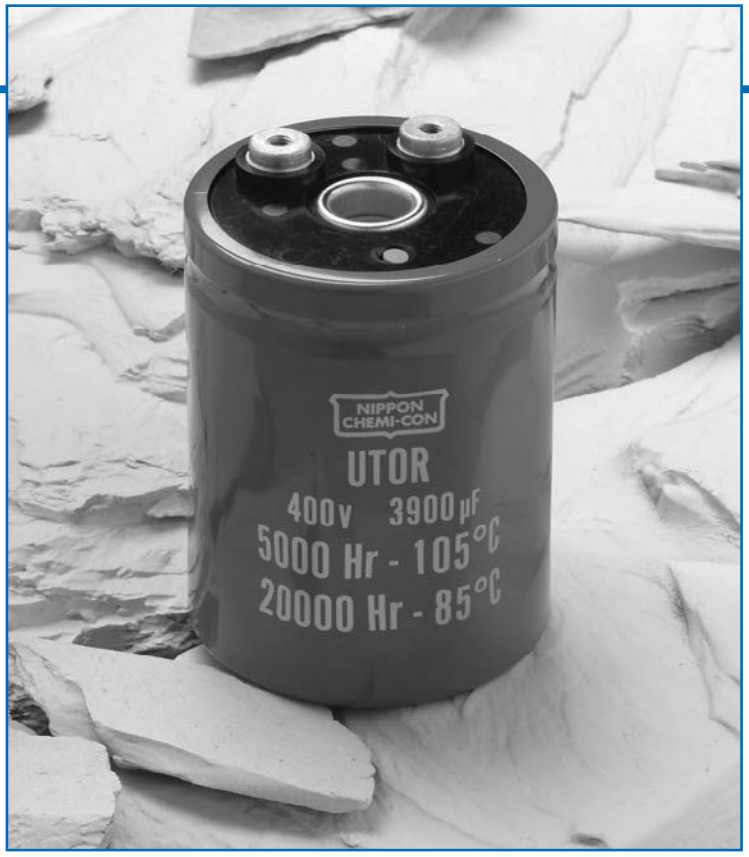
# UTOR Series

UNITED CHEMI-CON

- Large Can Toroidal Design
- Lowest Thermal Resistance
- Optimum Cooling Capability
- New Lower Profile Sizes
- New Heat-Sink Mounting Kit
- RoHS Compliant




The UTOR series now offers higher capacitance and ripple current per case size. The upgrade allows the inverter designer to significantly reduce the size, weight, and cost of the capacitor bank. Toroidal geometry is ideal for cooling by either forced air or by heat-sink with the use of a new mounting kit option. The heat-sink kit option provides optimum thermal transfer while maintaining electrical isolation. These capacitors have an endurance rating of 5,000 hours at 105℃ or 20,000 hours at 85℃ with the rated ripple current applied. The UTOR series represents the optimum cost per amp of ripple current for a screw terminal mounted electrolytic capacitor.

## Summary of Specifications

- **Screw terminals, high ripple Metric thread.**
- **Capacitance range: 680 to 10,000μF.**
- **Voltage range: 350 to 500VDC.**
- **Operating temperature range: −40°C to +105°C.**
- **Leakage current: 0.02CV(μA) or 5mA, whichever is smaller, after 5 minutes at +25°C.**
- **Standard capacitance tolerance: ±20%**
- **Nominal case size (D×L): D = 76mm (3.000”); L = 54mm (2.125”) to 168mm (6.625”).**
- **Rated lifetime: 5,000 hours at +105°C with rated ripple current applied.**

