

# 7000 Series/High Reliability Reed Relays

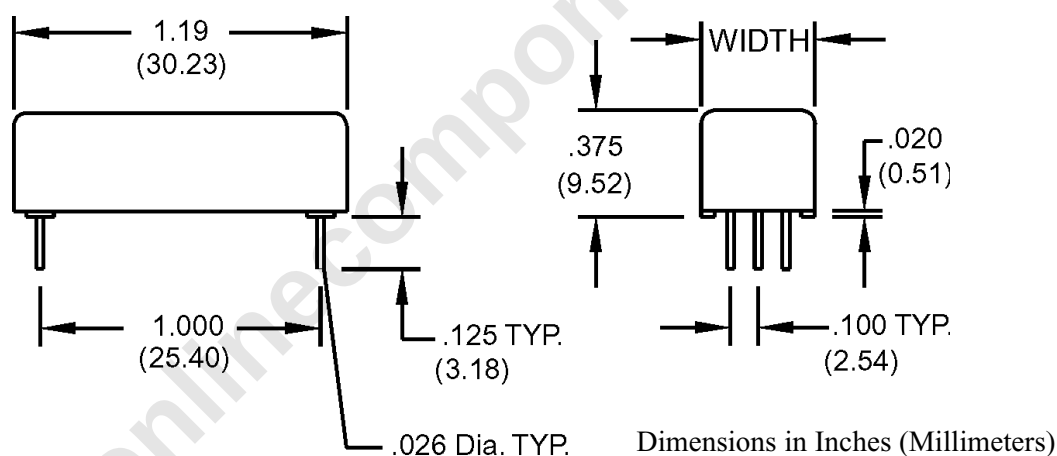


## HIGH RELIABILITY REED RELAYS

The 7000 Series is ideally suited to the needs of Instrumentation, Data Acquisition, Process Control, Telecommunications and General Purpose requirements. The specification tables allow you to select the appropriate relay for your particular application. These models are specifically designed for high quality and reliability with versatile switching capabilities and contact forms. If your requirements differ, please consult your local representative or Coto's Factory to discuss a custom reed relay.

## 7000 SERIES FEATURES

- ◆ Versatile, multi-pole contact forms. (Form A, B, and C)  
(For all models listed see pgs. 20-21)
- ◆ Wide range of switching capabilities; Low level, High Voltage, Hg wet.
- ◆ Hermetically sealed contacts for long life and high reliability.
- ◆ High speed switching compared to electromechanical relays.
- ◆ Potted in metal shell - Magnetic Shield.
- ◆ Optional Electrostatic Shield for reducing capacitive coupling.
- ◆ PCB mounting versatility - 1.0" x 0.100" grid.
- ◆ Optional coil suppression diode offered to protect coil drivers.



| WIDTH     | A               | B               | C               | D               |
|-----------|-----------------|-----------------|-----------------|-----------------|
| DIMENSION | .410<br>(10.41) | .500<br>(12.70) | .660<br>(16.76) | .760<br>(19.30) |

See pages 20-21 for Schematic Diagrams  
& Coil Data Corresponding to Package Widths

## Ordering Information

|                                     |                                                     |
|-------------------------------------|-----------------------------------------------------|
| <b>Part Number</b>                  | XXXX-XX-1XXX                                        |
| <b>Model Number</b>                 | See Tables (7000 Series)                            |
| <b>Coil Voltage</b>                 | 05=5 volts<br>12=12 volts<br>24=24 volts            |
| <b>Coil Termination</b>             | 0=End to End<br>1=Same End                          |
| <b>Diode Options</b>                | 0=No Diode<br>1=Diode Included                      |
| <b>Electrostatic Shield Options</b> | 0=No Electrostatic Shield<br>1=Electrostatic Shield |

