



規格承認書

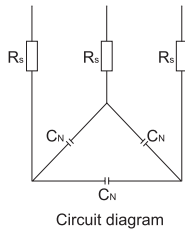
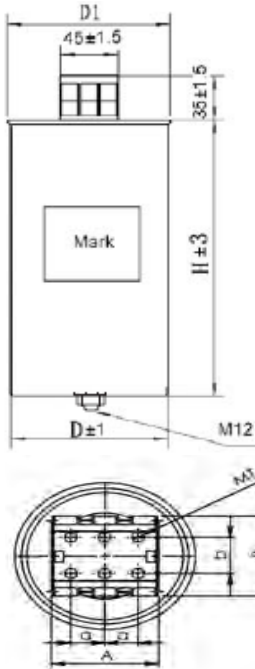
(SPECIFICATION FOR APPROVAL)

File No.: Q/BH .TS16949.13TECH1303

Product Name: Three-phase AC-filter Capacitor (Single case)
Product Type: C67(MKP67 三相交流滤波电容器)
Product Code: C67
Customer:
Customer Code:
Issue Date: (V3.0)

三相交流滤波电容器(一体) Three-phase AC-filter capacitors(single case)

■ 外形图 Outline Drawing



D	a	b	A	B	H1	MT	Torque
76~116	15	19.4	43.5	44.5	35	M5	1.2
136	16.5	22.5	49	54.5	45	M6	2.0


■ 特点

- 自愈
- 金属化聚丙烯膜结构
- 防爆设计, 过压力保护更安全
- 适用于三相功率因数校正、LCL滤波

■ Features

- Self-Healing
- Metallized polypropylene
- Anti-explosion design, overpressure tear-off fuse more safety
- Suitable for power factor correction and LCL filter

■ 安全认证 Safety Approvals

	UL/CUL (美国/加拿大)	UL 810, max. 850Vac,50/60Hz, "Protected" ,10 000AFC CSA C22.2.No190 , max. 660Vac,50/60Hz, 证书号(File No.): E232771, CCN: CYWT2
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■ 技术要求 Specifications

引用标准 Reference standards	GB/T 17702.1/2 (IEC61071) Optional: GB/T 12747.1/2 (IEC 60831)
过电压 Overvoltages	U _{rms} +10%, 8小时/天 up to 8h daily; 1.15U _{rms} , 30分钟/24小时 30min/24h; 1.20U _{rms} 5分钟或者1.3U _{rms} 1分钟在寿命期内允许出现200次; 1.20U _{rms} for 5 min or 1.3U _{rms} for 1min during life 200 times
工作温度范围(热点温度) Operating temperature range(Hotspot)	-40°C~70°C
额定电压范围 Rated voltage range(U _{rms})	230Vac~850Vac
额定频率 Rated Frequency	50/60Hz
额定容量 Capacitance C _N	8μF ~ 330μF
容量偏差 Capacitance Tolerance	± 5%,-5%~+10%
电容内部连接方式 Capacitance internal connection	Connect triangle(Δ)

贮存温度 storage Temperature	-40°C ~ 70°C	
外壳 Case	Aluminium can	
耐电压 Voltage Proof	引线之间 Between Terminals:	2.15U _{rms} (Vac) (10s)
	极壳之间 Between Terminals to Case:	1 000+2 U _N (Vac) (60s) (min 2 000 Vac)
绝缘电阻 Insulation Resistance(IR × C _N)	≥3 000s (20°C, 100Vdc, 1min)	
损耗角正切 Dissipation Factor(dielectric)	0.02%(50Hz,20°C)	
防爆装置 Explosion-proof device	Three phase overpressure disconnecter	
内部填充料 Internal stuffing	Oil (Non PCB)	
预期寿命 Life Expectancy	100 000 hours under rated conditions @50°C ΔC/C ≤5%	
安装位置 Mounting position	Vertical	
最大安装扭矩 Max. Torque of Installation	10Nm (M12)	
最大电极扭矩 Max Torque of terminals	2.0Nm (M5), 3.0Nm (M6)	
冷却方式 Cooling	Naturally air-cooled (or forced cooling)	
最高海拔 Maximum allowed altitude	2 000m	

