

C87 Series, Cylindrical Aluminum Case, Overpressure Protection, 420 VAC/470 VAC

Overview

Polypropylene metallized film with cylindrical aluminium can type filled with resin; faston, plastic deck or cable terminals and overpressure safety device.

Applications

Typical applications include motor run P2 safety class: single-phase motors, low power electric motors and compressors.

Benefits

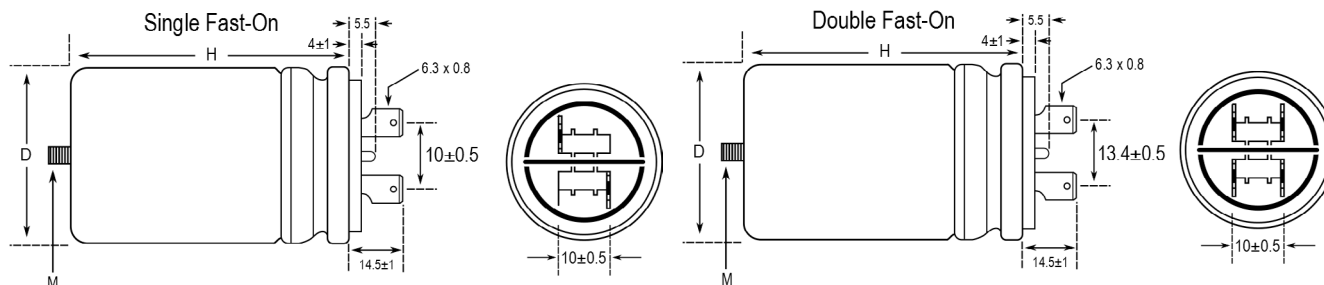
- Self-healing
- VDE, CQC and UL810 approved
- Rated frequency of 50 Hz and 60 Hz
- High capacitance density
- Safety device protection



Part Number System

C87	8	B	F	3	4300	AA	4	J
Series		Marking	Case & Fixing Bolt Code	Terminal Style	Capacitance Code (pF)	Packaging	Internal Use	Tolerance
C87 = Motor Run Capacitors	0 = 10,000 hours/420 VAC (Class B) or 3,000 hours/470 VAC (Class C) 8 = 30,000 hours/420 VAC (Class A) or 10,000 hours/470 VAC (Class B)	C870: C = Standard D = UL Z = Special C878: A = Standard B = UL Z = Special	F = Cylindrical aluminum can with M8 bolt G = Cylindrical aluminum can with M12 bolt E= Without fixing bolt/flat bottom	1 = Single faston 2.8 x 0.8 (hole) 2 = Single faston 6.3 x 0.8 3 = Double faston 6.3 x 0.8 4 = Single faston 2.8 x 0.8 (slot) 5 = Single faston 2.8 x 0.5 (hole)	Digits 2-4 indicate the first three digits of the capacitance value. First digit indicates the number of zeros to be added.	AA = Standard	0, 1, 2, 4, 5 = Standard	J = 5% K = 10% R = 0 to +10% X = Special tolerance

Dimensions – Millimeters



D	H	Mounting Stud (M)
+1/-0	± 2	
25	48	M8 x 10
25	60	M8 x 10
25	78	M8 x 10
30	48	M8 x 10
30	60	M8 x 10
30	78	M8 x 10
35	48	M8 x 10
35	60	M8 x 10
35	78	M8 x 10
35	98	M8 x 10
40	78	M8 x 10
40	98	M8 x 10
45	78	M8 x 10
45	98	M8 x 10
45	133	M8 x 10
50	133	M12 x 12.5
55	133	M12 x 12.5
60	98	M12 x 12.5
60	133	M12 x 12.5