# 7000 Series/High Reliability Reed Relays

| Parameters                                   | Test Conditions                                    | Units                  | Form A, B,<br>Latch | Form C           | Form A<br>Hg Wet | Form C Hg<br>Wet | Form A<br>High<br>Voltage |
|----------------------------------------------|----------------------------------------------------|------------------------|---------------------|------------------|------------------|------------------|---------------------------|
| <b>CONTACT RATINGS</b>                       |                                                    |                        |                     |                  |                  |                  |                           |
| Switching Voltage                            | Max DC/Peak AC Resist.                             | Volts                  | 200                 | 150              | 500              | 500              | 500                       |
| Switching Current                            | Max DC/Peak AC Resist.                             | Amps                   | 0.5                 | 0.25             | 1.0              | 1.0              | 0.5                       |
| Carry Current                                | Max DC/Peak AC Resist.                             | Amps                   | 2.0                 | 0.5              | 2.0              | 2.0              | 2.0                       |
| Contact Rating                               | Max DC/Peak AC Resist.                             | Watts                  | 10                  | 3                | 50               | 50               | 10                        |
| Life Expectancy-Typical <sup>1</sup>         | Signal Level 1.0V,10mA                             | x 10 <sup>6</sup> Ops. | 1000                | 100              | 1000             | 1000             | 100                       |
| Static Contact<br>Resistance (max. init.)    | 50mV, 10mA                                         | Ω                      | 0.100               | 0.150            | 0.075            | 0.100            | 0.100                     |
| Dynamic Contact<br>Resistance (max. init.)   | 0.5V, 50mA<br>at 100 Hz, 1.5 msec                  | Ω                      | 0.150               | 0.200            | 0.100            | 0.150            | 0.150                     |
| <b>RELAY SPECIFICATIONS</b>                  |                                                    |                        |                     |                  |                  |                  |                           |
| Insulation Resistance<br>(minimum)           | Between all Isolated Pins<br>at 100V, 25°C, 40% RH | Ω                      | 10 <sup>12</sup>    | 10 <sup>10</sup> | 10 <sup>12</sup> | 10 <sup>12</sup> | 10 <sup>12</sup>          |
| Capacitance - Typical                        | No Shield                                          | pF                     | 1.0                 | 2.0              | 1.0              | 2.0              | 1.0                       |
| Across Open Contacts                         | Shield Guarding                                    | pF                     | 0.2                 | 1.0              | 0.2              | 1.0              | 0.2                       |
| Dielectric Strength<br>(minimum)             | Between Contacts                                   | VDC/peak AC            | 250                 | 200              | 1000             | 1000             | 1200                      |
|                                              | Contacts to Shield                                 | VDC/peak AC            | 1000                | 1000             | 1000             | 1000             | 1000                      |
|                                              | Contacts/Shield to Coil                            | VDC/peak AC            | 1500                | 1500             | 1500             | 1500             | 1500                      |
| Operate Time - including<br>bounce - Typical | At Nominal Coil Voltage,<br>30 Hz Square Wave      | msec.                  | 1.0                 | 2.0.             | 2.0              | 2.0              | 1.0                       |
| Release Time - Typical                       | Zener-Diode Suppression <sup>4</sup>               | msec.                  | 0.1                 | 2.5              | 1.0              | 1.5              | 0.1                       |

*(See following pages for schematic  
diagrams and coil data.)*

## Notes:

<sup>1</sup>Consult factory for life expectancy at other switching loads.

<sup>2</sup>Relays ordered with diode option, pin #1 is positive.

<sup>3</sup>E-pin indicates electrostatic shield pin.

See schematics on pages 28-29.

<sup>4</sup>Consists of 20V Zener-diode and 1N4002 diode in series,  
connected in parallel with coil.

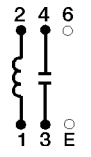
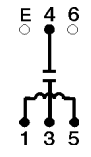
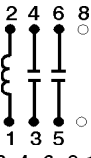
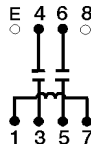
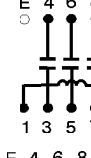
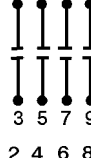
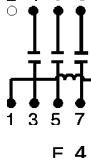
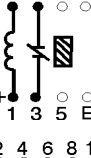
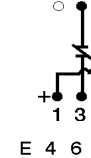
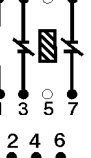
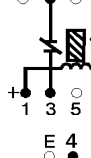
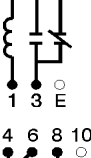
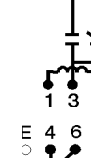
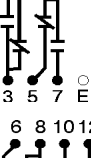
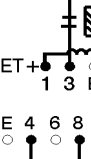
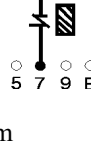
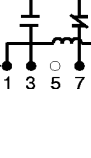
## Environmental Ratings

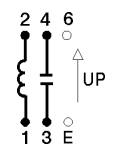
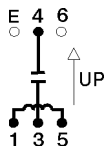
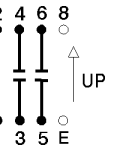
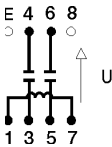
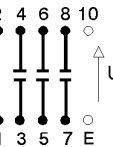
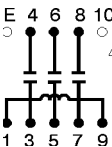
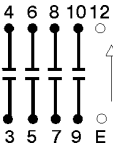
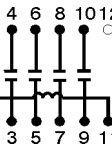
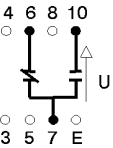
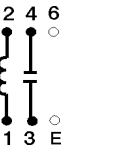
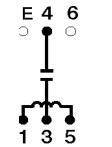
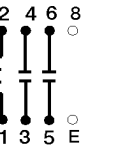
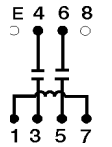
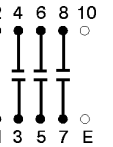
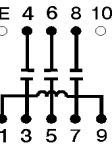
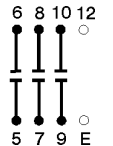
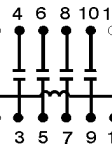
Storage Temp: -35°C to +100°C;

Operating Temp: -20°C to +85°C

The operate and release voltage and the coil resistance are  
specified at 25°C. These values vary by approximately  
0.4%/°C as the ambient temperature varies.

