



COMMONWEALTH SPRAGUE MOTOR RUN CAPACITOR CATALOG

COMMONWEALTH SPRAGUE CAPACITOR, INC.

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Corporate Profile

Commonwealth Sprague Capacitor, Inc. (CSCI), formerly a division of Sprague Electric Company, has been manufacturing motor run capacitors since the 1940's in North Adams, Massachusetts. Sprague has been a leading supplier to many of the well established motor, compressor, and HVAC manufacturers in the industry.

Commonwealth Sprague is the only US motor run capacitor manufacturer that metallizes its own polypropylene film. This key attribute

allows CSCI to quickly adjust material types to meet fluctuating market demand.

Commonwealth Sprague is dedicated to providing high quality products built to US standards for the international marketplace. Continuous improvements in the design, performance, and cost effectiveness of CSCI capacitors are the primary reasons we have been a premiere supplier of motor run capacitors for over 50 years.

Motor Run Capacitors

Description

Metallized polypropylene oil-filled capacitors manufactured by Commonwealth Sprague Capacitor, Inc. offer improved performance and proven reliability in split phase motor, compressor, filter, and general AC applications.

The metallized polypropylene capacitor is self healing. Any defect that occurs in the dielectric is automatically “cleared” within microseconds, and the capacitor continues to function at full efficiency. The metallized electrode evaporates around the defect allowing full functionality of the component with negligible capacitance loss.

The 325P and 328P Series capacitors have excellent capacitance stability with time and temperature, and very low internal power losses. The low power loss is a result of the minimal dissipation factor of the dielectric.

Offered in AC voltage ranges from 240 Volt to 660 Volt at 60 Hertz, these capacitors are available with capacitance values ranging from 3 to 100 μF (micro-Farads).

Metallized Polypropylene Film

The primary component of these motor run capacitors is the metallized film. The electrode is vacuum deposited on specially formulated polypropylene film to create a high quality metallized film.

CSCI also has led the industry in applying the latest film advances. This capability has allowed CSCI to lead the industry in the development of thinner metallized films and smaller capacitors.

The Capacitor Element

The master rolls of metallized film are slit into specific widths based on a capacitor model. These rolls are placed on high speed, computer controlled winding machines where the capacitor section is wound into discrete capacitor elements.

Once the section is wound, the ends are completely covered with a conductive end-spray and thermally cured to relieve any material stresses and stabilize the capacitance (Figure 1.1).



1.1 Single Capacitor Element

The Dual Capacitor Element

The dual, round concentric capacitor element (Figure 1.2) was developed in response to the application requirements of the HVAC industry. In a typical air conditioning (AC) system, two motor run capacitors are required. One capacitor is used for the fan motor (fan), the other for the compressor (herm). CSCI uses state-of-the-art winding technology to wind these two capacitors into one concentric element, resulting in a more compact package and increased cost savings.



1.2 Dual Round Concentric Element

The Interruptible Cover Assembly

The capacitor element is housed in a steel, aluminum, or plastic case with a cover. Both of the metal housings use a steel cover assembly (Figure 1.3), consisting of the cover blank, patented single bushing terminals, and a pressure actuated interrupter. The plastic capacitor uses a plastic cover.

the terminals. This creates an open circuit before allowing the case to rupture. This very important feature prevents a potentially dangerous catastrophic failure.

The patented single bushing terminal is designed to provide a leak proof seal and prevents terminal rotation.

The interrupter is a standard safety feature found on all high quality motor run capacitors. If the capacitor experiences a failure that disrupts the dielectric system, internal pressure builds up. Our pressure sensitive interrupter is designed to internally disconnect the tabs from



1.3 Interruptible Cover Assembly - Internal View

Motor Run Capacitors

Final Assembly and Test

Capacitors are filled with a specially formulated organic fluid, ECCOL II, that provides for optimal heat transfer, arc suppression, and shock absorption. After filling, our capacitors are double roll seamed. 100% of the finished product (Figure 1.4) undergoes a rigorous final electrical and quality inspection before being labeled and packaged.



