# Intelligent Reactive Compensation Controller

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## General Description

JKW series intelligent low voltage reactive auto compensation controller ( abbr. Controller) is the special device for compensating reactive power for low voltage distribution system. Its sampling physical quantity is reactive power, with various specifications of 1～16 step dynamic output(JKWD15, JKWD2C) and static output(JKW15、JKW2C、JKW1BF、JKW1BJ、JKW3B、JKW2B) etc, as well as with characteristics of novel design, multifunction, fine control performance and high reliability etc. It is at the leading position among similar products in domestic market and supplies a brand new device for distribution automation. This series product showing type face "ZHIYUE" when power on denotes the program version of product.

## Functional characteristics

1. Real time displays network state: including reactive power, power factor, secondary current, primary current and system voltage etc.
2. Automatically recognize the polarity of sampling signal, to avoid non-polarity connection.
3. With power down memory function by setting parameter. Data will not lose after power down.
4. With over voltage and under voltage protection functions.
5. With input and resect delay can be adjusted separately, with applicable capacity for electric network.
6. Re-inputting locking time can be set to ensure the capacitor with enough discharge time before inputting.
7. Output group quantity can cut off one group or start one group at will through the button.
8. Whole digital of all kinds of parameters is adjustable, can be widely used in different electric network.
9. With strong anti-interference capacity, can directly resist the interfering impulse with total amplitude value of 2000V from periphery.

## Service condition

**Power voltage:** Rated value is AC 380V, fluctuation should not exceed ±10%.
**Ambient temperature:** -25℃～55℃.
**Relative humidity:** Max 90% (at 20℃).
**Altitude:** not exceed 2000m.
**Environmental condition:** without explosive and flammable dangerous medium, without corrosive metal gas and the conductive dust that may damage the electric insulation.





## Basic technical parameters

**Rated current:** AC 0～5A
**Current input impedance:** ≤0.02Ω
**Frequency:** 50Hz/60Hz
**Rated voltage:** AC 220V/380V
**Protection grade of shell:** IP30
**Power:** Max 8W
**Contact capacity:** Dynamic state DC12V/50Ma(Staic state AC220V/7A) each branch
**Sensitivity:** 50mA

## Ex-store setting value for each parameter

| Code | Meanings | Setting value | Adjustable range |
|---|---|---|---|
| P-01 | Input threshold for power factor | 0.950 | 0.800～1.000 |
| P-02 | Resect threshold for power factor | 1.000 | 0.900～-.900 |
| P-03 | Input delay | 30 | 1～250s/0.1～60.0s |
| P-04 | Cut delay | 30 | 1～250s/0.1～60.0s |
| P-05 | Over voltage protection | 440/245 | 400～500/230～27 |
| P-06 | Re-inputting locking time | 30 | 0～240s |
| P-07 | Transformation ratio of transformer | 500 | 5～10000 |
| C-01~C-12 | Output of each controlled capacitor | 5 | 0～200kvar |

## Operation method for manual function

Click the set key ■ to perform fast transfer between automatic and manual operation. AUTO/MAN signal lights flash frequently under manual state. Operate ▲ can input one group. Operate ▼ can cut the group of input capacitor.

**Brief instruction for choosing JKW series products**

| Model | Rated voltage | Tapping size | Output |
|---|---|---|---|
| JKW15 | 380V | 113×113 | 1-12 step static output |
| JKW2C | 220V | 113×113 | 1-12 step static output |
| JKW1BF | 380V | 140×102 | 1-12 step static output |
| JKW1BJ | 220V | 140×102 | 1-12 step static output |
| JKW3B | 380V | 162×102 | 1-12 step static output |
| JKW2B | 220V | 162×102 | 1-12 step static output |
| JKWD15 | 380V | 113×113 | 1-12 step dynamic output |
| JKWD2C | 220V | 113×113 | 1-12 step dynamic output |


## General

JKWF series reactive power compensation controller (hereinafter referred to as controller), taking 8-position SCM as core, adopting the control scheme of phase splitting sampling, phase splitting compensation and common compensation plus phase splitting compensation, is used for controlling reactive compensation devices in unbalance three-phase load electric system with AC50Hz, 0.4KV. (JKW18 Is single-phase sampling, with same basic functions, to use referring to the instruction).

