BJ-CA212

Automatic Power Factor Controller

User Manual

Version：1.5

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Read me

When you use CA-212 Power factor controller, be sure to carefully read this user manual, and be able to fully understand the implications, the correct guidance of operations in accordance with user manual, which will help you make better use CA-212 Power factor controller, and help to solve the various problems at the scene.

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1. Before the meter turning on the power supply, be sure that the power supply within the provisions of the instrument;

2. When installation, the current input terminal must non-open, voltage input terminals must Non-short circuit;

3. Communication terminal (RS232 or RS485) is strictly prohibited to impose high pressure;

4. Be sure the instrument wiring consistent with the internal system settings;

5. When communicating with the PC, instrument communication parameters must be consistent with the PC

- **Please read carefully before using this user manual**
- **Please save this document**

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1. SUMMARIZE:

The Blue Jay Intelligent Automatic Power Factor Controller type BJ-CA212 is specially designed to provide accurate and reliable control of Power Factor of an electrical installation.

CA-212 has Microcontroller technology. Blue Jay technology specifically evolved for us APFCRs where the problems of electrical noise, transients etc, Are accentuated, and normal microprocessor technology fails under such condition.

2. FEATURES:

1. Determine the connection phase to automatically to set the compensate parameters, easy installation and debugging.

2. Set the controller parameters and test the relay, no current signal can accept.

3. Real-time dynamic display of power distribution system power factor, current, voltage.

4. Automatic monitoring and processing power over compensation and less compensation.

5. Over-voltage monitoring, display and protection, can reaction in a minimum time to remove compensation capacitors, total time less than 60s.

6. With ultra-small load distribution system monitoring, display and locking function, to prevent capacitor switching oscillation, under current protection value can be user-set.

7. LED display, show the circuit power factor, and LED indicator show the capacitors status.

3. SPECIFICATIONS:

1. - Reference standard:

JB/T9663-1999, DL/T597-1996

2. - Input

Voltage: AC380V (optional AC220V/AC110V)

Current: Rated 5A (min work current 0.1A)

Frequency: 50HZ

3. - Dielectric strength

IEC 688 / IEC 255-3 (1989)

2kV AC RMS 1 minute, between input / output / case / power supply

4. - Work environment

Temperature: -20℃~ +60℃

Humidity: RH 20%～85% (No condensation)

5. - Protection

Panel: IP40

6. - Storage Conditions

Temperature: -25℃～+70℃

Humidity: RH 20%～95%

7. - Working Power

AC 304V ~ 494V, 45-65Hz,

Maximum power consumption 6W

8. - Dimensions

L × W × H =120mm×120mm×125mm

L × W = (112.5+0.8mm) × (112.5+0.8mm)

9. - Installation hole size

4.- INSTALLATION AND START-UP

The manual you hold in your hand contains information and warnings that the user should respect in order to guarantee a proper operation of all the instrument functions and keep its safety conditions. The instrument must not be powered on and used until its definitive assembly on the cabinet's door.

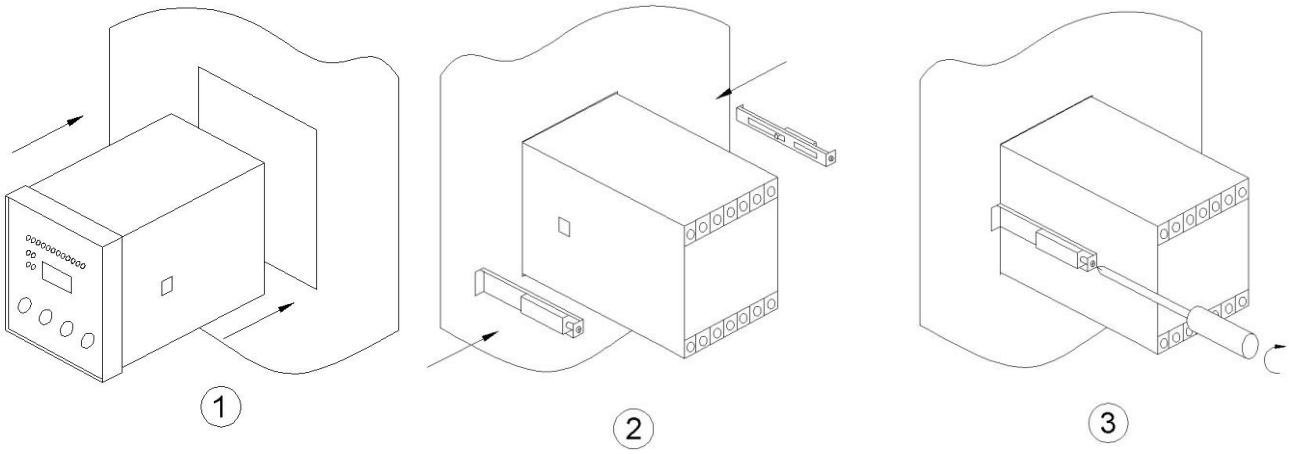
If the instrument is not used as manufacturer's specifications, the protection of the instrument will be damaged.

