

Type PC Power Conversion Capacitors



Type PC capacitors are designed to meet the demands of filter applications rich in system total harmonic distortion (THD). This series has a dual protection system utilizing self healing metallized polypropylene and a mechanical pressure interrupter to ensure a safe open circuit mode in the event of overload or end of life. (*)

Highlights

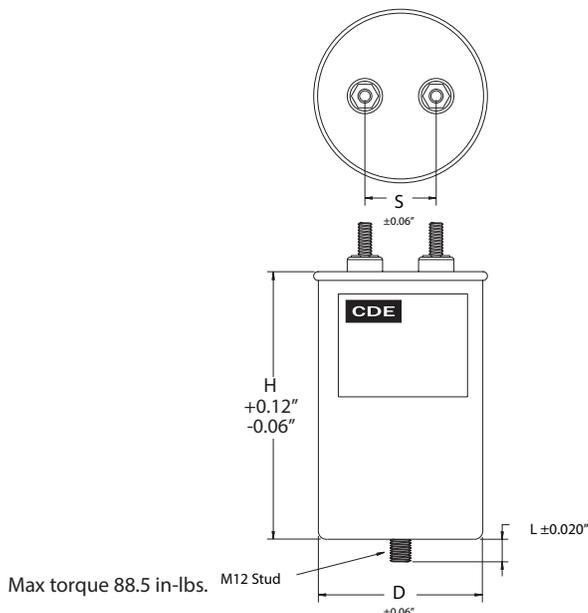
- Uninterruptable power supplies (UPS)
- AC Tuned filters (harmonic reduction)
- AC Input filtering
- Line conditioning
- Noise suppression
- Variable speed drives
- Wind turbine motoring
- cULus recognized File Number E71645

Specifications

| | |
|---------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Capacitance Range | 20 μ F to 125 μ F |
| Capacitance Tolerance | \pm 5% Standard, \pm 10%, \pm 6 and \pm 3% available |
| Rated Voltage | 300 Vac, 500 Vac, 700 Vac |
| Operating Temperature Range | -40 $^{\circ}$ C to +70 $^{\circ}$ C, 85 $^{\circ}$ C heavy duty option available |
| Maximum Permissible Voltage (Vmax) | 110% of rated rms voltage 120% of rated peak voltage ($1.2 \times \sqrt{2} \times V_{rms}$) |
| Maximum Permissible Current (Imax) | 135% of nominal rms current based on the combined effects of harmonics, over voltages capacitances and tolerances |
| Terminations | M6x1 Threaded tinplated brass terminals standard, other sizes available |
| Maximum Rated Current (Irms) | 85A (Limited by the terminals) |
| Service Life Objective | 60,000 h w/94% survival rate |
| FIT (Failure In Time) | $\leq 300 \times 10^9$ component h |
| Maximum Short Circuit Current (available fault current) | 10 kA (according to UL 810) |
| Notes | Additional ratings, sizes, terminals and encapsulation type available upon request. Case diameters available up to 4.57", low-loss / low ESR option and rack mounting solution available. |

Regulatory Information

Outline Drawing



| Construction Details | |
|----------------------|-------------------------------------------------------------------|
| Case Material | Extruded aluminum with steel or aluminum cover |
| Encapsulation | Environmentally safe dielectric fluid (Dry construction optional) |

| Case Diameter (in) | S Dimension (in) | L Dimension (in) |
|--------------------|------------------|------------------|
| 2.50 | 1.250 | 0.487 |
| 3.00 | 1.375 | 0.630 |
| 3.50 | 1.375 | 0.630 |

(*) The capacitor's safety pressure interrupter is designed to disconnect the capacitor element as the cover expands upward due to gas pressure build up. Catastrophic failure may result if movement of the cover and or terminals are restricted. Rigid bus bars are not recommended as they may restrict movement of the cover or terminals. Customers are advised to provide at least 0.5" clearance above the cover to allow for its expansion.

