

D-3240 Series Pneumatic Piston Actuators

The D-3240 Series Pneumatic Piston Actuators are multipurpose positioning devices designed for operating inlet vanes on centrifugal fans and compressors, in direct response to the output signal of a pneumatic controller. These actuators can also be used on other applications that require a large amount of positioning power from a single actuator, such as large damper applications, provided that the damper is designed to withstand the high torque capabilities of the actuator.

The D-3240 Series Actuators are furnished with an 8 to 13 PSIG (56 to 91 kPa) spring range and are available in two mounting configurations: swivel-mounted and pedestal (single or duplex) floor-mounted. Floor-mounted models are furnished with a factory installed and calibrated D-9502 Positioner; swivel-mounted models are available with or without the positioner. The positioner may also be ordered separately at a later date for additional positioning power should the application require it; refer to the Specifications Table for ordering information.

For actuators with a positioner, if it is necessary to extend the linkage piston rod to make the linkage attachment, loosen the positioner spring arm before extending the rod and make sure the spring is just taut before retightening it.

Mounting

Application requirements dictate the type of mounting necessary; refer to the dimension drawings for mounting details. Tables 1 and 2 list the actuator force values and maximum available

Fig. 1: Typical D-3240 Series Swivel-Mounted Actuator

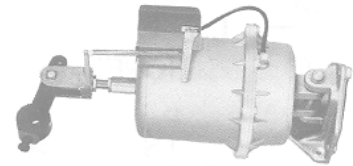
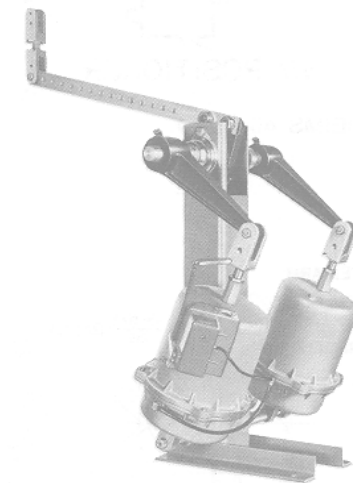


Fig. 2: Typical D-3240 Series Duplex Pedestal-Mounted Actuators



Specifications

Product	D-3240 Series Pneumatic Piston Actuators	
Models	See Table 3	
Stroke	D-3244 Series	4 in. (102 mm)
	D-3246 Series	6 in. (152 mm)
Mounting	D-3244 Series	Swivel and Single or Duplex Pedestal
	D-3246 Series	Swivel and Duplex Pedestal
Effective Diaphragm Area	23.4 in. ² (151 cm ²)	
Spring Range (Nominal)	8 to 13 PSIG (56 to 91 kPa)	
Control Air Pressure	25 PSIG (175 kPa) Maximum	
Air Connection	1/8 in. NPT Barbed Fitting for 5/32 or 1/4 in. O.D. Poly tubing	
Maximum Air Consumption	2 SCIM (.55 mL/s)	
Materials	Body	Die Cast Aluminum
	Diaphragm	Synthetic Elastomer
Ambient Temp Limits	-20 to 150°F (-29 to 66°C)	
Accessories (Order Separately)	D-9502-5 Positioner Kit	
	D-251-6660 Rubber Boot Kit	

The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.

torque with a 20 PSIG (140 kPa) supply and a nominal spring range of 8 to 13 PSIG (56 to 91 kPa).

Application and Drawing Identification



W/ POSITIONER

Table 1: D-3240 Series Swivel Mounted Actuator Force Values at 20 PSIG (140 kPa) Supply

Stroke	Force $\frac{\text{lb}}{\text{Newtons}}$
Power	$\frac{164}{729}$
Return	$\frac{187}{833}$

See BEIMS 45-2.03-1.

