

Replacement of Fisher™ 1052 Actuators with 2052 Actuators

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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.

Background

Emerson Automation Solutions introduces the Fisher 2052 spring-and-diaphragm rotary actuator. The small, compact Fisher 2052 actuator reduces valve/actuator envelope dimensions to provide greater valve installation versatility for both skids and tight processing lines where space is at a premium.

The Fisher 2052 actuator can be installed on rotary-shaft valve bodies for throttling or on-off applications. The actuator linkage features a clamped shaft lever and a single pivot point to reduce lost motion between the actuator and valve. The result is a 0.5% or less typical variability for a Fisher rotary control valve assembly.

In addition to its compact size, the Fisher 2052 actuator delivers several operations and maintenance advantages. It has an inherent fail-safe position on loss of operating air. In contrast to piston style actuators that rely on O-ring seals, the double-sided diaphragm in the 2052 provides extended service life. **

The Fisher 2052 actuator offers a nested spring design that requires no bench set adjustment, simplifying the actuator selection process. Powder paint coating is standard and offers an excellent corrosion-resistant finish on all external steel and cast iron parts. The Fisher 2052 actuator is available in three sizes, accommodating shaft sizes 12.7 to 38.1 mm (1/2 to 1-1/2 inch).

Contained in this document are two sections. First is a question and answer section to help end-users complete Management of Change approval documents when upgrading to a 2052 actuator. Secondly, there is a comparison of the Fisher 2052 and 1052 actuators. In this section, in addition to the similarities between these two actuators, you will see a number of advantages the 2052 design has compared to the 1052 design. These comparisons demonstrate why we believe the 2052 actuator will become the standard in rotary pneumatic actuation.

Question & Answer Checklist

- Q:** Does the proposed modification cause any changes to the piping and instrumentation diagram (P&ID)?

A: No. There will be no change in the existing P&IDs.

- 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: No.
- 4** Q: Does the proposed modification change process flows?
A: No. The modification does not change the process flow direction.
- 5** Q: Does the proposed modification change existing pressure relief cases?
A: No.
- 6** Q: Does the proposed modification change the process description?
A: No.
- 7** Q: Have the codes and standards to which the new equipment was designed changed?
A: No.
- 8** Q: Does the proposed modification change the materials of construction, such as a change in material form (cast, forged, or alloy)?
A: No.
- 9** 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 old equipment items.
- 10** Q: Does the proposed modification change existing operator training requirements?
A: Yes. The Emerson network of Local Business Partners and sales offices offer local training and support to ensure operators, maintenance personnel, and instrument technicians are fully trained on the 2052 pneumatic actuator.

- 11 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. The new equipment items require spare parts, training manuals, maintenance procedures, and training to maintenance departments that are specific to the new Fisher equipment items.
- 12 Q:** Does the proposed modification permanently remove the spares for existing pieces of equipment?
- A:** Yes. The spare parts of the existing equipment items have to be removed from the plant.
- 13 Q:** Does the proposed modification require welding work to be performed?
- A:** No.
- 14 Q:** Does the proposed modification change the inspection scope or inspection interval?
- A:** No.

Comparison of 1052 and 2052 Actuators

The 2052 and 1052 pneumatic actuators both perform the same task but the 2052 actuator has considerably better functionality and provides new features, making it more appealing to the customer. The following section identifies and compares some of these features.

Compact Design

The 2052 rotary actuator uses high pressure, nested springs, which allows for a lower overall height and diameter per torque output. This ensures reduced valve/actuator envelope dimensions leading to greater mounting versatility for both skids and process plants, where space is at a premium. See Figure 1 for valve dimensions.

