Motor Run Capacitors

C28, Cylindrical Plastic Case, Segmented Film 420 VAC/470 VAC

Overview

The C28 capacitor is a polypropylene metallized segmented film capacitor with a cylindrical, plastic can-type design filled with resin. It uses faston and plastic deck, or cable terminals.

Applications

Typical applications include motor run S3 safety class: single-phase motors, low power electric motors, and compressors.

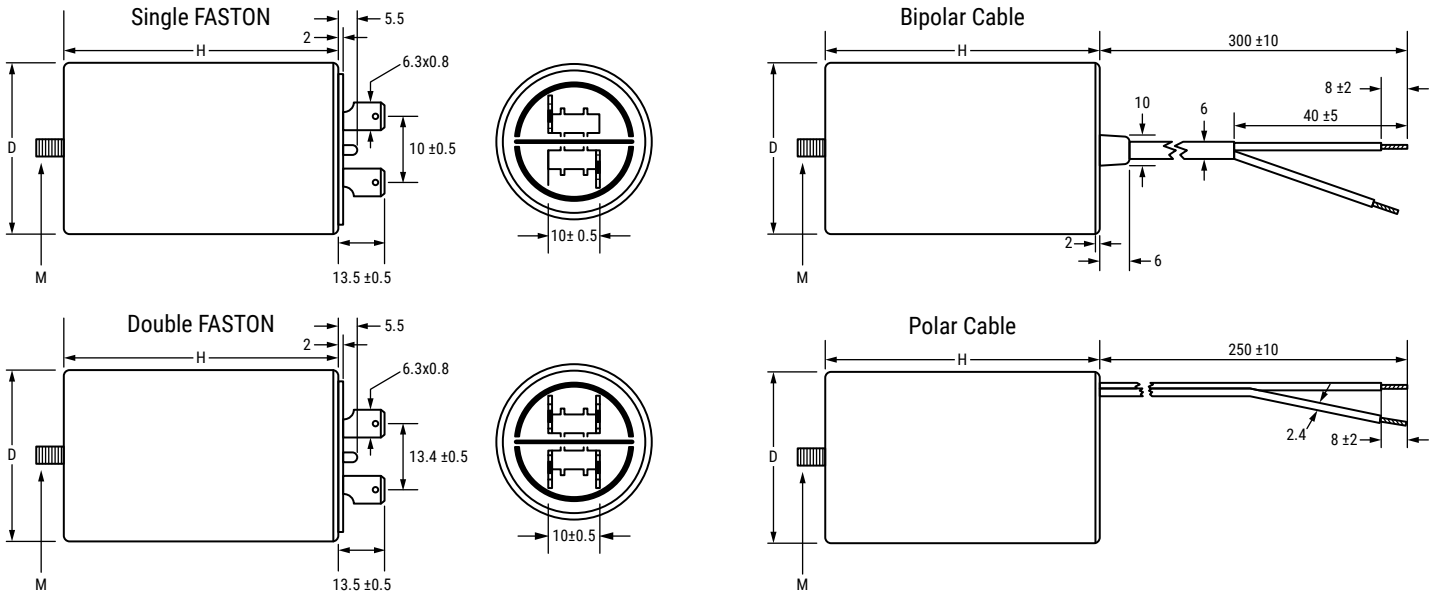
Benefits

- Self-healing
- IMQ approved
- Rated frequency of 50 Hz and 60 Hz
- High capacitance density
- Safety protection

Part Number System

C28	4	A	C	A	4300	AL	0	J
Series		Marking	Case and Fixing Bolt Code	Terminal Style	Capacitance Code (pF)	Packaging	Internal Use	Tolerance
C28 = Motor Run Capacitors	4 = 30,000 hours/ 420 VAC (Class A) or 10,000 hours/ 470 VAC (Class B)	C284: A = Standard	A = Without fixing bolt/flat bottom C = Cylindrical plastic case with M8 bolt D = Quick fit	2 = Single FASTON 6.3 x 0.8 3 = Double FASTON 6.3 x 0.8 A = Unipolar flexible cable (tinned end) B = Unipolar flexible cable (untinned end) F = Bipolar cable (tinned end) R = Unipolar rigid cable (tinned end)	Digits two – four indicate the first three digits of the capacitance value. First digit indicates the number of zeros to be added.	AA = FASTON terminals standard AL = Unipolar cable L = 300 mm, stripped 8 mm LF = Bipolar cable L= 250 mm unsheathed 40 mm, stripped 8 mm LH = Bipolar cable L = 350 mm unsheathed 40 mm, stripped 8 mm	0, 1, 2, 5 = Standard	J = 5%

Dimensions – Millimeters



D	H	Mounting Stud (M)
+1/-0	±2	
25	56.5	M8 x 10
25	58	M8 x 11
25	55	M8 x 12
25	58.5	M8 x 13
25	57	M8 x 14
30	56.5	M8 x 15
30	55	M8 x 16
30	69.5	M8 x 17
30	58.5	M8 x 18
30	57	M8 x 19
35	56.5	M8 x 20

