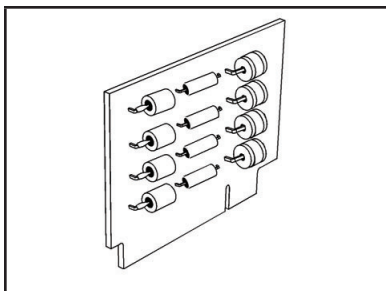
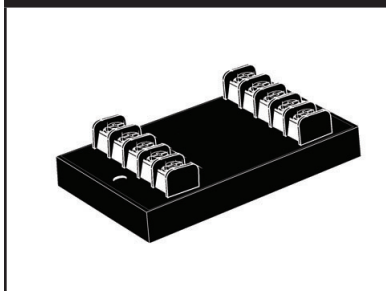


## TELEPHONE INTERFACE PROTECTOR



TEL185B



TEL185E

### DESCRIPTION

The TEL185B/E is a two-stage transient voltage protector that provides primary and secondary protection against lightning, inductive switching and electrostatic discharge (ESD) transient threats. The first stage diverts the transient current through the ground terminal return path and the second stage clamps the voltage to a safe level without interruption of service.

The TEL185B/E is designed to protect telcom lines from common mode (line-to-ground) transients. There are four (4) independent lines referenced to the ground terminals.

### FEATURES

- Compatible with IEC 61000-4-2 (ESD): Air - 15kV, Contact - 8kV
- Compatible with IEC 61000-4-4 (EFT): 40A - 5/50ns
- Compatible with IEC 61000-4-5 (Surge): 95A, 8/20 $\mu$ s, Level 4 (Line-Gnd) & 48A, Level 4 (Line-Line)
- Designed for  $\pm$ 185 Volt (Peak) Telephone Lines
- 4 Wire, Line-to-Ground Protection
- Permanent Two-Stage Protection
- Subnanosecond Response Time
- Automatic Reset - Does Not Interrupt Service
- Effective Against Lightning, Inductive Switching and ESD

### MECHANICAL CHARACTERISTICS

- Approximate Weight: 28 grams (TEL185B) & 142 grams (TEL185E)
- Flammability Rating UL 94V-0

### APPLICATIONS

- Telcom Equipment Connected to Telcom Lines
- Line Connected Modems and Fax Machines
- Remote Telephone Extensions
- Private Wire/Leased Phone Lines

## TYPICAL DEVICE CHARACTERISTICS

| MAXIMUM RATINGS @ 25°C Unless Otherwise Specified |           |            |              |
|---|-----------|------------|--------------|
| PARAMETER   | SYMBOL    | VALUE      | UNITS        |
| Peak Operating Line Voltage                       | $V_{OP}$  | ±185       | Volts        |
| Operating Line Current                            | $I_O$     | 200        | mA           |
| Transient Voltage                                 | -         | 20         | kV/Wire      |
| Transient Current - 8/20µs waveform               | -         | 10         | kA/Wire      |
| Transient Current - 8/20µs waveform               | -         | 40         | kA/Protector |
| Operating Temperature                             | $T_A$     | -55 to 100 | °C           |
| Storage Temperature                               | $T_{STG}$ | -55 to 100 | °C           |
| Response Time                                     | -         | < 1        | ns           |

| ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified |  |   |   |  |
|---|--|---|---|--|
| PART NUMBER   | MAXIMUM CLAMPING VOLTAGE (8/20µs)<br><br>@ ±500A<br>$V_C$<br>VOLTS | MAXIMUM LINE THROUGHPUT RESISTANCE<br><br>R<br>OHMS | MAXIMUM LEAKAGE CURRENT<br><br>@ ±185V <sub>OP</sub><br>$I_D$<br>µA | MAXIMUM CAPACITANCE<br><br>@ 0V, 1MHz<br>C<br>pF |
| TEL185B/E   | 330  | 12  | 5   | 800  |

## INSTALLATION INSTRUCTIONS

There are five (5) terminals on both the line and equipment side of the TEL185E - four telcom line terminals and one ground terminal. The ground terminal, as shown on the label, is connected internally. A single ground connection is sufficient. However, it is recommended that both ground connections be used for a lower impedance path to earth. This connection can be made through the green AC power ground wire or a known earth ground. The ground wire should be #14 stranded wire.