# UTOR Series

## UTOR Specifications - Screw Terminals

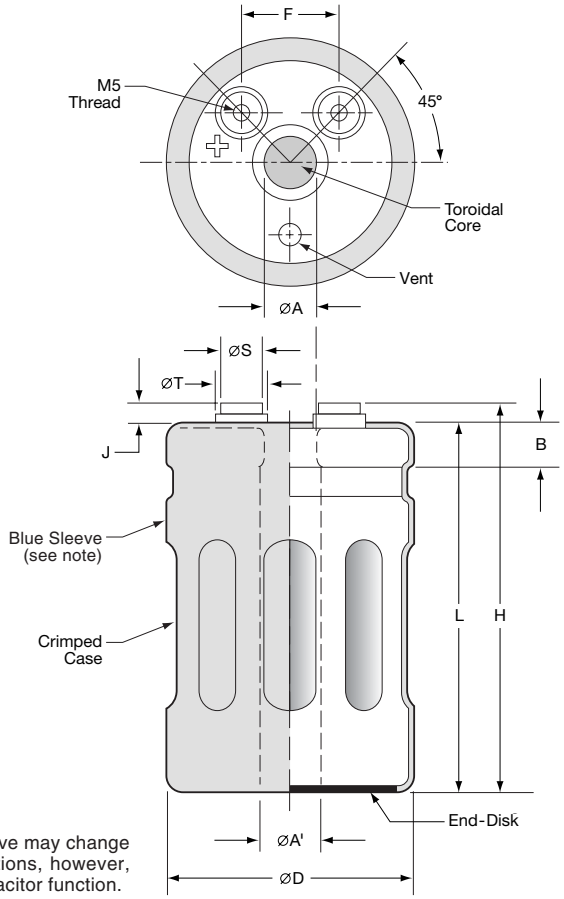
<table>
<tr><th>Item</th><th>Characteristics</th></tr>
<tr><td>Category Temperature Range</td><td>−40 to +105°C</td></tr>
<tr><td>Rated Voltage Range</td><td>350 to 500VDC</td></tr>
<tr><td>Capacitance Range</td><td>680 to 10,000μF at +25°C, 120Hz</td></tr>
<tr><td>Capacitance Tolerance</td><td>±20% (M) at +25°C, 120Hz</td></tr>
<tr><td>Leakage Current</td><td>I = 0.02CV (μA) or 5mA, whichever is smaller, after 5 minutes at +25°C.<br>Where I = Max. leakage current (μA), C = Nominal capacitance (μF) and V = Rated voltage (V)</td></tr>
<tr><td>Rated Ripple Current Multipliers</td><td>Ambient Temperature (°C)
<table>
<tr><td>+45°C</td><td>+65°C</td><td>+85°C</td><td>+105°C</td></tr>
<tr><td>2.45</td><td>2.12</td><td>1.73</td><td>1.00</td></tr>
</table>
Cooling
<table>
<tr><td rowspan="2">Mounting Type</td><td colspan="3">Air Velocity</td></tr>
<tr><td>Static</td><td>1.0m/s</td><td>2.0m/s</td></tr>
<tr><td>Clamp Mount</td><td>1.00</td><td>1.20</td><td>1.30</td></tr>
<tr><td>Heat-Sink (air cooled)</td><td>1.20</td><td>1.45</td><td>1.55</td></tr>
<tr><td>Heat-Sink (fluid cooled)</td><td>1.35</td><td>1.65</td><td>1.75</td></tr>
</table></td></tr>
<tr><td>Endurance<br>(Load Life)</td><td>The following specifications shall be satisfied when the capacitors are restored to +25°C after subjecting them to DC voltage for 5,000 hours at +105°C with the rated ripple current applied. The sum of the DC voltage and peak AC voltage must not exceed the full rated voltage of the capacitors.<br>Capacitance change : ≤±20% of initial measured value<br>ESR change : ≤ 200% of initial specified value<br>Leakage current : ≤ initial specified value</td></tr>
<tr><td>Shelf Test</td><td>The following specifications shall be satisfied when the capacitors are restored to +25°C after exposing them for 1,000 hours at +105°C without voltage applied. The rated voltage shall be applied to the capacitors for a minimum of 30 minutes, at least 24 hours and not more than 48 hours before the measurements.<br>Capacitance change : ≤±20% of initial measured value<br>ESR change : ≤ 200% of initial specified value<br>Leakage current : ≤ initial specified value</td></tr>
<tr><td>Vibration Rating</td><td>10-55Hz, 10g sinusoidal in three axis, 2 hours per axis.</td></tr>
<tr><td>Maximum Tightening Torque</td><td>
<table>
<tr><td rowspan="2">Terminal Code</td><td rowspan="2">Thread Size</td><td colspan="2">3 Threads Engaged</td><td colspan="2">6 Threads Engaged</td></tr>
<tr><td>in·lb</td><td>N·m</td><td>in·lb</td><td>N·m</td></tr>
<tr><td>CT</td><td>M5x0.8</td><td>18.0</td><td>2.0</td><td>28.5</td><td>3.2</td></tr>
</table></td></tr>
<tr><td>Typical Inductance</td><td>25nH at 1MHz</td></tr>
<tr><td>Custom Designs</td><td>Custom CV values per case size may be available upon request.<br>Contact appropriate representative with specific requirements.</td></tr>
</table>

