>(1)</sup>

Type	Actuator				Mounting Bracket		
	Double Acting		Spring Return		Mount to Valve Size	kg	lb
	kg	lb	kg	lb			
E25	1.3	2.7	1.7	3.7	2 and 3	1.0	2.3
E40	1.8	4.0	2.4	5.3	2-6	1.3	2.9
E65	2.4	5.3	3.6	7.9	2-6 8	1.3 2.8	2.9 6.1
E100	3.1	6.1	4.6	10.1	2-6 8	1.3 2.8	2.9 6.1
E200	5.8	12.8	9.1	20.1	2-6 8 10 12	1.3 1.5 1.6 3.8	2.9 3.2 3.6 8.4
E350	10.4	22.9	16.9	37.3	2-6 8 10 12	1.3 1.5 1.6 3.8	2.9 3.2 3.6 8.4
E600	19.4	42.8	27.6	60.8	8 10 12	2.4 2.2 4.5	5.3 4.8 9.9
E950	26.4	58.2	38.6	85.0	10 12	2.1 2.1	4.6 4.6
E1600	42.7	94.1	65.8	145	12	2.2	4.8

1. To approximate your PS Package weight without solenoids, positioners or switches, combine the weight of the actuator and mounting bracket from this table and the valve from table 5.

Table 5. Weight of Valve

Valve Size, NPS	Wafer		Single Flange	
	kg	lb	kg	lb
2	4	9.5	---	---
3	5	10	6	14
4	9	19	11	24
6	13	29	16	35
8	21	47	27	59
10	34	75	40	88
12	49	107	62	137



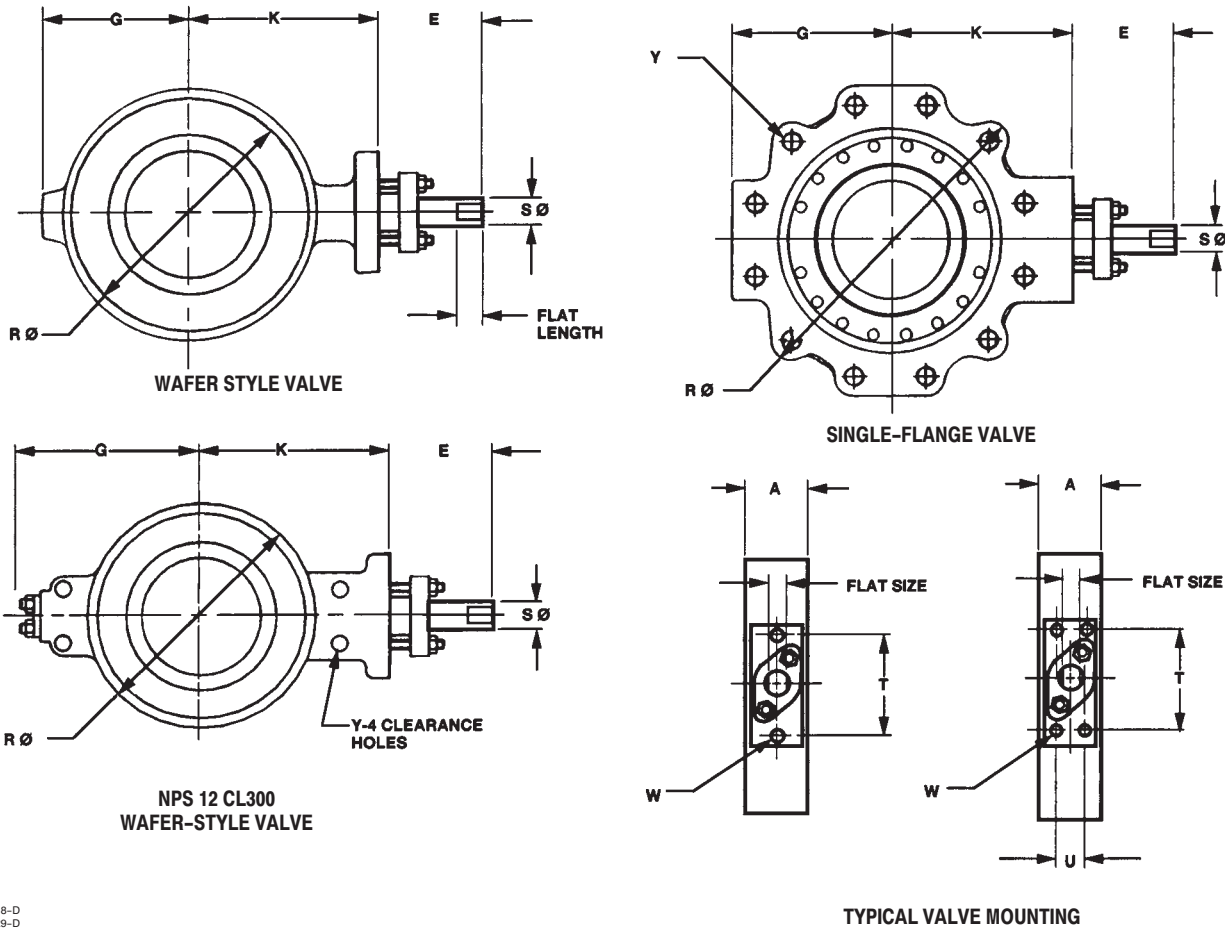
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Figure 2. Dimensions of Fisher® POSI-SEAL® Package with an E Series Actuator on an NPS 2 Valve (also see tables 6, 7 and 8)

