Joventa Standard Series
Electric Non Spring Return Actuators

Product Bulletin

The Joventa Standard Series Electric Actuators are direct-mount actuators. These bidirectional actuators do not require a damper linkage, and are easily installed on round shafts or square shafts using the standard shaft clamp included with the actuator.

A single Electric Non Spring Return Actuator provides 8, 16, 24 or 32 Nm torque depending on the model. Two integral line voltage auxiliary switches indicate end stop position or performs switching functions within the selected rotation range.

They provide 90° of rotation. A graduated scale from 0° to 90° and a position indicator provide visual indication of stroke.

- **8, 16, 24 & 32 Nm Rated Torque**
  Provides high torque in a compact package size to expand the range of damper applications in HVAC system.

- **Direct-Coupled Design**
  Requires non crankarm or linkage and is capable of direct mounting to a round shaft up to 20 mm diameter and to a square shaft up to 16 mm.

- **Selectable direction of rotation**
  Provides either clockwise or counter clockwise operation.

- **Electronic Stall Detection**
  Protects from overload at all angles of rotation. Power consumption is reduced in holding mode.
  The actuator may be stalled anywhere in its rotation range without the need for mechanical end switches.

- **Double-Insulated Construction**
  Eliminates need for electrical ground connection for regulatory agency compliance.

- **Load independent**
  Provides constant runtime independent of torque.

- **Optional Integrated Auxiliary Switches**
  Provides two integrated, line-voltage-capable Single-Pole, Double-Throw (SPDT) switches with continuously adjustable switch point. Facilitates safety interfacing or signaling.

- **Manufactured under International Standards Organization (ISO) 9001 Quality Control Standards**
  Ensures quality.

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Installation

The Joventa Standard Series Electric Non Spring Return Actuators mount directly to the surface in any convenient orientation using the anti-rotation bracket (parts included with the actuator).

No additional linkages or couplers are required. Electrical connections are identified with numbers permanently marked on the actuator terminal block. The wiring details are included on the actuator housing.

This Actuators can be easily installed on dampers with round shafts from 10 to 20 mm or square shafts from 10 to 16 mm using the standard shaft coupler included with the actuator. If the damper shaft extends less than 48 mm, install a shaft extension recommended by the damper manufacturer.

The direction of the powered operation can be changed, depending on the models by reversing the motor plug in the board or by setting a dipswitch *(see Actuators models section for more details)*.

The actuator is factory set to work clockwise.

A push button disengage the internal gears letting the actuator to be manually override.
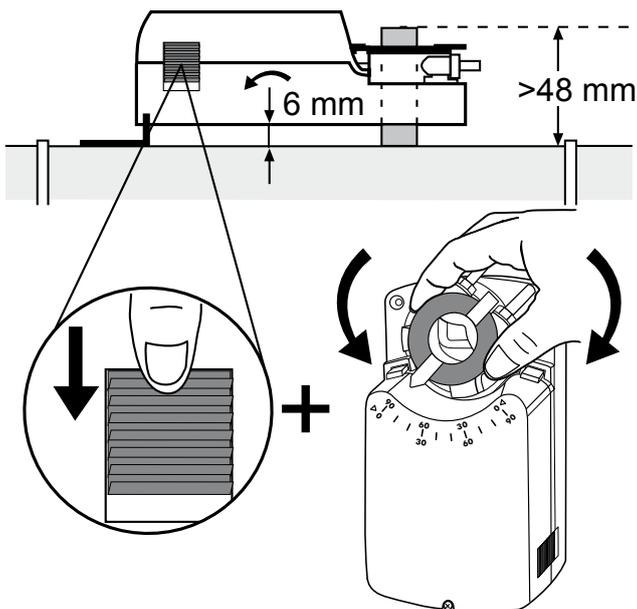
Mounting the Actuator

To mount the actuator, proceed as follows:

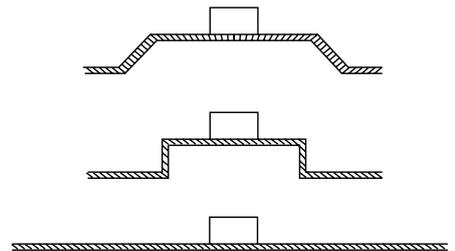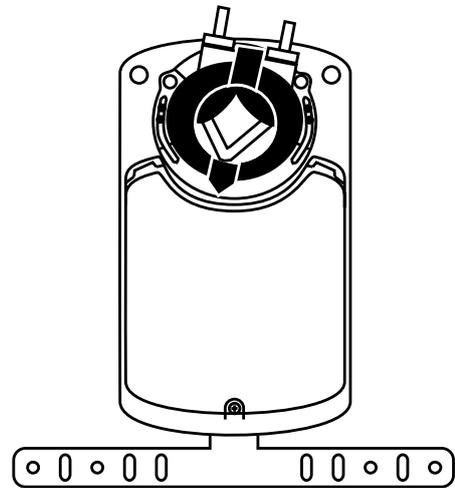1. Bend or cut the anti-rotation bracket to fit the damper frame or duct as illustrated in Figure 1.