## Functional characteristics

1. Real time displays three-phase network state: including system voltage, system current, active power, reactive power, apparent power, power factor and electric network frequency, control parameter etc.
2. Automatically recognize the polarity of sampling signal, to avoid non-polarity connection.
3. With power down memory function by setting parameter. Data will notlose after power down.
4. With over voltage and under voltage protection functions.
5. With double input threshold: Input just can be performed only the power factor and reactive power are lower than set value, to avoid input-resect vibration.
6. With input and resect delay can be adjusted separately, with applicable capacity for electric network.
7. With 5 kinds of input-resect program: sequential input-resect, code input-resect and optimized input-resect modes.
8. Re-inputting locking time can be set to ensure the capacitor with enough discharge time before inputting.
9. Output group quantity can cut off one group or start one group at will through the button.
10. Whole digit of all kinds of parameters is adjustable, can be widely used in different electric network.
11. With strong anti-interference capacity. can directly resist the interfering impulse with total amplitude value of 2000V from periphery.
12. Compensation modes: phase splitting compensation can be set, phase splitting compensation plus three-phase compensation, three-phasecompensation.
13. Output modes: static, dynamic and compound etc.





## Service condition

**Power voltage:** Rated value is AC 220V, fluctuation should not exceed±10%.
**Ambient temperature:** -25℃~55℃.
**Relative humidity:** Max 90% (at 20℃)
**Altitude:** Not exceed 2000m.
**Environmental condition:** Without explosive and flammable dangerous medium, without corrosive metal gas and the conductive dust that may damage the electric insulation.

## Basic technical parameters

**Rated current:** AC 0~5A
**Frequency:** 50Hz/60Hz
**Protection grade of shell:** IP40
**Contact capacity:** Dynamic state DC12V/50Ma(Static state AC220V/7A)each branch
**Sensitivity:** 20mA

## Ex-store setting value for each parameter

| Code | Meanings | Setting value | Adjustable range |
|---|---|---|---|
| P-01 | Input threshold for power factor | 0.950 | 0.800~1.000 |
| P-02 | Resect threshold for power factor | 1.000 | 0.900~-.900 |
| P-03 | Input delay | 10s | 0.1~100s |
| P-04 | Cut off delay | 10s | 0.1~100s |
| P-05 | Over voltage threshold | 245V | 220V~300V |
| P-06 | Capacitor discharge delay | 0 | 0~240s |
| P-07 | Sampling current transformer ratio | 500 | 5~9000 |
| P-8 | Compensation scheme | 3F07(2F06) | OF16-5F01(OF12~4F00) |
| C-01~C-16 | Output of each controlled capacitor | 5 | 0~200kvar |


## Safety operation and installation

PFC type distribution monitoring controller should be installed and operated by the electrician with certain experience. Please carefully read the instruction before using. According to the modes and steps stipulated in the instruction when debugging and musn't confuse the connection diagram and terminal label at back of the controller.

## Service conditions

1. Altitude: not exceed 2500m.
2. Ambie nt tempe rature: -25℃~50℃.
3. Air humidity should not exceed 50% at 40℃ and not exceed 90% at 20℃.
4. No corrosive gas, conductive dust and flammable and explosive medium around the ambient.
5. No fierce vibration at installation site.

## Technical parameters

1. Basic parameter
   - **Power voltage:** AC220V±10%
   - **Signal frequency:** 45-65Hz
   - **Signal current:** AC0-5A
   - **Power frequency:** 45-65Hz
   - **Signal voltage:** AC50-260V
   - **Power consumption of machine:** ＜10VA
2. Measure precision
   - **Voltage:** ±0.5%
   - **Power factor:** ±1.0%
   - **Reactive power:** ±1.0%
   - **Reactive coulom:** ±1.0%
   - **System clock:** ±4ppm, yearly error less than 2min
   - **Current:** ±0.5%
   - **Active power:** ±1.0%
   - **Active coulom:** ±1.0%
   - **Electric network frequency:** ±0.01Hz





