186

ARC Power Factor Automatic Compensation Controller (LCD)

Installation instructions T1.6

Acrel Electric Co., Ltd

Declare

Acrel reserves the right to modify the product specifications herein without notification. Please consult the local agent about the latest specifications before placing a purchase order.

Catalogue

Intelligent Capacitor Switching State Indicator

ARC-28(F)/Z-L Intelligent Capacitor Special Power Factor Controller

ARC-28(F)/Z-USB-L Intelligent Capacitor Special Power Factor Controller

ARC LCD Power Factor Automatic Compensation Controller

1 General

AZC-SI intelligent capacitor switching state indicator and the company's low-voltage intelligent power capacitor matching use, instead of the traditional capacitor state indicator. The product has high integration, small volume and convenient installation, which can greatly improve the production efficiency of the whole cabinet, reduce the probability of error, and improve the overall product quality.

2 Main characteristic & features

2.1 Technical characteristic

- An intelligent capacitor switching state indicator board is integrated with 136 high-light LED indicator lights , 6 state lights and a seven-segment digital tube. A single product can display capacitor switching states with a total of 32 and 24 sub-supplements, with low power consumption and high brightness.
- Through digital communication with capacitors, the switching state of each capacitor is reflected in real time.

2.2 Function description

- The intelligent capacitor switching state indicator can indicate the switching state of 32 common compensation and 24 separate compensation, and can also display the information of intelligent capacitor power factor and fault.
- Common compensation capacitor status indication: 32(1-32) intelligent capacitor switching state can be displayed. The number of intelligent capacitor addresses corresponds to the number on the LED lamp of the switching state indicator, and each of the common compensation intelligent capacitors occupies 2 LED lights. The C1, C2 switching state of the common compensation capacitor correspond to the LED lights from top to bottom.
- Separate compensation capacitor status indication: 24(1-24) intelligent capacitor switching state can be displayed. The number of intelligent capacitor addresses corresponds to the number on the LED lamp of the switching state indicator, and each of the separate compensation intelligent capacitors occupies 3 LED lights. The A, B, C switching state of the capacitor correspond to the LED lights from top to bottom.
- Working status indicator: the indicator has 6 working status indicators, which are:

  ①Capacitive indicator light, the light indicates that the load working in capacitive state;

  ②Fault indicator light, the light indicates the system malfunction;

  ③Three-phase indicator light, the light indicates that the seven-segment digital tube is showing three-phase average power factor of the system;

  ④A phase indicator lamp, the light indicates that the seven-segment digital tube is showing A phase power factor of the system;

  ⑤B phase indicator lamp, the light indicates that the seven-segment digital tube is showing B phase power factor of the system;

  ⑥C phase indicator lamp, the light indicates that the seven-segment digital tube is showing C phase power factor of the system.
- Digital tube display: seven-segment digital tube display intelligent capacitor as follows 4 power factors:

  ① When the three-phase indicator light is on, the three-phase average power factor of the system is displayed;

  ② When the A phase indicator light is on, the A phase power factor of the system is displayed;

  ③ When the B phase indicator light is on, the B phase power factor of the system is displayed;

④ When the C phase power factor of the system is displayed when the C phase indicator light is on.

Note: Seven-segment digital tube and three-phase, A phase, B phase, C phase indicator lamp corresponding to the corresponding power factor of the cycle display system, switching time is 5s.

3 Technical parameters

3.1 Basic parameters

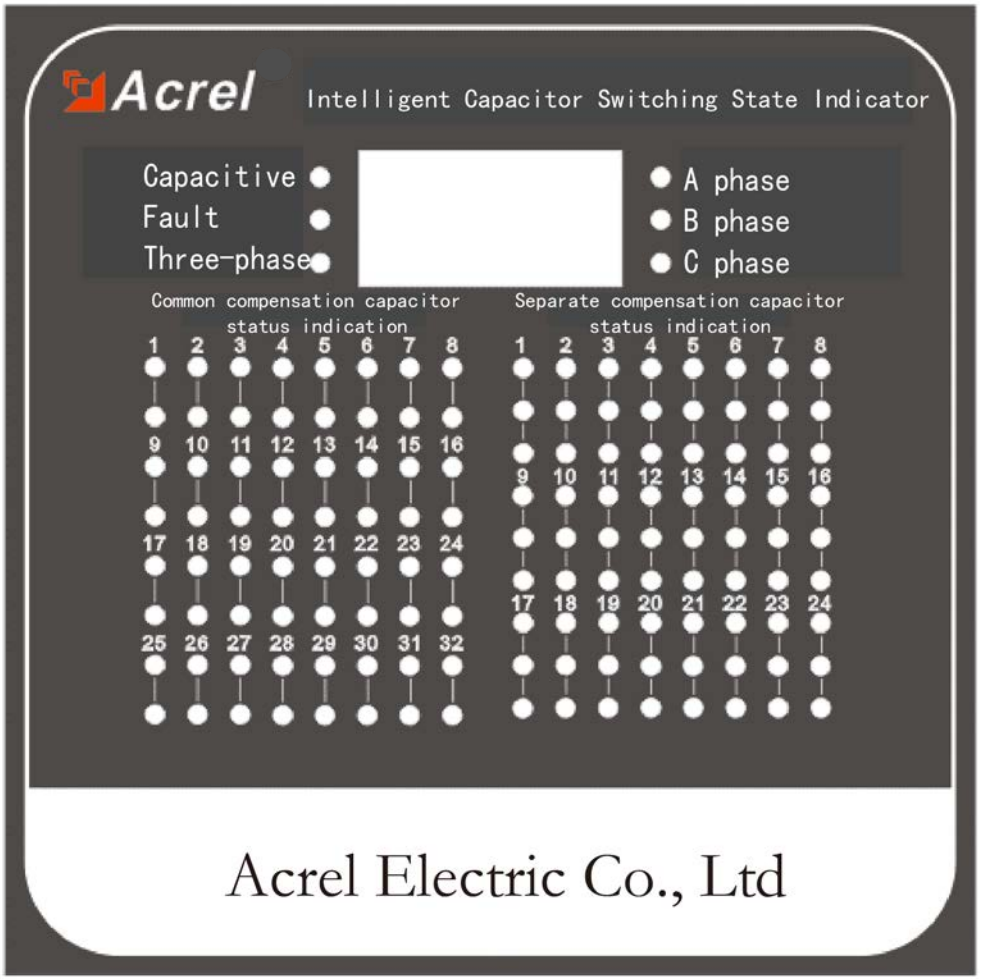
Working Voltage: AC380V±30% 50Hz

Power Consumption: less than 4VA

Dimensions: length * width * height: 144 mm*144mm*110mm

Installation and Hole Size: 138 mm*138mm

Note: Size and installation are consistent with reactive power compensation controller.



3.2 Working condition

Environmental Conditions: -25℃-55℃

Altitude: ≤2000m

Relative Humidity: 40℃, 20-90%

Atmospheric Pressure: 79.5-106.0Kpa

No conductive dust around Egypt corrosive gas, no flammable and explosive medium.

4 Wiring

4.1 Power terminal definition

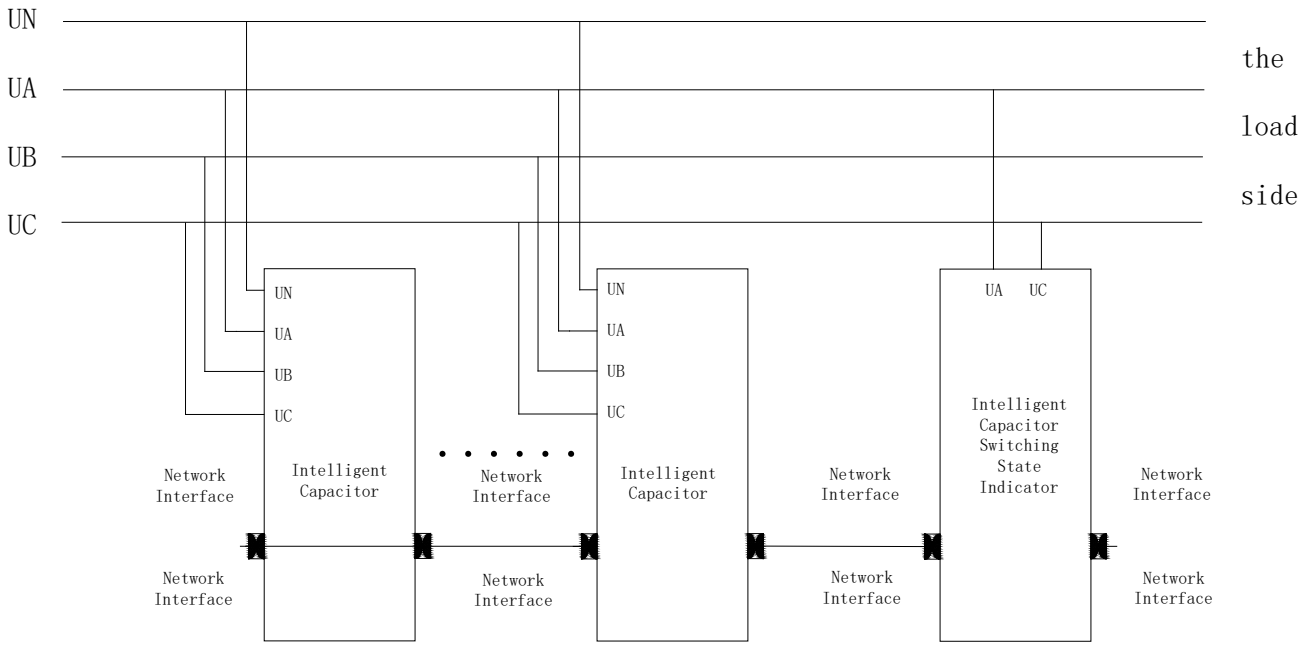
The UA, UC is the working power supply of the indicator (380V).

