Motor Run Capacitors

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

Overview

The C87 capacitor is a polypropylene metallized film capacitor with a cylindrical, aluminium can-type design filled with resin. It uses faston, plastic deck or cable terminals, and an overpressure safety device.

Applications

Typical applications include motor run S2 safety class: single-phase motors, low power electric motors, and compressors.

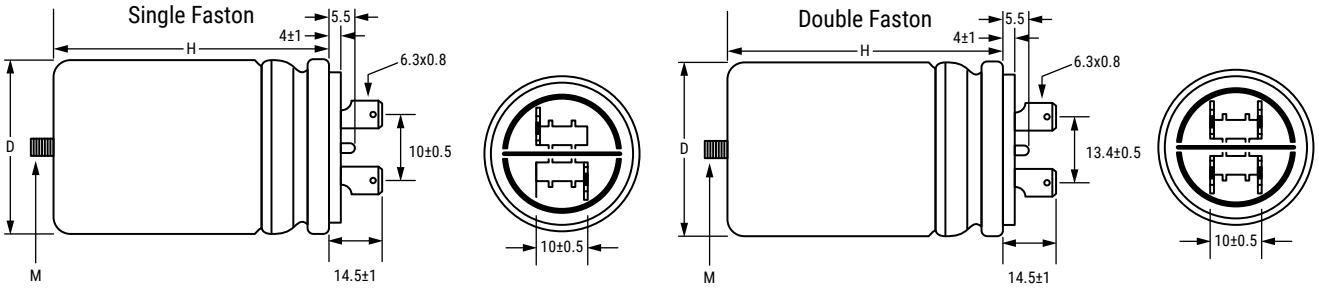
Benefits

- 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 and 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

Qualification

Reference Standards	IEC 252;EN 60252–1:2011/A1/2013, VDE, CQC, UL810 (construction only), approved up to 500 VAC
Vibration Test	IEC 68–2–6