1.4 Finished single capacitor product

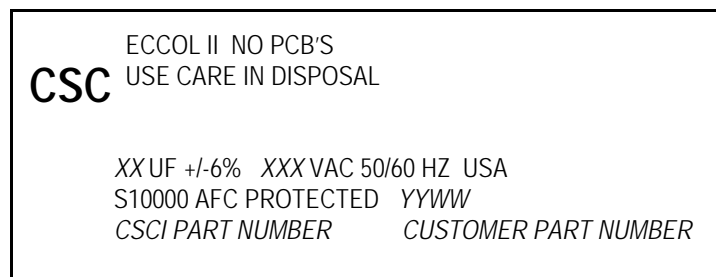
Stamping and Bar Coding

The last step in the process is to mark the capacitor for identification (Figure 1.5). All metal products are stamped with a durable ink formulated to withstand smudging and provide the highest degree of visibility. Paper labels may also be used. The standard markings include:

- CSCI part number
- Capacitance and Voltage rating
- Agency stamps - UL, CSA, VDE, and CE
- Date Code (yyww) *Year and Week*

Our computer controlled marking process is highly flexible, allowing customer part numbers and logos to be printed as well. All customer specific data is entered into a central database and linked to our state-of-the-art marking equipment.

Bar coding is also available by request on the capacitors.



1.5 Sample of a standard inkjet label

General Specifications

Specifications

Internal Construction:	Self-healing metallized polypropylene film
Dielectric Fluid:	Eccol II. IIIB liquid NFPA Classification Flash point: 430°F (221°C); Fire point: 495°F (257°C)
Cover Material:	Tin Plate Steel
Case Material:	Tin Plate Steel; or Aluminum
Interrupter:	Pressure sensitive, UL recognized. Rated for 10,000 AFC.
Terminals:	Multiple blades (3 or 4), tinned steel quick connect 0.25 in (6.35 mm) x 0.032 in (0.813 mm)
Capacitor Tolerance:	±6% Std. ±3% and ±10% available.
Operating Temperature:	-40°F (-40°C) to 158°F (70°C)
AC Voltage Ratings:	240, 300, 330, 370, 440, and 660 VAC

Agency Approvals

Commonwealth Sprague is committed to manufacturing quality capacitors. Our capacitors are recognized by one or more of the following agencies:

UL File Number E13806 (Guide CYWT-2)
CSA File Number 89446
VDE File Number F15619
Tecumseh H115

Common Applications

Permanent Split Capacitor (PSC) Motors	Used for fans, blowers, operations with low starting torque, gate operators, garage door openers, pumps
Run/Start Capacitor Motors	High starting torque requirements
Compressors	Refrigeration, Air Conditioning Systems, Chillers, Ice Machines, Heat Pumps,
Lighting	Fluorescent Ballast efficiency

Motor Run Capacitors

Physical Characteristics

Standard ratings, sizes, and physical characteristics are shown in the catalog.

All capacitors are supplied in tin-plate steel cans and covers unless otherwise specified.

AC Voltage Rating

Capacitors are capable of stable operation without decreased life at 110% of the rated voltage at frequencies up to 60 Hz provided the maximum case temperature of 70°C is not exceeded.

Capacitance and Tolerance

The capacitance of all capacitors are within the specified tolerance limits of the nominal rating when measured at a temperature of +25°C.

When measured at the operating case temperature limits, the capacitance of these capacitors will not change by more than -5% to +2% of the +25°C capacitance value.

Capacitance measurements shall be made on an AC bridge at a frequency of 60 Hz or else referred to measurements made at that frequency.

Rated Life

Commonwealth Sprague capacitors are designed to have a life expectancy of 60,000 hours with an estimated survival of better than 94%. Their first year survival under rated operating conditions is designed to be greater than 99.5%.

Dissipation Factor

The dissipation factor does not exceed 0.1% when measured at a frequency of 60 Hz and a case temperature of +25°C.

