



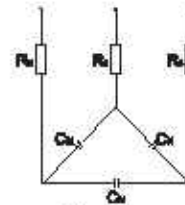
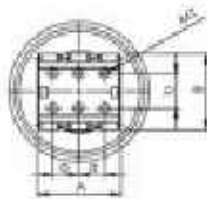
C67

三相交流滤波电容器(一体)

Three-phase AC-filter capacitors (single case)

■ 外形图 Outline Drawing

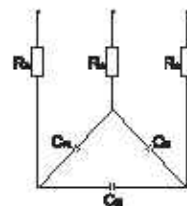
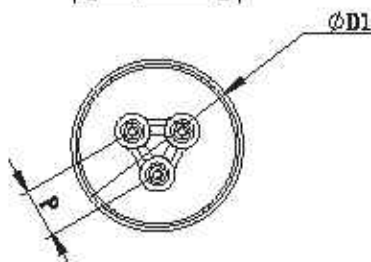
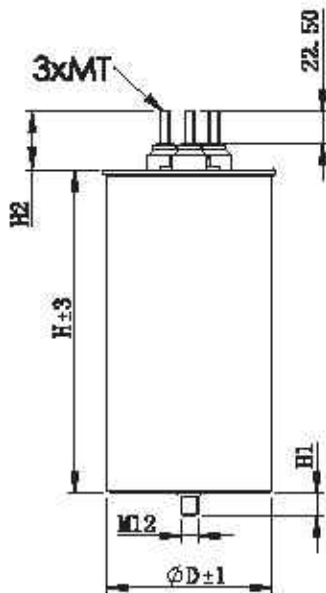
帽式设计(Cap type design):



Circuit diagram

D±1	a±0.5	b±0.5	A±1	B±1	H1±2	MT
78~118	15	19.4	43.5	44.5	35	M5
136	16.5	25.0	48	54.5	45	M6

螺栓式设计(Bolt type design): (D=116~136)



Circuit diagram

D±1	H1±1	P±1	MT
116	18	40	M8
136	18	40	M8



■ 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 film structure
- Anti-explosion design, overpressure tear-off fuse more safety
- Suitable for power factor correction and LCL filter

■ 安全认证 Safety Approvals

●		TUV Rheinland (德国)	EN 61071:2007, EN 61881-1:2011, U_{me} : 230Vac~850Vac, U_N : 330Vac~1200Vac $3 \times 8\mu F \sim 3 \times 330\mu F$, $-40^\circ C/70^\circ C$ 证书号(Certificate No.): R 50289789
●		ULACUL (美国/加拿大)	UL 810, max. 850Vac, 50/60Hz, "Protected", 10 000AFC, max. 80°C CSA C22.2.No180, max. 800Vac, 50/60Hz, 证书号(File No.): E232771, CCN: CYWT2/8

注: 以上认证仅适用于C67帽式设计, C67螺栓式设计正在认证中。

Note: Above certification applies only to C67 cap type design, C67 bolt type design is in certification.

■ 技术要求 Specifications

引用标准 Reference Standard	GB/T 17702 (IEC 61071) Optional: GB/T 12747 (IEC 60831)	
过电压 Over voltages	1.1 U_{me} , 8小时/天 up to 8h daily; 1.15 U_{me} , 30分钟/天 up to 30min daily; 1.2 U_{me} 5分钟或者 1.3 U_{me} 1分钟在寿命期内允许出现 200次 1.2 U_{me} for 5 min or 1.3 U_{me} for 1min during life 200 times	
可运行温度范围(热点温度) Operating temperature range (θ_{hm})	$-40^\circ C \sim 85^\circ C$	
额定均方根电压 Rated RMS Voltage (U_{me})	230Vac~850Vac	
额定频率 Rated Frequency	50/60Hz	
额定容量 Capacitance C_N	$8\mu F \sim 330\mu F$	
容量偏差 Capacitance Tolerance	$\pm 5\%$, $-5\% \sim +10\%$	
电容内部连接方式 Capacitor internal connection	三角形接法 Delta connection (Δ)	
贮存温度 Storage Temperature	$-40^\circ C \sim 70^\circ C$	
外壳 Case	Aluminium can	
耐电压 Voltage Proof	引线之间 Between Terminals:	2.15 U_{me} (Vac) (10s)
	极壳之间 Between Terminals To Case:	2 000+2 U_N (Vac) (10s) (min 3 000Vac)
绝缘电阻 Insulation Resistance ($IR \times C_N$)	$\geq 10\ 000s(20^\circ C, 100V, 1min)$	
介质损耗角正切 Dielectric dissipation factor $\tan \delta_d$	2×10^{-4} (50Hz, $20^\circ C$)	
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 Expected lifetime	$ \Delta C/C \leq 5\%$ after 100 000h @ U_{me} , $\theta_{hm} \leq 70^\circ C$	
安装位置 Mounting position	Vertical	
最大安装扭矩 Max. Torque of installation	10N·m (M12)	
最大电极扭矩 Max Torque of terminals	2N·m (M5); 3N·m (M6)	
	4N·m (M8); 6N·m (M10)	
冷却方式 Cooling	Naturally air-cooled or force cooled	
最高海拔 Maximum allowed altitude	2 000m	



