

# 突波吸收電容器 Surge Absorbing Capacitors

## 用途 / Application:

### 突波吸收用電容器:

用於連接線路與大地間，緩和、降低傳導至線路上的突波及斷路器等開關時產生的暫態突波，以保護變壓器、轉動機械、敏感性電子設備等。與被保護的設備並聯使用，不需隔離開關保護。

### 接地用電容器:

用於連接變壓器的二次側線路與大地之間，補償線路與大地之間的靜電電容，即使在負載側發生接地事故，仍供應充分電流，使接地繼電器或漏電斷路器動作。



### Surge absorbing capacitors:

It is developed to connect between line and ground, and to absorb and reduce surge voltages which may be generated from breaker turns on or off and lighting surge which may be delivered by connecting transmission line and ground. To protect transformers, rotating machines, and sensitive electronic equipment, etc. They are intended to be applied directly in parallel with the protected apparatus, with no separate protection.

### Grounding capacitors:

It is developed to connect between the secondary side power lines of transformer and ground to compensate the capacitance between line and ground. It can supply required current to active ground relay or leakage breaker even if a fault occurred on load side.

ISO 9001:2008 認證工廠

Ver. 2016.09



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## 規範及特性 / Specification and Performance

| 型 式<br>Type                                          | 高壓電力電容器<br>Power Capacitoors                                                                                                                                                                                                                                                                                 | 突波吸收電容器<br>Surge Absorbing                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 依據標準<br>Standards                                    | IEC 60871; CNS 1372, 3739; JIS C 4902                                                                                                                                                                                                                                                                        | JEM 1362, IEC 60871, CNS 1372                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 產品認證<br>Quality approval                             | 正字標記認證 (台正字第2846號)<br>CNS mark (No. 2846)                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 工廠認證<br>Factory approval                             | ISO 9001(2015年版) 認證, TAF ISO 17025(2017年版)測試實驗室認證<br>ISO 9001:2015 certificated, TAF ISO 17025:2017 Testing Laboratory Certificated                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 絕緣油<br>Insulation oil                                | 非PCB絕緣油<br>Non-PCB fluid                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 頻率<br>Frequency                                      | 60Hz (50Hz available on request.)                                                                                                                                                                                                                                                                            | 50/60Hz共用                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 容量誤差<br>Tolerance                                    | -5% / +10%(三相相間容量誤差在3%以內)<br>-5%~+10%(The capacity error between three phases is within 3%)                                                                                                                                                                                                                  | -5%~+10%<br>(三相相間容量最大值與最小值比<1.08)<br>-5%~+10% (In three-phase units, the ratio of maximum to minimum value of capacitance measured between any two terminals <1.08)                                                                                                                                                                                                                                                                                                                               |
| 周圍溫度<br>Ambient temperature                          | -25°C / A [+40°C], mean 30°C / day, mean 20°C / year<br>-25°C / B [+45°C], mean 35°C / day, mean 25°C / year<br>-25°C / C [+50°C], mean 40°C / day, mean 30°C / year<br>-25°C / D [+55°C], mean 45°C / day, mean 35°C / year                                                                                 | -20°C~+50°C (24小時平均溫度小於45°C)<br>[其他溫度種類可訂製]<br>-20°C~+50°C (24hours average below 45°C)<br>[Other ambient temperature categories on request]                                                                                                                                                                                                                                                                                                                                                      |
