

交流電動機電容器 (AC Motor Capacitors)

常用的標準術語

1. 額定容量 CN : 設計電容時採用的電容值

Rated capacitance CN Capacitance value for which the capacitor has been designed.

2. 額定電壓 UN 設計電容時採用的交流電壓的有效值。

Rated voltage UN r. m. s. value of the alternating voltage for which the capacitor has been designed.

3. 額定頻率 fN 設計電容時採用的最高頻率

Rated frequency fN Highest frequency for which the capacitor has been designed.

4. 額定電流 IN 在額定電壓和頻率下的交流電流的有效值。

Rated current IN r. m. s. value of the alternating current at the rated voltage and frequency.

5. 電容器損耗角正切 $\tan\delta$

在規定頻率的正弦波電壓作用下，電容器的損耗功率除以電容器的無功功率，其值為等效串聯電阻和容抗之比

Loss factor of the capacitor $\tan\delta$

The dissipation factor is ratio between reactive power of the impedance of the capacitor and effective power when capacitor is submitted to a sinusoidal voltage of specified frequency, it is that ratio between the equivalent series resistance and the capacitive reactance of a capacitor.

6. 運行等級在額定負荷條件、額定電壓、規定溫度和額定頻率下的最短總壽命。

Continuous operation Operation with no time limit within the normal life of the capacitor.

7. 運行等級在額定負荷條件、額定電壓、規定溫度和額定頻率下的最短總壽命。

Class of operation

The minimum total life for which the capacitor has been designed at rated duty, voltage, temperature and frequency

A 級(c)(c)30 000h B 級(c)(c)10 000h C 級(c)(c)3 000h D 級(c)(c)1 000

8. 最低允許電容器運行溫度 在投入期間，電容器外殼外表面的允許最低溫度

Minimum permissible capacitor operating temperature Minimum permissible temperature on the outside of the case at the moment of switching on the capacitor.

9. 最高允許電容器運行溫度 tC 在運行期間，電容器外殼外表面最熱區域的允許最高溫度。

Maximum permissible capacitor operating temperature tC

Maximum permissible temperature of the hottest area of the outside of the capacitor case during operation.

10. 安全防護等級

安全防護等級用下列 4 種代碼中的一種來表示，並標志在電容器上。

(S3)表示該類電容器使用安全膜結構設計；電容器失效時，剩餘容量 <1% CN ；並且是防火或防爆的。

(S2)表示該類電容器設計成失效時僅呈開路狀態，並且是防火或防爆的。注：等同於以前的 P2。

(S1)表示該類電容器失效時可呈開路狀態或短路狀態，

並且是防火或防爆的。注：等同於以前的 P1。

(S0)表示該類電容器無專門的故障保護 注：等同於以前的 P0

Class of safety protection

Class of safety protection identified by one of four codes to be marked on the capacitor.

(S3) indicates that the capacitor is of segmented film construction.

This capacitor type is required to fail with low residual

capacitance (<1% CN) and has protection against fire and shock

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hazard.

(S2) Indicates that the capacitor type has been designed to fail in the

open-circuit mode only and is protected against fire or shock hazard.

Note: formerly referred to as P2

(S1) Indicates that the capacitor type may fail in the open-circuit or short-circuit mode and is protected against fire or shock hazard.

Note: formerly referred to as P1

(S0) Indicates that the capacitor type has no specific failure protection. Note: formerly referred to as P0

11. 容量溫度係數 α

電容器在規定的溫度範圍內容量隨溫度的變化率。通常以 20°C 時電容量為參考，用百萬分之一每攝氏($10^{-6}/^{\circ}\text{C}$)表示。

$$(10^{-6}/^{\circ}\text{C}) = 1 \text{ ppm}/^{\circ}\text{C}$$

$$\alpha = \frac{C - C_0}{C_0(T_i - T_0)}$$

Ci : 電容器在溫度 Ti 時容量 C0 : 電容器在 T0(20±2)°C 時的容量

Temperature coefficient of capacitance α

The change rate of capacitance with temperature measured over a specified range of temperature. It is normally expressed in

parts per million per Celsius degree ($10^{-6}/^{\circ}\text{C}$) and referred to 20°C.

Ci : Capacitance at temperature Ti. C0 : Capacitance at temperature T0(20±2)°C.

12. 氣候類別 電容器所屬的氣候類別用斜線分隔的三個數來表示 (IEC 60068-1: 如: 40/70/21)

Climatic category

The climatic category which the capacitor belongs to is expressed in three numbers separated by slashes, (IEC 60068-1: example 40/70/21).

