



**GE Capacitors**

By REGAL-BELOIT

**CPD 510**

10 / 06



# **A-C Capacitors for Motor Run Applications**



# Capacitor Application Data Sheet

To ensure correct selection of a capacitor for your application, please provide the information indicated below. This sheet may be duplicated or additional copies may be obtained from RBC.

Of particular importance are the voltages and current waveforms complete with values of voltage and current over a complete cycle.

Send this data to your local RBC Sales Representative or directly to:

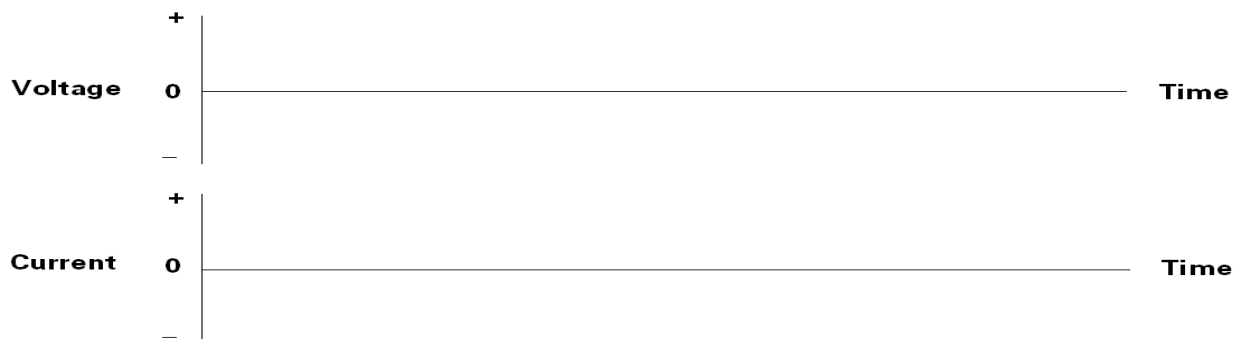
**GE Capacitors by Regal Beloit**  
**11970 PELLICANO DR., SUITE 300**  
**EL PASO, TEXAS 79936**  
**USA**

**Fax: (915) 849-5799**

## PRIMARY INFORMATION ( Essential )

1. **Application:** \_\_\_\_\_
2. **Capacitance:** \_\_\_\_\_ **Tolerance:** \_\_\_\_\_
3. **Peak Voltage:** \_\_\_\_\_ **RMS Voltage:** \_\_\_\_\_
4. **Peak Current:** \_\_\_\_\_ **RMS Current:** \_\_\_\_\_
5. **Transient Voltage:** \_\_\_\_\_ **Duration:** \_\_\_\_\_ **Freq. Of Occurrence:** \_\_\_\_\_
6. **Frequency or Repetition Rate (Hz):** \_\_\_\_\_ **Duty Cycle:** \_\_\_\_\_
7. **Ambient Temperature:** \_\_\_\_\_ **Max.:** \_\_\_\_\_ **Min.:** \_\_\_\_\_
8. **Capacitor Charge Time:** \_\_\_\_\_ **Discharge Time:** \_\_\_\_\_
9. **Required Operating Life (Hours):** \_\_\_\_\_

### 10. Waveforms:



## SECONDARY INFORMATION (Provide as Appropriate)

11. **Physical Size Limitations:** \_\_\_\_\_
12. **Mounting Requirements:** \_\_\_\_\_
13. **Applicable Specifications:** \_\_\_\_\_
14. **Type of cooling Available:** \_\_\_\_\_
15. **Unusual Atmospheric Conditions:** \_\_\_\_\_
16. **Other special Requirements:** \_\_\_\_\_
17. **Number of samples Required:** \_\_\_\_\_
18. **Potential Usage:** \_\_\_\_\_



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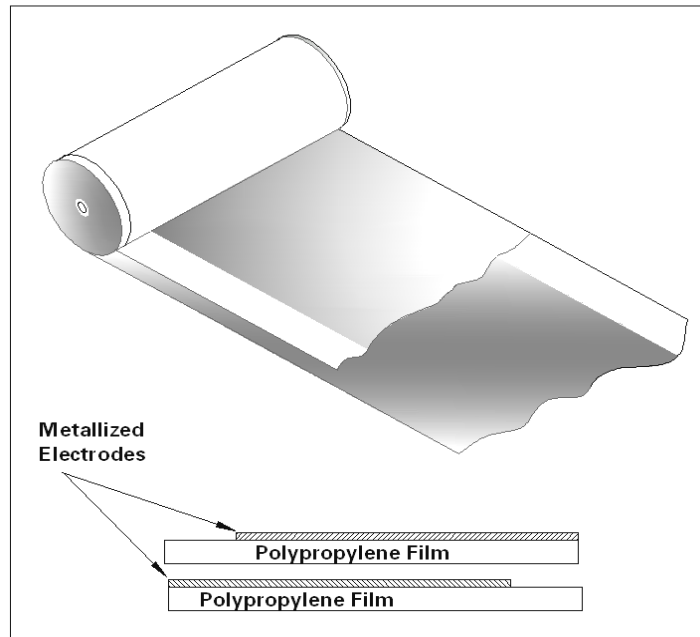
## Descriptive Information

### RBC Capacitors for Motor Run Applications

Metallized film capacitors are unsurpassed in terms of size, weight, performance, and reliability for AC applications. RBC - Capcom brings over 60 years of capacitor manufacturing experience to the product lines described in this publication. These capacitors represent the best in product design for long-term reliability and safe operation. RBC's materials, product, and process development work continue to provide capacitor users with outstanding total value.

The Gem III Motor Run Capacitors are widely used with permanent split phase capacitor motors for the more efficient use of electricity. These motors are used in heating and cooling equipment, appliances, business machines, office equipment, and a wide variety of light industrial equipment.

## GEM III Construction



RBC's Gem III capacitors are manufactured with high-grade metallized polypropylene film. This film is in the range of 5 to 10 microns thick, depending on the application voltage and conditions. The metallized electrode is several hundred angstroms thick.