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Part Numbering System

| PC | S | T | 30 | A | 150 | J | 569 | S |
|--------|----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-------------------------------------------------------------------|-------------------|---------------|-------------------------------------------------------------------------|-----------|
| Series | Type | Base Size | Voltage (Vrms) | Case Material | Capacitance | Tolerance (%) | Case Height (in) | Terminals |
| PC | S = Standard Cell H = Harmonic Rated Cell | T = 2½" Round (63.5 mm) V = 3" Round (76 mm) X = 3.5" Round (88 mm) W = 3.35" Round (85 mm) Y = 3.94" Round (100 mm) Z = 4.57" Round (116 mm) | 30 = 300 50 = 500 70 = 700 | A = Aluminum case and cover T = Aluminum case w/steel cover | Capacitance value | J = ±5% | Expressed as 3 digit number rounded and displayed without decimal point | S = Studs |

Ratings

| CDE Catalog Number | Cn (µF) | Rs (Ω) | E.S.L. (nH) | I peak (A) | dV/dT (V/µs) | Rth (hs) (°C/W) | Max Power (W) | | | Case Diameter | | Case Height | | SA (in²) |
|---------------------------|---------|--------|-------------|------------|--------------|-----------------|---------------|-------|-------|---------------|------|-------------|------|----------|
| | | | | | | | 25 °C | 50 °C | 70 °C | (in) | (mm) | (in) | (mm) | |
| 300 Vrms 424 Vpeak | | | | | | | | | | | | | | |
| PCST30A50J291S | 50 | 0.0028 | 44 | 2127 | 43 | 8.63 | 7.0 | 4.1 | 1.7 | 2.5 | 63.5 | 2.91 | 74 | 33 |
| PCST30A75J391S | 75 | 0.0035 | 75 | 2040 | 27 | 6.95 | 8.6 | 5.0 | 2.2 | 2.5 | 63.5 | 3.91 | 99 | 41 |
| PCST30A100J475S | 100 | 0.0044 | 102 | 1926 | 19 | 5.97 | 10.0 | 5.9 | 2.5 | 2.5 | 63.5 | 4.75 | 121 | 47 |
| PCSV30A125J475S | 125 | 0.0036 | 102 | 2908 | 23 | 4.78 | 12.6 | 7.3 | 3.1 | 3.0 | 76.0 | 4.75 | 121 | 59 |
| 500 Vrms 707 Vpeak | | | | | | | | | | | | | | |
| PCST50T40J475S | 40 | 0.0047 | 102 | 1252 | 31 | 5.97 | 10.0 | 5.9 | 2.5 | 2.5 | 63.5 | 4.75 | 121 | 47 |
| PCSV50T60J475S | 60 | 0.0037 | 102 | 1877 | 31 | 4.78 | 12.6 | 7.3 | 3.1 | 3.0 | 76.0 | 4.75 | 121 | 59 |
| PCSV50T80J475S | 80 | 0.0033 | 102 | 2503 | 31 | 4.78 | 12.6 | 7.3 | 3.1 | 3.0 | 76.0 | 4.75 | 121 | 59 |
| PCSV50T110J572S | 110 | 0.0039 | 133 | 2522 | 23 | 4.13 | 14.5 | 8.5 | 3.6 | 3.0 | 76.0 | 5.72 | 145 | 68 |
| PCSV50T125J572S | 125 | 0.0037 | 133 | 2865 | 23 | 3.42 | 17.5 | 10.2 | 4.4 | 3.5 | 88.0 | 5.72 | 145 | 82 |
| 700 Vrms 990 Vpeak | | | | | | | | | | | | | | |
| PCST70T20J475S | 20 | 0.0060 | 102 | 883 | 44 | 5.97 | 10.0 | 5.9 | 2.5 | 2.5 | 63.5 | 4.75 | 121 | 47 |
| PCST70T30J572S | 30 | 0.0071 | 133 | 970 | 32 | 5.14 | 11.7 | 6.8 | 2.9 | 2.5 | 63.5 | 5.72 | 145 | 55 |
| PCST70T40J616S | 40 | 0.0083 | 147 | 1020 | 26 | 4.83 | 12.4 | 7.2 | 3.1 | 2.5 | 63.5 | 6.16 | 157 | 58 |
| PCSV70T50J616S | 50 | 0.0071 | 147 | 1275 | 26 | 3.89 | 15.4 | 9.0 | 3.9 | 3.0 | 76.0 | 6.16 | 157 | 72 |
| PCSV70T60J616S | 60 | 0.0062 | 147 | 1530 | 26 | 3.89 | 15.4 | 9.0 | 3.9 | 3.0 | 76.0 | 6.16 | 157 | 72 |

