

# Replacement of Fisher™ 585CLS and ATI L DA Actuators with Fisher 685 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

The Fisher 685 is a double acting piston actuator that provides accurate, high thrust output for short to long travel sliding stem valve applications. The purpose of this document is to simplify the transition from existing piston actuator technologies, which are beyond their service life or no longer provide the control and reliability required, to the Fisher 685 actuator.

Contained in this guide are two sections, the first contains questions and answers and the second compares the Fisher 685 actuator to the ATI L DA and Fisher 585CLS actuators. The first section helps users complete management of change (MOC) approval documents when replacing existing actuators with the 685 model. The second section helps users better understand the differences and similarities between the 685, ATI L DA, and 585CLS actuators.

## Question & Answer Checklist

- 1**    **Q:** Does the proposed modification change process chemistry, technology, or operating and control philosophies?  
**A:** No.
- 2**    **Q:** Does the proposed modification change how the existing plant is operated?  
**A:** No.
- 3**    **Q:** Does the proposed modification change process flows?  
**A:** No.
- 4**    **Q:** Does the proposed modification cause any changes to P&IDs?  
**A:** No.

- 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: Have the operating and design conditions (flow, temperature, pressure) of the proposed modification changed?  
A: No.
- 9** Q: Does the proposed modification change the materials of construction such as a change in material form (cast, forged) or alloy?  
A: No.
- 10** Q: Does the proposed modification change 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.
- 11** Q: Does the proposed modification change existing operator training requirements?  
A: No.
- 12** Q: Does the proposed modification introduce new equipment items that require training, manuals, maintenance procedures, or training to teach maintenance department craftsmen how to maintain them?  
A: Yes, however the new equipment items have the same theory of operation and maintenance procedures as the old equipment items. See the [Fisher 685 Actuator Instruction Manual \(D103626X012\)](#) or contact your local Emerson sales office.

**13 Q:** Does the proposed modification introduce new equipment items that require spares or obsolete spares for existing equipment?

**A:** Yes, spares for old equipment items cannot be used with new equipment items due to differences in dimensions between the old and new equipment items. Documentation on recommended spares can be obtained by providing the two serial numbers, located on the actuator, to your local Emerson sales office.

**14 Q:** Does the proposed modification change the inspection scope or inspection interval?

**A:** No.

## Fisher 585CLS and 685 Actuator Comparison

Even though the 685 and 585CLS actuators have identical theories of operation, there are certain key differences and advantages in the design and feature set of the 685 actuator. This section provides insight on the differences and similarities between these two actuators.

### Basic Design and Features

The 685 actuator has the same theory of operation, valve to actuator mounting type, and valve stem connection diameters as the 585CLS actuator. The 685 actuator can also be mounted and installed onto the same valves that the 585CLS actuator is available for and currently installed onto. Table 1, 2, and 3 provide side-by-side comparisons of design specifications, instrument compatibility, materials of construction, and certifications between the 685 and 585CLS actuators.

Specification	Fisher 685 Actuator <sup>(1)</sup>	Fisher 585CLS Actuator <sup>(1)</sup>
Actuator Type	Double-acting piston for sliding stem valves	
Yoke Boss Diameter (Valve to actuator mounting type)	5H or 7 Inch	
Valve Stem Connection Diameter	1 1/4 or 2 Inch	
Manual Override Capability	Side-mounted handwheel	Side-mounted handwheel
Cylinder Diameter	305 to 660 mm (12 to 26 inches)	254 to 356 mm (10 to 14 inches)
Travel	25 to 610 mm (1 to 24 inches)	225 to 606 mm (8.875 to 23.875 inches)
Operating Pressure	2.7 to 10.3 bar (40 to 150 psig)	2.8 to 13.8 bar (40 to 200 psig) <sup>(2)</sup>
Operating Temperature Limits	Standard: -40 to 93 °C (-40 to 200 °F) Low Temp: -54 to 93 °C (-65 to 200 °F) High Temp: -29 to 204 °C (-20 to 400 °F)	Standard: -23 to 74 °C (-10 to 165 °F) Low Temp: -46 to 66 °C (-50 to 150 °F) High Temp: -23 to 121 °C (-10 to 250 °F)
Thrust <sup>(3)</sup>	20 to 354 kN (4,524 to 79,639 lbs)	14 to 103 kN (3,140 to 23,100 lbs)
Pressure Connections	3/4, 1, or 1 1/4 Inch NPT	1/4 Inch NPT

