

LV Capacitor

Safe and reliable, easy to use





LV Capacitor

Self-heating Shunt Capacitor



BZMJ

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Intelligent Reactive Power Compensation Controller



JKF8

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NWK1-GR

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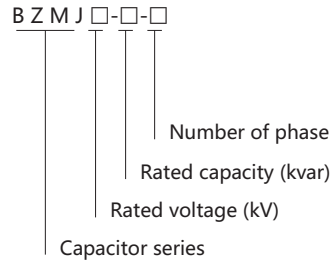


BZMJ Self-healing Shunt Capacitor

1. General

- 1.1 Electric ratings: \leq AC1000V;
- 1.2 Application: For improvement of power factor and power quality;
- 1.3 Standards: IEC/EN 60831-1:2014 IEC/EN 60831-2:2014.

2. Type designation



3. Operating conditions

- 3.1 Ambient temperature: $-25^{\circ}\text{C} \sim +50^{\circ}\text{C}$
- 3.2 Relative humidity: $\leq 50\%$ at 40°C , $\leq 90\%$ at 20°C
- 3.3 Altitude: $\leq 2000\text{m}$
- 3.4 Environmental conditions:
without dangerous gas & steam, insulated and explosive dust and dramatic mechanical vibration.

4. Technical data

- 4.1 Rated voltage: AC(0.23~1.0)kV;
- 4.2 Rated frequency: 50Hz or 60Hz;
- 4.3 Rated capacity: 1~60Kvar;
- 4.4 Capacity error: $-5\% \sim +10\%$;
- 4.5 Dielectric loss tangent value:
 $\leq 30\text{kvar}$ $\text{tgs} \leq 0.0012$
 $> 30\text{kvar}$ $\text{tgs} \leq 0.0015$
at rated power frequency voltage;
- 4.6 Max. Allowed over-voltage: 1.1Un;
- 4.7 Max. Allowed over-current: 1.3In (1.6 In, 2h/24h; 2.0 In, 30min/24h);
- 4.8 Having Self-discharging property: power off, voltage reduces from 2 Un to 75V and below within 3min;
- 4.9 Specific data;
- 4.10 Inrush current: 200In;
- 4.11 Withstand voltage: interelectrode, power frequency 2.15UN, 10s;
- 4.12 Withstand voltage: pole-to-case, power frequency 3.6kV, 60s;
- 4.13 Losses : $\leq 0.3\text{W/kvar}$.

Main product models and data sheet

| Serial number | Type and Specification | Rated voltage (kV) | Rated capacity (kvar) | Rated frequency (Hz) | Rated capacitor (µF) | Rated current (A) | Enclosure height (mm) | Figure |
|---------------|------------------------|--------------------|-----------------------|----------------------|----------------------|-------------------|-----------------------|--------|
| 1 | BZMJ 0.23-5-3 | 0.23 | 5 | 50 | 301 | 12.5 | 140 | Fig.1 |
| 2 | BZMJ 0.23-6-3 | 0.23 | 6 | 50 | 361 | 15.1 | 190 | Fig.1 |
| 3 | BZMJ 0.23-7.5-3 | 0.23 | 7.5 | 50 | 451 | 18.8 | 190 | Fig.1 |
| 4 | BZMJ 0.23-10-3 | 0.23 | 10 | 50 | 602 | 25.1 | 195 | Fig.2 |
| 5 | BZMJ 0.23-12-3 | 0.23 | 12 | 50 | 722 | 30.1 | 220 | Fig.2 |
| 6 | BZMJ 0.23-15-3 | 0.23 | 15 | 50 | 903 | 37.7 | 250 | Fig.2 |
| 7 | BZMJ 0.23-20-3 | 0.23 | 20 | 50 | 1203 | 50.2 | 295 | Fig.2 |
| 8 | BZMJ 0.23-30-3 | 0.23 | 30 | 50 | 1805 | 75.3 | 315 | Fig.3 |
| 9 | BZMJ 0.4-3-3 | 0.4 | 3 | 50 | 60 | 4.3 | 95 | Fig.1 |
| 10 | BZMJ 0.4-5-3 | 0.4 | 5 | 50 | 99 | 7.2 | 95 | Fig.1 |
| 11 | BZMJ 0.4-6-3 | 0.4 | 6 | 50 | 119 | 8.7 | 120 | Fig.1 |
| 12 | BZMJ 0.4-7.5-3 | 0.4 | 7.5 | 50 | 149 | 10.8 | 120 | Fig.1 |
| 13 | BZMJ 0.4-8-3 | 0.4 | 8 | 50 | 159 | 11.5 | 120 | Fig.1 |
| 14 | BZMJ 0.4-10-3 | 0.4 | 10 | 50 | 199 | 14.4 | 140 | Fig.1 |
| 15 | BZMJ 0.4-12-3 | 0.4 | 12 | 50 | 239 | 17.3 | 190 | Fig.1 |
| 16 | BZMJ 0.4-14-3 | 0.4 | 14 | 50 | 279 | 20.2 | 190 | Fig.1 |
| 17 | BZMJ 0.4-15-3 | 0.4 | 15 | 50 | 298 | 21.7 | 190 | Fig.1 |
| 18 | BZMJ 0.4-16-3 | 0.4 | 16 | 50 | 318 | 23.1 | 190 | Fig.1 |
| 19 | BZMJ 0.4-18-3 | 0.4 | 18 | 50 | 358 | 26.0 | 220 | Fig.1 |
| 20 | BZMJ 0.4-20-3 | 0.4 | 20 | 50 | 398 | 28.9 | 220 | Fig.1 |
| 21 | BZMJ 0.4-25-3 | 0.4 | 25 | 50 | 497 | 36.1 | 220 | Fig.2 |
| 22 | BZMJ 0.4-30-3 | 0.4 | 30 | 50 | 597 | 43.3 | 250 | Fig.2 |
| 23 | BZMJ 0.4-40-3 | 0.4 | 40 | 50 | 796 | 57.7 | 250 | Fig.3 |
| 24 | BZMJ 0.4-50-3 | 0.4 | 50 | 50 | 995 | 72.2 | 315 | Fig.3 |
| 25 | BZMJ 0.4-60-3 | 0.4 | 60 | 50 | 1194 | 86.6 | 315 | Fig.3 |
| 26 | BZMJ 0.45-3-3 | 0.45 | 3 | 50 | 47 | 3.8 | 120 | Fig.1 |
| 27 | BZMJ 0.45-5-3 | 0.45 | 5 | 50 | 79 | 6.4 | 120 | Fig.1 |
| 28 | BZMJ 0.45-6-3 | 0.45 | 6 | 50 | 94 | 7.7 | 120 | Fig.1 |
| 29 | BZMJ 0.45-7.5-3 | 0.45 | 7.5 | 50 | 118 | 9.6 | 120 | Fig.1 |
| 30 | BZMJ 0.45-8-3 | 0.45 | 8 | 50 | 126 | 10.3 | 120 | Fig.1 |
| 31 | BZMJ 0.45-10-3 | 0.45 | 10 | 50 | 157 | 12.8 | 140 | Fig.1 |
| 32 | BZMJ 0.45-12-3 | 0.45 | 12 | 50 | 189 | 15.4 | 190 | Fig.1 |
| 33 | BZMJ 0.45-14-3 | 0.45 | 14 | 50 | 220 | 18.0 | 190 | Fig.1 |
| 34 | BZMJ 0.45-15-3 | 0.45 | 15 | 50 | 236 | 19.2 | 190 | Fig.1 |
| 35 | BZMJ 0.45-16-3 | 0.45 | 16 | 50 | 252 | 20.5 | 190 | Fig.1 |
| 36 | BZMJ 0.45-18-3 | 0.45 | 18 | 50 | 283 | 23.1 | 220 | Fig.1 |
| 37 | BZMJ 0.45-20-3 | 0.45 | 20 | 50 | 314 | 25.7 | 220 | Fig.1 |
| 38 | BZMJ 0.45-25-3 | 0.45 | 25 | 50 | 393 | 32.1 | 220 | Fig.2 |
| 39 | BZMJ 0.45-30-3 | 0.45 | 30 | 50 | 472 | 38.5 | 250 | Fig.2 |
| 40 | BZMJ 0.45-40-3 | 0.45 | 40 | 50 | 629 | 51.3 | 250 | Fig.3 |
| 41 | BZMJ 0.45-50-3 | 0.45 | 50 | 50 | 786 | 64.2 | 315 | Fig.3 |
| 42 | BZMJ 0.45-60-3 | 0.45 | 60 | 50 | 943 | 77.0 | 315 | Fig.3 |
| 43 | BZMJ 0.525-5-3 | 0.525 | 5 | 50 | 58 | 5.5 | 120 | Fig.1 |
| 44 | BZMJ 0.525-10-3 | 0.525 | 10 | 50 | 115 | 11.0 | 140 | Fig.1 |
| 45 | BZMJ 0.525-15-3 | 0.525 | 15 | 50 | 173 | 16.5 | 190 | Fig.1 |
| 46 | BZMJ 0.525-20-3 | 0.525 | 20 | 50 | 231 | 22.0 | 220 | Fig.1 |
| 47 | BZMJ 0.525-25-3 | 0.525 | 25 | 50 | 289 | 27.5 | 220 | Fig.2 |
| 48 | BZMJ 0.525-30-3 | 0.525 | 30 | 50 | 346 | 33.0 | 250 | Fig.2 |
| 49 | BZMJ 0.525-40-3 | 0.525 | 40 | 50 | 462 | 44.0 | 250 | Fig.3 |
| 50 | BZMJ 0.525-50-3 | 0.525 | 50 | 50 | 577 | 55.0 | 315 | Fig.3 |
| 51 | BZMJ 0.525-60-3 | 0.525 | 60 | 50 | 693 | 66.0 | 315 | Fig.3 |



| Serial number | Type and Specification | Rated voltage (kV) | Rated capacity (kvar) | Rated frequency (Hz) | Rated capacitor (μF) | Rated current (A) | Enclosure height (mm) | Figure |
|---------------|------------------------|--------------------|-----------------------|----------------------|----------------------|-------------------|-----------------------|--------|
| 52 | BZMJ 0.69-5-3 | 0.69 | 5 | 50 | 33 | 4.2 | 95 | Fig.1 |
| 53 | BZMJ 0.69-10-3 | 0.69 | 10 | 50 | 67 | 8.4 | 140 | Fig.1 |
| 54 | BZMJ 0.69-15-3 | 0.69 | 15 | 50 | 100 | 12.6 | 190 | Fig.1 |
| 55 | BZMJ 0.69-20-3 | 0.69 | 20 | 50 | 134 | 16.7 | 220 | Fig.1 |
| 56 | BZMJ 0.69-25-3 | 0.69 | 25 | 50 | 167 | 20.9 | 220 | Fig.2 |
| 57 | BZMJ 0.69-30-3 | 0.69 | 30 | 50 | 201 | 25.1 | 250 | Fig.2 |
| 58 | BZMJ 0.69-40-3 | 0.69 | 40 | 50 | 267 | 33.5 | 250 | Fig.3 |
| 59 | BZMJ 0.69-50-3 | 0.69 | 50 | 50 | 334 | 41.8 | 315 | Fig.3 |
| 60 | BZMJ 0.69-60-3 | 0.69 | 60 | 50 | 401 | 50.2 | 315 | Fig.3 |
| 61 | BZMJ 1.14-10-3 | 1.14 | 10 | 50 | 25 | 5.1 | 220 | Fig.1 |
| 62 | BZMJ 1.14-15-3 | 1.14 | 15 | 50 | 37 | 7.6 | 250 | Fig.2 |
| 63 | BZMJ 0.4-7.5-3YN | 0.4 | 7.5 | 50 | 149 | 10.8 | 195 | Fig.2* |
| 64 | BZMJ 0.4-10-3YN | 0.4 | 10 | 50 | 199 | 14.4 | 195 | Fig.2* |
| 65 | BZMJ 0.4-15-3YN | 0.4 | 15 | 50 | 298 | 21.7 | 250 | Fig.2* |
| 66 | BZMJ 0.4-20-3YN | 0.4 | 20 | 50 | 398 | 28.9 | 295 | Fig.2* |

Note: The specifications marked with " * " are used for compensating the individual phase,the bigger one of the four terminals should be connected to the neutral line.

5. Features

- 5.1 Compact design and reliable quality thanks to advanced technology and excellent imported material;
- 5.2 Available for use in places with higher ambient temperature and voltage variation;
- 5.3 Having good sealing properties; amd outgoing terminals for convenient wiring and reliable connection;
- 5.4 Fixed type, convenient for mounting and elegant appearance due to novel mounting pins;
- 5.5 No painting thanks to coated metal Enclosure used.

6. Note

- 6.1 Please guarantee that the capacitors are operated under specified conditions,including the proper temperature, voltage and current, as over-voltage and over-current may shorten the life of the capacitor;
- 6.2 Please pay attention to the points following when the capacitor is shuntly connected in the system
 - a. For the system of current regulating system and the electric equipments system, the capacitor should not be directly connected;
 - b. Operational current of the capacitor should be less than the off-load current of the shuntly connected motor;
 - c. When the transformer is off-load,the capacitor should stop operating.
- 6.3 Specific switches, contactors and over-current relays should be adopted when the capacitor is shuntly connected in the system.