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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	额定均方根电压	Digit 4 to 5	Rated RMS Voltage
	P5=230 S1=440 T1=540 U2=690		P5=230 S1=440 T1=540 U2=690
	V2=760 K2=800 W1=850		V2=760 K2=800 W1=850
第6~8位	标称容量	Digit 6 to 8	Rated capacitance value
	A to H & J 表示0.1 to 0.9		A to H & J : 0.1 to 0.9
	举例: 506=50 × 10 ⁶ pF=50μF		For example: 506=50 × 10 ⁶ pF=50μF
	26E=26.5μF		26E=26.5μF
第9位	容量等级	Digit 9	Capactance tolerance
	J= ± 5%,K= ± 10%,6=-5%~+10%		J= ± 5%,K= ± 10%,6=-5%~+10%
第10位	产品外形尺寸代码	Digit 10	Dimension code
	正常尺寸: 0		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	
代码 Code	引出端方式 Terminal form	代码 Code	引出端方式 Fixed style	代码 Code	引出线长度 length of lead wire	代码 Code	是否配电阻 whether has Resister
2	插头螺栓 Plug bolt	7	底部螺栓 M12 Bottom-bolt M12	8	标准样式 Standard form	0	是 Yes (配电阻, 客户自行安装) (Resistor the other packing)
3	M8					R	是 (配电阻, 已预安装) Yes(Resistor pre-installed)
		N	否 No				

第16~18位 内部特征码

Digit 16 to 18 Internal use

■ 技术参数 Technical data (mm)

U _{max} =230Vac U _p =225Vdc											
C _{th} (μF)	D±1.0 (mm)	D1 _{max} (mm)	H±3.0 (mm)	R _{th} (mΩ)	L _{th} (nH)	R _{th} (K/W)	I _{max} (A)	I ₁ (kA)	I ₂ (kA)	M (kg)	Part number
3×84	78	79	200	3×1.5	100	4.5	3×34	1.8	4.8	1.1	C87P5848-002700+++
3×105	78	79	230	3×1.8	120	4.0	3×38	1.8	4.8	1.2	C87P6004-002700+++
3×160	86	90	230	3×1.2	120	3.5	3×43	2.3	6.9	1.6	C87P5167-002700+++
3×250	118	121	200	3×0.8	110	3.1	3×53	3.0	9.0	2.4	C87P5257-002700+++
3×330	118	121	230	3×0.9	130	2.7	3×54	4.8	14.3	2.8	C87P5337-002700+++