4.2 Control signal output RJ45 definition

The output end is two RJ45 network interface, which takes over one interface to the RJ45 port of intelligent integrated power capacitor.

4.3 Electrical wiring

Electrical wiring of switching state indicator network



5 Ordering instruction

1. Please specify the model name and quantity of products.
2. Supply address and time.
3. Please explain special requirements in advance.

1 General

ARC-28(F)/Z-L (F means Separate compensation) Power Factor Compensation Controller is developed by using mature reactive power hybrid compensation control strategy and high precision special metering chip. It can be connected with our intelligent capacitor to compensate reactive power loss, improve power factor, reduce line loss, and improve load capacity and power supply quality.

2 Operating standard

JB/T 9663-2013 Low Voltage Reactive Power Automatic Compensation Controller

3 Model specification

Product Model	Function Description
ARC-28(F)/Z-L	ARC-28(F)/Z-L power factor compensation controller can be used in conjunction with intelligent capacitors. Up to 28 intelligent capacitors can be connected, and voltage, current, power factor, active power, reactive power, harmonic content, frequency, apparent power, capacitor switching state indication can be displayed in real time through LCD screen.

4 Technical parameters

4.1 Basic parameters

Working Voltage: AC 220V±20%; 50Hz±10%

Sampling Voltage: AC three-phase four-wire 220V±20%, 50Hz±10%

Sampling Current: AC three-phase 0-5A

Number of online capacitors: ≤28

Local Power Consumption: ≤12VA

Measuring Sensitivity: 100mA

Measurement Accuracy: Voltage: 1.0 Current: 1.0 Power Factor: 0.5 Active Power: 1.0 Reactive Power: 2.5 Frequency: 0.1

Dimensions: 144 mm*144mm*110mm

Installation and Hole Size: 138 mm*138mm

4.2 Operating conditions

Environment Temperature: -25℃ to +65℃

Altitude: ≤2000m

Relative Humidity: 40℃, 20-90%

Atmospheric Pressure: 79.5-106.0Kpa

Environmental Conditions: No conductive dust Egypt corrosive gas, no flammable and explosive medium.

4.3 Technical features

- Controlled physical quantity: reactive power, small load and no switching oscillation;
- Coding switching function: can achieve cyclic switching and a variety of coding methods;
- It can realize full three-phase compensation, full separate-phase compensation, three-phase and separate-phase mixed compensation.

5 Installation & wiring

5.1 Installation schematic

Step 1: As shown, gently push the controller into the instrument cabinet panel with holes opened.

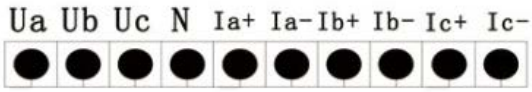
Step 2: As shown, clip the fixture into the slot on the side of the controller.

Step 3: Tighten the screws of the fixture clockwise with a screwdriver until the controller is firmly installed.

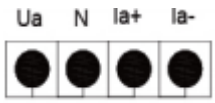
5.2 Wiring

5.2.1 Output port definition

Separate compensation signal sampling terminal definition:



Common compensation signal sampling terminal definition:

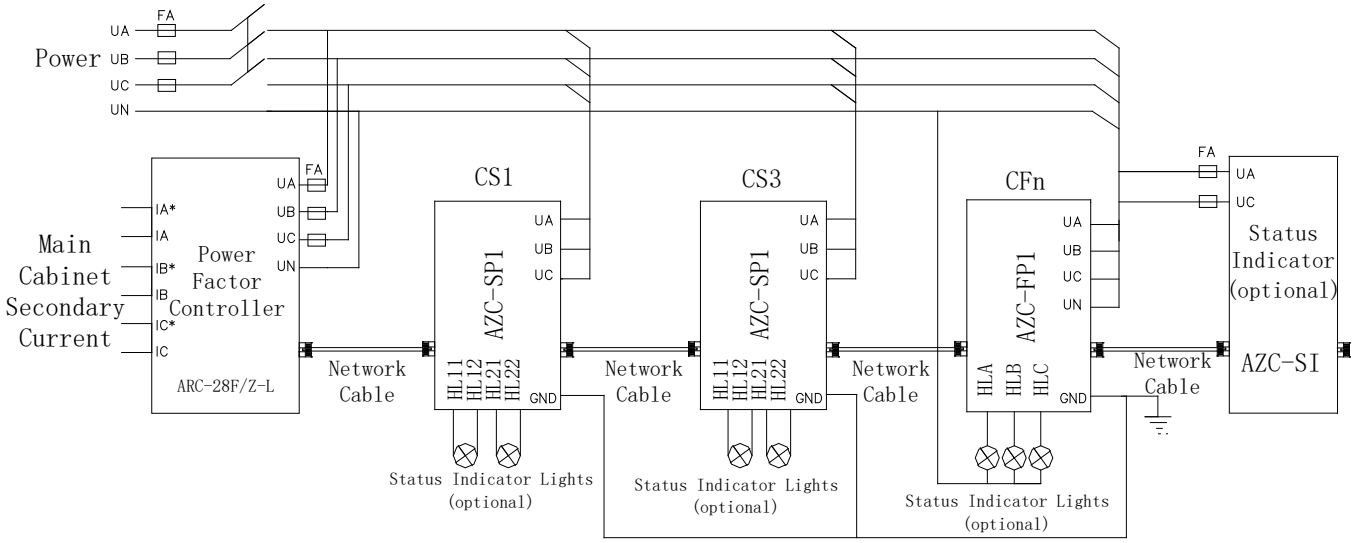


Control signal output RJ45 terminal definition:

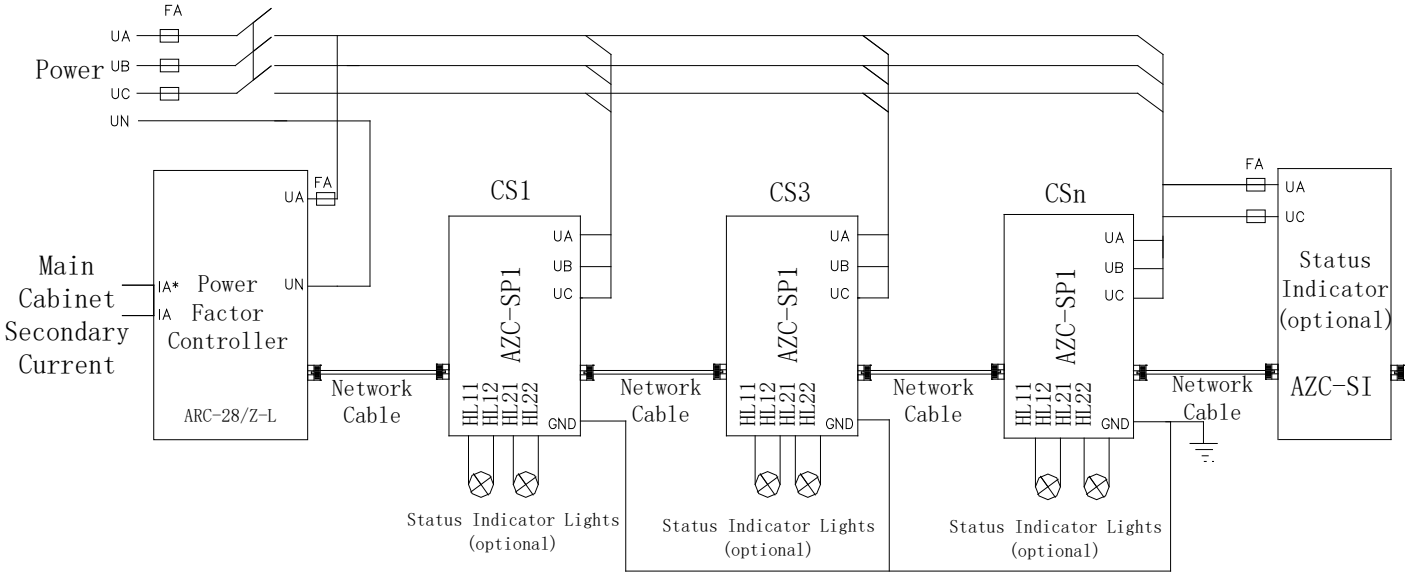
The output terminal has two RJ45 network interfaces, take over any interface to the RJ45 interface of the intelligent capacitor.