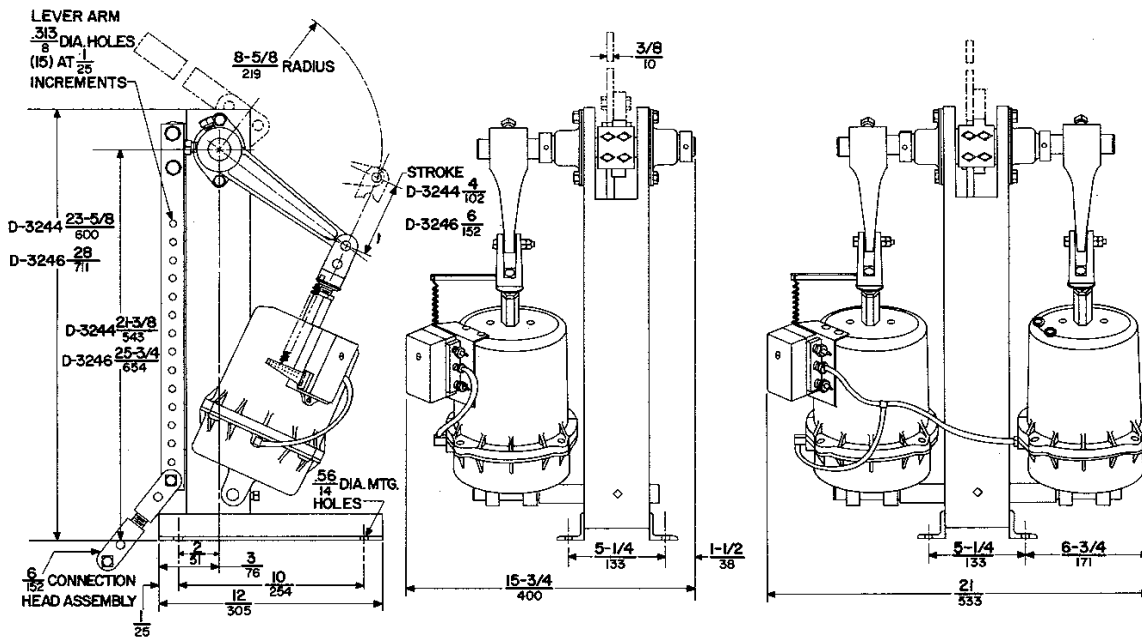


Fig. 3: D-3240 Series Single and Duplex Pedestal-Mounted Actuators Dimensions in./mm

Table 2: Maximum Available Torque at Various Angular Rotations

Angular Rotation in Degrees	D-3244-1	D-3244-3 & D-3244-4		D-3246-1 & D-3246-2	
	Torque* <u>lb in.</u> <u>N·m</u>	Torque** <u>lb in.</u> <u>N·m</u>	Control Arm Length <u>in.</u> <u>mm</u>	Torque** <u>lb in.</u> <u>N·m</u>	Control Arm Length <u>in.</u> <u>mm</u>
30.0	<u>1223</u> 138	<u>1223</u> 138	<u>7.73</u> 196	<u>1835</u> 207	<u>11.60</u> 295
32.5	<u>1124</u> 127	<u>1124</u> 127	<u>7.15</u> 182	<u>1686</u> 191	<u>10.72</u> 272
35.0	<u>1039</u> 117	<u>1039</u> 117	<u>6.65</u> 169	<u>1559</u> 176	<u>9.98</u> 253
37.5	<u>965</u> 109	<u>965</u> 109	<u>6.22</u> 158	<u>1447</u> 164	<u>9.33</u> 237
40.0	<u>900</u> 102	<u>900</u> 102	<u>5.85</u> 149	<u>1352</u> 153	<u>8.78</u> 223
42.5	<u>842</u> 95	<u>842</u> 95	<u>5.52</u> 140	<u>1264</u> 143	<u>8.28</u> 210
45.0	<u>792</u> 89	<u>792</u> 89	<u>5.23</u> 133	<u>1187</u> 134	<u>7.84</u> 199
47.5	<u>745</u> 84	<u>745</u> 84	<u>4.97</u> 126	<u>1117</u> 126	<u>7.43</u> 189
50.0	<u>703</u> 79	<u>703</u> 79	<u>4.73</u> 120	<u>1054</u> 119	<u>7.10</u> 180
52.5	<u>664</u> 75	<u>664</u> 75	<u>4.52</u> 115	<u>996</u> 113	<u>6.78</u> 172
55.0	<u>629</u> 71	<u>629</u> 71	<u>4.33</u> 110	<u>944</u> 107	<u>6.50</u> 165
57.5	<u>597</u> 67	<u>597</u> 67	<u>4.16</u> 106	<u>896</u> 101	<u>6.24</u> 158
60.0	<u>568</u> 64	<u>568</u> 64	<u>4.00</u> 102	<u>851</u> 96	<u>6.00</u> 152
62.5	<u>540</u> 61	<u>540</u> 61	<u>3.86</u> 98	<u>809</u> 91	<u>5.78</u> 147
65.0	<u>514</u> 58	<u>514</u> 58	<u>3.72</u> 94	<u>771</u> 87	<u>5.58</u> 142
67.5	<u>490</u> 55	<u>490</u> 55	<u>3.60</u> 91	<u>735</u> 83	<u>5.40</u> 137
70.0	<u>468</u> 53	<u>468</u> 53	<u>3.49</u> 89	<u>703</u> 79	<u>5.24</u> 133
72.5	<u>447</u> 51	<u>447</u> 51	<u>3.38</u> 86	<u>670</u> 76	<u>5.07</u> 129
75.0	<u>427</u> 48	<u>427</u> 48	<u>3.28</u> 83	<u>641</u> 72	<u>4.92</u> 125
77.5	<u>408</u> 46	<u>408</u> 46	<u>3.20</u> 81	<u>612</u> 69	<u>4.79</u> 122
80.0	<u>390</u> 44	<u>390</u> 44	<u>3.11</u> 79	<u>585</u> 66	<u>4.66</u> 118
82.5	<u>374</u> 42	<u>374</u> 42	<u>3.03</u> 77	<u>560</u> 63	<u>4.55</u> 116
85.0	<u>358</u> 40	<u>358</u> 40	<u>2.96</u> 75	<u>536</u> 61	<u>4.44</u> 113
87.5	<u>342</u> 39	<u>342</u> 39	<u>2.89</u> 73	<u>514</u> 58	<u>4.34</u> 110
90.0	<u>328</u> 37	<u>328</u> 37	<u>2.83</u> 72	<u>491</u> 55	<u>4.25</u> 108