1. Representative of standard constructions.  
2. Maximum operating pressure varies depending on cylinder diameter.  
3. Thrust varies depending on supply pressure, cylinder diameter, and stroke direction (push or pull). Values listed are for the push stroke direction.

Table 1. Design Specification Comparison

Instrument	Compatible (Yes/No)		
	Fisher 685 Actuator	Fisher 585CLS Actuator	ATI L DA Actuator
FIELDVUE™ DVC6000 Series Positioners	Yes	Yes	Yes
FIELDVUE DVC6200 Series Positioners	Yes	Yes	No
Fisher 2625 Volume Booster	Yes	Yes	Yes
Fisher SS-263 Volume Booster	Yes	Yes	No
Fisher 377 Trip Valve	Yes	Yes	Yes
TopWorx™ GO Switch™ Position Sensor	Yes	Yes	Yes

Table 2. Instrument Compatibility Comparison

Certification	Compatible (Yes/No)		
	Fisher 685 Actuator	Fisher 585CLS Actuator	ATI L DA Actuator
PED (97/23/EC)	Yes	Yes	Yes
ATEX	Yes	Yes	No
SIL	Yes	No	Yes

Table 3. Certifications Comparison

## Weight

The Fisher 685 and 585CLS actuators are similar in weight. Please contact your local Emerson sales office for a weight comparison between an installed 585CLS and 685 actuator.

## Envelope Dimensions

Refer to Table 4,5, and 6 with Figure 1 for a comparison of envelope dimensions between the 685 and 585CLS actuator.

	Width, mm (inches)			
	685 Size 12	585CLS Size 12	685 Size 14	585CLS Size 14
<b>Without Manual Override</b>	381 (15.0)	386 (15.2)	432 (17.0)	386 (15.2)
<b>With Manual Override</b>	528 (20.8)	513 (20.2)	650 (25.6)	513 (20.2)

Table 4. Width Envelope Dimensions

Travel	Height for a 127 mm (5H inch) yoke boss diameter, mm (inches)			
	685 Size 12	585CLS Size 12	685 Size 14	585CLS Size 14
<b>Without Manual Override</b>				
8 7/8	1077 (42.4)	1184 (46.6)	1125 (44.3)	1217 (47.9)
9 7/8	1077 (42.4)	1209 (47.6)	1125 (44.3)	1242 (48.9)
10 7/8	1077 (42.4)	1234 (48.6)	1125 (44.3)	1267 (49.9)
11 7/8	1077 (42.4)	1260 (49.6)	1125 (44.3)	1293 (50.9)
12 7/8	1280 (50.4)	1387 (54.6)	1328 (52.3)	1420 (55.9)
13 7/8	1280 (50.4)	1412 (55.6)	1328 (52.3)	1445 (56.9)
14 7/8	1280 (50.4)	1438 (56.6)	1328 (52.3)	1471 (57.9)
15 7/8	1280 (50.4)	1463 (57.6)	1328 (52.3)	1496 (58.9)
16 7/8	1483 (58.4)	1590 (62.6)	1532 (60.3)	1623 (63.9)
17 7/8	1483 (58.4)	1615 (63.6)	1532 (60.3)	1648 (64.9)
18 7/8	1483 (58.4)	1641 (64.6)	1532 (60.3)	1674 (65.9)
19 7/8	1483 (58.4)	1666 (65.6)	1532 (60.3)	1699 (66.9)
20 7/8	1687 (66.4)	1793 (70.6)	1735 (68.3)	1826 (71.9)
21 7/8	1687 (66.4)	1819 (71.6)	1735 (68.3)	1852 (72.9)
22 7/8	1687 (66.4)	1844 (72.6)	1735 (68.3)	1877 (73.9)
23 7/8	1687 (66.4)	1869 (73.6)	1735 (68.3)	1902 (74.9)

