

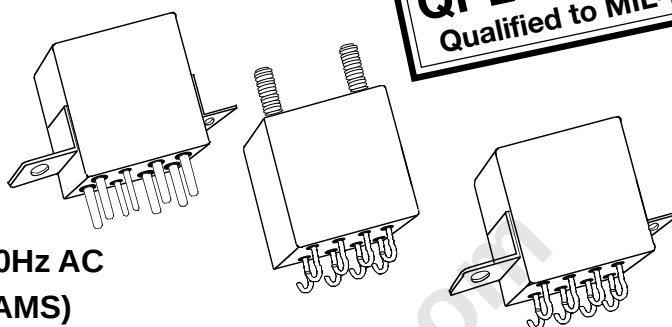


**SERIES**  
**FCA-210**

# Tyco Electronics Mid-Range Military/Aerospace Relays

**10 AMPERES, DPDT**

- HERMETICALLY SEALED
- ALL WELDED CONSTRUCTION
- BALANCED FORCE
- PERMANENT MAGNET DRIVE
- CONTACTS: SILVER CADMIUM OXIDE WITH GOLD PLATING
- COILS FOR DC, 50 TO 400Hz AND 400Hz AC
- WEIGHT 1.6 OUNCES MAX. (45.4 GRAMS)



The Series FCA-210 relay is a polarized single-side stable design, where the flux from a permanent magnet provides the armature holding force in the deactivated state, and its flux path is switched and combined with the coil flux in the operated state. This results in appreciably increased contact pressure in both states over that of a spring return nonpolar design. We also manufacture other versions of this relay:

**FCA-410:** 10 AMPERE 4PDT RELAY  
**FCA-610:** 10 AMPERE 6 PDT RELAY

## AVAILABLE

**FCA-215:** 15 AMPERE DPDT RELAY, HAS THE SAME SPECIFICATIONS AS THE FCA-210 EXCEPT IS RATED AT 15 AMPS.

## CONTACT RATING-AMPERES

Ratings Are Continuous Duty

| TYPE OF LOAD                              | LIFE (MIN.)<br>CYCLES X 10 <sup>3</sup> | 28 VDC | 115VAC<br>400Hz | 115/200VAC 3Ø |        |
|-------------------------------------------|-----------------------------------------|--------|-----------------|---------------|--------|
|                                           |                                         |        |                 | 400 Hz        | 60Hz * |
| Resistive                                 | 100                                     | 10     | 10              | 10            | 2.5    |
| Inductive                                 | 20                                      | 8      | 8               | 8             | 2.5    |
| Motor                                     | 100                                     | 4      | 4               | 4             | 2.0    |
| Lamp                                      | 100                                     | 2      | 2               | 2             | 1      |
| * 60 Hz LOADS RATED FOR 10,000 OPERATIONS |                                         |        |                 |               |        |

OVERLOAD CURRENT 40 AMPS DC, 60AMPS 400Hz  
RUPTURE CURRENT 50 AMPS DC, 80 AMPS 400Hz  
CONTACT MAKE BOUNCE 1 MILLISECOND AT NOMINAL VOLTAGE  
MAX. CONTACT DROP AT 10 AMPS: INITIAL 0.100 VOLTS.  
END OF LIFE 0.125 VOLTS

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## 10 AMPERES, DPDT

### COIL DATA

| COIL CODE | NOMINAL VOLTAGES | FREQ. Hz | DC RES. AC AMPS (B) | OVER TEMPERATURE RANGE |                        |                       |
|-----------|------------------|----------|---------------------|------------------------|------------------------|-----------------------|
|           |                  |          |                     | PICKUP OR BELOW VOLTS  | DROPOUT OR ABOVE VOLTS | MUST HOLD VOLTAGE (C) |
| 1         | 6                | DC       | 20 $\Omega$         | 4.5                    | 0.3                    | 2.5                   |
| 2         | 12               | DC       | 80 $\Omega$         | 9.0                    | 0.75                   | 4.5                   |
| 3         | 28               | DC       | 320 $\Omega$        | 18.0                   | 1.5                    | 7.0                   |
| 4 (A)     | 28               | DC       | 320 $\Omega$        | 18.0                   | 1.5                    | 7.0                   |
| 5         | 48               | DC       | 920 $\Omega$        | 32.0                   | 2.5                    | 14.0                  |
| 6         | 28               | 400Hz    | 180 mA              | 22.0                   | 1.25                   | 10.0                  |
| 7         | 28               | 50/400Hz | 100 mA              | 22.0                   | 1.25                   | 10.0                  |
| 8         | 115              | 400 Hz   | 40 mA               | 90.0                   | 5.0                    | 40.0                  |
| 9         | 115              | 50/400Hz | 30 mA               | 95.0                   | 5.0                    | 40.0                  |