| 最大容許過電壓<br>Maximum permissible voltage               | 額定電壓110% (24小時平均值下)<br>110% of rated voltage (average voltage in every 24 hrs)<br>額定電壓115% (24小時中30分鐘以內)<br>115% of rated voltage (30 min in every 24 hrs)<br>額定電壓120% (5分鐘最多200次)<br>120% of rated voltage (5 min / max. 200times)<br>額定電壓130% (1分鐘最多200次)<br>130% of rated voltage (1 min / max. 200times) | 額定電壓110% (24小時平均值下)<br>110% of rated voltage (average voltage in every 24 hrs)<br>額定電壓115% (24小時中30分鐘以內)<br>115% of rated voltage (30 min in every 24 hrs)<br>額定電壓120% (5分鐘以內)<br>120% of rated voltage (within 5 min)<br>額定電壓130% (1分鐘以內)<br>130% of rated voltage (within 1 min)<br>額定電壓182% (2秒鐘以內)<br>182% of rated voltage (within 2 sec)<br>(大於115%額定電壓, 在電容器壽命中不得超過200次)<br>(The having value higher than 115% of rated voltage do not occur more than 200 times in the capacitor's life.) |
| 最大容許過電流<br>Maximum permissible current               | 額定電流135%<br>135% of rated current                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 損失率<br>Dissipation factor                            | 小於0.05% 或 0.5W / kVAR<br>Less than 0.05% or 0.5W / kVAR                                                                                                                                                                                                                                                      | 小於0.5%<br>Less than 0.5%                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 溫升<br>Temperature rise                               | 周溫低於35°C時, 溫升25°C以下<br>below 25°C at ambient temperature 35°C.                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 密閉性<br>Sealing                                       | 80°C恆溫槽中4小時加熱, 電容器外表無漏油痕跡<br>No oil leaking after heating at 80°C for 4hrs.                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 絕緣電阻(T-C)<br>Insulation resistance                   | 1000MΩ以上<br>above 1000MΩ                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 內部等效電感值<br>Residual Inductance (T-C)                 | Exemptions                                                                                                                                                                                                                                                                                                   | 2uH以下<br>Less than 2uH                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 放電特性<br>Discharge character                          | 內裝放電電阻, 電容器切離電源5分鐘後其殘留電壓降至50V以下<br>With built-in discharge resistor, residual voltage drops to lower than 50V after capacitor is disconnected from power for 5 minutes.                                                                                                                                      | 無設計<br>Exemptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 串聯電阻<br>Series resistor                              | 無設計<br>Exemptions                                                                                                                                                                                                                                                                                            | 串聯電阻規格依製造者<br>Series resistor, the specification is according manufacturer.                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 端子間耐電壓<br>Test voltage between terminals             | 額定電壓×2VAC, 施加10秒<br>Rated voltage x 2 Vac, 10 second.                                                                                                                                                                                                                                                        | 3.3、3.45 kVAC @ 16 kVAC(1 minute)<br>4.16 kVAC @ 18 kVAC(1 minute)<br>6.0、6.6、6.9 kVAC @ 22 kVAC(1 minute)<br>11、11.95 kVAC @ 28 kVAC(1 minute)<br>13.8 kVAC @ 33.5 kVAC(1 minute)<br>15 kVAC @ 35 kVAC(1 minute)<br>22 kVAC @ 50 kVAC(1 minute)<br>24 kVAC @ 54 kVAC(1 minute)                                                                                                                                                                                                                   |
| 端子與外殼間耐電壓<br>Test voltage between terminals and case | 依額定電壓不同, 試驗值依標準規定值實施<br>Depend on rated voltage, test value is according to the requirements of standards.                                                                                                                                                                                                   | Exemptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 衝擊電壓(BIL)<br>Impulse voltage (BIL)                   | 依額定電壓不同, 試驗值依標準規定值實施<br>Depend on rated voltage, test value is according to the requirements of standards.                                                                                                                                                                                                   | Exemptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