* Torque for actuator with a 20 PSIG (140 kPa) supply, 8 to 13 PSIG (56 to 91 kPa) nominal spring range, and application similar to Fig. 8.

** Torque for actuator with 20 PSIG (140 kPa) supply, 8 to 13 PSIG (56 to 91 kPa) nominal spring range, and application similar to Fig. 7.

Note: Multiply the torque needed to operate the inlet vanes by 1.5 safety factor. The torque for duplex actuators is two times the listed single actuator torque.

Table 3: Ordering Information

Description	Shipping Weight lb*	Code Number
D-3244 Floor-Mounted Damper Actuator with 18 in. (457 mm) Lever Arm:		
Single, 8 to 13 PSIG (56 to 91 kPa) Spring, with D-9502-5 Positioner	45.5	D-3244-1
Duplex, 8 to 13 PSIG (56 to 91 kPa) Spring, with D-9502-5 Positioner	62.5	D-3244-2
D-3244 Swivel-Mounted Damper Actuator with Bracket, Clevis, and Crankarm:		
8 to 13 PSIG (56 to 91 kPa) Spring with D-9502-5 Positioner	15.0	D-3244-3
8 to 13 PSIG (56 to 91 kPa) Spring	14.0	D-3244-4
Spare Crankarm	1.2	D-3244-100
Spare Swivel Mounting Bracket	1.2	D-3244-101
D-3246 Floor-Mounted Damper Actuator with 18 in. (457 mm) Lever Arm:		
Duplex, 8 to 13 PSIG (56 to 91 kPa) Spring, with D-9502-5 Positioner	75.0	D-3246-3
D-3246 Swivel-Mounted Damper Actuator with Bracket, Clevis, and Crankarm:		
8 to 13 PSIG (56 to 91 kPa) Spring	15.5	D-3246-1
8 to 13 PSIG (56 to 91 kPa) Spring with D-9502-5 Positioner	16.5	D-3246-2
Spare Crankarm	1.2	D-3244-100
Spare Swivel Mounting Bracket	1.2	D-3244-101
D-3246 Damper Actuator (to replace D-251 No. 6 on Trane Centravac):		
8 to 13 PSIG (56 to 91 kPa) Spring, with D-9502-5 Positioner	15.0	D-3246-5