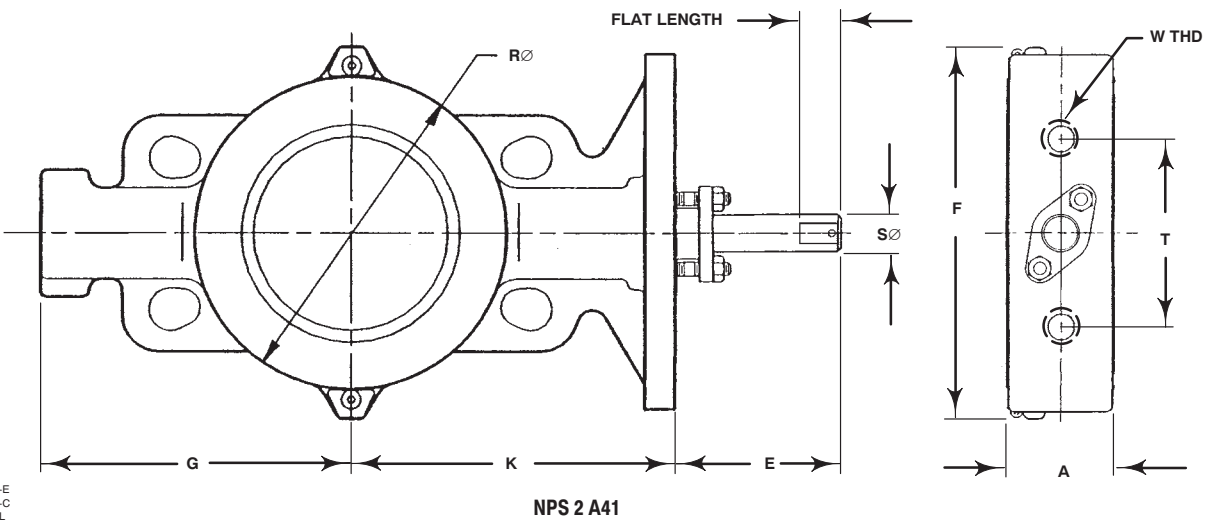
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14B0829-D  
14B0830-D  
B2437-2 / IL



16A3110-E  
18A9075-C  
A7082 / IL

Figure 3. Typical Valve Dimensions (also see tables 6, 7 and 8)