5.2.2 Example diagram of reactive power compensation output wiring

Separate compensation wiring diagram:



Common compensation wiring diagram:



NOTE:

①Check, set parameters and initialize;

②Before power transmission, it's necessary to check in detail whether the wring is correct, whether the wring is wrong, leakage or short circuit, whether the contact point is firm, and note the variable ratio of the installed CT;

③ Check whether the variable ratio of CT and configuration capacity are consistent with controller display, if not, please modify CT variable ratio and capacity settings of the controller; (very important)

④Check whether reactive power control parameters is correct.

6 Operating instruction

6.1 Panel and key description

6.1.1 LCD panel working state indicator diagram

6.1.2 Key description

①"ESC" key: Exit the current state and return to the main menu.

②"↑"Key: For each press, the value increase or decrease accordingly.

③"→"key: Move the cursor or menu left and right.

④"↵"Key: Confirm the settings.

⑤"SET" Key: Mode selection key.

6.2 Operating method

Before starting operation, please check in turn whether the wiring is correct, whether it is grounded, whether there is a short circuit between the terminals, whether the terminals, screws and so on are loose. If there is no the above problems, it can send electricity to the controller.

The main menu is as follows:

Power Parameters
Control Parameters
System Information

Power Parameters: Display various parameters of power grid in real time. Including: comprehensive parameters (voltage, current, power factor) power, test, compensation, distortion, harmonic submenu.

Control Parameters: Set various configuration parameters of terminal. Including: system settings, compensation settings, protection settings and other submenu.

System information: Display current manufacturer information of controller.

6.2.1 Power Parameters menu

Common compensation panel

Composite
Power
Compensation
Harmonic

Separate compensation panel

Composite	Compensation
Power	Distortion
Test	Harmonic

Press "ESC" key to return to the previous level menu; press "↑","→" key for menu up and down, left and right selection; press "↵" key is to confirm the settings made.

6.2.2 Composite

6.2.2.1 Common compensation panel

PF	1.00	THDu	0.23%
U	220.2	THDi	0.79%
I	50.73	FREQ	50Hz

Number of networking capacitors: 00

PF: phase power factor; V: phase voltage; I: phase current; FREQ: power grid frequency; THDu: voltage distortion rate; THDi: current distortion rate; Number of networking capacitors: the number of current system networking capacitors; Press "ESC" key to return to the previous level menu.

6.2.2.2 Separate compensation panel

	PF	U	I
A	1.00	220.1	0.000
B	1.00	220.2	0.000
C	1.00	220.3	0.000

Number of networking capacitors

PF: A, B, C phase power factor; U: A, B, C phase voltage; I: A, B, C phase current; Number of networking capacitors: the number of current system networking capacitors; press ESC" key to return to the previous level menu.

6.2.3 Power

A	8.81KW	11.02KVA
B	8.81KW	11.02KVA
C	8.81KW	11.02KVA
T	26.35KW	32.97KVA
A	6.81KVar	
B	6.82KVar	
C	6.83KVar	
T	19.84KVar	

2	1
3	4

Three-phase active power, three-phase reactive power, three-phase view power, power quadrant diagram; press "ESC" key to return to the previous level menu.

6.2.4 Test

Common Compensation Separate Compensation

Press "ESC" to return to the previous level menu; press "↵" to confirm the settings.

Common Compensation:

C03 C04 C05 C06 C07 C08
C09 C10 C11 C12 C13 C14

C03•••C28: The number of capacitor addresses in the network. Select one of the capacitor addresses and press the "↵" key to carry out virtual switching operation of capacitor. (Capacitor with machine doesn't switch truly, but the corresponding switching indicator light will be on.)

Press "↑", "→" keys to select the capacitor loop to be switched on; press the "ESC" key to return to the

previous level menu.

Separate compensation:

C03 C04 C05 C06 C07 C08
C09 C10 C11 C12 C13 C14

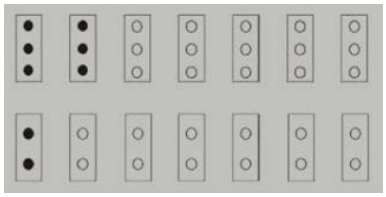
C03•••C28: The number of capacitor addresses in the network. Select one of the capacitor addresses and press the "↵" key to carry out virtual switching operation of capacitor. (Capacitor with machine doesn't switch truly, but the corresponding switch indicator light)

Press "↑", "→" keys to select the capacitor loop to be switched on; press the "ESC" key to return to the previous level menu.

6.2.5 Compensation

Automatic	Manual

6.2.5.1 Automatic compensation:



The solid circle represents capacitor input, and the hollow circle represents capacitor excision; press the "ESC" key to return to the previous level menu.

6.2.5.2 Manual compensation:

C03 C04 C05 C06 C07 C08
C09 C10 C11 C12 C13 C14

C03•••C28: The number of capacitor addresses in the network. Select one of the capacitor addresses and press the "↵" key to carry out switching operation of capacitor. Press"↑", "→" key, select the capacitor loop to be switched on; press "ESC" key to return to the previous level menu.

6.2.6 Distortion:

	THDu	THDi
A	0.21%	0.00%
B	0.31%	0.00%
C	0.07%	0.00%

A, B, C phase voltage total distortion rate; A, B, C phase current total distortion rate; press "ESC" key to return to the previous level menu.

6.2.7 Harmonic

6.2.7.1 Common compensation harmonic panel display

	THDu(%)	THDi(%)
03	0.43	0.53
05	0.99	0.81
07	0.66	0.62
09	0.29	0.50
11	0.38	0.69

Three-phase voltage harmonic rate; three-phase current harmonic rate;

Press "ESC" key to return to the previous level menu, press "↑", "→" button for the number of harmonic (voltage/current harmonic) up and down selection.

6.2.7.2 Separate compensation harmonic panel display

THDu(%)			
	A	B	C
03	0.43	0.53	0.76
05	0.99	0.81	0.91
07	0.66	0.62	0.89
09	0.29	0.50	0.41
11	0.38	0.69	0.58

A, B, C phase voltage harmonic content rate; A, B, C phase current harmonic content rate;

Press "ESC" key to return to the previous level menu, press "↑", "→" key for the number of harmonic (voltage/current harmonic) up and down selection.

6.3 Parameters setting

Select the "control parameter" in the main menu, press the "↵" key and display "please enter the user password ". When you enter the correct 5-bit password, you can enter the parameter setting, otherwise you will display" password error "(factory default value is: 00001).

User input password
00000

Press "↑", "→" key, can increase, reduce the number; long press "↑", "→", can quickly add and subtract the number key; press "↵" key to confirm the number input.

When the password is entered correctly, enter the parameter settings menu:

Common compensation panel

System
Compensation
Communication

Separate compensation panel

System Collection
Compensation Record
Communication Clock

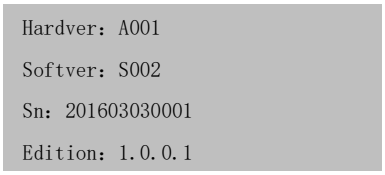
The parameter settings menu is as follows:

Parameter Attribute	Menu Name	Range	Parameter Function	Note
System	User Password	00000~99999	As a protective means of controlling parameters, when users need to modify parameter settings, they must enter five digits consistent with the system to enter the menu of parameter modification. Factory setting: 00001	
	Backlight Delay	000s~999s	Set the backlight off time, users operation any key and the backlight is turned on. After the time set by the user, the backlight is automatically turned off. When set to 000, the surface of backlight	

			is always on.	
	Work Mode	3P4L&3P3L	The working mode is different and the wiring is different. Factory setting is 3P4L.	
	Recovery Setting	Y/N	Factory setting is N	
Compensation	Operation Mode	Auto Net Hand	Operation mode of reactive power compensation: Auto: Automatic operation mode, reactive power compensation operates automatically. Net: server control mode. Hand: manual switching mode. When the output circuit needs to be tested in the factory, this mode can be set for manual switching capacitor experiment. Factory setting: Auto	
	CT Ratio	0000~9999	Like ratio of transformer is 100/5, setting to 20	
	PF	0.80~1.00	Target power factor setting, when the power factor of the power grid is lower than this value, the terminal will be put into the capacitor bank to make the power factor of the power grid reach the target value range. Factory setting: 0.94	This value is set according to the actual situation on the spot.
	Excision Kvar	00.0~99.9	Usually set to 000.0, that means no overcompensation be allowed. Factory setting: 0	
	Output Delay	000s~999s	The delay is between the terminal detects the need to put in the power capacitor and the actual issue of power capacitor switching instructions. Factory setting: 10s	
	Excision Delay	000s~999s	The time is the same set of capacitors from removed to reinvested. Factory setting: 60s.	This time should not be too short.
	Number Of Capacitors	0~28	The number of networking capacitors setting, factory setting: 20	

	Under Voltage Setting	000~999V	When under voltage, the controller is removed at a speed of 0.5s. There is no return voltage after under voltage, so long as the voltage is higher than the under voltage value, it is immediately re-entered. Factory setting: 180V	
	Over Voltage Setting	000~999V	When over voltage, the capacitor is removed at a speed of 0.5s. After over voltage, the voltage will only be re-entered if it below the overvoltage value: 5V (5V is value of the return voltage). Factory setting: 265V	
	Voltage Distortion	00.0%~99.9%	When the total voltage distortion rate is greater than the set value, the capacitor is removed at a speed of 0.5s, and only when the distortion rate is between the set point it'll be re-entered. Factory setting: 20%	
	Current Distortion	00.0%~99.9%	When the total distortion rate of the current is greater than the set value, the capacitor is removed at a speed of 0.5s, and only when the distortion rate is between the set point it'll be re-entered. Factory setting 20%	
Communication	Baud Rate	1200, 4800, 9600, 19200, 38400, 195200	Communication baud rate setting, factory setting: 38400	
	Check Bit	NONE(No check bit) ODD(ODD check bit) EVEN(EVEN check bit)	Check bit setting, factory setting: NONE (no check bit)	
	Stop Bit	1bit 2bit	Stop bit setting, factory setting: 1 bit	
	Communication Mode	485	485: wired RS485 communication	
Clock		0000~9999	Can modify the current year, month, day hours, minutes, seconds by key, after the modification press the "ENT" key, the clock automatically saved. (Note: Controller with USB interface has this function)	

6.4 System Information View



Hardver: hardware version; Softver: software version; Sn: product serial number; Edition: version

7 Random accessories, maintenance and attention

7.1 Random accessories

This device is equipped with operation instruction as random accessories, please check after opening the box, if there is any discrepancy can contact the manufacturer.