Figure 1

2. Mark or drill mounting holes in the damper frame or duct using the anti-rotation bracket as a guide.

3. Secure the anti rotation bracket to the damper frame or duct using the two No. M3.5 x 9.5 mm self-drilling sheet metal screws.

4. Slide the actuator onto the damper shaft, and position the anti-rotation bracket tab into the slot at the bottom of the actuator.

5. Hold the actuator perpendicular to the damper shaft. Evenly hand-tighten each nut on the coupler U bolt, then torque the coupler U bolt nuts to 11 to 14 Nm.

6. Apply power long enough for the actuator to travel a full stroke. Verify that the actuator rotates freely throughout the range.

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Limiting the Rotation

The actuator is factory set for 90° rotation, and its range is limited in 5° increments.

To limit the starting point proceed as follow:

1. If necessary, set the shaft coupler ,as shown in the pictures, by pushing the manual override button.
2. Remove the coupler pushing the little lever on the bottom of the actuator.
3. Rotate clockwise the coupler (30° degree in the sample below) and insert it in the actuator.
   Every tooth of the coupler housing correspond to 5° of rotation.
4. The actuator pointer shows the starting position. The actuator now perform a rotation from 30° to 90°.
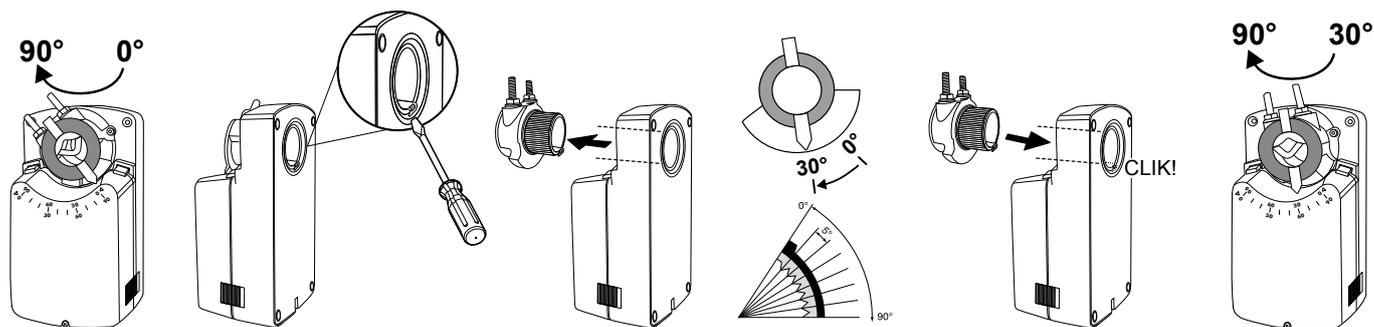
To limit the stop point proceed as follow:

5. If necessary, set the shaft coupler, as shown in the pictures, by pushing the manual override button.
6. Remove the coupler pushing the little lever on the bottom of the actuator.
7. Rotate the coupler counter clockwise (30° degree in the sample below) and insert it in the actuator.
   Every tooth of the coupler housing correspond to 5° of rotation.
8. The actuator pointer shows the end position (60° in the sample below). Set the shaft coupler to the starting point by pushing the manual override button and rotating it. The actuator now performs a rotation from 0° to 60°.
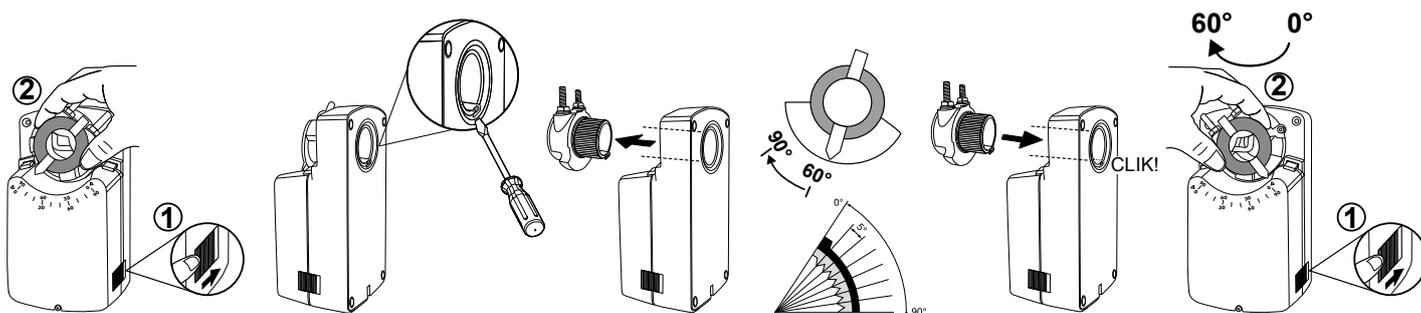
Auxiliary Switch