The film is wound into capacitor rolls on high-speed, high-precision machines. The winding is extremely tight so that there is not enough space between the layers for corona (localized partial electrical discharges) to occur. The rolls are sprayed on both ends with metal to make connection to the extremely thin edges of the metallized electrodes. This process is critical to the quality and performance of the capacitors.

The rolls are assembled in metal cases, RBC's proprietary Dielektrol VI liquid is introduced under vacuum, and the capacitors are sealed. They are then subjected to 100% electrical testing for capacitance, dissipation factor, and high potential electrical withstand, both terminal-to-terminal and terminal-to-case.

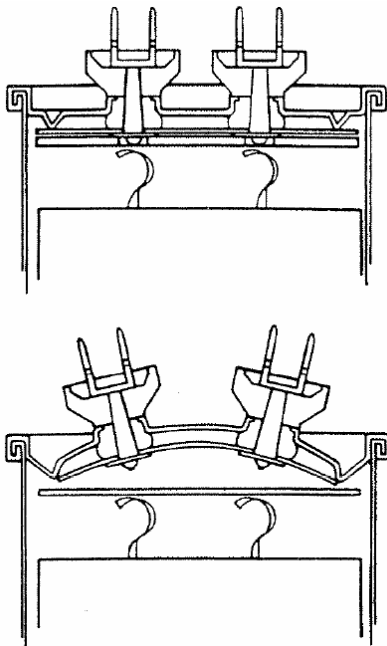
### Pressure Sensitive Interrupter

All the capacitors listed in this publication contain RBC's Pressure Sensitive Interrupter (PSI). This device, developed by RBC, is designed to sense the build-up of pressure within the capacitor if a fault occurs and to interrupt the internal electrical connections before the case can rupture.

The PSI carries U.L. \* recognition for applications where the specified fault currents are not exceeded. The fault current is the maximum current that is available from the circuit to flow through the capacitor if the capacitor were to become a short circuit with zero impedance. **It is the responsibility of the capacitor user to determine what the available fault current is for a particular application.**

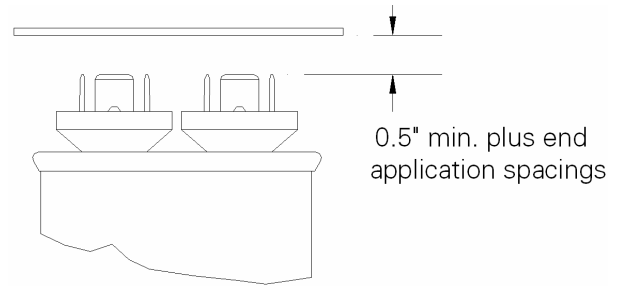
In the Catalog Number listings a four character U.L. Code, Pxxx, is given. This number is part of the listing for RBC in U.L. File No. E7793. When applying to U.L. for approvals or recognition of equipment using these capacitors refer to the Pxxx number and not the Catalog Number of the capacitor in question.

Proper operation of the PSI requires that the cover be able to expand without restriction. The following mounting considerations should be noted in mounting these capacitors.



### Vertical Clearance

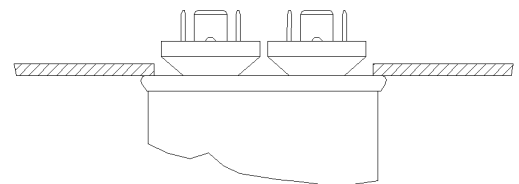
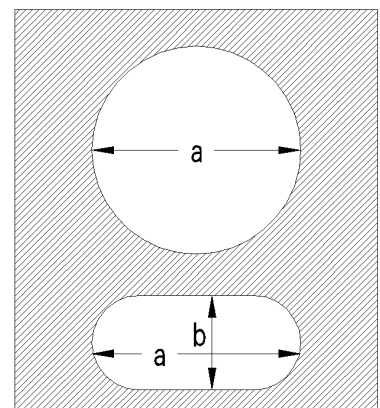
There must be sufficient clearance between the tops of the terminals (and/or the assembled wire connectors) and a plane perpendicular to the capacitor terminals. This clearance must be at least 0.5 inches plus the electrical spacing requirements of the end application.



### Cut-Out Clearance

In certain instances capacitors are mounted with the top of the capacitor case resting against the chassis and the terminals protruding through the chassis. Care must be taken to see that the cutout in the chassis is large enough. The following dimensions are recommended.

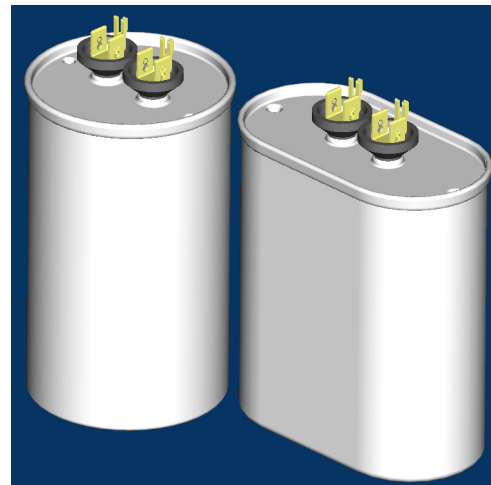
Case Style	a	b	Case Style	a
A	2.00	1.00	P	1.62
B	2.25	1.25	S	1.88
C	2.50	1.62	T	2.38
D	3.25	1.62		



\*Underwriter's Laboratories

## 370 and 440 Volts AC

This capacitor series is designed specifically for the motor run applications where the capacitors are used in conjunction with permanent split capacitor type motors. They may be used on either 50 or 60-Hertz systems but should not be used at higher frequencies or in applications where higher frequency harmonics are present. For those types of applications the General Purpose AC Capacitors shown on the following pages should be used. If there is any question regarding the correct application of these products, please contact your RBC sales representative.