- A. CODE 4 COILS HAVE BACK EMF SUPPRESSION TO 42 VOLTS MAX.
- B. DC COIL RESISTANCE  $\pm 10\%$  AT 25°C; AC COIL MAX. CURRENT AT NOMINAL VOLTAGE.
- C. RELAY WILL STAY IN PICKED-UP STATE DOWN TO MUST HOLD VOLTAGES SHOWN.
- D. MAX. OVERVOLTAGE: 6 & 12 VDC COILS 120% OF NOMINAL; ALL OTHERS 110% OF NOMINAL.
- E. COILS AVAILABLE FOR OTHER VOLTAGES AND FOR AC 50/60HZ.
- NOTE: Only DC Coil Models are QPL Approved.

### GENERAL SPECIFICATIONS

|                                     |                                                                                                                        |
|-------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| TEMPERATURE RATING:                 | -70°C TO + 125°C                                                                                                       |
| ALTITUDE:                           | 300,000 FEET                                                                                                           |
| SHOCK:*                             | Z, Y, & X ENCLOSURES 200 g FOR 6 mS<br>W & M ENCLOSURES (STUD MTG.) 100 g FOR 6 mS                                     |
| VIBRATION, SINUSOIDAL:*             | Z, Y, & X ENCLOSURES 30 g 33-3000Hz<br>W & M ENCLOSURES (STUD MTG.) 20 g 33-3000Hz                                     |
| VIBRATION, RANDOM: *                | Z, Y, & X ENCLOSURES 0.4 g <sup>2</sup> /Hz 50-2000Hz<br>W & M ENCLOSURES (STUD MTG.) 0.2 g <sup>2</sup> /Hz 50-2000Hz |
| DIELECTRIC STRENGTH AT SEA LEVEL:   | ALL CIRCUITS TO GROUND AND CIRCUIT TO CIRCUIT. 1250 V rms<br>COIL TO GROUND 1000 V rms                                 |
| DIELECTRIC STRENGTH AT 80,000 FEET: | 350 V rms                                                                                                              |
| INSULATION RESISTANCE:              | INITIAL (500 VDC) 100 M $\Omega$ MINIMUM<br>AFTER LIFE OR ENVIRONMENTAL TESTS 50 M $\Omega$ MINIMUM                    |
| OPERATE TIME AT NOMINAL VOLTAGE:    | DC RELAYS 10 ms OR LESS<br>AC RELAYS 15 ms OR LESS                                                                     |
| RELEASE TIME AT NOMINAL VOLTAGE:    | DC RELAYS 10 ms OR LESS<br>AC RELAYS 50 ms OR LESS                                                                     |

\* Max. contact opening under vibration or shock 10 microseconds



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## 10 AMPERES, DPDT

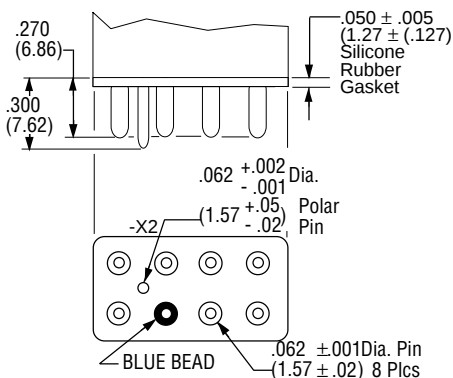
Below are shown the standard terminal types and the enclosures available. Specify the assembly as indicated under How To Order. Dimensions are shown in inches  $\pm .010$  and (Millimeters  $\pm .25$ ).