Performance Characteristics

Type of Service	Continuous
Operating Class	
C87/8	Class B 10,000 hours at 470 VAC, Class A 30,000 hours at 420 VAC
C87/0	Class B 10,000 hours at 420 VAC, Class C 3,000 hours at 470 VAC
C87/1	None
C87/5	None
Temperature Range	-25 to +85°C
Rated Voltage	470 VAC
Rated Frequency	50 – 60 Hz
Voltage Rise/Fall Time (Maximum)	0 = 15 V/μs 8 = 20 V/μs
Maximum Permissible Voltage	1.10 x rated voltage
Maximum Permissible Current	1.30 x rated current
Dissipation Factor (DF)	20×10^{-4} at +20°C, 50Hz
Safety Class	P2
Maximum Altitude	2,000 m
Capacitance Tolerance	±5%
Mounting	Any position
Case	Aluminium
Disk	Thermoplastic Polymer V0 (UL 94) Plastic deck with: - self-extinguishing features V0 (UL94) - GWT–GWFI–GWIT value in conformity with the Standard IEC60335-1 ed.4 par.30/EN60335-1 ed.3 par.30
Filling Resin	Polyurethane
Dielectric	Polypropylene
Plates	Self-healing metal layer
Test Voltage Terminal to Terminal (V_{TT})	$2 V_n$ for 2 seconds
Test Voltage Terminal to Can (V_{TC})	2,000 V for 2 seconds
Total Harmonic Distortion	Up to 10%
Fire Load	40 MJ/kg
Air Distance Between Live Parts	≥ 5 mm
Air Distance Between Live Parts and Case	≥ 6 mm
Vibration Test	IEC 68-2-6
Maximum Tightening Torque	5 Nm (M8), 10 Nm (M12)