7. Mounting dimensions (mm)

Figure 1

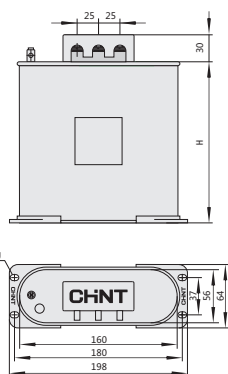


Figure 2

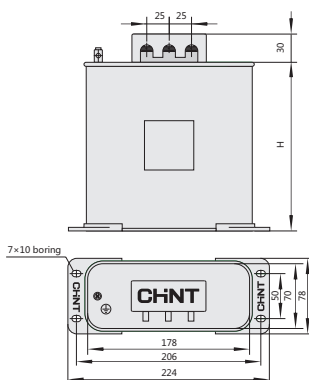
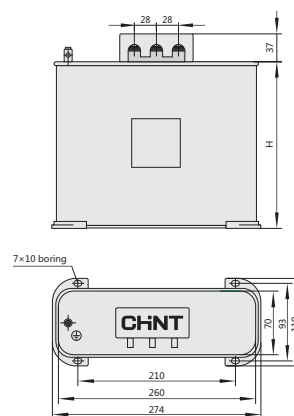


Figure 3





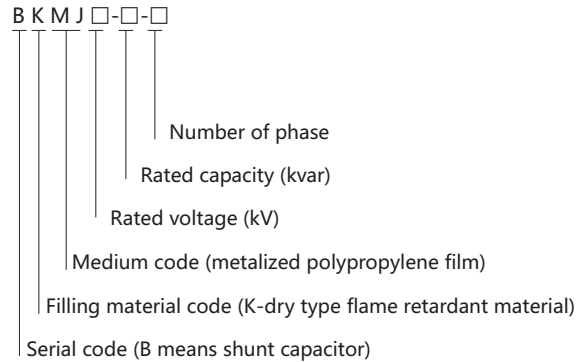
BKMJ Dry Type Low-voltage Shunt Capacitor

1. Scope of Application

BKMJ dry type low-voltage shunt capacitor is applied in nominal voltage 1000V and below power frequency AC power system for the purpose of raising the power factor, reducing the line loss and improving the voltage quality. Filled with dry type flame retardant material; it is safe and reliable with small product size and convenient installation.

Executed standard: IEC/EN 60831-1:2014 IEC/EN 60831-2:2014.

2. Type designation



Note: The split phase compensation capacitor model is the product with suffix YN. For example, BKMJ 0.4-15-3YN means the line voltage is 400V, three-phase aggregate capacity is 15kvar, and the product inside is of star connection, zero conductor N is led out.

3. Operating conditions

- 3.1 Ambient air temperature: -25°C~+50°C (-25/℃), -40°C~+55°C customizable;
- 3.2 Relative humidity: ≤50% at 40°C; ≤90% at 20°C;
- 3.3 Altitude:≤2000m. When it is higher than 2000m, please increase the capacitor' s rated voltage for derating use, and increase the mounting spacing and do well ventilation and heat emission;
- 3.4 Ambient conditions: no harmful gas and steam, no conductive or explosive dust, no violent mechanical vibration.

4. Main Technical Parameters and Technical Performance

- 4.1 Main technical parameters

Main product models and data sheet

| Serial number | Type and Specification | Rated voltage (kV) | Rated capacity (kvar) | Rated frequency (Hz) | Rated capacitor (μF) | Rated current (A) | Enclosure height (mm) | Figure |
|---------------|------------------------|--------------------|-----------------------|----------------------|----------------------|-------------------|-----------------------|--------|
| 1 | BKMJ 0.4-3-3 | 0.4 | 3 | 50 | 60 | 4.3 | 95 | Fig.1 |
| 2 | BKMJ 0.4-5-3 | 0.4 | 5 | 50 | 99 | 7.2 | 95 | Fig.1 |
| 3 | BKMJ 0.4-7.5-3 | 0.4 | 7.5 | 50 | 149 | 10.8 | 120 | Fig.1 |
| 4 | BKMJ 0.4-10-3 | 0.4 | 10 | 50 | 199 | 14.4 | 140 | Fig.1 |
| 5 | BKMJ 0.4-15-3 | 0.4 | 15 | 50 | 298 | 21.7 | 190 | Fig.1 |
| 6 | BKMJ 0.4-16-3 | 0.4 | 16 | 50 | 318 | 23.1 | 190 | Fig.1 |
| 7 | BKMJ 0.4-20-3 | 0.4 | 20 | 50 | 398 | 28.9 | 220 | Fig.1 |
| 8 | BKMJ 0.4-25-3 | 0.4 | 25 | 50 | 497 | 36.1 | 220 | Fig.2 |
| 9 | BKMJ 0.4-30-3 | 0.4 | 30 | 50 | 597 | 43.3 | 250 | Fig.2 |
| 10 | BKMJ 0.4-40-3 | 0.4 | 40 | 50 | 796 | 57.7 | 250 | Fig.3 |
| 11 | BKMJ 0.4-50-3 | 0.4 | 50 | 50 | 995 | 72.7 | 315 | Fig.3 |
| 12 | BKMJ 0.4-60-3 | 0.4 | 60 | 50 | 1194 | 86.6 | 315 | Fig.3 |
| 13 | BKMJ 0.45-3-3 | 0.45 | 3 | 50 | 47 | 3.8 | 95 | Fig.1 |
| 14 | BKMJ 0.45-5-3 | 0.45 | 5 | 50 | 79 | 6.4 | 95 | Fig.1 |
| 15 | BKMJ 0.45-7.5-3 | 0.45 | 7.5 | 50 | 118 | 9.6 | 120 | Fig.1 |
| 16 | BKMJ 0.45-10-3 | 0.45 | 10 | 50 | 157 | 12.8 | 140 | Fig.1 |
| 17 | BKMJ 0.45-15-3 | 0.45 | 15 | 50 | 236 | 19.2 | 190 | Fig.1 |
| 18 | BKMJ 0.45-16-3 | 0.45 | 16 | 50 | 252 | 20.5 | 190 | Fig.1 |
| 19 | BKMJ 0.45-20-3 | 0.45 | 20 | 50 | 314 | 25.7 | 220 | Fig.1 |
| 20 | BKMJ 0.45-25-3 | 0.45 | 25 | 50 | 393 | 32.1 | 220 | Fig.2 |
| 21 | BKMJ 0.45-30-3 | 0.45 | 30 | 50 | 472 | 38.5 | 250 | Fig.2 |
| 22 | BKMJ 0.45-40-3 | 0.45 | 40 | 50 | 629 | 51.3 | 250 | Fig.3 |
| 23 | BKMJ 0.45-50-3 | 0.45 | 50 | 50 | 786 | 64.2 | 315 | Fig.3 |
| 24 | BKMJ 0.45-60-3 | 0.45 | 60 | 50 | 943 | 77.0 | 315 | Fig.3 |
| 25 | BKMJ 0.525-3-3 | 0.525 | 3 | 50 | 35 | 3.3 | 95 | Fig.1 |
| 26 | BKMJ 0.525-5-3 | 0.525 | 5 | 50 | 58 | 5.5 | 95 | Fig.1 |
| 27 | BKMJ 0.525-7.5-3 | 0.525 | 7.5 | 50 | 87 | 8.2 | 120 | Fig.1 |
| 28 | BKMJ 0.525-10-3 | 0.525 | 10 | 50 | 115 | 11.0 | 140 | Fig.1 |
| 29 | BKMJ 0.525-15-3 | 0.525 | 15 | 50 | 173 | 16.5 | 190 | Fig.1 |
| 30 | BKMJ 0.525-16-3 | 0.525 | 16 | 50 | 185 | 17.6 | 190 | Fig.1 |
| 31 | BKMJ 0.525-20-3 | 0.525 | 20 | 50 | 231 | 22.0 | 220 | Fig.1 |
| 32 | BKMJ 0.525-25-3 | 0.525 | 25 | 50 | 289 | 27.5 | 220 | Fig.2 |
| 33 | BKMJ 0.525-30-3 | 0.525 | 30 | 50 | 346 | 33.0 | 250 | Fig.2 |
| 34 | BKMJ 0.525-40-3 | 0.525 | 40 | 50 | 462 | 44.0 | 250 | Fig.3 |
| 35 | BKMJ 0.525-50-3 | 0.525 | 50 | 50 | 577 | 55.0 | 315 | Fig.3 |
| 36 | BKMJ 0.525-60-3 | 0.525 | 60 | 50 | 693 | 66.0 | 315 | Fig.3 |
| 37 | BKMJ 0.69-5-3 | 0.69 | 5 | 50 | 33 | 4.2 | 95 | Fig.1 |
| 38 | BKMJ 0.69-7.5-3 | 0.69 | 7.5 | 50 | 50 | 6.3 | 120 | Fig.1 |
| 39 | BKMJ 0.69-10-3 | 0.69 | 10 | 50 | 67 | 8.4 | 140 | Fig.1 |
| 40 | BKMJ 0.69-15-3 | 0.69 | 15 | 50 | 100 | 12.6 | 190 | Fig.1 |
| 41 | BKMJ 0.69-20-3 | 0.69 | 20 | 50 | 134 | 16.7 | 220 | Fig.1 |
| 42 | BKMJ 0.69-25-3 | 0.69 | 25 | 50 | 167 | 20.9 | 220 | Fig.2 |
| 43 | BKMJ 0.69-30-3 | 0.69 | 30 | 50 | 201 | 25.1 | 250 | Fig.2 |
| 44 | BKMJ 0.69-40-3 | 0.69 | 40 | 50 | 267 | 33.5 | 250 | Fig.3 |
| 45 | BKMJ 0.69-50-3 | 0.69 | 50 | 50 | 334 | 41.8 | 315 | Fig.3 |
| 46 | BKMJ 0.69-60-3 | 0.69 | 60 | 50 | 401 | 50.2 | 315 | Fig.3 |
| 47 | BKMJ 1.20-10-3 | 1.20 | 10 | 50 | 22 | 4.8 | 190 | Fig.1 |
| 48 | BKMJ 1.20-15-3 | 1.20 | 15 | 50 | 33 | 7.2 | 250 | Fig.2 |
| 49 | BKMJ 1.20-20-3 | 1.20 | 20 | 50 | 44 | 9.6 | 250 | Fig.2 |
| 50 | BKMJ 1.20-30-3 | 1.20 | 30 | 50 | 66 | 14.4 | 315 | Fig.3 |
| 51 | BKMJ 1.20-40-3 | 1.20 | 40 | 50 | 88 | 19.2 | 315 | Fig.3 |
| 52 | BKMJ 0.4-5-3YN | 0.4 | 5 | 50 | 99 | 7.6 | 140 | Fig.2* |
| 53 | BKMJ 0.4-7.5-3YN | 0.4 | 7.5 | 50 | 149 | 10.8 | 195 | Fig.2* |
| 54 | BKMJ 0.4-10-3YN | 0.4 | 10 | 50 | 199 | 14.4 | 195 | Fig.2* |
| 55 | BKMJ 0.4-15-3YN | 0.4 | 15 | 50 | 298 | 21.7 | 250 | Fig.2* |
| 56 | BKMJ 0.4-20-3YN | 0.4 | 20 | 50 | 398 | 28.9 | 295 | Fig.2* |
| 57 | BKMJ 0.4-25-3YN | 0.4 | 25 | 50 | 497 | 36.1 | 315 | Fig.3* |
| 58 | BKMJ 0.4-30-3YN | 0.4 | 30 | 50 | 597 | 43.3 | 315 | Fig.3* |
| 59 | BKMJ 0.45-5-3YN | 0.45 | 5 | 50 | 99 | 7.6 | 140 | Fig.2* |
| 60 | BKMJ 0.45-7.5-3YN | 0.45 | 7.5 | 50 | 118 | 9.6 | 195 | Fig.2* |

- Notes: 1. The single-phase product may be custom-made. When rated voltage is lower than 800VAC, the overall dimensions of single-phase product are the same as those of three-phase product with the same specification;
2. System voltage 127V/220V, grid frequency 60Hz, please select the product of rated voltage 0.23kV or 0.25kV, frequency 60Hz;
3. The product with “*” is of split-phase compensation capacitor; the product has four connecting terminals of star connection, in which the isolated terminal is connected with the zero conductor N.

5. Main Features and Precautions for Use

5.1 Main features

- 5.1.1 Advanced import production equipment, good metalized polypropylene film, small product size, reliable quality.
- 5.1.2 Use safety: The product is filled with dry type flame retardant material and installed with the over-pressure protection device and self-discharge device, and is characterized by being free of oil, environmental friendly, corrosion proof, explosion proof, good safety and avoiding the product oil leakage and other hazards.
- 5.1.3 Applicable environment: applicable for all industrial users and places with high fire rating.
- 5.1.4 Convenient installation and use: The plastic mounting feet are first inserted from the bottom, and then the product is fixed and installed using screws; it may be installed vertically or horizontally.
- 5.1.5 BKMJ series products have good materials selected with certain design margin and long use life.
- 5.1.6 The external installing dimensions of BKMJ series products are the same as those of our BZMJ series, easy for product maintenance and replacement.

5.2 Precautions for use

5.2.1 Type selection of three-phase capacitor:

| Grid system voltage (V) | Capacitor rated voltage (kV) | User grid frequency 60 Hz |
|-------------------------|------------------------------|--|
| 127/220 | 0.23/0.25 | 0.25kV-50 Hz or 0.23kV-60Hz product may be selected |
| 220/380 | 0.4/0.45/0.525 | 0.45kV/0.525kV-50 Hz or 0.4kV-60Hz product may be selected |
| 660 | 0.69/0.75 | 0.75kV-50 Hz or 0.69kV-60Hz product may be selected |

5.2.2 Over-voltage and overheating will shorten the capacitor life. At the tropical or high-altitude region, please recommend the selection of products with higher rated voltage according to the grid system voltage.