# UTOR Series

## Diagram of Dimensions - Screw Terminals

### Toroidal Large Can/Screw Terminals

Unit: mm and inches




Note:
In some cases, the color of the sleeve may change slightly due to the operating conditions, however, the discoloration will not impair capacitor function.

### Terminal Specifications in Millimeters

| Terminal Code | Thread Size | Minimum Thread Depth | J ±0.50 | ØS ±0.25 | ØT ±0.25 |
|---|---|---|---|---|---|
| CT | M5x0.8 | 10.5 | 7.0 | 13.0 | 18.5 |

### Terminal Specifications in Inches

| Terminal Code | Thread Size | Minimum Thread Depth | J ±0.020 | ØS ±0.010 | ØT ±0.010 |
|---|---|---|---|---|---|
| CT | M5x0.8 | 0.413 | 0.276 | 0.512 | 0.728 |

### Case Dimensions in Millimeters

| ØA ±0.20 | ØA' ±0.30 | B ±0.5 | F ±0.25 |
|---|---|---|---|
| 16.3 | 18.9 | 9.5 | 31.8 |

| Case Size Code | ØD +2.0 | L +2.0 | H ±1.0 |
|---|---|---|---|
| E54 | 76 | 54 | 61 |
| E67 | 76 | 67 | 74 |
| E79 | 76 | 79 | 86 |
| E92 | 76 | 92 | 99 |
| EA5 | 76 | 105 | 112 |
| EB7 | 76 | 117 | 124 |
| ED0 | 76 | 130 | 137 |
| EE3 | 76 | 143 | 150 |
| EF5 | 76 | 155 | 162 |
| EG8 | 76 | 168 | 175 |

### Case Dimensions in Inches

| ØA ±0.008 | ØA' ±0.012 | B ±0.020 | F ±0.010 |
|---|---|---|---|
| 0.642 | 0.744 | 0.374 | 1.250 |

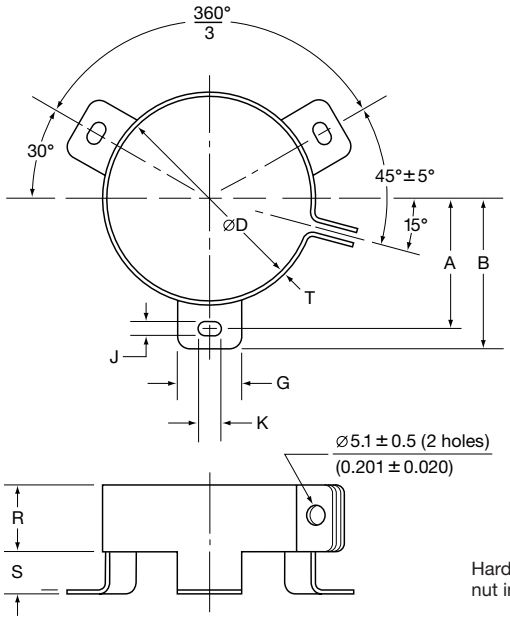
| Case Size Code | ØD +0.080 | L +0.080 | H ±0.040 |
|---|---|---|---|
| E54 | 3.000 | 2.125 | 2.402 |
| E67 | 3.000 | 2.625 | 2.913 |
| E79 | 3.000 | 3.125 | 3.386 |
| E92 | 3.000 | 3.625 | 3.898 |
| EA5 | 3.000 | 4.125 | 4.409 |
| EB7 | 3.000 | 4.625 | 4.882 |
| ED0 | 3.000 | 5.125 | 5.394 |
| EE3 | 3.000 | 5.625 | 5.906 |
| EF5 | 3.000 | 6.125 | 6.378 |
| EG8 | 3.000 | 6.625 | 6.890 |

# UTOR Series

## Mounting Hardware - Screw Terminals

### Type C: Three-Footed Clamp

Unit: mm (inches)




Hardware: Screw, washer and hexagon nut included with each clamp.