Leakage Current

When 115 VAC 60 Hz is applied between the shorted capacitor terminals and the bare case, the leakage current will not exceed the values shown on the following table:

Nominal Capacitance (µF)	Leakage Current
0-14	60
14.1-20	70
20.1-35	100
35.1 - up	150

Voltage Test

Between Terminals

Capacitors are capable of withstanding the applications of 1.75 times rated alternating voltage for a period of 1 second at +25°C. Capacitors can be discharged through a 10,000 ohm resistor to limit the current.

Terminals to Case

Capacitors are capable of withstanding the application of 2 times the rated alternating voltage plus 1000 volts for a period of 1 second at +25°C.

Alternate tests to those outlined above may be conducted at direct voltage equal to the peak alternating voltage.

Surge Voltage

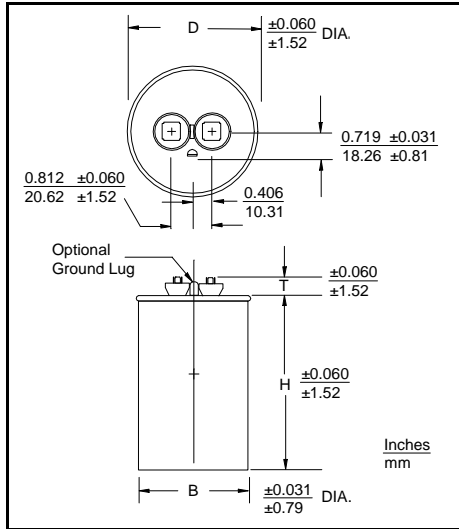
The maximum peak transient surge voltage will not exceed 315% of the nominal 60 Hz rms voltage.

Internal Interrupters

The mounting position of the capacitors will not affect the operation of the interrupter. To ensure proper operation, capacitors must be installed with a minimum of 0.5 inches (12.7 mm) of clearance between terminals or cover and any external restriction.

Motor Run Capacitors

Physical Configuration - Round Capacitors

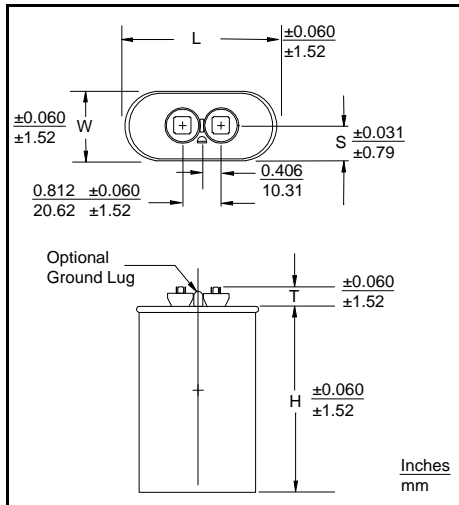


2.1 Round Capacitor Dimensions

DIMENSIONS						
	B		D		T	
Base Code	Inch	mm	Inch	mm	Inch	mm
M	1.75	44.5	1.875	47.6	.468	11.9
N	2.00	50.8	2.125	54.0	.468	11.9
P	2.50	63.5	2.625	66.7	.406	10.3

3.1 Round Capacitor Dimensions

Physical Configuration - Oval Capacitors



2.2 Oval Capacitor Dimensions

DIMENSIONS								
	L		W		S		T	
Base Code	Inch	mm	Inch	mm	Inch	mm	Inch	mm
A	2.156	54.8	1.312	33.3	.415	10.5	.468	11.9
C	2.906	73.8	1.906	48.4	.550	14.0	.406	10.3
D	3.656	92.9	1.968	50.0	.550	14.0	.406	10.3

3.2 Oval Capacitor Dimensions

Packaging

All capacitors are packaged in durable corrugated cardboard boxes, and protected against damage by cardboard spacers.

