



## S05 Series Spring Return Direct Coupled Actuators

MS4105, MS7505, MS8105

### SPECIFICATION DATA

MS4105, MS7505, MS8105 Spring Return Direct Coupled Actuators (DCA) are used within heating, ventilating, and air-conditioning (HVAC) systems. They can drive a variety of quarter-turn, final control elements requiring spring return fail-safe operation.

Applications include:

- Volume control dampers, mounted directly to the drive shaft or remotely (with the use of accessory hardware).
- Quarter-turn rotary valves, such as ball or butterfly valves mounted directly to the drive shaft.
- Linear stroke globe or cage valves mounted with linkages to provide linear actuation.

## SPECIFICATIONS

### Torque Ratings:

- Typical Holding, Driving, Spring Return: 44 lb-in. (5 N•m).
- Stall Maximum (fully open at 75°F): 100 lb-in. (11.3 N•m).

### Electrical Ratings:

- See Table 1.

### Electrical Connections:

- Field wiring 14 to 22 AWG (2.0 to 0.344 mm sq) to screw terminals, located under the removable access cover.

### Stroke:

- 95° ±3°, mechanically limited.

### Controller Type:

- See Models.
- Modulating (Series 70) or Floating (Series 60); controlled by selector switch.
- Input Impedance: 95K ohms minimum.
- Feedback Signal: 0 or 2-10 Vdc; Driving current is 3 mA minimum.

### Timing (At Rated Torque and Voltage):

- Drive Open (typical):
  - Floating, Modulating Models: 90 seconds.
  - Two-Position Models: 45 seconds ±5 seconds.
- Spring Close: 20 seconds typical.

### Temperature Ratings:

- Ambient: -40°F to 140°F (-40°C to 60°C).
- Shipping and Storage: -40°F to 158°F (-40°C to 70°C).

### Humidity Ratings:

- 5% to 95% RH noncondensing.

### Design Life (at Rated Voltage):

- Two-position models: 50,000 full stroke cycles; 50,000 full stroke spring returns.
- Floating and Modulating models: 60,000 full stroke cycles; 1,500,000 repetitions; 60,000 full stroke spring returns.

### End Switches (Two SPDT):

- Settings (fixed): 7° nominal stroke, 85° nominal stroke.
- Ratings (maximum load):
  - Low-Voltage Models: 250 Vac, 5A resistive, 3A inductive.
  - Line-Voltage Models: 250 Vac, 5A resistive.

### Dimensions:

- See Fig. 1.

## FEATURES

- Brushless DC submotor with electronic stall protection for floating/modulating models.
- Brush DC submotor with electronic stall protection for 2-position models.
- Self-centering shaft adapter (shaft coupling) for wide range of shaft sizes.
- Models available for use with two-position, single pole single throw (spst), line- (Series 40) or low- (Series 80) voltage controls.
- Models available for use with floating or switched single-pole, double-throw (spdt) (Series 60) controls.
- Models available for use with proportional current or voltage (Series 70) controls.
- Models available with combined floating/modulating control in a single device.
- Access cover to facilitate connectivity.
- Metal housing with built-in mechanical end limits.
- Spring return direction field-selectable.
- Shaft position indicator and scale.
- Manual winding capability with locking function.
- UL (cUL) listed and CE compliant.
- All Models are plenum-rated per UL873.

### Device Weight:

- 7 lb (3.2 kg).

### Mounting:

- Self-centering shaft adapter (shaft coupling).
  - Round Damper Shafts: 0.375 to 1.06 in. (10 to 27 mm).
  - Square Damper Shafts: 1/2 to 3/4 in. (13 to 19 mm).
  - Actuator can be mounted with shaft in any position.

### Minimum Damper Shaft Length:

- 1 in. (25 mm); 3 in. (76 mm) recommended.

### Noise Rating at 1m (Maximum):

- Holding: 20 dBA (no audible noise).
- Two-position models:
  - Driving: 50 dBA.
  - Spring Return: 65 dBA.
- Floating and Modulating models:
  - Driving: 40 dBA.
  - Spring Return: 50 dBA.

### Environmental Protection Ratings:

- NEMA2 (US Models) or IP54 (European Models) when mounted on horizontal shaft with access cover below the shaft.

### Approvals:

- UL/cUL.
- UL873 Plenum Rating, File No. E4436; Guide No. XAPX.
- CE.
- C-TICK.