### Type C: Clamp Specifications

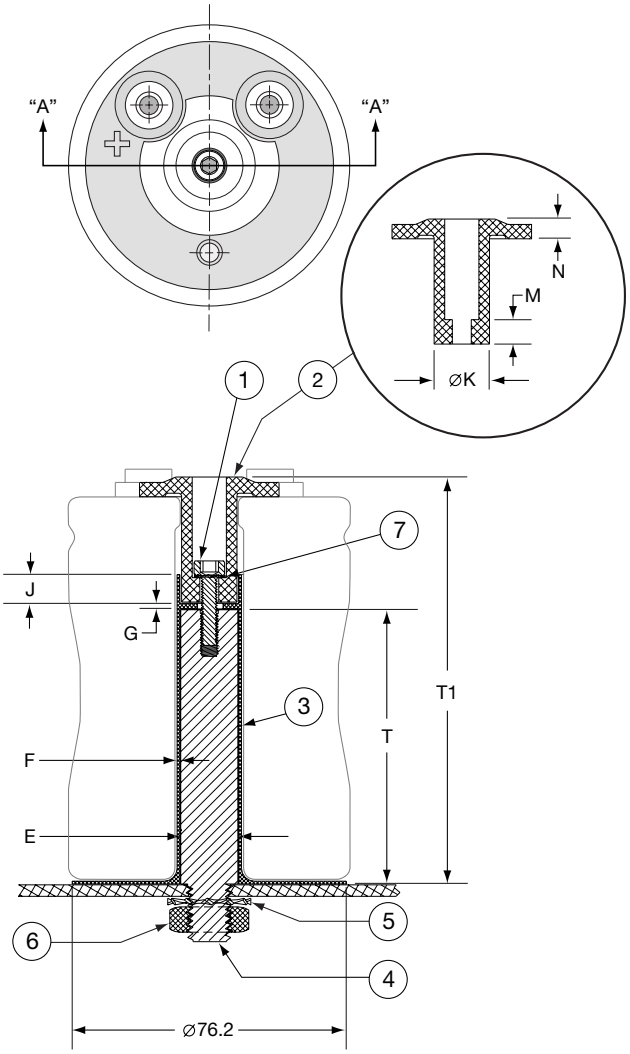
| Mounting Code | Case ØD | A ±1.0 (0.040) | B ±1.0 (0.040) | G ±1.0 (0.040) | J ±0.5 (0.020) | K ±0.5 (0.020) | R ±1.0 (0.040) | S ±1.0 (0.040) | T ±0.5 (0.020) |
|---|---|---|---|---|---|---|---|---|---|
| C | 76.2 (3.000) | 44.5 (1.750) | 49.2 (1.937) | 13.3 (0.524) | 4.5 (0.177) | 7.1 (0.280) | 19.1 (0.751) | 9.5 (0.374) | 1.0 (0.040) |

