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Approvals

-  CSA Certified: CSA C22.2 No. 24
-  UL Listed: UL 873

Attention



The installation and maintenance of this product must be done under the supervision of an experienced and trained specialist. Never perform work if gas pressure or power is applied, or in the presence of an open flame.

**Safety first
O.K.**

On completion of installation on the EMP, perform a function test.



Please read the instruction before installing or operating. Keep the instruction in a safe place. You find the instruction also at www.dungs.com. If these instructions are not heeded, the result may be personal injury or damage to property.

**IFGC
UL CSA
ANSI
NFPA**

This product is intended to be used in combination with a control valve to modulate the flow of gas or air.



Any adjustment and application-specific adjustment values must be made in accordance with the equipment manufacturers instructions.

Explanation of symbols

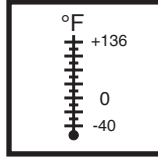
- 1, 2, 3 ... = Action
- = Instruction

Specification

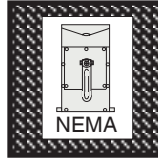
EMP-2 These actuators integrate an AE 504 paralleling relay, which allows an input resistance signal to drive the motor or slave actuating for damper control or valve control applications where it is desirable to move the crank arm in either direction, or to stop it at any point.



Ratings for Actuator
Electrical Ratings
 120 VAC (+10 % / -15 %); 60 Hz
Electrical Connection
 1/2" NPT conduit knockout
Power Consumption
 78 VA
Auxiliary Switch Ratings
 5.8 A Running; 34.8 A locked rotor



Ambient Temperature
 -40 °F to +136 °F (-40 °C to + 58 °C)



Environment
 NEMA Type 1

Mounting Position
 multipoised (best not to have shaft pointing downwards)

Ratings for AE-504
Power
 24 VAC, 50/60 Hz, 5 VA, normally supplied from an actuator. Line voltage actuator must have built in transformer

Input Signal
 100 to 135 ohm or 136-1000 ohm potentiometer. For use with 100 ohm internal feedback resistor.

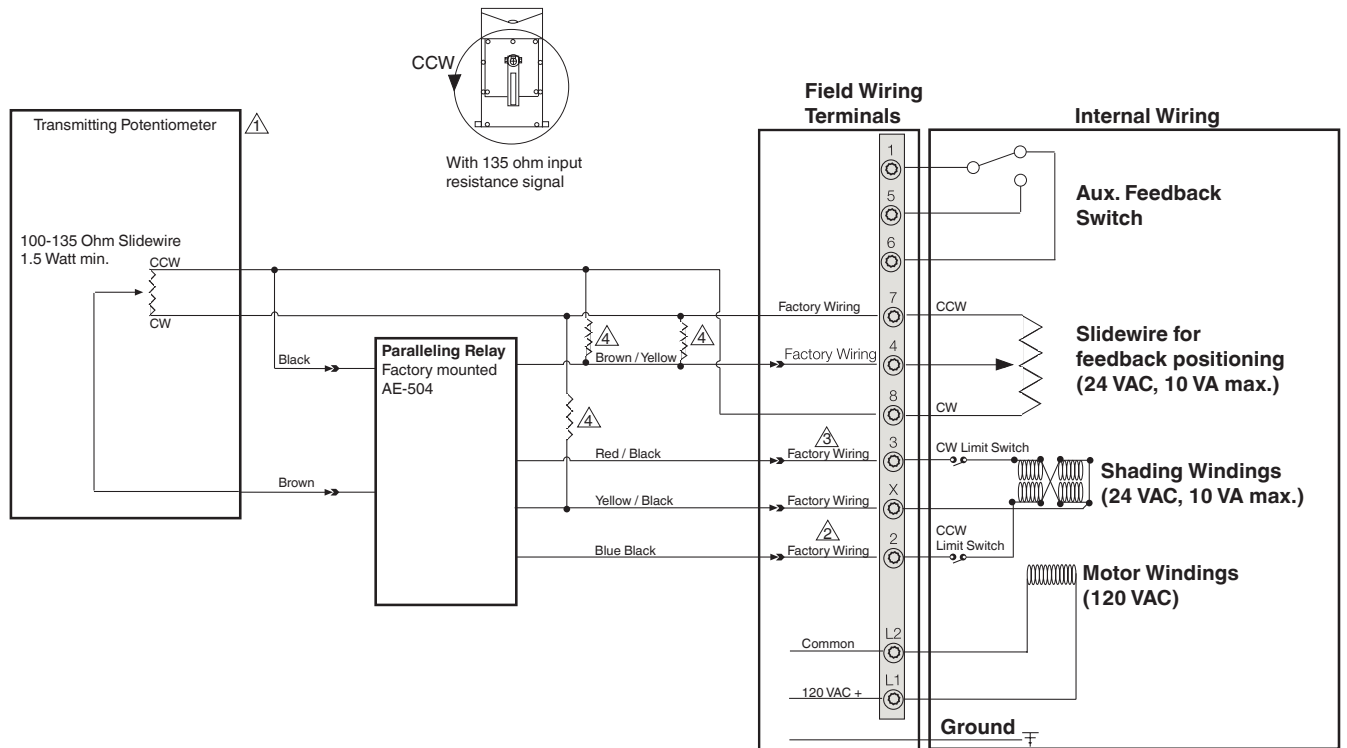
Slave Actuating
 Up to 3 actuators, each with AE-504. NOTE: For 1000 ohm input applications, the AE 504 still needs AM 332 (100 ohm external slidewire) for 100 ohm feedback.