*lb x 0.454 = kg

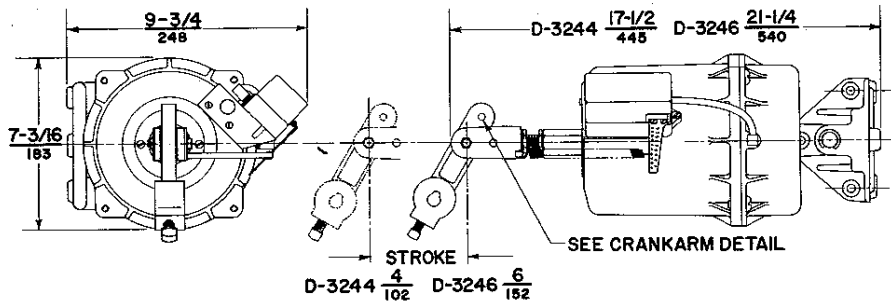


Fig. 4: D-3240 Series Swivel-Mounted Actuator Dimensions $\frac{\text{in.}}{\text{mm}}$

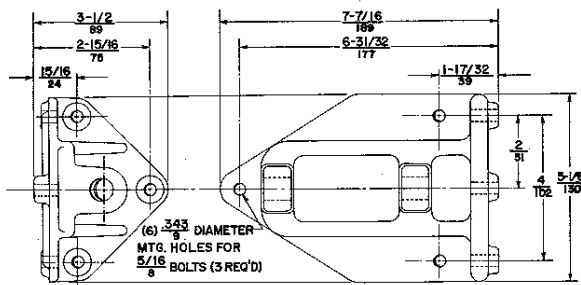


Fig. 5: Swivel Attachment Detail
Dimensions $\frac{\text{in.}}{\text{mm}}$

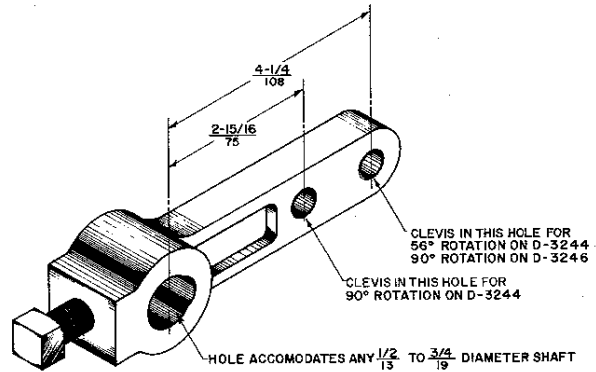


Fig. 6: Crankarm Detail
Dimensions $\frac{\text{in.}}{\text{mm}}$

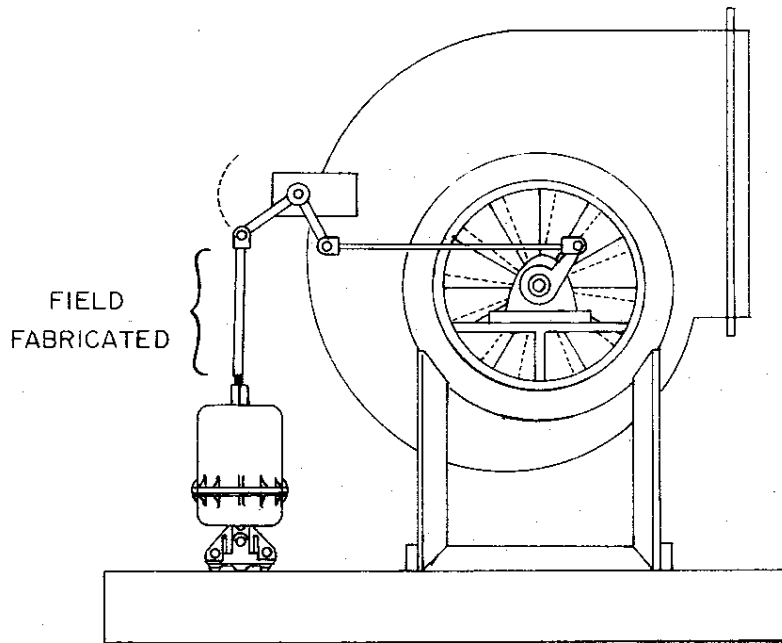


Fig. 7. See Pipe and Bar Stock Applications (page 6)