# UTOR Series

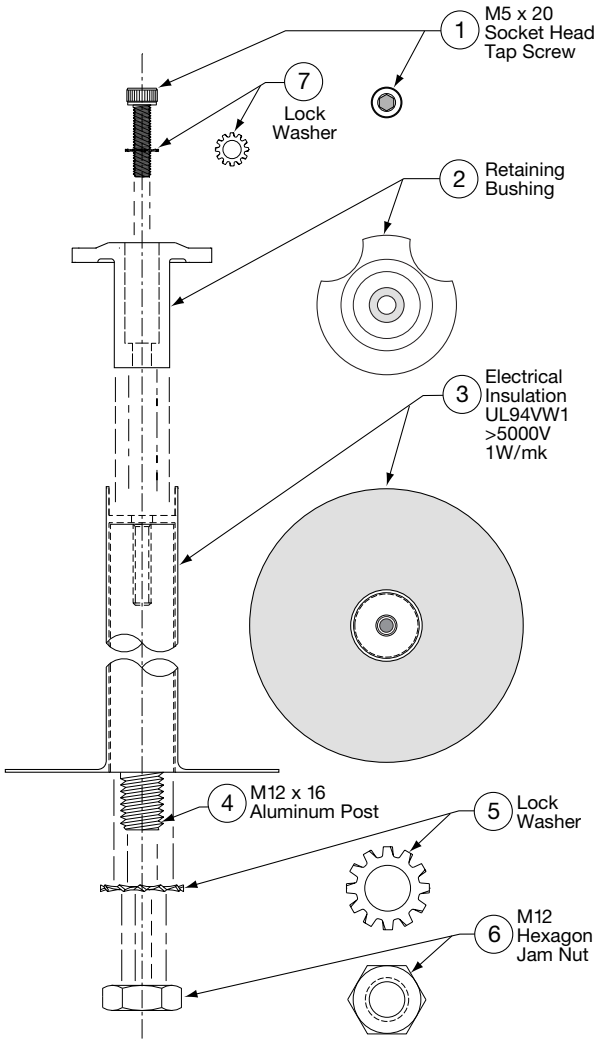
## Mounting Hardware - Screw Terminals

### Type H: Heat Sink Mounting Kit

Unit: mm (inches)




SECTION "A" – "A"




KIT ASSEMBLY TOP VIEWS

### Type H: Heat Sink Mounting Kit Dimensions

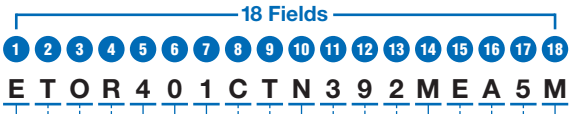
| Mounting Code | Case Size Code | T ±0.2 (0.008) | T1 ±0.5 (0.020) |
|---|---|---|---|
| H | E54 | 35 (1.378) | 58 (2.280) |
| H | E67 | 35 (1.378) | 71 (2.780) |
| H | E79 | 60 (2.362) | 83 (3.280) |
| H | E92 | 60 (2.362) | 96 (3.780) |
| H | EA5 | 60 (2.362) | 109 (4.280) |
| H | EB7 | 60 (2.362) | 121 (4.780) |
| H | ED0 | 111 (4.370) | 134 (5.280) |
| H | EE3 | 111 (4.370) | 147 (5.780) |
| H | EF5 | 111 (4.370) | 160 (6.280) |
| H | EG8 | 111 (4.370) | 172 (6.780) |

| Dimension | Millimeters | Inches |
|---|---|---|
| E | 18.6 Max. | 0.732 Max. |
| F | 0.56±0.05 | 0.022±0.002 |
| G | 2.00±0.13 | 0.080±0.005 |
| J | 8.00±0.13 | 0.315±0.005 |
| ØK | 15.24±0.20 | 0.600±0.008 |
| M | 6.76±0.13 | 0.266±0.005 |
| N | 5.49±0.13 | 0.216±0.005 |

# UTOR Series

## Part Numbering System for UTOR Series

When ordering, always specify complete 18-field global part number.




**9 Supplement Code.** Field 18.
M = PVC sleeve with end disk.
C = PET sleeve with end disk.

**8 Case Size.** Fields 15, 16 and 17.
The single letter diameter code is inserted in field 15.
E = Ø76.2mm (Ø3.000")

The double character length code is inserted in fields 16 and 17. For lengths ≤99mm, insert the actual length rounded to nearest millimeter. For lengths of 100mm or more, insert the appropriate alpha numeric code as indicated below.
54 = 54mm (2.125")
67 = 67mm (2.625")
79 = 79mm (3.125")
92 = 92mm (3.625")
A5 = 105mm (4.125")
B7 = 117mm (4.625")
D0 = 130mm (5.125")
E3 = 143mm (5.625")
F5 = 155mm (6.125")
G8 = 168mm (6.625")

**7 Capacitance Tolerance.** Field 14.
M = ±20%

**6 Capacitance.** Fields 11, 12 and 13.
Expressed in Microfarads. The first two digits are significant figures inserted in fields 11 and 12, and the third digit inserted in field 13 indicates the number of zeros for capacitance of 10μF or more. R indicates the decimal point for capacitance less than 10μF (e.g. 3R9 = 3.9μF; 390 = 39μF; 391 = 390μF; 392 = 3,900μF; 393 = 39,000μF).