The Dxxx.xS models include two integral auxiliary switches with a switch adjuster accessible removing the actuators cover.

The factory setting for the Auxiliary Switch is 10° closing (relative to the 0 to 90° rotation range as printed on the product label) for switch a and 80° opening for switch b. The switching position can be manually changed to any required position by turning the rachet.

3(1.5)A, AC 230 V
Actuator at 0° position

switch a

CLIK!

switch b

CLIK!

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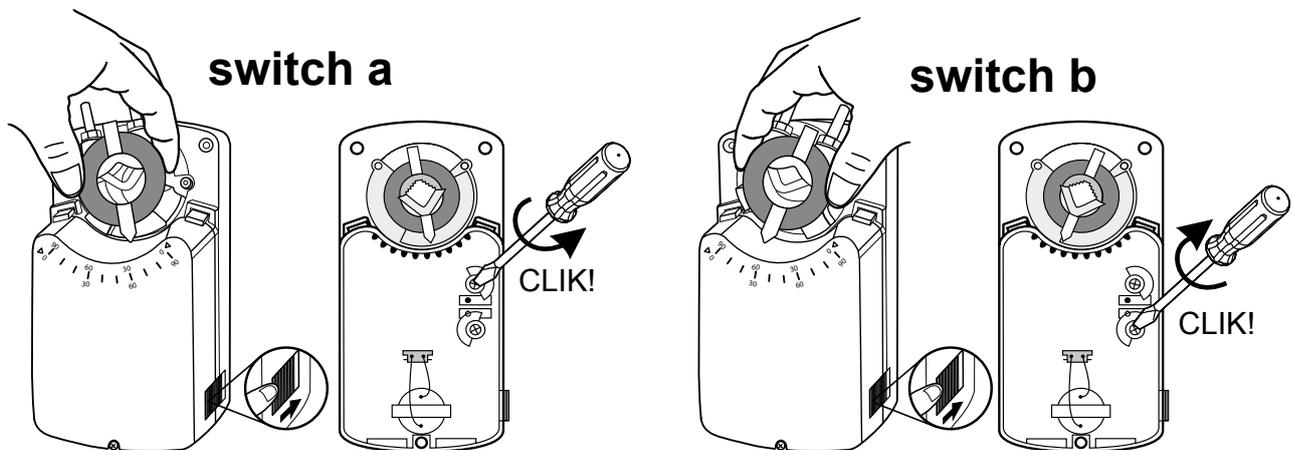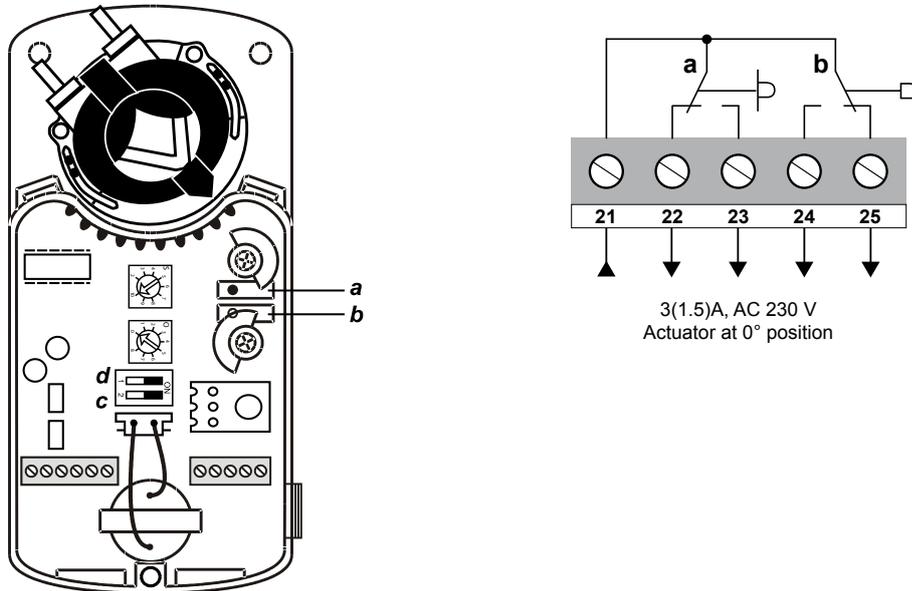
Proportional Actuators Series