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Table 6. Dimensions of Fisher® POSI-SEAL® Package/Actuators and Mounting Brackets

ACTUATOR TYPE	WIDTH DOUBLE ACTING	WIDTH SPRING RETURN	C HEIGHT	D DEPTH	MOUNTING BRACKET HEIGHT					
					2 and 3"	4"	6"	8"	10"	12"
mm										
E25	159	172	100	83	70	---	---	---	---	---
E40	180	204	113	96	70	70	70	---	---	---
E65	199	249	125	106	70	70	70	114	---	---
E100	221	267	138	117	70	70	70	114	---	---
E200	283	360	163	137	---	70	70	73	70	121
E350	305	387	201	181	---	---	70	73	70	121
E600	390	480	250	217	---	---	---	73	70	121
E950	440	532	289	242	---	---	---	---	70	70
E1600	520	641	327	274	---	---	---	---	---	70
Inches										
E25	6.26	6.77	3.94	3.27	2.75	---	---	---	---	---
E40	7.09	8.03	4.45	3.79	2.75	2.75	2.75	---	---	---
E65	7.84	9.80	4.92	4.19	2.75	2.75	2.75	4.50	---	---
E100	8.70	10.51	5.44	4.61	2.75	2.75	2.75	4.50	---	---
E200	11.14	14.17	6.42	5.39	---	2.75	2.75	2.88	2.75	4.75
E350	12.00	15.24	7.92	7.12	---	---	2.75	2.88	2.75	4.75
E600	15.24	18.78	9.84	8.53	---	---	---	2.88	2.75	4.75
E950	16.69	20.35	11.38	9.51	---	---	---	---	2.75	2.75
E1600	20.31	25.08	12.87	10.81	---	---	---	---	---	2.75

Table 7. Dimensions of Fisher® POSI-SEAL® Package/Valves

VALVE SIZE, NPS	R				G				K	
	Wafer		Single Flange		Wafer		Single Flange		Wafer and Single Flange	
	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches
2	103	4.06	---	---	102	4.0	---	---	102	4.00
3	133	5.25	189	7.44	70	2.75	79	3.12	121	4.00
4	171	6.75	219	8.62	86	3.38	102	4.0	124	4.88
6	219	8.62	273	10.75	121	4.75	129	5.06	152	6.00
8	272	10.69	333	13.12	155	6.12	157	6.19	181	7.12
10	330	13.00	406	16.00	186	7.31	198	7.81	229	9.00
12	387	15.25	476	18.75	222	8.75	230	9.06	254	10.00

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Table 8. Length of Entire Fisher® POSI-SEAL® Package

ACTUATOR SIZE	VALVE SIZE, NPS												
	Wafer						Single Flange						
	2	3	4	6	8	10	12	3	4	6	8	10	12
	mm												
E25	373.1	341.4	---	---	---	---	---	350.8	---	---	---	---	---
E40	386.1	354.3	392.7	455.9	---	---	---	363.7	408.4	463.8	---	---	---
E65	398.0	366.3	404.6	467.9	575.6	---	---	375.7	420.4	475.7	577.3	---	---
E100	---	379.5	417.8	481.1	588.8	---	---	388.9	433.6	489.0	590.6	---	---
E200	---	---	442.7	506.0	572.5	647.2	760.0	---	458.5	513.8	574.3	659.9	767.8
E350	---	---	---	544.1	610.6	685.3	798.1	---	---	551.9	612.4	698.0	805.9
E600	---	---	---	---	659.4	734.1	846.8	---	---	---	661.2	746.8	854.7
E950	---	---	---	---	---	773.2	835.2	---	---	---	---	785.9	843.0
E1600	---	---	---	---	---	---	873.0	---	---	---	---	---	880.9
	Inch												
E25	14.69	13.44	---	---	---	---	---	13.81	---	---	---	---	---
E40	15.20	13.95	15.46	17.95	---	---	---	14.32	16.08	18.26	---	---	---
E65	15.67	14.42	15.93	18.42	22.66	---	---	14.79	16.55	18.73	22.73	---	---
E100	---	14.94	16.45	18.94	23.18	---	---	15.31	17.07	19.25	23.25	---	---
E200	---	---	17.43	19.92	22.54	25.48	29.92	---	18.05	20.23	22.61	25.98	30.23
E350	---	---	---	21.42	24.04	26.98	31.42	---	---	21.73	24.11	27.48	31.73
E600	---	---	---	---	25.96	28.90	33.34	---	---	---	26.03	29.40	33.65
E950	---	---	---	---	---	30.44	32.88	---	---	---	---	30.94	33.19
E1600	---	---	---	---	---	---	34.37	---	---	---	---	---	34.68

