

Surge Protection for AC Rotating Machines

Capacitors, TRANQUELL™ Arresters
and Motor Surge Equipment



Product Selection & Application Guide

GE Surge Protection Capacitors & Equipment

Protective capacitors offer surge protection for AC generators, synchronous condensers and large motors. Surge capacitors protect the winding insulation by reducing the steepness of wave fronts applied to or reflected within the machine windings. Dielektrol™ is the GE non-PCB power capacitor dielectric fluid developed to provide an environmentally acceptable product with superior performance and reliability. GE protective capacitors contain an all film dielectric system and hermetically sealed bushings, which permit mounting these capacitors upright or on their side.

GE TRANQUELL Arresters when utilized with GE Surge capacitors provide additional security for AC rotating machines. Arresters provide a reduction of lightning stresses by limiting the amplitude of applied impulse waves or reflections within the machine windings.

GE provides the complete assembly solution suitable for indoor or outdoor applications. GE can also provide individual capacitor(s) and arresters for individual application requirements.

18L Series Protective Capacitors

38F Series Motor Surge Protection



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Introduction – Protective Capacitors

Dielektrol Non-PCB Protective Capacitors with Internal Discharge Resistors Indoor or Outdoor Application

Product Description, Features & Benefits

- Surge protection for AC generators, synchronous condensers and large motors
- Time proven GE dielectric system
- Dielektrol Non-PCB insulating fluid
- Provides turn-to-turn insulation protection by reducing steepness of wave fronts applied to or reflected within the machine
- Used in combination with TRANQUELL GE station arresters for optimum protection
- Protective capacitors contain a film dielectric and hermetically sealed bushings, which permit mounting of the capacitors in an upright position or on their side¹
- Altitude 0 to 15000²

Note 1: Upside down mounting is allowed for 18L0060WH, 18L0061WH and 18L0062WH only. See product table for rating details.

Note 2: See Altitude de-rating table for de-rating of application voltage.

Product Table

| Voltage Rating rms Volts L-L * | Maximum Voltage rms Volts L-L | Catalog number | Poles per Unit | Microfarads per Pole | Approximate net weight | | Drawing |
|-----------------------------------|----------------------------------|------------------------|----------------|-------------------------|------------------------|------|---------|
| | | | | | lbs | kg | |
| 0 - 650 | 715 | 9L18BBB301 | 3 | 1.0 | 4 | 18 | A |
| 2400 | 2640 | 18L0015WH | 3 | 0.5 | 36 | 16.5 | 4 |
| 4160 | 4576 | 18L0015WH | 3 | 0.5 | 36 | 16.5 | 4 |
| 6900 | 7590 | 18L0019WH | 1 | 0.5 | 29 | 13 | 1 |
| 7200 | 7960 | 18L0065WH | 3 | 0.5 | 35 | 16 | 5 |
| 13800 | 15180 | 18L0009WH | 1 | 0.25 | 33 | 15 | 2 |
| 13800 | 15180 | 18L0012WH | 3 | 0.25 | 66 | 30 | 6 |
| 24000 | 26400 | 18L0010WH | 1 | 0.125 | 57 | 26 | 3 |
| 24940 | - | 18L0070WH | 1 | 0.25 | 75 | 34 | 10 |
| 750 * | - | 18L0004WH | 1 | 4.0 | 12 | 5.5 | 9 |
| 3900 * | - | 18L0005WH | 1 | 4.0 | 46 | 20.9 | 8 |
| 13800 | 15180 | 18L0051WH | 1 | 0.05 | 49 | 22.3 | 11 |
| 13800 | 15180 | 18L0060WH ¹ | 1 | 0.25 | 32 | 14.5 | 6 |
| 6900 | 7590 | 18L0061WH ¹ | 1 | 0.5 | 30 | 13.6 | 1 |
| 4160 | 4576 | 18L0062WH ¹ | 3 | 0.5 | 36 | 16.4 | 4 |

* 18L0004WH and 18L0005WH are rated for DC Applications

¹ Units are rated for inverted mounting

² For other mounting arrangements contact factory

³ 2400 and 4160 volt rated designs are identical and use the same catalog number

⁴ All AC capacitor units are CSA labeled

Altitude De-Rating – Protective Capacitor

Altitude De-Rating of Capacitors Above 3,300 ft (1,000 m)

| Altitude | | Altitude Correction (1) |
|----------|------|-------------------------|
| (ft) | (m) | |
| 3,300 | 1000 | 1.00 |
| 4,000 | 1200 | 0.98 |
| 5,000 | 1500 | 0.95 |
| 6,000 | 1800 | 0.92 |
| 7,000 | 2100 | 0.89 |
| 8,000 | 2400 | 0.86 |
| 9,000 | 2700 | 0.83 |
| 10,000 | 3000 | 0.80 |
| 12,000 | 3600 | 0.75 |
| 14,000 | 4200 | 0.70 |
| 15,000 | 4500 | 0.67 |