7.2 Transport and storage

①Transport and handling should not be severely impacted.

②Storage ambient temperature is -25-70℃, relative humidity is not more than 85%, no corrosive gas in the air.

7.3 Maintenance

During the operation of the device, observe the working state regularly. If there is any abnormal situation, please stop and check immediately, or contact the manufacturer.

7.4 Attention

①This device is strictly prohibited for non-electricians to operate and use.

②Before installation and use, the pre-connected grid voltage should be measured, strictly in accordance with the requirements of power management.

③Maintenance, must first power failure, and so on connected capacitors discharge before carrying out.

8 Ordering instruction

1. Please specify the product model name, quantity.
2. Supply address and time.
3. Please explain special requirements in advance.

1 General

ARC-28(F)/Z- USB-L (F means Separate compensation) power factor compensation controller is developed to meet the needs of all aspects of the power market and meet the requirements of smart power grid construction by using mature reactive power hybrid compensation control strategy and high precision special metering chip. It adds USB interface and switching indication. It can not only be connect with compensation capacitor, compensate reactive power loss of power grid, improve power factor and reduce line loss, thus improve load capacity and power supply quality, but also monitor the three-phase voltage, current, power factor and harmonic data in real time.

2 Operating standard

JB/T 9663-2013 Low Voltage Reactive Power Automatic compensation controller

3 Model specification

Table 1 Model Functions

Model	Functional		Function Description
ARC-28（F）/Z-USB-L	Acquisition and Measurement Function	Measurement Accuracy	Voltage: Class 1.0
			Current: Class 1.0
			Active power factor: Class 1.0; Reactive power factor: Class 2.5
			Power factor: Class 0.5
			Clock error: <0.5 seconds/day
			Harmonic error: ≦±5%
	Real-time Measurement Function		①A, B, C phase current, A, B, C phase voltage; ②A, B, C phase and total active and reactive power (forward and reverse) and apparent power ③A, B, C phase and total power factor; ④Current active and reactive power indicator (forward and reverse) ⑤Current A, B, C three-phase voltage, current 2-21 harmonic rate; ⑥Grid frequency
	Meter Reading Function		Monitor date, curve data, daily data, monthly data through USB interface.
	Real-time Monitoring Function		Monitoring of switching of reactive power compensator.
	Statistical Analysis of Data		Curve data (upper computer software) ①A, B, C each phase current, voltage curve; ②A, B, C each phase and total active and reactive power curve; ③A, B, C each phase and total power factor curve;
	Power factor Overrun Statistics		According to the set power factor segment limit, the power factor of the monitoring point is analyzed and counted.
	Time recording and Alarm Function		The controller can save 256 important event records and 256 general event records.
	Self-diagnostic Function		The controller automatically judges internal faults, abnormal conditions and displays symbols or graphic identification, including voltage phase break and loss, internal program error, hardware failure, communication failure, etc.
	Protection Function		1. Overpressure protection: action return (6-12)V, total break time should not be more than 60s; 2. Under voltage protection: total break time limit not more than 60s; 3. Voltage loss protection: after power failure, all

		switchgear should be automatically disconnected to ensure that the capacitor banks are in the breaking state; 4. Harmonic protection: when the total distortion rate of voltage harmonics exceeds the set value, the capacitor is automatically locked in, and the capacitor is removed group by group. Voltage harmonic total distortion limit : 5%-20% adjustable, factory set 10%; 5. Phase-deficiency protection: in the event of phase-deficiency or neutral line breakage, the protection loop can achieve fast cutting;
	Self-checking Reset	After each electrification, the terminal self-check and return the output circuit to make it open.

4 Technical parameters

Table 2 Main technical parameters

Serial	parameter		Technical features
1	Power Supply Parameters	Power Supply	Three-phase four-wire power supply mode, under the condition of two-phase voltage, AC power supply can maintain the normal operation of the controller. Rated voltage: 220V, allowable deviation-20 to +20%
		Power Consumption	⩽5W
2	Safety	Electrical Gap and Creeping Distance	The minimum clearance between two live components in the device under normal service conditions⩾4 mm, the minimum electrical clearance between the surrogate and the exposed conductor⩾6 mm, the minimum creeping distance of⩾6mm
		Insulation Strength	The tested parts of each phase circuit, each phase circuit and auxiliary circuit can withstand 2500 V 50Hz AC voltage cycle 1 Min insulation strength test without breakdown, flashover and sudden voltage drop.
3	Analog Access	Voltage	Three-phase four-wire voltage direct access, rated voltage 3×220 V. AC voltage input range: 0-264V per phase (0-120%)
		Current	A three-phase current is connected through a current transformer with a rated current of 5A. AC current input range: 0-5A
4	Working Conditions	Environment Temperature	-25℃～+65℃
		Altitude	2000m
		Relative Humidity	≤90%
		Atmospheric Pressure	79.5～106.0Kpa
		Environment Conditions	No conductive dust Egypt corrosive gas, no flammable and explosive medium
5	Transport and Storage Conditions	Environment Temperature	-40~70℃
		Relative Humidity	95%
6	Installation Site		No violent vibration, installation tilt not greater than 5%
7	Appearance Structure	Displayer	128*64 lattice liquid crystal (blue backlight)
		Device Enclosure	Liquid crystal display, plastic case package

		Shell Protection Class	Compliance with IP43 requirements
8	System Platform		Current 32-bit microprocessor, system data storage capacity of 16 M byte.
9	Application Range		This product is suitable for 380V low voltage distribution network and can be installed indoors or outdoors.

5 Installation & Wiring

5.1 Mechanical dimensions

Dimensions: 144*144*110mm

Installation and Hole Size: 138*138mm

5.2 Installation schematic

Step 1: As shown, gently push the controller into the open-hole instrument cabinet panel.

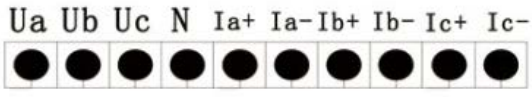
Step 2: As shown, clip the fixture into the slot on the side of the controller.

Step 3: Tighten the screws of the fixture clockwise with a screwdriver until the controller is firmly installed.

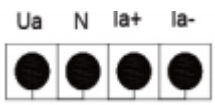
5.3 Wiring

5.3.1 Output port definition

Separate compensation signal sampling terminal definition:



Common compensation signal sampling terminal definition:

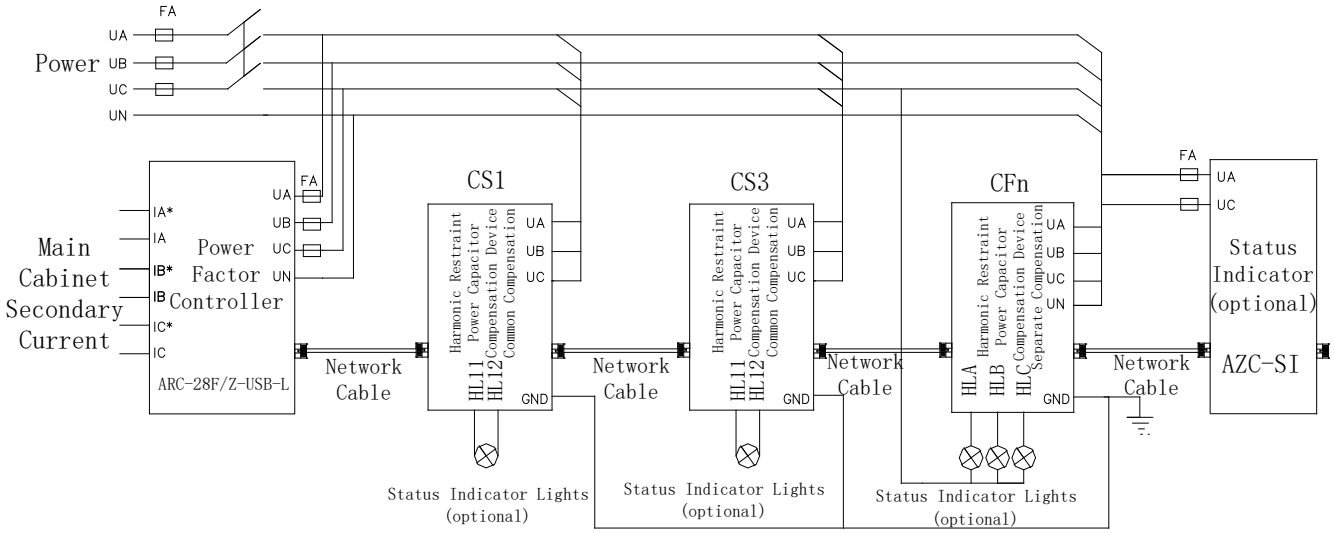


Control signal output RJ45 terminal definition:

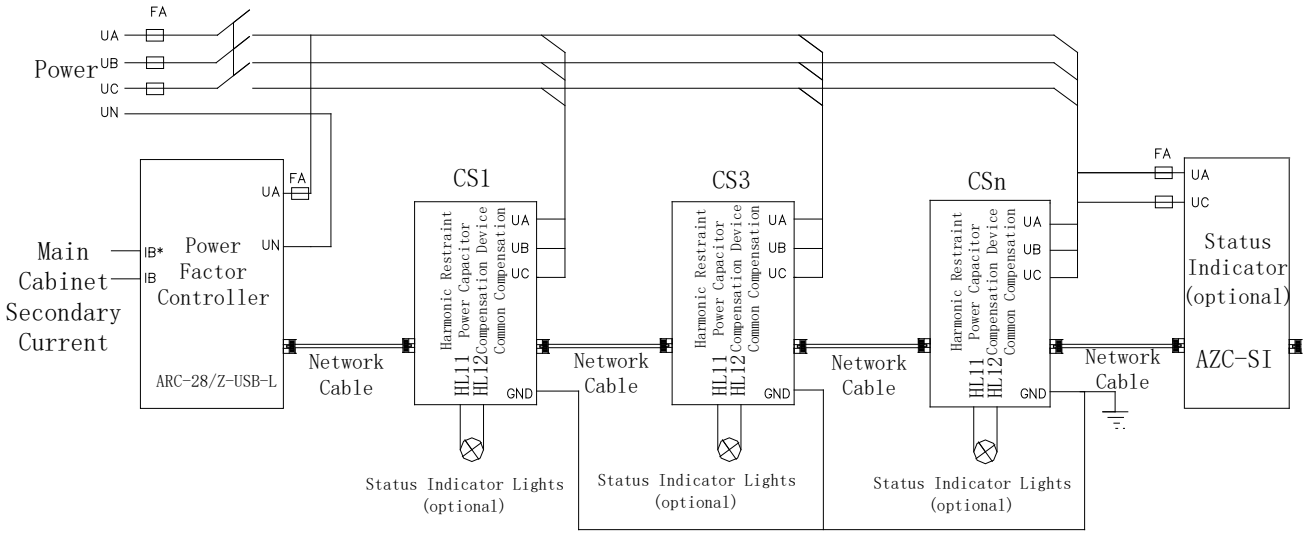
The output terminal has two RJ45 network interfaces. Take over any one to the RJ45 port of intelligent capacitor; 485 interface to a computer.

5.3.2 Example diagram of reactive power compensation output wiring

Separate compensation wiring diagram:



Common compensation wiring diagram:



NOTE:

①The corresponding relationship between voltage and current during installation, phase sequence and the same name must be correct.

②Before power transmission, we must check in detail whether the connection is correct, whether the connection is wrong, leakage or short circuit, whether the contact point is firm, and note the variable ratio of the installed CT;

③To check whether the CT variable ratio, configuration capacity and controller display is consistent, if not, please modify the controller CT variable ratio, capacity settings. (Very important)

6 Operating instruction

6.1 Panel and key instruction

6.1.1 LCD panel working state indicator diagram

6.1.2 Key Description

①“ESC”Key: Exit the current state and return to the main menu.

②“↑”Key: Each press the value of the corresponding increase or decrease.

③“→”Key: Move the cursor or menu left and right.

④“↵”Key: Confirm the settings.

⑤“SEL”Key: Mode selection key.

⑥C3-C26: Capacitor switching corresponding indicator lamp.

6.2 Operating method

Before starting operation, please check in turn whether the wiring is correct, whether it is grounded, whether there is a short circuit between the terminals, whether the terminals, screws and so on are loose; then send electricity to the controller.

The main menu is as follows:

Power Parameters
Control Parameters
System Information

Power parameters: real-time display of power grid parameters. Including: integrated parameters (voltage, current, power factor, number of networking capacitor), power, electricity, compensation, distortion, harmonic submenu.

Control parameters: Set various configuration parameters of terminal. Including: system, compensation, communication, acquisition, recording, clock and other submenu.

System information: Display the controller's current manufacturer information.

6.2.1 Power Parameters menu

Common compensation panel

Composite
Power
Compensation
Harmonic

Separate compensation panel

Composite
Power
Test

Compensation
Distortion
Harmonic

Press "ESC" key to return to the previous level menu; press "↑", "→" key to select the menu up and down, left and right; press“↵” key to confirm the settings made.

6.2.2 Composite

6.2.2.1 Common compensation panel

PF	1.00	THDu	0.23%
U	220.2	THDi	0.79%
I	50.73	FREQ	50Hz

Number of networking capacitors: 00

PF: phase power factor; V: phase voltage; I: phase current; power grid frequency; THDu: voltage distortion rate; THDi: current distortion rate; number of network capacitors: the number of current system network capacitors; press "ESC" key to return to the previous level menu.

6.2.2.2 Separate compensation panel

	PF	U	I
A	1.00	220.1	0.000
B	1.00	220.2	0.000
C	1.00	220.3	0.000

Number of networking capacitors

PF: A, B, C phase power factor; U: A, B, C phase voltage; I: A, B, C phase current; number of networking capacitors; press “ESC” key to return to the previous level menu.

6.2.3 PF

A	8.81KW	11.02KVA
B	8.81KW	11.02KVA
C	8.81KW	11.02KVA
T	26.35KW	32.97KVA
A	6.81KVar	
B	6.82KVar	
C	6.83KVar	
T	19.84KVar	

2	1
3	4

Three-phase active power, three-phase reactive power, three-phase apparent power, power quadrant diagram; press "ESC" key to return to the previous level menu.

6.2.4 Test

Common compensation Separate compensation

Press ESC" to return to the previous level menu; press “↵”to confirm the settings.

Common compensation panel:

C03 C04 C05 C06 C07 C08
C09 C10 C11 C12 C13 C14

C03•••C28: The number of capacitor addresses in the network, select a capacitor address and press the “↵” key to carry out virtual switching operation of capacitor. (Capacitor with machine doesn’t switch truly, but the corresponding switch indicator light will be on.)

Press the “↑”, “→” keys to select the capacitor loop to be switched on; press the “ESC” key to return to the previous level menu.

Separate compensation panel:

C03 C04 C05 C06 C07 C08
C09 C10 C11 C12 C13 C14

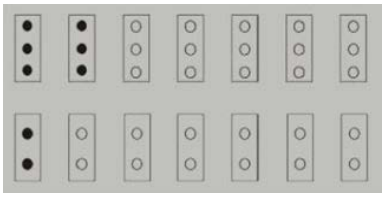
C03•••C28: The number of capacitor addresses in the network, select a capacitor address and press the "↵"key to carry out virtual switching operation of capacitor. (f Capacitor with machine doesn't switch truly, but the corresponding switch indicator light will be on.)

Press "↑", "→" key, select the capacitor loop to be switched on; press "ESC" key to return to the previous lever menu.

6.2.5 Compensation

Automatic Manual

6.2.5.1 Automatic compensation:



A solid circle represents a capacitor input, and a hollow circle represents a capacitor excision; press the ESC" key to return to the previous level menu.

6.2.5.2 Manual compensation:

C03 C04 C05 C06 C07 C08
C09 C10 C11 C12 C13 C14

C03•••C28: The number of capacitor addresses in the network, select a capacitor address and press the "↵" key to switch the capacitor.

Press the"↑", "→" keys to select the capacitor loop to be switched on; press the ESC" key to return to the previous layer menu.

6.2.6 Distortion:

	ThDu	THDi
A	0.21%	0.00%
B	0.31%	0.00%
C	0.07%	0.00%

A, B, C phase voltage total distortion rate; A, B, C phase current total distortion rate; press "ESC" key to return to the previous menu.

6.2.7 Harmonic

6.2.7.1 Common compensation harmonic panel display

	THDu(%)	THDi(%)
03	0.43	0.53
05	0.99	0.81
07	0.66	0.62
09	0.29	0.50
11	0.38	0.69

Three-phase voltage harmonic rate; three-phase current harmonic rate;

Press "ESC" key to return to the previous layer menu, press "↑", "→" button for the number of harmonics (voltage/current harmonics) up and down selection.