产品编码说明 Part number system

■ 18位产品代码如下:

The 18 digits part number is formed as follow:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
C	6	7															

第1~3位	型号代码	Digit 1 to 3	Series code
第4~5位	交流额定电压 P5=230 S1=440 T1=540 U2=690 V2=760 K2=800 W1=850	Digit 4 to 5	A.C. rated voltage P5=230 S1=440 T1=540 U2=690 V2=760 K2=800 W1=850
第6~8位	标称容量 A to H & J 表示0.1 to 0.9 举例: 506=50 × 10 ⁶ pF= 50 μ F 26E=26.5 μ F	Digit 6 to 8	Rated capacitance value A to H & J: 0.1 to 0.9 for example: 506=50 × 10 ⁶ pF= 50 μ F 26E=26.5 μ F
第9位	容量等级 J= ± 5%,K= ± 10%, 6=-5%~+10%	Digit 9	Capacitance tolerance J= ± 5%,K= ± 10%, 6=-5%~+10%
第10位	产品外形尺寸代码 正常尺寸: 0	Digit 10	Dimension code Normal: 0
第11位	内部特征码	Digit 11	Internal use
第12~15位	引出端形式代码	Digit 12 to 15	Terminals code

第12位 Digit 12		第13位 Digit 13		第14位 Digit 14		第15位 Digit 15	
Code	Terminal form	Code	Fixed style	Code	Length of terminals	Code	whether has resistor
2	Plug bolt	7	Bottom-bolt M12	0	standard form	0	no
						R	Yes(Resistor pre-installed)

第16~18位 内部特征码

Digit 16 to 18 Internal use

■ 技术参数 Technical data

U_{rms}=230Vac

C _N μF	D ± 1.0 (mm)	D1 (mm)	H ± 3.0 (mm)	R _s (mΩ)	L _s (nH)	R _{th} (°C/W)	I _{max} (A)	Î (kA)	Î _s (kA)	M (kg)	Part number
3 x 84	76	79	200	3 x 0.9	100	4.2	3 x 43	1.6	4.8	1.1	C67P5846-002700+++
3 x 105	76	79	230	3 x 1.1	120	3.6	3 x 42	1.5	4.5	1.2	C67P5004-002700+++
3 x 160	86	90	230	3 x 0.7	120	3.2	3 x 54	2.3	6.9	1.6	C67P5167-002700+++
3 x 250	116	121	200	3 x 0.4	110	3.1	3 x 56	3.0	9.0	2.5	C67P5257-002700+++
3 x 330	116	121	230	3 x 0.5	130	2.6	3 x 56	4.8	14.3	3.0	C67P5337-002700+++

U_{rms}=440Vac

C _N μF	D ± 1.0 (mm)	D1 (mm)	H ± 3.0 (mm)	R _s (mΩ)	L _s (nH)	R _{th} (°C/W)	I _{max} (A)	Î (kA)	Î _s (kA)	M (kg)	Part number
3 x 13	76	79	140	3 x 1.6	100	7.0	3 x 26	0.8	2.5	0.9	C67S1136-002700+++
3 x 16.5	76	79	140	3 x 1.3	100	6.4	3 x 30	1.1	3.2	0.9	C67S116E-002700+++
3 x 26.5	76	79	200	3 x 2.7	100	4.7	3 x 24	0.8	2.3	1.2	C67S126E-002700+++
3 x 33	76	79	200	3 x 2.2	100	4.3	3 x 28	1.0	2.9	1.2	C67S1336-002700+++
3 x 50	86	90	200	3 x 1.5	110	3.8	3 x 37	1.5	4.4	1.5	C67S1506-002700+++
3 x 66	86	90	230	3 x 1.7	120	3.2	3 x 37	1.4	4.3	1.7	C67S1666-002700+++
3 x 83	116	121	200	3 x 0.9	110	3.5	3 x 48	2.4	7.2	2.8	C67S1836-002700+++
3 x 100	116	121	200	3 x 0.8	110	3.0	3 x 56	2.9	8.7	2.8	C67S1107-002700+++
3 x 133	136	142	200	3 x 0.6	120	2.9	3 x 56	3.9	11.6	3.8	C67S1A00-002700+++
3 x 154	136	142	200	3 x 0.6	120	2.6	3 x 56	4.0	12.0	3.9	C67S1021-002700+++
3 x 170	136	142	230	3 x 0.7	130	2.4	3 x 56	4.5	13.4	4.3	C67S1177-002700+++