¹ Multiplier X rated voltage for reduced application voltage at the given altitude

Guide for Superseded Models

| Old Part Number | Current Part Number | Capacitor Voltage Rating | Number of Poles |
|-----------------|---------------------|--------------------------|-----------------|
| 18F107 | 18L0015WH | 4160 | 3 |
| 18F107G3 | 18L0019WH | 4160 | 1 |
| 18F26 | 18L0019WH | 2400 | 1 |
| 18F26G2 | 18L0019WH | 2400 | 1 |
| 18F27 | Discontinued | 2400 | 2 |
| 18F270G2 | 18L0010WH | 24000 | 1 |
| 18F27G2 | Discontinued | 2400 | 2 |
| 18F28 | 18L0015WH | 2400 | 3 |
| 18F29 | 18L0019WH | 4800 | 1 |
| 18F29G2 | 18L0019WH | 4800 | 1 |
| 18F30 | 18L0019WH | 6900 | 1 |
| 18F30G2 | 18L0019WH | 6900 | 1 |
| 18F35 | Discontinued | 11500 | 1 |
| 18F35G2 | Discontinued | 11500 | 1 |
| 18F451 | 18L0009WH | 13800 | 1 |
| 18F451G5 | 18L0009WH | 13800 | 1 |
| 18F467 | 18L0010WH | 24000 | 1 |
| 18F58 | 18L0015WH | 4160 | 3 |
| 18F585 | 18L0015WH | 2400 | 3 |
| 18F586 | 18L0015WH | 4160 | 3 |
| 18F59 | 18L0009WH | 13800 | 1 |
| 18L10RH | 18L0010WH | 24000 | 1 |
| 18L10WH | 18L0010WH | 24000 | 1 |
| 18L15RH2 | 18L0015WH | 4160 | 3 |
| 18L15RJ2 | 18L0065WH | 7200 | 3 |
| 18L15UJ | 18L0015WH | 4160 | 3 |
| 18L15WH | 18L0015WH | 4160 | 3 |

| Old Part Number | Current Part Number | Capacitor Voltage Rating | Number of Poles |
|-----------------|---------------------|--------------------------|-----------------|
| 18L15WH | 18L0015WH | 2400 | 3 |
| 18L19RH | 18L0019WH | 6900 | 1 |
| 18L19UH | 18L0019WH | 6900 | 1 |
| 18L19WH | 18L0019WH | 6900 | 1 |
| 18L65UH | 18L0065WH | 7200 | 3 |
| 18L65WH | 18L0065WH | 7200 | 3 |
| 18L6RH2 | 18L0015WH | 2400 | 3 |
| 18L9RH | 18L0009WH | 13800 | 1 |
| 18L9UH | 18L0009WH | 13800 | 1 |
| 18L9WH | 18L0009WH | 13800 | 1 |
| 9CL1B20 | 18L0015WH | 2400 | 3 |
| 9CL1B22 | 18L0019WH | 4800 | 1 |
| 9CL1B23 | 18L0019WH | 6900 | 1 |
| 9CL1B24 | Discontinued | 11500 | 1 |
| 9CL1B25 | 18L0009WH | 13800 | 1 |
| 9L18ACE101 | 18L0019WH | 2400 | 1 |
| 9L18ACE201 | Discontinued | 2400 | 2 |
| 9L18ACE301 | 18L0015WH | 2400 | 3 |
| 9L18ACG101 | 18L0019WH | 4160 | 1 |
| 9L18ACG301 | 18L0015WH | 4160 | 3 |
| 9L18ACH101 | 18L0019WH | 4800 | 1 |
| 9L18ACH301 | Discontinued | 4800 | 3 |
| 9L18ACJ101 | 18L0019WH | 6900 | 1 |
| 9L18ACK101 | Discontinued | 11500 | 1 |
| 9L18ACL101 | 18L0009WH | 13800 | 1 |
| 9L18ACM101 | 18L0010WH | 24000 | 1 |
| 9L18BCE301 | 18L0015WH | 2400 | 3 |