U _{max} =440Vac U _p =425Vdc											
C _{th} (μF)	D±1.0 (mm)	D1 _{max} (mm)	H±3.0 (mm)	R _{th} (mΩ)	L _{th} (nH)	R _{th} (K/W)	I _{max} (A)	I ₁ (kA)	I ₂ (kA)	M (kg)	Part number
3×19	78	79	140	3×1.8	100	6.2	3×22	0.8	2.5	0.9	C87S1138-002700+++
3×16.5	78	79	140	3×1.5	100	5.6	3×25	1.1	3.2	0.9	C87S119E-002700+++
3×28.5	78	79	200	3×2.3	100	4.4	3×25	0.8	2.3	1.2	C87S129E-002700+++
3×32	78	79	200	3×1.8	100	4.0	3×28	1.0	2.9	1.2	C87S1336-002700+++
3×50	86	90	200	3×1.4	110	3.4	3×34	1.5	4.4	1.4	C87S1506-002700+++
3×69	86	90	230	3×1.5	120	2.9	3×38	1.4	4.3	1.7	C87S1698-002700+++
3×83	118	121	200	3×1.1	110	3.1	3×40	2.4	7.2	2.4	C87S1836-002700+++
3×100	118	121	200	3×1.0	110	2.8	3×43	2.9	8.7	2.4	C87S1197-002700+++
3×133	138	142	200	3×0.8	120	2.5	3×46	3.9	11.6	3.3	C87S1A00-002700+++
3×154	138	142	200	3×0.8	120	2.3	3×48	4.0	12.0	3.3	C87S1021-002700+++
3×170	138	142	230	3×0.9	130	2.2	3×45	4.5	13.4	3.8	C87S1177-002700+++

U _{max} =540Vac U _p =788Vdc											
C _{th} (μF)	D±1.0 (mm)	D1 _{max} (mm)	H±3.0 (mm)	R _{th} (mΩ)	L _{th} (nH)	R _{th} (K/W)	I _{max} (A)	I ₁ (kA)	I ₂ (kA)	M (kg)	Part number
3×18	78	79	170	3×1.0	110	5.1	3×32	1.0	2.9	1.0	C87T1196-002700+++
3×23	78	90	170	3×1.0	110	5.0	3×33	1.2	3.6	1.2	C87T1236-002700+++
3×39	86	100	200	3×0.9	110	4.0	3×39	1.4	4.3	1.7	C87T1396-002700+++
3×48	88	100	230	3×1.0	120	3.8	3×40	1.3	4.0	1.9	C87T1488-002700+++
3×66	138	142	230	3×0.8	130	2.8	3×47	2.6	7.9	3.3	C87T1666-002700+++

U _{max} =880Vac U _p =820Vdc											
C _{th} (μF)	D±1.0 (mm)	D1 _{max} (mm)	H±3.0 (mm)	R _{th} (mΩ)	L _{th} (nH)	R _{th} (K/W)	I _{max} (A)	I ₁ (kA)	I ₂ (kA)	M (kg)	Part number
3×33.5	118	121	170	3×0.8	110	3.5	3×42	1.6	4.9	2.2	C87U233E-002700+++
3×39	118	121	200	3×0.8	110	3.5	3×40	1.3	3.9	2.4	C87U2368-002700+++



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U _{max} =760Vac/850Vac ² U _N =1 070Vac/1 280Vac											
C _N (μF)	D±1.0 (mm)	D1 _{max} (mm)	H±3.0 (mm)	R _s (mΩ)	L _s (nH)	R _{th} (K/W)	I _{max} (A)	I ₁ (kA)	I ₂ (kA)	M (kg)	Part number
3×8	76	79	170	3×1.3	110	5.6	3×24	0.6	1.7	1.0	C67W1805-002700+++
3×10	86	80	170	3×1.1	110	5.2	3×27	0.7	2.0	1.0	C67W1106-002700+++
3×12	88	90	170	3×1.0	110	4.8	3×29	0.9	2.6	1.0	C67W1126-002700+++
3×17	106	110	170	3×0.9	110	4.3	3×34	1.1	3.4	1.7	C67W1176-002700+++
3×23	86	90	230	3×1.1	120	3.4	3×37	0.9	2.7	1.6	C67W1236-002700+++
3×28	106	110	230	3×1.0	130	3.3	3×38	1.0	3.0	2.2	C67W1286-002700+++
3×33	106	110	230	3×1.0	130	3.0	3×41	1.2	3.5	2.3	C67W1336-002700+++
3×38	116	121	230	3×0.9	130	2.9	3×42	1.4	4.1	2.8	C67W1386-002700+++
3×48	136	142	230	3×0.9	130	2.7	3×43	1.6	5.7	3.7	C67W1486-002700+++
3×55.8	136	142	230	3×0.8	130	2.5	3×45	2.2	6.5	3.8	C67W1558-002700+++

备注: 1. “-”表示容量偏差, “-”=capacitance tolerance codes, J=±5%, K=±10%, G=±5%→+10%.

2. “+++”表示内部特征码, “+++”= Internal use.