This serie provides proportional modulation of dampers in HVAC systems that are controlled by an electronic controller or positioner.

The actuator responds to 0 to 10 VDC, 2 to 10 VDC, 0 to 20 mA or 4 to 20 mA control signal with a power supply of 24 VDC / AC and 230 V AC *(see the table below for the complete codes description)*.

A 0 to 10 VDC or 2 to 10 VDC feedback signal indicates position and provides support for master slave applications.

The proportional Series Actuators use a DC motor controlled by a microprocessor. The microprocessor drives the motor at constant speed, independent of torque. The microprocessor also monitors the motor's rotation to prevent damage to the actuator in a stall condition. The actuator can be stalled anywhere within its rotation range without the need for mechanical end switches.

Manual control system override applications are supported through field wiring, and include:

- Override to MIN position
- Override to MAX position

Ordering Informations

D	M	x	x.x	x			
				-	=	without auxiliary switches	
				S	=	with two auxiliary switches	
			1.1		=	24 V AC / DC power supply - 0(2)...10 V DC or 0(4)...20 mA Setpoint signal	
			2.2		=	230 V AC power supply - 0(2)...10 V DC Setpoint signal	
			2.5		=	230 V AC power supply - 0(4)...20 mA Setpoint signal	
		S			=	8 Nm Torque	
		-			=	16 Nm Torque	
		L			=	24 Nm Torque	
		G			=	32 Nm Torque	
	M				=	Proportional	

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Clockwise and counter clockwise operation

The rotation of the proportional actuators line can be changed in order to perform a clockwise or counter clockwise rotation when the signal set point increase.
The factory setting is a clockwise rotation.

To change the direction of the rotation remove the actuators cover and change the dipswitch n° 2 as follow:
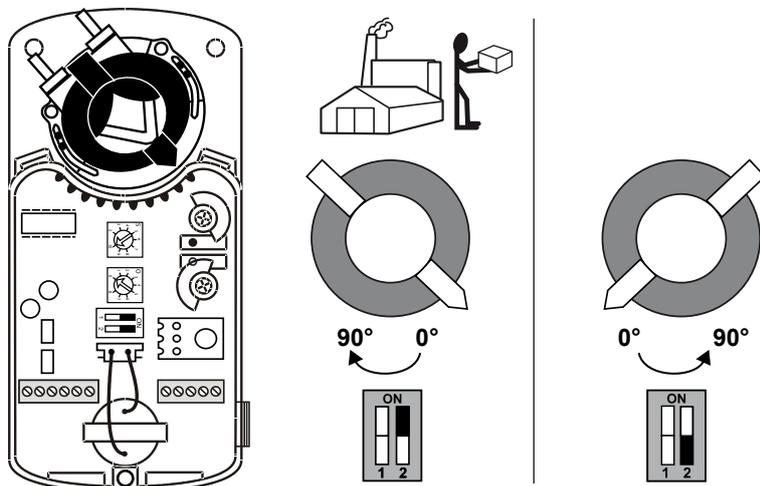
Input signal Setup and Adjustments

Valid for the following models: DMS1.1(S) / DM1.1(S) / DML1.1(S) / DMG1.1(S)

The proportional actuators with 24 V AC / DC power supply have the possibility to adjust the input signal changing the working range and the starting point of the signal.

The actuator has two internal potentiometers, marked with O for the staring signal and S for the working range.
The factory setting are O=0 and S=10 for a 0…10 V DC or 0….20 mA input signal.

Change the potentiometer O value according with the table below ("Starting point O") to set the starting point of the input signal.

Subtract the starting input signal value to the final value of the desired input signal. Find the result in the table below ("Working range S") and set the potentiometer S accordingly.

