



Balanced-Force Design  
 Hermetically sealed  
 Designed to the performance standards of **MIL-PRF-6106**

**PRINCIPLE TECHNICAL CHARACTERISTICS**

Contacts rated at **28 Vdc and 115 Vac, 400 Hz, 1Ø and 115/200 Vac 400Hz, 3Ø**  
 Weight **See Mounting**  
 Auxiliary contact models available.  
 Special units available upon request.

**APPLICATION NOTES:**

- [101](#)
- [102](#)
- [007](#)

**CONTACT ELECTRICAL CHARACTERISTICS**

| Contact rating per pole and load type | Load current in Amps |                   |                           |            |                               |
|---------------------------------------|----------------------|-------------------|---------------------------|------------|-------------------------------|
|                                       | 28 Vdc               | 115 Vac<br>400 Hz | 115/200 Vac<br>400 Hz, 3Ø | 28 Vdc [2] | DELTA<br>115/200 Vac<br>60 Hz |
| Resistive                             | 50                   | 100               | 100                       | 120        | 60                            |
| Inductive [1]                         | 30                   | 100               | 100                       | 80         | 60                            |
| Motor                                 | 30                   | 60                | 60                        | 80         | 40                            |
| Load transfer, resistive[7]           | -                    | -                 | 50                        | -          | -                             |



Featuring **LEACH®** power and control solutions  
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Data sheets are for initial product selection and comparison. Contact Esterline Power Systems prior to choosing a component.

**COIL CHARACTERISTICS (Vdc)****SERIES ZC, ZCD**

| CODE                                                         | A    | B    | C   | F<br>Vac 400 Hz | N<br>Suppressed[6] | Y [8]  | YN [6] |
|--------------------------------------------------------------|------|------|-----|-----------------|--------------------|--------|--------|
| Nominal operating voltage                                    | 28   | 12   | 6   | 115             | 28                 | 28     | 28     |
| Maximum operating voltage                                    | 29   | 14.5 | 7.2 | 124             | 29                 | 29     | 29     |
| Pick-up voltage maximum                                      |      |      |     |                 |                    |        |        |
| - Nominal                                                    | 18   | 9    | 4.5 | 90              | 18                 | 18     | 18     |
| - High temp test                                             | 20   | 10   | 5   | 95              | 20                 | 20     | 20     |
| - Continuous current test                                    | 22.5 | 11   | 5.7 | 100             | 22.5               | 22.5   | 22.5   |
| Drop-out voltage, maximum                                    | 7    | 4.5  | 2.5 | 30              | 7                  | 7      | 7      |
| Coil resistance in Ohms $\pm 20\%$ at $+25^{\circ}\text{C}$  | 150  | 38   | 9.3 | -               | 150                | xx/xxx | xx/xxx |
| Coil current Amp max. @ Nom. Volt. and $+25^{\circ}\text{C}$ | -    | -    | -   | 0.09            | -                  | -      | -      |

**GENERAL CHARACTERISTICS**

|                                                                      |                                                                    |
|----------------------------------------------------------------------|--------------------------------------------------------------------|
| Temperature range                                                    | -55°C to 71°C                                                      |
| Minimum operating cycles (life) at rated load                        | 50,000                                                             |
| Minimum operating cycles (life) at 25% rated load                    | 100,000                                                            |
| Dielectric strength at sea level                                     |                                                                    |
| - All circuits to ground and circuit to circuit                      | 1500 Vrms                                                          |
| - Coil to ground and Aux. contacts                                   | 1250 Vrms                                                          |
| Dielectric strength at altitude                                      | 700 Vrms (Main contacts)<br>500 Vrms (Coil and Auxiliary contacts) |
| Insulation resistance                                                |                                                                    |
| - Initial (500 Vdc)                                                  | 100 M $\Omega$ min                                                 |
| - After environmental tests (500 Vdc)                                | 50 M $\Omega$ min                                                  |
| Sinusoidal vibration (70 to 500 Hz)                                  | 5 G                                                                |
| Shock (6 ms duration)                                                | 15 G                                                               |
| Maximum contact opening time under vibration and shock               | 10 $\mu\text{s}$                                                   |
| Operate time at nominal voltage (Including bounce)                   | 60 ms max<br>25 ms max (Economizer coil)                           |
| Release time at nominal voltage (Including bounce)                   |                                                                    |
| -DC                                                                  | 40 ms max                                                          |
| -AC                                                                  | 80 ms max                                                          |
| Release time at nominal voltage (Including bounce) : Economizer coil |                                                                    |
| -DC                                                                  | 25 ms max                                                          |
| -AC                                                                  | 35 ms max                                                          |