Table 1 – Ratings & Part Number Reference

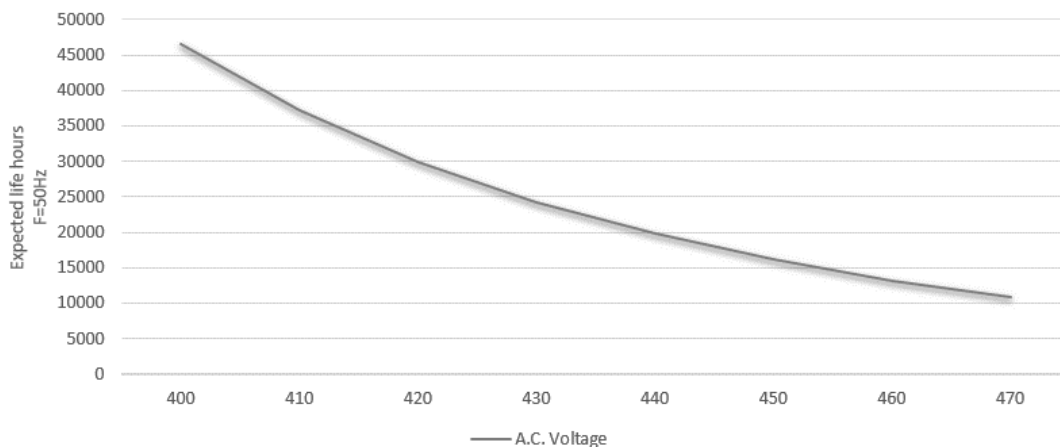
Capacitance Value (μF)	VAC	Maximum Dimensions in mm		dV/dt (V/μs)	Termination	Part Number
		D	H			
16	470	40	78	15	Double Fast-On	C870CF35160AA1J
18	470	40	78	15	Double Fast-On	C870CF35180AA0J
20	470	35	98	15	Double Fast-On	C870CF35200AA0J
20	470	35	98	15	Double Fast-On	C870CF35200AA1J
22	470	40	78	15	Double Fast-On	C870CF35220AA0J
25	470	45	78	15	Double Fast-On	C870CF35250AA0J
25	470	40	98	15	Double Fast-On	C870CF35250AA1J
30	470	40	98	15	Double Fast-On	C870CF35300AA1J
35	470	45	98	15	Double Fast-On	C870CF35350AA0J
40	470	45	98	15	Double Fast-On	C870CF35400AA0J
45	470	45	133	15	Double Fast-On	C870CF35450AA0J
50	470	50	133	15	Double Fast-On	C870CG35500AA1J
60	470	60	98	15	Double Fast-On	C870CG35600AA5J
70	470	55	133	15	Double Fast-On	C870CG35700AA1J
75	470	60	133	15	Double Fast-On	C870CG35750AA0J
75	470	50	133	15	Double Fast-On	C870CG35750AA2J
80	470	50	133	15	Double Fast-On	C870CG35800AA2J
100	470	55	133	15	Double Fast-On	C870CG36100AA0J
100	470	55	133	15	Double Fast-On	C870CG36100AA0K
100	470	60	133	15	Double Fast-On	C870CG36100AA1J
110	470	60	133	15	Double Fast-On	C870CG36110AA0J
1	450	30	48	20	Double Fast-On	C878BF34100SA4J
1.5	450	30	48	20	Double Fast-On	C878BF34150SA4J
1.8	450	30	48	20	Double Fast-On	C878ZF34180SA0J
2	450	30	48	20	Double Fast-On	C878BF34200SA0J
2.5	450	30	48	20	Double Fast-On	C878BF34250SA4J
3	450	30	48	20	Double Fast-On	C878BF34300SA4J
3.5	450	35	48	20	Double Fast-On	C878BF34350SA4J
4	450	35	48	20	Double Fast-On	C878BF34400SA0J
5	450	30	60	20	Double Fast-On	C878BF34500SA0J
6	450	30	78	20	Double Fast-On	C878BF34600SA0J
7.5	450	30	78	20	Double Fast-On	C878BF34750SA0J
8	450	30	78	20	Double Fast-On	C878BF34800SA0J
10	450	35	78	20	Double Fast-On	C878BF35100SA0J
11	450	35	78	20	Double Fast-On	C878BF35110SA0J
12	450	35	78	20	Double Fast-On	C878BF35120SA0J
15	450	40	78	20	Double Fast-On	C878BF35150SA0J
16	450	40	78	20	Double Fast-On	C878BF35160SA0J
20	450	45	78	20	Double Fast-On	C878BF35200SA0J
23	450	45	78	20	Double Fast-On	C878BF35230SA0J
25	450	45	98	20	Double Fast-On	C878BF35250SA0J
29	450	45	98	20	Double Fast-On	C878BF35290SA0J
30	450	45	98	20	Double Fast-On	C878BF35300SA0J
46	450	45	133	20	Double Fast-On	C878BF35460SA0J
50	450	50	133	20	Double Fast-On	C878BF35500SA0J
55	450	50	133	20	Double Fast-On	C878BF35550SA0J
60	450	50	133	20	Double Fast-On	C878BF35600SA0J
8	470	30	78	20	Single Fast-On	C878AF24800AA0J
8	470	35	78	20	Single Fast-On	C878AF24800AA1J
10	470	35	78	20	Single Fast-On	C878AF25100AA0J
12	470	35	78	20	Single Fast-On	C878AF25120AA0J
12	470	40	78	20	Single Fast-On	C878AF25120AA1J
16	470	40	78	20	Single Fast-On	C878AF25160AA0J
16	470	40	98	20	Single Fast-On	C878AF25160AA1J
20	470	45	78	20	Single Fast-On	C878AF25200AA0J
25	470	45	98	20	Single Fast-On	C878AF25250AA0J
30	470	45	98	20	Single Fast-On	C878AF25300AA0J
40	470	45	133	20	Single Fast-On	C878AF25400AA0J
1	470	30	48	20	Double Fast-On	C878AF34100AA4J
2	470	30	48	20	Double Fast-On	C878AF34200AA4J
2.5	470	30	48	20	Double Fast-On	C878AF34250AA4J
Capacitance Value (μF)	VAC	B (mm)	H (mm)	dV/dt (V/μs)	Termination	Part Number

