

## APPLICATION

Electronic actuator drive is used to provide proportional control of an electric gear train actuator from a variable milliamp DC signal from a controller.

## SPECIFICATIONS

### **Input Signal:**

**Range**, Factory set at 4 to 20 mA DC. Field adjustable to accept ranges such as 2 thru 7, 2 thru 12, 7 thru 12, 4 thru 12, 12 thru 20 mA DC.

**Span**, Factory set at 16 mA DC. Field adjustable 4 to 16 mA DC.

**Start Point**, Factory set at 4 mA DC. Field adjustable from 2 to 16 mA DC.

**Impedance**, 250 ohms for constant current output controllers. Other impedances can be obtained by adding series or parallel resistors for controllers without a constant current output.

**Grounding**, Either or both input wires grounded will not cause damage.

**Maximum**, 40 mA DC.

**Isolation**, Optically.

**Series Operation:** A common controller connected in series with two actuator drives will control each drive independently of the other.

**Hysteresis:** Factory set for 3 to 5% of 16 mA span.

Hysteresis is the difference between the input signal which will rotate the actuator shaft one way and the level which will drive it the other way.

**Linearity:** 0.15% of actuator rotation.

**Power Requirements:** 120 or 240 Vac,  $\pm 10\%$ , with fixed input signal offset of  $\pm 1\%$  maximum. 24 Vac units not available.

**Power Consumption:** 3.5 VA at 120 or 240 Vac, 50 or 60 Hz.

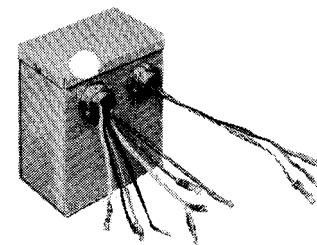
**Ambient Temperature Limits:** -13 to 140° F (-25 to 60°C).

**Connections:** Color coded pigtail leads.

**Case:** Aluminum.

**Mounting:** Directly to actuator. Upright position preferred, but other positions are acceptable.

**Dimensions:** 4-5/8" high x 4-1/16" wide x 2-1/2" deep (117 mm x 103 mm x 63 mm).



**Table-1 TYPICAL ACTUATORS**

Actuator Series	Volts (60Hz)	Torque		Stroke (Degrees)	Spring Return
		Lb.-in.	N-m		
MP-2130-500 <sup>a</sup>	120	50	5.6	90	
MP-2150-500 <sup>a</sup>	120	50	5.6	180	
MP-465 <sup>a</sup>	120	50	5.6	180	CW
MP-475 <sup>a</sup>	120	50	5.6	180	CCW
MP-483 <sup>a</sup>	120	220	24.9	90	
MP-485 <sup>a</sup>	120	220	24.9	180	
MP-486 <sup>a</sup>	120	220	24.9	180	
MP-495 <sup>a</sup>	120	450	50.8	180	
MP-9750 <sup>a</sup>	120	800	90.4	180	
MP-9810	120	1300	146.9	180	
MP-9830	120	1300	146.9	90	
MP-9910	120	1600	179.2	180	
MP-4851	240	220	24.9	180	

<sup>a</sup> **CAUTION:** Remove red and blue transformer wires from terminal 7 and 8 or actuator and tape.