| Old Part Number | Current Part Number | Capacitor Voltage Rating | Number of Poles |
|-----------------|---------------------|--------------------------|-----------------|
| 9L18BCG301 | 18L0015WH | 4160 | 3 |
| 9L18BCG302 | 18L0065WH | 7200 | 3 |
| 9L18BCJ101 | 18L0019WH | 6900 | 1 |
| 9L18BCL101 | 18L0009WH | 13800 | 1 |
| 9L18BCM101 | 18L0010WH | 24000 | 1 |
| 9L18CCE301 | 18L0015WH | 2400 | 3 |
| 9L18CCG301 | 18L0015WH | 4160 | 3 |
| 9L18CCG302 | 18L0065WH | 7200 | 3 |
| 9L18CCJ101 | 18L0019WH | 6900 | 1 |
| 9L18CCJ301 | 18L0015WH | 6900 | 3 |
| 9L18CCL101 | 18L0009WH | 13800 | 1 |
| 9L18CCM101 | 18L0010WH | 24000 | 1 |
| 9L18DCE301 | 18L0015WH | 2400 | 3 |
| 9L18DCG301 | 18L0015WH | 4160 | 3 |
| 9L18DCG302 | 18L0065WH | 7200 | 3 |
| 9L18DCJ101 | 18L0019WH | 6900 | 1 |
| 9L18DCL101 | 18L0009WH | 13800 | 1 |
| 9L18DCM101 | 18L0010WH | 24000 | 1 |
| 9L18DCM102 | 18L0010WH | 24000 | 1 |
| 9L18ECE301 | 18L0015WH | 2400 | 3 |
| 9L18ECG301 | 18L0015WH | 4160 | 3 |
| 9L18ECG302 | 18L0065WH | 7200 | 3 |
| 9L18ECJ101 | 18L0019WH | 6900 | 1 |
| 9L18FCG301 | 18L0015WH | 4160 | 3 |
| 9L18FCG302 | 18L0065WH | 7200 | 3 |
| 9LA6A29 | Discontinued | 300 | |
| 9LA6B1 | 18L0010WH | 24000 | 1 |

Application Guide – Protective Capacitors

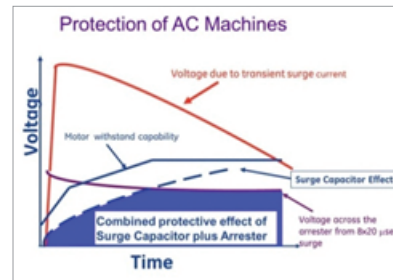
Application Information

GE Dielektrol Surge Capacitors and TRANQUELL Motor Surge Protectors can be applied directly at the motor or generator terminals to reduce the potential for damage caused by lightning and or switching surges.

GE Surge Protective Capacitors reduce the steepness of wave fronts to protect turn to turn insulation from surges applied to or reflected within machine windings.

GE TRANQUELL Motor Surge Protectors utilize GE TRANQUELL Surge Arresters applied in parallel with GE Dielektrol Surge Capacitors. When applied together, the arresters protect the major insulation to ground by limiting the amplitude of applied impulse waves or reflections within the machine windings, while the protective capacitor(s) reduce the steepness of the wave fronts. Studies indicate that this dual protection approach results in significant reduction of lightning stresses imposed on rotating machines and contribute to increased security against failures and downtime costs. The enclosures are suitable for indoor and outdoor applications. (See Figure 1).

Figure 1



TRANQUELL Motor Surge Protection Product Selection Process

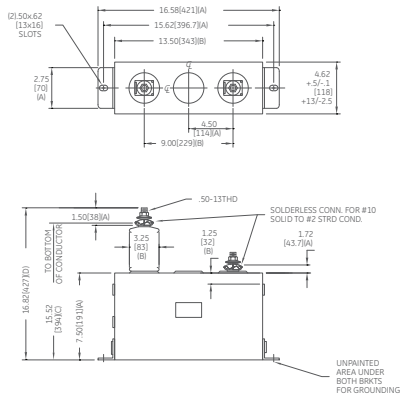
1. Determine the nominal system voltage and connection at the equipment being protected (Line-to-Line, delta or wye, grounded or ungrounded).
2. Select product from the Selection Table (catalog number from columns 2 or 3, based upon line-to-line voltage in column 1).

