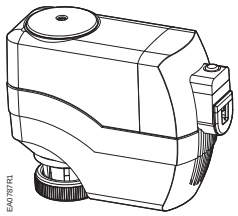
Dodge Engineering & Controls, Inc.

Technical Instructions

ENZ3B2, ESZ3B2, ENZ3C2 & ESZ3C2 Series Electronic Valve Actuator



Product Description

The ENZ3B2, ESZ3B2, ENZ3C2 & ESZ3C2 actuators require a 24 Vac, Class 2 supply and provide a 0 to 10 Vdc or 3-position (floating) control signal. The actuator controls a G Series valve with a 7/32-inch (5.5-mm) stroke.

Installation Conventions

Warning		Personal injury/loss of life may occur if a procedure is not performed as specified.
Caution		Equipment damage may occur if the user does not follow a procedure as specified.

Product Number

ENZ3B2	0 to 10 Vdc, proportional control, fail-in-place
ESZ3B2	0 to 10 Vdc, proportional control, fail-safe
ENZ3C2	3-position (floating) control, fail-in-place
ESZ3C2	3-position (floating) control, fail-safe

Estimated Installation Time

20 minutes

Required Tools

- Small Phillips head screwdriver
- Small flat-blade screwdriver
- Wire stripper
- 3 mm hex wrench

Prerequisites

WARNING:

1. If mounting the actuator to a valve already in line, either close the shut-off in the piping (upstream first, then downstream) or switch off the pump to allow the differential pressure in the valve to drop.
2. Disconnect the controller power before replacing the actuator.
3. If high voltage cable is co-located with the actuator, conduit or shielded wire may need to be used.

CAUTION:

Before applying power, make certain a valve is connected to the actuator.

If applying power to the actuator when a valve is not connected, the actuator will respond to a control signal and the shaft will extend until it reaches its maximum end stop. Thereafter, it will not respond to any signal.

If this occurs, turn the manual position indicator (Figures 5 and 10*)* on the top of the actuator to the 0 position and verify the actuator shaft retracts completely. Disconnect power. Connect a valve to the actuator, reapply power, and the actuator will return to normal operation.

Mounting

The vertical position is recommended for mounting the actuator (Figure 1).

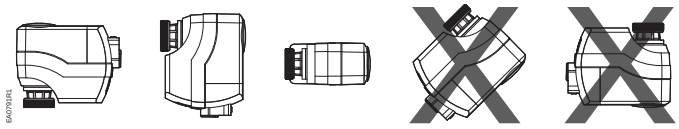


Figure 1.

Acceptable Actuator Mounting Positions.

Installation

If you are mounting an actuator on a new valve, begin with the instructions *Mounting an Actuator on a Valve.*

Removing the actuator from a valve

1. Using a Phillips head screwdriver, remove the terminal cover (Figure 2).
2. Identify and disconnect wiring from the terminals.
3. Remove wiring retention screw.
4. Do one of the following:
   - Remove flex conduit.
   - Remove plenum cable adapter and plenum cable.
5. Loosen the actuator coupling on the valve (Figure 3, reverse #2).
6. Remove the actuator from the valve.

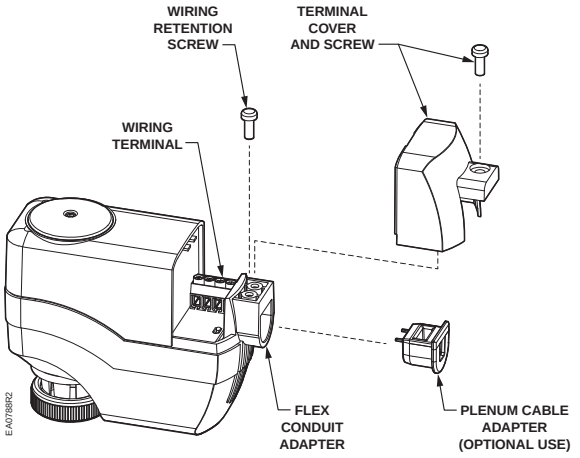


Figure 2. EN/ESZ3B2, EN/ESZ3C2 Actuator Components.