D	H	Mounting Stud (M)
+1/-0	±2	
35	73.5	M8 x 21
35	55	M8 x 22
35	57	M8 x 23
35	71.5	M8 x 24
35	74	M8 x 25
35	69.5	M8 x 26
35	58.5	M8 x 27
40	73.5	M8 x 28
40	71.5	M8 x 29
40	74	M8 x 30
40	69.5	M8 x 31

Qualifications

Reference Standards	IEC 252, EN 60252-1:2011/A1/2013, IMQ
Vibration Test	IEC 68-2-6

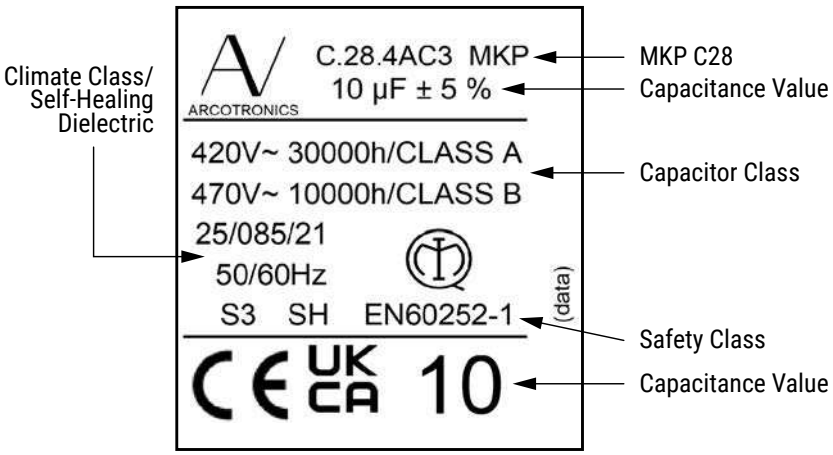
Performance Characteristics

Type of Service	Continuous
Operating Class	
C284	Class A 30,000 hours at 420 VAC or Class B 10,000 hours at 470 VAC
Temperature Range	−25°C to +85°C
Storage Temperature	−40°C to +90°C
Rated Voltage	470 VAC
Rated Frequency	50 – 60 Hz
Voltage Rise/Fall Time (Maximum)	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	S3
Maximum Altitude	2,000 m
Capacitance Tolerance	±5%
Mounting	Any position
Can	Polypropylene with self-extinguishing features V2 (UL 94) Noryl with self-extinguishing features VI (UL 94) for diameters > 50 mm
Disk	FASTON execution: Nylon PA66 with self-extinguishing features V0
	Cable execution: PC-A with self-extinguishing features V0
	For diameters > 40 mm cable execution: Noryl PPO with self-extinguishing features VI
Filling Resin	Epoxy
Dielectric	Polypropylene
Plates	Self-healing metal layer
Test Voltage Terminal to Terminal (VTT)	2 V_n for 2 seconds
Test Voltage Terminal to Can (VTC)	2,000 V for 2 seconds
Air Distance Between Live Parts	≥ 5 mm
Air Distance Between Live Parts and Case	≥ 6 mm

Table 1 – Ratings & Part Number Reference

Capacitance Value (µF)	VAC	Maximum Dimensions (mm)		dV/dt (V/µs)	Termination	Packaging Quantity	Part Number
		D	H				
2	470	25	55	20	Unipolar flexible cable (tinned end)	162	C284ACA4200AL0J
2.5	470	25	55	20	Unipolar flexible cable (tinned end)	162	C284ACA4250AL0J
3	470	25	55	20	Unipolar flexible cable (tinned end)	162	C284ACA4300AL0J
4	470	30	55	20	Unipolar flexible cable (tinned end)	110	C284ACA4400AL0J
5	470	30	55	20	Unipolar flexible cable (tinned end)	110	C284ACA4500AL0J
6	470	30	69.5	20	Unipolar flexible cable (tinned end)	110	C284ACA4600AL2J
3	470	25	55	20	Unipolar rigid cable (tinned end)	162	C284ACR4300AL0J
8	470	30	69.5	20	Unipolar rigid cable (tinned end)	110	C284ACR4800AL2J
10	470	35	69.5	20	Unipolar rigid cable (tinned end)	86	C284ACR5100AL0J
Capacitance Value (µF)	**VAC**	**B (mm)**	**H (mm)**	**dV/dt (V/µs)**	**Termination**	**Packaging Quantity**	**Part Number**

Marking



(data): Manufacturing Plant, Date Code, Day of Production, Internal Mark

Marking cont.

Manufacturing Date Code (IEC–60062)			
Year	**Code**	**Month**	**Code**
2020	M	January	1
2021	N	February	2
2022	P	March	3
2023	R	April	4
2024	S	May	5
2025	T	June	6
2026	U	July	7
2027	V	August	8
2028	W	September	9
2029	X	October	O
2030	A	November	N
2031	B	December	D
2032	C		
2033	D		
2034	E		
2035	F		
2036	G		
2037	H		
2038	J		
2039	K		
2040	L		

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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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