【其他規格規範均可承製】 Other specification available on request

## 結構 / Construction:

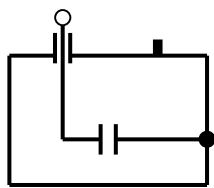
|                          |                                                                                                                                                           |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| 電介質 / Dielectric         | 聚丙烯塑膠膜 / Polypropylene film                                                                                                                               |
| 絕緣油 / Insulation fluid   | 非 PCB 絕緣油 / Non-PCB fluid                                                                                                                                 |
| 套管及顏色<br>Bushing & Color | 硬質瓷濕製法製成，顏色：淺天藍色, Munsell 5B 8/4<br>Wet process porcelain, Color: Baby blue, Munsell 5B 8/4                                                               |
| 外殼材質<br>Case material    | 鋼板 (可指定採用不銹鋼)<br>Steel (Stainless steel available upon request)                                                                                           |
| 塗裝 / 顏色<br>Paint / Color | 防銹、耐酸鹼及耐候樹脂塗裝，顏色：沙色, Munsell 7.5Y 7/2<br>Epoxy / Urethane system with corrosion, acid and alkali, and weather resistant;<br>Color: Sand, Munsell 7.5Y 7/2 |
| 接地方式<br>Earth connection | 一邊掛耳附接地端子 (可依要求掛耳底不塗裝接地用)<br>One side bracket has ground terminal (On request for unpainted area under the brackets for earthing)                         |

## 型式說明 / Type Formation:

$\frac{Y}{1} \frac{H}{2} \frac{E}{3} \frac{\square}{4} - \frac{\square}{5} \frac{K}{6} \frac{\square}{7} \frac{\square}{8}$

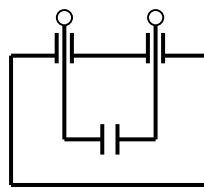
|   |                   |                                             |
|---|-------------------|---------------------------------------------|
| 1 | 裕昌牌               | Yuhchang brand                              |
| 2 | 高壓電容器             | High voltage power capacitors               |
| 3 | 介質為聚丙烯膜           | Dielectric is polypropylene film            |
| 4 | 頻率：A為60Hz, B為50Hz | Frequency: A is 60Hz, B is 50Hz             |
| 5 | 額定電壓/100          | Rated voltage /100                          |
| 6 | 額定容量以Kvar為單位      | Unit of capacity in Kvar                    |
| 7 | 額定容量Kvar值         | Value of Kvar capacity                      |
| 8 | 相數：S為單相, T為三相     | Phase: S is single phase, T is three phases |

