

COMMONWEALTH  
SPRAGUE

POWER FACTOR CORRECTION  
CAPACITOR CELLS



## **Description**

Metallized polypropylene capacitors manufactured by Commonwealth Sprague offer improved performance and proven reliability in applications requiring power factor correction or harmonic filtering.

Metallized polypropylene film is used for its ability to operate at low temperatures and minimal loss of capacitance over the life of the cell. Encapsulated by a thermal setting polymer resin, excellent heat dissipation is achieved. In the event of a fault, three-phase pressure sensitive interrupters disconnect all three phases effectively taking the capacitor out of the circuit.



Figure 1-1: CSCI Capacitor Cell

## **Capacitor Properties**

- ▶ Individual capacitors are self-healing. Vacuum deposited conductors on a polypropylene dielectric act as electrodes in this process.
- ▶ Each three-phase capacitor is furnished with a U.L. recognized, pressure sensitive interrupter. The interrupter will disconnect all three phases at the same time to maintain a balanced circuit.
- ▶ Capacitors are contained in hermetically sealed metal cans to prevent atmospheric contaminants from reducing the useful life.
- ▶ The dielectric material exhibits a loss of less than 0.5 Watts per KVAR.
- ▶ Encapsulation medium shall be a thermosetting polymer resin, which allows out gassing to engage the pressure interrupter.
- ▶ Nominal design life is 20 years.
- ▶ Individual capacitor cells are covered by a 2-year limited warranty.
- ▶ All capacitor cell terminations are threaded terminals for wire connection.
- ▶ All three-phase capacitors are listed as U.L. Recognized, C.S.A., and CE.



## Construction Features

### Termination

12-24 NC-2A threaded studs to ensure superior contact through compression. See figures 2-1 and 2-2.

### Cell Housing

Constructed from a plated steel, the cell is hermetically sealed to prevent contamination.

### Dielectric / Electrode

Constructed of metallized polypropylene film - a self healing, low loss material. Results in low operating temperature and minimal loss of capacitance over the life of the cell.

### Three-Phase Construction

Internally connected in a three-phase delta connection to ensure three-phase operation under all conditions and minimize external wiring.

### Three-Phase Pressure Interrupters

U.L. Recognized device (10,000 amps fault current) to disconnect all three phases if a fault occurs thus preventing single phase operation.