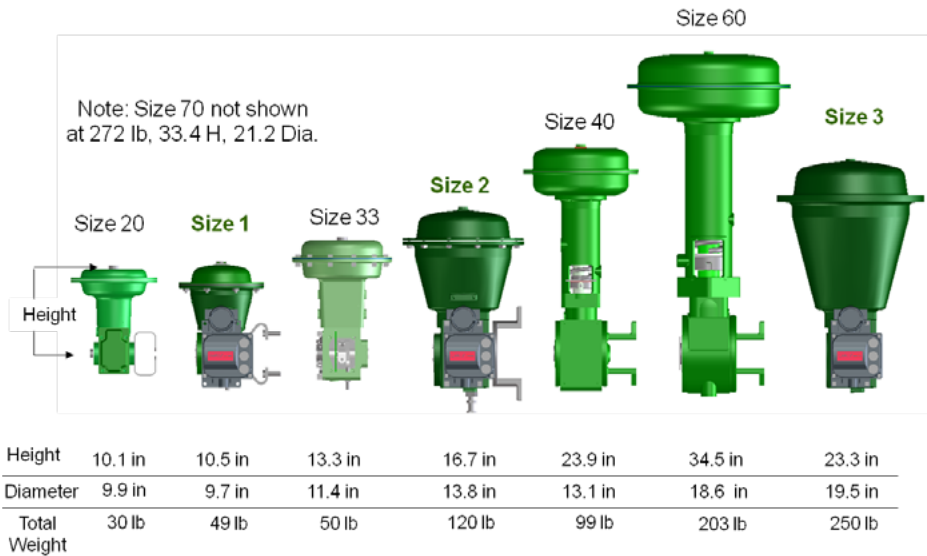


Figure 1. 1052 and 2052 Actuator Size Comparison

Simplified Sizing and Selection

The Fisher 1052 actuator has five different sizes and three design platforms (20,33,40-70). The Fisher 2052 has three different sizes and a single design platform. This substantially eases the process of sizing and reduces the number of spare components.

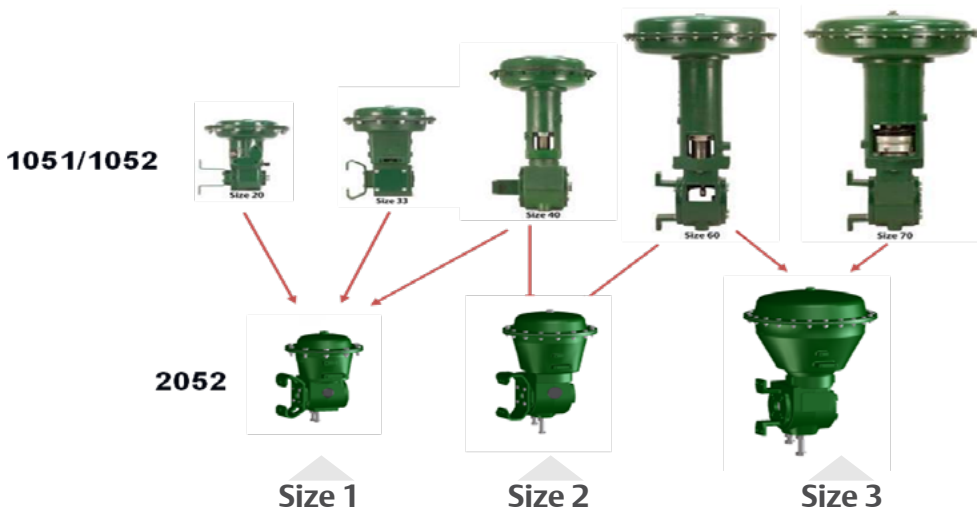


Figure 2. Actuator Simplicity - Size Reduction

Shaft Diameter	2052 Size		
	Size 1	Size 2	Size 3
Inches			
1/2	NPS 1-4		
5/8			
3/4		NPS 2-10	NPS 3-14
1			
1-1/4			
1-1/2			
1-3/4			
2			

Table 1. Actuator Simplicity - Valve Size Matches

1051/1052 Torque by Size		2052 Torque by Size/Springs					
		Size 1		Size 2		Size 3	
		1 Spring	2 Spring	1 Spring	2 Spring	1 Spring	2 Spring
Size	Torque Outputs	228	456	935	1870	2890	5583
1052/20	160	X					
1051/22	287	X	X				
1052/33	440		X				
1051/40	830			X			
1052/40	1030			X	X		
1051/60	2320				X		
1052/60	3090					X	X
1052/70	5079						X

"X" denotes compatible torque outputs

Note: The 1052 size 70 remains available for applications that require push-down-to-close torques. The standard push down to open torque value is listed here.