Mounting an Actuator on a Valve

1. If you are attaching the actuator to a new valve, remove the protective device from the valve stem.
2. Turn the manual position indicator on the top of the actuator to the 0 position (Figure 10).
3. Using a Phillips head screwdriver, remove the terminal cover (Figure 2).
4. Remove wiring retention screw.
5. Remove plenum cable adapter.
6. For plenum applications, complete wiring as follows:
   a. Route cable through plenum cable adapter so there is sufficient cable to complete wiring terminations.
   b. Insert plenum cable adapter into flex conduit adapter and secure in place with wiring retention screw.

      NOTE: Insert wiring retention screw in hole farthest from wiring terminals. (The hole nearest the wiring terminals is to secure the terminal cover in place.)

   c. Continue with Step 8.
7. For 3/8-inch flex conduit applications, complete wiring as follows:
   a. Discard plenum cable adapter.
   b. Insert flex conduit into flex conduit adapter and secure in place with wiring retention screw.

      NOTE: Insert wiring retention screw in hole farthest from wiring terminals. (The hole nearest the wiring terminals is to secure the terminal cover in place.)

   c. Route wiring through flex conduit for wiring terminations.
8. Connect wires to wiring terminals per the *Wiring* section of this document.
9. Using a Phillips head screwdriver, secure the terminal cover in place over the wiring terminals (Figure 3).
10. Place the actuator on the valve and firmly hand-tighten (Figure 3).

The installation is complete.

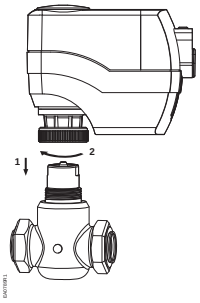


Figure 3. Coupling Actuator to Valve.

Manual Override

To position the actuator manually, use a 3 mm hex wrench in the center of the position indicator (Figure 4).

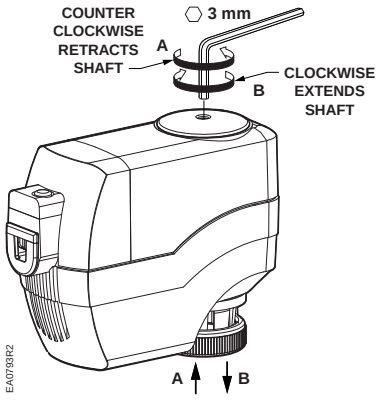


Figure 4. Manual Override.

Calibration Stroke

The EN/ESZ3B2 & EN/ESZ3C2 Series writes its calibration stroke parameters to nonvolatile memory on the first startup of the actuator. Successive startups bypass the calibration stroke unless the memory is manually cleared. If installing the actuator on a different valve (such as on a replacement valve), manually clear the calibration stroke from memory as follows:

1. Remove the terminal cover using a Phillips head screwdriver.
2. Locate hole on the circuit board with the shorting bars (Figure 5).
3. With power applied to the unit, insert and gently twist a flat-blade screwdriver to electrically connect the shorting bars. The actuator then performs a new calibration stroke.
4. Secure the terminal cover back in place.

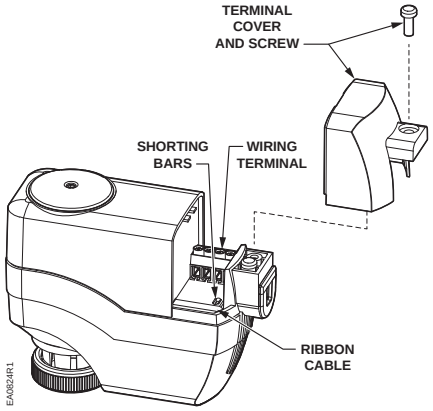
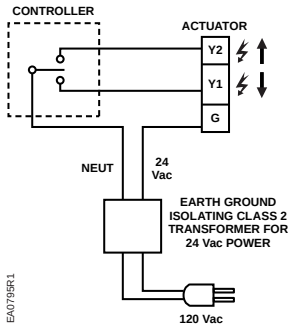


Figure 5. Manually Clearing Calibration Stroke from ENZ3B2 and ESZ3B2 Nonvolatile Memory.

