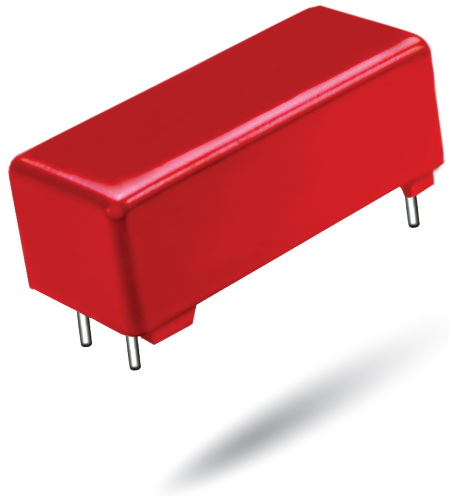
# 3500 SERIES/LOW THERMAL EMF REED RELAYS



## 3500 Series Low Thermal EMF Reed Relays

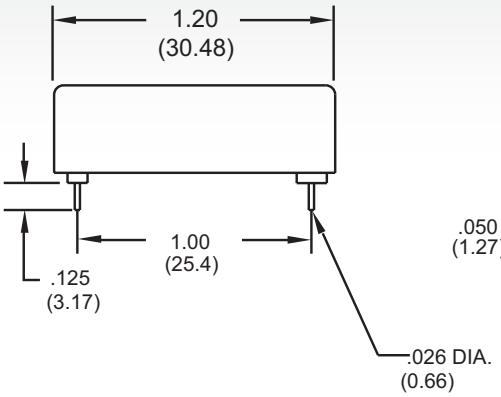
The 3500 Series is ideally suited to the needs of Instrumentation, Data Acquisition and Process Control. The specification tables allow you to select the appropriate relay for your particular application. Recommended for use in high accuracy DVM's, Multiplexers and Digital or Analog Multipoint Recorders. If your requirements differ from the selection options, please consult Coto's Factory to discuss a custom reed relay.

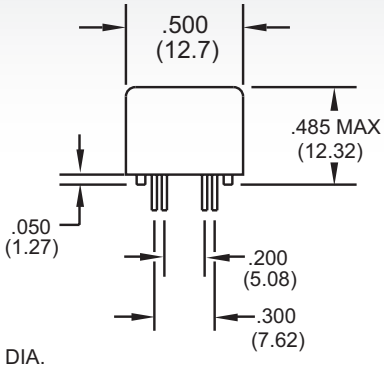
## 3500 Series Features

- Low Thermal EMF: < 10 µV through < 0.5 µV with 50 nV stability
- Patented Low Thermal Design. U.S. Patent #4,084,142
- Low power coils to ensure low thermal EMF
- High Insulation Resistance - $10^{12}\Omega$
- Control/Signal isolation of 1500 VDC
- High reliability, hermetically sealed contacts
- Form A, Dry or Hg Wetted contacts. High Dielectric Strength
- Epoxy coated steel shell provides magnetic shielding
- RoHS compliant (except for 3520)

