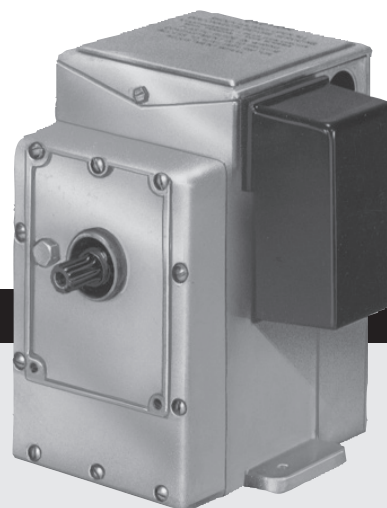


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Approvals



UL Listed: UL 873 and CSA C22.2 No. 24-93

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

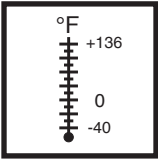
- 1, 2, 3 ... = Action
- = Instruction

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 running; 0.65 A
5 VA holding
Auxiliary Switch Ratings
5.8 A Running; 34.8 A locked rotor



Ambient Temperature
-40 °F to +136 °F (-40 °C to + 58 °C)
Note: Surface temperature during normal operation can reach 40 °F above ambient.



Environment
NEMA Type 1

Cycling Rate:
EMP is rated for 100 % duty cycling & continuous cycle. Cycle life rating is 100,000 cycles (0-90°/cycle).

Mounting Position
multipositioned (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. Not suitable for high torque motors.

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

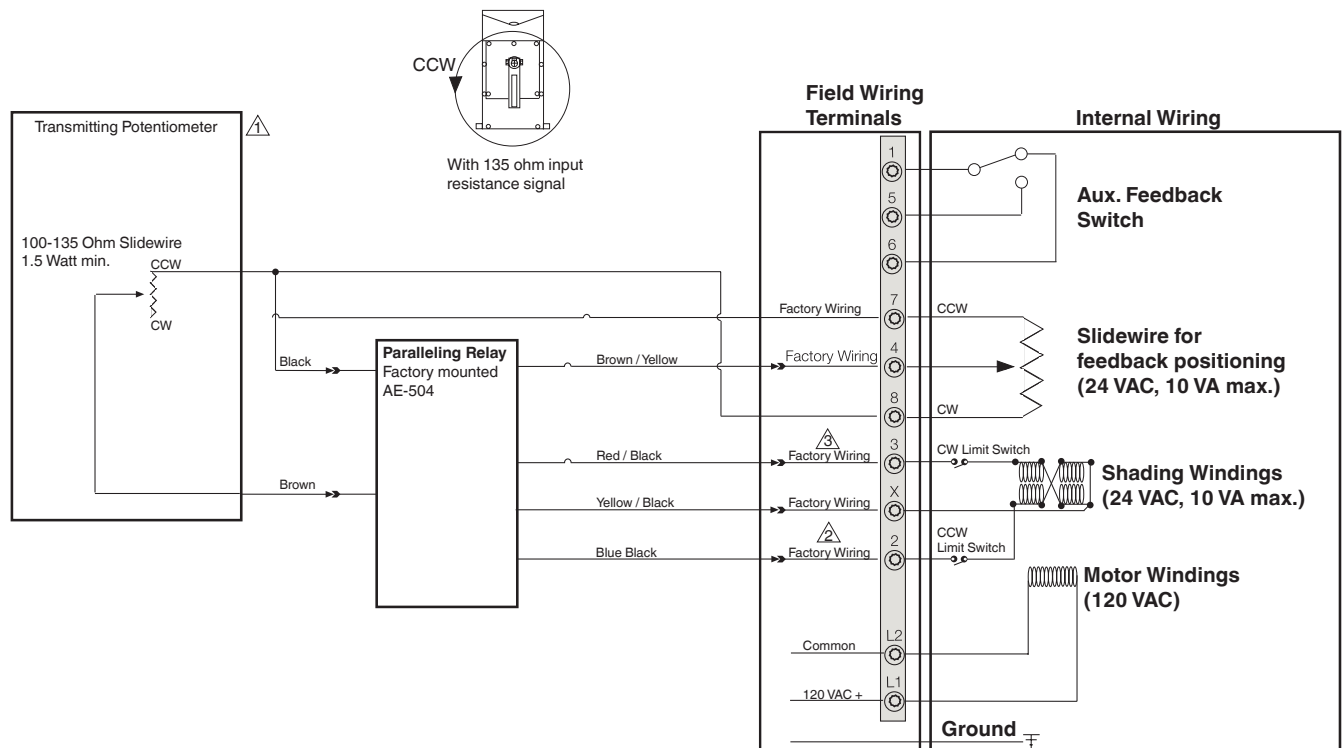
Slave Actuating
Up to 3 actuators, each with AE-504. NOTE: For 1000 ohm input applications, the AE 504 still needs AM 332 (100 ohm external slidewire) for 100 ohm feedback.

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	267228	90°	Fixed timing	12 s	60	9/10
EMP-424-2	267204	90°	Adjustable timing	12 s*	60	9/10
EMP 454-2	267212	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
- Remove the two 680 ohm 0.5 W resistors and a 50 ohm resistor from the terminals

- 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.