5.2.3 When the system is installed with the shunt capacitor, it should pay attention to:

- a. Harmonic current amplification is the main cause for capacitor damage. Common harmonic sources include: power electronic devices, frequency converters (energy conservation transformation, such as motor speed control, inverter air conditioner), DC rectifier, inverter, electrolytic plating equipment, electric arc furnace, intermediate frequency furnace, etc. Under the harmonic environment, please refer to the following table for the capacitor type selection and harmonic suppression measures:

| Product type selection | Harmonic source power/transformer capacity | | |
|--|--|----------------------------|-----------------------------------|
| | NLL≤10% | NLL≤20% | 20%≤NLL≤40% |
| Harmonic voltage resultant distortion factor | THDu≤3% | 3%<THDu≤5% | THDu>5% |
| Capacitor rated voltage | 0.4kV, 0.45kV | 0.45kV, 0.48kV | 0.525 kV |
| Harmonic suppression measures | No need | Proposed series reactor 7% | Proposed series reactor 7% or 14% |

Note: The harmonic power ratio NLL means the ratio of the sum of load power generating harmonic to the distribution transformer capacity. When the harmonic power ratio NLL is >40%, it must be installed with CKSG series reactor or take the harmonic suppression measures.

b. In the AC 380V grid system, when the capacitor is in front series connection with the reactor, the capacitor's rated voltage is selected as follows:

When the reactance ratio of the reactor is 6% or 7%, the capacitor's rated voltage should have 0.45kV or 0.48kV selected;

When the reactance ratio of the reactor is 12% or 14%, the capacitor's rated voltage should have 0.525kV selected;

Reactor model selection: The reactor's rated capacity is calculated according to the formula $QC \times \text{reactance ratio} (\%)$. For example, the capacitor BKMJ0.48-30-3 is equipped with the reactor with 7% of reactance ratio, the model of series reactor is CKSG-2.1/0.48-7%.

c. When the motor is in permanent connection with the shunt capacitor, the capacitor's running current should be not more than 90% of the motor's no-load current.

d. When the transformer is of no load, it should ensure the capacitor is out of service to prevent overcompensation.



5.2.4 To ensure normal use of the capacitor, the capacitor circuit should have short-circuit, over-pressure, over-current protections and surge current stopping device (like series reactor or CJ19 special switch contactor).

5.2.5 To disconnect the capacitor power supply, the short-circuit discharge must be done before it can be contacted or tested.

5.2.6 The capacitor terminals and conductors should be in good connection. The current-carrying capacity of the connecting conductor should be 1.43times higher than the capacitor' s rated current.

| Product' s rated voltage (kV) | Capacity range (kvar) | Conductor section area (mm ²) |
|-------------------------------|-----------------------|---|
| 0.4, 0.45 | ≤10 | 4.0 |
| 0.4, 0.45 | 12~20 | 6.0 |
| 0.4, 0.45 | 24~32 | 10.0 |
| 0.4, 0.45 | 35~50 | 16.0 |
| 0.4, 0.45 | 60 | 25.0 |

5.2.7 The capacitor' s top should keep more than 20mm of distance from other components; the capacitor' s mounting spacing should not be less than 30mm, when the altitude is higher than 2000mm, the mounting spacing should not be less than 80mm.

5.2.8 When the capacitor is in fault or its life expires, the product' s internal over-pressure protective device will burst, playing a role of explosion protection; in such case, the shell side will slightly bulge, and the capacitor manifests failure. The user is requested to regularly test the capacitor' s operating voltage and operating current to fulfill prompt maintenance or replacement.

6. Outline and Installing Dimensions:

Fig.1

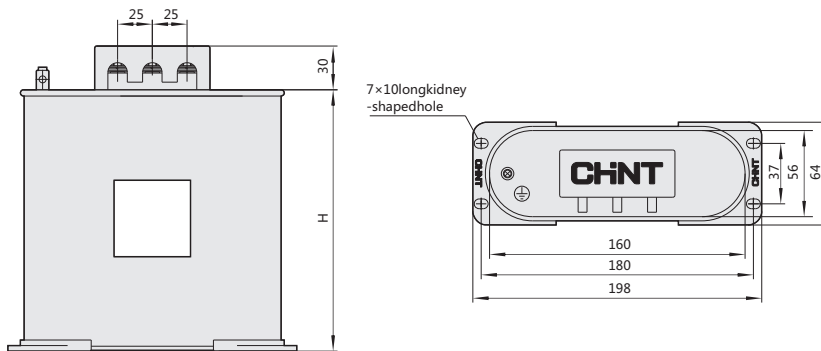


Fig.2

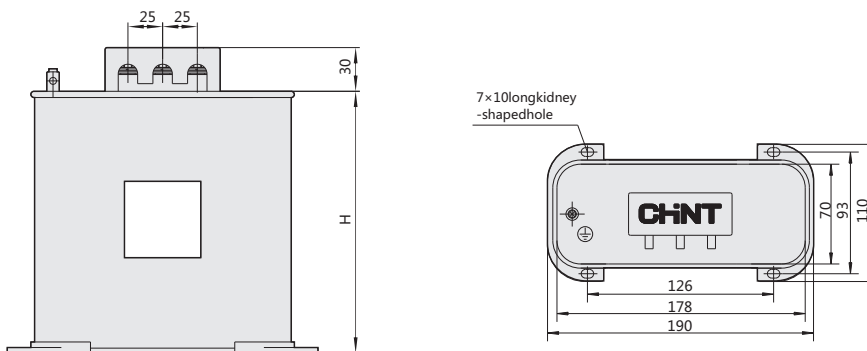
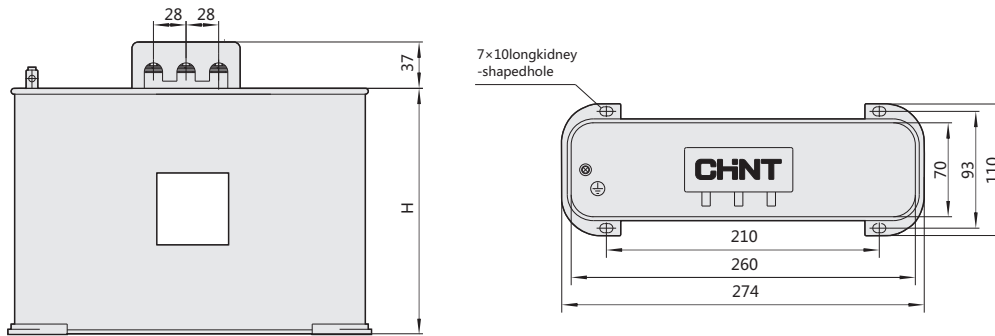


Fig.3



7. Order Instructions

7.1 The user should provide the product' s rated voltage, rated capacity, frequency, number of phases and other parameters.

7.2 The user should provide as much as possible some features of the use place, such as environmental conditions and grid quality.

For example, BKMJ 0.45-30-3 10units

Ordering 10 BKMJ capacitors with rated voltage 450V, rated capacity 30kavr and 3 phases.



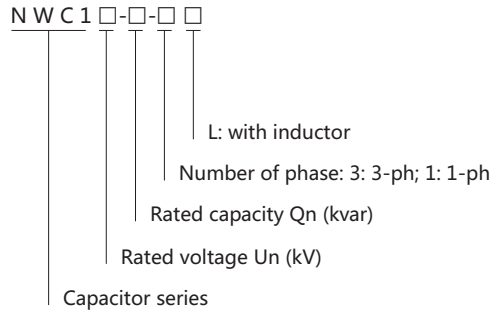


NWC1 Self-healing Shunt Capacitor

1. General

- 1.1 Electric ratings: \leq AC1000V;
- 1.2 Application: For improvement of power factor and power quality;
- 1.3 Standards: IEC/EN 60831-1:2014 IEC/EN 60831-2:2014.

2. Type designation



3. Operating conditions

- 3.1 Ambient temperature: $-25^{\circ}\text{C} \sim +50^{\circ}\text{C}$
- 3.2 Relative humidity: $\leq 50\%$ at 40°C , $\leq 90\%$ at 20°C
- 3.3 Altitude: $\leq 2000\text{m}$
- 3.4 Environmental conditions:
without dangerous gas & steam,
insulated and explosive dust
and dramatic mechanical vibration.

4. Technical data

- 4.1 Rated voltage: 0.4, 0.415, 0.45, 0.525 and 0.69kV
- 4.2 Rated frequency: 50Hz or 60Hz.
- 4.3 Rated capacity: 5~100kvar
- 4.4 Capacity error: $-5 \sim +10\%$;
- 4.5 Dielectric loss tangent value:
 $\leq 30\text{kvar}$ $\text{tgs} \leq 0.0012$
 $> 30\text{kvar}$ $\text{tgs} \leq 0.0015$
at rated power frequency voltage.
- 4.6 Max. allowed over-voltage: $1.1U_n$, not exceed 8h in 24h;
- 4.7 Max. allowed over-current: $1.3I_n$;
- 4.8 Having Self-discharging property: power off,
voltage reduces from $\sqrt{2} U_n$ (DC) to 75V
and below within 3min.
- 4.9 Model and Specifications
- 4.10 Inrush current: $200 I_n$;
- 4.11 Withstand voltage: interelectrode, power frequency $2.15U_n$,
10s;
- 4.12 Withstand voltage: pole-to-case, power frequency $3.6kV$,
60s;
- 4.13 Losses : $\leq 0.3\text{W/kvar}$;
- 4.14 Expected life : $\geq 170,000$ h.

Main product models and data sheet

| Serial number | Type and Specification | Rated voltage (kV) | Rated capacity (kvar) | Rated frequency (Hz) | Rated capacitor (µF) | Rated current (A) | Enclosure height (mm) | Figure |
|---------------|------------------------|--------------------|-----------------------|----------------------|----------------------|-------------------|-----------------------|--------|
| 1 | NWC1-0.4-5-3 | 0.4 | 5 | 50 | 99 | 7.2 | 160 | Fig.1 |
| 2 | NWC1-0.4-6-3 | 0.4 | 6 | 50 | 119 | 8.7 | 160 | Fig.1 |
| 3 | NWC1-0.4-7.5-3 | 0.4 | 7.5 | 50 | 149 | 10.8 | 160 | Fig.1 |
| 4 | NWC1-0.4-8-3 | 0.4 | 8 | 50 | 159 | 11.5 | 160 | Fig.1 |
| 5 | NWC1-0.4-10-3 | 0.4 | 10 | 50 | 199 | 14.4 | 160 | Fig.1 |
| 6 | NWC1-0.4-12-3 | 0.4 | 12 | 50 | 239 | 17.3 | 220 | Fig.1 |
| 7 | NWC1-0.4-14-3 | 0.4 | 14 | 50 | 279 | 20.2 | 220 | Fig.1 |
| 8 | NWC1-0.4-15-3 | 0.4 | 15 | 50 | 298 | 21.7 | 220 | Fig.1 |
| 9 | NWC1-0.4-16-3 | 0.4 | 16 | 50 | 318 | 23.1 | 220 | Fig.1 |
| 10 | NWC1-0.4-18-3 | 0.4 | 18 | 50 | 358 | 26.0 | 260 | Fig.1 |
| 11 | NWC1-0.4-20-3 | 0.4 | 20 | 50 | 398 | 28.9 | 260 | Fig.1 |
| 12 | NWC1-0.4-24-3 | 0.4 | 24 | 50 | 477 | 34.6 | 230 | Fig.2 |
| 13 | NWC1-0.4-25-3 | 0.4 | 25 | 50 | 497 | 36.1 | 230 | Fig.2 |
| 14 | NWC1-0.4-30-3 | 0.4 | 30 | 50 | 597 | 43.3 | 230 | Fig.2 |
| 15 | NWC1-0.4-35-3 | 0.4 | 35 | 50 | 696 | 50.5 | 270 | Fig.2 |
| 16 | NWC1-0.4-40-3 | 0.4 | 40 | 50 | 796 | 57.7 | 270 | Fig.2 |
| 17 | NWC1-0.45-5-3 | 0.45 | 5 | 50 | 79 | 6.4 | 160 | Fig.1 |
| 18 | NWC1-0.45-6-3 | 0.45 | 6 | 50 | 94 | 7.7 | 160 | Fig.1 |
| 19 | NWC1-0.45-7.5-3 | 0.45 | 7.5 | 50 | 118 | 9.6 | 160 | Fig.1 |
| 20 | NWC1-0.45-8-3 | 0.45 | 8 | 50 | 126 | 10.3 | 160 | Fig.1 |
| 21 | NWC1-0.45-10-3 | 0.45 | 10 | 50 | 157 | 12.8 | 160 | Fig.1 |
| 22 | NWC1-0.45-12-3 | 0.45 | 12 | 50 | 189 | 15.4 | 220 | Fig.1 |
| 23 | NWC1-0.45-14-3 | 0.45 | 14 | 50 | 220 | 18.0 | 220 | Fig.1 |
| 24 | NWC1-0.45-15-3 | 0.45 | 15 | 50 | 236 | 19.2 | 220 | Fig.1 |
| 25 | NWC1-0.45-16-3 | 0.45 | 16 | 50 | 252 | 20.5 | 220 | Fig.1 |
| 26 | NWC1-0.45-18-3 | 0.45 | 18 | 50 | 283 | 23.1 | 260 | Fig.1 |
| 27 | NWC1-0.45-20-3 | 0.45 | 20 | 50 | 314 | 25.7 | 260 | Fig.1 |
| 28 | NWC1-0.45-24-3 | 0.45 | 24 | 50 | 377 | 30.8 | 230 | Fig.2 |
| 29 | NWC1-0.45-25-3 | 0.45 | 25 | 50 | 393 | 32.1 | 230 | Fig.2 |
| 30 | NWC1-0.45-30-3 | 0.45 | 30 | 50 | 472 | 38.5 | 230 | Fig.2 |
| 31 | NWC1-0.45-35-3 | 0.45 | 35 | 50 | 550 | 44.9 | 270 | Fig.2 |
| 32 | NWC1-0.45-40-3 | 0.45 | 40 | 50 | 629 | 51.3 | 270 | Fig.2 |
| 33 | NWC1-0.525-5-3 | 0.525 | 5 | 50 | 58 | 5.5 | 160 | Fig.1 |
| 34 | NWC1-0.525-6-3 | 0.525 | 6 | 50 | 69 | 6.6 | 160 | Fig.1 |
| 35 | NWC1-0.525-7.5-3 | 0.525 | 7.5 | 50 | 87 | 8.2 | 160 | Fig.1 |
| 36 | NWC1-0.525-8-3 | 0.525 | 8 | 50 | 92 | 8.8 | 160 | Fig.1 |
| 37 | NWC1-0.525-10-3 | 0.525 | 10 | 50 | 115 | 11.0 | 160 | Fig.1 |
| 38 | NWC1-0.525-12-3 | 0.525 | 12 | 50 | 139 | 13.2 | 220 | Fig.1 |
| 39 | NWC1-0.525-14-3 | 0.525 | 14 | 50 | 162 | 15.4 | 220 | Fig.1 |
| 40 | NWC1-0.525-15-3 | 0.525 | 15 | 50 | 173 | 16.5 | 220 | Fig.1 |
| 41 | NWC1-0.525-16-3 | 0.525 | 16 | 50 | 185 | 17.6 | 220 | Fig.1 |
| 42 | NWC1-0.525-18-3 | 0.525 | 18 | 50 | 208 | 19.8 | 260 | Fig.1 |
| 43 | NWC1-0.525-20-3 | 0.525 | 20 | 50 | 231 | 22.0 | 260 | Fig.1 |
| 44 | NWC1-0.525-24-3 | 0.525 | 24 | 50 | 277 | 26.4 | 230 | Fig.2 |
| 45 | NWC1-0.525-25-3 | 0.525 | 25 | 50 | 289 | 27.5 | 230 | Fig.2 |
| 46 | NWC1-0.525-30-3 | 0.525 | 30 | 50 | 346 | 33.0 | 230 | Fig.2 |
| 47 | NWC1-0.525-35-3 | 0.525 | 35 | 50 | 404 | 38.5 | 270 | Fig.2 |
| 48 | NWC1-0.525-40-3 | 0.525 | 40 | 50 | 462 | 44.0 | 270 | Fig.2 |