| Voltage Rating rms Volts (L-L) | Catalog Number for Delta & Ungrounded Neutral Systems | Catalog Number for Grounded Neutral Systems | Arrester Rating kV rms | Arrester MCOV kV rms | Capacitor Microfarads per Pole μF | Dimension "D" (side view in inches) ¹ | Weight in lbs. |
|-----------------------------------|--|---|---------------------------|-------------------------|--|--|----------------|
| 2400 | 38F2401 | — | 3 | 2.55 | 0.5 | 23 | 300 |
| 4160 | 38F2402 | — | 6 | 5.1 | 0.5 | 23 | 300 |
| — | — | 38F2403 | 3 | 2.55 | 0.5 | 23 | 300 |
| 4800 | 38F2404 | — | 6 | 5.1 | 0.5 | 23 | 300 |
| 6900 | 38F2405 | — | 9 | 7.65 | 0.5 | 23 | 300 |
| 7200 | 38F2406 | — | 9 | 7.65 | 0.5 | 23 | 300 |
| 13200 | 38F2407 | — | 18 | 15.3 | 0.25 | 23 | 300 |
| — | — | 38F2408 | 10 | 8.4 | 0.25 | 23 | 300 |
| 13800 | 38F2409 | — | 18 | 15.3 | 0.25 | 23 | 300 |
| — | — | 38F2410 | 12 | 10.2 | 0.25 | 23 | 300 |
| 24000 | 38F2411 | — | 27 | 22 | 0.125 | 36 | 350 |
| — | — | 38F2412 | 21 | 17 | 0.125 | 36 | 350 |

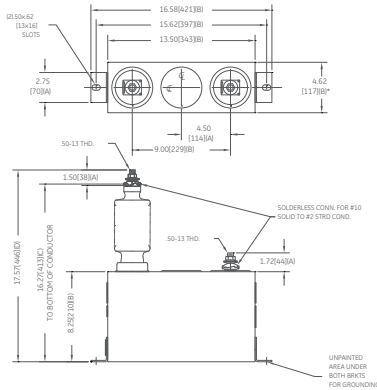
¹ See drawing 7 for detail

Product Drawings

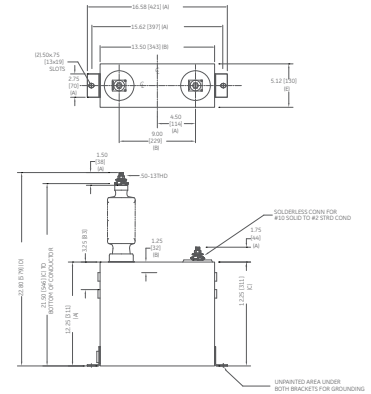
Drawing 1:
Single-Pole, 6,900 volts



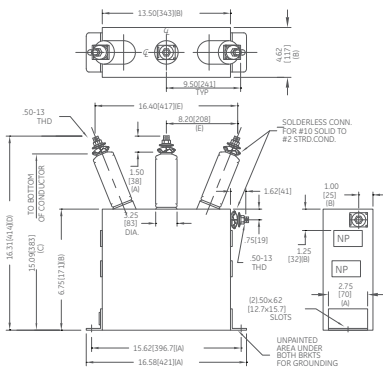
Drawing 2:
Single-Pole, 13,800 volts



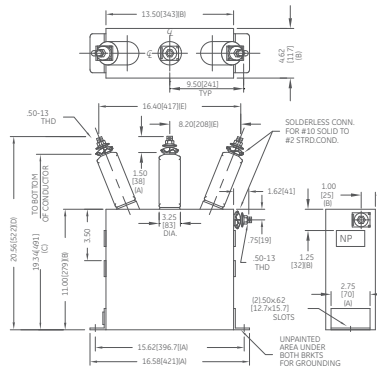
Drawing 3:
Single-Pole, 24,000 volts



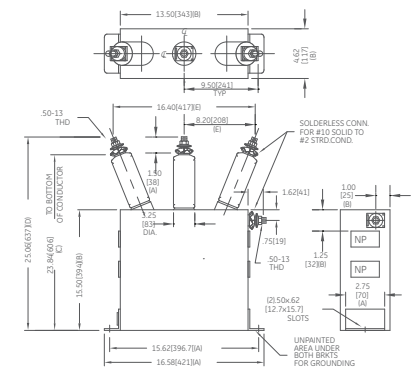
Drawing 4:
Three-Poles, 2,400 & 4,160 volts