Example 1:
Control signal Y1 working between DC 3…9 V
Set the potentiometer O=3
9-3=6 VDC then set the potentiometer S=6

Example 2:
Control signal Y2 working between 6…18 mA
Set the potentiometer O=3
18-6=12 mA then set S=6

Start point **O**

Scale O	0	1	2	3	4	5	6	7	8
for Y1 (VDC)	0	1	2	3	4	5	6	7	8
for Y2 (mA)	0	2	4	6	8	10	12	14	16

Working range **S**

Scale S	2	3	4	5	6	7	8	9	10
for Y1 (VDC)	2	3	4	5	6	7	8	9	10
for Y2 (mA)	4	6	8	10	12	14	16	18	20

Note: The starting and final position of the rotation depend on how the actuator has been set (See "limiting the rotation" paragraph).

Valid for the following models: DMS2.x(S) / DM2.x(S) / DML2.x(S) / DMG2.X(S)

The proportional actuators with 230 V AC power supply don't have the possibility to adjust the input signal as written above.
Only the starting point of the input signal can be changed by dipswitch n°1.
For the actuators models DMx2.2(S) the range can be 0…10 VDC (factory setting) or 2...10 VDC.
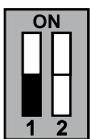
0...10 VDC   2...10 VDC

For the actuator models DMx2.5(S) the range can be 0…20 mA (factory setting) or 4...20 mA.
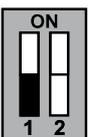
0...20 mA   4...20 mA
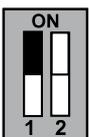
Calibration Function

Valid for the following models: DMS1.1(S) / DM1.1(S) / DML1.1(S) / DMG1.1(S)

The Calibration function enables the actuator to redefine the selected input signal range proportionally across a reduced rotation range. The actuator maintains calibration when power is lost or removed.

Follow these steps to calibrate the input signal range:

With power applied to the actuator, move the dipswitch 1 from the Deactivated position to the Activated position.

DECTIVATED   ACTIVATED
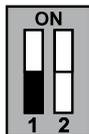
The actuator begins rotating until the end-stops are found. When the actuator reach the starting position and stops it's calibrated and ready to work.

⚠	**WARNING:** **The dipswitch 1 must remain in the "activated" position.**

Note: The proportional actuators with 230 V AC power supply don't have the calibration function.

Wiring Diagrams

1	2	3	4	5	6
⊥	~		Y2	Y1	U

AC/DC 24 V

0...20 mA
DC 0...10 V
DC 0...10 V

DMx1.1(S)

1	2	3	4	5	6
N	L1	V+	⊥	Y1	U

AC 230 V

DC 0(2)...10 V
DC 0(2)...10 V

DMx2.2(S)

1	2	3	4	5	6
N	L1	V+	⊥	Y1	U

AC 230 V

0(4)...20 mA
DC 0(2)...10 V

DMx2.5(S)

Parallel Connections
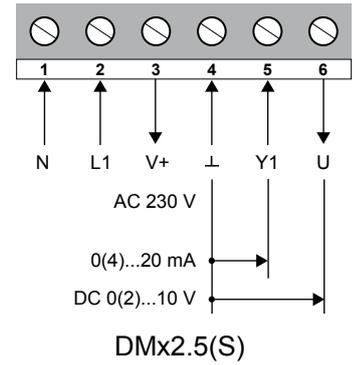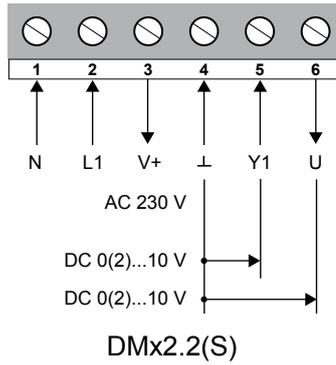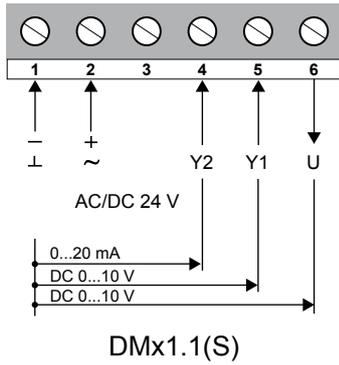
1	2	3	4	5	6
		Slave			

1	2	3	4	5	6
		Master			U

− +
⊥ ~   Y2 Y1   DC 0...10 V
AC/DC 24 V   DC 0...10 V
             0...20 mA

Max. 5 actuators

DMx1.1(S)

1	2	3	4	5	6
		Slave			

1	2	3	4	5	6
		Master			

N   L1   ⊥   Y1
AC 230 V   DC 0(2)...10 V

Max. 5 actuators

DMx2.2(S)

1	2	3	4	5	6
		Slave			

1	2	3	4	5	6
		Master			U

N   L1   ⊥   Y1
AC 230 V   0(4)...20 mA

Max. 5 actuators

DMx2.5(S)

Override Control

1	2	3	4	5	6

1 2 3

− +
⊥ ~   Y
AC/DC 24 V   DC 0(2)...10 V

The actuator can be forced to override control
when wired in acordance with the diagram.