| Serial number | Type and Specification | Rated voltage (kV) | Rated capacity (kvar) | Rated frequency (Hz) | Rated capacitor (μF) | Rated current (A) | Enclosure height (mm) | Figure |
|---------------|------------------------|--------------------|-----------------------|----------------------|----------------------|-------------------|-----------------------|--------|
| 49 | NWC1-0.69-5-3 | 0.69 | 5 | 50 | 33 | 4.2 | 160 | Fig.1 |
| 50 | NWC1-0.69-6-3 | 0.69 | 6 | 50 | 40 | 5.0 | 160 | Fig.1 |
| 51 | NWC1-0.69-7.5-3 | 0.69 | 7.5 | 50 | 50 | 6.3 | 160 | Fig.1 |
| 52 | NWC1-0.69-8-3 | 0.69 | 8 | 50 | 53 | 6.7 | 160 | Fig.1 |
| 53 | NWC1-0.69-10-3 | 0.69 | 10 | 50 | 67 | 8.4 | 160 | Fig.1 |
| 54 | NWC1-0.69-12-3 | 0.69 | 12 | 50 | 80 | 10.0 | 220 | Fig.1 |
| 55 | NWC1-0.69-14-3 | 0.69 | 14 | 50 | 94 | 11.7 | 220 | Fig.1 |
| 56 | NWC1-0.69-15-3 | 0.69 | 15 | 50 | 100 | 12.6 | 220 | Fig.1 |
| 57 | NWC1-0.69-16-3 | 0.69 | 16 | 50 | 107 | 13.4 | 220 | Fig.1 |
| 58 | NWC1-0.69-18-3 | 0.69 | 18 | 50 | 120 | 15.1 | 260 | Fig.1 |
| 59 | NWC1-0.69-20-3 | 0.69 | 20 | 50 | 134 | 16.7 | 260 | Fig.1 |
| 60 | NWC1-0.69-24-3 | 0.69 | 24 | 50 | 160 | 20.1 | 230 | Fig.2 |
| 61 | NWC1-0.69-25-3 | 0.69 | 25 | 50 | 167 | 20.9 | 230 | Fig.2 |
| 62 | NWC1-0.69-30-3 | 0.69 | 30 | 50 | 201 | 25.1 | 230 | Fig.2 |
| 63 | NWC1-0.69-35-3 | 0.69 | 35 | 50 | 234 | 29.3 | 270 | Fig.2 |
| 64 | NWC1-0.69-40-3 | 0.69 | 40 | 50 | 267 | 33.5 | 270 | Fig.2 |
| 65 | NWC1-0.4-50-3 | 0.4 | 50 | 50 | 995 | 72.2 | 300 | Fig.3 |
| 66 | NWC1-0.4-60-3 | 0.4 | 60 | 50 | 1194 | 86.6 | 300 | Fig.3 |
| 67 | NWC1-0.4-80-3 | 0.4 | 80 | 50 | 1591 | 115.5 | 300 | Fig.4 |
| 68 | NWC1-0.4-100-3 | 0.4 | 100 | 50 | 1990 | 144.3 | 300 | Fig.4 |
| 69 | NWC1-0.45-50-3 | 0.45 | 50 | 50 | 786 | 64.2 | 300 | Fig.3 |
| 70 | NWC1-0.45-60-3 | 0.45 | 60 | 50 | 943 | 77 | 300 | Fig.3 |
| 71 | NWC1-0.45-80-3 | 0.45 | 80 | 50 | 1258 | 102.6 | 300 | Fig.4 |
| 72 | NWC1-0.45-100-3 | 0.45 | 100 | 50 | 1573 | 128.0 | 300 | Fig.4 |

5. Notices

- 5.1 Please guarantee that the capacitors are operated under specified conditions, including the proper temperature, voltage and current, as over-voltage and over-current may shorten the life of the capacitor;
- 5.2 Please pay attention to the points following when the capacitor is shuntly connected in the system
 - a. For the system of current regulating system and the electric equipments system, the capacitor should not be directly connected;
 - b. Operational current of the capacitor should be less than the off-load current of the shuntly connected motor;
 - c. When the transformer is off-load, the capacitor should stop operating.
- 5.3 Specific switches, contactors and over-current relays should be adopted when the capacitor is shuntly connected in the system.

6. Mounting dimensions (mm)

Figure 1

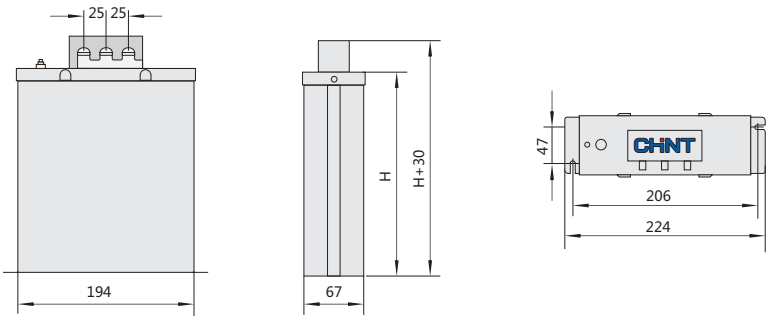


Figure 2

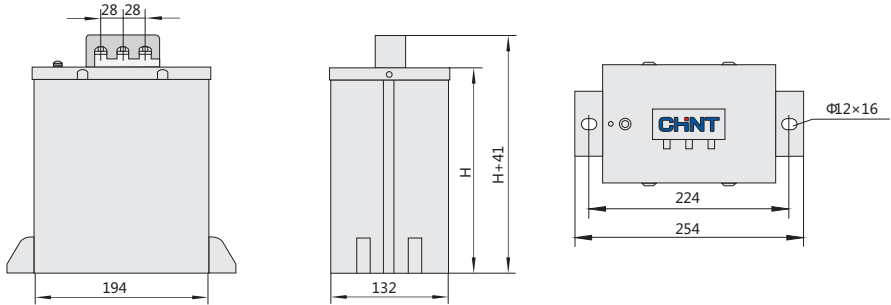
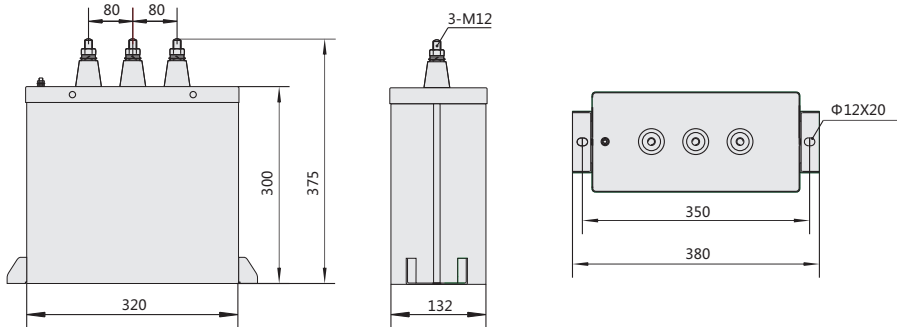
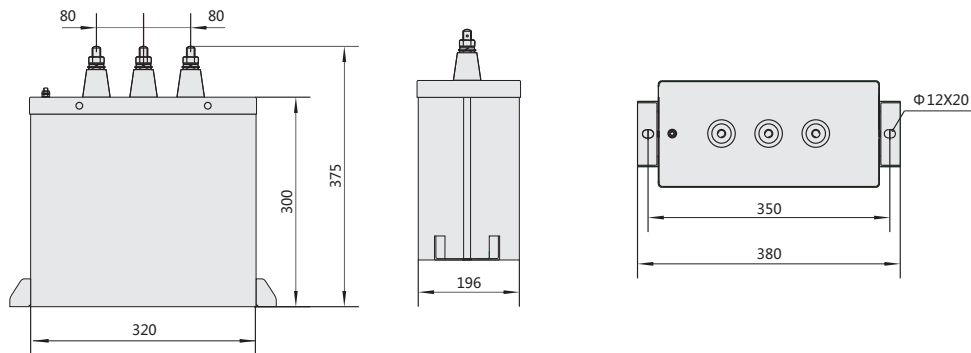


Figure 3





7. Ordering information

On ordering, please clarify rated voltage, capacity, number of phase, frequency, etc of the products; and associated conditions at the mounting place.

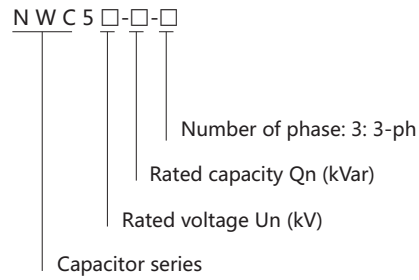


NWC5 Self-healing Shunt Capacitor

1. General

- 1.1 Electric ratings: $\leq AC1000V$.
- 1.2 Application: Newly developed energy-saving product for improvement of power factor and power quality;
- 1.3 Standards: IEC/EN 60831-1:2014 IEC/EN 60831-2:2014

2. Type designation



3. Operating conditions

- 3.1 Ambient temperature: $-25^{\circ}C \sim +50^{\circ}C$
- 3.2 Relative humidity: $\leq 50\%$ at $40^{\circ}C$, $\leq 90\%$ at $20^{\circ}C$
- 3.3 Altitude: $\leq 2000m$
- 3.4 Environmental conditions: without dangerous gas & steam, insulated and explosive dust and dramatic mechanical vibration.