## Coefficients

Table 9. A41 CL150, Forward Flow

Coefficients	Valve Size, NPS	Valve Rotation, Degrees								
		10	20	30	40	50	60	70	80	90
C <sub>v</sub>	2 <sup>(1)</sup>	2.25	11.4	19.9	32.6	48.1	58.9	64.0	69.8	80.2
K <sub>v</sub>		1.95	9.86	17.2	28.2	41.6	50.9	55.4	60.4	69.4
F <sub>L</sub>		---	0.78	0.77	0.76	0.74	0.76	0.77	0.76	0.71
X <sub>T</sub>		0.295	0.289	0.315	0.314	0.357	0.497	0.540	0.518	0.442
F <sub>d</sub>		0.090	0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70
C <sub>v</sub>	3	3.21	20.8	40.5	66.7	90.1	115	150	189	237
K <sub>v</sub>		2.78	18.0	35.0	57.7	77.9	99.5	130	163	205
F <sub>L</sub>		0.78	0.89	0.80	0.75	0.68	0.71	0.65	0.61	0.58
X <sub>T</sub>		0.855	0.602	0.461	0.404	0.372	0.358	0.306	0.259	0.232
F <sub>d</sub>		0.090	0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70
C <sub>v</sub>	4	18.2	52.6	96.7	154	199	270	351	447	499
K <sub>v</sub>		15.7	45.5	83.6	133	172	234	304	387	432
F <sub>L</sub>		0.80	0.85	0.79	0.73	0.74	0.69	0.64	0.61	0.53
X <sub>T</sub>		0.474	0.474	0.500	0.416	0.407	0.326	0.271	0.220	0.196
F <sub>d</sub>		0.090	0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70
C <sub>v</sub>	6	34.7	109	198	321	452	664	882	1180	1250
K <sub>v</sub>		30.0	94.3	171	278	391	574	763	1020	1080
F <sub>L</sub>		0.85	0.83	0.75	0.71	0.71	0.67	0.65	0.61	0.55
X <sub>T</sub>		0.389	0.552	0.528	0.438	0.424	0.331	0.278	0.206	0.203
F <sub>d</sub>		0.090	0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70
C <sub>v</sub>	8	60.5	190	345	560	788	1160	1540	2060	2180
K <sub>v</sub>		52.3	164	298	484	682	1000	1330	1780	1890
F <sub>L</sub>		0.81	0.81	0.79	0.82	0.71	0.66	0.60	0.55	0.48
X <sub>T</sub>		0.368	0.520	0.498	0.412	0.399	0.310	0.261	0.193	0.191
F <sub>d</sub>		0.090	0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70
C <sub>v</sub>	10	83.3	259	463	727	1090	1670	2400	3340	3600
K <sub>v</sub>		72.1	224	400	629	943	1440	2080	2890	3110
F <sub>L</sub>		0.81	0.81	0.79	0.82	0.71	0.66	0.60	0.55	0.48
X <sub>T</sub>		0.626	0.658	0.646	0.622	0.538	0.381	0.285	0.201	0.167
F <sub>d</sub>		0.090	0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70
C <sub>v</sub>	12	125	388	694	1090	1640	2500	3600	5010	5400
K <sub>v</sub>		108	336	600	943	1420	2160	3110	4330	4670
F <sub>L</sub>		0.83	0.78	0.78	0.78	0.75	0.66	0.61	0.52	0.47
X <sub>T</sub>		0.528	0.556	0.547	0.528	0.451	0.324	0.241	0.170	0.141
F <sub>d</sub>		0.090	0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70