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
Temperature Range	–25 to +85°C valid for all C87 Series –25 to +100°C valid only for C878H with temperature, cap. range 1 – 12 µF
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 x 10^{-4} at +20°C, 50 Hz
Safety Class	S2
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)	Packaging Quantity	Termination	Part Number
		D	H				
3	470	30	48	15	115	Single Fast-On	C870CF24300AA4J
4	470	30	48	15	115	Single Fast-On	C870CF24400AA4J
5	470	35	48	15	86	Single Fast-On	C870CF24500AA4J
6	470	30	60	15	115	Single Fast-On	C870CF24600AA1J
8	470	30	78	15	115	Single Fast-On	C870CF24800AA0J
8	470	30	60	15	86	Single Fast-On	C870CF24800AA1J
10	470	30	78	15	115	Single Fast-On	C870CF25100AA0J
10	470	35	78	15	86	Single Fast-On	C870CF25100AA2J
12	470	35	78	15	86	Single Fast-On	C870CF25120AA0J
12.5	470	35	78	15	86	Single Fast-On	C870CF25125AA0J
14	470	35	78	15	86	Single Fast-On	C870CF25140AA0J
16	470	35	78	15	86	Single Fast-On	C870CF25160AA0J
18	470	40	78	15	62	Single Fast-On	C870CF25180AA0J
20	470	40	78	15	62	Single Fast-On	C870CF25200AA0J
25	470	40	98	15	62	Single Fast-On	C870CF25250AA1J
30	470	40	98	15	62	Single Fast-On	C870CF25300AA1J
40	470	45	98	15	50	Single Fast-On	C870CF25400AA0J
4	470	30	48	15	115	Double Fast-On	C870CF34400AA4J
5	470	35	48	15	86	Double Fast-On	C870CF34500AA4J
8	470	30	78	15	115	Double Fast-On	C870CF34800AA0J
9	470	30	78	15	115	Double Fast-On	C870CF34900AA0J
10	470	30	78	15	115	Double Fast-On	C870CF35100AA0J
14	470	35	78	15	86	Double Fast-On	C870CF35140AA0J
15	470	35	78	15	86	Double Fast-On	C870CF35150AA0J
16	470	35	78	15	86	Double Fast-On	C870CF35160AA0J
18	470	40	78	15	62	Double Fast-On	C870CF35180AA0J
20	470	40	78	15	62	Double Fast-On	C870CF35200AA0J
20	470	35	98	15	86	Double Fast-On	C870CF35200AA1J
22	470	40	78	15	62	Double Fast-On	C870CF35220AA0J
25	470	45	78	15	50	Double Fast-On	C870CF35250AA0J
30	470	40	98	15	62	Double Fast-On	C870CF35300AA1J
35	470	45	98	15	50	Double Fast-On	C870CF35350AA0J
40	470	45	98	15	50	Double Fast-On	C870CF35400AA0J
45	470	45	133	15	50	Double Fast-On	C870CF35450AA0J
50	470	50	133	15	40	Double Fast-On	C870CG35500AA1J
60	470	60	98	15	28	Double Fast-On	C870CG35600AA5J
70	470	55	133	15	32	Double Fast-On	C870CG35700AA1J
75	470	60	133	15	28	Double Fast-On	C870CG35750AA0J
75	470	50	133	15	40	Double Fast-On	C870CG35750AA2J
80	470	50	133	15	40	Double Fast-On	C870CG35800AA2J
100	470	55	133	15	32	Double Fast-On	C870CG36100AA0J
100	470	55	133	15	32	Double Fast-On	C870CG36100AA0K
100	470	60	133	15	28	Double Fast-On	C870CG36100AA1J
110	470	60	133	15	28	Double Fast-On	C870CG36110AA0J
1	470	30	48	20	115	Single Fast-On	C878AF24100AA4J
1	470	25	48	20	162	Single Fast-On	C878AF24100AA5J
1.25	470	30	48	20	115	Single Fast-On	C878AF24125AA4J
1.5	470	25	60	20	162	Single Fast-On	C878AF24150AA1J
1.5	470	30	48	20	115	Single Fast-On	C878AF24150AA4J
1.5	470	25	48	20	162	Single Fast-On	C878AF24150AA5J
2	470	25	60	20	162	Single Fast-On	C878AF24200AA1J
2	470	30	48	20	115	Single Fast-On	C878AF24200AA4J
2.5	470	25	60	20	162	Single Fast-On	C878AF24250AA1J
2.5	470	30	48	20	115	Single Fast-On	C878AF24250AA4J
3	470	25	60	20	162	Single Fast-On	C878AF24300AA2J
3	470	30	48	20	115	Single Fast-On	C878AF24300AA4J
4	470	25	78	20	162	Single Fast-On	C878AF24400AA0J
4	470	35	60	20	86	Single Fast-On	C878AF24400AA2J
4	470	35	48	20	86	Single Fast-On	C878AF24400AA4J
4	470	30	78	20	115	Single Fast-On	C878AF24400AA5J
5	470	30	60	20	115	Single Fast-On	C878AF24500AA1J
Capacitance Value (µF)	**VAC**	**B (mm)**	**H (mm)**	**dV/dt (V/µs)**		**Termination**	**Part Number**

Table 1 – Ratings & Part Number Reference cont.