Wiring

- All wiring must conform to NEC and local codes and regulations.
- Use earth ground isolating step-down Class 2 transformers. Do *not* use autotransformers.
- Determine the supply transformer rating by summing the total VA of all actuators used. The maximum rating for a Class 2 step-down transformer is 100 VA.
- Do not power more than 10 actuators with one transformer.

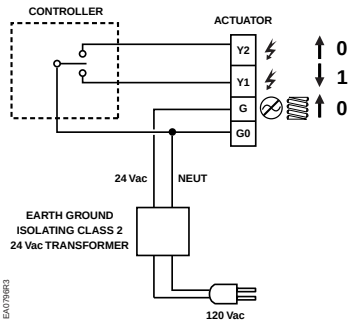
ENZ3C2



Y2…Retracts actuator shaft
Y1…Extends actuator shaft
G…System potential

Figure 6. ENZ3C2 (Fail-in-Place) 3-Position Control Wiring Diagram.

ESZ3C2

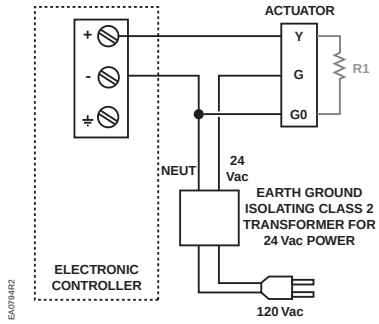


G, G0…24 Vac operating voltage
Y2…Retracts actuator shaft
Y1…Extends actuator shaft
G…System potential
G0…System neutral

Figure 7. ESZ3C2 (Fail-Safe) 3-Position Control Wiring Diagram.

CAUTION:
Terminals must be properly wired for correct function and full life of the actuator.

ENZ3B2 and ESZ3B2



G, G0…24 Vac operating voltage
Y…0 to 10 Vdc control signal
G…System potential
G0…System neutral
R1…500 ohm resistor (optional for 0-20mA operation)

Figure 8. ENZ3B2 (Fail-in-Place) and ESZ3B2 (Fail Safe) 0-10 Vdc Proportional Control Wiring Diagram.

Start-up

Check the wiring and the position indicator (Figure 10).

Position Indicator	Output Shaft
0	Retracted
1	Extended

NOTE: "0" and "1" markings are intended for reference only, and not stroke measurement.

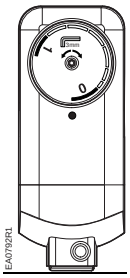


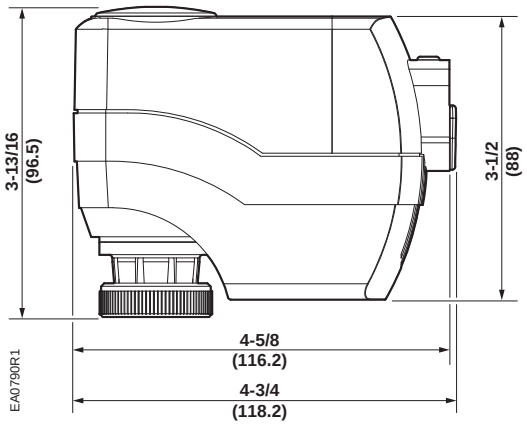
Figure 9. Position Indicator (Shown in 0 Position).

Troubleshooting

Check the wiring for the proper connections.

Technical Instructions
Electronic Valve Actuator 24 Vac Proportional Control
Electronic Valve Actuator 24 Vac 3-position (Floating) Control
GT2 Series Terminal Unit Two-Way Valves
GT3 Series Terminal Unit Three-Way Valves

Dimensions



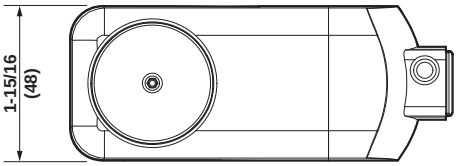


Figure 10. EN/ESZ3B2 and EN/ESZ3C2 Actuator Dimensions in Inches (Millimeters).

Service Envelope

Minimum access space recommended:

1. 8 inches (200 mm) above the actuator.
2. 8 inches (200 mm) beside the terminal cover.