

EDA-2040/ATP-2040 Electric Motor Actuator

The EDA-2040 synchronous motor driven actuator provides incremental (3-wire) control of a Variable Air Volume (VAV) box damper or small and medium-sized dampers in Heating, Ventilating, and Air Conditioning (HVAC) applications. This compact, non-spring return actuator has a 35 lb-in (4 N-m) running torque and 40 lb-in (4.5 N-m) stall torque in a compact easy-to-install package. Available in 1, 2, 5-1/2, or 11-minute 90° travel time models.

The ATP-2040 Actuator/Transmitter combines an EDA-2040 with the DPT-2015 Differential Pressure Transmitter with a 0 to 1.5 in. W.C. (0 to 374 Pa) differential pressure range.

The optional EDA-2040-102 Switch Kit has two auxiliary contacts that can be adjusted for any make/break position between 0 and 90° and visual indication of the damper blade position.



Figure 1: EDA-2040 and ATP-2040 with EDA-2040-102 Switch Kit

Features and Benefits	
<input type="checkbox"/> Direct Shaft Mount	Simplifies installation
<input type="checkbox"/> Magnetic Clutch	Provides torque protection for the actuator gear train and the damper, eliminates the need for end of stroke switches
<input type="checkbox"/> Adjustable Rotation	Allows application versatility with 30 to 90° Clockwise (CW) or Counterclockwise (CCW) rotation
<input type="checkbox"/> Manual Override, Gear Release Lever	Enables quick release of gears for easy setup and air balancing
<input type="checkbox"/> Optional Plenum-rated Wiring Harness with Quick Connects	Meets stringent customer requirements and simplifies wiring
<input type="checkbox"/> Optional Switch Kit	Increases applications by allowing sequencing control of auxiliary devices

Application

The EDA-2040 is used to position dampers, such as RD-2000 Series Round Dampers and CD-1300 Control Dampers, in typical HVAC applications. It is also used to position the blades in a VAV box.

Refer to the damper or VAV box manufacturer's information to select the proper timing for the actuator.

Refer to the appropriate application note for specific wiring diagrams and information.

Operation

IMPORTANT: All EDA-2040/ATP-2040 motor actuators are designed for use only in conjunction with operating controls. Where an operating control failure would result in personal injury and/or loss of property, it is the responsibility of the installer to add safety devices or alarm systems that protect against, and/or warn of, control failure.

The EDA-2040 mounts directly to the surface of a VAV box, round damper, or small rectangular control damper with a single No. 10 self-drilling sheet metal screw (included). There are no additional linkages or couplers required. Installation is simplified with clearly labeled electrical terminals and a CBL-2000-x Wiring Harness with 1/4 in. quick connects.

When combined with a VAV controller, the EDA-2040 or ATP-2040 provides reliable, integrated damper control. No programming of the actuator is required. Figure 2 shows the relationship of the actuator and transmitter to the VAV box and controller.

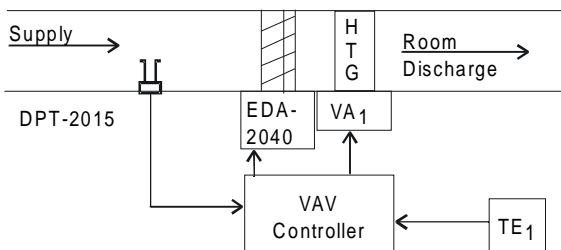


Figure 2: Pressure-Independent Application

A 24 VAC signal from the controller to the CW or CCW terminal of the actuator causes the motor to rotate in the proper direction, and moves the damper blade open or closed. When the controller stops sending the signal, the actuator remains in place.

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).

Depending on the model, the actuator rotates 90° in 1, 2, 5-1/2, or 11 minutes at 60 Hz (20% slower at 50 Hz). The actuator rotation is field adjustable from 30 to 90°. Determine the actual rotation time for actuators using less than 90° rotation, and use that value with the controller software.

The DPT-2015 is connected to the airflow pickup of the VAV box. It measures differential pressure and generates a proportional voltage signal. The voltage signal from the DPT-2015 is read by the VAV controller and converted to airflow in cubic feet per minute (cfm). Calibration is not required, except for zero calibration performed within the controller. The VAV controller must be provided with the correct "K" factor and box size to perform the calculations. Refer to the *OEM Reference Manual (FAN 638)* for this information.

Use the EDA-2040-102 Switch Kit to end-stop limit an EDA-2040 or ATP-2040 actuator, when the actuator is controlled by a device other than a Johnson Controls VAV controller. Total switching load may not exceed 2000 VA by both switches.

