

Replacement of Fisher™ Double-Ported A-Body Control Valves with Fisher easy-e™ Sliding-Stem Control Valves

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Management of Change

Management of Change (MOC) is a procedure used to proactively manage changes that have the potential to impact safety or the process within a plant. Evaluating new techniques for improving MOC approval procedures can have an impact on plant efficiency. Historically, upgrading obsolete products or replacing existing process control equipment had been delayed or abandoned due to the extensive paperwork involved in completing a complex MOC approval sheet.

Contained in the following sections are design comparisons between inactive Fisher double-ported A and AR control valves, and current Fisher easy-e ED and ET control valves. Fisher double-ported A and AR control valves will be referenced as “Fisher A-body” throughout this document; Fisher easy-e ED and ET control valves will be referenced as “Fisher easy-e.” These comparisons are intended to help end-users understand the similarities and differences between Fisher A-body and Fisher easy-e control valves and to complete MOC approval documents for an efficient and safe transition.

Background

Fisher A-Body control valves are double-ported balanced designs with a variety of characteristics, valve plug guiding options, and material offerings allowing them to be used in a wide range of industrial applications as rugged, high-capacity globe valves. Direct-acting Fisher A-body or reverse-acting (AR) control valves are compatible with many spring-and-diaphragm or piston actuators. NPS 1, 1 ¼ and 1 ½ Fisher A-body control valves are obsolete products and the 10-year guarantee of recommended spare parts availability for these products ended in 2000. NPS 2 thru 16 Fisher A-body control valves are inactive Fisher products, with limited parts availability and increased lead time for new assembly orders.

Fisher A-body control valves have been general service control valves for several decades, still used within various service applications. Due to modern advancements in control valve technology, which allow for smaller actuation, tighter shutoff, and more material choices, Fisher A-body control valves have been declared obsolete to transition to recently developed control valves. Fisher easy-e control valves are offered as replacements for Fisher A-body control valves based on shared actuation platforms and the wide ranges of trim and material options.

The Fisher easy-e series is comprised of ED, ES, ET, EZ, and EW constructions; this document will specifically discuss ED and ET control valves. Fisher ED control valves most closely match the capabilities of Fisher A-body control valves within a wide range of operating temperatures. Fisher ET control valves are also similar, but offer PTFE trim seals and seat options, and tighter shutoff at lower temperatures. Fisher easy-e control valves are cage guided, single-port globe valves, with balanced valve plugs in a quick change trim design that simplifies maintenance. These control valves are generally used for throttling or on-off control applications for a wide array of liquids and gases. For more information regarding other Fisher easy-e control valves, please contact your local Emerson sales office.

Question & Answer Checklist

- 1** **Q:** Does the proposed modification cause any changes to the piping and instrumentation diagram (P&ID)?
A: Possibly. If the control valve size changes, concentric reducers to the control valve inlet and outlet may need to be added to the P&ID.
- 2** **Q:** Does the proposed modification change process chemistry, technology, or operating and control philosophies?
A: No.
- 3** **Q:** Does the proposed modification change how the existing plant is operated?
A: Possibly. Review capacity information (page 7, Table 1) to ensure no issues will take place.
- 4** **Q:** Does the proposed modification change process flows?
A: Possibly. Review capacity information (Table 1) to ensure no issues will take place.
- 5** **Q:** Does the proposed modification change the process description?
A: No.
- 6** **Q:** Have the codes and standards to which the new equipment was designed changed?
A: No, although they may have been updated since Fisher A-body control valves were installed.
- 7** **Q:** Does the proposed modification change the materials of construction, such as a change in material form (cast, forged, or alloy)?
A: No.
- 8** **Q:** Does the proposed modification introduce new equipment items that require periodic predictive maintenance?
A: No. The new equipment items will require the same periodic maintenance as required by the previous equipment items.
- 9** **Q:** Does the proposed modification change existing operator training requirements?
A: No.

- 10 Q:** Does the proposed modification introduce new equipment items that require spare parts, training manuals, maintenance procedures or training to teach the maintenance department how to maintain them?
- A:** Yes. Emerson sales offices offer local training and support to help ensure operators, maintenance personnel, and instrument technicians are trained on Fisher easy-e control valves.
- 11 Q:** Does the proposed modification introduce new equipment items that require spares or obsolete spares for existing equipment?
- A:** Yes.
- 12 Q:** Does the proposed modification permanently remove the spares for existing pieces of equipment?
- A:** Yes. New spares are required for Fisher easy-e control valve that are not compatible with Fisher A-body control valves, with the exception of some shared Fisher valve packing kits.
- 13 Q:** Does the proposed modification change the inspection scope or inspection interval?
- A:** No.
- 14 Q:** Does the proposed modification require welding work to be performed?
- A:** Possibly. Welding requirements will depend on valve flange connection.
- 15 Q:** Does the proposed modification change existing pressure relief cases?
- A:** Probably. If Fisher easy-e control valve replacement selections exceed the maximum rated Cv of the existing Fisher A-body, then pressure relief cases will require evaluation. Review capacity information (Table 1) to ensure no issues will take place.
- Pressure relief valve sizing is not considered when sizing and selecting Fisher control valves for end-user applications. If the control valve is determined to affect upstream or downstream safety relief cases, review by the end user or third party is recommended.
- 16 Q:** Have the materials of construction been reviewed to ensure that the metallurgy is correct?
- A:** Yes.