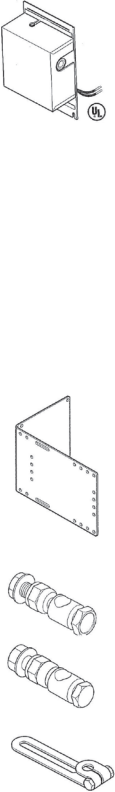
Auxiliary Switch

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

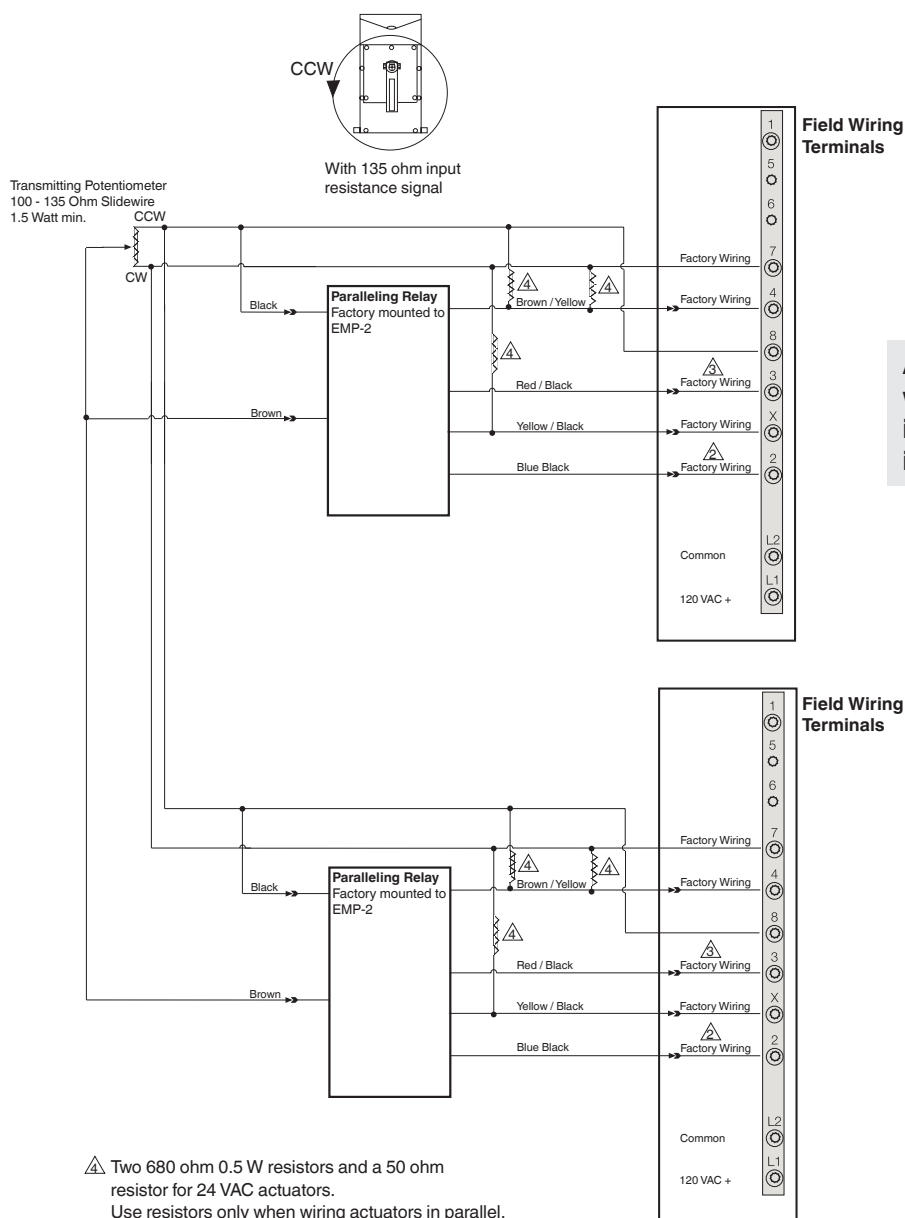
the auxiliary switch, removing the top metal cover, and locate the small opening next to the terminal block and positioned **next to terminal 1**. Insert a flathead screwdriver through this opening and turning the disc clockwise as seen from shaft end of the actuator causes the switch to operate nearer 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.

Accessories & Replacement

Model #	Description	Order No.	
AM-321-0-2	Auxiliary feedback switch. Two independent SPDT snap switches for position feedback	269234	
ADDA-274-010	1000 ohm slidewire; 90 deg	269221	
ADDA-38-010	100 ohm slidewire; 180 deg	269241	
ADDA-902-5	100 ohm 90 deg slidewire and wiper arm kit	269220	
AM 332-102-1	100 Slidewire potentiometer for position indicating or paralleling (same housing as AM 321-0-2)	269236	
AM 301	90 deg mounting bracket	267191	
AE 504	Paralleling Relay for driving up to 3 actuators with one input signal (comes standard)	269237	
AM 132	5/16" hole; ball joint linkage-swivel connector for non-parallel linking	269232	
AM 122	5/16" hole; straight linkage connector for parallel linking	269233	
AM 113	1/2" crank arm	267224	
AM 116	1/2" splined crank arm (not shown)	267242	
AM 125	5/16" diameter rod (20"long)	267223	
AM 363	NEMA 4 Cover	269239	

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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