U_{rms}=540Vac

C _N μF	D ± 1.0 (mm)	D1 (mm)	H ± 3.0 (mm)	R _s (mΩ)	L _s (nH)	R _{th} (°C/W)	I _{max} (A)	Î (kA)	Î _s (kA)	M (kg)	Part number
3 x 19	76	79	170	3 x 1.1	110	4.9	3 x 33	1.0	2.9	1.2	C67T1196-002700+++
3 x 23	76	79	170	3 x 1.0	110	4.5	3 x 36	1.2	3.6	1.4	C67T1236-002700+++
3 x 39	86	90	200	3 x 1.1	110	3.7	3 x 39	1.4	4.3	1.9	C67T1396-002700+++
3 x 48	86	90	230	3 x 1.3	120	3.2	3 x 38	1.3	4.0	2.1	C67T1486-002700+++
3 x 96	136	142	230	3 x 1.1	130	2.5	3 x 50	2.6	7.9	4.7	C67T1966-002700+++

U_{rms}=690Vac

C _N μF	D ± 1.0 (mm)	D1 (mm)	H ± 3.0 (mm)	R _s (mΩ)	L _s (nH)	R _{th} (°C/W)	I _{max} (A)	Î (kA)	Î _s (kA)	M (kg)	Part number
3 x 33.5	116	121	170	3 x 1.1	110	3.2	3 x 46	1.6	4.9	2.3	C67U233E-002700+++
3 x 38	116	121	200	3 x 1.3	110	3.2	3 x 43	1.3	3.9	2.6	C67U2386-002700+++

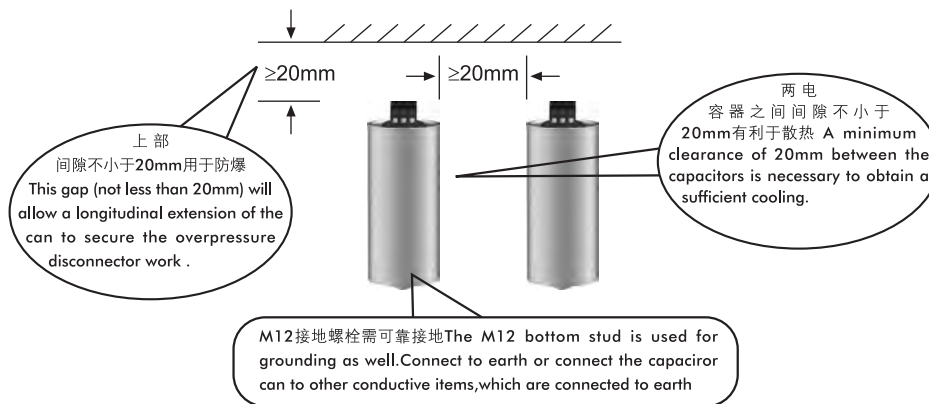
$U_{rms}=760Vac/850Vac$

C _N μF	D ± 1.0 (mm)	D1 (mm)	H ± 3.0 (mm)	R _s (mΩ)	L _s (nH)	R _{th} (°C/W)	I _{max} (A)	\hat{I} (kA)	\hat{I}_s (kA)	M (kg)	Part number
3x8	76	79	170	3x1.4	110	4.7	3x34	0.6	1.7	0.9	C67W1805-002700+++
3x10	86	90	170	3x1.2	110	4.6	3x36	0.7	2.0	1.2	C67W1106-002700+++
3x12	86	90	170	3x1.1	110	4.1	3x40	0.9	2.6	1.2	C67W1126-002700+++
3x17	106	110	170	3x1.0	110	3.7	3x45	1.1	3.4	1.8	C67W1176-002700+++
3x23	86	90	230	3x1.6	120	2.9	3x39	0.9	2.7	1.6	C67W1236-002700+++
3x28	106	110	230	3x1.5	130	2.9	3x41	1.0	3.0	2.3	C67W1286-002700+++
3x33	106	110	230	3x1.4	130	2.6	3x45	1.2	3.5	2.4	C67W1336-002700+++
3x38	116	121	230	3x1.3	130	2.6	3x47	1.4	4.1	2.8	C67W1386-002700+++
3x49	136	142	230	3x1.2	130	2.5	3x49	1.9	5.7	3.7	C67W1496-002700+++
3x55.8	136	142	230	3x1.2	130	2.3	3x53	2.2	6.5	3.8	C67W155H-002700+++