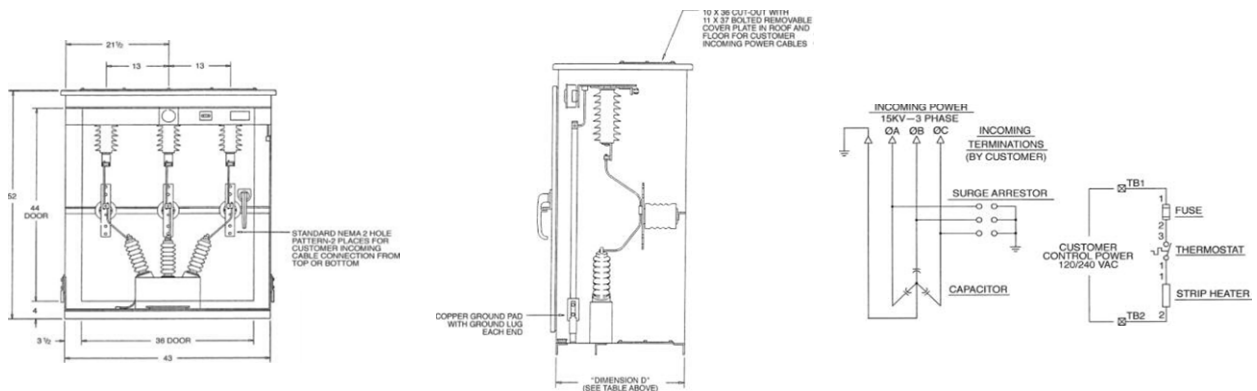
Drawing 5:
Three-Poles, 7,200 volts



Drawing 6:
Three-Poles, 13,800 volts

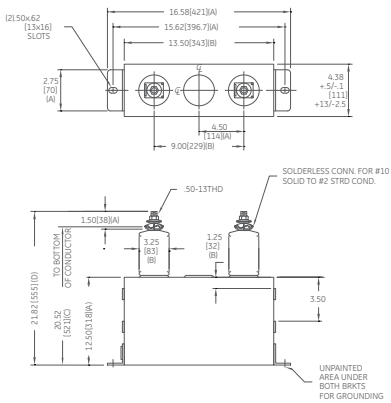


Drawing 7:
38F series

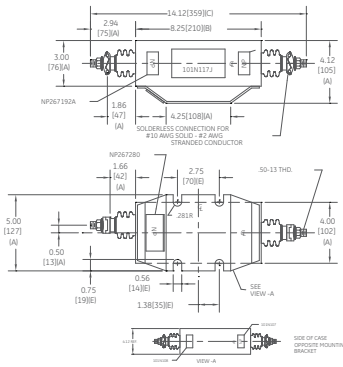


Product Drawings

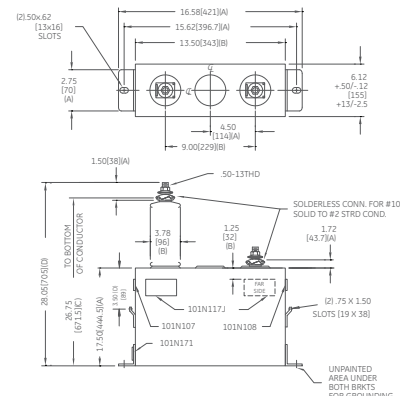
Drawing 8:
3,900 volts DC



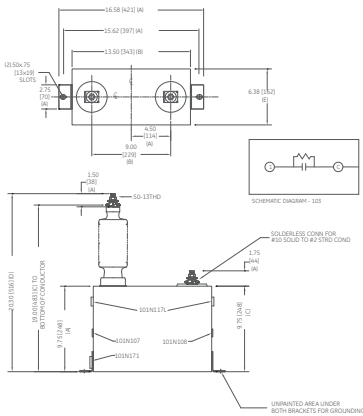
Drawing 9:
750 volts DC



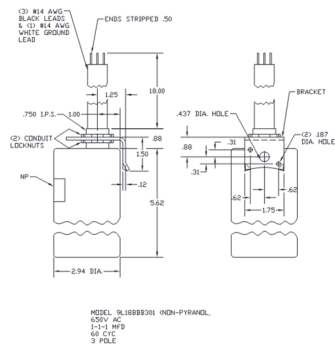
Drawing 10:
Single-Pole, 24,940 volts



Drawing 11:
Single-Pole, 13,800 volts



Drawing A:
Three-Pole, 0-650 volts



- GE 18L surge capacitor terminals are supplied with solderless connectors for #10 solid to #2 stranded conductors.
- Information nameplates are stainless steel also with CSA and non-PCB labels,

Digital Energy

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