Depicts the torque output from each of the three 2052 sizes versus the torque output from the comparable 1052 sizes.

Table 2. 1051/2052 Actuator Torque Crossover

Actuator Size and Action	Operating Pressure			
	2 barg (29 psig) ⁽¹⁾		4 barg (58 barg) ⁽²⁾	
	Torque		Torque	
	N + m	lbf + in	N + m	lbf + in
1 (PDTO, PDTC)	25,5	225	51.2	453
2 (PDTO, PDTC)	105	930	210	1860
3 (PDTO)	327	2890	631	5583
3 (PDTC)	280	2479	584	5173

1. Operating pressure up to 3 barg (44 psig) is allowable for single spring connection.
2. Operating pressure up to 5 barg (73 psig) is allowable for dual spring construction.

Table 3. 2052 Actuator Torque Specifications

Actuator Size	Pressure Connection			
	1/4 NPT	1/2 NPT	3/4 NPT	G 1/4
1	standard	optional	not available	optional
2	standard	optional	not available	optional
3	not available	standard	optional	not available

Table 4. 2052 Actuator Pressure Connections

External Travel Adjustment

Adjustable travel stops are standard with an optional lockout feature. This 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.

Compatibility and Mounting

The Fisher 2052 rotary actuator is compatible with Fisher FIELDVUE™ DVC2000, DVC6200, and DVC6000 digital valve controllers, and Fisher 3610J and 3620 positioners. Linkage-less feedback, via a contact-less magnetic array, from the lever to the end-mounted is available with the FIELDVUE DVC2000 digital valve controller. Integral window mounting of the DVC6000, DVC6200, DVC6000, 3610J, and 3620J is also available.

The 2052 actuator can 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 conforming to ISO 5211.

The 1052/1051 actuator bracket is not interchangeable with the 2052 actuator. The 2052 actuator does not have the shaft bushing on the mounting bracket.

Bench Set

The nested springs in the 2052 actuator do not require the bench set to be adjusted as was required with the 1052 actuator. This simplifies the actuator selection process (see Figure 3), sizing, and maintenance. For complete 2052 actuator spring data, please see the 2052 Supplemental Actuator Sizing and Stroking Speed Information PS Sheet, Catalog 14 Page D-135(A) from November of 2009.

Mounting Orientations

The 2052 actuator can be mounted in the same orientations as the 1051/1052 actuator products.