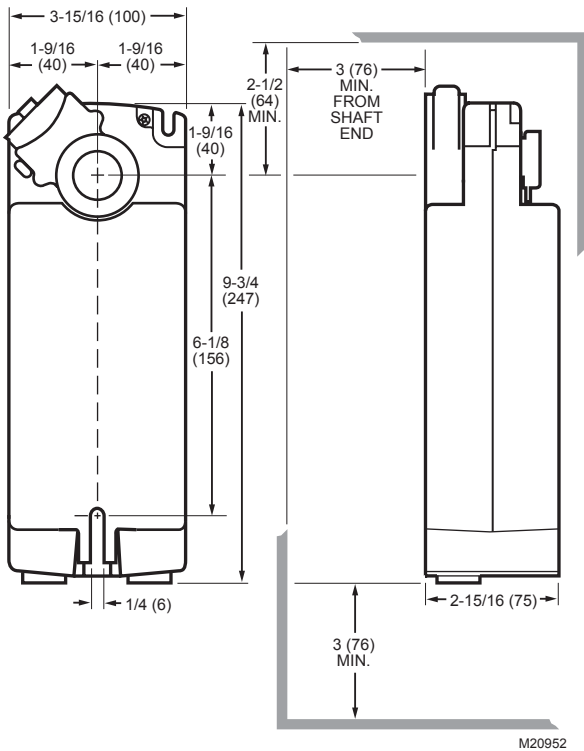


**Models:**

<b>S</b>	Spring Return Fail Safe Mode		
	<b>05</b>	44 lb-in. (5 N•m); Spring Return Only	
		<b>24-2POS</b>	24 Vac Two-Position Control
		<b>120-2POS</b>	120 Vac Two-Position Control
		<b>230-2POS</b>	230 Vac Two-Position Control
		<b>010</b>	24 Vac Modulating and Floating Control
			Fixed Zero/Span, No End Switches
<b>S</b>	<b>05</b>	<b>24-2POS</b>	

**Accessories:**

- 27518 Balljoint (5/16 in.).
- 103598 Balljoint (1/4 in.).
- 205860 Electronic Minimum Position Potentiometer.
- 27520A-E,G,H-L,Q Pushrod (5/16 in. diameter).
- 32000085-001 Water-tight Cable Gland/Strain-relief Fitting (10 pack).
- 32003036-001 Weather Enclosure.
- 32004254-002 Self-Centering Shaft Adapter (supplied with actuator).
- 50001194-001 Foot Mount Kit.
- 50005859-001 NEMA4/4X Enclosure.
- 50006427-001 Anti-Rotation Bracket (supplied with actuator).
- SW2-US Auxiliary Switch Package.
- See also Form 62-2620.



**Fig. 1. Dimensional drawing of actuator in in. (mm).**

**TYPICAL SPECIFICATION**

Spring return actuators shall be direct coupled type requiring neither crankarm nor linkage and be capable of direct mounting to a jackshaft of up to 1.05 in. diameter. The actuator shall connect to the shaft using a removable output hub with a self-centering shaft coupling. This coupling shall provide concentric mounting and include an integral adjustable range-stop mechanism.

The actuator shall provide two-position, floating, or proportional control. Proportional control refers to direct acceptance of 0-10 Vdc, 2-10 Vdc or—with addition of a 500 ohm resistor—a 4-20 mA input signal. Proportional and floating control models provide a 2-10 Vdc feedback signal. Actuators shall provide wiring terminals located within an integral access cover with conduit connections. Proportional and floating actuators shall have a rotation direction control switch accessible on the cover. Proportional and floating actuators shall use a brushless DC submotor. Two-position actuators shall use a brush DC submotor with a microprocessor control protected from overload at all angles of rotation.

All spring return actuators must be designed for either clockwise or counterclockwise fail-safe operation with a continuously engaged mechanical return spring. This spring must return the actuator to a fail-safe position within 20 seconds of power loss. All actuators shall provide a means of manually positioning the output hub in the absence of power. All actuators shall be designed for a minimum of 50,000 full-stroke cycles at actuator rated torque and temperature, 50,000 spring-return cycles and 1,500,000 repositions as documented in the product literature. Run time shall be constant and independent of: load, temperature, and supply voltage (within specifications). All actuators shall be UL873 and cUL (CSA22.2) listed, have a five year warranty, and be manufactured under ISO 9001 International Quality Control Standards. Actuators shall be as manufactured by Honeywell.

**Table 1. Electrical Ratings.**

Model(s)	Power Input		Power Consumption (VA)	
	Voltage	Frequency	Driving	Holding
Floating, Modulating	24 Vac ±20% (Class 2), 24 Vdc	50/60 Hz.	13	5
Two-Position, Low-voltage	24 Vac ±20% (Class 2), 24 Vdc	50/60 Hz.	25	8
Two-Position, Line-voltage	100-250 Vac	50/60 Hz.	45	13

**Table 2. O.S. Number Selection**

<b>M</b>	Electrical Motor						
	<b>S</b>	Fail Safe Function (Spring Return)					
		<b>41</b>	120 Vac Two-Position Control; Reversible Mount				
		<b>75</b>	24 Vac Modulating and Floating Control; Reversible Mount				
		<b>81</b>	24 Vac Two-Position Control; Reversible Mount				
		<b>05</b>	44 lb-in. (5 N•m)				
		<b>A</b>	Standard U.S. Model				
		<b>B</b>	Standard European Model				
		<b>1</b>	No Feedback				
		<b>2</b>	Voltage Feedback Signal				
		<b>0</b>	No End Switches				
		<b>XX</b>	System Controlled Numbers				
<b>M</b>	<b>S</b>	<b>75</b>	<b>05</b>	<b>A</b>	<b>2</b>	<b>0</b>	<b>XX</b>

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