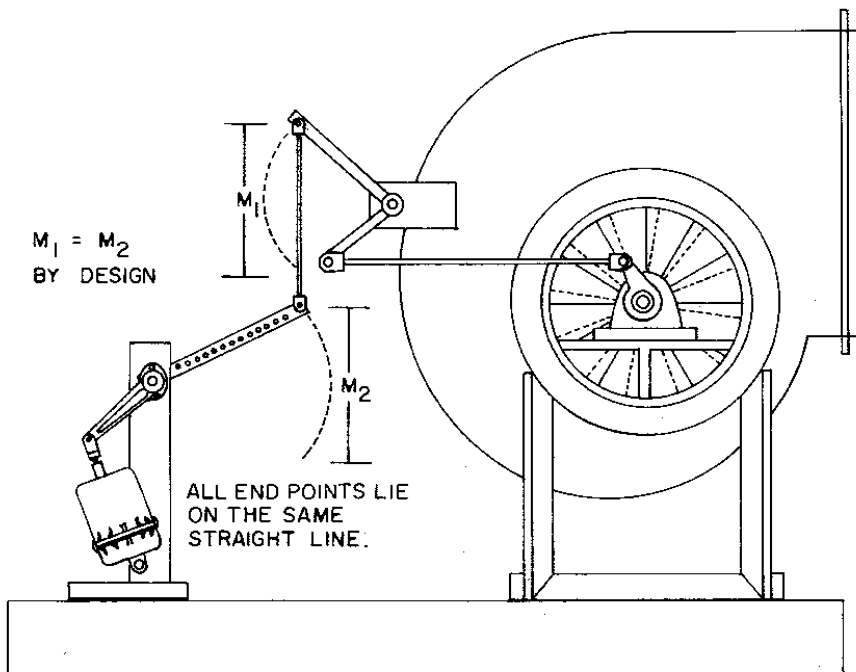


Fig. 8. See Pedestal-Mounted Application (page 6)

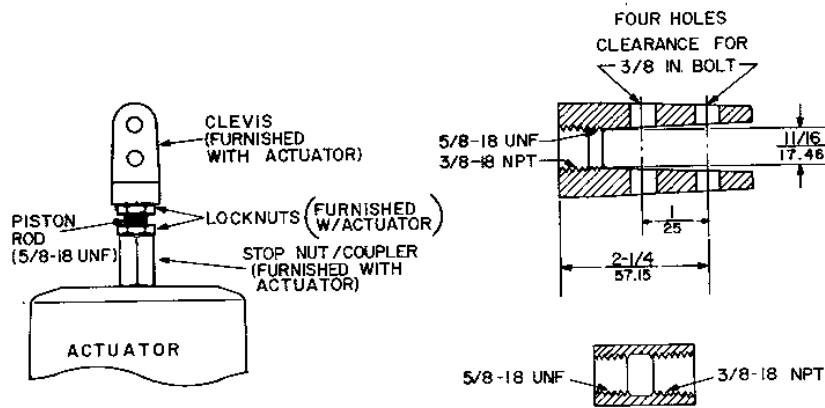


Fig. 9: Clevis and Stop Nut/Coupler

Assembly and Detail - Dimensions in./mm

Swivel-Mounted Actuator Using 3/8 in. Schedule 40 Pipe Extension (extra stop nut/coupler furnished) - Application "A":

1. Remove the clevis and screw the extra stop nut/coupler (eight or nine turns) onto the 5/8-18-UNF threaded end of the actuator shaft.
2. Back the locknut tightly into the stop nut.
3. Cut the 3/8 in. Schedule 40 pipe to the necessary length; the maximum length should not exceed 36 in. (914 mm). Thread the pipe on both ends.
4. Screw the pipe tightly into the stop nut.