1. The NPS 2 is multirated to CL150, 300 and 600.

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Table 10. A41 CL150, Reverse Flow

Coefficients	Valve Size, NPS	Valve Rotation, Degrees								
		10	20	30	40	50	60	70	80	90
C <sub>v</sub>	2 <sup>(1)</sup>	2.11	9.96	20.7	34.0	50.5	68.4	81.0	81.0	81.0
K <sub>v</sub>		1.83	8.62	17.9	29.4	43.7	59.2	70.0	70.0	70.0
F <sub>L</sub>		- - -	0.88	0.84	0.77	0.71	0.69	0.67	0.71	0.69
X <sub>T</sub>		0.399	0.507	0.354	0.334	0.340	0.342	0.359	0.401	0.401
F <sub>d</sub>		0.090	0.17	0.26	.034	0.42	0.49	0.57	0.64	0.70
C <sub>v</sub>	3	1.79	23.0	37.0	58.8	91.9	139	192	270	259
K <sub>v</sub>		1.55	19.9	32.0	50.9	79.5	120	166	234	224
F <sub>L</sub>		0.70	0.81	0.73	0.76	0.75	0.66	0.60	0.50	0.54
X <sub>T</sub>		0.449	0.455	0.395	0.417	0.423	0.313	0.256	0.188	0.203
F <sub>d</sub>		0.090	0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70
C <sub>v</sub>	4	17.2	50.2	87.8	146	206	285	365	465	521
K <sub>v</sub>		14.9	43.4	75.9	126	178	247	316	402	451
F <sub>L</sub>		0.72	0.84	0.79	0.75	0.71	0.63	0.58	0.53	0.55
X <sub>T</sub>		0.445	0.471	0.481	0.417	0.370	0.276	0.225	0.191	0.196
F <sub>d</sub>		0.090	0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70
C <sub>v</sub>	6	30.6	100	173	285	424	640	893	1180	1290
K <sub>v</sub>		26.5	86.5	150	247	367	554	772	1020	1120
F <sub>L</sub>		0.83	0.83	0.80	0.78	0.76	0.69	0.59	0.52	0.54
X <sub>T</sub>		0.444	0.608	0.574	0.485	0.441	0.316	0.227	0.176	0.182
F <sub>d</sub>		0.090	0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70
C <sub>v</sub>	8	53.6	175	303	499	743	1120	1560	2070	2260
K <sub>v</sub>		46.4	151	262	432	643	969	1350	1790	1950
F <sub>L</sub>		0.79	0.83	0.82	0.79	0.73	0.66	0.58	0.51	0.48
X <sub>T</sub>		0.413	0.567	0.534	0.449	0.409	0.295	0.213	0.164	0.170
F <sub>d</sub>		0.090	0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70
C <sub>v</sub>	10	84.4	232	423	737	1180	1730	2560	3250	3710
K <sub>v</sub>		73.0	200	366	638	1020	1500	2210	2810	3210
F <sub>L</sub>		0.79	0.83	0.82	0.79	0.73	0.66	0.58	0.51	0.48
X <sub>T</sub>		0.542	0.745	0.673	0.590	0.489	0.380	0.245	0.189	0.156
F <sub>d</sub>		0.090	0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70
C <sub>v</sub>	12	126	347	631	1100	1760	2590	3820	4850	5540
K <sub>v</sub>		109	300	546	95.2	1520	2240	3300	4200	4790
F <sub>L</sub>		0.78	0.87	0.85	0.80	0.75	0.69	0.55	0.51	0.47
X <sub>T</sub>		0.491	0.671	0.610	0.535	0.443	0.343	0.222	0.171	0.141
F <sub>d</sub>		0.090	0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70