### SPECIFICATIONS:

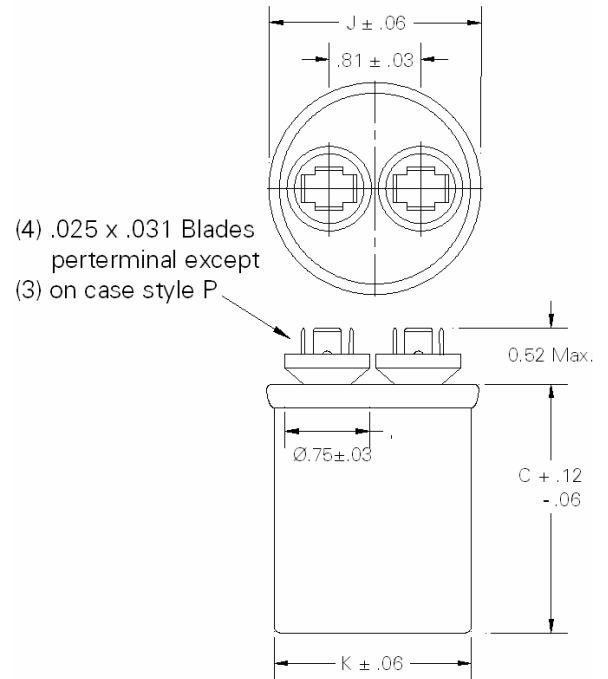
- Available Capacitance Range:** 2 to 120  $\mu$ F
- Capacitance Tolerance:**  $\pm$  6%
- Capacitance Variation with Temperature:** See chart M-3 on page 9.
- Rated Voltage:** See Rating Tables. Rating is the 50/60 Hz RMS voltage for a sinusoidal waveform.
- Leakage Current:** 30  $\mu$ A maximum
- Frequency:** 50/60 Hz For higher frequencies use the General Purpose AC Capacitor Series.
- Operating Temperature:** -40 °C to +70 °C
- Storage Temperature:** -40 °C to +90 °C
- Operating Life:** 60,000 hours with 94% survival
- Dissipation Factor:** 0.1% maximum
- Case Material/Finish:** Unpainted Aluminum case, tern plate steel cover. Contact RBC if material/finish to meet UL outdoor standards is required.
- Terminations:** 'Combo' terminal: 0.250" x 0.031" quick connect blades.
- Dielectric Fluid:** Dielektrol VI
- Internal Protection:** UL recognized Pressure Sensitive Interrupter. See Ratings Table for RBC's UL code Number listed under RBC's UL File E7793 (N). For UL submittals with these capacitors use the RBC 'Pxxx' number not the Catalog Number. The corresponding generic UL designation that includes the Available Faults Current (AFC) rating is given below. All these capacitors are capable of interrupting available fault currents of up to 10,000 amperes.

Case Style	RBC Code	Generic UL Code
A	P921	A10000AFC
P	P965	P10000AFC
S	P968	S10000AFC
T	P969	T10000AFC

## \*STANDARD RATINGS

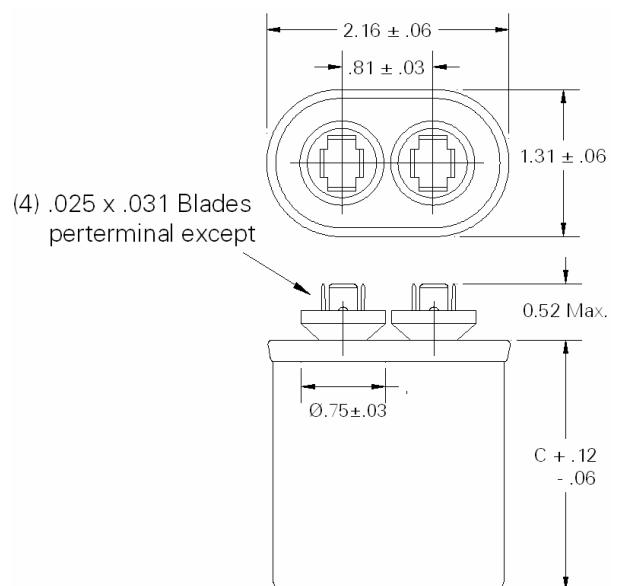
Capacitance (μF)	Catalog Number	Case Style	Height C (in.)	UL Code
<b>370 Volts AC Nominal</b>				
3	27L595	A	1.56	P921
4	27L571	A	1.56	P921
5	27L570	A	1.56	P921
6	97F5706	A	2.12	P921
7.5	27L566	A	2.12	P921
10	97F9002	A	2.88	P921
12.5	27L572	A	2.88	P921
15	27L567	A	2.88	P921
20	97F9602	P	2.88	P965
25	97F9606	P	2.88	P965
30	97F9608	P	3.88	P965
35	97F9611	P	3.88	P965
40	97F9614	P	3.88	P965
45	97F9884	P	4.75	P965
50	97F9802	P	4.75	P965
55	97F9010	S	4.75	P968
60	97F5276	T	3.88	P969
65	97F9011	T	3.88	P969
70	97F9012	T	4.75	P969
<b>440 Volts AC Nominal</b>				
3	97F5437	A	2.12	P921
4	97F5337	A	2.88	P921
5	97F5339	A	2.88	P921
6	97F5436	A	2.88	P921
7.5	97F9036	A	3.88	P921
10	97F5300	A	3.88	P921
12.5	97F9080	A	4.75	P921
15	97F9625	A	4.75	P921
20	97F9630	P	3.88	P965
25	97F9632	P	3.88	P965
30	97F9635	P	3.88	P965
35	97F9639	S	3.88	P968
40	97F9642	S	3.88	P968
45	97F9645	S	4.75	P968
50	97F5211	T	3.88	P969
55	97F9042	T	4.75	P969
60	97F9043	T	4.75	P969
65	97F5241	T	4.75	P969
70	97F5251	T	4.75	P969