Capacitance Value (µF)	VAC	Maximum Dimensions in mm		dV/dt (V/µs)	Packaging Quantity	Termination	Part Number
		D	H				
5	470	35	60	20	86	Single Fast-On	C878AF24500AA2J
5	470	35	48	20	86	Single Fast-On	C878AF24500AA4J
6	470	30	78	20	115	Single Fast-On	C878AF24600AA0J
6	470	35	78	20	86	Single Fast-On	C878AF24600AA1J
6.3	470	35	60	20	86	Single Fast-On	C878AF24630AA2J
7	470	30	78	20	115	Single Fast-On	C878AF24700AA0J
7.5	470	30	78	20	115	Single Fast-On	C878AF24750AA0J
7.5	470	35	60	20	86	Single Fast-On	C878AF24750AA2J
8	470	30	78	20	115	Single Fast-On	C878AF24800AA0J
8	470	35	78	20	86	Single Fast-On	C878AF24800AA1J
10	470	35	78	20	86	Single Fast-On	C878AF25100AA0J
12	470	35	78	20	86	Single Fast-On	C878AF25120AA0J
12	470	40	78	20	62	Single Fast-On	C878AF25120AA1J
16	470	40	78	20	62	Single Fast-On	C878AF25160AA0J
16	470	40	98	20	62	Single Fast-On	C878AF25160AA1J
20	470	45	78	20	50	Single Fast-On	C878AF25200AA0J
25	470	45	98	20	50	Single Fast-On	C878AF25250AA0J
30	470	45	98	20	50	Single Fast-On	C878AF25300AA0J
40	470	45	133	20	50	Single Fast-On	C878AF25400AA0J
1	470	30	48	20	115	Double Fast-On	C878AF34100AA4J
1.8	470	30	48	20	115	Double Fast-On	C878AF34180AA0J
2	470	30	48	20	115	Double Fast-On	C878AF34200AA4J
2.5	470	30	48	20	115	Double Fast-On	C878AF34250AA4J
3	470	30	48	20	115	Double Fast-On	C878AF34300AA4J
3.5	470	35	48	20	86	Double Fast-On	C878AF34350AA4J
4	470	35	48	20	86	Double Fast-On	C878AF34400AA4J
5	470	35	48	20	86	Double Fast-On	C878AF34500AA4J
6	470	30	78	20	115	Double Fast-On	C878AF34600AA0J
6	470	35	78	20	86	Double Fast-On	C878AF34600AA1J
7.5	470	30	78	20	115	Double Fast-On	C878AF34750AA0J
7.5	470	35	60	20	86	Double Fast-On	C878AF34750AA2J
8	470	30	78	20	115	Double Fast-On	C878AF34800AA0J
9	470	35	78	20	86	Double Fast-On	C878AF34900AA0J
10	470	35	78	20	86	Double Fast-On	C878AF35100AA0J
11	470	35	78	20	86	Double Fast-On	C878AF35110AA0J
12	470	35	78	20	86	Double Fast-On	C878AF35120AA0J
12	470	40	78	20	62	Double Fast-On	C878AF35120AA1J
12.5	470	35	78	20	86	Double Fast-On	C878AF35125AA0J
14	470	40	78	20	62	Double Fast-On	C878AF35140AA0J
15	470	40	78	20	62	Double Fast-On	C878AF35150AA0J
16	470	40	78	20	62	Double Fast-On	C878AF35160AA0J
16	470	40	98	20	62	Double Fast-On	C878AF35160AA1J
16	470	35	98	20	86	Double Fast-On	C878AF35160AA2J
18	470	45	78	20	50	Double Fast-On	C878AF35180AA0J
20	470	45	78	20	50	Double Fast-On	C878AF35200AA0J
22.5	470	45	78	20	50	Double Fast-On	C878AF35225AA0J
25	470	45	98	20	50	Double Fast-On	C878AF35250AA0J
30	470	45	98	20	50	Double Fast-On	C878AF35300AA0J
30	470	45	133	20	50	Double Fast-On	C878AF35300AA1J
31.5	470	45	98	20	50	Double Fast-On	C878AF35315AA0J
35	470	45	133	20	50	Double Fast-On	C878AF35350AA0J
40	470	45	133	20	50	Double Fast-On	C878AF35400AA0J
40	470	50	133	20	40	Double Fast-On	C878AG35400AA2J
45	470	50	133	20	40	Double Fast-On	C878AG35450AA0J
50	470	50	133	20	40	Double Fast-On	C878AG35500AA0J
50	470	55	133	20	32	Double Fast-On	C878AG35500AA1J
55	470	50	133	20	40	Double Fast-On	C878AG35550AA0J
60	470	50	133	20	40	Double Fast-On	C878AG35600AA0J
60	470	60	133	20	28	Double Fast-On	C878AG35600AA1J
80	470	60	133	20	28	Double Fast-On	C878AG35800AA0J
1	470	30	48	20	115	Double Fast-On	C878BF34100AA4J
Capacitance Value (µF)	**VAC**	**B (mm)**	**H (mm)**	**dV/dt (V/µs)**		**Termination**	**Part Number**

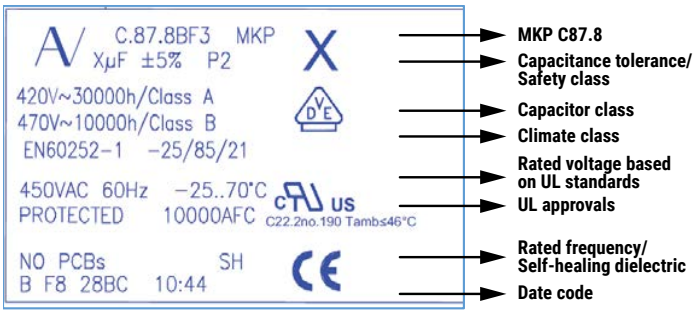
Table 1 – Ratings & Part Number Reference cont.