13. 絕緣電阻(IR)時間常數(t)

絕緣電阻為電容器充電 1 分鐘後所加的直流電壓和流經電容器的漏電流值的比值，單位為 MΩ。時間常數為絕緣電阻和電容量的乘積，通常以秒表示，公式如下：

$$t[s] = IR[M\Omega] \times CN[\mu F]$$

一般情況下，絕緣電阻用於描述小容量電容器的絕緣特性，時間常數用於描述大容量(如: CN>0.33μF)電容器的絕緣特性。

Insulation Resistance(IR) / Time Constant (t)

The insulation resistance is the ratio between an applied D.C. voltage and the resulting leakage current after a minute of charge. It is

expressed in MΩ. The time constant is expressed in seconds with the following formula: In general, Insulation resistance is used

for describing smaller capacitance capacitors' insulation character, Time Constant for describing bigger one's (example: CN>0.33μF).

14. 自愈性(僅對金屬化膜電容器)

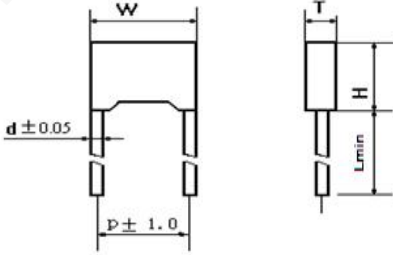

電容器的電特性在發生局部電介質擊穿後迅速而基本地恢復到擊穿前的值的過程。

金屬化膜的金屬鍍層是通過真空蒸發的方法將金屬沉積在薄膜上，厚度只有幾十個納米，當介質上存在弱點、雜質時，局部電擊穿就可能發生，電擊穿處的電弧放電所產生的能量足以使電擊穿點鄰近處的金屬鍍層蒸發，使擊穿點與周圍極板隔開，電容器電氣性能即可恢復正常。

Self-healing (Only for metallized film capacitor)

Process by which the electrical properties of the capacitor, after a local breakdown of the dielectric, are rapidly and essentially restored to the values before the breakdown.

The metallized coatings of the metallized film, which are vacuum-deposited directly onto the plastic film, have a thickness of only several tens nm. At weak points or impurities in the dielectric, a dielectric breakdown would occur. The energy released by the arc discharge in the breakdown channel is sufficient to totally evaporate the thin metal coating in the vicinity of the channel. The insulated region thus resulting around the former faulty area will cause the capacitor to regain its full operability.

技術要求 Specifications		外型圖 Outline Drawing								
引用標準 Reference Standard	GB10190(IEC60384-14)									
氣候類別 Climatic Category	40/85/21C									
工作溫度範圍 Rated Temperature Range	-40°C~+70°C									
表面溫升 (ΔT) Surface overtemperature (ΔT)	電容本體溫升比使用環境溫度≤5°C									
額定電壓 Rated Voltage	250VAC, 50/60HZ									
標稱容量 Capacitance	18uF		W---表示本體寬度(W±0.5) Width(W±0.5)							
容量偏差 Capacitance Tolerance	±5%(J)		H---表示本體高度(H±0.5) High(H±0.5)							
耐電壓 Voltage Proof	引線之間 Between Terminals	2UR(Vdc), 2S		T---表示本體厚度(T±0.5) Thickness(T±0.5)						
	極殼之間 Between Terminals To Case:	2000 Vac, 2s		P---表示腳距(P±1.0) Pin pitch(P±1.0)						
損耗角正切 Dissipation Factor	≤0.002 20°C 1KHz, 輸出水平 1.0V		L---表示腳長(22min 可變動) Lead length(L22, Variable)							
絕緣電阻 (20°C 1min) Insulation Resistance	Ur > 100V Cr ≥ 0.33 μF IR ≥ 5000 MΩ.uF									
外形尺寸 Dimensions(mm)										
Item	W±0.5	H±0.5		T±0.5	P±0.5	d	L±1.0			
18UF/250VAC	58	37	26	52	1.0	4				
電性能測試 Property test										
No.	1	2	3	4	5	6	7	8	9	10
Co(nF)										
DF										
IR	≥3000 s									
TV (DC)	500VDC									
判定 Result	合格									
備注 Remark	需方已閱讀本協議書內容并確認完全理解其涵義.Purchaser have read this technology confer and confirm that completely understand it.									
客戶確認 簽章										

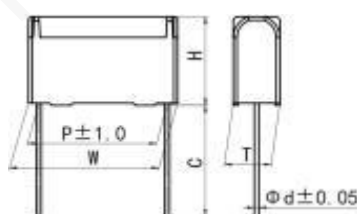
金屬化聚丙烯膜交流電動機電容器(塑料外殼)

Metallized polypropylene film AC motor capacitor(Box-type)