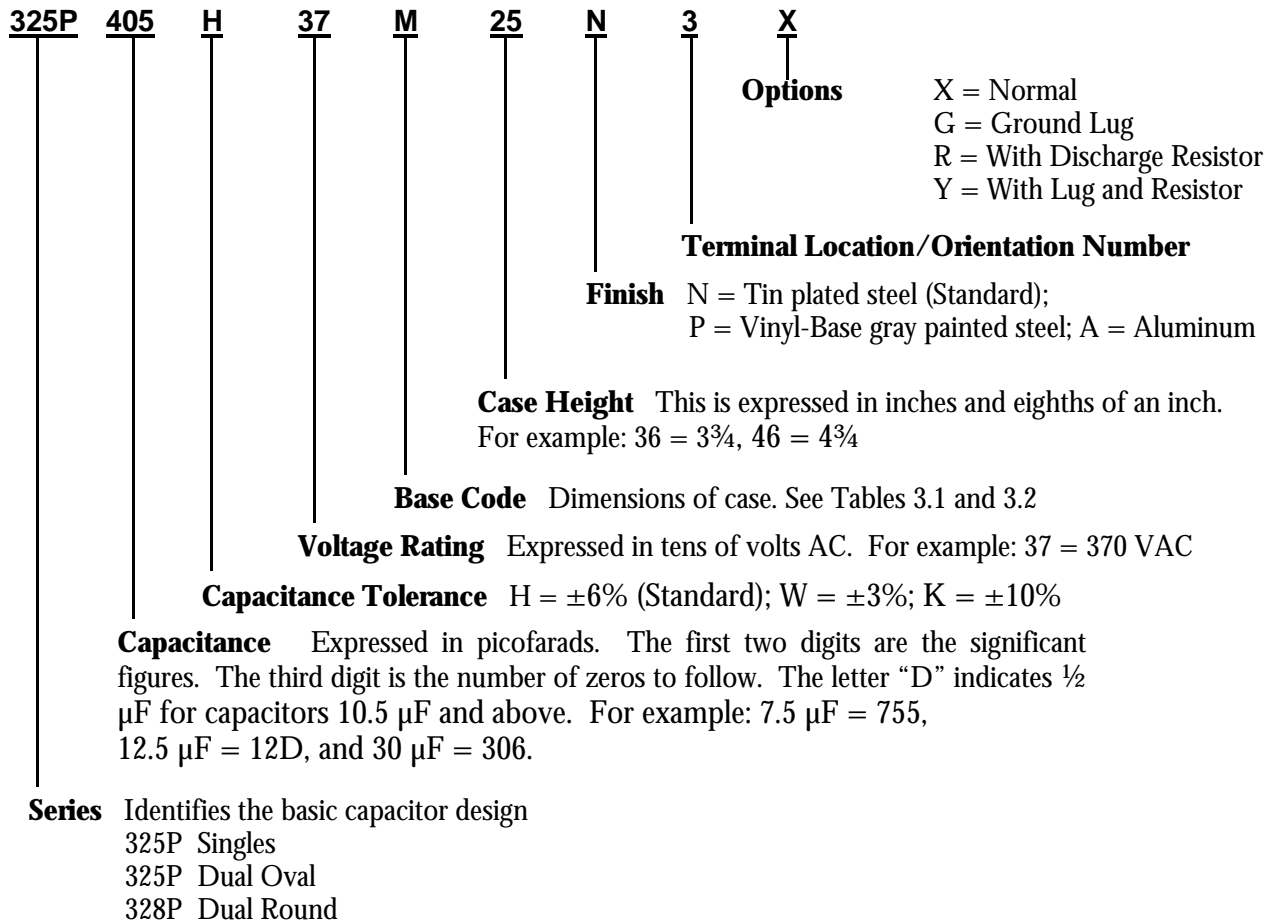
The size of the capacitors will determine how many actually fit into a box. Table 3.3 has been provided for your reference.

Can Size	Full Box Qty
A	72
C	36
D	30
M	54
N	40
P	28

3.3 Full box quantity of capacitors

Dimensions and Part Numbers

Part Numbering System



Part Numbers

On the following pages, the standard listing for motor run capacitors in 240 VAC through 660 VAC is presented.

This listing is a guide to our most common sizes. There are a number of additional capacitors available in different physical sizes and/or capacitance ratings. Contact the factory for additional information on your special requirements.

