

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

## Overview

C87 is a polypropylene metallized film, with a cylindrical aluminium can-type construction 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

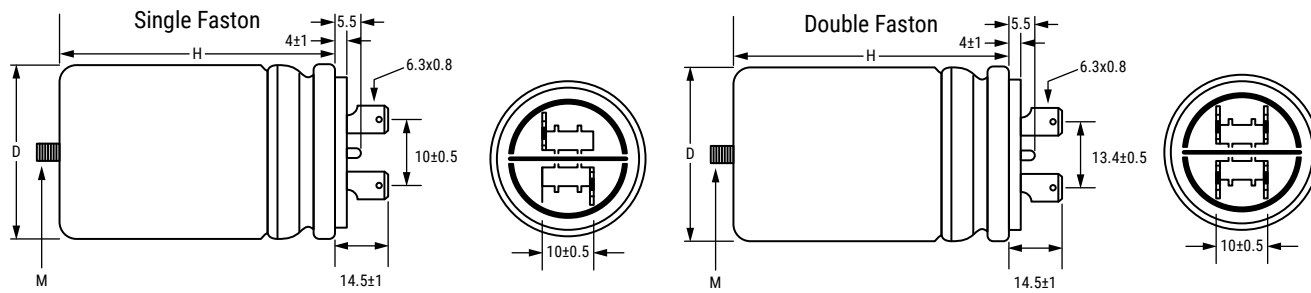
- Self-healing
- VDE, CQC and UL810 approved
- Rated frequency of 50 Hz and 60 Hz
- High capacitance density
- Safety device protection



## Part Number System

C87	8	B	F	3	4300	AA	4	J
Series	Marking	Case & 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
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)	$20 \times 10^{-4}$ 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				
1	470	25	48	20	162	Single faston	C878AF24100AA5J
1.5	470	30	48	20	115	Single faston	C878AF24150AA4J
2	470	30	48	20	115	Single faston	C878AF24200AA4J
2.5	470	30	48	20	115	Single faston	C878AF24250AA4J
3	470	30	48	20	115	Single faston	C878AF24300AA4J
4	470	35	48	20	86	Single faston	C878AF24400AA4J
5	470	35	48	20	86	Single faston	C878AF24500AA4J
6	470	30	78	20	115	Single faston	C878AF24600AA0J
6.3	470	35	60	20	86	Single faston	C878AF24630AA2J
7	470	30	78	20	115	Single faston	C878AF24700AA0J
7.5	470	30	78	20	115	Single faston	C878AF24750AA0J
8	470	30	78	20	115	Single faston	C878AF24800AA0J
10	470	35	78	20	86	Single faston	C878AF25100AA0J
12	470	35	78	20	86	Single faston	C878AF25120AA0J
16	470	40	78	20	62	Single faston	C878AF25160AA0J
20	470	45	78	20	50	Single faston	C878AF25200AA0J
25	470	45	98	20	50	Single faston	C878AF25250AA0J
30	470	45	98	20	50	Single faston	C878AF25300AA0J
40	470	45	133	20	50	Single faston	C878AF25400AA0J
1	470	30	48	20	115	Double faston	C878AF34100AA4J
1.8	470	30	48	20	115	Double faston	C878AF34180AA0J
2	470	30	48	20	115	Double faston	C878AF34200AA4J
2.5	470	30	48	20	115	Double faston	C878AF34250AA4J
3	470	30	48	20	115	Double faston	C878AF34300AA4J
3.5	470	35	48	20	86	Double faston	C878AF34350AA4J
4	470	35	48	20	86	Double faston	C878AF34400AA4J
5	470	35	48	20	86	Double faston	C878AF34500AA4J
6	470	30	78	20	115	Double faston	C878AF34600AA0J
7.5	470	30	78	20	115	Double faston	C878AF34750AA0J
8	470	30	78	20	115	Double faston	C878AF34800AA0J
10	470	35	78	20	86	Double faston	C878AF35100AA0J
12	470	35	78	20	86	Double faston	C878AF35120AA0J
12.5	470	35	78	20	86	Double faston	C878AF35125AA0J
14	470	40	78	20	62	Double faston	C878AF35140AA0J
15	470	40	78	20	62	Double faston	C878AF35150AA0J
16	470	40	78	20	62	Double faston	C878AF35160AA0J
18	470	45	78	20	50	Double faston	C878AF35180AA0J
20	470	45	78	20	50	Double faston	C878AF35200AA0J
25	470	45	98	20	50	Double faston	C878AF35250AA0J
30	470	45	98	20	50	Double faston	C878AF35300AA0J
31.5	470	45	98	20	50	Double faston	C878AF35315AA0J
35	470	45	133	20	50	Double faston	C878AF35350AA0J
40	470	45	133	20	50	Double faston	C878AF35400AA0J
1	470	30	48	20	115	Double faston	C878BF34100AA4J
1.5	470	30	48	20	115	Double faston	C878BF34150AA4J
2	470	30	48	20	115	Double faston	C878BF34200AA0J
2.5	470	30	48	20	115	Double faston	C878BF34250AA4J
3	470	30	48	20	115	Double faston	C878BF34300AA4J
3.5	470	35	48	20	86	Double faston	C878BF34350AA4J
4	470	35	48	20	86	Double faston	C878BF34400AA0J
5	470	30	60	20	115	Double faston	C878BF34500AA0J
6	470	30	78	20	115	Double faston	C878BF34600AA0J
7.5	470	30	78	20	115	Double faston	C878BF34750AA0J
8	470	30	78	20	115	Double faston	C878BF34800AA0J
10	470	35	78	20	86	Double faston	C878BF35100AA0J
11	470	35	78	20	86	Double faston	C878BF35110AA0J
12	470	35	78	20	86	Double faston	C878BF35120AA0J
15	470	40	78	20	62	Double faston	C878BF35150AA0J
16	470	40	78	20	62	Double faston	C878BF35160AA0J
20	470	45	78	20	50	Double faston	C878BF35200AA0J
23	470	45	78	20	50	Double faston	C878BF35230AA0J