A-Body and easy-e Control Valve Comparison

The following tables are intended to provide a nominal comparison between Fisher A-body and Fisher easy-e control valves, specifically Fisher ED and ET. Specifications for other Fisher easy-e control valves will vary from the tables below; contact your Emerson local business partner or sales office for unlisted models or configurations.

Capacities (Cv) by Size

Due to differences in flow geometry and small variations in sizing coefficients, each control valve should be reviewed to ensure appropriate Fisher easy-e control valves are selected for each application. This sizing review should be completed using current Fisher valve sizing software. Table 1 provides necessary catalog sizing and capacity information to compare Fisher A-body and Fisher easy-e control valves. For more information on control valve sizes and flow characteristics, please contact your local Emerson sales office.

Both quick opening and equal percentage flow characteristics are the same in Fisher A-body and Fisher easy-e control valves. Fisher A-body control valves have a “modified parabolic” flow characteristic following a curve similar to linear flow. Figure 3 illustrates the percent of rated flow coefficient, dictated by the percent of rated travel. Complete flow curves for specific characteristics and sizes can be found by contacting your Emerson local business partner or sales office.

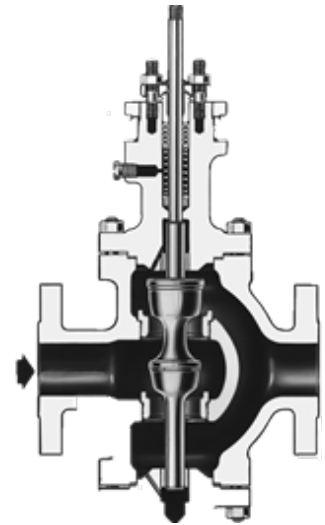


Figure 1. Fisher A-Body Control Valve

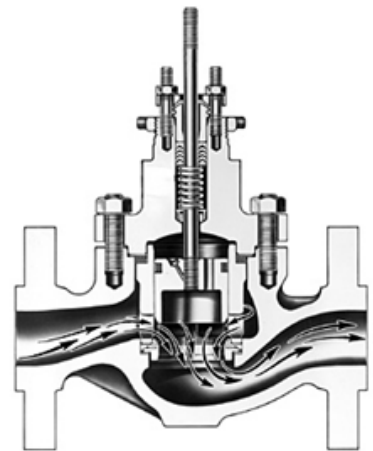


Figure 2. Fisher easy-e Control Valve

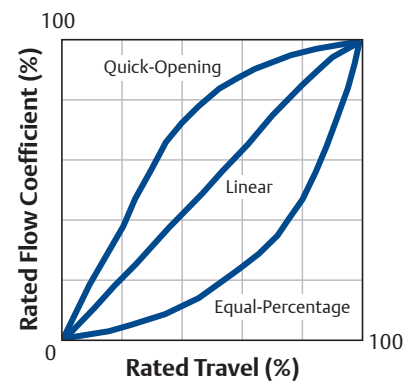


Figure 3. Fisher easy-e Control Valve
Percent of Rated Flow

NPS	Quick Opening		Linear (Modified Parabolic)		Equal Percentage	
	Fisher A-Body	Fisher easy-e	Fisher A-Body	Fisher easy-e	Fisher A-Body	Fisher easy-e
1	19.1	22.1	12.6 (high and low lift) 15.8 (throttle)	20.6	12.5	17.2
1 ¼	23.8	22.1	22.5 (high and low lift) 22.8 (throttle)	20.6	20.1	17.2
1 ½*	29.3	29.9	18.1	29.2	12.0	23.1
1 ½	45.0	44.0	32.0 (high and low lift) 34.1 (throttle)	39.2	31.0	35.8
2*	43.8	31.2	27.6	33.3	21.1	24.3
2	56.2	77.6	53.1 (high lift) 51.4 (low lift) 57.0 (throttle)	72.9	51.6	59.7
2 ½*	67.5	71.2	34.9	57.0	30.2	43.9
2 ½	90.3	109	74.6 (high lift) 80.8 (low lift) 71.0 (throttle)	108	72.0	99.4
3*	105	91.9	52.6	102	46.7	70.7
3	124	161	121 (high lift) 105 (low lift) 107 (throttle)	148	116	136
4*	163	130	85.0	113	74.3	112
4	243	251	190 (high lift) 134 (low lift) 203 (throttle)	236	196	224
5*	219	--	130	--	118	--
5	323	--	289 (high lift) 215 (low lift) 308 (throttle)	--	304	--