Motor Run Capacitors

240 VAC; 50/60 Hz

ROUND			
MFD	Part Number	Can Style	Can Height
3	325P305H24M25N3X	M	2.625
4	325P405H24M25N3X	M	2.625
5	325P505H24M25N3X	M	2.625
6	325P605H24M25N3X	M	2.625
7.5	325P755H24M25N3X	M	2.625
10	325P106H24M25N3X	M	2.625
12.5	325P12DH24M25N3X	M	2.625
15	325P156H24M25N3X	M	2.625
17.5	325P17DH24M25N3X	M	2.625
20	325P206H24M25N3X	M	2.625
22.5	325P22DH24M25N3X	M	2.625
25	325P256H24M25N3X	M	2.625
27.5	325P27DH24M25N3X	M	2.625
30	325P306H24M25N3X	M	2.625
35	325P356H24M30N3X	M	3.000
40	325P406H24M30N3X	M	3.000
45	325P456H24M36N3X	M	3.750
50	325P506H24M36N3X	M	3.750
55	325P556H24M36N3X	M	3.750
60	325P606H24N36N4X	N	3.750
65	325P656H24N36N4X	N	3.750
70	325P706H24N36N4X	N	3.750
75	325P756H24N36N4X	N	3.750
80	325P806H24P36N4X	P	3.750
85	325P856H24P36N4X	P	3.750
90	325P906H24P36N4X	P	3.750

OVAL			
MFD	Part Number	Can Style	Can Height
3	325P305H24A25N4X	A	2.625
4	325P405H24A25N4X	A	2.625
5	325P505H24A25N4X	A	2.625
6	325P605H24A25N4X	A	2.625
7.5	325P755H24A25N4X	A	2.625
10	325P106H24A25N4X	A	2.625
12.5	325P12DH24A25N4X	A	2.625
15	325P156H24A25N4X	A	2.625
17.5	325P17DH24A30N4X	A	3.000
20	325P206H24A30N4X	A	3.000
22.5	325P22DH24A36N4X	A	3.750
25	325P256H24A36N4X	A	3.750
27.5	325P27DH24A36N4X	A	3.750
30	325P306H24C25N4X	C	2.625
35	325P356H24C25N4X	C	2.625
40	325P406H24C30N4X	C	3.000
45	325P456H24C30N4X	C	3.000
50	325P506H24C36N4X	C	3.750
55	325P556H24C36N4X	C	3.750
60	325P606H24C36N4X	C	3.750
65	325P656H24C36N4X	C	3.750
70	325P706H24C46N4X	C	4.750
75	325P756H24C46N4X	C	4.750
80	325P806H24C46N4X	C	4.750
85	325P856H24C46N4X	C	4.750
90	325P906H24C46N4X	C	4.750

370 VAC; 50/60 Hz

ROUND			
MFD	Part Number	Can Style	Can Height
3	325P305H37M25N3X	M	2.625
4	325P405H37M25N3X	M	2.625
5	325P505H37M25N3X	M	2.625
6	325P605H37M25N3X	M	2.625
7.5	325P755H37M25N3X	M	2.625
10	325P106H37M25N3X	M	2.625
12.5	325P12DH37M25N3X	M	2.625
15	325P156H37M25N3X	M	2.625
17.5	325P17DH37M25N3X	M	2.625
20	325P206H37M25N3X	M	2.625
22.5	325P22DH37M30N3X	M	3.000
25	325P256H37M30N3X	M	3.000
27.5	325P27DH37M30N3X	M	3.000
30	325P306H37M36N3X	M	3.750
35	325P356H37M36N3X	M	3.750
40	325P406H37N36N4X	N	3.750
45	325P456H37N36N4X	N	3.750
50	325P506H37N36N4X	N	3.750
55	325P556H37N46N4X	N	4.750
60	325P606H37N46N4X	N	4.750
65	325P656H37N46N4X	N	4.750
70	325P706H37N46N4X	N	4.750
75	325P756H37P46N4X	P	4.750
80	325P806H37P46N4X	P	4.750
85	325P856H37P46N4X	P	4.750
90	325P906H37P46N4X	P	4.750