Switch position:
1 = Actuator runs at 10 V
2 = Actuator runs at 0(2) V
3 = Automatic control

DMx1.1(S)

Technical Specifications

DMS1.1(S) / DM1.1(S) / DML1.1(S) / DMG1.1(S)

Actuator		DMS1.1(S	DM1.1(S)	DML1.1(S)	DMG1.1(S)
Torque		8 Nm	16 Nm	24 Nm	32 Nm
Running Time		30 s	80 s	125 s	200 s
		Independent of load, at nominal conditions and room temperature			
Supply Voltage		AC 24 V ±20% / DC ±10%			
Frequency		50-60 Hz			
Power Consumption					
- Running		2.5 W			
- At end position		0.3 W			
For wire sizing		6.0 VA / 3.6 A @ 2 ms			
Control Signal		Adjustable			
	Y1	DC 0... 10 V / Ri 250 Ω			
	Y2	0...20 mA / Ri 388 Ω			
Position Signal	*U*	DC 0...10 V / R > 50 kΩ			
Angle of rotation					
- Working range		90° (93°mech.)			
- Limiting		5°...85° in 5° < steps			
Auxiliary Switch rating		3(1.5) A, AC 230 V			
Life time		60.000 rotations			
Sound power level		45 dB (A)			
Protection Class		II			
Degree of Protection		IP 54 cable down			
Ambient conditions					
- Operating temperature		-20...+50 °C			
- Storage temperature		-30...+60 °C			
- Humidity		5...95% RH not condensing			
Weight		1.1 Kg			
Service		Maintenance-free			
C E **Compliance**		Johnson Controls, Inc., declares that these products are in compliance with the essential requirements and other relevant provisions of the EMC Directive 2004/108/EC and Low Voltage Directive 2006/95/EC.			

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DMS2.2(S) / DM2.2(S) / DML2.2(S) / DMG2.2(S)

Actuator	DMS2.2(S)	DM2.2(S)	DML2.2(S)	DMG2.2(S)
Torque	8 Nm	16 Nm	24 Nm	32 Nm
Running Time	30 s	80 s	125 s	140 s
	Independent of load, at nominal conditions and room temperature			
Supply Voltage	AC 230 V ±15%			
Frequency	50-60 Hz			
Power Consumption				
- Running	5.5 W			
- At end position	0.6 W			
For wire sizing	6.0 VA / 0.1 A @ 2 ms			
Control Signal Y1	DC 0(2)... 10 V			
Imput resistance Y1	Ri 100 Ω			
Position signal U	DC 0...10 V / R>50kΩ			
Angle of rotation				
- Working range	90° (93°mech.)			
- Limitation	5°...85° in 5° steps			
Auxiliary Switches	3(1.5) A, AC 230 V			
Life time	60.000 rotations			
Noise level	45 dB (A)			
Protection Class	II			
Degree of Protection	IP 54 cable down			
Ambient conditions				
- Operating temperature	−20...+50 °C			
- Storage temperature	−30...+60 °C			
- Humidity	5...95% r.F. no condensed			
Weight	1.2 Kg			
Service	Maintenance-free			
CE **Compliance**	Johnson Controls, Inc., declares that these products are in compliance with the essential requirements and other relevant provisions of the EMC Directive 2004/108/EC and Low Voltage Directive 2006/95/EC.			