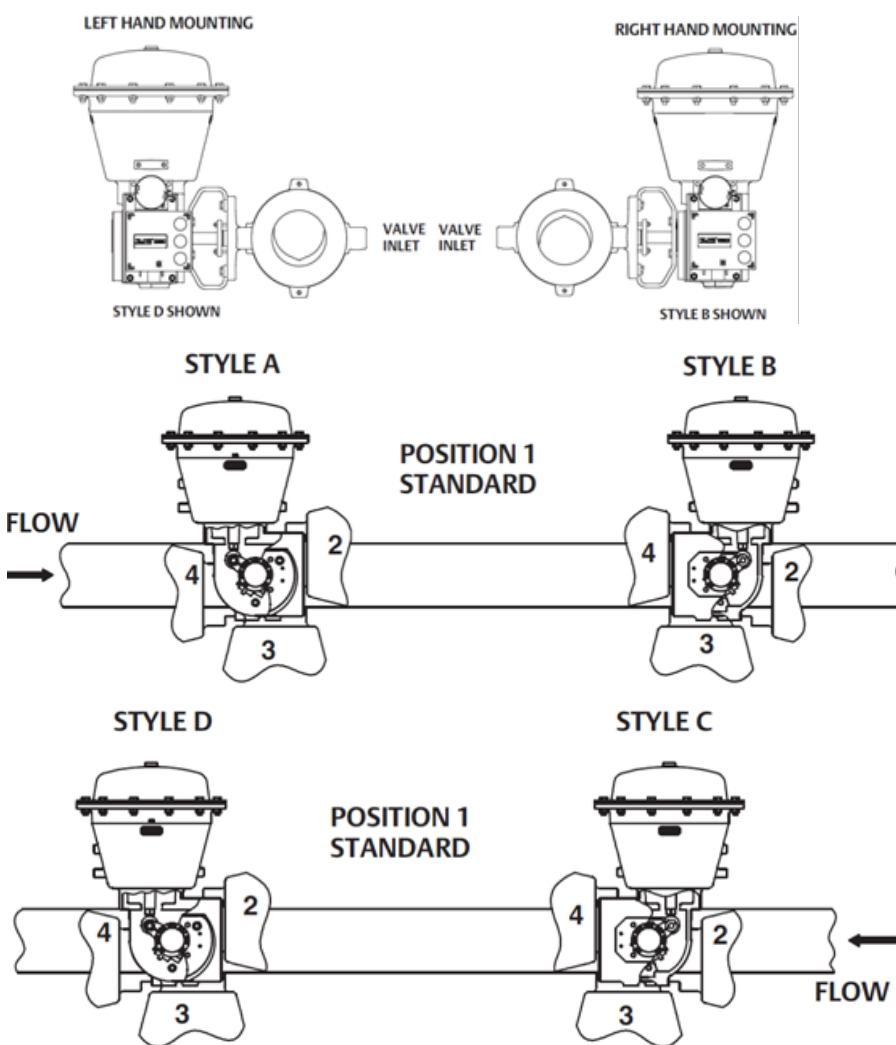


Figure 3. 2052 Actuator Mounting Options

Options

The 2052 actuator has several different options including the following:

- Top-mounted hand wheel– for infrequent use as a manual actuator.
- Declutchable handwheel actuator– an end-mounted manual actuator can be used to provide on-site control and to provide override capabilities.
- Actuator locking mechanism– can be used to keep the actuator in the locked, spring fail position during maintenance.

Conclusion

Fisher control valves have led the industry for more than 130 years with reliable control valves, actuators, and instruments. With a simplistic and efficient design, the Fisher 2052 pneumatic actuator will provide the same reliability and service life as its predecessor while easing service, selection, and setup.

Feature	1052 Actuator	2052 Actuator
Operating Pressure	0-18, 33, 40, or 55 psi	2 bar (29 psi) or 4 bar (58 psi)
Travel Adjustment	Size 33 external, all others internal via turnbuckle or screw	All external
Changing Action	Yes, no additional parts	Yes, no additional parts
Instrument Mounting	DVC/3610 window - UNC thread	DVC/3610 window - metric thread, plus Namur end mount
Valve Mounting	Style F with clamped lever	Style F with clamped level plus ISO 5211
Air Connection	20-60-1/4 standard; 1/2 option; 70-1/2 standard	Size 1 and 2 - 1/4 standard; 1/2 option; Size 3-1/2 standard
Actuator Sizes	5 sizes, 3 design platforms (20, 33, 40-10)	3 sizes, 1 design platform
Diaphragm Materials	Nitrile; -40° F to 180° F; Silicone available for up to 300° F	E88 standard; -50° F to 180° F; Silicone available for up to 300° F
Cycle Life	Depends on spring selection	Designed for 1 million plus cycles
Lock Out Feature	Optional	Optional
Travel Stops	Standard with 30° travel stop capability; option for sizes 40, 60, and 70	Standard with 30° travel stop capability
<i>Note: Responsibility for selection, use, and maintenance remains with the customer or end-user, as applicable.</i>		

Table 5. 1052 and 2052 Actuator Features

Additional Resources

See the following resources to learn more or contact your [local Emerson sales office](#) to speak to a representative.

- [2052 Product Bulletin \(D103295X012\)](#)
- [2052 Actuator Instruction Manual \(D103296X012\)](#)
- [Fisher Rotary Valves Brochure \(D351601X012\)](#)



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