OVAL			
MFD	Part Number	Can Style	Can Height
3	325P305H37A25N4X	A	2.625
4	325P405H37A25N4X	A	2.625
5	325P505H37A25N4X	A	2.625
6	325P605H37A25N4X	A	2.625
7.5	325P755H37A25N4X	A	2.625
10	325P106H37A25N4X	A	2.625
12.5	325P12DH37A30N4X	A	3.000
15	325P156H37A36N4X	A	3.750
17.5	325P17DH37A36N4X	A	3.750
20	325P206H37A36N4X	A	3.750
22.5	325P22DH37C25N4X	C	2.625
25	325P256H37C25N4X	C	2.625
27.5	325P27DH37C30N4X	C	3.000
30	325P306H37C30N4X	C	3.000
35	325P356H37C36N4X	C	3.750
40	325P406H37C36N4X	C	3.750
45	325P456H37C36N4X	C	3.750
50	325P506H37C46N4X	C	4.750
55	325P556H37C46N4X	C	4.750
60	325P606H37C46N4X	C	4.750
65	325P656H37D46N4X	D	4.750
70	325P706H37C46N4XT	C	4.750
75	325P756H37C46N4XT	C	4.750
80	325P806H37D46N4XT	D	4.750
85	325P856H37D46N4XT	D	4.750
90	325P906H37D46N4XT	D	4.750

COMMONWEALTH SPRAGUE CAPACITOR, INC.

1560 Curran Highway, North Adams, MA 01247 413.664.4461 Fax: 413.664.0756

Single Capacitors

440 VAC; 50/60 Hz

ROUND			
MFD	Part Number	Can Style	Can Height
3	325P305H44M25N3X	M	2.625
4	325P405H44M25N3X	M	2.625
5	325P505H44M25N3X	M	2.625
6	325P605H44M25N3X	M	2.625
7.5	325P755H44M25N3X	M	2.625
10	325P106H44M25N3X	M	2.625
12.5	325P12DH44M25N3X	M	2.625
15	325P156H44M25N3X	M	2.625
17.5	325P17DH44M30N3X	M	3.000
20	325P206H44M30N3X	M	3.000
22.5	325P22DH44M36N3X	M	3.750
25	325P256H44M36N3X	M	3.750
27.5	325O27DH44M36N3X	M	3.750
30	325P306H44N36N4X	N	3.750
35	325P356H44N36N4X	N	3.750
40	325P406H44N46N4X	N	4.750
45	325P456H44N46N4X	N	4.750
50	325P506H44N46N4X	N	4.750
55	325P556H44P36N4X	P	3.750
60	325P606H44P36N4X	P	3.750
65	325P656H44P46N4X	P	4.750

OVAL			
MFD	Part Number	Can Style	Can Height
3	325P305H44A25N4X	A	2.625
4	325P405H44A25N4X	A	2.625
5	325P505H44A25N4X	A	2.625
6	325P605H44A25N4X	A	2.625
7.5	325P755H44A25N4X	A	2.625
10	325P106H44A30N4X	A	3.750
12.5	325P12DH44A36N4X	A	3.750
15	325P156H44C25N4X	C	2.625
17.5	325P17DH44C25N4X	C	2.625
20	325P206H44C25N4X	C	2.625
22.5	325P22DH44C30N4X	C	3.000
25	325P256H44C36N4X	C	3.750
27.5	325P27DH44C36N4X	C	3.750
30	325P306H44C36N4X	C	3.750
35	325P356H44C46N4X	C	4.750
40	325P406H44C46N4X	C	4.750
45	325P456H44C46N4X	C	4.750
50	325P506H44C46N4X	C	4.750
55	325P556H44C46N4XT	C	4.750
60	325P606H44C46N4XT	C	4.750
65	325P656H44D36N4XT	D	3.750
70	325P706H44D36N4XT	D	3.750
75	325P756H44D46N4XT	D	4.750