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DMS2.5(S) / DM2.5(S) / DML2.5(S)

Actuator	DMS2.5(S)	DM2.5(S)	DML2.5(S)
Torque	8 Nm	16 Nm	24 Nm
Running Time	30 s	80 s	125 s
Supply Voltage	AC 230 V ± 15%		
Frequency	50-60 Hz		
Power Consumption			
- Running	5.5 W		
- At end position	0.6 W		
Dimensioning	6.0 VA / 0.1 A @ 2 ms		
Control Signal Y1	0(4)...20 mA		
Imput resistance Y1	Ri 100 Ω		
Position signal U	DC 0...10 V / R>50kΩ		
Angle of rotation / Working range	90° (93°mech.)		
Angle of rotation/Limitation	5°...85° in 5° < steps		
Auxiliary Switches	3(1.5) A, AC 230 V		
- S1 setting range	5°...85° < adjustable		
- S2 setting range			
Life time	60.000 rotations		
Noise level	45 dB (A)		
Protection Class	II		
Degree of Protection	IP 54 cable down		
Ambient conditions			
- Operating temperature	–20...+50 °C / IEC 721-3-3		
- Storage temperature	–30...+60 °C / IEC 721-3-2		
- Humidity	5...95% r.F. no condensed		
Weight	1.2 Kg		
Service	Maintenance-free		
CE Compliance	Johnson Controls, Inc., declares that these products are in compliance with the essential requirements and other relevant provisions of the EMC Directive 2004/108/EC and Low Voltage Directive 2006/95/EC.		

ON/OFF and Floating Actuators Series

This series provide an on/off and floating modulation on dampers in HVAC systems.

The floating actuators run at constant speed, independent of torque. The actuator can be stalled anywhere within its rotation range without the need for mechanical end switches.

The actuators are available with 24 VDC / AC or 100...230 V AC power supply, with or without two auxiliary switches and with three feedback potentiometer types.

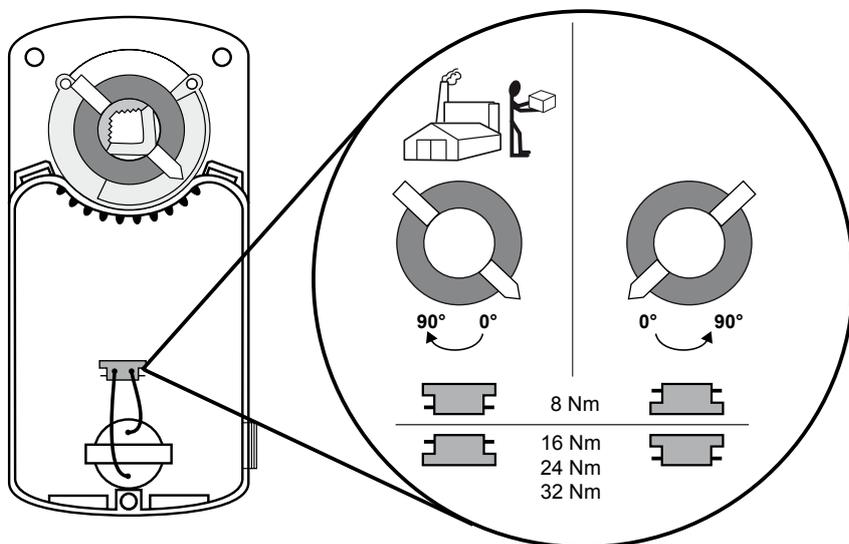The table below shows the complete codes description.

Ordering Informations

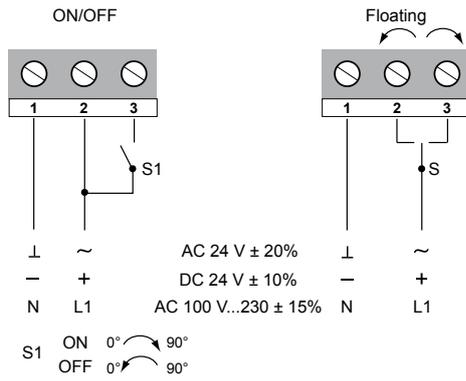| D	A	x	x	.	x			
					-	=	without auxiliary switches	
					S	=	with two auxiliary switches	
					P1	=	1 kΩ feedback potentiometer	
					P2	=	140 Ω feedback potentiometer	
					P4	=	2 kΩ feedback potentiometer	
				1		=	24 V AC / DC power supply	
				2		=	100...230 V AC power supply	
			S			=	8 Nm Torque	
			-			=	16 Nm Torque	
			L			=	24 Nm Torque	
			G			=	32 Nm Torque	
	A					=	Floating and ON/OFF	

Clockwise and counter clockwise operation

The rotation of the Floating line can be changed in order to perform a clockwise or counter clockwise rotation.