6.2.7.2 Separate compensation harmonic panel display

THDu(%)

	A	B	C
03	0.43	0.53	0.76
05	0.99	0.81	0.91
07	0.66	0.62	0.89
09	0.29	0.50	0.41
11	0.38	0.69	0.58

A, B, C phase voltage harmonic content rate; A, B, C phase current harmonic content rate;

Press "ESC" key to return to the previous layer menu, press "↑", "→" key for harmonic number (voltage/current harmonic) up and down selection.

6.3 Parameters setting

Select the "control parameter" in the main menu, press the "↵" key and display "please enter the user password ". When you enter the correct 5-bit password, you can enter the parameter setting, otherwise you will display" password error "(factory default value is 00001).

User input password
00000

Press "↑", "→" key, can increase, reduce the number ; long press "↑", "→", can quickly add and subtract the number key; press "↵" key to confirm the number input.

When the password is entered correctly, enter the parameter settings menu:

Common compensation panel

System
Compensation
Communication

Separate compensation panel

System Collection
Compensation Record
Communication Clock

The parameter settings menu is as follows:

Parameter Attribute	Menu	Span	Parameter Function	Note
System	User Password	00000~99999	As a protective means of controlling parameters, when users need to modify parameter settings, they must enter 5 digits consistent with the system to enter the parameter modification menu. Factory setting: 00001	
	Backlight Delay	000s~999s	Set backlight turn-off time, user operation any key backlight open. After waiting for the time set by the user, the backlight is automatically turned off. When set to 000, the surface backlight	

			remains on.	
	Work Mode	3P4L&3P3L	Work mode selection, different working modes, wiring is also inconsistent. Factory setting: 3P4L	
	Region Code	0000~9999	Terminal area code set, factory setting is 1234	
	Terminal Address	000000-999999	Terminal address setting, factory setting is 000002	
	Recovery Settings	Y/N	Factory set to N	This setting is prudent.
Compensate	Mode of Operation	Auto Net	Operation mode of reactive power compensation: Automatic Auto: operation mode, reactive power compensation automatic execution Net: server control mode. Factory set as: Auto	
	CT Ratio	0000~9999	EX.500/5 is set to 100, factory setting is 100	
	Power Factor	0.80~1.00	The target power factor is set. When the power factor of the power network is lower than this value, the terminal will make the power factor of the power network reach the target value range. Set to 0.94	This value is set according to the actual situation on the spot
	Cut off Kvar	00.0~99.9	Usually set to 000.0, that is, no overcompensation is allowed. factory setting 0	
	Output Delay	000s~999s	The terminal detects the delay between the start of the power capacitor and the actual power capacitor switching instruction. Factory setting: 10 s	
	Cutoff Delay	000s~999s	Refers to the time between the removal of the same set of capacitors and another input. Factory setting: 60s	This time should not be too short
	Number of Capacitors	0~28	Network number set, factory setting: 20	

	Pressure Loss Set	000~999V	When under voltage, the controller is removed at a speed of 0.5 seconds. There is no return voltage after under voltage, so long as the voltage is higher than the under voltage value, it is immediately re-entered. Factory setting: 180V	
	Overpressure Setting	000~999V	When overvoltage, the capacitor is removed at a speed of 0.5 seconds. After overvoltage, the voltage will only be re-entered if it reaches 5V, below the overvoltage value (5V is the return voltage). Factory setting: 265V	
	Voltage Distortion	00.0%~99.9%	When the total voltage distortion rate is greater than the set value, the capacitor is removed at a speed of 0.5 seconds, and only when the distortion rate is within the set value will it be re-entered. Factory setting: 20%	
	Current Distortion	00.0%~99.9%	When the total distortion rate of the current is greater than the set value, the capacitor is removed at a speed of 0.5 seconds, and only when the distortion rate is within the set value will it be re-entered. Factory setting: 20%	
Communication	Baud Rate	1200, 4800, 9600, 19200, 38400, 195200	Communication baud rate set, Factory setting: 38400	
	Check Bit	NONE(No check bit) ODD(ODD check bit） EVEN(EVEN check bit）	Check bit setting, factory setting: NONE(no check bit)	
	Stop Bit	1bit 2bit	Stop bit setting, factory setting: 1 bit	
	Communication Mode	485	485: RS 485 communication	
Collection	Storage U Disk	Y/N	Choose whether to use the U disk to collect data. Factory setting: N	
	Storage Zero	Y/N	Select whether to clear the storage. Factory setting: N	

Records	Voltage Upper Limit	0-999V	Set the voltage overrun threshold for counting the voltage overrun time. Factory setting: 260V	
	Lower Limit Voltage	0-999V	Set the voltage limit threshold for counting the voltage limit time. Factory setting: 180V	
	Current Upper Limit	0-999A	Set the current overrun threshold for counting the current overrun time. Factory setting: 110A	
	Harmonic Upper Limit	1~99%	It is used to calculate the maximum time of total harmonic of voltage and current. Factory setting: 20%	
	Temperature Upper Limit	0~99 ℃	Set the environmental temperature over the upper limit threshold for statistics of the environmental temperature over the upper limit time. Factory setting: 80 ℃	
	Temperature Lower Limit	0~99 ℃	Set the threshold of ambient temperature over the lower limit for statistics of ambient temperature over the lower limit time. Factory setting: 10℃	
	Upper Load Limit	20~130%	Set the load rate upper limit threshold to count the load rate over the upper limit time. Factory setting: 100 %	
	Lower Load Limit	1~100%	Set the load rate lower limit threshold to count the load rate over the lower limit time. Factory setting: 099%	
	Balance Cap	1~15%	Set the balance upper limit threshold for statistical balance upper limit time. Factory setting: 15%	
	COS Upper Limit	0.00~1.00	The upper limit threshold of power factor is set to calculate the upper limit time of power factor. Factory setting: 0.19	
	COS Lower Limit	0.00~1.00	Set the lower limit threshold of power factor for statistics of power factor over the lower limit time. Factory setting: 0.10	
	COS Interval 1	00~99min	When all capacitors are cut, the	

			power factor of the power network is higher than the target value and is capacitive reactive power. When the maintenance time of this condition exceeds this value, it is judged that overcompensation occurs.	
	COS Interval 2	00~99min	When all capacitors are put into operation, the power factor of the power network is lower than the target value and is inductive reactive power. When the maintenance time of this condition exceeds this value, the under compensation occurs.	
	Memory Time	000~999min	Set the storage interval for curve recording data. Factory setting: 15 min	
	Electricity to Zero	Y/N	Electric energy return to zero setting item, when Y, all electrical energy zero.	This setting is prudent
Clock		0000~9999	Can modify the current year, month, day timely, minutes, seconds, after the modification press the ENT key, the clock automatically saved.	

6.4 System Information View

```
Hardver：A001
Softver：S002
Sn：201412010001
Edition：1.0.0.1
```

Hardver: hardware version; Softver: software version; Sn: product serial number; Edition: version

6.5 Restoration of factory settings

Under the main menu long press "↑" key, enter the recovery factory settings, press "↵" key to confirm the recovery factory value. Be careful!)

7 Random attachments, maintenance and attention

7.1 Random annexes

This device random accessories instructions, please check after the user open the box, if there is any discrepancy can contact the manufacturer.

7.2 Transport and storage

①Transport and handling should not be severely impacted.

②Storage ambient temperature is -25-70℃, relative humidity is not more than 85, no corrosive gas in the air.

7.3 maintenance

During the operation of the device, observe the working state regularly. If there is any abnormal situation, please stop and check immediately, or contact the manufacturer.

7.4 Matters need attention

①This device is strictly prohibited for non-electricians to operate and use.

②Before installation and use, the pre-connected grid voltage should be measured, strictly in accordance with the requirements of power management.

③Maintenance, must first power failure, and so on connected capacitors discharge before carrying out.

8 Ordering instruction

1. Please specify the product model name, quantity.
2. Supply address and time.
3. Please explain special requirements in advance.

1 General

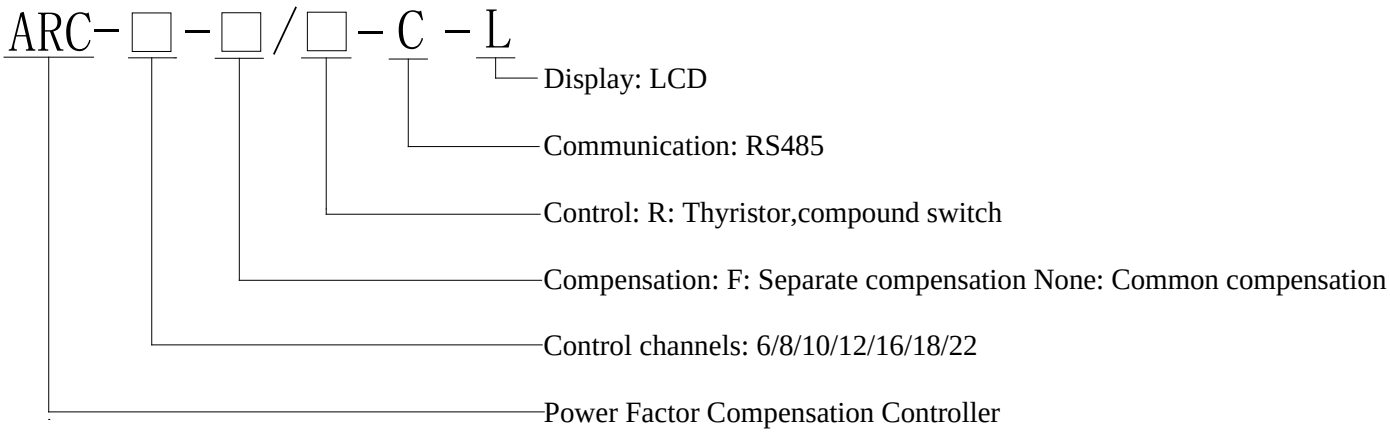
ARC LCD power factor automatic compensation controller adopts high performance MCU as the core and high precision electric quantity special chip. It is a compensator with reactive power as the sampling physical quantity. The controller can operate reliably in any harsh power grid environment such as large harmonic, non-sinusoidal current, strong interference and so on. The advanced and unique adaptive function ensures the safety of the power capacitor, realizes the automatic and stable switching of the capacitor compensation cabinet, and effectively improves the power factor of the power grid. It is an ideal choice for the low voltage distribution system to compensate the reactive power controller.

