

## Overview

Polypropylene metallized film with cylindrical aluminium can type filled with resin, 3 phase delta connection and safety device FPU.

## Applications

Typical applications power factor correction.

## Benefits

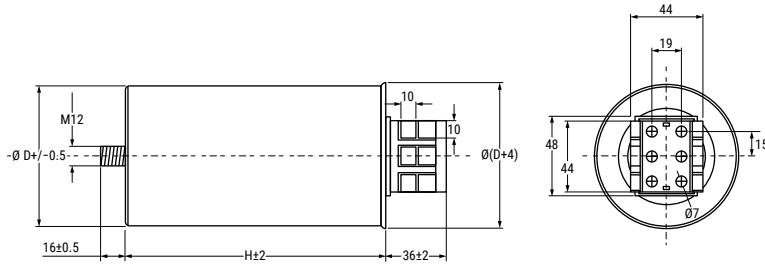
- Approval: VDE
- Overpressure safety device
- High capacitance density
- Long lifetime
- 3 phase delta connections



## Part Number System

C9T	S	5	M	D	6137	AAR	X
Series	Type	Rated Voltage (VAC)	Terminal Style	Internal Connection	Capacitance Code (pF)	Internal Code	Tolerance
C9T = Cylindrical Three-Phase Capacitors	S = Slim	5 = 415 6 = 440	M = Screw clamp Terminal	D = Delta	Digits 2-4 indicate the first three digits of the capacitance value. First digit indicates the number of zeros to be added.	AAR = Standard	X = -5%/+10%

## Dimensions – Millimeters



D	H	Mounting Stud (M)
±0.5	±2	
75	160	M12x16
75	230	M12x16
75	280	M12x16
85	160	M12x16
85	230	M12x16
85	280	M12x16

## Qualifications

Reference Standards	IEC 831-1/2
	Approved VDE-REG.Nr.F064
Protected 10,000 AFC	-25°C to +70°C

## General Technical Data

Reference Standards	IEC 60831-1/2
	Approved VDE-REG.Nr.F064
	UL810 compliant
Dielectric	Polypropylene film
	Non-Inductive type winding
Climatic Category	-25/D - IEC 60831-1
	Maximum: 55°C
	Highest mean over any period of 24 hours: 45°C
	Highest mean over any period of 1 year: 35°C
Maximum Hot Spot Temperature	+70°C
Endurance Test IEC 60831-2	IEC 60831-2 clause 17.1-17.2

## Electrical Characteristics

Rated Voltage	$U_n =$ (see table) $V_{rms}$
Over Voltage	IEC 60831-1 clause 20:
	1,10* $U_n$ – 8 hours in every 24 hours
	1,15* $U_n$ – 30 minutes in every 24 hours
	1,20* $U_n$ – 5 minutes in the lifetime
	1,30* $U_n$ – 1 minutes in the lifetime
Capacitance Tolerance	-5% +10% (X)

## Mechanical Characteristics

Maximum Torque:	6 [N*m] for Terminal screw
	12 [N*m] for M12 Bolt
Installation	Whatever position
Aluminum deck with self extinguishing UL94 V0 plastic cover	

## Life Expectancy

Life Expectancy	100.000 hours at $U_{rms}$ with $T_{hs} \leq 70^\circ C$
Capacitance drop at end of life	-5% (typical)
Failure rate IEC 61709	$300 \cdot 10^{-9}$ components/hours

## Test Method

Test voltage term to term (Utt)	$2,15 \cdot U_{rms}$ for 2 seconds at $25^\circ C$
Test voltage term to case (Utc)	3600 V – 50 Hz for 2 seconds
Relative Humidity	Annual average $\leq 80\%$ at $24^\circ C$
	On 30 days/year permanently 100%. On other days occasionally 90%.
	Dewing not admitted
Capacitance Deviation in Temperature Range ( $-40..+50^\circ C$ )	$\pm 1.5\%$ maximum on capacitance value at $20^\circ C$
Damp Heat	IEC 60068-2-78
Change of Temperature	IEC 60068-2-14
Vibration Strength	IEC 60068-2-6

**NOTICE:** Care should be taken to ensure that there still is electrical clearance of 15 mm between terminations and other live or earthed parts above the capacitor, in case of safety device activation.