Capacitance Value (µF)	VAC	Maximum Dimensions in mm		dV/dt (V/µs)	Packaging Quantity	Termination	Part Number
		D	H				
1.5	470	30	48	20	115	Double Fast-On	C878BF34150AA4J
2	470	30	48	20	115	Double Fast-On	C878BF34200AA0J
2.5	470	30	48	20	115	Double Fast-On	C878BF34250AA4J
3	470	30	48	20	115	Double Fast-On	C878BF34300AA4J
3.5	470	35	48	20	86	Double Fast-On	C878BF34350AA4J
4	470	35	48	20	86	Double Fast-On	C878BF34400AA0J
5	470	30	60	20	115	Double Fast-On	C878BF34500AA0J
6	470	30	78	20	115	Double Fast-On	C878BF34600AA0J
7.5	470	30	78	20	115	Double Fast-On	C878BF34750AA0J
8	470	30	78	20	115	Double Fast-On	C878BF34800AA0J
10	470	35	78	20	86	Double Fast-On	C878BF35100AA0J
11	470	35	78	20	86	Double Fast-On	C878BF35110AA0J
12	470	35	78	20	86	Double Fast-On	C878BF35120AA0J
15	470	40	78	20	62	Double Fast-On	C878BF35150AA0J
16	470	40	78	20	62	Double Fast-On	C878BF35160AA0J
20	470	45	78	20	50	Double Fast-On	C878BF35200AA0J
23	470	45	78	20	50	Double Fast-On	C878BF35230AA0J
25	470	45	98	20	50	Double Fast-On	C878BF35250AA0J
29	470	45	98	20	50	Double Fast-On	C878BF35290AA0J
30	470	45	98	20	50	Double Fast-On	C878BF35300AA0J
35	470	45	133	20	50	Double Fast-On	C878BF35350AA0J
40	470	45	133	20	50	Double Fast-On	C878BF35400AA0J
46	470	50	133	20	40	Double Fast-On	C878BF35460AA0J
55	470	50	133	20	40	Double Fast-On	C878BF35550AA0J
60	470	50	133	20	40	Double Fast-On	C878BF35600AA0J
50	470	50	133	20	40	Double Fast-On	C878BG35500SA0J
55	470	50	133	20	40	Double Fast-On	C878BG35550SA0J
60	470	50	133	20	40	Double Fast-On	C878BG35600SA0J
1.8	470	30	48	20	115	Double Fast-On	C878ZF34180SA0J
Capacitance Value (µF)	**VAC**	**B (mm)**	**H (mm)**	**dV/dt (V/µs)**		**Termination**	**Part Number**