2 Operating standard

JB/T 9663-2013 Low Voltage Reactive Power Automatic Compensation Controller.

3 Model specification

With communication C (R-C-L Type):



No Communication C (J(R)-L Type):

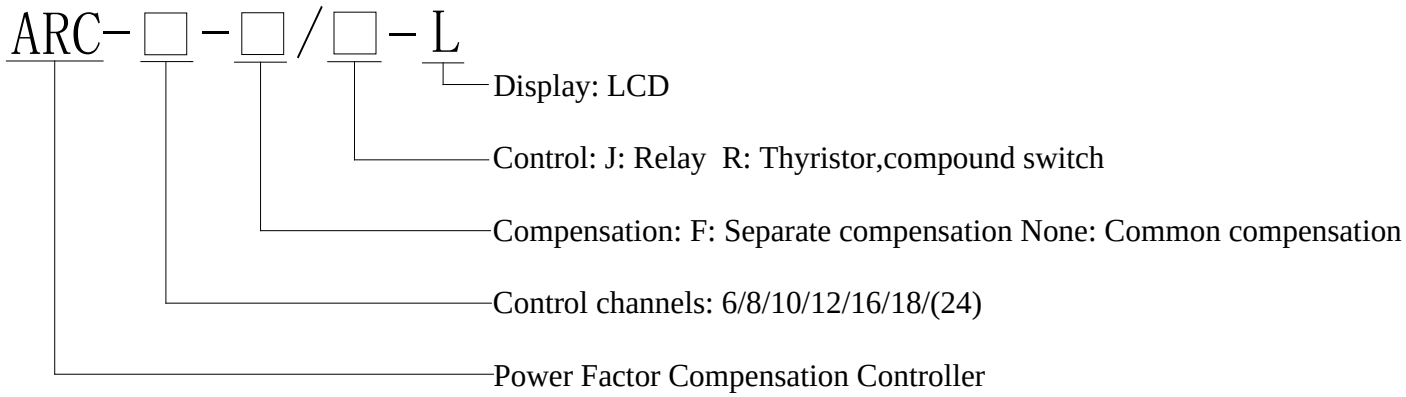


Table 1 Model Description

Communication	Product Model	Method of Compensation	Switch Type
With Communication （C）	ARC-6（8, 10, 12, 16, 18, 22）F/R-C-L	Separate compensation	Thyristor, composite switch
	ARC-6（8, 10, 12, 16, 18, 22）/R-C-L	Common compensation	

No Communication(C)	ARC-6（8, 10, 12, 16, 18, 24）F/R-L	Separate compensation	Thyristor, composite switch
	ARC-6（8, 10, 12, 16, 18, 24）/R-L	Common compensation	
	ARC-6（8, 10, 12, 16, 18）F/J-L	Separate compensation	contactor
	ARC-6（8, 10, 12, 16, 18）/J-L	Common compensation	

Note: when the controller is controlled by contactor, the maximum number of control paths is 18.

Table 2 Functional overview

Product Model	Basic Functions, Characteristics
ARC-××/×××	● large screen color LCD, Chinese display, graphical interface and menu operation and settings, data hold when power is lost; ● can display the voltage, current, power factor, reactive power, active power of the power network; can display the content of each harmonic; display the running state of the capacitor and the capacitor bank that can be put into operation, and display the on-off state of each capacitor bank; ● can be equal capacity cast cut, but also according to the proportion of cast cut; ● with automatic control, manual operation and other working methods; for the same capacity capacitor, according to the reactive power capacity to determine the switching, according to the number of times to select the number of capacitor balanced switching; ● when the power grid voltage is too high or too low, automatically remove the capacitor alarm and lock, after the fault can automatically resume work; ● Device has a variety of protection functions, such as power on protection, power off protection, overvoltage protection, under voltage protection, undercurrent protection, harmonic over-limit protection and so on. ● Each output capacity is programmable.

4 Technical parameters

4.1 Basic parameter

Working voltage: AC 220V±20%; 50Hz±10%

Sampling voltage: AC three-phase four-wire 220V±20%, 50Hz±10%

Sampling current: AC three-phase 0-5 A

Output number:≤22 channel(use contactor up to 18 channel, no communication up to 24 channel)

Local power consumption: VA≤12

Measuring sensitivity: 100mA

Measurement accuracy: Voltage: 1.0 current: 1.0 power factor: 0.5 active power: 1.0 reactive power: 2.5 Frequency: 0.1

Dimensions: 144 mm*144mm*92mm

Installation and Hole Size: 138 mm*138mm

4.2 Working conditions

Ambient temperature: -25℃ to 65℃

Altitude: m≤2000

Relative humidity: 40℃, 20-90%

Atmospheric pressure: 79.5-106.0Kpa

Environmental conditions: no conductive dust Egypt corrosive gas, no flammable and explosive medium.

4.3 Technical features

- control physical quantity: reactive power, small load does not produce switching oscillation;
- coding switching function: can achieve cyclic switching and a variety of coding methods;
- Full three-phase compensation, full-phase compensation, three-phase and split-phase compensation

5 Installation & wiring

5.1 Installation schematic

Step 1: As shown, gently push the controller into the open-hole instrument cabinet panel.

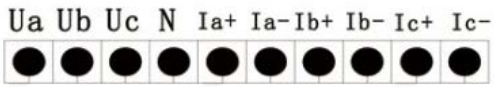
Step 2: As shown, clip the fixture into the slot on the side of the controller.

Step 3: Tighten the screws on the fastener clockwise with a screwdriver until the controller is firmly installed.

5.2 Wiring

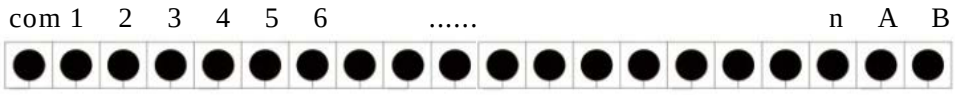
5.2.1 Output port definition

Separate compensation signal sampling terminal definition:



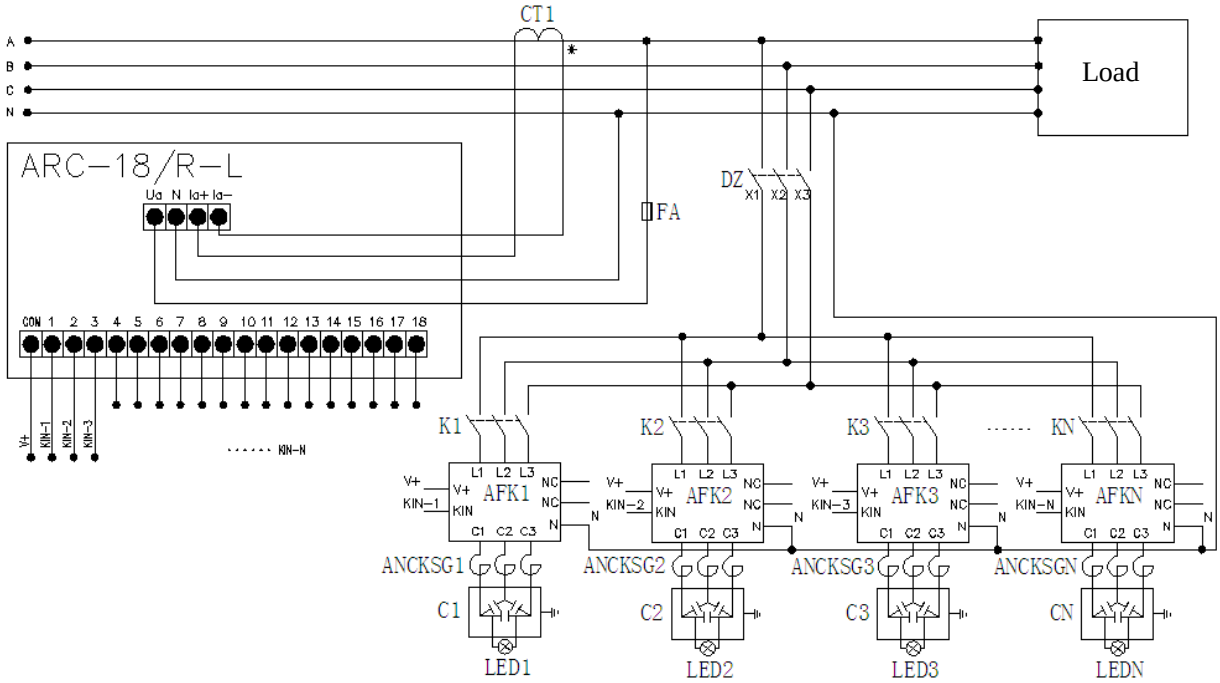
Common compensation signal sampling terminal definition