3. “#”当额定均方根电压为760Vac时, 第4-5位是V2, “#” when the rated RMS voltage is 760Vac, the digit 4-5 is V2.

4. “R_{th}”是指自然冷却条件下, 电容器热点到环境的阻抗, “R_{th}”=R_{th} between hotspot and ambient on natural cooling condition.

5. I_{max}为电容器通过电容器接线端子参考最大电流, 表格中数值是基于温升小于30℃计算所得, 其值必须小于端子所能承受的载流能力; 建议使用过程中电容器的热点温度不超过70℃, 必要时采取强迫冷却措施。

I_{max} according to R_{th}, R_m and environmental temperature (θ_{amb}) to calculate, but I_{max} must not over than the terminal can withstand maximum current. Recommend the most hot spot temperature does not exceed 70 °C, forced cooling measures when necessary.

$$I_{max} = \sqrt{\frac{\theta_{hot} - \theta_{amb} - Q_n \times \text{tg} \delta_s}{R_{th}}} \quad (Q_n = 3 \times \omega C U_{rms}^2, \text{实际计算时 } U_{max} \text{ 按实际有效电压取值})$$

5.如需螺栓式设计, 请联系技术工程师。If need bolt type design, please contact our technical engineer.

■ 安装空间要求 (以帽式设计为例) Installation space requirements (Take cap type design as an example)

电容要安装在阴凉、通风良好的位置, 且其周围不能有热辐射的物体, 如滤波电路电抗器、太阳直射。

The capacitor is to be installed at a cool and well-ventilated place, and must not be installed within the range of heat radiating objects, e.g. filter circuit reactors, direct sun radiation.



电容必须要垂直安装, 且引出端子朝上。

The capacitor must be mounted vertically with the terminal is upward.

■ 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.

对于帽式设计,可安装的最大引线截面积为 $16\text{ mm}^2(\text{M}5)/25\text{ mm}^2(\text{M}6)$,可根据实际电流值来选择合适的电缆。

For the cap type design, maximum cable cross section is $16\text{ mm}^2(\text{M}5)/25\text{ mm}^2(\text{M}6)$, according to actual result to choose the appropriate cable.

对于螺栓式设计,根据实际电流值来选择合适的电缆。

For the bolt type design, according to actual result to choose the appropriate cable.

以帽式设计为例,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,若有其他连接方式请联系我们。

Take cap type design as an example, for capacitors connected in parallel, each capacitor should use independent lead wires, if you have any other connection way please contact us.



■ 安装注意事项 Installation cautions

操作前注意电容器必须充分放电 Discharge the capacitor completely before operation

注意端子最大可承受电流,端子总电流不得超出规定的最大值

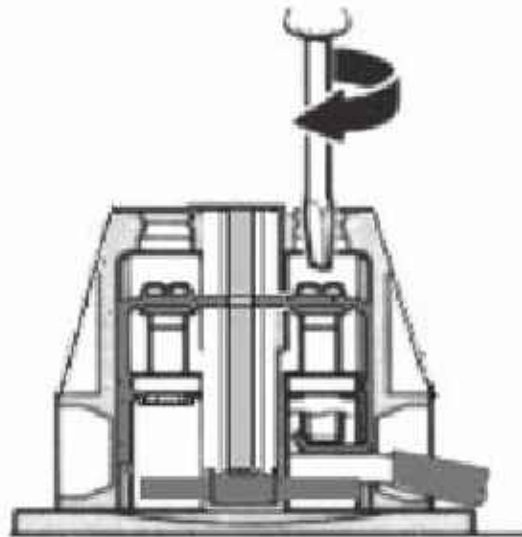
Pay attention to the Max. Current on the terminals, the total current on terminals must not go beyond the Max. current by specified

■ 直径小于 136mm , 端子最大电流 56A The Max. Current on terminals is 56A for $D < 136\text{mm}$

■ 直径等于 136mm , 端子最大电流 80A The Max. Current on terminals is 80A for $D = 136\text{mm}$

对于帽式设计,安装引出端子推荐使用一字螺丝刀,刀面的直径小于防护盖孔以方便插入防护盖上的孔。

For the cap type design, recommend to using a slotted screwdriver to install the terminals.