### TERMINALS

SOCKET PINS ARE GOLD PLATED  
POLARIZING PINS ARE TIN/LEAD PLATED  
CIRCUIT BOARD PINS ARE TIN/LEAD PLATED  
DIMENSIONS EXCEPT AS NOTED:  
INCHES  $\pm .010$  (MILLIMETERS  $\pm .25$ )

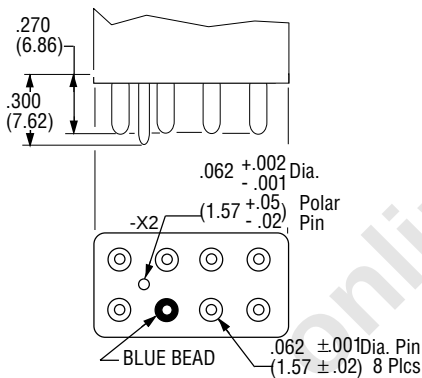
#### CODE

##### "A" Socket Pins - All DC Coils



#### CODE

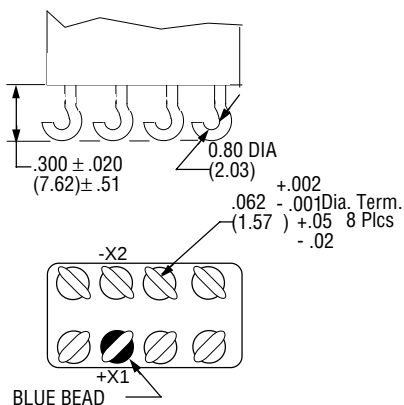
##### "B" Circuit Board Pins - All DC Coils



#### CODE

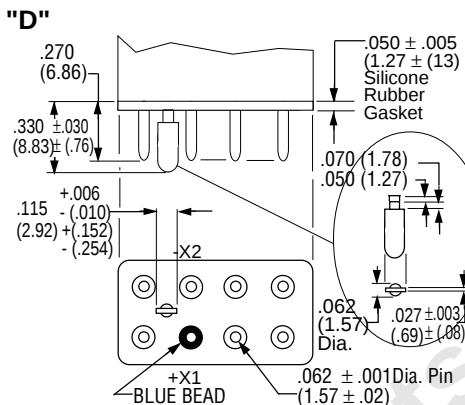
##### "C" Solder Hook Terminals

HOOK TERMINALS TIN/LEAD PLATED



#### CODE

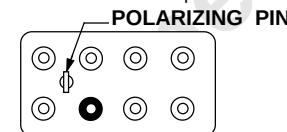
##### "D" Socket Pins 115 VAC



#### CODE

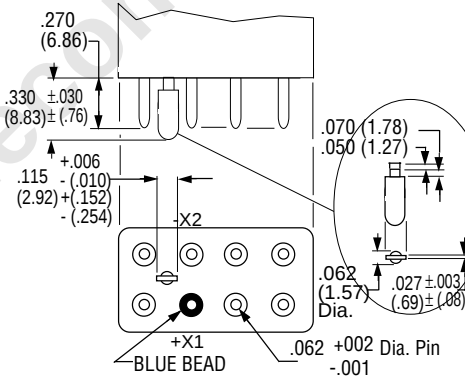
##### "E" Socket Pins 28 VAC Coils

Same as Code "D" Except polarizing Pin turned 90° to this plane.



#### CODE

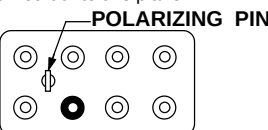
##### "F" Circuit Board Pins 115 VAC Coils



#### CODE

##### "F" Circuit Board Pins 28 VAC Coils

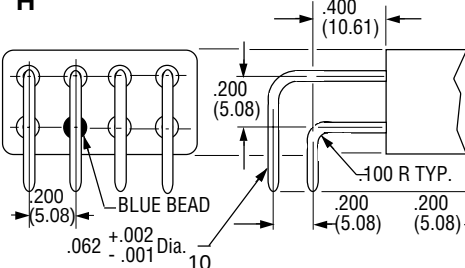
Same as Code "D" Except polarizing Pin turned 90° to this plane.



#### CODE

##### "H" 90° Solder Pins

All Pins Bright Acid Tin/lead



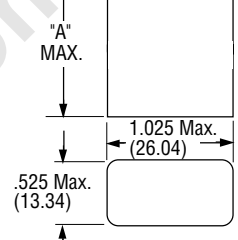
### ENCLOSURES

All Enclosures have Cupro-Nickel Cans bright acid tin/lead plated after assembly to terminal headers.