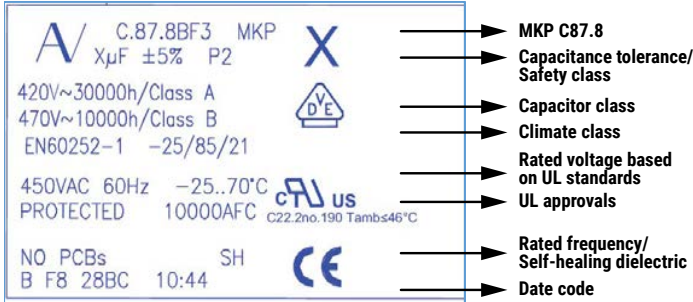
Table 1 – Ratings &amp; Part Number Reference cont'd

Capacitance Value (μF)	VAC	Maximum Dimensions in mm		dV/dt (V/μs)	Packaging Quantity	Termination	Part Number
		D	H				
25	470	45	98	20	50	Double faston	C878BF35250AA0J
29	470	45	98	20	50	Double faston	C878BF35290AA0J
30	470	45	98	20	50	Double faston	C878BF35300AA0J
35	470	45	133	20	50	Double faston	C878BF35350AA0J
40	470	45	133	20	50	Double faston	C878BF35400AA0J
46	470	50	133	20	40	Double faston	C878BF35460AA0J
55	470	50	133	20	40	Double faston	C878BF35550AA0J
60	470	50	133	20	40	Double faston	C878BF35600AA0J
3	470	30	48	15	115	Single faston	C870CF24300AA4J
4	470	30	48	15	115	Single faston	C870CF24400AA4J
5	470	35	48	15	86	Single faston	C870CF24500AA4J
6	470	30	60	15	115	Single faston	C870CF24600AA1J
8	470	30	78	15	115	Single faston	C870CF24800AA0J
10	470	30	78	15	115	Single faston	C870CF25100AA0J
12	470	35	78	15	86	Single faston	C870CF25120AA0J
12.5	470	35	78	15	86	Single faston	C870CF25125AA0J
14	470	35	78	15	86	Single faston	C870CF25140AA0J
16	470	35	78	15	86	Single faston	C870CF25160AA0J
18	470	40	78	15	62	Single faston	C870CF25180AA0J
20	470	40	78	15	62	Single faston	C870CF25200AA0J
25	470	40	98	15	62	Single faston	C870CF25250AA1J
30	470	40	98	15	62	Single faston	C870CF25300AA1J
40	470	45	98	15	50	Single faston	C870CF25400AA0J
5	470	35	48	15	86	Double faston	C870CF34500AA4J
8	470	30	78	15	115	Double faston	C870CF34800AA0J
9	470	30	78	15	115	Double faston	C870CF34900AA0J
10	470	30	78	15	115	Double faston	C870CF35100AA0J
14	470	35	78	15	86	Double faston	C870CF35140AA0J
15	470	35	78	15	86	Double faston	C870CF35150AA0J
16	470	35	78	15	86	Double faston	C870CF35160AA0J
18	470	40	78	15	62	Double faston	C870CF35180AA0J
20	470	40	78	15	62	Double faston	C870CF35200AA0J
22	470	40	78	15	62	Double faston	C870CF35220AA0J
25	470	45	78	15	50	Double faston	C870CF35250AA0J
30	470	40	98	15	62	Double faston	C870CF35300AA1J
35	470	45	98	15	50	Double faston	C870CF35350AA0J
40	470	45	98	15	50	Double faston	C870CF35400AA0J
45	470	45	133	15	50	Double faston	C870CF35450AA0J
50	470	50	133	15	40	Double faston	C870CG35500AA1J
60	470	60	98	15	28	Double faston	C870CG35600AA5J
70	470	55	133	15	32	Double faston	C870CG35700AA1J
75	470	60	133	15	28	Double faston	C870CG35750AA0J
80	470	50	133	15	40	Double faston	C870CG35800AA2J
100	470	55	133	15	32	Double faston	C870CG36100AA0J
110	470	60	133	15	28	Double faston	C870CG36110AA0J
Capacitance Value (μF)	VAC	B (mm)	H (mm)	dV/dt (V/μs)		Termination	Part Number