Incoming telcom lines are cut or disconnected from the equipment to insert the TEL185E product. The line side of the terminals are to be connected to outside telephone or telecommunication lines that carry the transient threats into the equipment to be protected. The equipment side of the terminals are to be connected to the equipment to be protected. The location of the product should be such that these wires are as short as possible. A #18 or 20 gauge wire can be used for these connections.

The TEL185B requires an edge connector interface for installation. A standard 15 position edge connector can be used. When mounting or wiring the connectors onto a printed circuit board, be sure that the correct terminals are soldered. The line side of the board connections are finger contacts 2 thru 5. The boards are conformal coated for limited protection against moisture.

ProTek's telcom line protector is designed with a short circuit failure mode to give maximum protection. A fuse, PTC, fusible link, or circuit breaker is recommended for each signal line on the input (line) side of the protector for those applications that require an open circuit failure mode.

**Caution:** A low DC resistance ground may not be indicative of a good lightning ground. Lightning contains a broad spectrum of frequencies - up to 1 MHz. A low impedance path to ground at the transient frequencies is necessary. A ground strap is recommended or a #6 AWG stranded wire. For wire lengths over 1.5 meters, there may be some excessive line to earth potential under severe thunderstorm conditions. For these applications, an additional protector may be necessary at the equipment interface.