4. Technical data

- 4.1 Rated voltage: 0.23, 0.4, 0.45, 0.525kV
- 4.2 Rated frequency: 50Hz or 60Hz.
- 4.3 Rated capacity: (1~40)kVar
- 4.4 Capacity error: $-5\% \sim +10\%$;
- 4.5 Dielectric loss tangent value: ≤ 0.0012 , at rated power frequency voltage
- 4.6 Max. allowed over-voltage: $1.1U_n$, not exceed 8h in 24h
- 4.7 Max. allowed over-current: $1.3I_n$ ($1.6 I_n$, 2h/24h; $2.0 I_n$, 30min/24h)
- 4.8 Having Self-discharging property: power off, voltage reduces from $\sqrt{2} U_n$ (DC) to 75V and below within 3min.
- 4.9 Model and Specifications
- 4.10 Inrush current: $200I_n$
- 4.11 Withstand voltage: interelectrode, power frequency $2.15U_n$, 10s
- 4.12 Withstand voltage: pole-to-case, power frequency $3.6kV$, 60s
- 4.13 Losses : $\leq 0.2W/kvar$
- 4.14 Use safety : over-pressure protection device, self-healing
- 4.15 Fixing: Threaded bolt M12 and M16
- 4.16 Expected life : $\geq 170,000 h$

Main product models and data sheet

| Serial number | Type and Specification | Rated voltage (kV) | Rated frequency (Hz) | Rated capacity (kVar) | Rated capacitor (μF) | Rated current (A) | Dimensions D×H(mm) | Mounting dimensions | figure number |
|---------------|------------------------|--------------------|----------------------|-----------------------|----------------------|-------------------|--------------------|---------------------|---------------|
| 1 | NWC5-0.23-1-3 (60Hz) | 0.23 | 60 | 1 | 50 | 2.5 | Φ60×190 | M10×10 | Figure 1 |
| 2 | NWC5-0.23-3-3 (60Hz) | 0.23 | 60 | 3 | 151 | 7.5 | Φ60×240 | | |
| 3 | NWC5-0.23-5-3 (60Hz) | 0.23 | 60 | 5 | 251 | 12.6 | φ76×240 | M12×16 | Figure 2 |
| 4 | NWC5-0.23-7.5-3 (60Hz) | 0.23 | 60 | 7.5 | 376 | 18.8 | φ76×290 | | |
| 5 | NWC5-0.23-10-3 (60Hz) | 0.23 | 60 | 10 | 502 | 25.1 | φ86×290 | | |
| 6 | NWC5-0.23-15-3 (60Hz) | 0.23 | 60 | 15 | 753 | 37.7 | φ96×290 | M16×25 | Figure 3 |
| 7 | NWC5-0.23-20-3 (60Hz) | 0.23 | 60 | 20 | 1003 | 50.2 | φ116×290 | | |
| 8 | NWC5-0.4-3-3 | 0.4 | 50 | 3 | 59.7 | 4.3 | Φ60×175 | M10×10 | Figure 1 |
| 9 | NWC5-0.4-5-3 | 0.4 | 50 | 5 | 99 | 7.2 | Φ60×175 | | |
| 10 | NWC5-0.4-7.5-3 | 0.4 | 50 | 7.5 | 149 | 10.8 | Φ60×240 | M12×16 | Figure 2 |
| 11 | NWC5-0.4-10-3 | 0.4 | 50 | 10 | 199 | 14.4 | φ76×240 | | |
| 12 | NWC5-0.4-15-3 | 0.4 | 50 | 15 | 298 | 21.7 | Φ76×290 | | |
| 13 | NWC5-0.4-16-3 | 0.4 | 50 | 16 | 318 | 23.1 | Φ76×290 | M16×25 | Figure 3 |
| 14 | NWC5-0.4-20-3 | 0.4 | 50 | 20 | 398 | 28.9 | Φ86×290 | | |
| 15 | NWC5-0.4-25-3 | 0.4 | 50 | 25 | 497 | 36.1 | Φ96×290 | M12×16 | Figure 2 |
| 16 | NWC5-0.4-30-3 | 0.4 | 50 | 30 | 597 | 43.3 | φ106×290 | | |
| 17 | NWC5-0.4-40-3 | 0.4 | 50 | 40 | 796 | 57.7 | φ116×290 | | |
| 18 | NWC5-0.45-3-3 | 0.45 | 50 | 3 | 47.2 | 3.8 | Φ60×175 | M10×10 | Figure 1 |
| 19 | NWC5-0.45-5-3 | 0.45 | 50 | 5 | 79 | 6.4 | Φ60×175 | | |
| 20 | NWC5-0.45-7.5-3 | 0.45 | 50 | 7.5 | 118 | 9.6 | Φ60×240 | M12×16 | Figure 2 |
| 21 | NWC5-0.45-10-3 | 0.45 | 50 | 10 | 157 | 12.8 | φ76×240 | | |
| 22 | NWC5-0.45-15-3 | 0.45 | 50 | 15 | 236 | 19.2 | Φ76×290 | | |
| 23 | NWC5-0.45-16-3 | 0.45 | 50 | 16 | 252 | 20.5 | Φ76×290 | M16×25 | Figure 3 |
| 24 | NWC5-0.45-20-3 | 0.45 | 50 | 20 | 314 | 25.7 | Φ86×290 | | |
| 25 | NWC5-0.45-25-3 | 0.45 | 50 | 25 | 393 | 32.1 | Φ96×290 | M12×16 | Figure 2 |
| 26 | NWC5-0.45-30-3 | 0.45 | 50 | 30 | 472 | 38.5 | φ106×290 | | |
| 27 | NWC5-0.45-40-3 | 0.45 | 50 | 40 | 629 | 51.3 | φ116×290 | | |
| 28 | NWC5-0.48-3-3 | 0.48 | 50 | 3 | 41.5 | 3.6 | Φ60×175 | M10×10 | Figure 1 |
| 29 | NWC5-0.48-5-3 | 0.48 | 50 | 5 | 69 | 6.0 | Φ60×175 | | |
| 30 | NWC5-0.48-7.5-3 | 0.48 | 50 | 7.5 | 104 | 9.0 | Φ60×240 | M12×16 | Figure 2 |
| 31 | NWC5-0.48-10-3 | 0.48 | 50 | 10 | 138 | 12.0 | φ76×240 | | |
| 32 | NWC5-0.48-15-3 | 0.48 | 50 | 15 | 207 | 18.0 | Φ76×290 | | |
| 33 | NWC5-0.48-16-3 | 0.48 | 50 | 16 | 221 | 19.2 | Φ76×290 | M16×25 | Figure 3 |
| 34 | NWC5-0.48-20-3 | 0.48 | 50 | 20 | 277 | 24.0 | Φ86×290 | | |
| 35 | NWC5-0.48-25-3 | 0.48 | 50 | 25 | 346 | 30.0 | Φ96×290 | M12×16 | Figure 2 |
| 36 | NWC5-0.48-30-3 | 0.48 | 50 | 30 | 415 | 36.1 | φ106×290 | | |
| 37 | NWC5-0.48-40-3 | 0.48 | 50 | 40 | 553 | 48.1 | φ116×290 | | |
| 38 | NWC5-0.525-3-3 | 0.525 | 50 | 3 | 34.7 | 3.3 | Φ60×240 | M10×10 | Figure 1 |
| 39 | NWC5-0.525-5-3 | 0.525 | 50 | 5 | 58 | 5.5 | Φ60×240 | | |
| 40 | NWC5-0.525-7.5-3 | 0.525 | 50 | 7.5 | 86.7 | 8.2 | Φ60×240 | M12×16 | Figure 2 |
| 41 | NWC5-0.525-10-3 | 0.525 | 50 | 10 | 115 | 11.0 | φ76×240 | | |
| 42 | NWC5-0.525-15-3 | 0.525 | 50 | 15 | 173 | 16.5 | Φ76×290 | | |
| 43 | NWC5-0.525-16-3 | 0.525 | 50 | 16 | 185 | 17.6 | Φ76×290 | M16×25 | Figure 3 |
| 44 | NWC5-0.525-20-3 | 0.525 | 50 | 20 | 231 | 22.0 | Φ86×290 | | |
| 45 | NWC5-0.525-25-3 | 0.525 | 50 | 25 | 289 | 27.5 | Φ96×290 | M12×16 | Figure 4 |
| 46 | NWC5-0.525-30-3 | 0.525 | 50 | 30 | 346 | 33.0 | φ106×290 | | |
| 47 | NWC5-0.525-40-3 | 0.525 | 50 | 40 | 346 | 33.0 | φ116×290 | | |
| 48 | NWC5-0.45-5-3YN | 0.45 | 50 | 5 | 79 | 6.4 | φ76×240 | M12×16 | Figure 4 |
| 49 | NWC5-0.45-7.5-3YN | 0.45 | 50 | 7.5 | 118 | 9.6 | φ76×240 | | |
| 50 | NWC5-0.45-10-3YN | 0.45 | 50 | 10 | 157 | 12.8 | φ76×290 | M16×25 | Figure 4 |
| 51 | NWC5-0.45-15-3YN | 0.45 | 50 | 15 | 236 | 19.2 | φ86×290 | | |
| 52 | NWC5-0.45-16-3YN | 0.45 | 50 | 16 | 252 | 20.5 | φ96×290 | | |
| 53 | NWC5-0.45-20-3YN | 0.45 | 50 | 20 | 314 | 25.7 | φ96×290 | M12×16 | Figure 4 |
| 54 | NWC5-0.45-25-3YN | 0.45 | 50 | 25 | 393 | 32.1 | φ106×290 | | |
| 55 | NWC5-0.45-30-3YN | 0.45 | 50 | 30 | 472 | 38.5 | φ116×290 | | |

Note: All sizes are customizable with rated frequency 50Hz or 60Hz, single-phase or three-phase capacitor; the products of the same capacity have the same overall dimensions.

5. Features

- 5.1 Safe and reliable operation because of the independent protective enclosure;
- 5.2 With good sealing properties; and outgoing terminals for convenient wiring and reliable connection;
- 5.3 Available for use in the places with higher ambient temperature and voltage variation ;
- 5.4 Fixed type, convenient for mounting and elegant appearance due o to novel mounting pins.

6. Note

- 6.1 Please guarantee that the capacitors are operated under specified conditions, including the proper temperature, voltage and current, as over-voltage and over-current may shorten the life of the capacitor;
- 6.2 Please pay attention to the points following when the capacitor is shuntly connected in the system
 - a. For the system of current regulating system and the electric equipments system, the capacitor should not be directly connected;
 - b. Operational current of the capacitor should be less than the off-load current of the shuntly connected motor;
 - c. When the transformer is off-load, the capacitor should stop operating.
- 6.3 Specific switches, contactors and over-current relays should be adopted when the capacitor is shuntly connected in the system.

7. Mounting dimensions (mm)

Figure 1

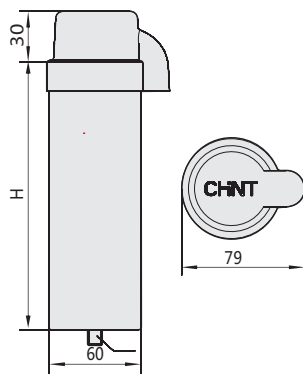


Figure 2

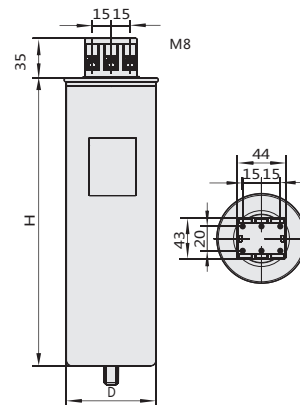


Figure 3

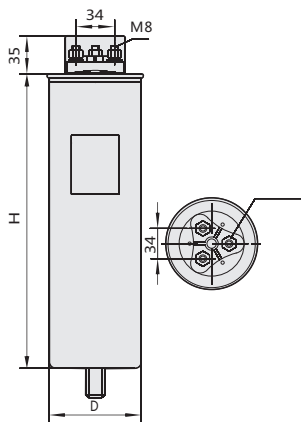
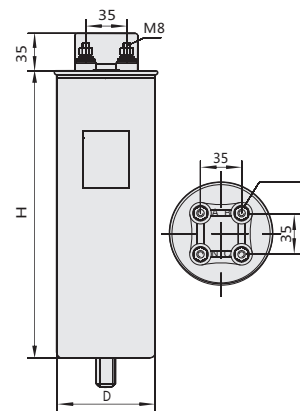


Figure 4



Note: The capacity of three-phase capacitor (1~8)kvar is seen in Fig.1; (10~25)kvar in Fig.2; (30~40)kvar in Fig.3;The split phase compensation capacitor has 4 connecting terminals with star connection and neutral line N lead-out, as shown in Fig.4.





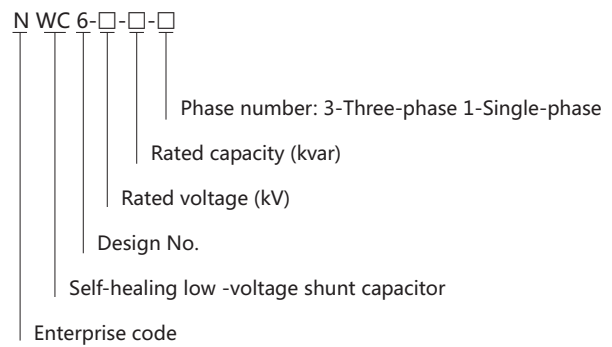
NWC6 series dry low-voltage shunt capacitor

1. Scope of application

NWC6 series dry low-voltage shunt capacitor is suitable for power frequency AC power system with nominal voltage of 1000V and below to raise power factor, reduce line loss and improve voltage quality. It is filled with dry flame-retardant materials internally.

Operative norm: IEC/EN 60831-1:2014 IEC/EN 60831-2:2014.

2. Model and its meaning



Note: The default rated frequency is 50Hz. For products with the rated frequency of 60Hz, mark 60Hz.