**GENERAL CHARACTERISTICS CONTINUED**

**SERIES ZC, ZCD**

|                                   |                               |
|-----------------------------------|-------------------------------|
| Contact bounce at nominal voltage | 4 ms max                      |
| Weight                            | Noted                         |
| Overload                          | 600 Amp @ 115/200 Vac, 400 Hz |
| Rupture                           | 800 Amp @ 115/200 Vac, 400 Hz |
| Altitude                          | 50,000 Feet                   |

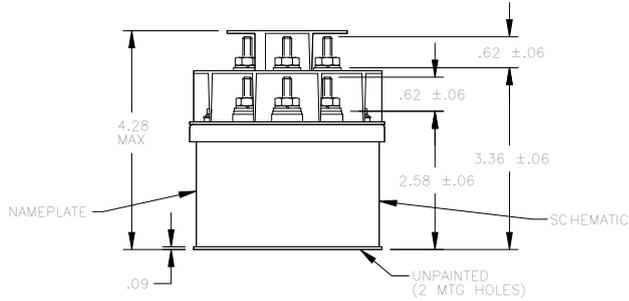
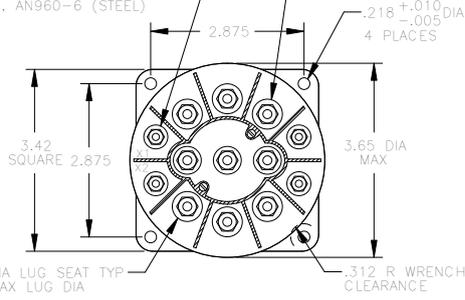
**NUMBERING SYSTEM**

|                                  |           |   |   |   |   |
|----------------------------------|-----------|---|---|---|---|
|                                  | ZC        | - | X | O | X |
|                                  | [ 9 ] ZCD | - | X | O | X |
| Relay family_____                |           |   |   |   |   |
| 1-Mounting Style(A,B,Etc.)_____  |           |   |   |   |   |
| 2-Terminal & Circuit_____        |           |   |   |   |   |
| 3-Coil Voltage(A,B,C,F & N)_____ |           |   |   |   |   |

**NOTES**

- [1] Inductive load life, 20,000 cycles.
- [2] Ratings are for double make terminal type 2, 4 & 6.
- 3. Alternate contact configurations and other special models available upon request. Please contact factory.
- [4] Greater values for suppressed coils.
- 5. Terminal strength per para. 3,4,8,2,1 of MIL-R-6106.
- [6] Suppressed "N & NY" coils have back EMF suppression to 62 Volts max.
- [7] Suitable for transfer between unsynchronized power sources at rating shown.
- [8] Economizer coils have a lower resistance primary coil for faster operate time. Once relay operates, the coil switches to a higher resistance for lower power drain. Do not ramp up voltage on these coils.
- [9] Non hermetic gasket sealed version.
- 10. This series drawing is for general use only. Please consult factory for special requirements.

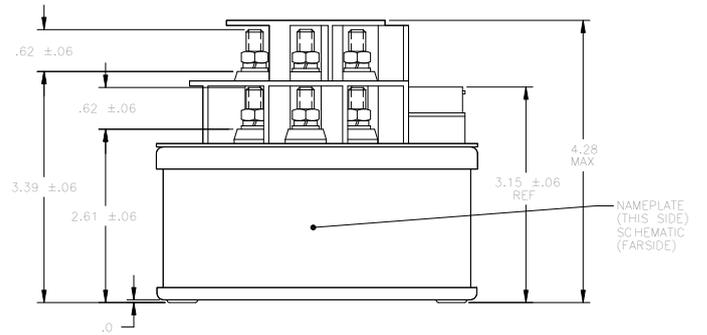
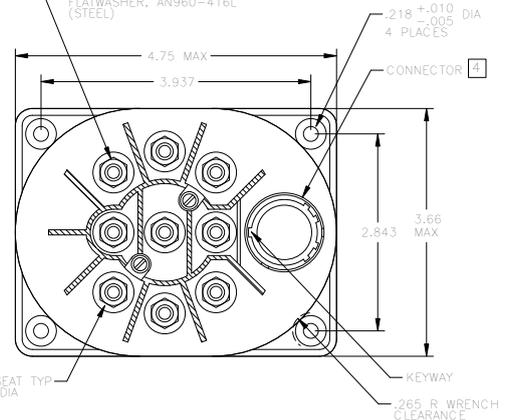
COIL & AUXILIARY TERMINALS  
 .138-32 UNC-2A, STUD  
 NUT, .138-32 UNC-2B X 1/4 X 3/32  
 STEEL CAD PLATE  
 LOCKWASHER, MS35338-41  
 (STEEL)  
 FLATWASHER, AN960-6 (STEEL)