**5 Mounting Hardware.** Field 10.
N = None.
C = Three-footed clamp.
H = Heat sink kit.

**4 Terminal Type.** Fields 8 and 9.
CT = M5x0.8 screw thread.

**3 DC Rated Voltage.** Fields 5, 6 and 7.
Expressed in Volts. The first two digits are significant figures inserted in fields 5 and 6, and the third digit inserted in field 7 indicates the number of zeros for rated voltage of 10VDC or more. R indicates the decimal point for rated voltage less than 10VDC (e.g. 4R0 = 4.0VDC; 400 = 40VDC; 401 = 400VDC).

**2 Series Name.** Fields 2, 3 and 4.
Enter the 3-letter/digit series name in fields 2, 3 and 4. If the series name is only 2 letters/digits, place a dash in field 4. For a series name with more than 3 letters/digits, refer to the individual series for the appropriate 3-field series name.

**1 Capacitor Type.** Field 1.
Aluminum Electrolytic Capacitor (Polar).

# UTOR Series

## Standard Voltage Ratings - Screw Terminals

| Rated Voltage (WVDC) | Capacitance (μF) | Global Part Number† | Nominal Case Size* D×L (mm) | Case Size Code | Maximum ESR (mΩ) at +25°C,120Hz | Rated Ripple Current (A rms) at +105°C | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | 120Hz | 300Hz | >3kHz |
| **350 Volts 400 Volts Surge** | 1,800 | ETOR351CTN182ME54M | 76 × 54 | E54 | 44 | 11.8 | 14.1 | 16.5 |
| | 2,700 | ETOR351CTN272ME67M | 76 × 67 | E67 | 30 | 15.4 | 18.5 | 21.6 |
| | 3,300 | ETOR351CTN332ME79M | 76 × 79 | E79 | 24 | 17.1 | 20.5 | 23.9 |
| | 4,700 | ETOR351CTN472ME92M | 76 × 92 | E92 | 17 | 21.6 | 26.0 | 30.3 |
| | 5,600 | ETOR351CTN562MEA5M | 76 × 105 | EA5 | 14 | 24.9 | 29.9 | 34.9 |
| | 6,800 | ETOR351CTN682MED0M | 76 × 130 | ED0 | 12 | 30.2 | 36.2 | 42.2 |
| | 8,200 | ETOR351CTN822MEE3M | 76 × 143 | EE3 | 10 | 34.5 | 41.4 | 48.3 |
| | 10,000 | ETOR351CTN103MEG8M | 76 × 168 | EG8 | 8 | 41.0 | 49.2 | 57.4 |
| **400 Volts 450 Volts Surge** | 1,500 | ETOR401CTN152ME54M | 76 × 54 | E54 | 53 | 10.7 | 12.9 | 15.0 |
| | 2,200 | ETOR401CTN222ME67M | 76 × 67 | E67 | 36 | 13.9 | 16.7 | 19.5 |
| | 2,700 | ETOR401CTN272ME79M | 76 × 79 | E79 | 30 | 15.4 | 18.5 | 21.6 |
| | 3,300 | ETOR401CTN332ME92M | 76 × 92 | E92 | 24 | 18.1 | 21.8 | 25.4 |
| | 3,900 | ETOR401CTN392MEA5M | 76 × 105 | EA5 | 21 | 20.8 | 25.0 | 29.1 |
| | 4,700 | ETOR401CTN472MEB7M | 76 × 117 | EB7 | 17 | 24.0 | 28.8 | 33.6 |
