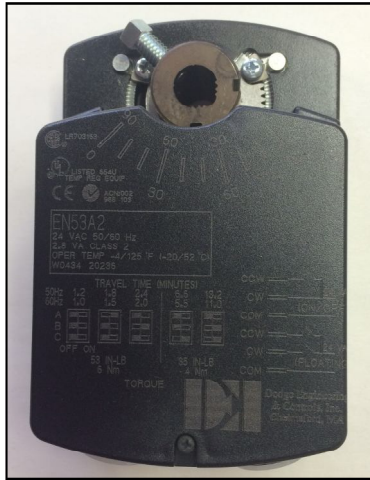




Non-Spring Return, 24 VAC Electronic Actuators, Tri-State (Floating)/Two-Position EN53A2(-S), EN53C2(-S); EN70C2, EN140C2, EN210C2 & EN280C2(-S), (-P), (-P2)



EN53 Series Actuator

The EN "A" or "C" Series is a direct-mount line of actuators that operates on 24 VAC (or 24 VDC power for the EN70, 140, 210, and 280) and is available for use with floating controllers. The EN53 actuators are easily installed on a Variable Air Volume (VAV) box, a round damper shaft up to 1/2 inch (13 mm) diameter, and a 3/8 inch (10 mm) square shaft. The EN70, 140, 210 and 280 bidirectional actuators do not require a damper linkage and are easily installed on a round shaft up to a 3/4 inch (20 mm) diameter or a square shaft up to 5/8 inch (16 mm).

All actuators can also be mounted to valves (ball, globe, and butterfly) using one of the many valve linkage kits available through Dodge Engineering & Controls.

The EN models deliver up to 280 in-lb (32 N-m) of torque in a single mount configuration, and up to 560 in-lb (64 N-m) of torque in a tandem mount configuration. The angle of rotation is mechanically adjustable from 0° to 90° in 5° increments. Integral auxiliary switches are available to indicate end-stop position or to perform switching functions at any angle within the selected rotation range. Position feedback is available through switches or a potentiometer signal.



EN70, 140, 210, 280 Series Actuator

Torque Minimum: EN53A2 or EN53C2: 53 in-lb; EN70C2: 70 in-lb; EN140C2: 140 in-lb; EN210C2: 210 in-lb; EN280C2: 280 in-lb

Application: EN Series actuators are designed to position air dampers and valves in HVAC systems. Applications include: positioning return air or exhaust dampers; controlling face and bypass dampers; positioning blades for variable volume fans; positioning ball, butterfly or globe valves. Refer to the manufacturer's information to size properly the damper, valve and/or actuator. Spring return actuators, such as Dodge Engineering's ES Series, are recommended for use with outdoor air dampers in cold climates.

Operation (EN53): The EN53 Series provides a 53 in-lb (6 N-m) running torque for floating control of dampers, VAV box dampers or control valves. The EN53 Series mounts directly on the duct surface, round damper or small rectangular damper with an anti-rotation bracket and two sheet metal screws (included). Additional linkages or couplers are not required. A controller provides a control signal to the actuator depending upon the desired movement of the damper blade. This signal causes the motor to rotate in the proper direction and moves the damper blade open or closed.

Note: To avoid excessive wear or drive time on the motor, use a controller and/or software that provides a time-out function to remove the signal at the end of rotation (stall).

The EN53C2(-S) actuator rotates at a nominal rate of 1.5° per second (90° in 60 seconds) at 60 Hz input (72 seconds @ 50 Hz) with a load independent rotation time. The actuator rotation is field adjustable from 30° to 90°. Actual rotation time for actuators using less than 90° rotation should be determined and that value used with the controller software. For example, 40 seconds would be used for 60° rotation. The EN53A2(-S) models offer adjustable rotation times of 1, 1.5, 2, 5.5 and 11 minutes. The 1, 1.5 and 2 minute settings provide 53 in-lb of torque and are ideal for two-position and floating applications. The 5.5 and 11 minute settings provide 35 in-lb of torque.

Operation (EN70, 140, 210 and 280): EN Series actuators operate on 24 VAC at 50/60 Hz or 24 VDC. These compact actuators use a DC motor with stall detection circuitry that operates throughout the entire stroke. The proportional actuators employ noise filtering techniques on the control signal to eliminate response to spurious noise. Rotation is mechanically limited to 93° by integral end-stops. The position of the actuator is visually indicated from 0° to 90° on the cover. An anti-rotation bracket prevents lateral movement of the actuator. For hand positioning the coupler, pressing the spring-loaded gear release on the actuator cover can manually disengage the gear train.