## Case Style P, S, and T



Case Style	K	J
P	1.75	1.88
S	2.00	2.12
T	2.50	2.62

## Case Style A



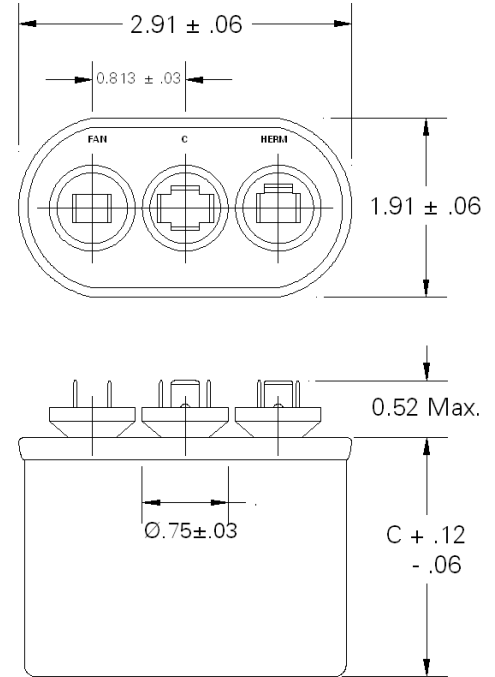
\* It is RBC's goal to serve you with the most cost effective and the highest quality capacitor designs. Standardization to the catalog type shown is a major program at RBC. However, RBC remains sensitive to your needs and requirements, and will continue to offer the above ratings (and more) in case configurations to meet your application (s).

## DUAL SECTION

### \*STANDARD RATINGS

Capacitance		Catalog Number	Case Style	Height C(in.)	UL Code
( $\mu$ F) (Herm)	( $\mu$ F) (Fan)				
<b>370 Volts AC Nominal</b>					
10	10	27L956	C	2.12	P923
15	5	97F9437	C	2.88	P923
15	7.5	97F9526	C	2.88	P923
20	5	97F9673	C	2.88	P923
20	7.5	97F9991	C	2.88	P923
25	5	97F9675	C	2.88	P923
25	7.5	97F9677	C	2.88	P923
30	5	97F9681	C	3.88	P923
30	7.5	97F9683	C	3.88	P923
35	5	97F9796	C	3.88	P923
35	7.5	97F9864	C	3.88	P923
40	5	97F9840	C	3.88	P923
40	7.5	97F9845	C	3.88	P923
45	5	97F9859	C	3.88	P923
45	7.5	97F9841	C	3.88	P923
50	5	97F9885	C	4.75	P923
50	7.5	97F9858	C	4.75	P923
<b>440 Volts AC Nominal</b>					
15	5	97F9694	C	2.88	P923
15	7.5	97F9992	C	2.88	P923
20	5	97F9695	C	2.88	P923
20	7.5	97F9696	C	3.88	P923
25	5	97F9730	C	3.88	P923
25	7.5	97F9993	C	3.88	P923
30	5	97F9994	C	3.88	P923
30	7.5	97F9995	C	3.88	P923
35	5	97F9842	C	4.75	P923
35	7.5	97F9892	C	4.75	P923
40	5	97F9843	C	4.75	P923
40	7.5	97F9996	C	4.75	P923

### Case Style C



Case Style	RBC Code	Generic UL Code
C	P923	C10000AFC
D	P924	D10000AFC

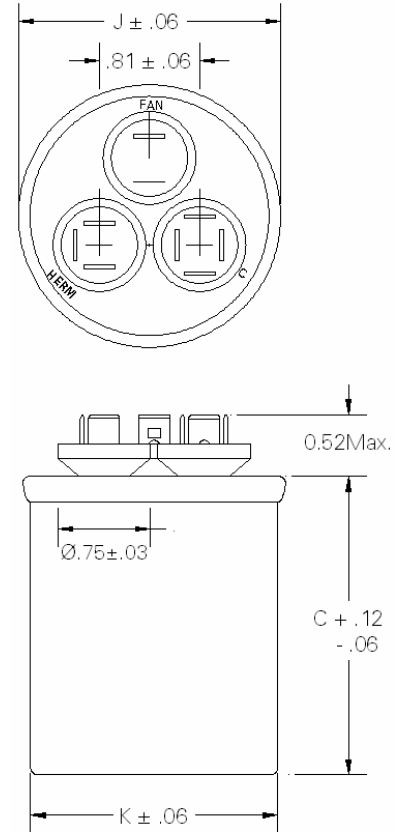
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## CONCENTRIC ROUND \*STANDARD RATINGS

## Case Style S,T

Capacitance		Catalog Number	Case Style	Height C(in.)	UL Code
( $\mu$ F) (Herm)	( $\mu$ F) (Fan)				
<b>370 Volts AC Nominal</b>					
15	5	97F9810	S	2.88	P968
15	7.5	97F9811	S	2.88	P968
20	5	97F9814	S	2.88	P968
20	7.5	97F9966	S	2.88	P968
20	10	97F9967	S	2.88	P968
25	5	97F9803	S	2.88	P968
25	7.5	97F9826	S	2.88	P968
25	10	97F9827	S	3.88	P968
30	3	27L955	S	2.88	P968
30	5	27L877	S	2.88	P968
30	7.5	97F9868	S	3.88	P968
30	10	97F9828	S	3.88	P968
35	5	97F9834	S	3.88	P968
35	7.5	97F9829	S	3.88	P968
40	5	97F9849	S	3.88	P968
40	7.5	97F9855	S	3.88	P968
40	10	97F9831	S	3.88	P968
45	5	27L880	S	3.88	P968
45	7.5	27L947	S	3.88	P968
45	10	97F9832	S	4.75	P968
50	5	97F9970	S	4.75	P968
50	7.5	97F9971	S	4.75	P968
50	10	97F9972	S	4.75	P968
55	5	97F9815	T	3.88	P969
55	7.5	97F9973	T	3.88	P969
55	10	97F9974	T	3.88	P969
60	5	27L954	T	3.88	P969
60	7.5	97F9817	T	4.75	P969
80	5	27L651	T	4.75	P969