3. Normal working conditions and installation conditions

3.1 Ambient air temperature: $-25^{\circ}\text{C} \sim +50^{\circ}\text{C}$ -25/C) ;
(can customized -25/D)

3.2 Relative humidity: $\leq 50\%$ at 40°C ; $\leq 90\%$ at 20°C ;

3.3 Altitude: $\leq 2000\text{m}$;

3.4 Environmental conditions: No harmful gases and vapor, conductive or explosive dust and severe mechanical vibration.

4. Main technical parameters and technical performance

- 4.1 Rated voltage: 0.23 kV, 0.25 kV, 0.4kV, 0.45kV, 0.48 kV, 0.525kV;
- 4.2 Rated frequency: 50Hz or 60Hz;
- 4.3 Rated capacity: (5 ~ 40)kvar;
- 4.4 Capacitance deviation: -5% ~ +10% ; the ratio of maximum and minimum measured of the capacitance between any two outlet terminals of the three-phase capacitor should not exceed 1.08;
- 4.5 Tangent of the loss angle tgδ: Lower than 0.0012 under rated power frequency voltage;
- 4.6 Withstand voltage: interelectrode, power frequency 2.15U_N, 10s; pole-to-case, power frequency 3.6kV, 60s;
- 4.7 Maximum permissible overvoltage: 1.1 U_N; no more than 8h every 24h;
- 4.8 Maximum permissible current: 1.3I_N; (1.6 I_n, 2h/24h; 2.0 I_n, 30min/24h)
- 4.9 Self-discharge characteristic: After the capacitor is applied with $\sqrt{2}$ U_N DC voltage and the power is disconnected for 3min, the remaining voltage drops 75V or below;
- 4.10 Inrush current: 200 I_n
- 4.11 Withstand voltage: interelectrode, power frequency 2.15UN, 10s
- 4.12 Withstand voltage: pole-to-case, power frequency 3.6kV, 60s
- 4.13 Losses : ≤0.20W/kvar
- 4.14 Use safety: Dry-type, over-pressure protection device, self-healing
- 4.15 Fixing: Bottom threaded bolt M12 and M16
- 4.16 Expected life: ≥200,000 h

Main product models and data sheet

| Serial number | Type and Specification | Rated voltage (kV) | Rated frequency (Hz) | Rated capacity (kVar) | Rated capacitor (μF) | Rated current (A) | Dimensions D×H(mm) | Mounting dimensions | Figure number |
|---------------|--------------------------|--------------------|----------------------|-----------------------|----------------------|-------------------|--------------------|---------------------|---------------|
| 1 | NWC6-0.23-1-3 (60Hz) | 0.23 | 60 | 1 | 50 | 2.5 | Φ60×190 | M10×10 | Figure 1 |
| 2 | NWC6-0.23-3-3 (60Hz) | 0.23 | 60 | 3 | 151 | 7.5 | Φ60×240 | | |
| 3 | NWC6-0.23-5-3 (60Hz) | 0.23 | 60 | 5 | 251 | 12.6 | Φ76×240 | M12×16 | Figure 2 |
| 4 | NWC6-0.23-7.5-3 (60Hz) | 0.23 | 60 | 7.5 | 376 | 18.8 | Φ76×290 | | |
| 5 | NWC6-0.23-10-3 (60Hz) | 0.23 | 60 | 10 | 502 | 25.1 | Φ86×290 | | |
| 6 | NWC6-0.23-15-3 (60Hz) | 0.23 | 60 | 15 | 753 | 37.7 | Φ96×290 | M16×25 | Figure 3 |
| 7 | NWC6-0.23-20-3 (60Hz) | 0.23 | 60 | 20 | 1003 | 50.2 | Φ116×290 | | |
| 8 | NWC6-0.4-3-3 | 0.4 | 50 | 3 | 59.7 | 4.3 | Φ60×175 | M10×10 | Figure 1 |
| 9 | NWC6-0.4-5-3 | 0.4 | 50 | 5 | 99 | 7.2 | Φ60×175 | | |
| 10 | NWC6-0.4-7.5-3 | 0.4 | 50 | 7.5 | 149 | 10.8 | Φ60×240 | | |
| 11 | NWC6-0.4-10-3 | 0.4 | 50 | 10 | 199 | 14.4 | Φ76×240 | M12×16 | Figure 2 |
| 12 | NWC6-0.4-15-3 | 0.4 | 50 | 15 | 298 | 21.7 | Φ76×290 | | |
| 13 | NWC6-0.4-16-3 | 0.4 | 50 | 16 | 318 | 23.1 | Φ76×290 | | |
| 14 | NWC6-0.4-20-3 | 0.4 | 50 | 20 | 398 | 28.9 | Φ86×290 | | |
| 15 | NWC6-0.4-25-3 | 0.4 | 50 | 25 | 497 | 36.1 | Φ96×290 | M16×25 | Figure 3 |
| 16 | NWC6-0.4-30-3 | 0.4 | 50 | 30 | 597 | 43.3 | Φ106×290 | | |
| 17 | NWC6-0.4-40-3 | 0.4 | 50 | 40 | 796 | 57.7 | Φ116×290 | | |
| 18 | NWC6-0.45-3-3 | 0.45 | 50 | 3 | 47.2 | 3.8 | Φ60×175 | M10×10 | Figure 1 |
| 19 | NWC6-0.45-5-3 | 0.45 | 50 | 5 | 79 | 6.4 | Φ60×175 | | |
| 20 | NWC6-0.45-7.5-3 | 0.45 | 50 | 7.5 | 118 | 9.6 | Φ60×240 | | |
| 21 | NWC6-0.45-10-3 | 0.45 | 50 | 10 | 157 | 12.8 | Φ76×240 | M12×16 | Figure 2 |
| 22 | NWC6-0.45-15-3 | 0.45 | 50 | 15 | 236 | 19.2 | Φ76×290 | | |
| 23 | NWC6-0.45-16-3 | 0.45 | 50 | 16 | 252 | 20.5 | Φ76×290 | | |
| 24 | NWC6-0.45-20-3 | 0.45 | 50 | 20 | 314 | 25.7 | Φ86×290 | | |
| 25 | NWC6-0.45-25-3 | 0.45 | 50 | 25 | 393 | 32.1 | Φ96×290 | M16×25 | Figure 3 |
| 26 | NWC6-0.45-30-3 | 0.45 | 50 | 30 | 472 | 38.5 | Φ106×290 | | |
| 27 | NWC6-0.45-40-3 | 0.45 | 50 | 40 | 629 | 51.3 | Φ116×290 | | |
| 28 | NWC6-0.48-3-3 | 0.48 | 50 | 3 | 41.5 | 3.6 | Φ60×175 | M10×10 | Figure 1 |
| 29 | NWC6-0.48-5-3 | 0.48 | 50 | 5 | 69 | 6.0 | Φ60×175 | | |
| 30 | NWC6-0.48-7.5-3 | 0.48 | 50 | 7.5 | 104 | 9.0 | Φ60×240 | | |
| 31 | NWC6-0.48-10-3 | 0.48 | 50 | 10 | 138 | 12.0 | Φ76×240 | M12×16 | Figure 2 |
| 32 | NWC6-0.48-15-3 | 0.48 | 50 | 15 | 207 | 18.0 | Φ76×290 | | |
| 33 | NWC6-0.48-16-3 | 0.48 | 50 | 16 | 221 | 19.2 | Φ76×290 | | |
| 34 | NWC6-0.48-20-3 | 0.48 | 50 | 20 | 277 | 24.0 | Φ86×290 | | |
| 35 | NWC6-0.48-25-3 | 0.48 | 50 | 25 | 346 | 30.0 | Φ96×290 | M16×25 | Figure 3 |
| 36 | NWC6-0.48-30-3 | 0.48 | 50 | 30 | 415 | 36.1 | Φ106×290 | | |
| 37 | NWC6-0.48-40-3 | 0.48 | 50 | 40 | 553 | 48.1 | Φ116×290 | | |



| Serial number | Type and Specification | Rated voltage (kV) | Rated frequency (Hz) | Rated capacity (kVar) | Rated capacitor (μF) | Rated current (A) | Dimensions D×H(mm) | Mounting dimensions | figure number |
|---------------|------------------------|--------------------|----------------------|-----------------------|----------------------|-------------------|--------------------|---------------------|---------------|
| 38 | NWC6-0.525-3-3 | 0.525 | 50 | 3 | 34.7 | 3.3 | Φ60×240 | M10×10 | Figure 1 |
| 39 | NWC6-0.525-5-3 | 0.525 | 50 | 5 | 58 | 5.5 | Φ60×240 | | |
| 40 | NWC6-0.525-7.5-3 | 0.525 | 50 | 7.5 | 86.7 | 8.2 | Φ60×240 | | |
| 41 | NWC6-0.525-10-3 | 0.525 | 50 | 10 | 115 | 11.0 | Φ76×240 | M12×16 | Figure 2 |
| 42 | NWC6-0.525-15-3 | 0.525 | 50 | 15 | 173 | 16.5 | Φ76×290 | | |
| 43 | NWC6-0.525-16-3 | 0.525 | 50 | 16 | 185 | 17.6 | Φ76×290 | | |
| 44 | NWC6-0.525-20-3 | 0.525 | 50 | 20 | 231 | 22.0 | Φ86×290 | M16×25 | Figure 3 |
| 45 | NWC6-0.525-25-3 | 0.525 | 50 | 25 | 289 | 27.5 | Φ96×290 | | |
| 46 | NWC6-0.525-30-3 | 0.525 | 50 | 30 | 346 | 33.0 | Φ106×290 | | |
| 47 | NWC6-0.525-40-3 | 0.525 | 50 | 40 | 346 | 33.0 | Φ116×290 | M12×16 | Figure 4 |
| 48 | NWC6-0.45-5-3YN | 0.45 | 50 | 5 | 79 | 6.4 | Φ76×240 | | |
| 49 | NWC6-0.45-7.5-3YN | 0.45 | 50 | 7.5 | 118 | 9.6 | Φ76×240 | | |
| 50 | NWC6-0.45-10-3YN | 0.45 | 50 | 10 | 157 | 12.8 | Φ76×290 | M16×25 | Figure 4 |
| 51 | NWC6-0.45-15-3YN | 0.45 | 50 | 15 | 236 | 19.2 | Φ86×290 | | |
| 52 | NWC6-0.45-16-3YN | 0.45 | 50 | 16 | 252 | 20.5 | Φ96×290 | | |
| 53 | NWC6-0.45-20-3YN | 0.45 | 50 | 20 | 314 | 25.7 | Φ96×290 | M16×25 | Figure 4 |
| 54 | NWC6-0.45-25-3YN | 0.45 | 50 | 25 | 393 | 32.1 | Φ106×290 | | |
| 55 | NWC6-0.45-30-3YN | 0.45 | 50 | 30 | 472 | 38.5 | Φ116×290 | | |

Note: All sizes are customizable with rated frequency 50Hz or 60Hz, single-phase or three-phase capacitor; the products of the same capacity have the same overall dimensions.

5. Main technical parameters and technical performance

5.1 Main features

- 5.1.1 Use safety: This product is a dry product; it is filled with dry flame-retardant materials internally, such as: thermal conductivity silica gel. Cylindrical aluminum tensile shell is provided with the over-pressure protection device; it is characterized by oil-free, environmentally friendly, corrosion-resistant, anti-explosion etc. and it is safe and reliable.
- 5.1.2 Applicable environment: Suitable for places of higher fire rating.
- 5.1.3 Easy installation: The bottom is the M12/M16 stud fixedly installed; the product can be both mounted vertically and horizontally.
- 5.1.4 Using NWC6 dry capacitor can realize reactive power compensation cabinet modular design, reduce unit cost and make maintenance more convenient.

5.2 Notice for use

5.2.1 Capacitor selection:

| Grid system voltage | Capacitor rated voltage | User grid frequency |
|---------------------|-------------------------|---|
| 127/220 | 0.23/0.25 | Use 0.25kV-50 Hz or order 60Hz products |
| 220/380 | 0.4/0.45/0.525 | Use 0.45kV-50 Hz or order 60Hz products |

5.2.2 Overvoltage and overheating will shorten the life of the capacitor. In tropical or high-altitude regions, recommend the users to choose products of higher rated voltage according to the voltage of power network system.

5.2.3 When the system is installed with the shunt capacitor, attention should be paid to the following circumstances:

- a. Under the circumstance of severe harmonic content, do not directly install the shunt capacitor and connect the 7%/14% reactor in series for use. Under the circumstance of modest harmonic content, enhance the voltage level of the capacitor for derating, such as: 0.525kV. (Common harmonic sources are frequency converter, DC rectifier, inverter, electrolytic plating equipment, medium frequency furnace, electric arc furnace etc.).
- b. When the motor is fixedly connected with the shunt capacitor, operating current of the
- c. When the transformer is in empty load, the capacitor should be guaranteed to exit from the operation to prevent excessive compensation.

5.2.4 To ensure proper use of the capacitor, there should be short circuit, over-voltage, over-current protection and limiting inrush device in the capacitor circuit (such as series reactor or CJ19 special switch contacts).

5.2.5 The capacitor is disconnected from the power supply and must be short-circuited discharged, and then can be touched or tested.

5.2.6 The capacitor terminals and conductors should be well connected. Current-carrying capacity of the connecting wire is 1.43 times higher than the rated current of the capacitor.

| Product rated voltage | Capacity range | Wire cross-sectional area |
|-----------------------|----------------|---------------------------|
| 0.23, 0.25 | ≤5 | 4.0 |
| 0.23, 0.25 | 6~12 | 6.0 |
| 0.23, 0.25 | 14~20 | 10.0 |
| 0.4, 0.45 | ≤10 | 4.0 |
| 0.4, 0.45 | 12~20 | 6.0 |
| 0.4, 0.45 | 24~30 | 10.0 |

5.2.7 A distance of 20mm or more between the top of the capacitor and other components should be kept to ensure reliable operation of over-pressure protection device. The installation space between capacitors should be considered for the cooling condition of the equipment.