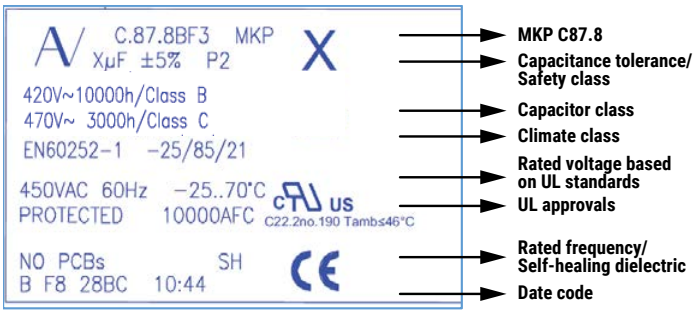
Marking

C87.8

From 1 µF up to 45 µF

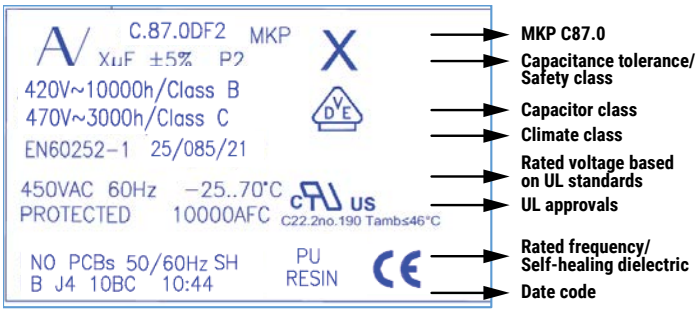


Over 45 µF

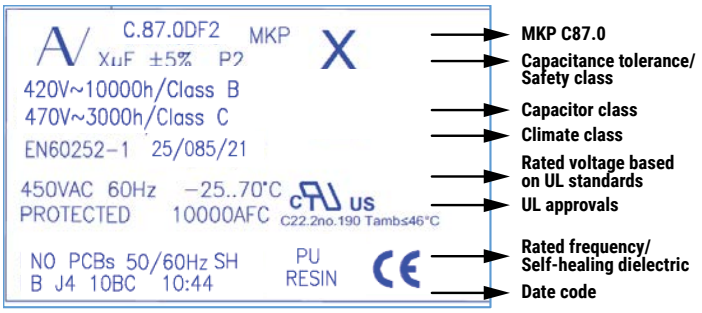


C87.0

From 1 µF up to 80 µF



Over 80 µF



Marking cont.

Manufacturing Date Code (IEC–60062)			
Y = Year, Z = Month			
Year	**Code**	**Month**	**Code**
2010	A	January	1
2011	B	February	2
2012	C	March	3
2013	D	April	4
2014	E	May	5
2015	F	June	6
2016	H	July	7
2017	J	August	8
2018	K	September	9
2019	L	October	O
2020	M	November	N
2021	N	December	D
2022	P		
2023	R		
2024	S		
2025	T		
2026	U		
2027	V		
2028	W		
2029	X		
2030	A		

Environmental Compliance

As a leading global supplier of electronic components and an environmentally conscious company, KEMET continually aspires to improve the environmental effects of our manufacturing processes and our finished electronic components.

In Europe (RoHS Directive) and in some other geographical areas such as China (China RoHS), legislation has been enacted to prevent or otherwise limit the use of certain hazardous materials, including lead (Pb), in electronic equipment. KEMET monitors legislation globally to ensure compliance and endeavors to adjust our manufacturing processes and/or electronic components as may be required by applicable law.

For military, medical, automotive, and some commercial applications, the use of lead (Pb) in the termination is necessary and/or required by design. KEMET is committed to communicating RoHS compliance to our customers. Information related to RoHS compliance will be provided in data sheets and using specific identifiers on the packaging labels.

All KEMET power film capacitors are RoHS compliant.

Materials & Environment

The selection of raw materials that KEMET uses for the production of its electronic components is the result of extensive experience. KEMET directs specific attention toward environmental protection. KEMET selects its suppliers according to ISO 9001 standards and performs statistical analyses on raw materials before acceptance for use in manufacturing our electronic components. All materials are, to the best of KEMET's knowledge, non-toxic and free from cadmium; mercury; chrome and compounds; polychlorine triphenyl (PCB); bromide and chlorinedioxins bromurate clorurate; CFC and HCFC; and asbestos.

Dissipation Factor

Dissipation factor is a complex function involved with capacitor inefficiency. The tgδ may vary up and down with increased temperature. For more information, refer to Performance Characteristics.

Sealing

Hermetically Sealed Capacitors
As the temperature increases, the pressure inside the capacitor increases. If the internal pressure is high enough, it can cause a breach in the capacitor. Such a breach can result in leakage, impregnation, filling fluid, or moisture susceptibility.

Barometric Pressure
The altitude at which hermetically sealed capacitors are operated controls the capacitor's voltage rating. 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. These effects can be in the form of capacitance changes, dielectric arc-over, and/or low insulation resistance. Altitude can also affect heat transfer. Heat that is generated in an operation cannot be dissipated properly, and high RI2 losses and eventual failure can result.

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Although KEMET designs and manufactures its products to the most stringent quality and safety standards, given the current state of the art, isolated component failures may still occur. Accordingly, customer applications which require a high degree of reliability or safety should employ suitable designs or other safeguards (such as installation of protective circuitry or redundancies) in order to ensure that the failure of an electrical component does not result in a risk of personal injury or property damage.

Although all product–related warnings, cautions and notes must be observed, the customer should not assume that all safety measures are indicted or that other measures may not be required.