When any protection failure is suspected to exist (for example, it presents external visible damages),the instrument must be immediately powered off. In this case contact a qualified service representative.

4.1.- Installation

Mounting

Instrument is to be mounted on panel (cut-out 112.5+*0.8 x* 112.5+*0.8 mm*). All connections keep inside the cabinet.



Notes:

A. Voltage input:

Input voltage should not exceed the rated input voltage products (please confirm it before your order), the input voltage to be installed in the 1A fuse.

B. Current Input:

Standard input current is 5A, if greater than 5A should use external CT.

Even if you are using on the CT are connecting with other instruments, wiring methods should be used in series. Before remove the current input connection, must be sure to disconnect the primary circuit or shorted secondary circuit of CT. Suggest using the terminal block, please not directly connect to CT, in order to facilitate disassembly.

4.2. - Connection terminal (see label on the rear part)

Terminal description

Upper connection terminal

1	3	5	7	9	11	Ib	In
						Current input +	Current input -

Lower connection terminal

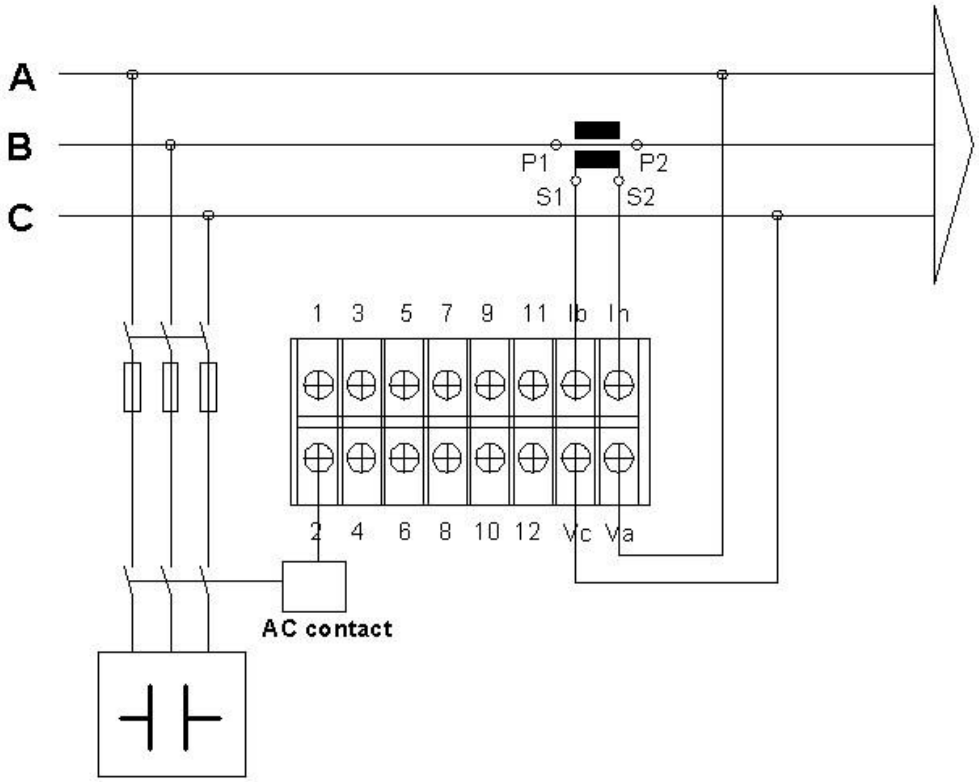
2	4	6	8	10	12	Ua	Uc
						voltage input +	voltage input -

I_B, I_N: Current sampling signal connection terminal (connect to CT)