6*	385	358	185	322	170	274
6	597	460	438 (high lift) 442 (low lift) 467 (throttle)	433	490	394
8*	607	--	312	--	314	--
8	1025	--	765 (high lift) 715 (low lift) 843 (throttle)	--	--	--
8 (max travel 2 in)	--	744	--	688	--	576
8 (max travel 3 in)	--	1040	--	975	--	924
10	1580	--	1320	--	1110	--
10 x 6	--	637	--	617	--	508
10 x 8	--	1040	--	975	--	924
12	2380	--	1760	--	1680	--
12 (max travel 4 in)	--	1500	--	1500	--	--
12 (max travel 5 in)	--	1570	--	1570	--	1397
16	3390	--	2760	--	2760	--
16 (max travel 4 in)	--	1753	--	1601	--	--
16 (max travel 5 in)	--	1601	--	1875	--	1595

Table 1. Capacities (Cv) by Size

Face-to-Face Dimensions

Face-to-face dimensions (dimension “A,” illustrated in Figures 4 and 5) of each control valve size are generally the same between Fisher A-body and Fisher easy-e control valves. Reference Table 2 for any dimension differences, particularly if a different Fisher easy-e control valve size is needed, a screwed end connection is used, or the pressure rating was previously CL400. See Figures 4 and 5.

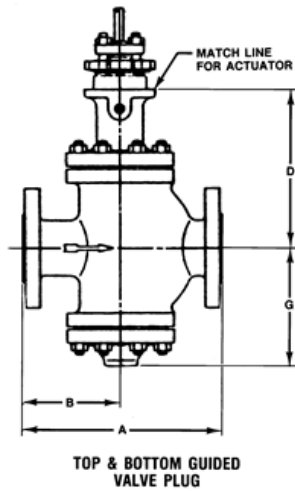


Figure 4: Fisher A-Body Control Valve Face-to-Face Dimensions

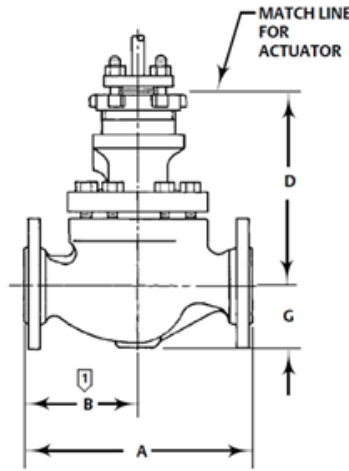


Figure 5: Fisher easy-e Control Valve Face-to-Face Dimensions

NPS Size	Screwed	BWE	CL150 RF	CL150 RTJ	CL300 RF	CL300 RTJ	CL400 RF	CL400 RTJ	CL600 RF	CL600										
	inches																			
1	6.0	8.3	8.3	8.3	7.2	7.2	7.8	7.2	7.8	7.8	8.3	8.3	8.3	---	8.3	---	8.3	8.3	8.3	8.3
1 ¼	6.0	9.0	9.0	---	7.9	---	8.4	---	8.4	---	8.9	---	9.0	---	9.0	---	9.0	---	9.0	---
1 ½	7.8	9.9	9.9	9.9	8.7	8.7	9.3	9.3	9.3	9.3	9.8	9.8	9.9	---	9.9	---	9.9	9.9	9.9	9.9
2	9.1	11.3	11.3	11.3	10.0	10.0	10.5	10.5	10.5	10.5	11.1	11.1	11.3	---	11.4	---	11.3	11.3	11.4	11.4
2 ½	---	---	12.2	12.2	10.9	10.9	11.4	11.5	11.5	11.5	12.1	12.1	12.2	---	12.4	---	12.2	12.2	12.4	12.4
3	---	---	13.3	13.3	11.7	11.7	12.2	12.2	12.2	12.5	13.1	13.1	13.3	---	13.4	---	13.3	13.3	13.4	13.4
4	---	---	15.5	15.5	13.9	13.9	14.4	14.4	14.5	14.5	15.1	15.1	15.2	---	15.4	---	15.5	15.5	15.6	15.6
5	---	---	18.0	---	15.9	---	16.4	---	16.7	---	17.5	---	17.6	---	17.6	---	18.0	---	18.1	---
6	---	---	20.0	20.0	17.8	17.8	18.3	18.3	18.6	18.6	19.3	19.3	19.5	---	19.6	---	20.0	20.0	20.1	20.1
8	---	---	24.0	24.0	21.4	21.4	21.9	21.9	22.4	22.4	23.0	23.0	23.4	---	23.5	---	24.0	24.0	24.1	24.1
10	---	---	29.6	29.6	26.5	26.5	27.0	---	27.9	27.9	28.5	28.5	28.9	---	29.0	---	29.6	29.6	29.8	29.8
12	---	---	---	32.2	29.0	29.0	29.5	---	30.5	30.5	31.1	31.1	---	---	---	---	32.2	32.2	32.4	32.4
16	---	---	---	---	40.4	---	---	---	42.0	---	---	---	---	---	---	---	44.0	---	---	---