Dimensions

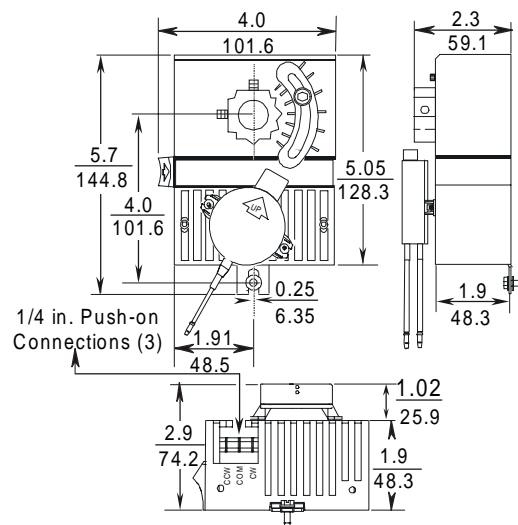


Figure 3: ATP-2040 Actuator/Transmitter Dimensions, in. (mm)

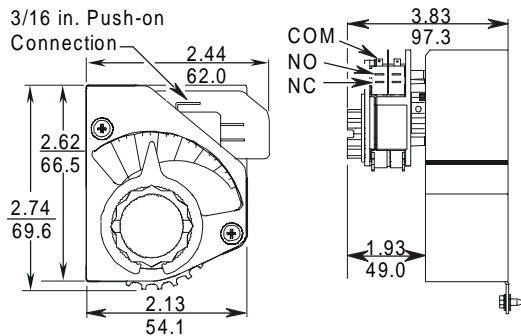


Figure 4: EDA-2040-102 Switch Kit Dimensions, in. (mm)

Ordering

The EDA-2040 Electric Motor Actuator, EDA-2040-102 Switch Kit, and DPT-2015 Differential Pressure Transmitter can be ordered and installed separately. However, they are usually used together for incremental damper control and transmission of differential pressure within VAV systems.

When ordered as a package, the ATP-2040 Actuator/Transmitter includes the DPT-2015-0 Differential Pressure Transmitter and the 20 in. (0.5 m) CBL-2000-1 Wiring Harness. (See Figure 5.)

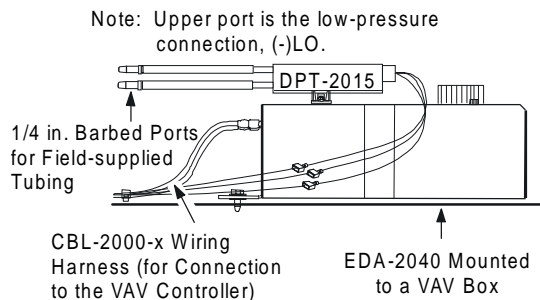


Figure 5: ATP-2040 with the Wiring Harness

Note: The CBL-2000-1 is accepted by Underwriters Laboratories (UL) for plenum use.

The color-coded wiring harness is used to connect the transmitter and actuator to the VAV Series controller. The CBL-2000-1, CBL-2000-2, and CBL-2000-3 Wiring Harnesses have 1/4 in. quick connects for easy installation, and can be ordered separately. (See Table 2.)

The standard shaft coupler is used for installation on shafts longer than 2.1 in. (53.3 mm). The short shaft coupler can be mounted from the bottom of the actuator to capture shafts as short as 1/2 in. (12.7 mm) above the mounting surface.

The couplers are available to fit 3/8 in. (9.5 mm) square or round, or 1/2 in. (12.7 mm) round damper shafts to reduce actuator eccentric motion.

The shaft coupler has a rubber O-ring on one end for retention in the actuator body during installation and prior to tightening the set screws.

Repair and Replacement

None of the components can be repaired in the field. Refer to Table 1 or 2, and contact your nearest Johnson Controls representative for a replacement.

Table 1: Actuators Available

Code Number	Coupler Size (Inches)	Rotation Time (Minutes)*	Switch Kit	Code Number	Coupler Size (Inches)	Rotation Time (Minutes)*	0-1.5 W.C. (0-374 Pa)	Switch Kit
EDA-2040-11	1/2	1.0		EDA-2040-112	3/8	11.0		
EDA-2040-12	3/8	1.0		ATP-2040-112	1/2	1.0	■	
EDA-2040-21	1/2	2.0		ATP-2040-122	3/8	1.0	■	
EDA-2040-22	3/8	2.0		ATP-2040-212	1/2	2.0	■	
EDA-2040-23	1/2	2.0	■	ATP-2040-222	3/8	2.0	■	
EDA-2040-24	3/8	2.0	■	ATP-2040-232	1/2	2.0	■	■
EDA-2040-61	1/2	5.5		ATP-2040-242	3/8	2.0	■	■
EDA-2040-62	3/8	5.5		ATP-2040-612	1/2	5.5	■	
EDA-2040-63	1/2	5.5	■	ATP-2040-622	3/8	5.5	■	
EDA-2040-64	3/8	5.5	■	ATP-2040-632	1/2	5.5	■	■
EDA-2040-111	1/2	11.0		ATP-2040-642	3/8	5.5	■	■

* Rotation time at 50 Hz is nominally 20% slower.