Impedance
 50 ohms @ 0 VAC,
 350 ohms @ 12 VAC

Model No.	Order No.	Travel	Description	Timing (s)	Torque (in.- lbs.)	Weight Lbs. (actual/shipping)
EMP-423-2	43158-2	90°	Fixed timing	12 s	60	9/10
EMP-424-2	43032-2	90°	Adjustable timing	12 s*	60	9/10
EMP-453-2	43033-2	90°	Fixed timing	40 s	220	9/10
EMP 454-2	43087-2	90°	Adjustable timing	40 s*	220	9/10

* up to ten times the set timing

Wiring Schematic when Driving one Actuator



- ⚠ Transmitting potentiometer typically AM-332 on actuator, manual potentiometer, or 135 ohm slidewire controller.
- ⚠ Shaft rotates CW
- ⚠ Shaft rotates CCW
- ⚠ Two 680 ohm 0.5 W resistors and a 50 ohm resistor for 24 VAC actuators. Use resistors only when wiring actuators in parallel.

- This wiring diagram shows clockwise rotation to LOW fire, counterclockwise rotation to HIGH fire. As viewed from the front.
- Terminal # 1 is COMMON of the SPDT auxiliary switch
- Terminal # 5 is HIGH FIRE contact
- Terminal # 6 is LOW FIRE contact.
- Do NOT apply voltage across the slidewire.

Adjustment

Limit Switch

The counterclockwise limit switch is factory set to stop the actuator after 90° of travel. This setting can be changed in the field. To adjust the limit switch, removing the top metal cover, and locate the small opening next to the terminal block and positioned **between terminals 3 and 4**. Insert a flathead screwdriver through this opening and turn the cam clockwise as seen from the shaft end of the actuator to increase the degree of actuator rotation up to a maximum of 320°. Each click of the cam represents about 3° change in actuator rotation. Attempting to adjust for more than 320° rotation will result in both limit switches opening in the clockwise end of the actuator rotation, and the unit will no longer operate. The clockwise limit switch is fixed and cannot be field adjusted.

Do not adjust the limit switch beyond 90° unless the standard slidewire has been replaced with a 180° slidewire.