- 备注: 1. “-”表示容量偏差。 “-” =capacitance tolerance code J= ± 5%,K= ± 10%,6=-5%~+10%
2. “+++”表示内部特征码。 “+++” = Internal use
3. 对于760Vac/850Vac系列, 当额定电压为760Vac时产品代码第4-5位为“V2”。 For 760Vac/850Vac series, when the rated voltage is 760Vac, the digit 4 to 5 is V2.
4. I_{max}为电容器参考最大电流, 对于环境温度(θ_{amb})大于55°C, I_{max}可按R_s、R_{th}和环境温度(θ_{amb})来进行计算, 但必须小于端子所能承受电流(56A), 而且必须保证电容器的最热点温度不得超过70°C。 For θ_{amb}>55°C I_{max} according to R_s, R_{th} and environmental temperature(θ_{amb}) to calculate, but I_{max} must not over than 56A and θ_{hs} must not over than 70°C.

$$I_{max} < \sqrt{\frac{70 - \theta_{amb}}{R_{th}} - Q_n X \operatorname{tg} \delta} \cdot R_s$$

■ 安装空间要求 Installation space requirements



■ 连接电缆 Connection of the supply cable

上部必须保持足够的空间,该空间内不能安装其他组件。连接电缆应使用软性电线并保持松弛,不要用硬芯电缆。

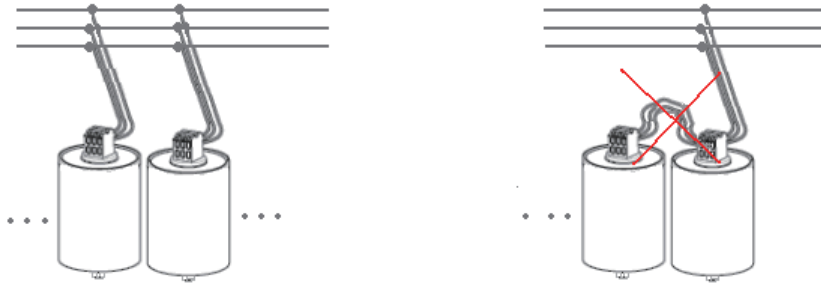
Keep enough space on the top of the capacitors and do not fix any mounting components at the top. The connection cable shall be of flexible type and keep slack , do not use hard core cable.

可安装的最大引线截面积为16 mm², 可根据实际电流值来选择合适的电缆

Maximum cable cross section is 16 mm², according to actual result to choose the appropriate cable.

对于多个电容器并联, 每个电容器采用直接连接到母线上方式

For capacitors connected in parallel, each capacitor should use independent lead wires.



电容器均只能作为一个独立的分支，不能在电容器的一端连接负载(放电电阻除外)。

Each capacitor is only used as an independent subfield, and not connected the load in the terminals (Except discharge resistors).



■ 放电电阻连接 Connection of the discharge resistors

放电电阻用于对电容器进行放电以保护人免受电击的危险，同时也在自动PFC装置内电容器进行切换时放电。

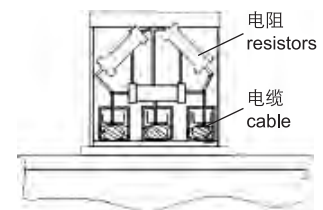
Discharge resistors are required for discharging capacitor for protection of human being (Electric shock risk), and for re-switching capacitors in automatic PFC equipment(Phase opposition)

电阻的设计应满足在3分钟内从峰值电压放电至75V或更低(IEC60831)

Discharge resistors must be designed to discharge capacitors within 180s down to 75V or below.

注意：放电电阻必须安装于电缆之上，不得安装在连接电缆之下防止电阻与电容器外壳产生短路，如下图所示。

Attention: Discharge resistors must not be assembled between cable and the top of the capacitor, to prevent short circuits.