Vibration: 20 G's to 2000 Hz; Shock: 50 G's

| Contact Form            | Model Number | Nominal Coil Voltage VDC | Must Operate Voltage VDC max. | Must Release Voltage VDC min. | Coil Resistance $\pm 10\%$ @25°C | Width (See Table Page 18) | Schematic Top View                                                                    |                                                                                       |
|-------------------------|--------------|--------------------------|-------------------------------|-------------------------------|----------------------------------|---------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|                         |              |                          |                               |                               |                                  |                           | End to End Coil                                                                       | Same End Coil                                                                         |
| 1A                      | 7101         | 5                        | 3.75                          | 0.4                           | 300                              | A                         |    |    |
|                         |              | 12                       | 9.0                           | 1.0                           | 1600                             |                           |                                                                                       |                                                                                       |
|                         |              | 24                       | 18.0                          | 2.0                           | 4200                             |                           |                                                                                       |                                                                                       |
| 2A                      | 7102         | 5                        | 3.75                          | 0.4                           | 150                              | B                         |    |    |
|                         |              | 12                       | 9.0                           | 1.0                           | 1000                             |                           |                                                                                       |                                                                                       |
|                         |              | 24                       | 18.0                          | 2.0                           | 3500                             |                           |                                                                                       |                                                                                       |
| 3A                      | 7103         | 5                        | 3.75                          | 0.4                           | 100                              | C                         |    |    |
|                         |              | 12                       | 9.0                           | 1.0                           | 800                              |                           |                                                                                       |                                                                                       |
|                         |              | 24                       | 18.0                          | 2.0                           | 2400                             |                           |                                                                                       |                                                                                       |
| 4A                      | 7104         | 5                        | 3.75                          | 0.4                           | 80                               | D                         |   |   |
|                         |              | 12                       | 9.0                           | 1.0                           | 550                              |                           |                                                                                       |                                                                                       |
|                         |              | 24                       | 18.0                          | 2.0                           | 2000                             |                           |                                                                                       |                                                                                       |
| 1B <sup>1</sup>         | 7121         | 5                        | 3.75                          | 0.4                           | 150                              | B                         |  |  |
|                         |              | 12                       | 9.0                           | 1.0                           | 1000                             |                           |                                                                                       |                                                                                       |
|                         |              | 24                       | 18.0                          | 2.0                           | 3500                             |                           |                                                                                       |                                                                                       |
| 2B <sup>1</sup>         | 7122         | 5                        | 3.75                          | 0.4                           | 100                              | C                         |  |  |
|                         |              | 12                       | 9.0                           | 1.0                           | 800                              |                           |                                                                                       |                                                                                       |
|                         |              | 24                       | 18.0                          | 2.0                           | 2400                             |                           |                                                                                       |                                                                                       |
| 1C                      | 7141         | 5                        | 3.75                          | 0.4                           | 175                              | A                         |  |  |
|                         |              | 12                       | 9.0                           | 1.0                           | 1100                             |                           |                                                                                       |                                                                                       |
|                         |              | 24                       | 18.0                          | 2.0                           | 4200                             |                           |                                                                                       |                                                                                       |
| 2C                      | 7142         | 5                        | 3.75                          | 0.4                           | 65                               | C                         |  |  |
|                         |              | 12                       | 9.0                           | 1.0                           | 490                              |                           |                                                                                       |                                                                                       |
|                         |              | 24                       | 18.0                          | 2.0                           | 1550                             |                           |                                                                                       |                                                                                       |
| 3C                      | 7143         | 5                        | 3.75                          | 0.4                           | 55                               | D                         |  |  |
|                         |              | 12                       | 9.0                           | 1.0                           | 300                              |                           |                                                                                       |                                                                                       |
|                         |              | 24                       | 18.0                          | 2.0                           | 1350                             |                           |                                                                                       |                                                                                       |
| 1A Latch <sup>1,2</sup> | 7150         | 5                        | 3.75                          | 0.4                           | 550/550                          | B                         |  |  |
|                         |              | 12                       | 9.0                           | 1.0                           | 1750/1750                        |                           |                                                                                       |                                                                                       |
| 1A1B <sup>1,3</sup>     | 7160         | 5                        | 3.75                          | 0.4                           | 80                               | D                         |  |  |
|                         |              | 12                       | 9.0                           | 1.0                           | 550                              |                           |                                                                                       |                                                                                       |
|                         |              | 24                       | 18.0                          | 2.0                           | 2000                             |                           |                                                                                       |                                                                                       |