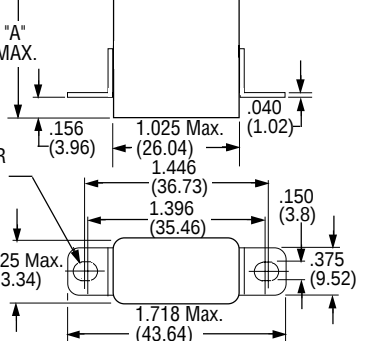
Dimensions: Inches  $\pm .010$  (mm  $\pm .25$ )

"A" AC Coils 1.125 in. (28.57) Max.  
DC Coils 1.010 in. (25.65) Max.

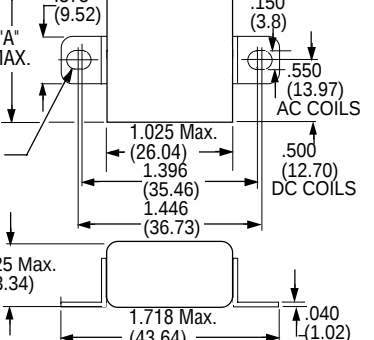
#### CODE



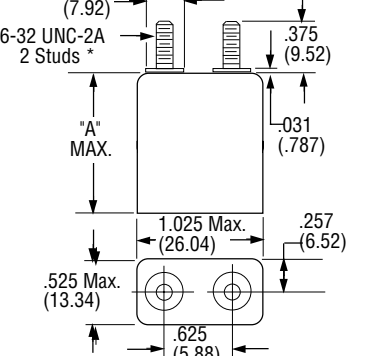
#### CODE



#### CODE



#### CODE



\*Metric threads available. To specify use M in place of W

**SERIES**  
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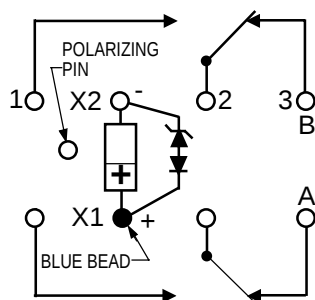


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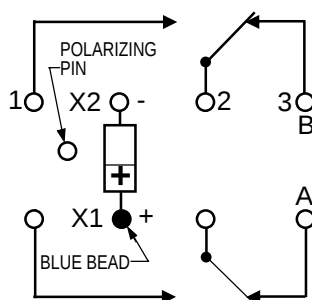
**10 AMPERES, DPDT**

## TERMINAL WIRING

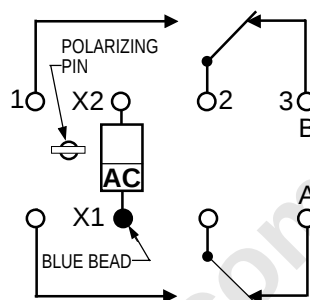
DC COILS WITH  
TRANSIENT SUPPRESSION



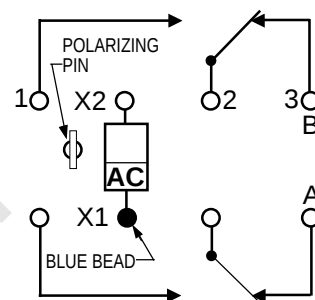
DC COILS



AC COILS  
115 VAC



AC COILS  
28 VAC

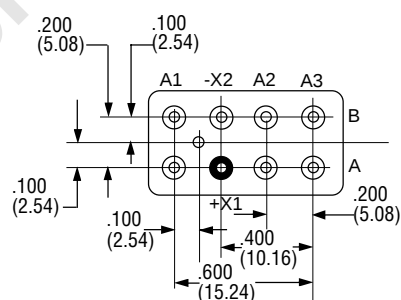


**NOTE:** Polarity must be observed with DC coil supply. Relay is polarized with a permanent magnet and will not operate or be damaged by reverse polarity.

Diodes used in transient suppression and in AC rectifier circuits have peak inverse voltage rating of 600 VDC minimum. Zener diodes have a minimum rating of 1 watt.

Terminal designations are for reference only and do not appear on the header.

## TERMINAL LAYOUT



## HOW TO ORDER

(EXAMPLE) \_\_\_\_\_ **FCA-215-**  
**FCA-210-A Y 4**  
 RELAY TYPE \_\_\_\_\_  
 TERMINALS (Socket Pins, DC Coil) \_\_\_\_\_  
 ENCLOSURE (With Flanges) \_\_\_\_\_  
 COIL (28 VDC With Transient Suppression). \_\_\_\_\_

**NOTE: Only DC coil models are QPL Approved**