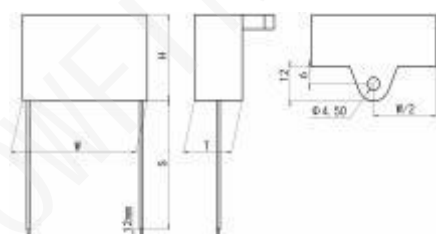
■ 外形圖 Outline Drawing



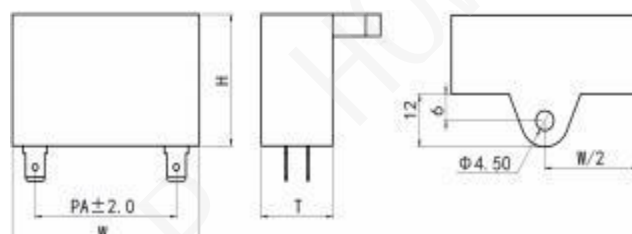
Tinned Wires
方底 (Square-bottom)



Tinned Wires
圓弧底 (Arc-bottom)



Insulated flexible lead



Tabs

■ 特點

- 適用於頻率為 50Hz/60Hz 交流電源供電的單相電動機起動和運轉
- 有自愈特性
- 性能穩定,可靠性高

■ Features

- Widely applied to starting and running of AC single-phase motors at 50Hz/60Hz frequency power
- Self-healing property
- High performance and reliability

■ 技術要求 Specifications

額定電壓 Rated Voltage	5 0 0 Vac (50 Hz/60 Hz)	4 5 0 Vac (50 Hz/60 Hz)	3 0 0 Vac/350 V ac (50 Hz/60 Hz)	2 5 0 Vac (50 Hz/60 Hz)	
運行等級 Class of operation	Class C	Class B or Class	Class C	Class C	
電容量範圍 Capacitance Range	0.1 μ F~9.5 μ F	0.1 μ F~9.5 μ F	0.5 μ F~20.0 μ F	0.1 μ F~20.0 μ F	
電容量偏差 Capacitance Tolerance	\pm 5% (J), \pm 10% (K)				
安全防護等級 Class of safety protection	S0				
氣候類別 Climate category	40/70/21 or 40/85/21		40/85/21		
耐電壓 Voltage Proof	引綫之間 Between Terminals	1 000Vac (2s)	900Vac (2s)	700Vac (2s)	500Vac (2s)
	極殼之間 Between Terminals and	3 000Vac (2s)			
最高運行電壓 Maximum permissible voltage	1.1 UN				
最高運行電流 Maximum permissible current	1.3IN				
絕緣電阻 Insulation Resistance(IR×CN)	>3 000s (20 ① , 100V, 1min)				
損耗角正切 Dissipation Factor	<20 \times 10 ⁻⁴ (20 ① , 1kHz)				

產品尺寸表(PRODUCT SIZE TABLE mm)

250Vac (Class C)									
CN (μ F)	W \pm 1	H \pm 1	T	P \pm 1	CN (μ F)	W \pm 1	H \pm 1	T \pm 1	P \pm 1
1	37	20	10	25	6	47	28	16	35
1.5	37	20	10	25	7	47	30	18	35
2	37	23	13	25	8	47	30	18	35
2.5	37	23	13	25	9	47	34	18	35
3	37	28	14	25	10	47	34	20	35
3.5	37	28	14	25	11	47	34	22	35
4	37	28	14	25	12	47	34	22	35
5	37	30	18	25	13	47	36	24	35
6	37	30	18	25	14	47	36	24	35
7	37	33	18	25	15	47	38	26	35
8	37	36	20	25	15	57	36	22	45
9	37	36	20	25	18	58	37	26	52
4	47	26	14	35	20	57	38	24	45
5	47	28	16	35	20	67	36	24	55

備注(Note): 特殊規格可按需求定制(Special specifications can be customized according to requirements)

客戶訂購指南 Guide for customer ordering

1. 額定電容量及允許偏差 . Rated capacitance and tolerance

2. 2.電壓:包括額定電壓、工作電壓、紋波電壓、非周期衝擊電壓等

Voltage: including rated voltage, working voltage, ripple voltage, non- recurrent surge voltage etc

3. 電流: 包括最大電流、工作電流、最大峰值電流、最大衝擊電流等

Current: including maximum current, working current, maximum peak current, maximum surge current etc

4. 頻率: 包括工作頻率, 脈衝頻率, 紋波電壓的頻率等

Frequency: including working frequency, pulse frequency, frequency of ripple voltage etc

5. 工作環境: 如溫度範圍、濕度、海拔等

Working environment: for example, temperature range, humidity, altitude etc

6. 產品尺寸: 如直徑、高度或長度、寬度、高度等

Dimensions: for example, diameter, height or length, width, height etc.

7. 端子類型: 如螺絲式、接線片、插片式等

Terminal form: for example, stud, lug, tab, etc

8. 安全要求: 如阻燃、防爆等

Safety: for example, flame resistance, anti-explosion etc.

9. 預期壽命: 在給定的工作條件下的預期壽命

Expected lifetime: under given working conditions