Table 1 – Ratings & Part Number Reference cont'd

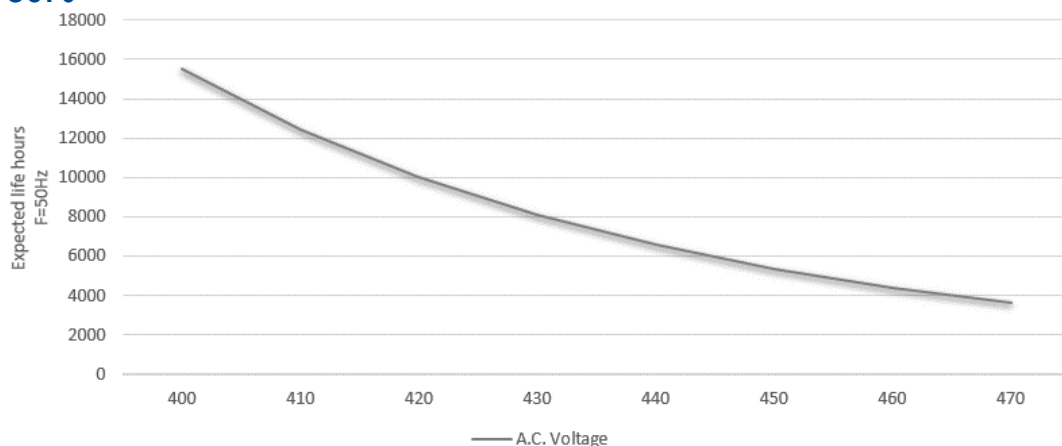
Capacitance Value (μF)	VAC	Maximum Dimensions in mm		dV/dt (V/μs)	Termination	Part Number
		D	H			
3	470	30	48	20	Double Fast-On	C878AF34300AA4J
3.5	470	35	48	20	Double Fast-On	C878AF34350AA4J
4	470	35	48	20	Double Fast-On	C878AF34400AA4J
5	470	35	48	20	Double Fast-On	C878AF34500AA4J
6	470	30	78	20	Double Fast-On	C878AF34600AA0J
6	470	35	78	20	Double Fast-On	C878AF34600AA1J
7.5	470	30	78	20	Double Fast-On	C878AF34750AA0J
7.5	470	35	60	20	Double Fast-On	C878AF34750AA2J
8	470	30	78	20	Double Fast-On	C878AF34800AA0J
9	470	35	78	20	Double Fast-On	C878AF34900AA0J
10	470	35	78	20	Double Fast-On	C878AF35100AA0J
11	470	35	78	20	Double Fast-On	C878AF35110AA0J
12	470	35	78	20	Double Fast-On	C878AF35120AA0J
12	470	40	78	20	Double Fast-On	C878AF35120AA1J
12.5	470	35	78	20	Double Fast-On	C878AF35125AA0J
14	470	40	78	20	Double Fast-On	C878AF35140AA0J
15	470	40	78	20	Double Fast-On	C878AF35150AA0J
16	470	40	78	20	Double Fast-On	C878AF35160AA0J
16	470	40	98	20	Double Fast-On	C878AF35160AA1J
16	470	35	98	20	Double Fast-On	C878AF35160AA2J
18	470	45	78	20	Double Fast-On	C878AF35180AA0J
20	470	45	78	20	Double Fast-On	C878AF35200AA0J
22.5	470	45	78	20	Double Fast-On	C878AF35225AA0J
25	470	45	98	20	Double Fast-On	C878AF35250AA0J
30	470	45	98	20	Double Fast-On	C878AF35300AA0J
30	470	45	133	20	Double Fast-On	C878AF35300AA1J
31.5	470	45	98	20	Double Fast-On	C878AF35315AA0J
35	470	45	133	20	Double Fast-On	C878AF35350AA0J
40	470	45	133	20	Double Fast-On	C878AF35400AA0J
40	470	50	133	20	Double Fast-On	C878AG35400AA2J
45	470	50	133	20	Double Fast-On	C878AG35450AA0J
50	470	50	133	20	Double Fast-On	C878AG35500AA0J
50	470	55	133	20	Double Fast-On	C878AG35500AA1J
55	470	50	133	20	Double Fast-On	C878AG35550AA0J
60	470	50	133	20	Double Fast-On	C878AG35600AA0J
60	470	60	133	20	Double Fast-On	C878AG35600AA1J
80	470	60	133	20	Double Fast-On	C878AG35800AA0J
Capacitance Value (μF)	VAC	B (mm)	H (mm)	dV/dt (V/μs)	Termination	Part Number

Expected Life Hours

C878



C870



Marking

A	C.87.8BF3 MKP	X	→ MKP C87
$X_{\mu F} \pm 5\%$	P2		→ Capacitance Tolerance/Safety Class
420V~30000h/Class A		D'E	→ Capacitor Class
470V~10000h/Class B			→ Climate Class
EN60252-1 -25/85/21			
450VAC 60Hz -25..70°C	us		→ Rated Voltage based on UL Standards
PROTECTED 10000AFC	C22.2no.190 Tamb≤46°C		→ UL Approvals
NO PCBs	SH		→ Self-Healing dielectric
B F8 28BC 10:44	CE		→ Data Code

Dissipation Factor

Dissipation factor is a complex function involved with the inefficiency of the capacitor. The $\tan \delta$ may change up and down with increased temperature. For more information, please refer to Performance Characteristics.