## OPTIONS

None

## ACCESSORIES

None

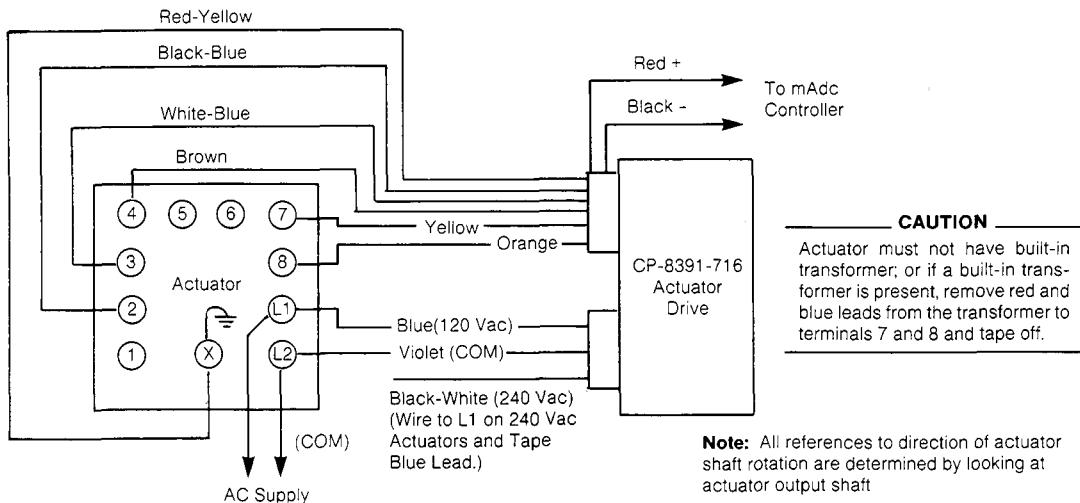


Figure-1 Typical Wiring Diagram, CP-8391-716 to MP-4XX Series, MP-21XX Series and MP-9750 Actuators, Increasing Input Signal, CCW Actuator Rotation.

## PRE-INSTALLATION

### Inspection

Visually inspect the carton for damage. If damaged, notify the appropriate carrier immediately. If undamaged, open the carton and visually inspect the device for obvious defects. Return damaged or defective products.

### Required Installation Items

- Wiring diagram
- Tools (not provided):
  - DVM meter with a 1 to 20 mA (or higher) range
  - Appropriate screwdriver for terminal screws and locknuts

## INSTALLATION

### **Caution:**

Installer must be a qualified, experienced technician.

Disconnect power supply before installation to prevent electrical shock and equipment damage.

Make all connections in accordance with the wiring diagram, and in accordance with national and local electrical codes.

Do not exceed ratings of the device.

### Mounting

Locate the instrument to avoid dust or oil accumulations and moisture. If installed outdoors, the CP-8391-716 must be protected from moisture and kept within ambient temperature limits. Upright mounting of the CP-8391-716 is preferred, but other positions are acceptable. See Figures 3 and 4.

Mount the drive to either side of the actuator by inserting the two conduit connectors into the 1/2" knockouts on the actuator. Secure the drive with the two (2) locknuts provided. See Figures 3 and 4.

Unused line Voltage wire of the CP-8391-716 transformer should either be clipped or carefully insulated. See Figures 4 through 8.

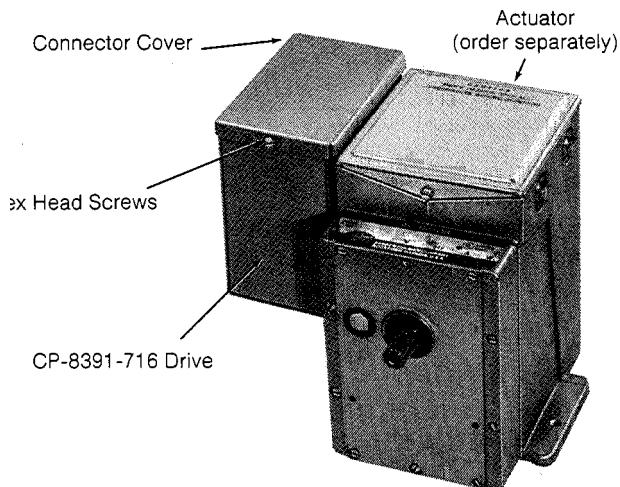


Figure-2 CP-8391-716 Mounted on the Side of an Electric Actuator.

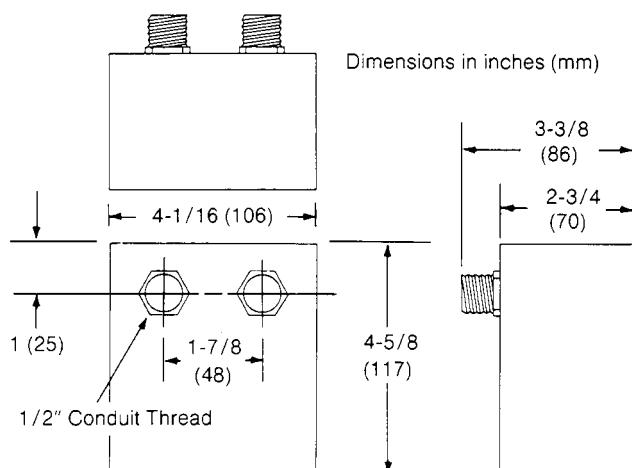


Figure-3 Mounting Dimensions.