Table 2. Face-to-Face Dimensions

Shutoff Class

Fisher easy-e ED control valves have the same standard shutoff (Class II) as Fisher A-body control valves, while Fisher easy-e ET control valves have Class IV standard (seen in Table 3). Fisher easy-e control valves have tighter shutoff capabilities, dependent on trim selection.

Type	NPS Size	Shutoff Class				
		II	III	IV	V	VI
Fisher A-Body	All	Standard	Optional	---	---	---
Fisher easy-e	All	Standard (ED)	Optional (ED)	Standard (ET) Optional (ED)	Optional (ED/ET)	Optional (ET)

Table 3. Shutoff Class

Trim Materials

Fisher easy-e control valves are available with a wide range of trim materials; the most common trim designations are listed in Table 4. Materials not listed may be available upon request. For more information, please contact your Emerson local business partner or sales office.

Trim		Material		
		Valve Plug	Seat Ring	Guide Bushing
Fisher A-Body	1	S31600	S31600	S17400
	3	S31600/CoCr-A	S31600/CoCr-A	S31600/CoCr-A
	6	S31600/CoCr-A	S31600/CoCr-A	S31600/CoCr-A
	7	S17400	S17400	S17400
	9	N04400	N04400	N05500
Fisher easy-e		Valve Plug	Seat Ring	Cage
	1	S41600 HT	S41600 HT or CA15 HT	CB7Cu-1 HT
	3	S31600/CoCr-A	R30006	R30006
	4	S31600	S31600	CB7Cu-1 HT
	27	S31600/CoCr-A	R30006	CB7Cu-1 HT
	28	S31600/CoCr-A	R30006	CF8M/ENC
	29	S31600	S31600	CF8M/ENC
	37	S31600/CoCr-A	R30006	CF8M/ENC
	85 (NACE)	S31600	S31600	CF8M/ENC
	87 (NACE)	S31600/CoCr-A	CoCr-A	CF8M/ENC

Table 4. Trim Material

Product Features

Fisher A-body and Fisher easy-e control valve features are very similar; Table 5 provides a concise side-by-side comparison for product features not addressed in other sections.

	Fisher A-Body	Fisher easy-e
Body	CL125, CL150, CL250, CL300, CL400, CL600	CL125, CL150, CL250, CL300, CL600
Plug Design	Balanced	Balanced
Packing	PTFE and graphite single, double and ENVIRO-SEAL™	PTFE and graphite single, double and ENVIRO-SEAL
Flow Characteristics	Quick Opening, Modified Parabolic, Equal Percentage	Quick Opening, Linear, Equal Percentage

Table 5. Product Features

Approximate Control Valve Assembly Weights

Fisher easy-e control valves tend to be lighter than Fisher A-body control valves, but not in all cases. The exact weight of a specific assembly is dependent upon body material, trim, end connections, etc. Table 6 is intended to give a general sense of the weight differences. For more specific numbers, please contact your Emerson local business partner or sales office.

NPS Size	Fisher A-Body	Fisher easy-e
	Pounds	
1	47	30
1 1/4	47	30
1 1/2	88	45
2	101	85
2 1/2	155	100
3	196	125
4	316	170
6	587	350
8	908	900
10	1608	--
10 x 6	--	950
10 x 8	--	1640
12	2056	3100
16	5134	5600

Table 6. Approximate Assembly Weight

Conclusion

Fisher control valves have been used in the process control industry for over 130 years. Emerson offers Fisher easy-e control valves as replacements for inactive Fisher A-body control valves. Fisher easy-e control valves offer quick change trim for ease of maintenance, reduced parts complexity, spare parts availability and support, as well as improved lead times.

Additional Resources

Contact your [local Emerson sales office](#) for additional details or questions regarding Fisher easy-e control valves or refer to the documents below.

[EZ Valve Instruction Manual \(D100401X012\)](#)

[easy-e Valve Brochure \(D350365X012\)](#)



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