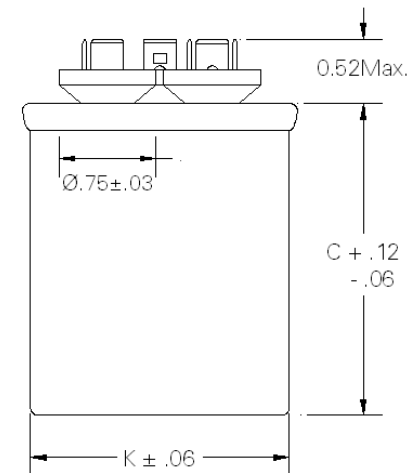
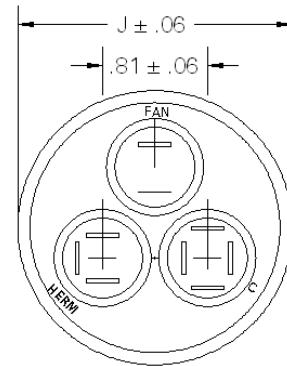
Case Style	K	J
S	2.00	2.12
T	2.50	2.62

\* It is RBC's goal to serve you with the most cost effective and the highest quality capacitor designs. Standardization to the catalog type shown is a major program at RBC. However, RBC remains sensitive to your needs and requirements, and will continue to offer the above ratings (and more) in case configurations to meet your application (s).

## CONCENTRIC ROUND \*STANDARD RATINGS

## Case Style S,T

Capacitance		Catalog Number	Case Style	Height C (in.)	UL Code
( $\mu$ F) (Herm)	( $\mu$ F) (Fan)				
<b>440 Volts AC Nominal</b>					
15	5	97F9997	S	2.88	P968
15	7.5	97F9998	S	3.88	P968
20	5	97F9975	S	2.88	P968
20	7.5	97F9976	S	3.88	P968
25	5	97F9978	S	3.88	P968
25	7.5	97F9979	S	3.88	P968
30	5	97F9981	S	3.88	P968
30	7.5	97F9982	S	3.88	P968
30	10	97F9983	S	3.88	P968
35	5	97F9848	S	4.75	P968
35	7.5	97F9881	S	4.75	P968
40	5	97F9838	S	4.75	P968
40	7.5	97F9882	S	4.75	P968
40	5	27L946	T	2.88	P969
45	5	97F9851	T	3.88	P969
45	7.5	97F9883	T	3.88	P969
50	5	27L569	T	4.25	P969
50	7.5	97F9987	T	4.75	P969
55	5	97F9839	T	4.75	P969
55	7.5	97F9874	T	4.75	P969
60	5	97F9897	T	4.75	P969