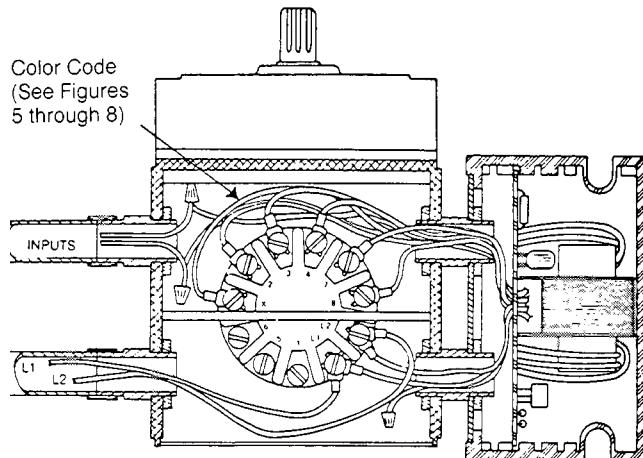


Figure-4 Wiring and Mechanical Arrangement (Shown for MP-400, MP-2100 Series, and MP-9750 Actuators).

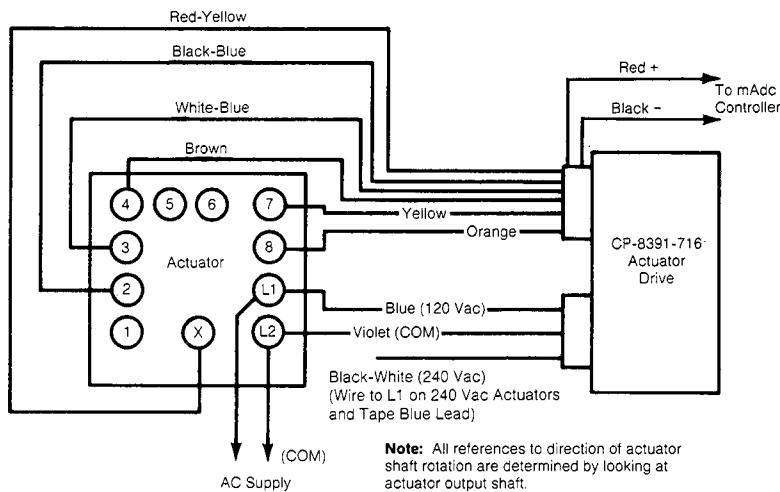


Figure-5 Installation Wiring Diagram, CP-8391-716 to MP-4XX Series, MP-21XX Series, and MP-9750 Actuators, Increasing Input Signal, CCW Actuator Rotation.

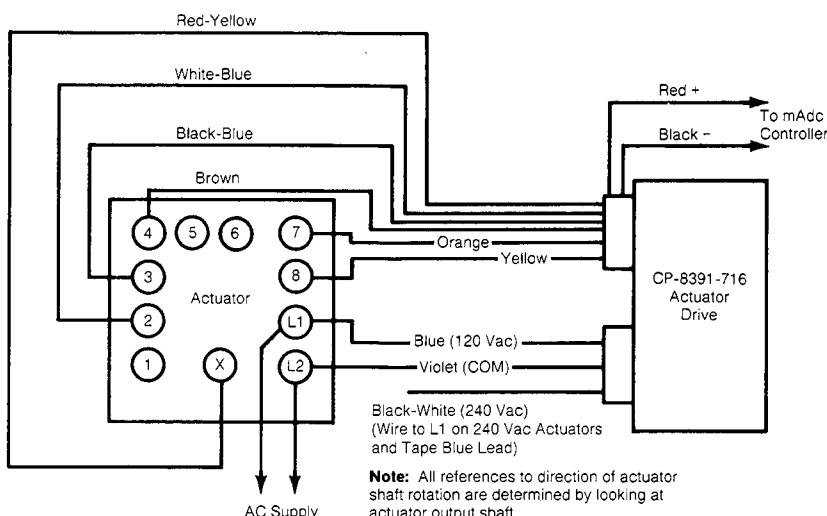


Figure-6 Installation Wiring Diagram, CP-8391-716 to MP-4XX Series, MP-21XX Series, and MP-9750 Actuators, Increasing Input Signal, CW Actuator Rotation.