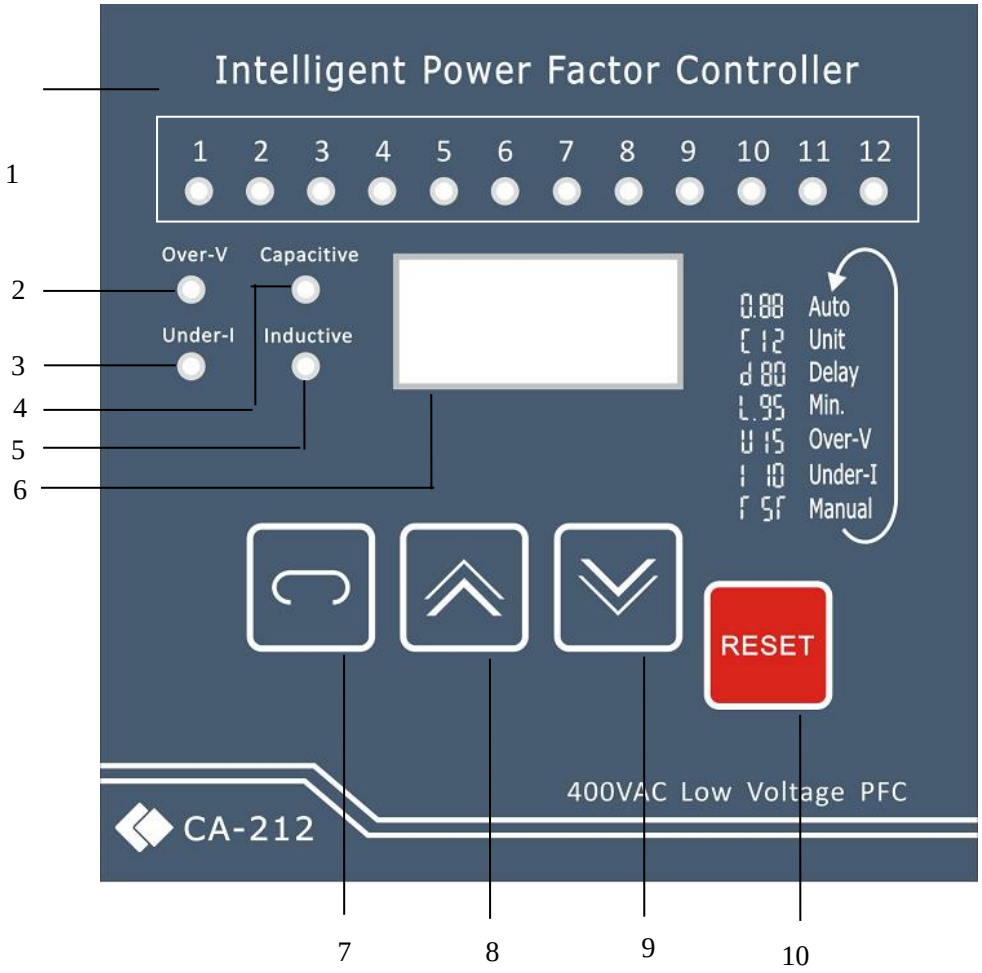
U_A,U_C: Voltage power supply and the voltage sampling signal connection terminal (connect to L1,L2 or L1,L3 or L2,L3)

1~12: Output terminal (connected AC contactor coil)

4.3. - Connection Drawing for the CB-212



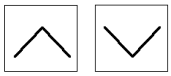
5. SCREEN DISPLAY



1. 12 LED indicator show the capacitors working status
2. “Over-V” LED on mean the over-voltage
3. “Under-I” LED on mean the load under current
4. “Capacitive” LED on mean the current is capacitive circuit
5. “Inductive” LED on mean the current is inductive circuit
6. Main display show the power factor data
7. “MODE” key
8,9. “UP” and “DOWN” key
10. “RESET” mean reset key

6. - OPERATION MODE

“**MODE**” key can open the programming menu.



“**UP**” and “**DOWN**” key Press these keys in programming mode, will modify the value.

“**RESET**” key can reset the controller when it have failure

7. - SETUP PROCEDURE

The SETUP procedure of the CA212 is performed by means of several SETUP options. Once into the SETUP, use the keyboard to select different options and enter required variables:

The instrument has one line displays. And 4 LED type indicator (red color) show the circuit status; 12 LED type indicators (red color) show the capacitors status.

When the CA-212 is powered up, all the LED indicator will on, and meter start self- test, after some seconds, the controller is ready for operation and shows one of the available screens.

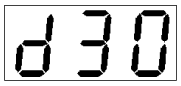
Note: 1. If there is no voltage signal, the display will show '**noU**'
2. If there is no current signal, the display will show '**noI**', in this situation user can setting the parameter and test the switching of capacitor.