**Table 1A – Ratings & Part Number Reference**

Capacitance Value	Voltage	Dimensions (mm)		Rated Current	Qn	Operating Frequency	dV/dt	Packaging Quantity	Part Number
μF	VAC	Ø	H	A	kVAr	Hz	V/μs		
3 x 31.1	415	75	160	9	5.0	50	30	12	C9TS5MD5311AARX
3 x 46.0	415	75	160	14	7.5	50	30	12	C9TS5MD5460AARX
3 x 61.5	415	85	160	18	10.0	50	30	9	C9TS5MD5615AARX
3 x 77.0	415	75	230	23	12.5	50	30	12	C9TS5MD5770AARX
3 x 92.2	415	85	230	27	15.0	50	30	9	C9TS5MD5920AARX
3 x 108.0	415	75	280	32	17.5	50	30	12	C9TS5MD6108AARX
3 x 123.0	415	75	280	36	20.0	50	30	12	C9TS5MD6123AARX
3 x 154.0	415	85	280	45	25.0	50	30	9	C9TS5MD6154AARX
3 x 27.4	440	75	160	9	5.0	50	30	12	C9TS6MD5274AARX
3 x 41.1	440	75	160	13	7.5	50	30	12	C9TS6MD5411AARX
3 x 54.8	440	85	160	17	10.0	50	30	9	C9TS6MD5548AARX
3 x 68.5	440	75	230	21	12.5	50	30	12	C9TS6MD5685AARX
3 x 83.0	440	85	230	26	15.0	50	30	9	C9TS6MD5830AARX
3 x 96.0	440	75	280	30	17.5	50	30	12	C9TS6MD5960AARX
3 x 110.0	440	75	280	34	20.0	50	30	12	C9TS6MD6110AARX
3 x 137.0	440	85	280	43	25.0	50	30	9	C9TS6MD6137AARX

(\* Maximum admissible RMS current. This ≤ 70°C.

## 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 and Pb-Free capacitors.

Because of 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 acceptance. All materials are, to the company's present knowledge, 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 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 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.

## Marking

CEI EN 60831/1-2		Via Sagittario, 1/3 40037 Sasso Marconi (BO) ITALY Tel (+39) 051 939.111 http://www.kemet.com	— Manufacturer Logo			
ATTENZIONE!!! PER ACCEDERE,DISINSERIRE,ATTENDERE 3 MINUTI METTERE I TERMINALI IN CORTO CIRCUITO E A TERRA ATTENTION!!! AVANT D'OUVRIR ATTENDEZ 3 MINUTES, METTEZ LE BORNES EN CURT-CIRCUIT AT A' LA TERRE		ATTENTION!!! TO OPEN SWITCH OFF, WAIT 3 MINUTES PLACE TERMINALS ON SHORT CIRCUIT AND ON GROUND ACHTUNG!!! VOR DEM OFFNEN,NETZ AUSSUHLTEN 3 MINUTEN WARTEN KURZSCHELIESSEN UND BERDEN		— Safety Warning		
THREE PHASE SELF HEALING CAPACITOR		VDE-REG.-Nr.F064	— Self-healing Dielectric and Approval			
PART NUMBER	C9TS6MD6137AARX	M/A	— Part Number, Batch Number and Production Date			
REACTIVE POWER Qn	25	kvar	RATED CURRENT In	43	A	— Rated Reactive Power and Current
RATED VOLTAGE Urms	440	V	INSULATING LEVEL	3/8	KV	— Rated Voltage and Insulating Level
NOMINAL FREQUENCY Fn	50	Hz	CONNECTIONS	DELTA		— Rated Frequency and Internal Connections
TEMPERATURE CLASS -25/D - INDOOR USE ONLY			— Climatic Class			
OVERPRESSURE SAFETY DEVICE - NO PCBs						

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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.

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