(continued)

Travel	Height for a 127 mm (5H inch) yoke boss diameter, mm (inches)			
	685 Size 12	585CLS Size 12	685 Size 14	585CLS Size 14
<b>With Manual Override</b>				
8 7/8	1191 (46.9)	1689 (66.5)	1293 (50.9)	1722 (67.8)
9 7/8	1191 (46.9)	1715 (67.5)	1293 (50.9)	1748 (68.8)
10 7/8	1191 (46.9)	1740 (68.5)	1293 (50.9)	1773 (69.8)
11 7/8	1217 (47.9)	1765 (69.5)	1318 (51.9)	1798 (70.8)
12 7/8	1318 (51.9)	1994 (78.5)	1420 (55.9)	2027 (79.8)
13 7/8	1318 (51.9)	2019 (79.5)	1420 (55.9)	2052 (80.8)
14 7/8	1318 (51.9)	2045 (80.5)	1420 (55.9)	2078 (81.8)
15 7/8	1420 (55.9)	2070 (81.5)	1521 (59.9)	2103 (82.8)
16 7/8	1598 (62.9)	2299 (90.5)	1699 (66.9)	2332 (91.8)
17 7/8	1598 (62.9)	2324 (91.5)	1699 (66.9)	2357 (92.8)
18 7/8	1598 (62.9)	2350 (92.5)	1699 (66.9)	2383 (93.8)
19 7/8	1623 (63.9)	2375 (93.5)	1725 (67.9)	2408 (94.8)
20 7/8	1801 (70.9)	2604 (102.5)	1902 (74.9)	2637 (103.8)
21 7/8	1801 (70.9)	2629 (103.5)	1902 (74.9)	2662 (104.8)
22 7/8	1801 (70.9)	2654 (104.5)	1902 (74.9)	2687 (105.8)
23 7/8	1826 (71.9)	2680 (105.5)	1928 (75.9)	2713 (106.8)

Table 5. Height Envelope Dimensions for Actuators with 127 mm (5H inch) Yoke Boss Diameters