1. The NPS 2 is multirated to CL150, 300 and 600.

# POSI-SEAL Package

Table 11. A41 CL300, Forward Flow

Coefficients	Valve Size, NPS	Valve Rotation, Degrees								
		10	20	30	40	50	60	70	80	90
C <sub>v</sub>	2 <sup>(1)</sup>	2.25	11.4	19.9	32.6	48.1	58.9	64.0	69.8	80.2
K <sub>v</sub>		1.95	9.86	17.2	28.2	41.6	50.9	55.4	60.4	69.4
F <sub>L</sub>		- - -	0.78	0.77	0.75	0.74	0.75	0.77	0.75	0.71
X <sub>T</sub>		0.299	0.292	0.319	0.318	0.362	0.502	0.546	0.525	0.446
F <sub>d</sub>		0.090	0.17	0.26	.034	0.42	0.49	0.57	0.64	0.70
C <sub>v</sub>	3	3.21	20.8	40.5	66.7	90.1	115	150	189	237
K <sub>v</sub>		2.78	18.0	35.0	57.7	77.9	99.5	130	163	205
F <sub>L</sub>		0.78	0.88	0.78	0.77	0.79	0.80	0.72	0.69	0.64
X <sub>T</sub>		0.370	0.542	0.433	0.411	0.464	0.469	0.397	0.346	0.286
F <sub>d</sub>		0.090	0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70
C <sub>v</sub>	4	12.9	37.4	72.9	124	174	236	318	420	488
K <sub>v</sub>		11.2	32.4	63.1	107	151	204	275	363	422
F <sub>L</sub>		0.81	0.86	0.79	0.73	0.72	0.71	0.65	0.60	0.54
X <sub>T</sub>		0.455	0.499	0.416	0.395	0.410	0.363	0.292	0.235	0.210
F <sub>d</sub>		0.090	0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70
C <sub>v</sub>	6	39.6	120	215	340	440	598	777	1050	1100
K <sub>v</sub>		34.3	104	186	294	381	604	672	908	952
F <sub>L</sub>		0.80	0.77	0.71	0.68	0.71	0.68	0.62	0.60	0.56
X <sub>T</sub>		0.420	0.433	0.434	0.369	0.360	0.299	0.282	0.214	0.205
F <sub>d</sub>		0.090	0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70
C <sub>v</sub>	8	73.9	224	401	634	821	1120	1450	1960	2070
K <sub>v</sub>		63.9	194	347	548	710	969	1250	1700	1790
F <sub>L</sub>		0.80	0.79	0.77	0.75	0.71	0.66	0.61	0.55	0.49
X <sub>T</sub>		0.367	0.380	0.381	0.322	0.314	0.260	0.248	0.187	0.177
F <sub>d</sub>		0.090	0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70
C <sub>v</sub>	10	64.6	248	453	706	1070	1630	2340	3280	3480
K <sub>v</sub>		55.9	215	392	611	926	1410	2020	2840	3010
F <sub>L</sub>		0.80	0.79	0.77	0.75	0.71	0.66	0.61	0.55	0.49
X <sub>T</sub>		0.464	0.565	0.562	0.544	0.455	0.335	0.255	0.179	0.159
F <sub>d</sub>		0.090	0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70
C <sub>v</sub>	12	95.2	365	668	1040	1580	2410	3450	4840	5130
K <sub>v</sub>		82.3	316	578	900	1370	2080	2980	4190	4440
F <sub>L</sub>		0.86	0.80	0.78	0.79	0.74	0.67	0.59	0.53	0.48
X <sub>T</sub>		0.422	0.514	0.506	0.492	0.412	0.301	0.231	0.162	0.144
F <sub>d</sub>		0.090	0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70

1. The NPS 2 is multirated to CL150, 300 and 600.

# Product Bulletin

20.1:PSP  
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# POSI-SEAL Package