Case Style	K	J
S	2.00	2.12
T	2.50	2.62

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Life  
Vs  
Temperature

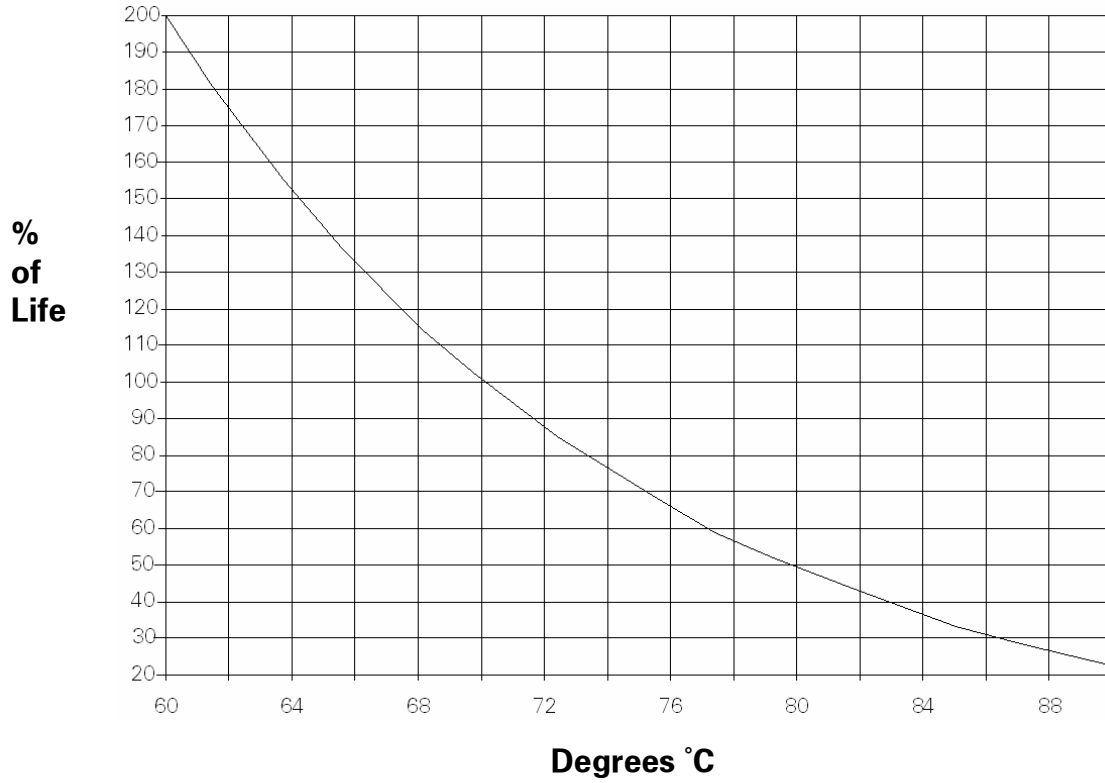


Chart M-1

Life  
Vs  
Voltage

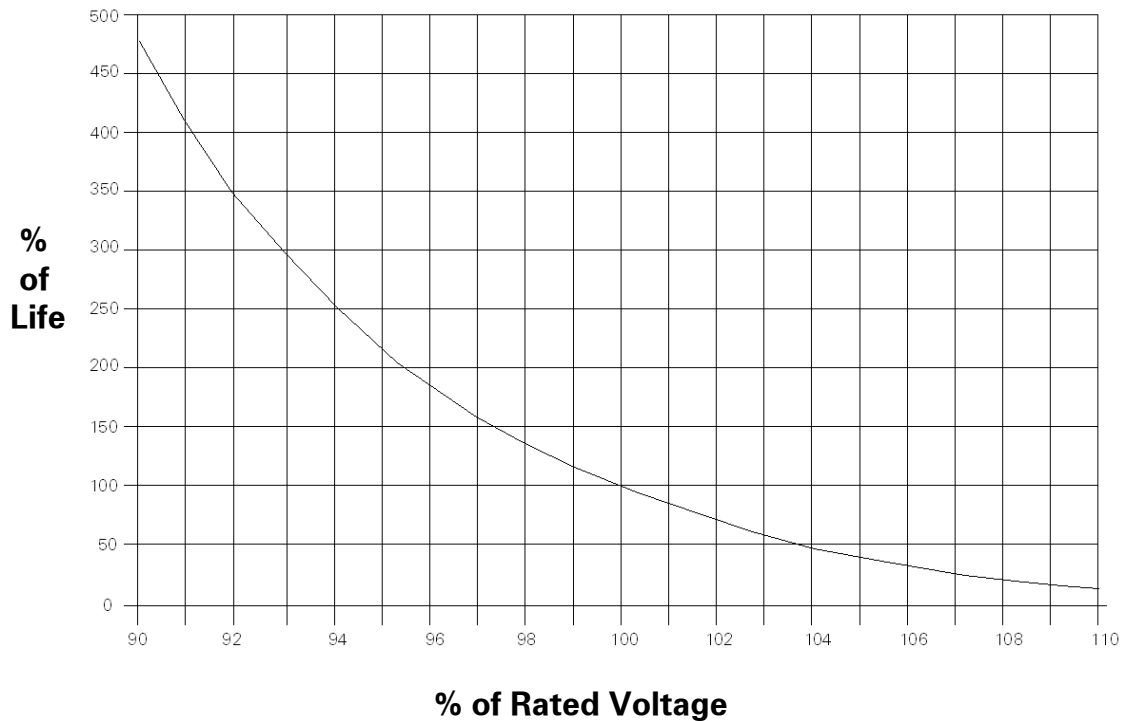
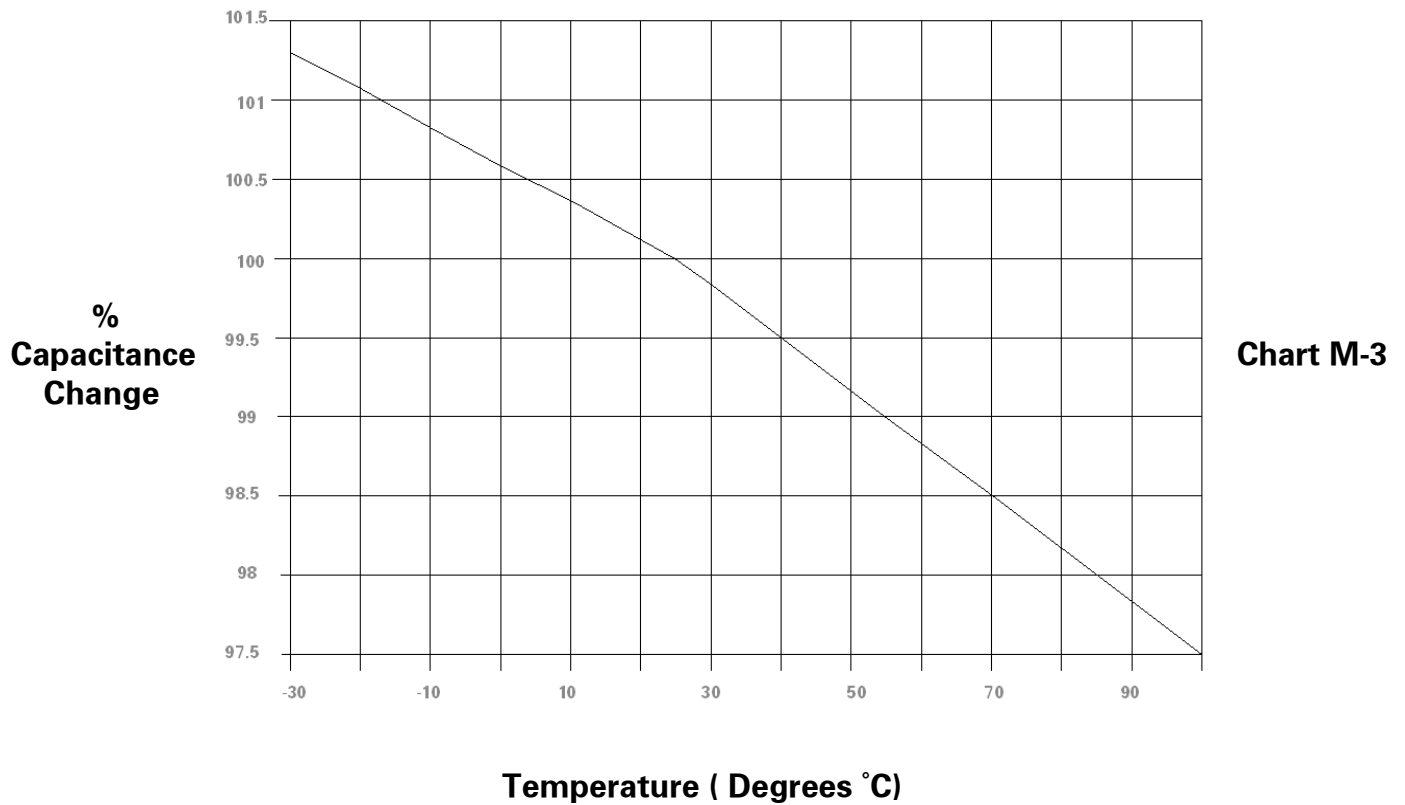