## Power Wiring

When the CP-8391-716 is mounted on an electric actuator, all power is supplied by the electric actuator. See Figures 5 through 8.

The VIOLET lead is power line common. The BLUE lead is for 120 Vac. The BLACK-WHITE lead is for 240 Vac.

## Input Wiring

The two input wires of the CP-8391-716 which must be connected to the controller are color coded BLACK (negative) and RED (positive), respectively. See Figures 4 through 9.

## INPUT FROM CONTROLLER

Controller or transmitter should be capable of delivering a 4-20 mA signal into a 250 ohm load on the CP-8391-716.

## Output Wiring

See Figures 4 through 8.

### CAUTION

Actuator must not have built-in transformer; or if a built-in transformer is present, remove red and blue leads from the transformer to terminals 7 and 8 and tape off.

**Note:** All references to direction of actuator shaft rotation are determined by looking at actuator output shaft.

### CAUTION

Actuator must not have built-in transformer; or if a built-in transformer is present, remove red and blue leads from the transformer to terminals 7 and 8 and tape off.

**Note:** All references to direction of actuator shaft rotation are determined by looking at actuator output shaft.

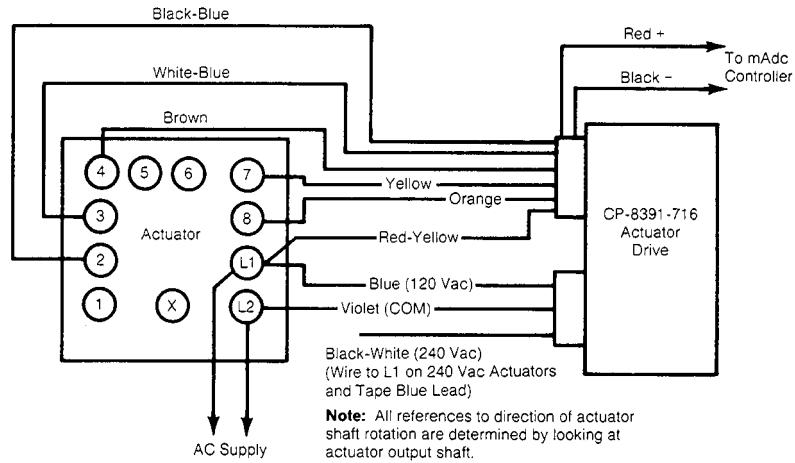


Figure-7 Installation Wiring Diagram, CP-8391-716 to MP-98XX and MP-99XX Series Actuators, Increasing Input Signal, CCW Actuator Rotation.

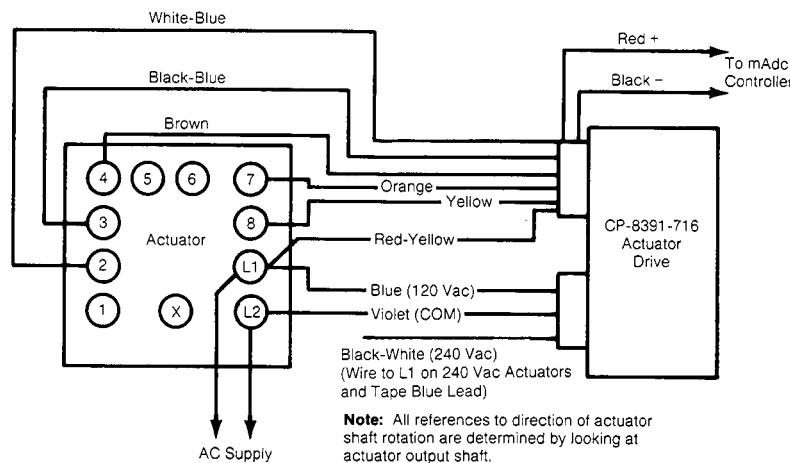


Figure-8 Installation Wiring Diagram, CP-8391-716 to MP-98XX and MP-99XX Series Actuators, Increasing Input Signal, CW Actuator Rotation.