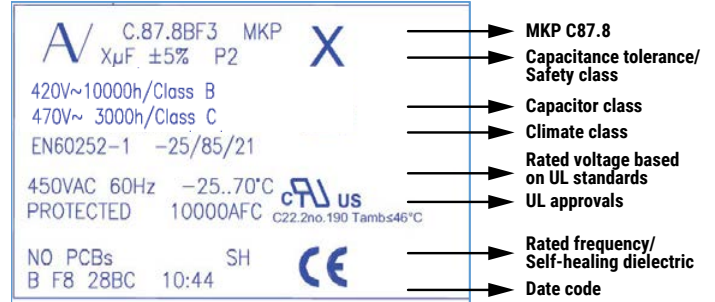
## Marking

### C87.8

From 1  $\mu$ F up to 45  $\mu$ F

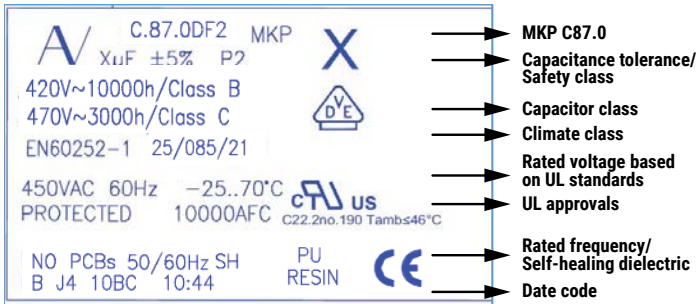


Over 45  $\mu$ F

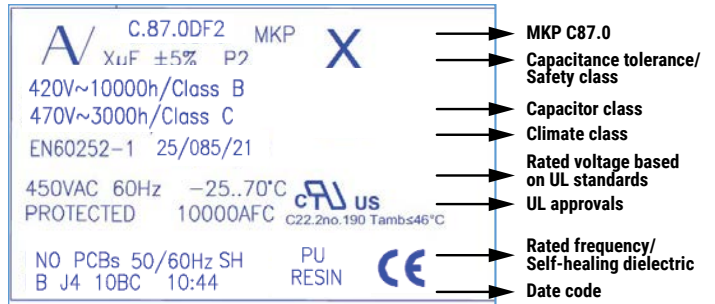


### C87.0

From 1  $\mu$ F up to 80  $\mu$ F



Over 80  $\mu$ F



## Marking (cont.d)

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	0
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 an environmentally conscious company, KEMET is working continuously to improve the environmental effects of both our capacitors and their production.

In Europe, due to the RoHS Directive, and in some other geographical areas such as China, legislation has been put in place to prevent the use of some hazardous materials, including 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 including medical, defense and automotive electronics may still require the use of lead in electrode coatings. To clarify the situation and distinguish products, the following symbols are used on the packaging labels for RoHS compliant and Pb-free capacitors.

Due to customer requirements, additional markings such as "LF" for lead-free or "LFW" for lead-free wires may appear on the packaging label.

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## 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 the acceptance. All the materials, to the company's present knowledge, are non-toxic and free from cadmium, mercury, chrome and compounds, polychlorine triphenyl (PCB), 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 the 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.

## Dissipation Factor

Dissipation factor is a complex function involved with the inefficiency of the capacitor. The  $\text{tg}\delta$  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 an operation, cannot be dissipated properly and can result in high RI2 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.

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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 indicated or that other measures may not be required.