**Non-Spring Return, 24 VAC Electronic Actuators, Tri-State (Floating)/Two-Position
EN53C2(-S); EN70C2, EN140C2, EN210C2 & EN280C2(-S), (-P), (-P2)**

Technical Data	EN53C2(-S), EN53A2(-S)	EN70C2 (-S)(-P)(-P2)	EN140C2 (-S)(-P)(-P2)	EN210C2 (-S)(-P)(-P2)	EN280C2 (-S)(-P)(-P2)
Power supply	20 to 30 VAC @ 50/60 Hz	20 to 30 VAC, 24 VDC +/- 10%, 50/60 Hz			
Transformer sizing	C2(-S) ¹ : 2.5 VA A2(-S) ² : 2.8 VA (class 2 power source req. for UL)	6.5 VA (class 2 power source req. for UL)		7.5 VA (class 2 power source req. for UL)	
Electrical connection	1/4" spade terminals**	screw terminals for 22 to 14 AWG(max. of two 18-22 AWG/terminals)			
Control signal	C2(-S): floating A2(-S): two-position or floating 20-30 VAC @ 50/60 Hz	floating (20 to 30 VAC at 50/60 Hz)			24 VAC @ 50/60 Hz or 24 VDC
Factory setting	Direct (CW) or reverse (CCW) with signal increase (jumper selectable)				
Feedback signal (-P) or (-P2) option	—	1000 Ω (-P) or 135 Ω (-P2)			
Input impedance	C2(-S) ¹ : 200 Ω A2(-S) ² : 160 Ω	400 Ω			
Switch contact rating (-S) option	Two SPDT rated @ 24 VAC, 1.5 A inductive, 3 A resistive, 35 VA max per switch, class 2				
Mechanical connection (shaft size)	3/8" to 1/2" (10-12.7 mm) diameter round shaft 3/8" (10 mm) square shaft	3/8" to 3/4" (10-20 mm) diameter round shaft 3/8" to 5/8" (10-16 mm) square shaft			
Angle of rotation	Adjustable from 30-90°	0-90° in 5° increments, mechanical limitation 93°			
Torque	1, 1.5, and 2 minute settings: 53 in-lb (6 N-m) 5.5 and 11 minute settings: 35 in-lb (4 N-m)	70 in-lb (8 N-m)	140 in-lb (16 N-m)	210 in-lb (24 N-m)	280 in-lb (32 N-m)
Direction of rotation	CW or CCW	CW or CCW with proper wiring			
Position indication	bolt indicator	clip-on indicator			
Running time	C2(-S) ¹ : 60 secs @ 60 Hz, 72 secs @ 50 Hz A2(-S) ² : 60 secs factory set, adjustable with switch: 60, 90, 120, 330, or 660 secs @ 60 Hz; 72, 108, 144, 396, or 792 secs @ 50 Hz	25-50 secs for 0-70 in-lb (0-8 N-m)	70-115 secs for 0-140 in-lb (0-16 N-m)	115-175 secs for 0-210 in-lb (0-24 N-m)	115-185 secs for 0-280 (0-32 N-m)
Humidity	0 to 90% RH non-condensing	0 to 95% RH non-condensing			
Operating temperature	-4°F to 125°F (-20°C to 52°C)	-4°F to 122°F (-20°C to 50°C)			
Storage temperature	C2(-S) ¹ : -40°F to 176°F (-40°C to 80°C) A2(-S) ² : -40°F to 186°F (-40°C to 86°C)	-40°F to 186°F (-40°C to 86°C)			
Housing type*	NEMA 2, IP32	NEMA 2, IP42			
Agency listings	UL 873 listed; CSA C22.2, CE 89/336/EEC				
Noise level	<35 dBA @ 1 m	<45 dBA @ 1 m			
Servicing	maintenance free				
Quality standard	ISO 9002				
Weight	2.4 lbs (1.08 kg)	2.9 lbs (1.3 kg)			

Notes:

* Most commercial assemblies are available with an optional NEMA 4/4X type housing. See applicable data sheet for details.

** Optional pluggable terminal blocks.

1 Tri-State only

2 Two-Position or Tri-State



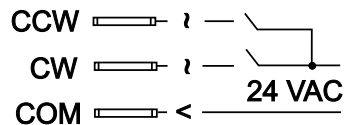
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EN53A2(-S), EN53C2(-S); EN70C2, EN140C2, EN210C2 & EN280C2(-S), (-P), (-P2)**

Wiring Diagrams

EN53C2(-S) & EN53A2(-S)

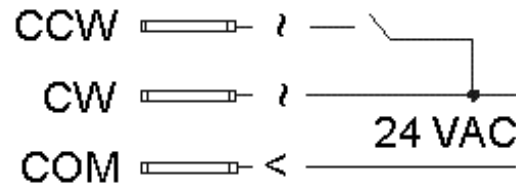
Floating Control

Models: EN53C2 and EN53C2-S
EN53A2 and EN53A2-S



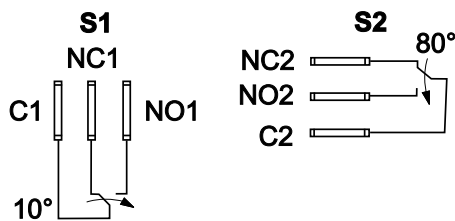
Two-Position Control

Models: A2 and A2-S



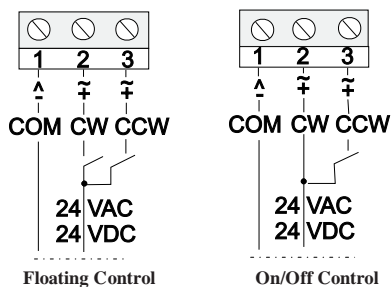
Auxiliary Switches

Models: EN53C2-S and EN53A2-S



EN70C2, EN140C2, EN210C2 & EN280C2(-S),(-P),(-P2)

Terminal Block 1



Models: C2, C2-S, C2-P2 and C2-P

Terminal Block 2