480 VAC; 50/60 Hz

ROUND			
MFD	Part Number	Can Style	Can Height
3	325P305H48M25N3X	M	2.625
4	325P405H48M25N3X	M	2.625
5	325P505H48M25N3X	M	2.625
6	325P605H48M25N3X	M	2.625
7.5	325P755H48M25N3X	M	2.625
10	325P106H48M25N3X	M	2.625
12.5	325P12DH48M25N3X	M	2.625
15	325P156H48M30N3X	M	3.000
17.5	325P17DH48M36N3X	M	3.750
20	325P206H48M36N3X	M	3.750
22.5	325P22DH48M36N3X	M	3.750
25	325P256H48M36N4X	N	3.750
27.5	325P27DH48N36N4X	N	3.750
30	325P306H48N36N4X	N	3.750
35	325P356H48N46N4X	N	4.750
40	325P406H48N46N4X	N	4.750
45	325P456H48P36N4X	P	3.750
50	325P506H48P46N4X	P	4.750
55	325P556H48P36N4X	P	3.750
60	325P606H48P36N4X	P	3.750
65	325P656H48P46N4X	P	4.750

OVAL			
MFD	Part Number	Can Style	Can Height
3	325P305H48A25N4X	A	2.625
4	325P405H48A25N4X	A	2.625
5	325P505H48A25N4X	A	2.625
6	325P605H48A25N4X	A	2.625
7.5	325P755H48A30N4X	A	3.000
10	325P106H48A36N4X	A	3.750
12.5	325P12DH48C25N4X	C	2.625
15	325P156H48C25N4X	C	2.625
17.5	325P17DH48C30N4X	C	3.000
20	325P206H48C30N4X	C	3.000
22.5	325P22DH48C36N4X	C	3.750
25	325P256H48C36N4X	C	3.750
27.5	325P27DH48C46N4X	C	4.750
30	325P306H48C46N4X	C	4.750
35	325P356H48C46N4X	C	4.750
40	325P406H48C46N4X	C	4.750
45	325P456H48D36N4XT	D	3.750
50	325P506H48D36N4XT	D	3.750
55	325P556H48D36N4XT	D	3.750
60	325P606H48D46N4XT	D	4.750
65	325P656H48D46N4XT	D	4.750
70	325P706H48D46N4XT	D	4.750
75	325P756H48D46N4XT	D	4.750

COMMONWEALTH SPRAGUE CAPACITOR, INC.

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Motor Run Capacitors

660 VAC; 50/60 Hz

ROUND			
MFD	Part Number	Can Style	Can Height
2	325P205H66M25N3X	M	2.625
3	325P305H66M25N3X	M	2.625
4	325P405H66M25N3X	M	2.625
5	325P505H66M25N3X	M	2.625
6	325P605H66M30N3X	M	3.000
7.5	325P755H66M36N3X	M	3.750
10	325P106H66N36N4X	N	3.750
12.5	325P12DH66N36N4X	N	3.750
15	325P156H66P36N4X	P	3.750
17.5	325P17DH66P36N4X	P	3.750
20	325P206H66P36N4X	P	3.750
22.5	325P22DH66P46N4X	P	4.750
25	325P256H66P46N4X	P	4.750
27.5	325P27DH66P46N4X	P	4.750
30	325P306H66P46N4X	P	4.750

OVAL			
MFD	Part Number	Can Style	Can Height
2	325P205H66A25N4X	A	2.625
3	325P305H66A30N4X	A	3.000
4	325P405H66A36N4X	A	3.750
5	325P505H66A36N4X	A	3.750
6	325P605H66C25N4X	C	2.625
7.5	325P755H66C30N4X	C	3.000
10	325P106H66C36N4X	C	3.750
12.5	325P12DH66C46N4X	C	4.750
15	325P156H66C46N4X	C	4.750
17.5	325P17DH66D36N4XT	D	3.750
20	325P206H66D36N4XT	D	3.750
22.5	325P22DH66D36N4XT	D	3.750
25	325P256H66D46N4XT	D	4.750
27.5	325P27DH66D46N4XT	D	4.750
30	325P306H66D46N4XT	D	4.750