Sealing

Hermetically Sealed Capacitors

When the temperature increases, the pressure inside the capacitor increases. If the internal pressure is high enough, it can cause a breach in the capacitor which can result in leakage, impregnation, filling fluid or moisture susceptibility.

Resin Encased/Wrap & Fill Capacitors

The resin seals on resin encased and wrap and fill capacitors will withstand short-term exposure to high humidity environments without degradation. Resins and plastic tapes will form a pseudo-impervious barrier to humidity and chemicals. These case materials are somewhat porous and through osmosis can cause contaminants to enter the capacitor. The second area of contaminated absorption is the lead-wire/resin interface. Since resins cannot bond 100% to tinned wires, there can be a path formed up to the lead wire into the capacitor section. Aqueous cleaning of circuit boards can aggravate this condition.

Barometric Pressure

The altitude at which hermetically sealed capacitors are operated controls the voltage rating of the capacitor. As the barometric pressure decreases, the susceptibility to terminal arc-over increases. Non-hermetic capacitors can be affected by internal stresses due to pressure changes. This can be in the form of capacitance changes or dielectric arc-over as well as low insulation resistance. Heat transfer can also be affected by altitude operation. Heat generated in operation cannot be dissipated properly and can result in high R12 losses and eventual failure.

Radiation

Radiation capabilities of capacitors must be taken into consideration. Electrical degradation in the form of dielectric embitterment can take place causing shorts or opens.

Environmental Compliance

As an environmentally conscious company, KEMET is working continuously with improvements concerning the environmental effects of both our capacitors and the production of them.

In Europe (RoHS Directive) and in some other geographical areas like China, legislation has been put in place to prevent the use of some hazardous materials, like Lead (Pb), in electronic equipment. All products in this catalog are produced to help our customers' obligations to guarantee their products to fulfill these legislative requirements. The only material of concern in our products has been Lead (Pb), which has been removed from all designs to fulfill the requirement of containing less than 0.1% of Lead in any homogeneous material.

KEMET will closely follow any changes in legislation world wide and makes any necessary changes in its products, whenever needed. Some customer segments like Medical, Military and Automotive Electronics may still require the use of Lead in electrode coatings. To clarify the situation and distinguish products from each other, a special symbol is used on the packaging labels for RoHS compatible capacitors.

Because of customer requirements there may appear additional markings like LF = Lead Free or LFW = Lead Free Wires on the label.

Materials & Environment

The selection of materials used by KEMET for the production of capacitors is the result of extensive experience and constant attention to environmental protection. KEMET selects its suppliers according to ISO 9001 standards and carries out statistical analysis on the materials purchased before acceptance. All materials are, to the company's present knowledge, non-toxic and free from Cadmium, Mercury, Chrome and compounds, PCB (Polychlorine Triphenyl), Bromide and Chlorine Dioxins Bromurate Chlorurate, CFC and HCFC and Asbestos.

Green Products

All KEMET power film products are ROHS Compliant.

Insulation Resistance

When the capacitor temperature increases, the insulation resistance decreases. This is due to increased electron activity. Low insulation resistance can also be the result of moisture trapped in the windings, caused by a prolonged exposure to excessive humidity.

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The Customer acknowledges the following limitations of the prototype samples:

- (1) Prototype samples are manufactured from preliminary designs and manufacturing processes; may not represent final designs; have not been released for commercial use and are not subject to the same quality control procedures applicable to released products.*
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- (3) Prototype samples are not intended for commercial use; are provided for engineering evaluation only and are not recommended for use in the Customer's production line.*
- (4) The Customer assumes the risk of any and all uses that the Customer makes of the prototype samples.*

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