MOUNTING STYLE A

WEIGHT: 2 LB MAXIMUM  
 WEIGHT IS DEPENDENT UPON CONFIGURATION REQUIRED.  
 PLEASE CONSULT FACTORY.

POWER TERMINALS  
 .250-28 UNF-2A, STUD  
 NUT, .250-28 UNF-2B X 3/8 X 3/16  
 STEEL CAD PLATE  
 LOCKWASHER, MS35338-44  
 (STEEL)  
 FLATWASHER, AN960-416L  
 (STEEL)

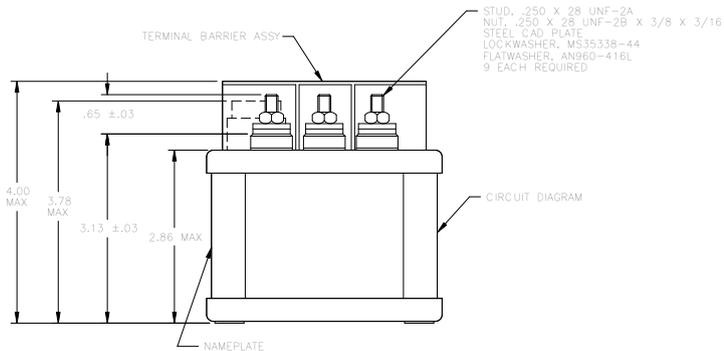
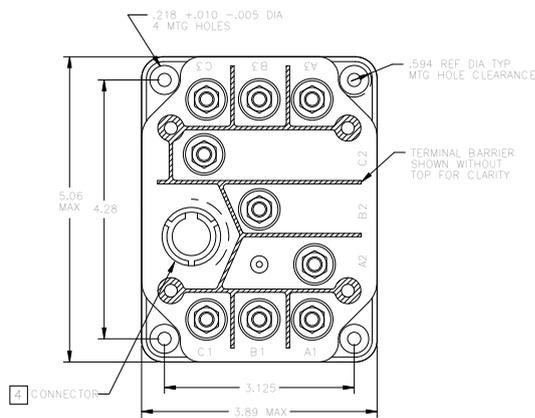


MOUNTING STYLE B

WEIGHT: 2 LB 6 OZ MAXIMUM  
 WEIGHT IS DEPENDENT UPON CONFIGURATION REQUIRED.  
 PLEASE CONSULT FACTORY.