5. Screw the clevis onto the other end of the pipe.
6. Attach the clevis to the fan inlet vane linkage.

Using Bar Stock - Application "B":

1. Cut the bar stock to the necessary length.
2. Drill two 3/8 in. (10 mm) holes into the bar stock using the clevis as a template.
3. Attach the extension to the clevis using the 3/8 in. nuts and bolts supplied.
4. Drill an appropriately sized hole into the opposite end of the extension and attach it to the fan inlet vane linkage.

Pedestal-Mounted Actuator:

1. Select the necessary lever arm length and attach the clevis in the appropriate holes.
2. Remove the end clevis and close nipple.
3. Cut the 3/8 in. Schedule 40 pipe to the necessary length; the maximum length should not exceed 36 in. (914 mm). Thread the pipe to 3/8-18 NPT on both ends.
4. Screw one end of the pipe into the clevis on the lever arm and the other end into the clevis from Step 2.
5. Connect the end clevis to the fan inlet vane linkage.

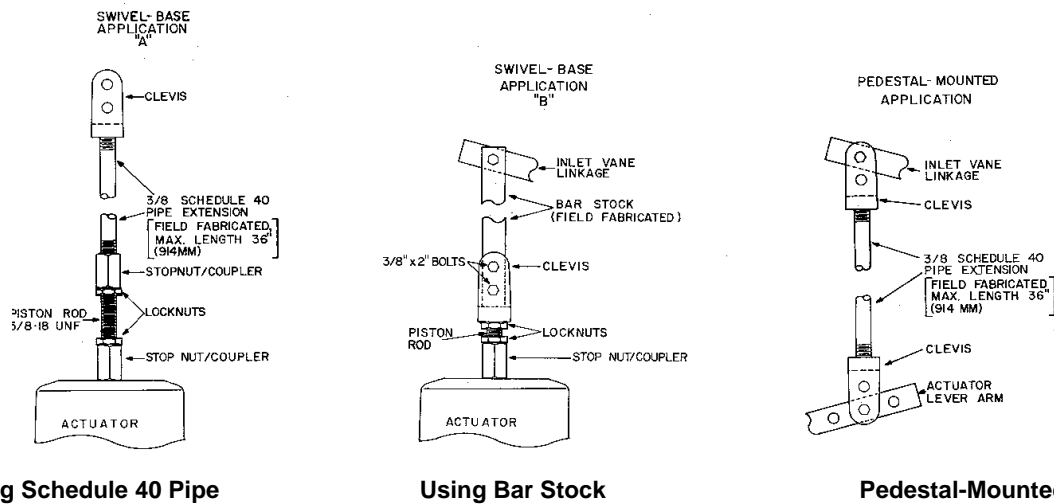


Fig. 10: Actuator Application Assemblies

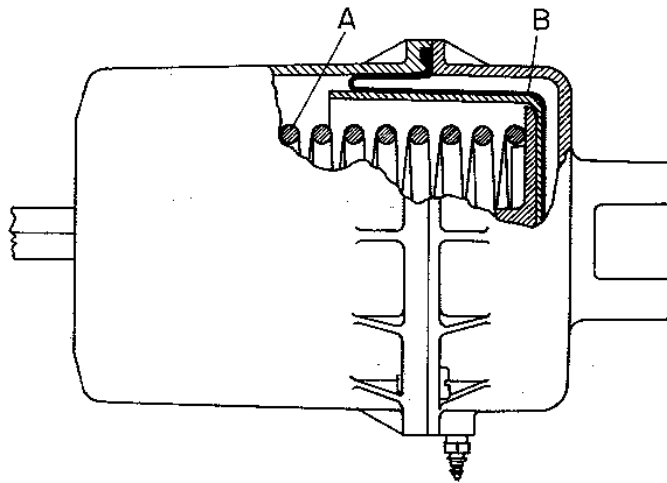


Fig. 11: D-3240 Series Actuator

Table 4: Repair Parts

Item	Description	Shipping Weight lb*	Code Number
A	Springs:		
	For D-3244 Series Actuators	2.3	D-251-6057
	For D-3246 Series Actuators	4.9	D-251-6055
B	Rubber Diaphragm:		
	For Both D-3244 and D-3246 Series Actuators	0.3	D-251-6042

*lb x 0.454 = kg

Notes



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