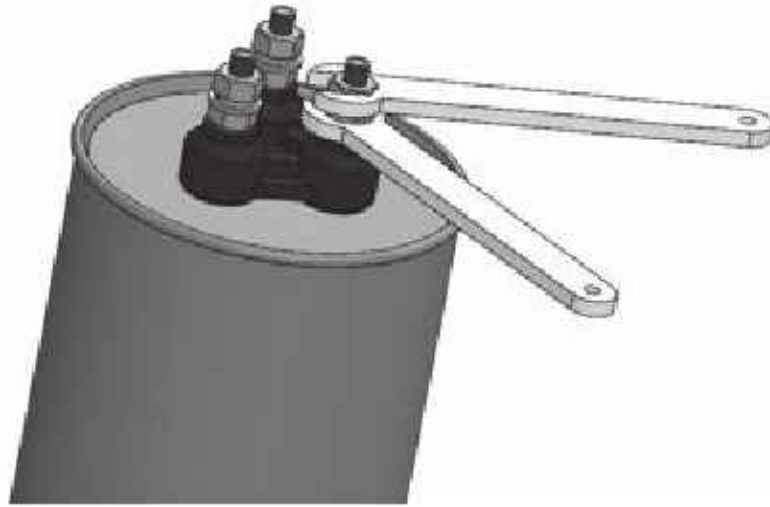


对于螺栓式设计,安装电容器时,建议使用两边扳手进行对锁,下部扳手用于保证扭矩不传递到电容器本体,避免造成电板板部受损。

For the bolt type design, installing a capacitor, it is recommended to be made between two nuts, the lower torque wrench is used to ensure the ontology is not passed to the capacitor.

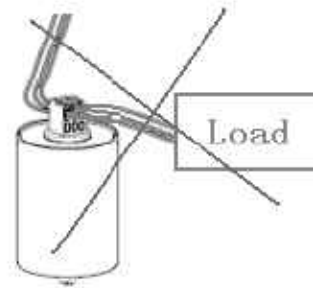


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以帽式设计为例，电容器均只能作为一个独立的分支，不能在电容器的一端连接负载（放电电阻除外）。

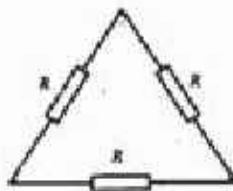
Takes cap type design as an example, each capacitor is only used as an independent subfield, and not connected the load in the terminals (Except discharge resistors).



■ 放电电阻连接 Connection of the discharge resistors

当用户有需求时，应提供将每一电容器单元或电容器组在10min之内从初始电压U_n放电到75V或更低的装置。
When required by the user, each capacitor unit or bank shall be provided with means for discharging each unit in 10 min to 75 V or less, from an initial voltage U_n.

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).



C67帽式设计电容器系列有可选配的放电电阻，其配套的放电电阻能满足在3分钟内使电容器放电到小于75V，放电电阻值的计算可以按如下公式：

Capacitors of the C67 series (cap type design) are fitted with discharge resistors for a discharge <75V within <180s, the resistors to be used can be calculated with the following formula:

R ≤ T / (C × ln(U_o × √2 / U))

T: 放电时间 Discharge time

C: 每一相的容量 Capacitance of one phase

U_o: 使用电压 Operating voltage

U: 最大允许的残留电压

Maximum permissible voltage after discharge (T later)

■ 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、焊机、备用电源等。谐波由一系列频率为50Hz或60Hz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.

在使用过程中计算产品的温升以及核心热点温度是必要的,若使用过程中理论计算出的电容器热点超出了允许的最高范围,建议检查输入线的电流谐波畸变总系数THDI,并联系我们的技术服务人员。

It is necessary to calculate the temperature rise of the capacitors from hotspot to case during the using process. If the temperature rise of theoretical calculation of capacitors' hotspot beyond the maximum allowable range, we would propose to check the total harmonic current distortion (THDI) of the input terminals, and contact our technical service personnel.

$$THD_I = \frac{\sqrt{\sum_{n=1}^{\infty} I_n^2}}{I_0} \quad (THD_I: \text{Total harmonic distortion}, I_0: \text{fundamental current}, I_n: \text{harmonic current})$$

■ 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



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

建议使用限流熔断器或真空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 is recommended to use. 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.

■ 安装与测试步骤 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