MOUNTING STYLE K

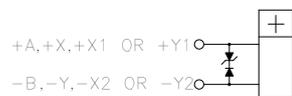
WEIGHT: 2 LB 13 OZ MAXIMUM



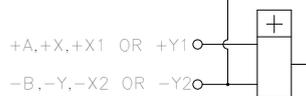
COIL CIRCUIT CONFIGURATION 3



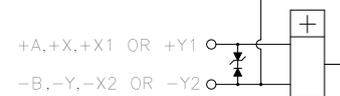
STANDARD  
 "A, B, C & F" COIL



STANDARD  
 WITH  
 COIL SUPPRESSION  
 "N" COIL

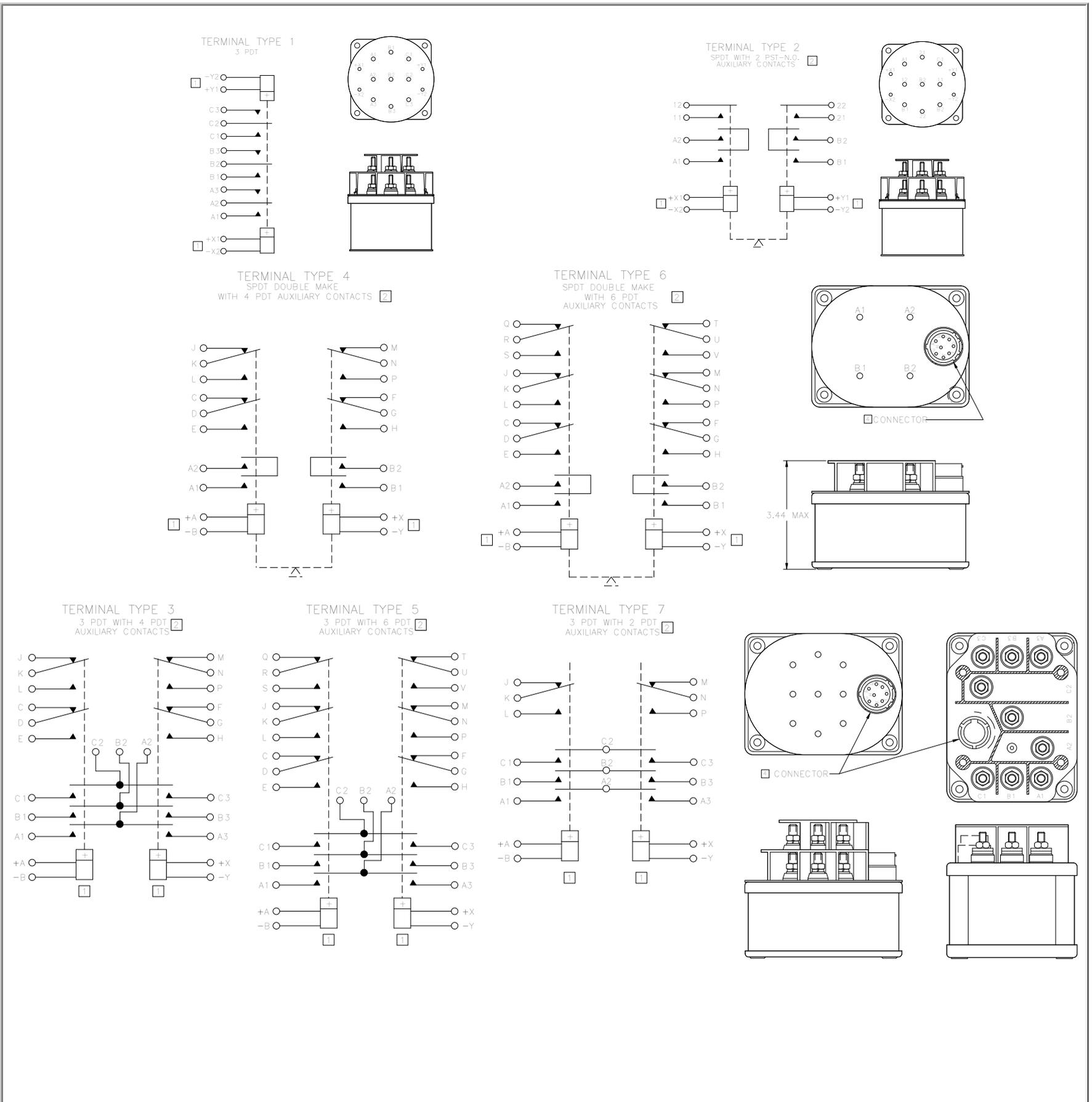


ECONOMIZER COIL  
 "Y" COIL



ECONOMIZER COIL  
 WITH  
 COIL SUPPRESSION  
 "YN" COIL

Standard Tolerance: .XX ±.03, .XXX ±.010



**TERMINAL TYPE 9**  
 IS A GENERAL CATEGORY USED  
 FOR ALL TERMINAL TYPES NOT  
 ILLUSTRATED. FOR OTHER  
 VARIATIONS OF TERMINAL  
 CONFIGURATIONS—PLEASE  
 CONTACT FACTORY.

- 1 POLARITY INDICATION APPLIES TO D.C. COILS ONLY
- 2 AUXILIARY CONTACT RATING 28 VDC OR 115 VAC  
 RESISTIVE 5 AMP  
 INDUCTIVE 3 AMP  
 LAMP 1 AMP  
 BOUNCE AT NOMINAL VOLTAGE .004 SEC MAX
- 3 COIL TERMINALS MAY BE IDENTIFIED AS  
 A-B, X1-X2, Y1-Y2 OR X-Y.  
 OTHER AUXILIARY CONTACT FORMS AVAILABLE,  
 PLEASE CONTACT FACTORY.
- 4 CIRCULAR CONNECTOR MS-STYLE OR EQUIVALENT

NOTE: Although all configuration and/or terminal type options are available, some combinations may require a setup charge and be subject to minimum order size.