5.2.8 When the capacitor malfunctions or the service life is terminated, over-pressure protection device inside the product will be broken, the upper cover slightly bulges and the capacitor failure occurs. Users are asked to periodically detect the operating current and surface temperature of the capacitor and timely maintain it.

6. Physical and installation dimensions:

Figure 1

Figure 2

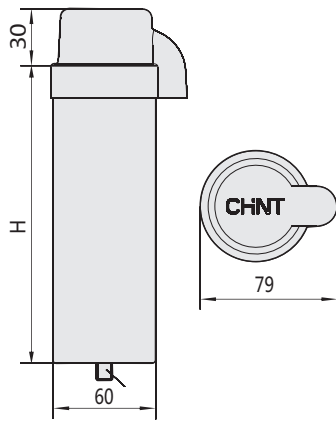


Figure 3

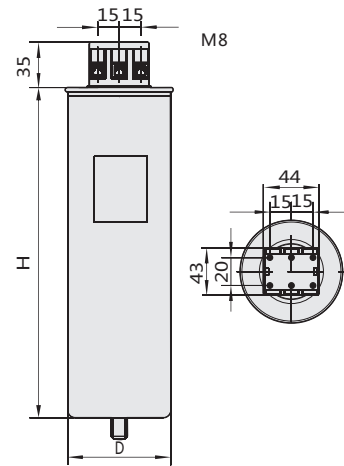
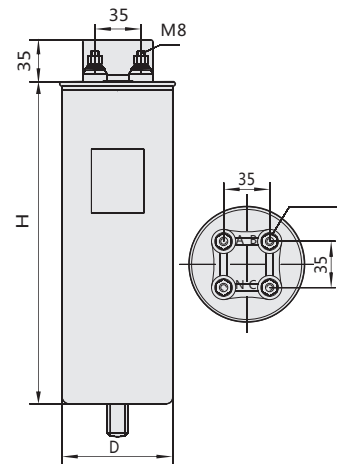
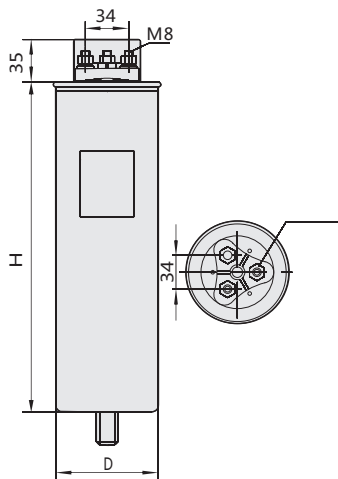


Figure 4



Note: The capacity of three-phase capacitor (1~8)kvar is seen in Fig.1; (10~25)kvar in Fig.2; (30~40)kvar in Fig.3;The split phase compensation capacitor has 4 connecting terminals with star connection and neutral line N lead-out, as shown in Fig.4.

7. Ordering information

7.1 Users must provide product rated voltage, rated capacity, frequency, phase number and other parameters.

7.2 Users must provide some of the features of the places of use as far as possible, such as environmental conditions, power network quality.

Such as: NWC6 0.4-30-3 10 sets

Ordering 10 NWC6 series three-phase capacitors with the rated voltage of 400V and rated capacity of 30kvar.



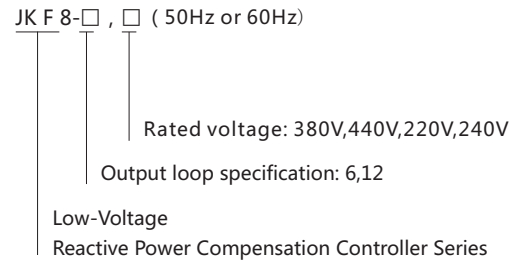


JKF8 Intelligent Low-Voltage Reactive Power Compensation Controller

1. General

JKF8 Intelligent Low-Voltage Reactive Power Compensation Controller (hereinafter referred to as 'controller') is a dedicated controller which can make compensations for the reactive power of low voltage distribution system.

2. Type designation



3. Features

- 3.1 With combined control on reactive power and power factor, a reliable input can be ensured under low load, and surge switching can be prevented.
- 3.2 Real-time display of the network status, including parameters such as power factor, voltage, current, active power, and reactive power, etc.
- 3.3 The polarity of the sampling signal can be automatically identified. Therefore, there is no need to worry about wrong connections with reversed polarity.
- 3.4 In case the voltage of the electrical power network is lower than 300 V, or exceeds the preset over-voltage protection value, the connected capacitor banks will be automatically and rapidly(5 sec.) disconnected in steps, and the voltage value will be displayed.
- 3.5 In case the signal from the secondary coil of the current transformer is smaller than 150 mA, the controller will prevent any more capacitor from being connected, in the mean time, automatically and rapidly (5 sec.) disconnect the connected capacitor banks step-wise.
- 3.6 Switching (opening/closing control of the contactor) prevention time for the same group of capacitors is 3 minutes (capacitor discharge duration)
- 3.7 The controller is with cyclic automated-self-test function, which facilitates the factory acceptance test for a capacitor panel.

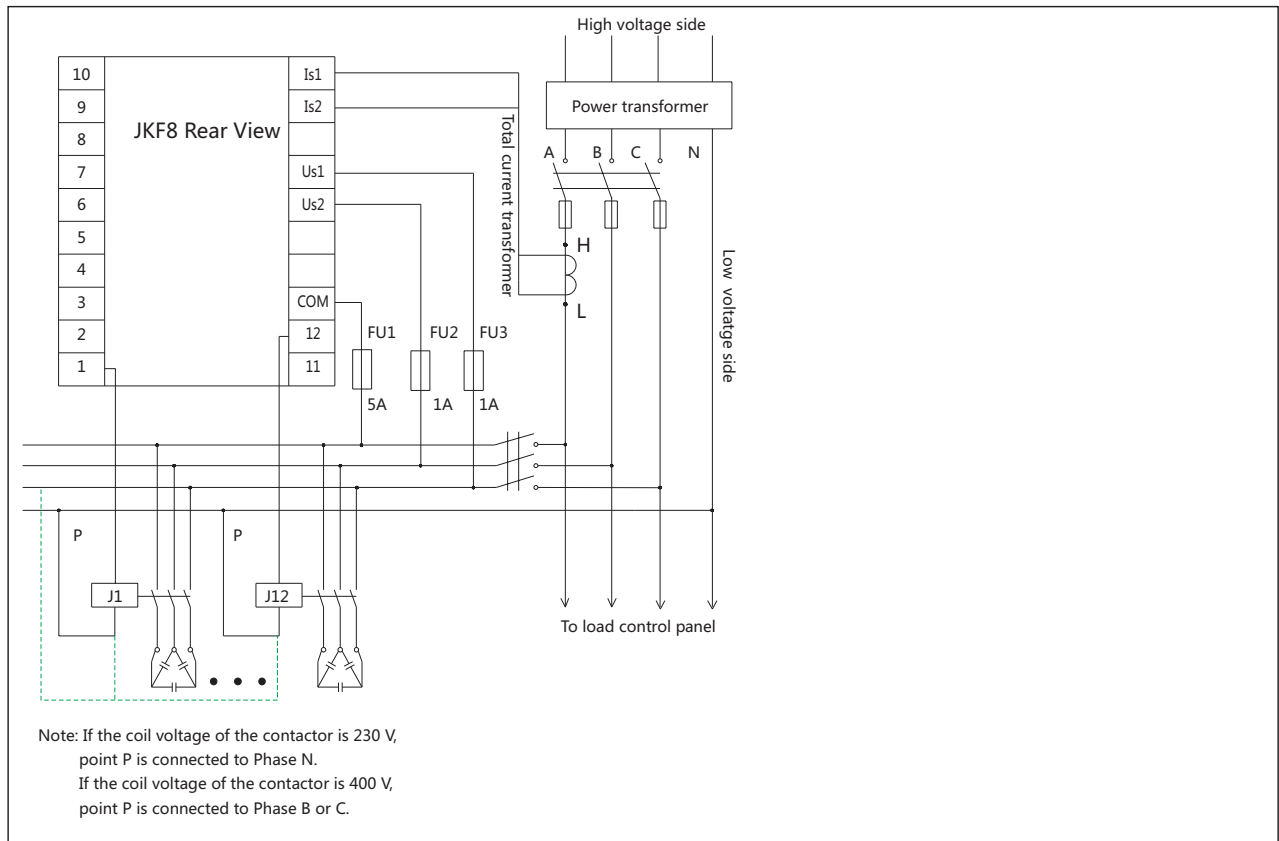
4. Operating conditions

- 4.1 Ambient temperature: -10°C~+40°C
- 4.2 Relative humidity: ≤50%, when 40°C, ≤90% when 20°C
- 4.3 Altitude: ≤2000 m
- 4.4 Operation environment: free of hazardous gas and/or vapor, conductive or explosive dust, or rigorous mechanical vibration.
- 4.5 Operation voltage: $U_n \pm 20\%$

5. Technical data

| Parameters | Technical Specifications |
|---|---|
| Sampling voltage | 400VAC±10% (Can be customized: 220VAC, 440VAC) |
| Sampling current | 150mA~5 A |
| Rated frequency | 50/60Hz±5% |
| Low-current capacitor connection prevention | ≤150 mA |
| Current transformation ratio | Range of transformation ratio for sampling current transformer: 5~800, Preset value of the ratio (preset value in factory: 60, which means 300/5) |
| Time lag | 5~120 seconds (preset value in factory: 30 seconds) |
| Preset mode | Full automation mode (displayed code F-0: 1): no need to set the capacitor connection threshold or the capacitor disconnection threshold. Manual setup mode(displayed code F-0: 0): need to set the capacitor connection threshold and the capacitor disconnection threshold manually. |
| Capacitor connection threshold | Full automation mode: capacitor banks in the smallest step Manual mode: preset value for reactive power: 1~120 kvar (preset value in factory: 10 kvar) |
| Capacitor disconnection threshold | Power factor, 0.85 ~ -0.95 continuously adjustable (preset value in factory: 1.00) |
| Over-voltage threshold | 400 V~456 V (preset value in factory: 430 V), 230V~270V (preset value in factory: 250 V) |
| Loop number | JKF8-6 (loop number can be set between 1 and 6), JKF8-12(loop number can be set between 1 and 12) |
| Operation mode | Automated cyclic opening/closing control & manual operation |
| Max. power consumption | 15 W |
| Output contact point capacity | 5A/230V(or 3A/400V) |
| Weight | Approximately 1.5 Kg |

6. Wiring diagram



- 6.1 Connection terminal US1 and US2 are to be connected to the sampling voltage. AC 400 V or AC 220V shall be connected.
- 6.2 Terminal IS1 and IS2 are to be connected to the sampling current, which shall be sampled from the transformed current generated by the current transformer for the load, and which shall not be in-phase with US1 and US2 (if A is for current, then B and C are for voltage).
- 6.3 Terminal COM is the common shared terminal to be connected to number 1 to 12 relays in the output lines of the controller, and each of the terminals 1~12 is to be connected to the output control line to control the respective contactor in the respective compensation loop of the capacitor panel.
- 6.4 If the coil voltage of the contactor J is 230 V, then Point P is connected to Phase N.
If the coil voltage of the contactor J is 400 V, then Point P is connected to Phase C (as long as it is not in-phase with terminal COM).
- 6.5 FU1~3 are to be connected to fusers which are supplied by the user.

7. Description of parameters

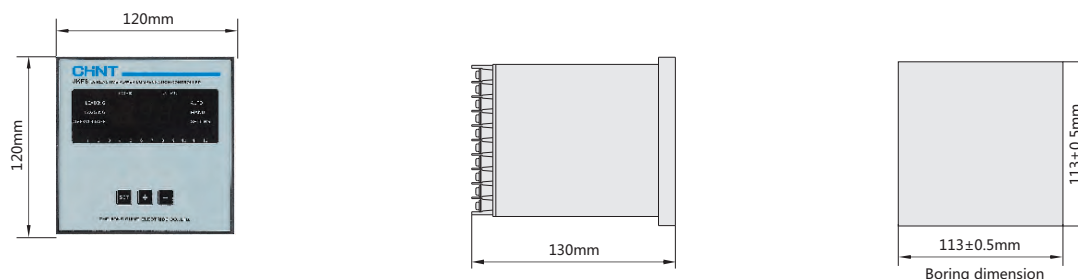
7.1 Description of dynamic parameters

| Code | Signification | Unit | Description |
|------|----------------|------|--|
| I | Current | A | If the measured value is out of the display range, the approximate value will be displayed, e.g., 1260 A is displayed as E13 |
| U | Voltage | V | Display the measured voltage value |
| Q | Reactive power | kVar | If the measured value is out of the display range, the approximate value will be displayed, e.g., 1360 Kvar is displayed as E14. |
| P | Active power | kW | If the measured value is out of the display range, the approximate value will be displayed, e.g., 1360 kW is displayed as E14. |

7.2 Description of preset parameters (menu description)

| Code | Description | Range of Settings | Factory Settings | Change Step | Remark |
|------|--|-------------------|------------------|-------------|--|
| F-0 | Preset mode | 1 or 0 | 1 | — | 1 full automation 0 manual setup |
| F-1 | Capacitor connection threshold | 1~120 kVar | 10 kVar | 1 kVar | This parameter is invalid under the full automation mode |
| F-2 | Target power factor | 0.85~0.95 | 1.00 | 0.01 | "—" stands for system capacity |
| F-3 | Switching time lag | 5~120 sec . | 30 sec. | 1 sec. | |
| F-4 | Over-voltage protection | 400 V~456 V | 430 V | 2 V | Voltage difference: 8~10V |
| F-5 | Number of control loop | 1~6 or 1~12 | 6 or 12 | 1 | Two types of specifications |
| F-6 | Transformation ratio of the sampling current transformer | 5~800 | 60 | 5 | (300: 5) |

8. Mounting dimensions (mm)



9. Ordering information

On ordering, please clarify rated voltage, number of phase, frequency, etc of the products; and associated conditions at the mounting place.