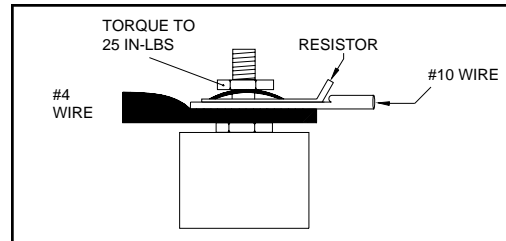


Figure 2-1: Cell Termination Connection 1

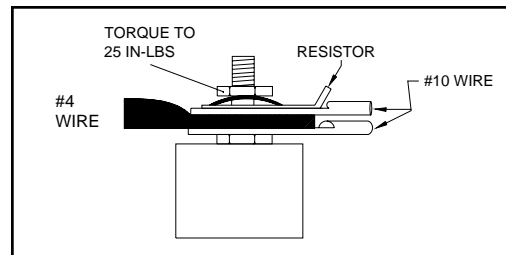


Figure 2-2: Cell Termination Connection 2

**Note:** Wire size shown is for example only. Wire should be sized according to each application.

## Dimensions

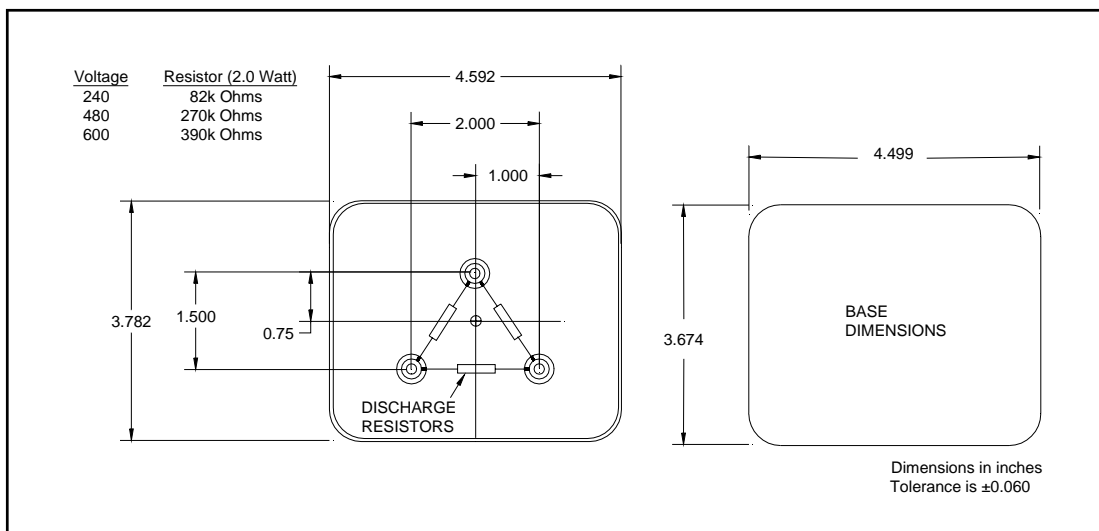


Figure 2-3: Cell Dimensions



## Performance Characteristics

### Ambient Temperature Range

- 40°F to 115°F (- 40°C to 46°C)

### Operating Temperature Range

- 40°F to 158°F (- 40°C to 70°C)

### Design Life

Life expectancy of capacitor cells is 20 years within operating specifications

### Continuous Operation

Up to 135% rated (nameplate) KVAR, including the effects of 110% rated voltage (121% KVAR), 15% capacitance tolerance and harmonic voltages over the fundamental frequency (60 Hz).

### Tolerance

Capacitor cell KVAR tolerance is 0% to +5%.

## Model Selection

Tables 1 & 2 provide a listing of our most commonly used capacitor cell ratings.

Table 1 should be used to select capacitors for applications requiring “hardened” cells where harmonics are expected. Using these capacitors assures maximum life.

Table 2 offers a wide array of standard capacitor cells for most Power Factor Correction applications.

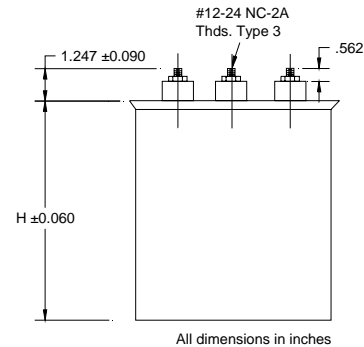


Figure 3-1: Dimensions

<b>Voltage Rating</b>	<b>kVAR</b>	<b>Model Number</b>	<b>Height (H)</b>	<b>Weight</b>
VAC			<i>Inches</i>	<i>Pounds</i>
480	3.00	343PHDMF	4.00	2.1
480	4.00	443PHDMF	4.00	2.1
480	5.00	543PHDMF	4.50	2.3
480	7.50	7X43PHDMF	5.50	3.2
480	10.00	1043PHDMF	7.00	4.2
480	12.50	12X43PHDMF	7.00	4.2
480	15.00	1543PHDMF	8.80	5.0
480	16.67	16S43PHDMF	9.80	6.0
600	3.00	363PHDMF	5.00	2.6
600	5.00	563PHDMF	5.00	2.6
600	7.50	7X63PHDMF	5.50	3.2
600	10.00	1063PHDMF	6.00	3.3
600	12.50	12X63PHDMF	7.00	3.5
600	15.00	1563PHDMF	8.80	5.0
600	16.67	16S63PHDMF	8.80	5.0