## 內部結線 / Internal Connection:



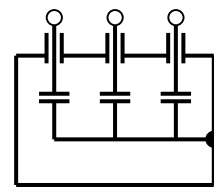
單絕緣套管

1-Phase & 1 bushing



兩絕緣套管

1-Phase & 2 bushings



三絕緣套管

3-Phases & 3 bushings

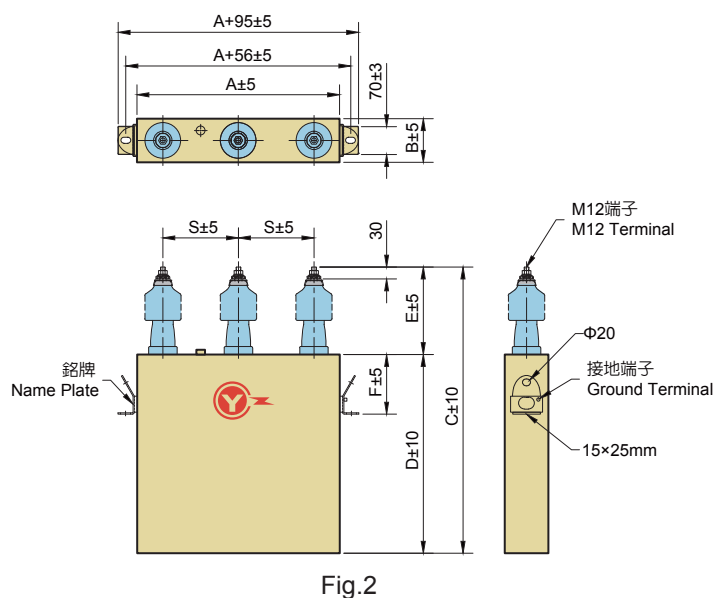
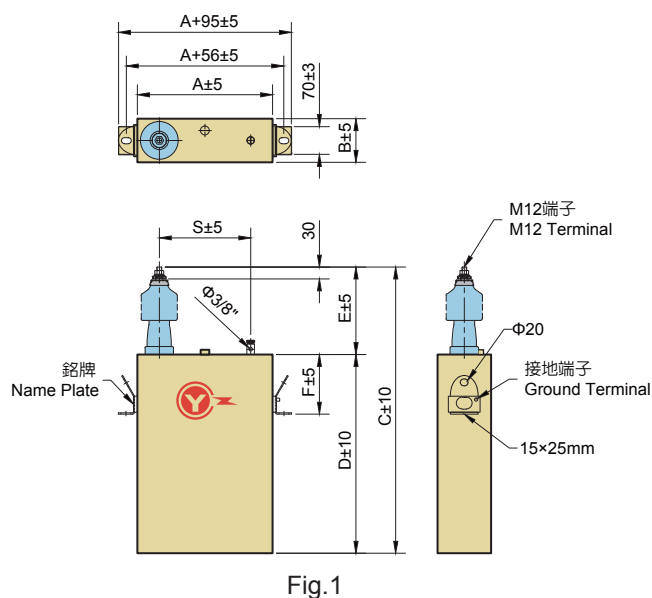
## 一般選用電容值(線對地) / Typical Capacitance Values (Line to ground):

| 額定系統電壓 (kV)<br>Rated system Voltage | 電容值 (uF)<br>Capacitance |
|-------------------------------------|-------------------------|
| 2.4 - 6.9                           | 0.5                     |
| 13.8                                | 0.25                    |
| 24.0                                | 0.125                   |
| 34.5                                | 0.0833 <sup>a</sup>     |

a. 以 1 台 13.8kV 0.25uF 及 1 台 24kV 0.125uF 串聯使用，其中有 1 台要對地絕緣)

One 13.8kV 0.25uF in series with one 24kV 0.125uF (one capacitor unit must be insulated from ground).