The factory setting is a clockwise rotation. To change the direction of the rotation, remove the actuator cover and change the motors connector as below:

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Wiring Diagrams

ON/OFF

Floating

S1

S

⊥	~		⊥	~
−	+	AC 24 V ± 20%	−	+
N	L1	DC 24 V ± 10%	N	L1
		AC 100 V...230 ± 15%		

S1   ON   0° 90°
     OFF   0° 90°

Parallel Connections

max. 5

ON/OFF

Floating

Potentiometer (P)

100%

0   100%

11	12	13

P1 = 1K Ω/0,5 W/±10%
P2 = 140 Ω/0,5 W/±10%
P4 = 2K Ω/0,5 W/±10%

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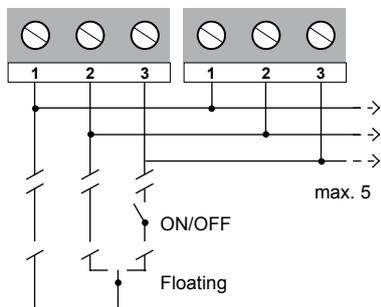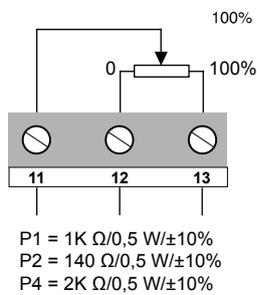
DAS1.x / DA1.x / DAL1.x / DAG1.x

Actuator	DAS1.x	DA1.x	DAL1.x	DAG1.x
Torque	8 Nm	16 Nm	24 Nm	32 Nm
Running Time	30 s	80 s	125 s	140 s
	Independent of load, at nominal conditions and room temperature			
Supply Voltage	AC 24 V ± 20% / DC ± 10%			
Frequency	50-60 Hz			
Power Consumption				
- Running	2.5 W		4.0 W	
- At end position	0.5 W		0.5 W	
Dimensioning	5.0 VA / 3.4 A @ 2 ms		3.0 VA / 3.4 A @ 2 ms	
Control Signal	ON/OFF or Floating			
Position Signal	Potentiometer 0.5 W / ±10%			
Angle of rotation / Working range	90° (93°mech.)			
Angle of rotation / Limitation	5°...85° in 5° < steps			
Auxiliary Switches	3(1.5) A, AC 230 V			
- S1 setting range *- S2 setting range*	5°...85° < adjustable			
Life time	60.000 rotations			
Noise level	45 dB (A)			
Protection Class	II			
Degree of Protection	IP 54			
Mode of Action	Type 1			
Ambient conditions				
- Operating temperature	–20...+50 °C / IEC 721-3-3			
- Storage temperature	–30...+60 °C / IEC 721-3-2			
- Humidity	5...95% r.F. no condensed			
Weight	1.1 Kg			
Service	Maintenance-free			
CE Compliance	Johnson Controls, Inc., declares that these products are in compliance with the essential requirements and other relevant provisions of the EMC Directive 2004/108/EC and Low Voltage Directive 2006/95/EC.			

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DAS2.x / DA2.x / DAL2.x / DAG2.x

Actuator	DAS2.x	DA2.x	DAL2.x	DAG2.x
Torque	8 Nm	16 Nm	24 Nm	32 Nm
Running Time	30 s	80 s	125 s	140 s
	Independent of load, at nominal conditions and room temperature			
Supply Voltage	100 ... 230 V AC ± 15%			
Frequency	50-60 Hz			
Power Consumption				
- Running	3.2 W	2.6 W	3 W	3 W
- At end position	0.3 W	0.3 W	0.3 W	0.3 W
Dimensioning				
110 V	5 VA	5 VA	5.5 VA	5.5 VA
230 V	7.5 VA	6.8 VA	8 VA	8 VA
Control Signal	ON/OFF or Floating			
Position Signal	Potentiometer 0.5 W / ±10%			
Angle of rotation / Working range	90° (93°mech.)			
Angle of rotation / Limitation	5°...85° in 5° < steps			
Auxiliary Switches	3(1.5) A, AC 230 V			
- S1 setting range	5°...85° < adjustable			
- S2 setting range	5°...85° < adjustable			
Life time	60.000 rotations			
Noise level	45 dB (A)			
Protection Class	II			
Degree of Protection	IP 54			
Mode of Action	Type 1			
Ambient conditions				
- Operating temperature	–20...+50 °C / IEC 721-3-3			
- Storage temperature	–30...+60 °C / IEC 721-3-2			
- Humidity	5...95% r.F. no condensed			
Weight	1.1 Kg			
Service	Maintenance-free			
C€ Compliance	Johnson Controls, Inc., declares that these products are in compliance with the essential requirements and other relevant provisions of the EMC Directive 2004/108/EC and Low Voltage Directive 2006/95/EC.			

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Dimensions in mm

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