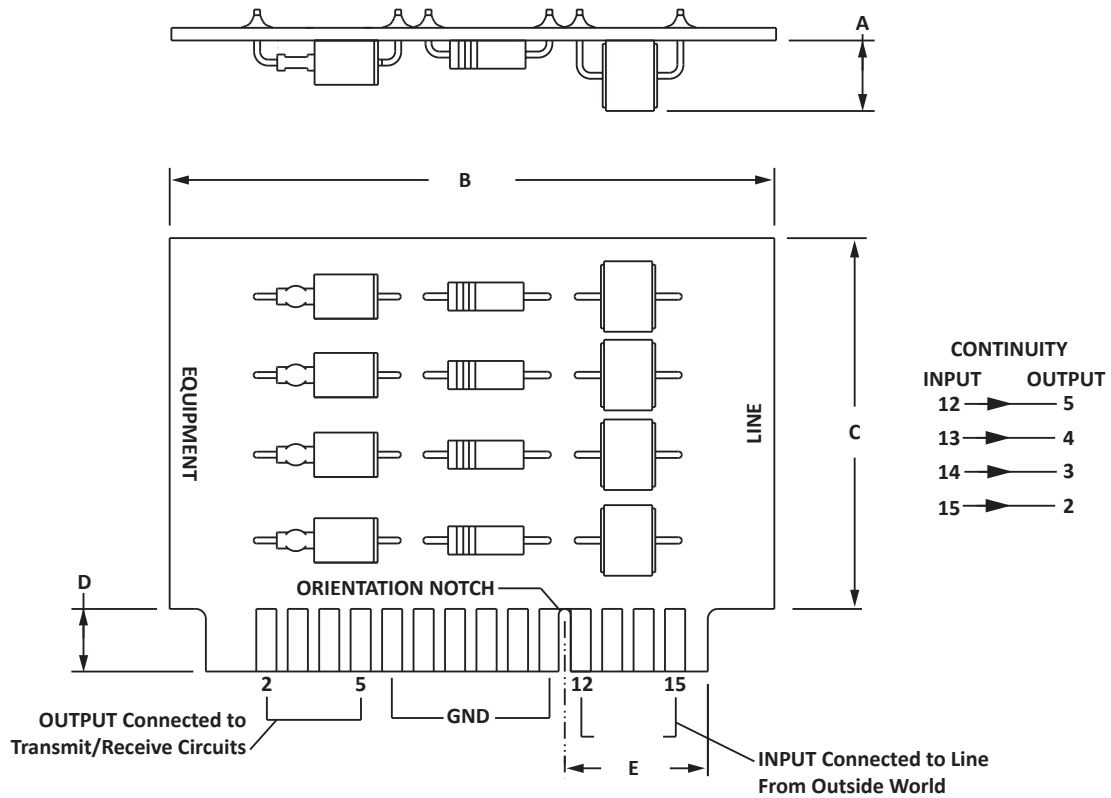
## PACKAGE INFORMATION

### TEL185B OUTLINE DIMENSIONS

| DIM | MILLIMETERS |      | INCHES |      |
|-----|-------------|------|--------|------|
|     | MIN         | MAX  | MIN    | MAX  |
| A   | -           | 12.7 | -      | 0.50 |
| B   | -           | 76.2 | -      | 3.0  |
| C   | -           | 48.2 | -      | 1.90 |
| D   | -           | 7.6  | -      | 0.30 |
| E   | -           | 17.8 | -      | 0.7  |

#### NOTES

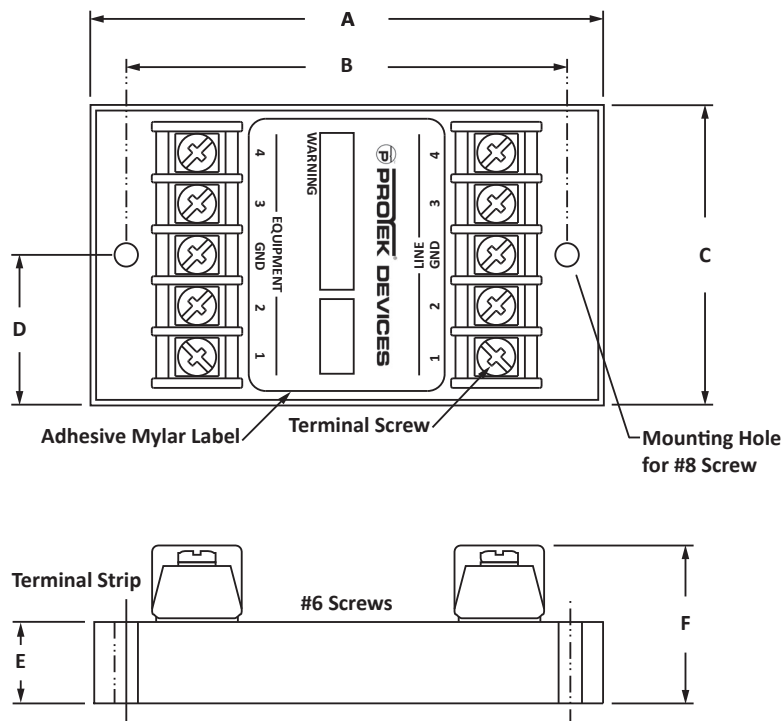
- I/O contacts spaced at 0.156" (3.96mm) centers.



## PACKAGE INFORMATION

### TEL185E OUTLINE DIMENSIONS

| DIM | MILLIMETERS |       | INCHES |       |
|-----|-------------|-------|--------|-------|
|     | MIN         | MAX   | MIN    | MAX   |
| A   | -           | 95.5  | -      | 3.8   |
| B   | 82.22       | 82.98 | 3.235  | 3.265 |
| C   | -           | 57.2  | -      | 2.25  |
| D   | -           | 30.2  | -      | 1.125 |
| E   | -           | 15.5  | -      | 0.61  |
| F   | -           | 30.2  | -      | 1.19  |



### ORDERING INFORMATION

| BASE PART NUMBER | MARKING  |
|------------------|--|
| TEL185B          | Logo, Date Code, Terminal Designations and Part Number |
| TEL185E          | Logo, Date Code, Terminal Designations and Part Number |

## COMPANY INFORMATION

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### COMPANY PROFILE

In business more than 20 years, ProTek Devices™ is a privately-held company located in Tempe, Arizona, that offers a product line of transient voltage suppressors (TVS); avalanche breakdown diodes; steering diode TVS arrays and other surge suppressor component products. These TVS devices protect electronic systems from the effects of lightning, electrostatic discharge (ESD), nuclear electromagnetic pulses (NEMP), inductive switching and EMI / RFI. ProTek Devices also offers high performance interface and linear products that include analog switches; multiplexers; LED drivers; audio control ICs; RF and related high frequency products. The analog devices work in a host of consumer; industrial; automotive and other applications.

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