7.1- Parameter setting

Step1: Press key "  "and hold 3 sec, the controller will start in programming mode, you will see:

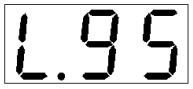
This is show the capacitors routes, **setting value from 1~12**.You can use  and  to change the value.

Step2: Then press key "  "and hold 2 sec, you will see:



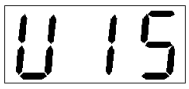
This is show the delay time of capacitors switching, **setting value is 10, 20, 30, 40, 50, 60, 70, 80, 90**.You can use  and  to change the value.

Step3: Then press key "  "and hold 2 sec, you will see:



This is show the lower value of power factor, the controller input or the removal the capacitors to keeping the power factor in an economic range. **Setting value form 0.90~0.99**.
You can use ∧ and ∨ to change the value.

Step 4: Then press key " ⊂⊃ "and hold 2 sec, you will see:



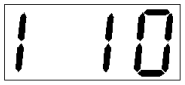
This is show the over-voltage setting, **Setting range is 5%. 10%. 15%. 20%.**

U05 means voltage setting is 5% (399V),
U10 means voltage setting is 10% (418V),
U15 means voltage setting is 15% (437V),
U20 means voltage setting is 20% (456V).

When the grid voltage exceeds the over-voltage setting value, the over-voltage indicator light is on. The controller will remove all capacitors in one minute to ensure all capacitors safe.

You can use ∧ and ∨ to change the value.

Step 5: Then press key " ⊂⊃ "and hold 2 sec, you will see:



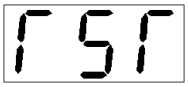
This is show the load under current settings. **Setting range is 2%. 4%. 6%. 8%. 10%.**

I02 means current setting is 2% (0.1A),
I04 means current setting is 4% (0.2A),
I06 means current setting is 6% (0.3A),
I08 means current setting is 8% (0.4A).
I10 means current setting is 10% (0.5A).

When the gird load is less than the set value, the controller remove the inputted capacitor, the under current indicator light on, and the controller will not input the capacitor during the low current period. To avoid the switching oscillation, protect the capacitor.

You can use and to change the value.

Step 6: Then press key " " and hold 2 sec, you will see:



This is CA-212 test mode, user can press and to input or cut-off the capacitor, the capacitor indicator will on or off to show the status. The display can show the grid power factor change. This can test the capacitor connecting.

Step 7: Then press key " " and hold 2 sec, the controller will escape the programming mode, and show the current power factor data.

Notes:

1. In setting/test mode, if 15 seconds without action, the controller will return to automatic control mode.
2. If the controller show 'UAC, UBC, UAB" to indicate the wiring method is 3P3W
   show ' IA ,IB, IC 'to indicate the wiring method is 3P4W.
3. shows the current power factor, if the current power factor greater than 0.5, and does not advance, go to next step
   λ If the current power factor less than 0.5 or advanced,
   then thatconnection error --- current signal and voltage signals are in phase, circular display 'UAC' or 'IB' or 'Err'; if it is satisfied there is noconnection error, that is, that the current grid True power factor ofless than 0.5, hold down the button to confirm, can enter the next step

7.2 Workflow description

1. Power on and reset, the LED screen all on, show" **888** "

2. Controller automatic test voltage and current signals:

★ Show "**noU**", mean no voltage signal (see troubleshooting for solution)

★ Show "**noI**", mean no current signal (see troubleshooting for solution)

3. Automatically determine the terminal connection mode:

If the controller show " **UAC, UBC, UAB**" to indicate the wiring method is 3P3W
show " **IA ,IB, IC** 'to indicate the wiring method is 3P4W.

If the current power factor less than 0.5 or advanced, controller judge as connection error, the display show " **Err** " mean that wiring is incorrect.

After diagnosis by artificial, eliminate wiring errors, user can press  to skip the check.

4. Then press  to set the control parameter (Details please refer to **Chapter 7.1**).

★ controller detects and displays the current grid power factor, when the power factor is under the lower limit set, controller automatically connect capacitor until the power factor between the lower and 1.00.

★ When the power factor over the 1.00, the controller automatically removed capacitor until the power factor in the set range.

★ When the load current is less than the set under current value, the controller running in lock method, without any action to protect the capacitor.

★ When the grid voltage exceeds the over-voltage setting value, the controller automatically cut off all capacitor.

8.- TECHNICAL SERVICE

For any inquiry about the instrument performance or whether any failure happens, contact to Blue Jay's technical service.

Blue Jay - After-sales service

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