| | 5,600 | ETOR401CTN562MED0M | 76 × 130 | ED0 | 14 | 27.4 | 32.9 | 38.3 |
| | 6,800 | ETOR401CTN682MEE3M | 76 × 143 | EE3 | 12 | 31.4 | 37.7 | 44.0 |
| | 8,200 | ETOR401CTN822MEG8M | 76 × 168 | EG8 | 10 | 37.1 | 44.5 | 52.0 |
| **420 Volts 470 Volts Surge** | 1,200 | ETOR421CTN122ME54M | 76 × 54 | E54 | 89 | 9.3 | 11.1 | 13.0 |
| | 1,800 | ETOR421CTN182ME67M | 76 × 67 | E67 | 59 | 12.2 | 14.6 | 17.1 |
| | 2,200 | ETOR421CTN222ME79M | 76 × 79 | E79 | 40 | 14.9 | 17.9 | 20.9 |
| | 3,300 | ETOR421CTN332ME92M | 76 × 92 | E92 | 32 | 17.5 | 21.0 | 24.5 |
| | 3,900 | ETOR421CTN392MEA5M | 76 × 105 | EA5 | 27 | 20.1 | 24.1 | 28.2 |
| | 4,700 | ETOR421CTN472MED0M | 76 × 130 | ED0 | 23 | 24.2 | 29.1 | 33.9 |
| | 5,600 | ETOR421CTN562MEE3M | 76 × 143 | EE3 | 19 | 27.6 | 33.1 | 38.6 |
| | 6,800 | ETOR421CTN682MEG8M | 76 × 168 | EG8 | 16 | 32.7 | 39.2 | 45.7 |
| **450 Volts 500 Volts Surge** | 1,000 | ETOR451CTN102ME54M | 76 × 54 | E54 | 89 | 9.3 | 11.1 | 13.0 |
| | 1,500 | ETOR451CTN152ME67M | 76 × 67 | E67 | 59 | 12.2 | 14.6 | 17.1 |
| | 2,200 | ETOR451CTN222ME79M | 76 × 79 | E79 | 48 | 13.5 | 16.2 | 18.9 |
| | 2,700 | ETOR451CTN272ME92M | 76 × 92 | E92 | 40 | 15.9 | 19.0 | 22.2 |
| | 3,300 | ETOR451CTN332MEA5M | 76 × 105 | EA5 | 32 | 18.5 | 22.2 | 25.9 |
| | 3,900 | ETOR451CTN392MEB7M | 76 × 117 | EB7 | 27 | 21.1 | 25.3 | 29.6 |
| | 4,700 | ETOR451CTN472MED0M | 76 × 130 | ED0 | 23 | 24.2 | 29.1 | 33.9 |
| | 5,600 | ETOR451CTN562MEF5M | 76 × 155 | EF5 | 19 | 28.6 | 34.3 | 40.1 |
| **500 Volts 550 Volts Surge** | 680 | ETOR501CTN681ME54M | 76 × 54 | E54 | 206 | 6.5 | 7.8 | 9.1 |
| | 1,000 | ETOR501CTN102ME67M | 76 × 67 | E67 | 140 | 8.4 | 10.1 | 11.8 |
| | 1,500 | ETOR501CTN152ME79M | 76 × 79 | E79 | 93 | 10.3 | 12.4 | 14.4 |
| | 1,800 | ETOR501CTN182ME92M | 76 × 92 | E92 | 78 | 12.0 | 14.4 | 16.8 |
| | 2,200 | ETOR501CTN222MEA5M | 76 × 105 | EA5 | 64 | 14.0 | 16.8 | 19.6 |
| | 2,700 | ETOR501CTN272MEB7M | 76 × 117 | EB7 | 52 | 16.3 | 19.5 | 22.8 |
| | 3,300 | ETOR501CTN332MEE3M | 76 × 143 | EE3 | 42 | 19.6 | 23.5 | 27.4 |
| | 3,900 | ETOR501CTN392MEG8M | 76 × 168 | EG8 | 36 | 22.1 | 26.5 | 31.0 |

**†For mounting and construction options, refer to the part numbering system for descriptions and codes.**
*** Refer to diagram of dimensions for detailed case size specifications.**