## Main functions

1. PFC distribution monitoring controller is mainly used for auto controlling to capacitance reactive compensation devices in low voltage distribution system, to make the power factor of electric network be optimal.
2. Full big screen display (contain back light, the back light is bright by operating any key. If within 1min there is n`t any operation, the back light will extinguish automatically), with friendly human machine interface and visual and simple Chinese present operation. Actual time calculation displays three-phase power factor, three-phase active power, three-phase reactive power, three-phase voltage, three-phase current, zero sequence current, three-phase voltage distortion rate, three-phase current distortion rate, 3-13 times voltage and current harmonic wave contain rate, real time clock, active electrical degree and reactive electrical degree etc.
3. PFC type distribution monitoring controller can widely store 24 integral points data and the daily statistical data reaching min 200 days, and also can be extended to 800 days according to user`s requirement. Data includes the three-phase voltage, three-phase current, three-phase power factor, three-phase active power, three-phase reactive power, three-phase voltage distortion rate, three-phase current distortion rate, active electrical degree and reactive electrical degree of everyday integral hours. Calculate everyday max and min three-phase voltage and the time of occurrence, daily max and min three-phase current and the time of occurrence, daily min three-phase power factor and the time of occurrence, daily max and min three-phase active power and the time of occurrence, daily max and min three-phase reactive power and the time of occurrence, daily max and min three-phase voltage distortion rate and the time of occurrence, daily max and min three-phase current distortion rate and the time of occurrence, daily three-phase voltage on the high and low side time, daily three-phase voltage percent of pass, daily three-phase voltage distortion rate standard-exceeding time, daily three-phase current distortion rate standard-exceeding time, daily three-phase power factor less than 0.95 time, load unbalance rate standard-exceeding time, running total time of 1-6 step capacitor, input-resect times of 1-6 step capacitor, power failure moment, incoming power moment, power failure times incoming power times, daily max current value for 15 min and the time of occurrence.
4. Various control parameter functions of full digital pre-set, password, ID number (for communication),PT transformation ratio, CT transformation ratio, over voltage threshold, under voltage threshold, target power factor threshold, input-resect delay, distortion rate threshold, clock, compensation schemes, input-resect codes and capacitor capacity etc can be set.
5. Communication functions: with RS232 and Rs485 communication port of hardware conventions, adopting 101 or MODEBUS-RTU communication conventions, on site or long-distance communication can be executed. Can realize real time, summon various electric parameter by timing, modify control parameter and input-resect capacitance through long-distance. On site operation through short-distance (30-50m) wireless communication function and portable computer data can be performed.
6. With manual input-resect capacitance function, manual input and resect capacitor under the condition without voltage and current signal. Integrated protection function. PFC distribution monitoring compensator has functions of protecting against over voltage, phase loss, under voltage, harmonic wave overflow etc. and it can allow or forid alarm relay drawing and closing through control parameters.

## Analysis system software for upper position computer

1. **Running environment (operating system)**
   windows 98/2000/xp
2. **Communication functions**
   Adjust the control parameter and clock of PFC with long-distance by making use of the communication functions of analysis system software, can monitor all parameters of electric network and the input-resect states of capacitors under real time, input-resect the capacitors under long-distance control, also can display all electric parameters including harmonic wave under real time and download the history recorded data etc.
3. **Analysis functions**
   The analysis functions will downlad history data in large quantities and store, classify and collate according to the device No. orderly. It can display or print any electric network parameter according to user`s indicated time interval through table curve or bar diagram form.
4. **Simplo opcration**
   With menu and shortcut toolbar, visual and lucid, and its majority part of operation can be achieved by the mouse and detailed operation instruction is attached.


## General Description

JKW18G high voltage reactive power compensation controller is a new generation distribution test control device as integrating data acquisition, power network parameter analysis, reactive power compensation communication as a unit, which is suitable for controlling the high voltage power network system parameter monitors and reactive compensation, can offer the perfect and accurate data basis for power network safety running, reasonable distributing load improving electric energy quality ect.

## Service conditions

1. Altitude: not exceed 2500m.
2. Ambient temperature: -25℃~50℃.
3. Air humidity should not exceed 50% at 40℃ and not exceed 90% at 20℃.
4. No corrosive gas, conductive dust and flammable and explosive medium around the ambient.
5. No fierce vibration at in stallation site.

## Main specification model

| Product model | Tapping size | Power voltage | Signal frequency | Control circuit | Display |
|---|---|---|---|---|---|
| JKW18G | 139×139 | AC220V | 50/60Hz | 1~6 | LCD |

## Technical parameters

**1. Basic parameter**

**Power voltage:** AC220V±10%
**Power frequency:** 45-65Hz
**Signal frequency:** 45-65Hz
**Signal voltage:** AC50-260V
**Signal current:** AC0-5A
**Power consumption of machine:** ＜10VA