Performance Notes

I max: Maximum rms current value for continuous operation (A)

I peak: Maximum current amplitude for continuous operation (A)

Rs: Equivalent series resistance – Ohmic resistances (Ohm)

Dielectric Dissipation Factor: $\tan \delta$ (Polypropylene: 0.0002)

T_{hs}: Hot spot temperature within the capacitor: $T_{hs} = T_a + (P_{total} \cdot 280 / SA)$

T_a: Ambient temperature

R_{th}: Thermal resistance: °C/ Watt, indicates hot spot temperature rise due to power dissipation losses

P_{max}: Maximum power dissipation: $P_{max} = (85 °C - T_a) / R_{th}$ (Watts)

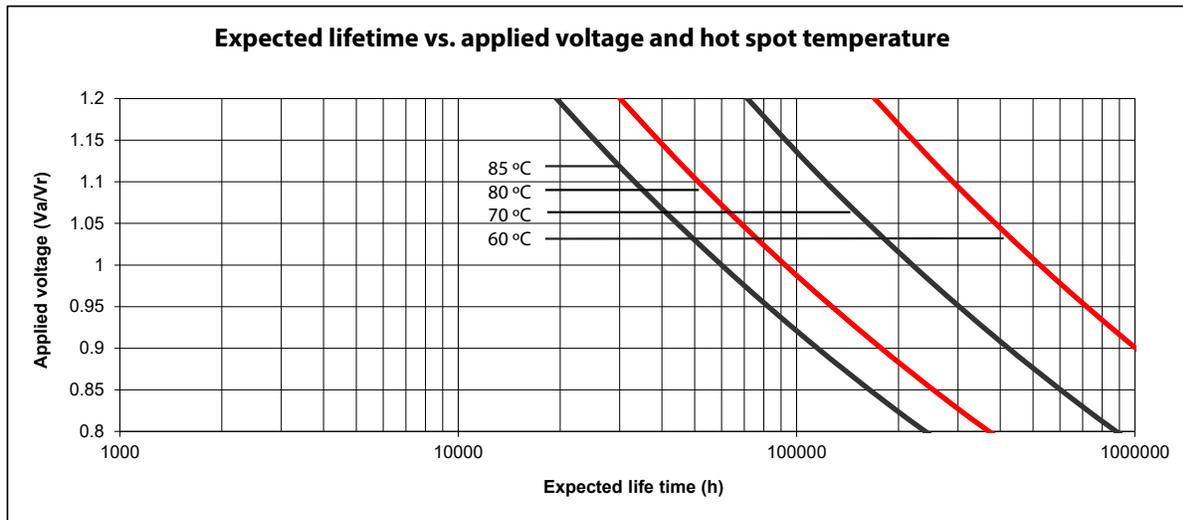
P_{Total}: Total Power generated by Dielectric and Ohmic Losses: $P = V_{peak}^2 \cdot C \cdot TT \cdot F \cdot DF$ (Watts) given Voltage

$P = I^2 \cdot [R_s + (X_C \cdot DF)]$ (Watts) given Current

Where $P_{Total} = P_{Fund} + P_{Harm1} + P_{Harm2} + \dots + P_{Harm\infty}$

Design life: 60,000 hours 94% survival T_{hs} : 85 °C

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