Travel	Height for a 178 mm (5H inch) yoke boss diameter, mm (inches)			
	685 Size 12	585CLS Size 12	685 Size 14	585CLS Size 14
<b>Without Manual Override</b>				
8 7/8	1077 (42.4)	1184 (46.6)	1125 (44.3)	1217 (47.9)
9 7/8	1077 (42.4)	1209 (47.6)	1125 (44.3)	1242 (48.9)
10 7/8	1077 (42.4)	1234 (48.6)	1125 (44.3)	1267 (49.9)
11 7/8	1077 (42.4)	1260 (49.6)	1125 (44.3)	1293 (50.9)
12 7/8	1280 (50.4)	1387 (54.6)	1328 (52.3)	1420 (55.9)
13 7/8	1280 (50.4)	1412 (55.6)	1328 (52.3)	1445 (56.9)
14 7/8	1280 (50.4)	1438 (56.6)	1328 (52.3)	1471 (57.9)
15 7/8	1280 (50.4)	1463 (57.6)	1328 (52.3)	1496 (58.9)
16 7/8	1483 (58.4)	1590 (62.6)	1532 (60.3)	1623 (63.9)
17 7/8	1483 (58.4)	1615 (63.6)	1532 (60.3)	1648 (64.9)
18 7/8	1483 (58.4)	1641 (64.6)	1532 (60.3)	1674 (65.9)
19 7/8	1483 (58.4)	1666 (65.6)	1532 (60.3)	1699 (66.9)
20 7/8	1687 (66.4)	1793 (70.6)	1735 (68.3)	1826 (71.9)
21 7/8	1687 (66.4)	1819 (71.6)	1735 (68.3)	1852 (72.9)
22 7/8	1687 (66.4)	1844 (72.6)	1735 (68.3)	1877 (73.9)
23 7/8	1687 (66.4)	1869 (73.6)	1735 (68.3)	1902 (74.9)
<b>Without Manual Override</b>				
8 7/8	1191 (46.9)	1689 (66.5)	1293 (50.9)	1722 (67.8)
9 7/8	1191 (46.9)	1715 (67.5)	1293 (50.9)	1748 (68.8)
10 7/8	1229 (48.4)	1740 (68.5)	1331 (52.4)	1773 (69.8)
11 7/8	1229 (48.4)	1765 (69.5)	1331 (52.4)	1798 (70.8)
12 7/8	1394 (54.9)	1994 (78.5)	1496 (58.9)	2027 (79.8)
13 7/8	1394 (54.9)	2019 (79.5)	1496 (58.9)	2052 (80.8)
14 7/8	1433 (56.4)	2045 (80.5)	1534 (60.4)	2078 (81.8)
15 7/8	1433 (56.4)	2070 (81.5)	1534 (60.4)	2103 (82.8)
16 7/8	1598 (62.9)	2299 (90.5)	1699 (66.9)	2332 (91.8)
17 7/8	1598 (62.9)	2324 (91.5)	1699 (66.9)	2357 (92.8)
18 7/8	1636 (64.4)	2350 (92.5)	1737 (68.4)	2383 (93.8)
19 7/8	1636 (64.4)	2375 (93.5)	1737 (68.4)	2408 (94.8)
20 7/8	1801 (70.9)	2604 (102.5)	1902 (74.9)	2637 (103.8)
21 7/8	1801 (70.9)	2629 (103.5)	1902 (74.9)	2662 (104.8)
22 7/8	1839 (72.4)	2654 (104.5)	1941 (76.4)	2687 (105.8)
23 7/8	1839 (72.4)	2680 (105.5)	1941 (76.4)	2713 (106.8)

Table 6. Height Envelope Dimensions for Actuators with 178 mm (7 inch) Yoke Boss Diameters



