

# Low-Voltage Capacitors

低压电容器

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## PART / 01

- Low-Voltage  
Power Factor Correction  
低压功率因数校正

## PART / 02

## PART / 03

## PART / 04



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### Purpose and Area of Usage

ECP series capacitors are used in industrial and commercial facilities for serving the purpose of power factor correction. The product fixes the power factor ( $\cos \varphi$ ) and allows the user to consume less reactive power from the grid circuit. In return, the costs of electric usage fall and the energy quality enhances.

### 用途和使用范围

ECP系列电容器用于功率因数校正系统，广泛应用于工业和商业。该产品保障功率因数数值 ( $\cos\varphi$ )，补偿系统容性容量，从而使得用户从电网电路消耗较少的无功功率。作为回报，用户电力使用成本下降，电能质量得到提高。

### Components of ECP Series Capacitors

#### ECP 系列电容器元件组成

- |  |                 |
|--|-----------------|
| - Metallized self-healing polypropylene film | - 金属化自愈聚丙烯薄膜    |
| - Winding cores                              | - 绕组芯           |
| - Separators                                 | - 分离器           |
| - Paper and resine                           | - 用于隔离的绝缘纸和填充树脂 |
| - Mechanic fuses for disconnection ,         | - 机械熔断器         |
| - Aluminum can                               | - 铝罐            |
| - Terminal blocks                            | - 接线端子          |
| - Discharge resistors                        | - 放电电阻          |

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### Long Life

In case of a short circuit between the electrodes of a capacitor element, the metal layers around the short circuit vaporize and cease a possible breakdown; therefore allowing the capacitor to self-heal itself and continue its operation. Also, factory applies “torture tests” to all of its prototypes before launching, thus ensuring top quality.

### 长寿命

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当电容器元件的电极之间发生短路，短路周围的金属层会汽化并阻止且覆盖可能的击穿；因此实现电容器自我修复并继续工作。为确保高质量产品，工厂在发货前对所有的产品都进行了严格的出厂测试。

### Ergonomy

ECP series capacitors provide ergonomy advantage through its compact dimensions and design which allows the product to fit almost anywhere.

### 工效学

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ECP系列电容器通过其紧凑的尺寸和设计提供了工效学上的优势，使得产品几乎可以安装在任何地方。

## Environment-friendly

All materials used in ECP series Capacitors production line are non-toxic and environment-friendly.

## 环保产品

ECP系列电容器生产线所用材料均无毒、环保材料。

## Production Process

The production commences with the winding of metallized PP film with low dielectric loss in a clean room under high vacuum. This forms the capacitor element. On the next step, both cylindrical sides of the element are sprayed with 99.95% pure zinc, and the conductive materials are soldered between the terminals and elements. The processed single-phase elements are then dehydrated under vacuum and impregnated with highly purified gas.

In order to avoid any connection with air and to provide an excellent insulation, the processed elements are put into plastic tubes and filled with natural polyurethane resin. Depending on the product type, the wires of elements inside plastic tubes are either left as single-phase or connected in a delta position to provide a three-phase output and mounted into aluminum cans, forming the final product.

## 生产工艺

生产开始时，金属化聚丙烯薄膜的低介电损耗是在一个高真空下的无尘车间进行。这就形成了下一步的电容器元件，元件的两个圆柱面都喷上99.95%的纯锌，在端子和元件之间焊接导电材料。处理后的单相元件在真空下脱水并用高纯度气体浸渍。为了避免与空气发生任何接触，并提供良好的绝缘性，加工后的元件放入塑料管中，并填充天然聚氨酯树脂。根据产品类型，塑料管内元件的导线或保持单相，或以三角形连接，提供三相输出，安装在铝罐中，形成最终产品。

### Temp. Categories 类别

Symbol 标识	-25/A	-25/B	-25/C	-25/D
Meaning 内容	-25/+40°C	-25/+45°C	-25/+50°C	-25/+55°C

### Ambient Air 环境空气

Max	40°C	45°C	50°C	55°C
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### Highest mean over any period of °C 最高平均值

24 Hours	30	35	40	45
1 Year	20	25	45	35

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### Features and Technical Details of Capacitors