NWK1-GR Series Low Voltage Reactive Compensation Controller

1. Scope of application

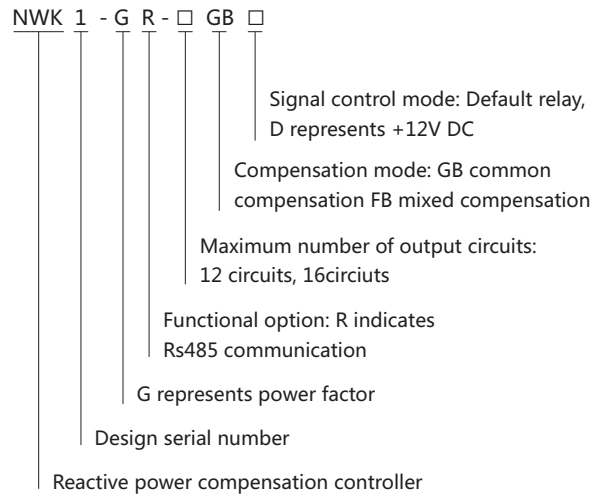
NWK1-GR series low voltage reactive power compensation controller adopts large dot matrix LCD screen and mobile phone menu operation mode to realize man-machine exchange. Its sampling voltage range is AC (100~800) V and operating frequency range is (45~65) Hz, which are suitable for reactive power compensation and power distribution monitoring in different regions of the world.

ASIC chip is used to calculate and analyze the voltage and current collected through FFT (Fast Fourier Transform), so under a large harmonic component of power grid, the reactive power can be used as the basis of switching capacitors and combined with the power factor for switching. The capacitor capacity can be matched or switched in three phases or single phase by cycle, code or any combination of values to realize the optimal compensation effect. It is the newest smart reactive compensation controller introduced by our company.

The product integrates the functions of digital power grid measurement, record and storage, as well as Chinese and English or graphic real-time display of dozens of electricity, with high power measurement accuracy under harmonic environment. Besides, it provides power quality analysis, harmonic value protection and RS485 communication transmission function.

Applicable standards: JB/T9663-2013; DL/T597-1996.

2. Model and definition



Note: When the control signal outputs +12V DC, the control object is ZCK smart combination switch or TSC thyristor switch.

3. Operating conditions

- 3.1 Ambient temperature -20°C~55°C.
- 3.2 The air humidity shall not exceed 50% at 40°C and 90% at 20°C.
- 3.3 The altitude shall not exceed 2500 m.
- 3.4 There is no corrosive gas, no conductive dust and no inflammable and explosive medium in the surrounding environment.
- 3.5 There is no violent vibration at the location of installation.

4. Main functional characteristics:

- 4.1 The product can realize full three-phase compensation or can be tailor-made for mixed compensation of three phases and single phase.
- 4.2 The dot matrix LCD displays real-time fundamental power factor, power factor with harmonic, voltage, frequency, current, ΔKVAR, active power, reactive power, apparent power, THDU, THDI, 3rd-15th harmonic bar chart, phase angle, electric energy, temperature, time and other power grid parameters.
- 4.3 Unique smart line checking function: The product can check the phase sequence of three-phase voltage, current polarity and phase sequence, perform software wire change, and guide users to check and change the line according to Chinese prompts, which is extremely convenient.
- 4.4 Capacitance setting: The capacitance can be set flexibly and conveniently according to coded value, equal capacity value or arbitrary value.



- 4.5 For capacitors with the same capacity, select the capacitors according to operation frequency to achieve balanced switching; for more than two kinds of capacitors with different capacity, select suitable capacitors automatically according to the reactive power required, switch them on or off one by one, and give consideration to the number of times; for compensation schemes with both different capacity and the same capacity, select suitable capacitors automatically according to the reactive power required, then switch them according to operation frequency, and switch the capacitors with low operation frequency at first. This mode is especially suitable for users with unstable electric load or frequent light load of distribution transformer.
- 4.6 The capacity of the capacitors which have been shut down or have fault is set to 0, and such capacitors will no longer be involved in operation.
- 4.7 The product has a perfect alarm mechanism. The LCD screen will display Chinese prompts for overvoltage, undercurrent, over-harmonic, power factor assessment value and other items, with user-friendly interface.
- 4.8 Connect to SCADA and PLC system through RS485 communication interface, provide product communication protocol, and directly connect with mainstream industrial control configuration software for data transmission.

5. Main technical parameters

| Item | NWK1-GR-16GB |
|-----------------------------------|---|
| Sampling voltage | AC380V±20% or AC (100~800) V, independent auxiliary power supply |
| Sampling current (A) | 0.05~5 |
| Rated frequency (Hz) | 45~65 |
| Range of CT ratio | 5/5~6000/5 |
| COSΦ switch-on threshold | Settable between 0.85L~0.85C |
| switch-off threshold | Settable between 0.85L~0.85C |
| Delay in switching (S) | 2~180 |
| Overvoltage threshold (V) | 100~800 |
| Undervoltage threshold (V) | 75~620 |
| THDV threshold | Off / (3~90)% |
| Capacitor configuration (kvar) | Set the capacity of each circuit |
| Capacitor discharge delay (s) | 0~240 |
| Zero sequence threshold (%) | Off |
| Alarm output (S) | Off / (10~300) / Normally on |
| Fan start-up (°C) | Off / 35~65 |
| High temperature alarm (°C) | Off / 50~85 |
| Large screen main interface | Off/On |
| Password protection | Off/On |
| Date change | None |
| Time change | None |
| Relay contact output | AC220V, 5A, fastest response speed: 2 seconds; |
| Active DC output | + 12V DC, 100mA, fastest response speed: 2 seconds, or dynamic response: 100 milliseconds |
| Power consumption (W) | ≤8 |
| Maximum number of output circuits | 12 circuits, 16 circuits |
| Restore to factory settings | Off/On |

6. Configuration of main models

| Model | Number of circuits | Sampling voltage (V) | Output mode | Functional Characteristics |
|---------------|--------------------|----------------------|---------------|--|
| NWK1-GR-12GB | 12 | 100-800 | Relay contact | Basic type + RS485 + subharmonic + alarm |
| NWK1-GR-12GBD | 12 | 100-800 | +12V DC | Basic type + RS485 + subharmonic |
| NWK1-GR-16GB | 16 | 100-800 | Relay contact | Basic type + RS485 + subharmonic |
| NWK1-GR-16GBD | 16 | 100-800 | +12V DC | Basic type + RS485 + subharmonic |

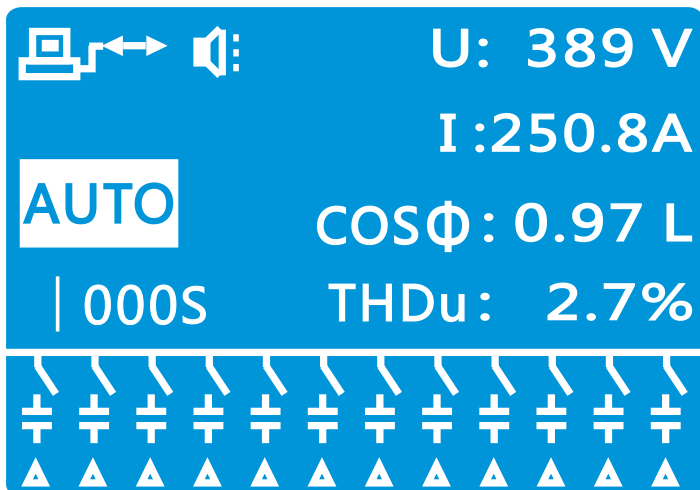
Note: When the control signal outputs +12V DC, the control object is ZCK smart combination switch or TSC thyristor switch.

7. Introduction of panel functions

7.1 Boot screen

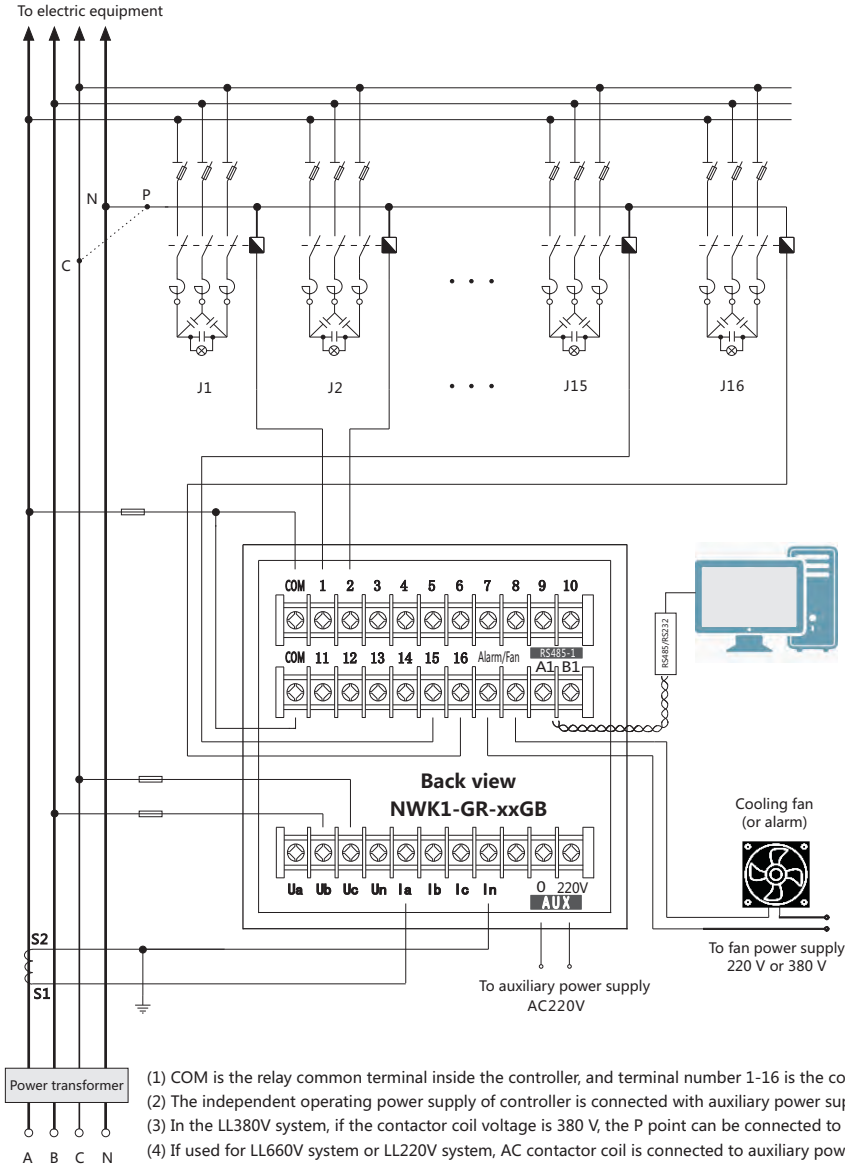


7.2 Automatic main interface

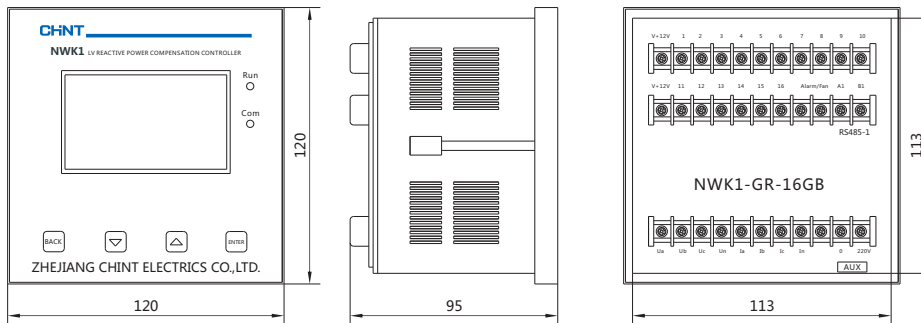


8. Product wiring diagram

8.1 Common compensation controller NWK1-GR-12GB / NWK1-GR-16GB (relay contact output, applicable to AC 127V / 220V, 220V / 380V or three-phase 660V power grid systems)



9. Product installation and overall dimensions



Overall dimension: 120 mm × 120 mm × 95 mm, embedded hole size: 113 mm × 113 mm

10. Ordering information

When ordering, users are responsible for selecting the compensation type, rated voltage, number of output circuits, control signal output mode (default relay output, suffix D represents +12VDC), etc. If the product exceeds the operating condition and main technical parameters, it can be ordered through negotiation.

For example: Order NWK1-GR-16GB, 10 sets.

It indicates ordering NWK1-GR series low-voltage reactive compensation controller, with common compensation type, 16 channels, control signal relay output, RS485 communication and data transmission function, and the ordering quantity is 10 sets.