## Technical parameters

**2. Measure precision**

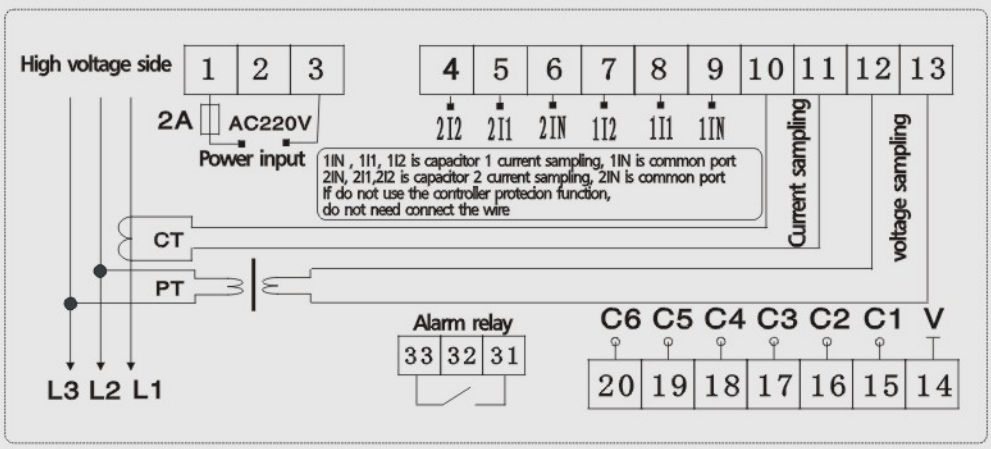
**Voltage:** ±0.5%
**Current:** ±0.5%
**Power factor:** ±1.0%
**Active power:** ±1.0%
**Reactive power:** ±1.0%
**Active coulom:** ±1.0%
**Reactive coulom:** ±1.0%
**Electric network frequency:** ±0.01Hz
**System clock:** ±4ppm, yearly error less than 2min

## Function characteristic

1. suitable for controlling the high voltage power network system, to make the power factor of electric network to be optimal.
2. Full big screen display (contain back light. The back light is bright by operating any key. If within 1min there isn`t any operation, the back light will extinguish automatically), with friendly human machine interface and visual and simple Chinese present operation. Actual time calculation displays three-phase power factor, three-phase active power, three-phase reactive power, three-phase voltage, three-phase current, zero sequence current, three-phase voltage distortion rate. Three-phase current distortion rate, 3-13 times voltage and current harmonic wave contain rate, real time clock, active electrical degree and reactive electrical degree etc.
3. JKW18G type distribution monitoring controller can widely store 24 integral points data and the daily statistical data reaching min 200 days. And also can be extended to 800 days according to user`s requirement, Data includes the three-phase voltage, three-phase current, three-phase power factor, three- phase active power, three-phase reactive power, three-phase voltage distortion rate, three-phase current distortion rate. active electrical degree and reactive electrical degree of everyday integral hours. Calculate everyday max and min three-phase voltage and the time of occurrence, daily max and min three-phase current and the time of occurrence. daily min three-phase power factor and the time of occurrence, daily max and min three-phase active power and the time of occurrence, daily max and min three-phase reactive power and the time of occurrent, daily max and min three-phase voltage distortion rate and the time of occurrence, daily max and min three-phase current distortion rate and the time of occurrence. daily three-phase voltage on the high and low side time. daily three-phase voltage percent of pass. daily three-phase voltage distortion rate standards exceeding time. daily three-phase current distortion rate standard-exceeding time, daily three-phase power factor less than 0.95 time, load unbalance rate standard-exceeding time. running total time of 1-6 step capacitor, input-resect times of 1-6 step capacitor, power failure moment, incoming power moment. Power failure times, incoming power times. daily max current value for 15min and the time of occurrence.
4. Various control parameter functions of full digital pre-set, password, ID number (for communication), PT transformation ratio, CT transformation ratio, over voltage threshold, under voltage threshold, target power factor threshold, input-resect delay, distortion rate threshold. Clock. Compensation schemes. Input-resect codes and capacitor capacity etc can be set.
5. Communication functions: with RS232 and RS485 communication port of hardware conventions. Adopting 101 or MODEBUS-RTU communication conventions. On site or long-desiance communication can be executed. Can realize real time, summon various electric parameter by timing, modify control parameter and input-resect capacitance through long-distance. On site operation through short-distance (30-50m) wireless communication function and portable computer data can be performed.
6. With manual input-resect capacitance function, manual input and resect capacitor under the condition without voltage and current signal. Integrated protection function. JKW18G distribution monitoring compensator has functions of protecting against over voltage. Phase loss. under voltage. Harmonic wave overflow etc. And it can allow or forbid alarm relay drawing and closing through control parameters.

# JKW18G Series
# High Voltage Reactive Power Compensation Controller

## Connection drawing




1.3: Power input

2: Earth the ground(can not connect)

4.5.6: Any two phase of capacitor 2 current sampling input, one side of the second output line of two current transformers connect to 4 and 5, the other side shunt to 6 port

7.8.9 Any two phase of capacitor 1current sampling input, one side of the second output line of two current transfermers connect to 7and 8, the other side shunt to 9port

10.11 Sampling current signal input AC0-5A

12.13 Sampling voltage signal

14: The common port of output control signal

15-20: 6 Step drive output, AC220V/5A each step

31、33: Alarm output contact capacity of passive normal open switch: AC220A 5A

## Installation mode

**Flush type and guide rail type**