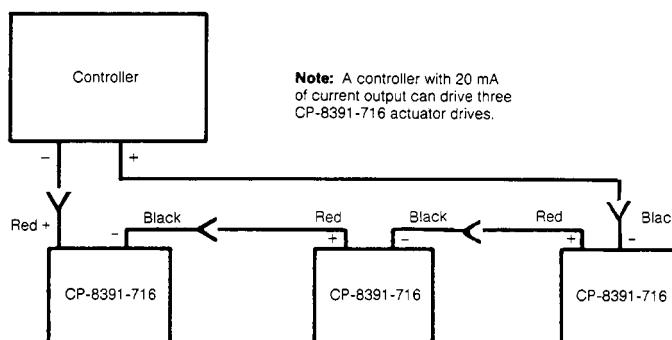


Figure-9 Wiring for Typical Series Application.

## ADJUSTMENTS

### Models Shipped from the Factory

The CP-8391-716 is shipped with the SPAN pot and the start point adjusted for 4 to 20 mAdc signal input from a controller. The hysteresis pot is factory adjusted for 3 to 5% of span.

### Readjusting Models in the Field

See Figures 2 and 10. Remove cover to the CP-8391-716.

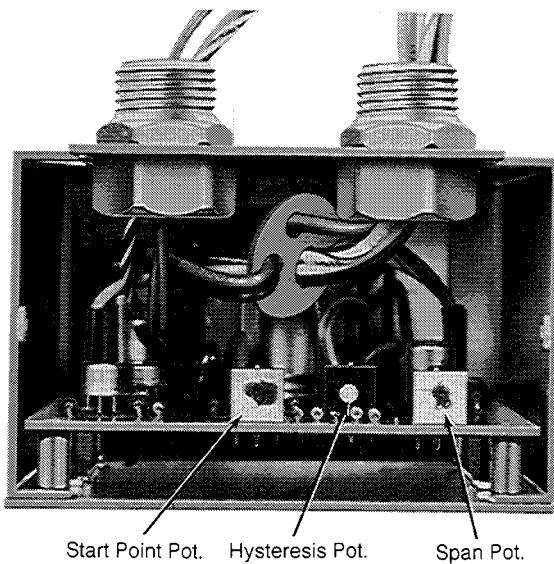


Figure-10 Adjustment Locations.

### Hysteresis

Hysteresis is adjustable by potentiometer. The maximum percentage of hysteresis depends upon the signal span. For the input span of 10 mAdc, the maximum is 8%. For the maximum input span of 16 mAdc, the maximum is 5%.

### Start Point and Span

1. Connect power to the CP-8391-716.
2. Connect the driving controller for the new range.
3. Connect the electric actuator.
4. Apply the maximum current signal for the new range from the controller to the input terminals.
5. Adjust the SPAN pot so that the actuator slidewire drives to its limit.
6. Apply the minimum signal for the new range from the controller to the input terminals. Adjust the start point pot so that the actuator slidewire drives to its limit.
7. Reapply the maximum and minimum inputs and check the end points.

## MAINTENANCE

Regular maintenance of the total system is recommended to assure sustained optimum performance.

## SERVICE

See Figures 11 and 12 for wiring diagrams if additional wiring information is required on actuator/electronic drive combinations.

## REPAIR

Do not field repair. Replace the drive with a functioning device if the unit is found to be defective.