Table 12. A41 CL300, Reverse Flow

Coefficients	Valve Size, NPS	Valve Rotation, Degrees								
		10	20	30	40	50	60	70	80	90
C <sub>v</sub>	2 <sup>(1)</sup>	2.11	9.96	20.7	34.0	50.5	68.4	81.0	81.0	81.0
K <sub>v</sub>		1.83	8.62	17.9	29.4	43.7	59.2	70.0	70.0	70.0
F <sub>L</sub>		---	0.88	0.84	0.77	0.71	0.69	0.67	0.71	0.69
X <sub>T</sub>		0.399	0.507	0.354	0.334	0.340	0.342	0.359	0.401	0.401
F <sub>d</sub>		0.090	0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70
C <sub>v</sub>	3	1.79	23.0	37.0	58.8	91.9	139	192	270	259
K <sub>v</sub>		1.55	19.9	32.0	50.9	79.5	120	166	234	224
F <sub>L</sub>		0.71	0.75	0.77	0.81	0.79	0.71	0.62	0.49	0.59
X <sub>T</sub>		0.370	0.542	0.433	0.411	0.464	0.469	0.397	0.346	0.286
F <sub>d</sub>		0.090	0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70
C <sub>v</sub>	4	12.7	35.2	61.3	105	163	242	361	463	482
K <sub>v</sub>		11.0	30.4	53.0	90.8	141	209	312	400	417
F <sub>L</sub>		0.74	0.80	0.82	0.80	0.77	0.69	0.57	0.51	0.55
X <sub>T</sub>		0.455	0.499	0.416	0.395	0.410	0.363	0.292	0.235	0.210
F <sub>d</sub>		0.090	0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70
C <sub>v</sub>	6	38.8	106	183	294	436	605	779	976	1100
K <sub>v</sub>		33.6	91.7	158	254	377	523	674	844	952
F <sub>L</sub>		0.78	0.81	0.79	0.80	0.74	0.68	0.59	0.58	0.57
X <sub>T</sub>		0.420	0.433	0.434	0.369	0.360	0.299	0.282	0.214	0.205
F <sub>d</sub>		0.090	0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70
C <sub>v</sub>	8	73.1	200	345	554	821	1140	1470	1840	2090
K <sub>v</sub>		63.2	173	298	479	710	986	1270	1590	1810
F <sub>L</sub>		0.80	0.83	0.83	0.80	0.74	0.66	0.58	0.50	0.48
X <sub>T</sub>		0.405	0.454	0.542	0.451	0.346	0.269	0.239	0.206	0.173
F <sub>d</sub>		0.090	0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70
C <sub>v</sub>	10	66.2	217	399	708	1110	1690	2400	3100	3560
K <sub>v</sub>		57.3	188	345	612	960	1460	2080	2680	3080
F <sub>L</sub>		0.80	0.83	0.83	0.80	0.74	0.66	0.58	0.50	0.48
X <sub>T</sub>		0.505	0.714	0.672	0.557	0.465	0.339	0.243	0.187	0.155
F <sub>d</sub>		0.090	0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70
C <sub>v</sub>	12	100	328	603	1070	1680	2550	3620	4690	5380
K <sub>v</sub>		86.5	284	522	926	1450	2210	3130	4060	4650
F <sub>L</sub>		0.80	0.86	0.87	0.80	0.75	0.66	0.55	0.50	0.48
X <sub>T</sub>		0.451	0.636	0.595	0.494	0.414	0.303	0.217	0.167	0.138
F <sub>d</sub>		0.090	0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70

1. The NPS 2 is multirated to CL150, 300 and 600.

## **Note**

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**Emerson Process Management**

Marshalltown, Iowa 50158 USA

Sorocaba, 18087 Brazil

Chatham, Kent ME4 4QZ UK

Dubai, United Arab Emirates

Singapore 128461 Singapore

[www.Fisher.com](http://www.Fisher.com)