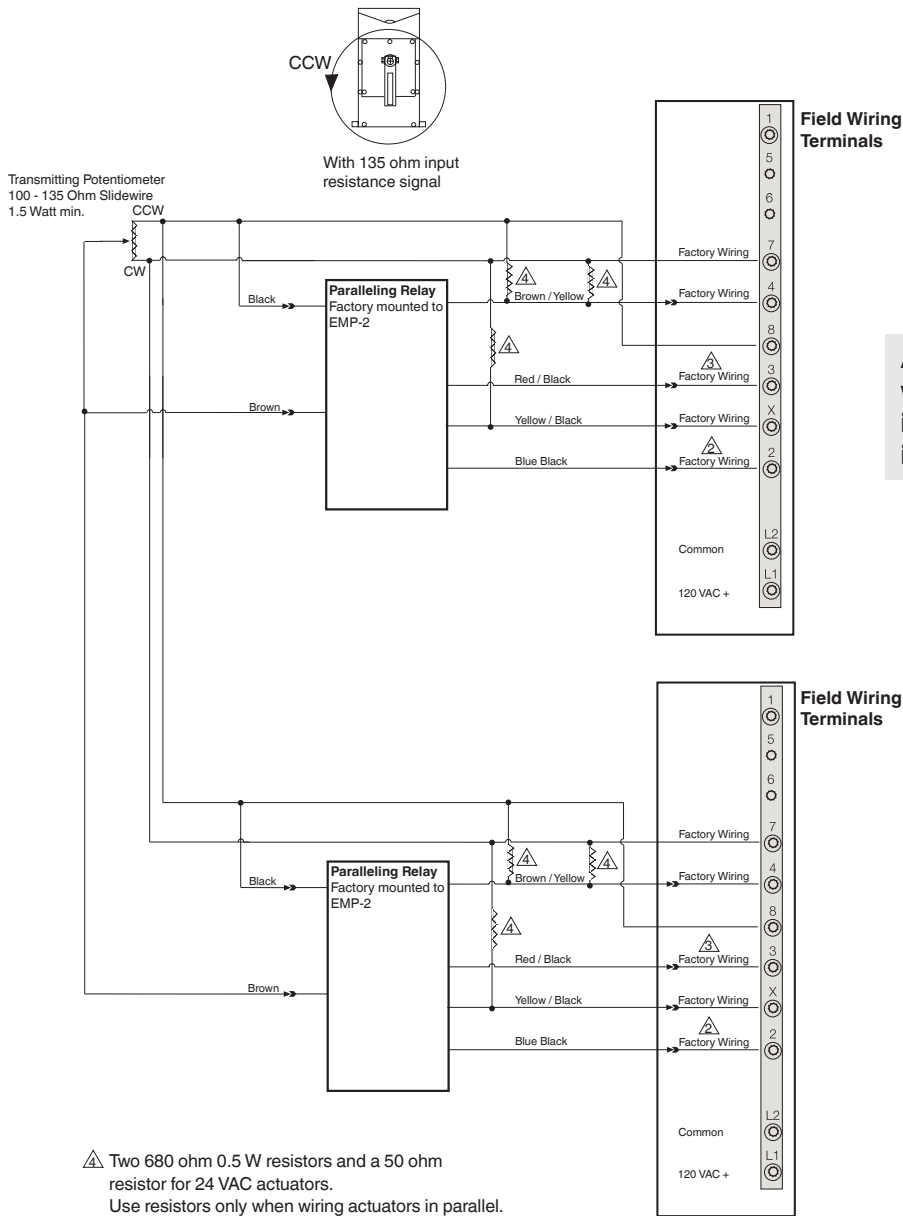
Auxiliary Switch

An adjustable cam operated SPDT switch is built into each actuator. The switch is factory set to operate at the clockwise end of the actuator rotation, making terminal 1 to terminal 6. As the cam turns counterclockwise from this point, the cam follower drops, breaking 1 to 6 and making 1 to 5. To adjust

the auxiliary switch, removing the top metal cover, and locate the small opening next to the terminal block and positioned **next to terminal 1**. Insert a flathead screwdriver through this opening and turning the disc clockwise as seen from shaft end of the actuator causes the switch to operate nearer the counterclockwise end of actuator rotation. Each click of the cam represents about 3° change in operating point. NOTE: After turning the disc, remove back plate and reposition the wiper; it will need to be repositioned back to zero.

Speed Adjustment (EMP-424-1 & EMP-454-1 only) Actuator timing is varied by a slotted adjustment screw on the lower left side of the shaft (Models 424 & 454 only) housing. Turning the screw clockwise decreases the speed. If the adjustment screw is turned too far clockwise, the motor will stall but will not be damaged. If stalling occurs, turn the screw counterclockwise until the motor resumes operation. Total adjustment is normally 3-1/2 turns.

Wiring Schematic for Parallel Operation



As shown, two actuators are wired for parallel operation. Wiring to three for parallel operation is possible.

Testing

Power the actuator with 120 VAC. Disconnect the field lead from terminal "X". Jumper actuator terminal "X" to terminal 2; the actuator shaft should turn clockwise. When the connection between terminals "X" and 2 is broken, the shaft should remain stationary.

Using a volt-ohm-meter, measure the voltage from terminal 4 to X as the actuator drives from 0 to 90 deg, the voltage should smoothly change from 24 VAC to 12 VAC.

We reserve the right to make modifications in the course of technical development.



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