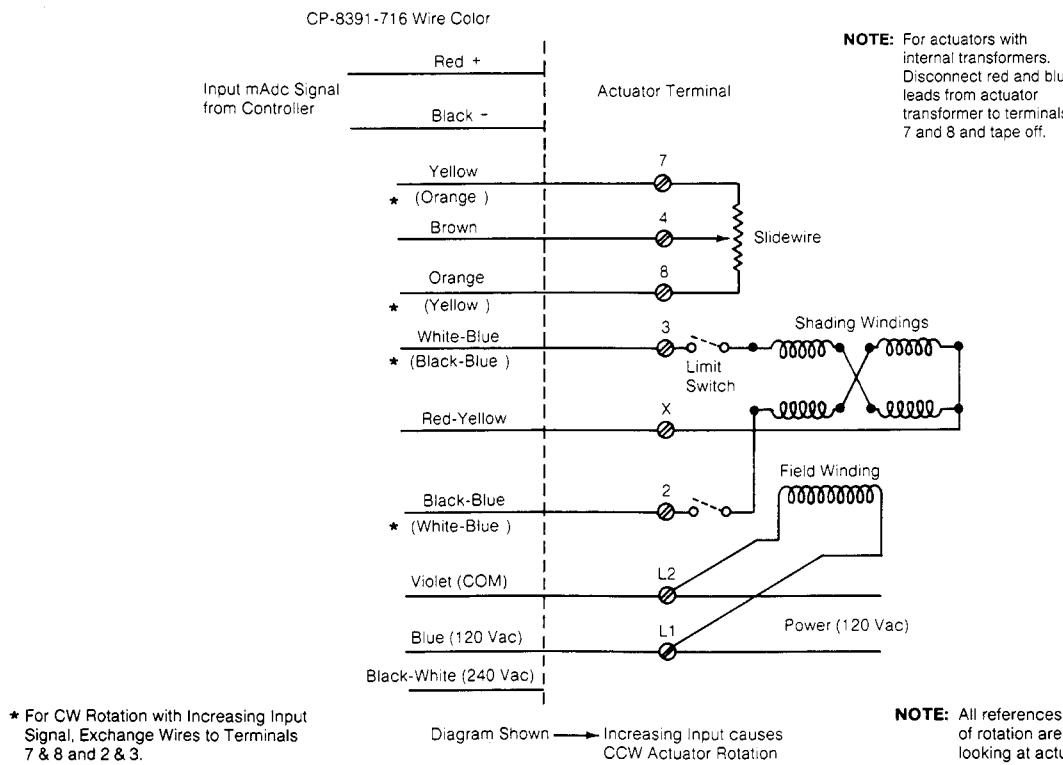
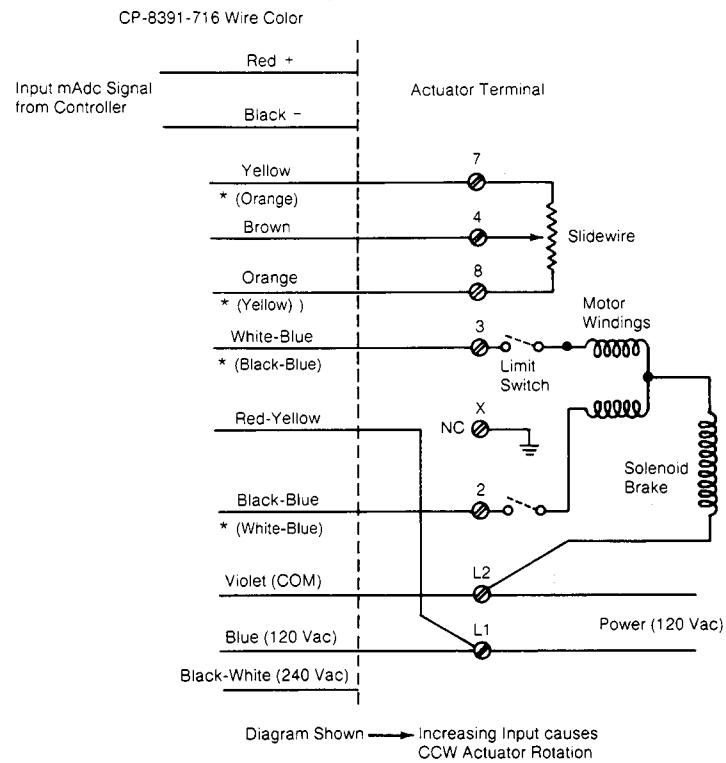


Figure-11 Service Application Wiring Diagram CP-8391-716 to MP-4XX Series, MP-21XX, and MP-9750 Actuator Connections (See Table 1 for specific Actuators).



\* For CW Rotation with Increasing Input Signal, Exchange Wires to Terminals 7 & 8 and 2 & 3.

**NOTE:** All references to direction of rotation are determined by looking at actuator output shaft.

Figure-12 Service Application Wiring Diagram CP-8391-716 tp MP-98XX and MP-99XX Series Actuator Connections  
(See Table 1 for specific Actuators).

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**Schneider**  
 **Electric**

1.888.610.7664

 [www.calcert.com](http://www.calcert.com)

[sales@calcert.com](mailto:sales@calcert.com)