Table 1: Harmonic Dry Cell Chart



Voltage Rating	kVAR	Model Number	Height (H)	Weight
VAC			<i>Inches</i>	<i>Pounds</i>
240	0.50	243PCDMF	4.00	2.1
240	1.00	443PCDMF	4.00	2.1
240	1.50	643PCDMF	4.00	2.1
240	2.00	843PCDMF	4.00	2.1
240	2.50	1043PCDMF	4.50	2.5
240	3.00	12X43PCDMF	5.50	3.2
240	4.00	16S43PCDMF	6.00	3.5
240	5.00	523PCDMF	5.00	2.8
240	6.25	6A23PCDMF	6.00	3.2
240	7.50	7X23PCDMF	6.00	3.5
240	8.33	8B23PCDMF	7.00	3.5
480	1.00	143PCDMF	4.00	2.1
480	2.00	243PCDMF	4.00	2.1
480	2.50	2X43PCDMF	4.00	2.1
480	3.00	343PCDMF	4.00	2.1
480	4.00	443PCDMF	4.00	2.1
480	5.00	543PCDMF	4.00	2.1
480	6.00	643PCDMF	4.00	2.1
480	7.50	7X43PCDMF	4.00	2.1
480	8.00	843PCDMF	4.00	2.1
480	10.00	1043PCDMF	5.00	2.5
480	12.50	12X43PCDMF	5.50	3.2
480	15.00	1543PCDMF	6.00	3.2
480	16.67	16S43PCDMF	6.00	3.5
480	17.50	17X43PCDMF	7.00	3.5
480	20.00	2043PCDMF	7.00	4.2
600	2.00	263PCDMF	4.00	2.1
600	2.50	2X63PCDMF	4.00	2.1
600	5.00	563PCDMF	4.00	2.1
600	7.50	7X63PCDMF	4.00	2.1
600	10.00	1063PCDMF	5.00	2.6
600	12.50	12X63PCDMF	6.00	3.2
600	15.00	1563PCDMF	6.00	3.5
600	16.67	16S63PCDMF	7.00	3.5
600	17.50	17X63PCDMF	7.00	3.5
600	20.00	2063PCDMF	8.80	5.0

Table 2: Standard Dry Cell Chart

Notes:

1. All capacitor cells are shown as 3 phase units.
2. These capacitors use a dry type thermoplastic medium.
3. CUSTOMER must provide over-current protection as required by code.
4. All units are supplied un-painted. Paint can be requested as an option.
5. Case material is plated steel approx. 0.017 inches thick.
6. Discharge resistors are included with all capacitor cells.



## Capacitor Cell Questionnaire

1. What is the application category?
  - A. 3-phase, shunt power factor correction.  
(Proceed to question 3.)
  - B. Other (motor run/start, SCR commutation circuit, snubber, other OEM equipment).  
(Proceed to question 2)
  
2. Submit an electrical schematic showing the location and electrical specifications (Voltage,  $\mu\text{F}$ ) of the capacitor in the circuit. Include normal circuit voltages and frequencies if appropriate.  
(Proceed to question 6)
  
3. What type of unit will the cells be assembled into?  
\_\_\_ Switched Bank (i.e. Automatic)                      \_\_\_ Fixed Bank
  
4. Will the cells be assembled into a harmonic filter bank (i.e. w/ series tuning reactors) or otherwise be subjected to significant harmonic voltages? (Y/N) \_\_\_.
  
5. What is the total kVar value of the assembled bank?                      \_\_\_\_\_ kVar
  
6. What ambient temperature will the capacitor be exposed to?                      \_\_\_\_\_ C° or F°
  
7. What provisions for ventilation are provided?  
\_\_\_\_\_  
\_\_\_\_\_
  
8. Will the capacitor be exposed to any vibration? (Y / N)                      \_\_\_\_\_ If yes, please quantify
  
9. Describe how the capacitor will be mounted and secured.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



## **General Terms and Conditions**

### **Minimum Order Requirements**

Minimum order of \$250 US Dollars required.

### **Payment Terms**

1% 10 days, Net 30 days available with approved credit. Cash-in-Advance, and AMEX/MC/VISA payment are also accepted.

### **Shipment**

Shipments are made F.O.B. El Paso, TX. Commonwealth Sprague will select the freight carrier unless otherwise directed. Smaller shipments are sent via UPS.

### **Returns**

To make a product return for warranty replacement or credit, contact our Customer Service department for a Return Material Authorization (RMA) number. No returns will be accepted without a valid RMA number.

### **Limited 1-Year Warranty**

Commonwealth Sprague Capacitor offers a 1-Year limited warranty on its Capacitor Cell products.

## **COMMONWEALTH SPRAGUE CAPACITOR, INC.**

865 S Church St., North Adams, MA 01247

Phone: 413.664.4461 Fax: 413.664.0756

**[WWW.CAPACITOR.COM](http://WWW.CAPACITOR.COM)**