Table 2: Accessories Available

Code Number	Description
EDA-2040-1000	1/2 in. (12.7 mm) round, standard shaft coupler
EDA-2040-1001	3/8 in. (9.5 mm) square or round, standard shaft coupler
EDA-2040-1002	1/2 in. (12.7 mm) round, short shaft coupler
EDA-2040-1003	3/8 in. (9.5 mm) square or round, short shaft coupler
EDA-2040-102	Auxiliary switch kit
CBL-2000-1	20 in. (0.5 m) wiring harness (UL accepted for plenum use)
CBL-2000-2	20 in. (0.5 m) plenum-rated wiring harness
CBL-2000-3	72 in. (1.8 m) plenum-rated wiring harness
DPT-2015-0	0 to 1.5 in. W.C. (0 to 374 Pa) differential pressure transmitter
DPT-2015-1	0 to 1.5 in. W.C. (0 to 374 Pa) differential pressure transmitter with the DPT-2015-MNT
DPT-2015-MNT	Mounting kit for the DPT-2015-0 (to replace the DPT-2000)

Note: Use the short shaft coupler on all shafts less than 2.1 in. (53.3 mm) in length.

Specifications

Products	EDA-2040 Electric Damper Actuator ATP-2040 Electric Damper Actuator with Transmitter EDA-2040-102 Switch Kit
Power Requirements	EDA-2040: 24 VAC (20 to 30 VAC) at 50/60 Hz, 3.4 VA maximum at nominal voltage, Class 2 DPT-2015: 15 VDC (14.5 to 17 VDC, unregulated); 15 mA, maximum
Electrical Connections	EDA/ATP-2040: 1/4 in. spade terminals EDA-2040-102: 3/16 in. spade terminals
90° Rotation Time	1, 2, 5-1/2, or 11 minutes at 60 Hz, depending on the model 1.2, 2.4, 6.6, or 13.2 minutes at 50 Hz, depending on the model
DPT-2015	Pressure Range: 0 to 1.5 in. W.C. (0 to 374 Pa), maximum Over Pressure Limit: 15 in. W.C. (3.74 kPa)
Pressure Connections	6 in. (152 mm) length of silicone tubing with barbed fittings for 1/4 in. (6.35 mm) O.D. tubing
Switch Kit Contact Rating	Total switching load is limited to 2000 VA in any of the following combinations: Pilot Duty: 24 VAC, 50 VA; 125/250/277 VAC, 125 VA Direct Motor: 125/250/277 VAC, 1/3 hp Resistive Load: 125 VAC, 11A; 250 VAC, 8A; 277 VAC, 7A (all maximum values)
Ambient Operating Conditions	EDA-2040: 35 to 125°F (2 to 52°C); 90% RH maximum, non-condensing ATP-2040: 35 to 125°F (2 to 52°C); 90% RH maximum, non-condensing 60 to 100°F (16 to 38°C); 90% RH max., non-condensing for DPT rated accuracy EDA-2040-102: 35 to 125°F (2 to 52°C); 90% RH
Ambient Storage Conditions	All: -20 to 150°F (-29 to 66°C); 90% RH maximum, non-condensing
Dimensions (H x W x D)	Refer to Figures 3 and 4.
Shipping Weight	EDA-2040: 1.5 lb (0.68 kg) without switch kit ATP-2040: 1.7 lb (0.77 kg) without switch kit EDA-2040-102: 0.3 lb (0.15 kg)
Torque	Running: 35 lb-in (4 N·m) Breakaway: 35 lb-in (4 N·m) minimum Stall: 40 lb-in (4.5 N·m) minimum
Cycles	65,000 full stroke cycles; 2,000,000 repositions rated at 35 lb-in (4 N·m)
Rotation Range	Adjustable from 30 to 90°, clockwise or counterclockwise
Enclosure	NEMA 1, IP20
Agency Compliance	EDA-2040 Actuator and ATP-2040 Actuator/Transmitter: UL 916 Listed, File E107041, Guide PAZX CSA C22.2 No. 205 Certified, File LR68965, Class 4812 05 EDA-2040-102 Switch Kit: UL 916 Recognized, File E107041, Guide PAZX2 CSA C22.2 No. 205 Certified, File LR68965, Class 4812 05

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.



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