■ 环境温度 Ambient temperature

该电容的环境温度类别是-40/D, 意思环境温度最高可达55℃，若在强制制冷的条件下环境温度还可以再高些，但应保证电容器的外壳温度最高点不得高于60℃；温度对于聚丙烯膜式电容器来讲是影响损耗的一大因素，这会影响到产品的使用寿命。

The ambient temperature category is -40/D, means ambient temperature up to max. 55℃. Under forced cooling conditions higher ambient temperature is possible, but should guarantee the capacitor shell temperature point no more than 60℃. Temperature is one of the main stress factors for polypropylene type capacitors, means it has a major influences on the life cycle of the capacitor.

■ 冲击电流限制 Inrush current limitation

电网切入PFC电容器时，特别是切入时其他并联着的具有电能的器件时，电容器可能会产生是额定电流200倍的冲击电流，这种高冲击电流可能影响电网质量如：瞬间电压下降。

Switching PFC capacitors, especially switching in parallel to other already energized ones cause high inrush currents up to 200 times the rated current. This may cause additional stress to contactors as well as capacitors and reduce their life cycle. On top of that high inrush currents have a negative effect on power quality, e.g. transients, voltage drop.

■ 谐波 Harmonics

谐波是由于一些非线性电器运行时造成的，这些载荷诸如现代电力电子中的转换器、电气传动、焊接机、备用电源等。纹波由一系列频率为50赫或60赫倍数的正弦电流和电压组成。

Harmonics result from the operation of electrical loads with non-linear voltage-current characteristics. They are caused by loads operated with modern power electronic, such as converters, electrical drives, welding machines and stand-by power supplies. Harmonics are sinusoidal voltages and currents with frequencies that are multiples of a 50Hz or 60Hz power supply frequency.

■ 安全注意事项 Safety

电容器外壳保持良好和可靠接地。

Maintain good and effective earthing for enclosures of capacitors.

拆装电容器时要确保电容器已放电干净

Handle capacitor to ensure capacitor has discharge clean

遵循良好的工程规范

Follow good engineering practices

■ 过流/短路保护 Over current/short circuit protection

必须使用限流熔断器或塑壳断路器来进行短路保护。短路保护的元件以及连接电缆需能长时间承受1.5倍电容器额定电流。

HRC-fuse or MCCB for short circuit protection have to be used. Short circuit protection equipment and connection cable should be selected so that the 1.5 times rated current of the capacitor can be managed permanently.

限流熔断器额定电流值应为正常电容电流的1.6~1.8倍

HRC-fuse rating has to be 1.6 to 1.8 times nominal capacitor current

使用热磁继电器为过载保护

Use thermal magnetic overcurrent relays for overload protection

■ 维护 Maintenance

检查连接线与端子螺丝是否打紧

Check tightness of Connections/terminals periodically

定期清理引出端子避免因灰尘或其他可导电的垃圾引起短路

Clean the terminals periodically to avoid dust or other conductive garbage can cause a short-circuit

检查短路保护保险丝

Check short circuit protection fuses

每半年使用电流钳表或其他在线测电流的工具测量电容器电流

Every half a year use current clamp table or other on-line measuring tools of current measurement capacitor current

检查放电电阻是否正常工作，可以通过电容器先上电后断开3分钟后测量电容器的电压是否降至75V以下来进行判断

Check the discharge resistance whether normal work. By power the capacitor up and down, after 3 minutes the capacitor voltage must less than 75V.

■ 安装与调试步骤 Installation & commissioning procedures

1、打开包装箱取出电容 Unpack Capacitor

取电容时请勿直接抓取端子

Do not touch capacitor terminals by hand directly while taking them.



2、检查电容器外观(是否有机械损伤)

Check Physically

3、固定好电容器

Fixed capacitors

4、确保使用电容器场合的电压、频率、温度在电容器额定值以下

Ensure for correctness of supply voltage, frequency, temperature

5、连接好电容器

Connect Capacitor

6、打开电源开关

Switch on supply

7、检查主回路的电压与电流是否正常

Check main supply Voltage & current

8、电容器正常运行

Capacitor is commissioned