#### 技术参数

Rated voltage 额定电压	V	230-850V/ 50 Hz
Inrush current 涌流	$I_s$	$>200 \times I_n(\max 400I_n)$
Frequency 频率	f	50 Hz
Capacitance tolerance 容量公差	%	-5% / +10%
Internal connection 内部连接		Delta or single phase
Losses (dielectric-total) 损耗	$I_{max}$	Up to $1,3 \times I_s$ (including total effects of harmonics, overvoltage and capacitance)
Over voltage 过电压	W/kVAr	$< 0.2 \text{ W/kVAr}$ $< 0.45 \text{ W/ kVAr}$ (without discharge resistor)
Over current 过电流	$V_{max}$	$V_R + 10\%$ (up to 8 h daily) $V_R + 15\%$ (up to 30 min daily) $V_R + 20\%$ (up to 5 min daily) $V_R + 30\%$ (up to 1 min daily)
Test voltage, terminal / terminal 极间测试电压	V	$2,15 \times V_R$ AC, 2 sec.
Test voltage,terminal / body 极壳测试电压	V	3000 V AC, 10 sec
Design life 使用寿命	hour	150.000-200000 h
Number of switching operations 操作切换次数		Max 5000 switchings per year according to IEC 60831-1+2
Ambient temperature 环境温度	$^{\circ}\text{C}$	Max. temperature $55^{\circ}\text{C}$ Min. temperature $-25^{\circ}\text{C}$
Cooling 冷却		Natural or forced
Protection degree 防护等级		IP20
Filling materials 填充物		Inert gas $\text{N}_2$ or dry resin 氮气或干式树脂
Humidity 湿度	%	Max 95%
Altitude 海拔	m	Max. 2000m above sea level
Overpressure disconnecter 过压保护		Three phase disconnecter 三相拉断
Discharge resistor 放电电阻		75V in 3 min
Standard 标准		IEC 60831-1+2

# Low-Voltage Capacitors

## 低压电容器

### Model and Specification

#### 选型表

Type 产品型号	Voltage 电压 (V)	Output power 输出功率 (kvar)	Current 电流 (A)	Capacity 容量 ( $\mu$ )	Size 尺寸 (DxH)	Weight 重量 (Kg)
<b>Mono Phase Capacitors 单相 (230V, 50 Hz, delta connection)</b>						
ECP1 230/0,50	230	0,5	2,2	1x30	65x100	0,4
ECP1 230/1,0	230	1,0	4,4	1x60	65x112	0,4
ECP1 230/1,5	230	1,5	6,5	1x90	70x112	0,7
ECP1 230/2,5	230	2,5	10,9	1x150	70x112	0,7
ECP1 230/5,0	230	5,0	21,7	1x301	75x247	0,9
<b>Three Phase Capacitors 三相 (440V, 50Hz, delta connection)</b>						
ECP3-440/1,0	440	1	1,3	3x5,5	65x95	0,4
ECP3-440/1,5	440	1,5	2,0	3x8,3	65x110	0,4
ECP3-440/2,5	440	2,5	3,3	3x13,7	65x172	0,7
ECP3-440/5,0	440	5	6,6	3x27,5	65x172	0,7
ECP3-440/7,5	440	7,5	9,9	3x41,2	65x210	0,9
ECP3-440/10,0	440	10,0	13,1	3x55	70x210	0,9
ECP3-440/12,5	440	12,5	16,4	3x69	70x247	1
ECP3-440/15,0	440	15,0	19,7	3x82	75x247	1,6
ECP3-440/20,0	440	20	26,3	3x109,7	85x247	1,8
ECP3-440/25,0	440	25	32,8	3x137,1	100x247	2
ECP3-440/30,0	440	30	39,4	3x164	100x247	2,2

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Type 产品型号	Voltage 电压 (V)	Output power 输出功率 (kvar)	Current 电流 (A)	Capacity 容量 ( $\mu$ )	Size 尺寸 (DxH)	Weight 重量 (Kg)
<b>Three Phase Capacitors 三相 (480V, 50Hz, delta connection)</b>						
ECP3-480/0,5	480	0,5	0,6	3x2,3	55x90	0,4
ECP3-480/1,0	480	1	1,2	3x4,6	55x160	0,4
ECP3-480/1	480	1,5	1,8	3x6,9	55x160	0,4
ECP3-480/2,5	480	2,5	3,0	3x11,5	55x160	0,7
ECP3-480/5,0	480	5	6,0	3x23	65x172	0,7
ECP3-480/7,5	480	7,5	9,0	3x34,6	65x210	0,9
ECP3-480/10,0	480	10,0	12	3x46,1	70x210	0,9
ECP3-480/12,5	480	12,5	15,1	3x57,6	70x247	1
ECP3-480/15,0	480	15,0	18,1	3x69,1	75x247	1,6
ECP3-480/20,0	480	20	24,1	3x92,2	85x247	1,8
ECP3-480/25,0	480	25	30,1	3x115,2	100x247	2
ECP3-480/30,0	480	30	36,1	3x138,2	100x247	2,2
<b>Three Phase Capacitors 三相 (525V, 50Hz, delta connection)</b>						
ECP3-525/20,0	525	20	22	3x77,1	85x247	1,8
ECP3-525/25,0	525	25	27,5	3x96,3	100x247	2
ECP3-525/30,0	525	30	33	3x116	100x247	2,2
ECP3-525/40,0	525	40	44	3x154,1	100x285	2,2