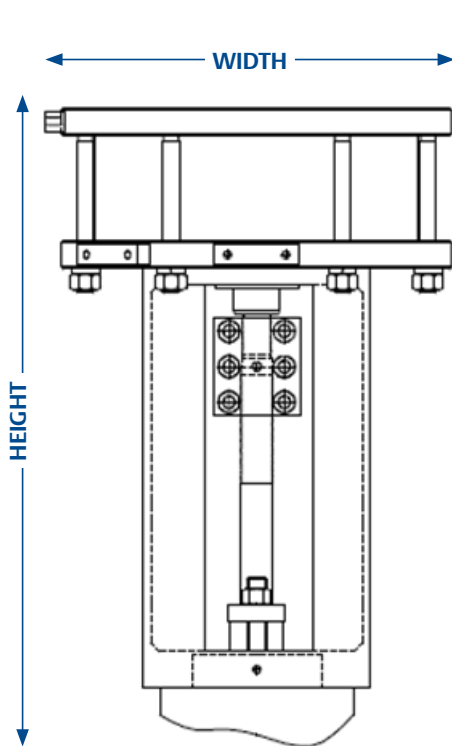


Figure 1. Front view of 685 Actuator without manual override

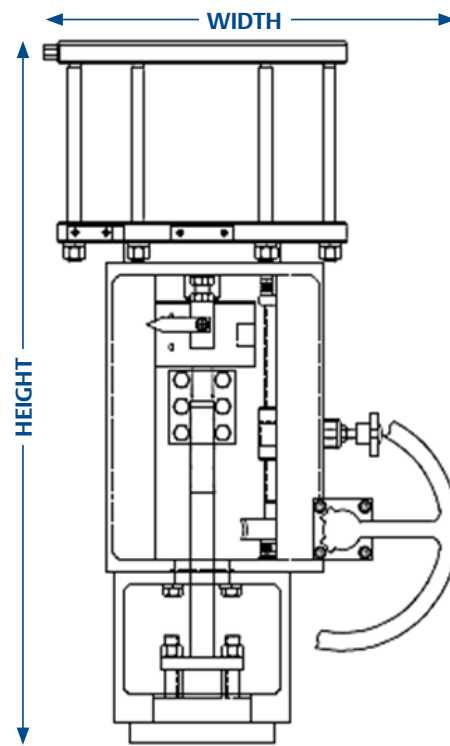


Figure 2. Front view of 685 Actuator with manual override

## ATI L DA and Fisher 685 Actuator Comparison

Even though the Fisher 685 and ATI L DA actuators have identical theories of operation, there are certain key differences in the design and feature set of the 685 actuator. This section provides insight on the differences and similarities between these two actuators.

### Basic Design and Features

The 685 actuator has the same theory of operation, yoke boss diameters, and valve stem connection diameters as the ATI L DA. The 685 actuator can also be mounted and installed onto the same valves that the ATI L DA is available for and currently installed onto. Table 2, 3, and 6 provide side-by-side comparisons of design specifications, instrument compatibility, materials of construction, and certifications between the 685 and ATI L DA actuators.

Specifications	Fisher 685 Actuator <sup>(1)</sup>	ATI L DA Actuator
Actuator Type	Double-acting piston for sliding-stem valves	
Yoke Boss Diameter (valve to actuator mounting type)	5H or 7 inch	
Valve Stem Connection Diameter	1 1/4 or 2 Inch	
Manual Override Capability	Side mounted handwheel	
Cylinder Diameter	305 to 660 mm (12 to 26 inches)	102 to 1,118 mm (4 to 44 inches)
Travel	25 to 610 mm (1 to 24 inches)	25 to 1,270 mm (1 to 50 inches)
Operating Pressure	2.7 to 10.3 bar (40 to 150 psig)	
Operating Temperature Limits	Standard: -40 to 93 °C (-40 to 200 °F) Low Temp: -54 to 93 °C (-65 to 200 °F) High Temp: -29 to 204 °C (-20 to 400 °F)	
Thrust <sup>(2)</sup>	20 to 354 kN (4,524 to 79,639 lbs)	2 to 964 kN (478 to 216,676 lbs)
Pressure Connection Size	3/4, 1, or 1 1/4 Inch NPT	
<small>1. Representative of standard constructions. Special constructions are available to cover additional cylinder diameters, travels, and thrusts. 2. Thrust varies depending on supply pressure, cylinder diameter, and stroke direction (push or pull). Values listed are for the push stroke direction.</small>		

Table 7. Design Specifications Comparison

## Weight and Envelope Dimensions

The Fisher 685 actuator and ATI L DA actuator have identical envelope dimensions and weights when comparing actuators with similar feature sets.

## Conclusion

Introducing the Fisher 685 actuator in place of the ATI L DA actuator and Fisher 585CLS actuator will not affect 585CLS actuators currently installed in plants. Spares for existing 585CLS actuators will continue to be available, but all spares for the ATI L DA and 585CLS actuators will not be compatible with the 685 actuator. The Fisher 685 actuator offers new sizes and features in addition to the previous 585CLS actuator offerings and will offer at least the same application coverage range as the ATI L DA actuator.

## Additional Resources

Contact your [local Emerson sales office](#) or see the resources below for more information about Fisher 685 actuators.

[685 Actuator Bulletin](#)

[685 Actuator Instruction Manual](#)



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