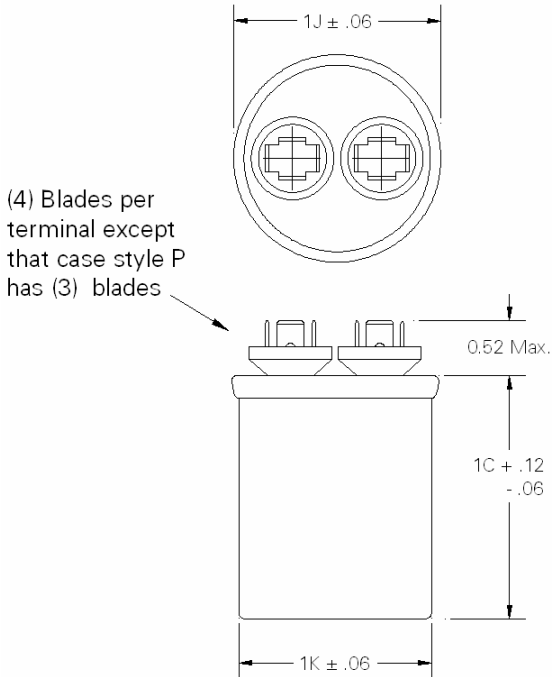
Chart M-2



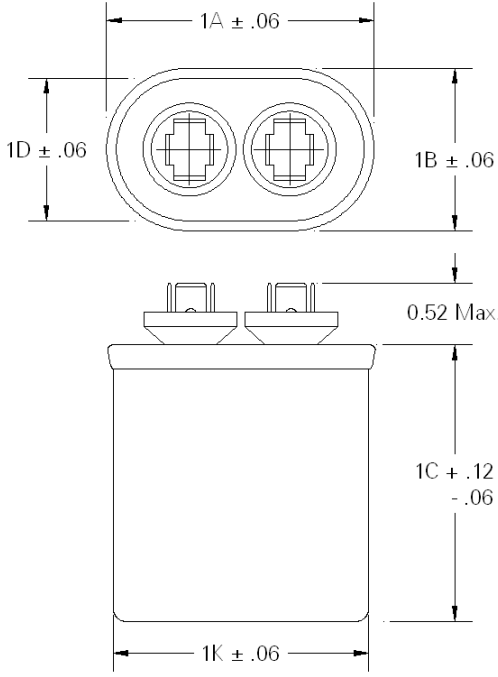
## Percent Capacitance Vs Temperature



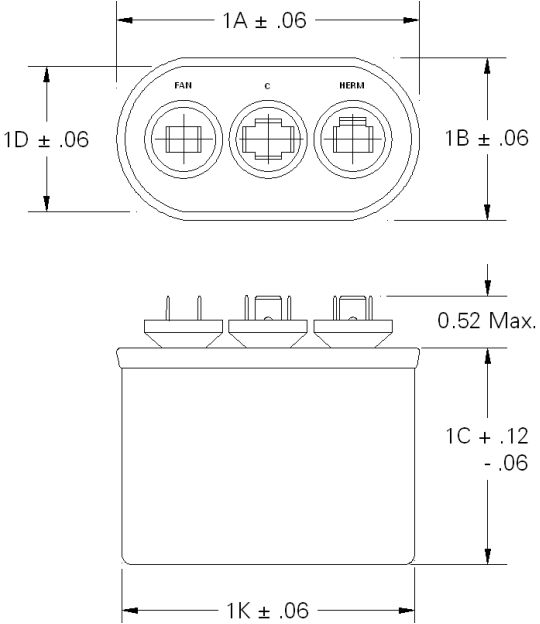
**Round Case Style ( P,S,T )**



**Oval Case Style ( A,B,C,D )**



**Dual Oval Case Style ( C )**



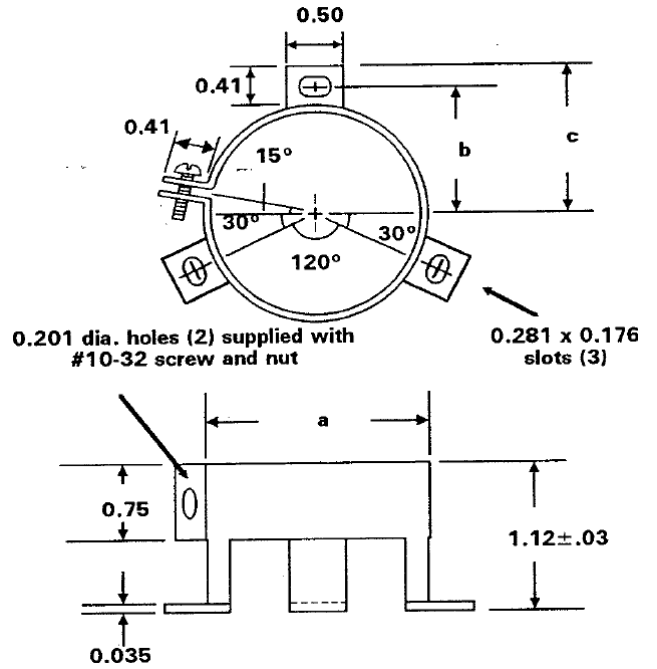
Oval Case Style		Dimensions			
		1A	1B	1D	1K
A	Oval	2.16	1.31	1.21	2.06
B	Oval	2.69	1.56	1.47	2.58
C	Oval	2.91	1.91	1.81	2.81
D	Oval	3.66	1.97	1.88	3.56
C	Dual Oval	2.91	1.91	1.81	2.81
Round Case Style		Dimensions			
		1K			1J
P	Round	1.75	—	—	1.88
S	Round	2.00	—	—	2.12
T	Round	2.50	—	—	2.62



## UNIVERSAL WRAP AROUND BRACKETS

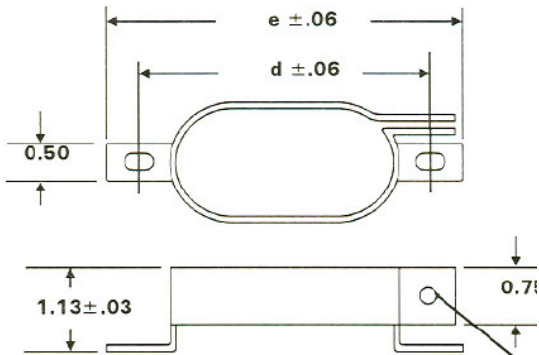
### ROUND CASE STYLES

Case Style	Bracket Part Number	a	b	c
P	295A6016P31	1.75	1.12	1.31
S	295A6016P32	2.00	1.25	1.44
T	295A6016P33	2.50	1.50	1.69