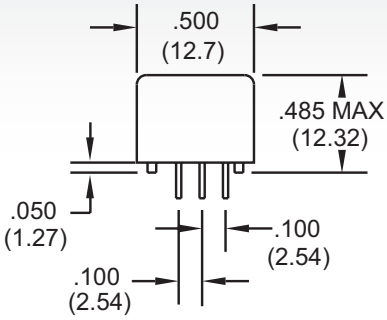
## DIMENSIONS

*in Inches (Millimeters)*




For Model
3501 & 3540




For Model
3502, 3520 & 3541

**Bottom View**

## Ordering Information

**Part Number** XXXX-XX-X1X

**Model Number**
3501 3502 3520 3540 3541

**Coil Voltage**
05=5 volts
12=12 volts

**Shielding Options**[2]
1=Electrostatic Shield

**Thermal EMF Rating**
See available ratings in specification table.
1=<10µV Hg Wetted Only
9=<5µV Dry or Wetted
8=<3µV Dry Only
7=<1µV Dry Only
5=<0.5µV Dry Only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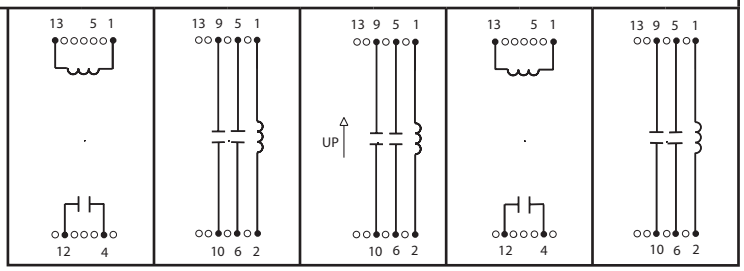
| MODEL NUMBER | | | 3501[2] | 3502[2] | 3520[2,3] | 3540[2] | 3541[2] |
|---|---|---|---|---|---|---|---|
| **Parameters** | **Test Conditions** | **Units** | **1 Form A** | **2 Form A** | **1 Form A** Hg Wetted | **1 Form A** High Voltage | **2 Form A** High Voltage |
| Thermal EMF Options | Measured after 5 minutes at nominal coil voltage (Refer to Reed Relay Technical Section for details) | µV | Individual<br><5µV<br><3µV<br><1µV<br><0.5µV | Differential<br><5µV<br><3µV<br><1µV<br><0.5µV | Differential<br><10µV<br><5µV<br>-<br>- | Individual<br><5µV<br><3µV<br>-<br>- | Differential<br><5µV<br><3µV<br>-<br>- |
| **COIL SPECS.** | | | | | | | |
| Nom. Coil Voltage | | VDC | 5 12 | 5 12 | 5 12 | 5 12 | 5 12 |
| Coil Resistance | +/- 10%, 25° C | Ω | 350 2000 | 350 2000 | 200 850 | 250 1500 | 250 1500 |
| Operate Voltage | Must Operate by | VDC - Max. | 3.8 9.0 | 3.8 9.0 | 3.8 9.0 | 3.8 9.0 | 3.8 9.0 |
| Release Voltage | Must Release by | VDC - Min. | 0.4 1.0 | 0.4 1.0 | 0.4 1.0 | 0.4 1.0 | 0.4 1.0 |
| **CONTACT RATINGS** | | | | | | | |
| Switching Voltage | Max DC/Peak AC Resist. | Volts | 200 | 200 | 500 | 500 | 500 |
| Switching Current | Max DC/Peak AC Resist. | Amps | 0.5 | 0.5 | 1.0 | 0.5 | 0.5 |
| Carry Current | Max DC/Peak AC Resist. | Amps | 1.5 | 1.5 | 2.0 | 2.0 | 2.0 |
| Contact Rating | Max DC/Peak AC Resist. | Watts | 10 | 10 | 28 | 10 | 10 |
| Life Expectancy-Typical[1] | Signal Level 1.0V, 10mA | x $10^6$ Ops. | 500 | 100 | 1000 | 100 | 100 |
| Static Contact Resistance (max. init.) | 50mV, 10mA | Ω | 0.200 | 0.100 | 0.050 | 0.200 | 0.100 |
| Dynamic Contact Resistance (max. init.) | 0.5V, 50mA at 100 Hz, 1.5 msec | Ω | 0.300 | 0.200 | 0.100 | 0.300 | 0.200 |
| **RELAY SPECIFICATIONS** | | | | | | | |
| Insulation Resistance (minimum) | Between all Isolated Pins at 100V, 25°C, 40% RH | Ω | $10^{12}$ | $10^{12}$ | $10^{12}$ | $10^{12}$ | $10^{12}$ |
| Capacitance - Typical Across Open Contacts | No Shield<br>Shield Guarding | pF<br>pF | 3.0<br>1.9 | 1.7<br>0.2 | 1.7<br>0.2 | 3.0<br>1.9 | 1.7<br>0.2 |
| Dielectric Strength (minimum) | Between Contacts<br>Contacts to Shield<br>Contacts/Shield to Coil | VDC/peak AC<br>VDC/peak AC<br>VDC/peak AC | 700<br>1000<br>1500 | 350<br>1000<br>1500 | 1000<br>1000<br>1500 | 1500<br>1000<br>1500 | 1500<br>1000<br>1500 |
| Operate Time - including bounce - Typical | At Nominal Coil Voltage, 30 Hz Square Wave | msec. | 0.75 | 0.75 | 2.0 | 1.0 | 1.0 |
| Release Time - Typical | | msec. | 0.1 | 0.1 | 1.0 | 0.2 | 0.2 |

Top View[4]:
Dot stamped on top of relay refers to pin #1 location
Grid = .1"x.1" (2.54mm x 2.54mm)




**Notes:**

[1] Consult factory for life expectancy at other switching loads.

[2] Models 3501 and 3540, optional electrostatic shield is tied to pin #5.
Models 3502, 3520 and 3541, optional electrostatic shield is tied to pin #13.

[3] Model 3520 has Hg wetted contacts - position sensitive, must be mounted within 30° of vertical plane. See schematic. Hg content per capsule: Form A, 0.04 grams.

**Environmental Ratings:**

*Storage Temp:* -35°C to +100°C; *Operating Temp:* -20°C to +85°C; *Solder Temp:* 270°C max; 10 sec. max
All electrical parameters measured at 25°C unless otherwise specified.
*Vibration:* 20 G's to 2000 Hz; *Shock:* 50 G's

Общество с ограниченной ответственностью «МосЧип» ИНН 7719860671 / КПП 771901001
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