## 外型圖 / Outline Drawing



## 尺寸規格表 / Specification Size

突波吸收 / Surge Absorbing

1Ø / 3Ø, 50 / 60Hz

| 線路電壓<br>Line Voltage<br>kV | 容量<br>Capacitance<br>(μF) x Phase | 尺寸<br>Size (mm) |     |     |     |     |     |     | 概略重量<br>Weight<br>kg | 參考圖<br>Diagram |
|----------------------------|-----------------------------------|-----------------|-----|-----|-----|-----|-----|-----|----------------------|----------------|
|                            |                                   | A               | B   | C   | D   | E   | F   | S   |                      |                |
| 3.45                       | 0.5X3                             | 510             | 110 | 400 | 240 | 160 | 120 | 190 | 21.4                 | Fig.2          |
| 3.45                       | 0.4X3                             | 510             | 110 | 360 | 200 | 160 | 120 | 190 | 18.7                 | Fig.2          |
| 3.45                       | 0.3X3                             | 510             | 110 | 360 | 200 | 160 | 120 | 190 | 18.7                 | Fig.2          |
| 3.45                       | 0.1X3                             | 510             | 110 | 360 | 200 | 160 | 120 | 190 | 18.7                 | Fig.2          |
| 4.16                       | 0.5X3                             | 510             | 110 | 460 | 300 | 160 | 150 | 190 | 25.8                 | Fig.2          |
| 4.16                       | 0.3X3                             | 510             | 110 | 360 | 200 | 160 | 120 | 190 | 18.0                 | Fig.2          |
| 4.16                       | 0.1X3                             | 510             | 110 | 360 | 200 | 160 | 120 | 190 | 18.0                 | Fig.2          |
| 6.6                        | 0.5X3                             | 510             | 110 | 620 | 400 | 220 | 150 | 190 | 37.0                 | Fig.2          |
| 6.9                        | 0.5X3                             | 510             | 110 | 620 | 400 | 220 | 150 | 190 | 34.6                 | Fig.2          |
| 6.9                        | 0.3X3                             | 510             | 110 | 500 | 280 | 220 | 150 | 190 | 25.7                 | Fig.2          |
| 6.9                        | 0.2X3                             | 510             | 110 | 420 | 200 | 220 | 120 | 190 | 20.2                 | Fig.2          |
| 6.9                        | 0.5X1                             | 340             | 110 | 450 | 230 | 220 | 120 | 230 | 13.5                 | Fig.1          |
| 11                         | 0.25X3                            | 510             | 110 | 620 | 400 | 220 | 150 | 190 | 37.0                 | Fig.2          |
| 11.95                      | 0.3X3                             | 510             | 110 | 660 | 440 | 220 | 150 | 190 | 39.2                 | Fig.2          |
| 11.95                      | 0.2X3                             | 510             | 110 | 500 | 360 | 220 | 150 | 190 | 26.0                 | Fig.2          |
| 11.95                      | 0.1X3                             | 510             | 110 | 500 | 360 | 220 | 150 | 190 | 25.7                 | Fig.2          |
| 11.95                      | 0.5X1                             | 340             | 135 | 620 | 400 | 220 | 150 | 230 | 28.0                 | Fig.1          |
| 11.95                      | 0.3X1                             | 340             | 110 | 540 | 320 | 220 | 150 | 230 | 17.3                 | Fig.1          |
| 13.8                       | 0.3X3                             | 510             | 110 | 947 | 680 | 267 | 150 | 190 | 59.9                 | Fig.2          |
| 13.8                       | 0.25X3                            | 510             | 110 | 867 | 600 | 267 | 150 | 190 | 53.0                 | Fig.2          |
| 13.8                       | 0.1X3                             | 510             | 110 | 547 | 280 | 267 | 150 | 190 | 28.0                 | Fig.2          |
| 13.8                       | 0.25X1                            | 340             | 135 | 547 | 280 | 267 | 150 | 230 | 20.0                 | Fig.1          |
| 15                         | 0.1X3                             | 510             | 110 | 567 | 300 | 267 | 150 | 190 | 29.9                 | Fig.2          |
| 15                         | 0.5X1                             | 340             | 140 | 747 | 480 | 267 | 150 | 230 | 33.6                 | Fig.1          |
| 15                         | 0.3X1                             | 340             | 135 | 607 | 340 | 267 | 150 | 230 | 19.1                 | Fig.1          |
| 15                         | 0.125X1                           | 340             | 110 | 487 | 220 | 267 | 120 | 230 | 12.3                 | Fig.1          |
| 22                         | 0.1X3                             | 510             | 110 | 867 | 600 | 267 | 150 | 190 | 54.0                 | Fig.2          |
| 22                         | 0.1X1                             | 340             | 110 | 587 | 320 | 267 | 150 | 230 | 17.9                 | Fig.1          |
| 24                         | 0.125X3                           | 630             | 140 | 727 | 460 | 267 | 150 | 190 | 60.3                 | Fig.2          |
| 24                         | 0.1X3                             | 510             | 110 | 867 | 600 | 267 | 150 | 190 | 53.6                 | Fig.2          |
| 24                         | 0.125X1                           | 340             | 110 | 687 | 420 | 267 | 150 | 230 | 23.6                 | Fig.1          |
| 24                         | 0.1X1                             | 340             | 110 | 587 | 320 | 267 | 150 | 230 | 17.9                 | Fig.1          |
| 24                         | 0.5X3                             | 830             | 280 | 867 | 600 | 267 | 150 | 300 | 184                  | Fig.2          |

【其他規格規範均可承製】 Other specification available on request