## UNIVERSAL WRAP AROUND BRACKETS

### OVAL CASE STYLES



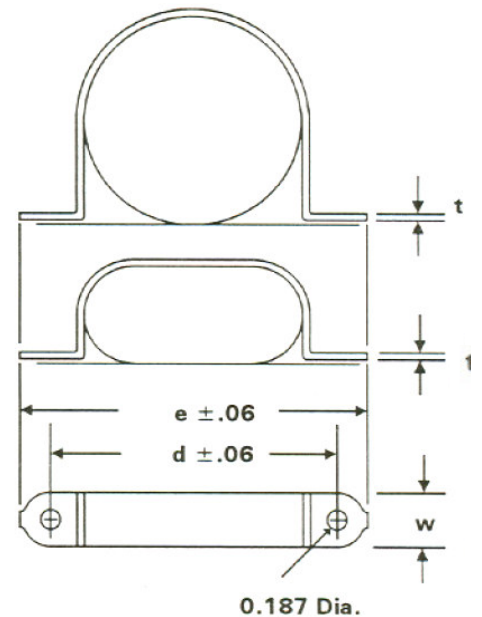
Case Style	Bracket Part Number	d	e
A	128A2244ACP21	2.69	3.13
B	128A2244ABP25	3.27	3.70
C	128A2244ABP22	3.44	3.88
D	128A2244ABP23	4.19	4.63

(2) .156 dia holes supplied with # 6-32 screw and nut

## WRAP AROUND BRACKETS

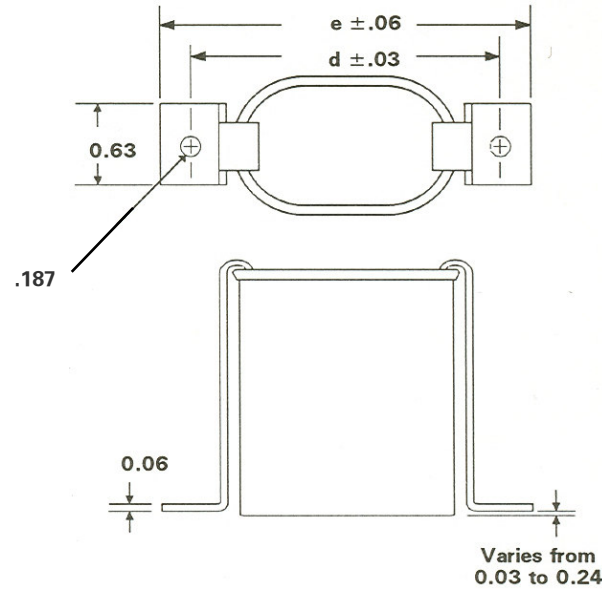
### ROUND AND OVAL CASE STYLES

Case Style	Bracket Part Number	d	e	w	t
A	K9827065P21	2.56	2.94	0.50	0.02
B	K9827065P31	3.06	3.50	0.63	0.02
C	614A301P61	3.31	3.81	0.75	0.03
D	614A301P51	4.06	4.56	0.75	0.03
P	279A7235P24	2.50	2.88	0.75	0.04
S	279A7235P22	2.75	3.12	0.75	0.04
T	279A7235P23	3.25	3.62	0.75	0.04



## FOOTED BRACKETS

Case Height	Bracket Part Number	Case Style	d	e
		A	2.56	3.00
2.12	302C920P210	B	3.13	3.56
2.88	302C920P113	C	3.38	3.81
3.88	302C920P115	D	4.13	4.56
4.75	302C920P116			
5.75	302C920P209	P	2.33	2.76
		S	2.57	3.00
		T	3.07	3.50

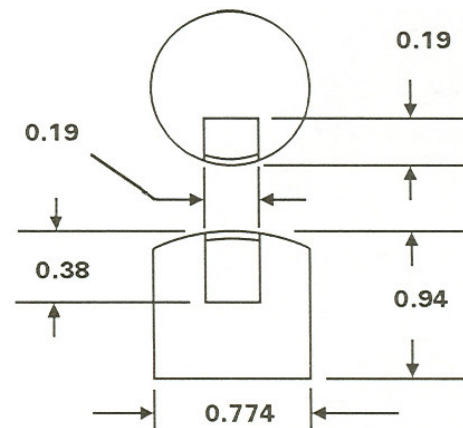
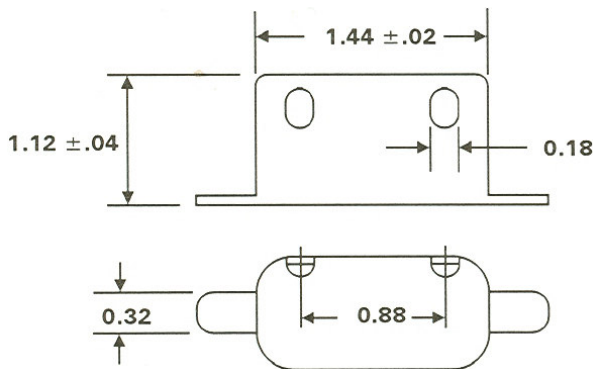


## PROTECTIVE BOOT

## PROTECTIVE CAP

Boot Part Number	Temperature Rating
614A527P21	60 °C
178A3744P21	105 °C

Cap Part Number:	115A1552P23
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AVAILABLE RBC COMPONENT CAPACITOR PUBLICATIONS		
Publication	Description	Replaces
CPD-510	AC Motor Run Capacitors	CPD-501
CPD-511	AC HID Lighting Capacitors	CPD-501
CPD-512	General Purpose Capacitors	CPD-501
CPD-517	Power Electrolytic Capacitors (General)	New Pub.

Please contact your RBC Sales Representative for further information  
Call or write directly to,

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**EL PASO , TEXAS 79936**  
**USA**

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**Fax: (915) 849-5799**



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