| Contact Form           | Model Number | Nominal Coil Voltage VDC | Must Operate Voltage VDC max. | Must Release Voltage VDC min. | Coil Resistance $\pm 10\%$ @25°C | Width (See Table Page 18) | Schematic Top View                                                                    |                                                                                       |
|------------------------|--------------|--------------------------|-------------------------------|-------------------------------|----------------------------------|---------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|                        |              |                          |                               |                               |                                  |                           | End to End Coil                                                                       | Same End Coil                                                                         |
| 1A Hg wet <sup>5</sup> | 7201         | 5                        | 3.75                          | 0.4                           | 70                               | A                         |    |    |
|                        |              | 12                       | 9.0                           | 1.0                           | 450                              |                           |                                                                                       |                                                                                       |
|                        |              | 24                       | 18.0                          | 2.0                           | 1785                             |                           |                                                                                       |                                                                                       |
| 2A Hg wet <sup>5</sup> | 7202         | 5                        | 3.75                          | 0.4                           | 60                               | B                         |    |    |
|                        |              | 12                       | 9.0                           | 1.0                           | 340                              |                           |                                                                                       |                                                                                       |
|                        |              | 24                       | 18.0                          | 2.0                           | 1330                             |                           |                                                                                       |                                                                                       |
| 3A Hg wet <sup>5</sup> | 7203         | 5                        | 3.75                          | 0.4                           | 50                               | C                         |    |    |
|                        |              | 12                       | 9.0                           | 1.0                           | 300                              |                           |                                                                                       |                                                                                       |
|                        |              | 24                       | 18.0                          | 2.0                           | 1200                             |                           |                                                                                       |                                                                                       |
| 4A Hg wet <sup>5</sup> | 7204         | 5                        | 3.75                          | 0.4                           | 40                               | D                         |    |    |
|                        |              | 12                       | 9.0                           | 1.0                           | 250                              |                           |                                                                                       |                                                                                       |
|                        |              | 24                       | 18.0                          | 2.0                           | 960                              |                           |                                                                                       |                                                                                       |
| 1C Hg wet <sup>5</sup> | 7241         | 5                        | 3.75                          | 0.4                           | 50                               | C                         |   |                                                                                       |
|                        |              | 12                       | 9.0                           | 1.0                           | 300                              |                           |                                                                                       |                                                                                       |
|                        |              | 24                       | 18.0                          | 2.0                           | 1200                             |                           |                                                                                       |                                                                                       |
| 1A High Voltage 7301   | 7301         | 5                        | 3.75                          | 0.4                           | 175                              | A                         |  |  |
|                        |              | 12                       | 9.0                           | 1.0                           | 1100                             |                           |                                                                                       |                                                                                       |
|                        |              | 24                       | 18.0                          | 2.0                           | 4200                             |                           |                                                                                       |                                                                                       |
| 2A High Voltage 7302   | 7302         | 5                        | 3.75                          | 0.4                           | 100                              | B                         |  |  |
|                        |              | 12                       | 9.0                           | 1.0                           | 640                              |                           |                                                                                       |                                                                                       |
|                        |              | 24                       | 18.0                          | 2.0                           | 2450                             |                           |                                                                                       |                                                                                       |
| 3A High Voltage 7303   | 7303         | 5                        | 3.75                          | 0.4                           | 65                               | C                         |  |  |
|                        |              | 12                       | 9.0                           | 1.0                           | 490                              |                           |                                                                                       |                                                                                       |
|                        |              | 24                       | 18.0                          | 2.0                           | 1550                             |                           |                                                                                       |                                                                                       |
| 4A High Voltage 7304   | 7304         | 5                        | 3.75                          | 0.4                           | 55                               | D                         |  |  |
|                        |              | 12                       | 9.0                           | 1.0                           | 300                              |                           |                                                                                       |                                                                                       |
|                        |              | 24                       | 18.0                          | 2.0                           | 1350                             |                           |                                                                                       |                                                                                       |

## Notes:

<sup>1</sup>These relays contain bias magnets. Correct coil polarity must be observed.

<sup>2</sup>Coil suppression diode is required for proper operation. Correct coil polarity must be observed.

<sup>3</sup>Break before make not guaranteed.

<sup>4</sup>Dot stamped on top of relay refers to pin #1 location. E-pin indicates Electrostatic shield pin. Unused pins omitted. Pin numbers for reference only.

<sup>5</sup>All models with Hg wet contacts are position sensitive, must be mounted within 30° of vertical plane. See schematic.