Switching output and communication terminal (communication terminal only R-C-L configuration):

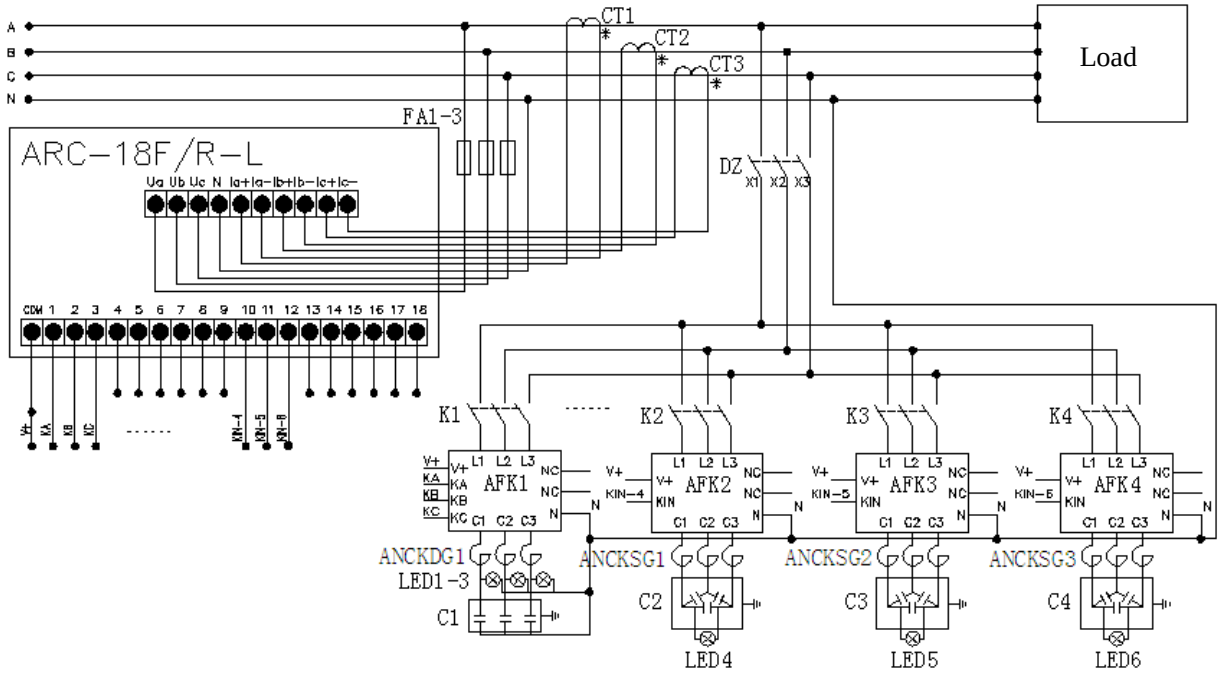


5.2.2 Example diagram of reactive power compensation output wiring

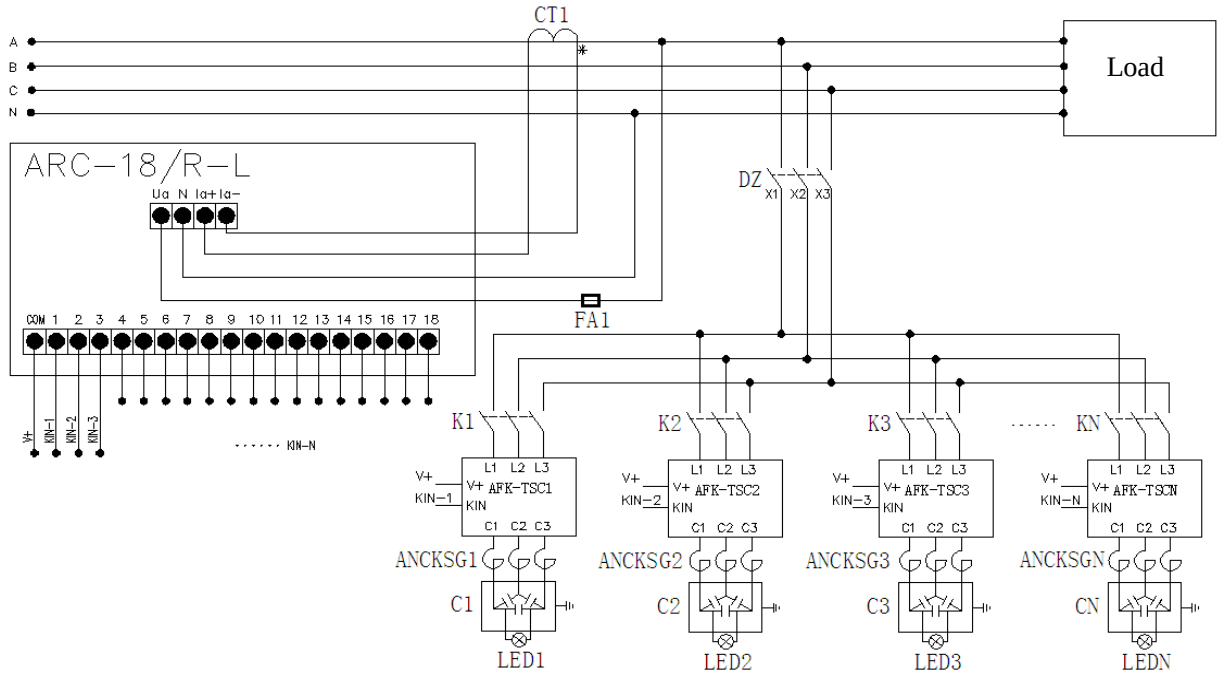
5.2.2.1 Common compensation wiring diagram with compound switch



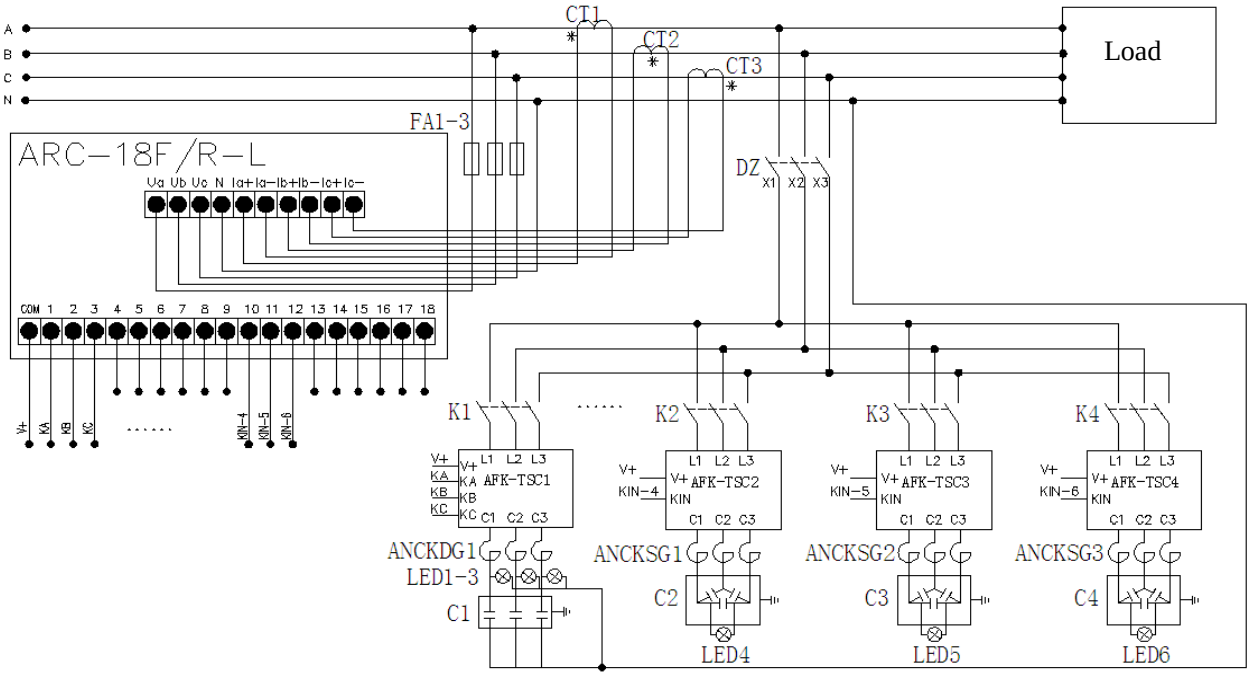
5.2.2.2 Separate compensation wiring diagram with compound switch



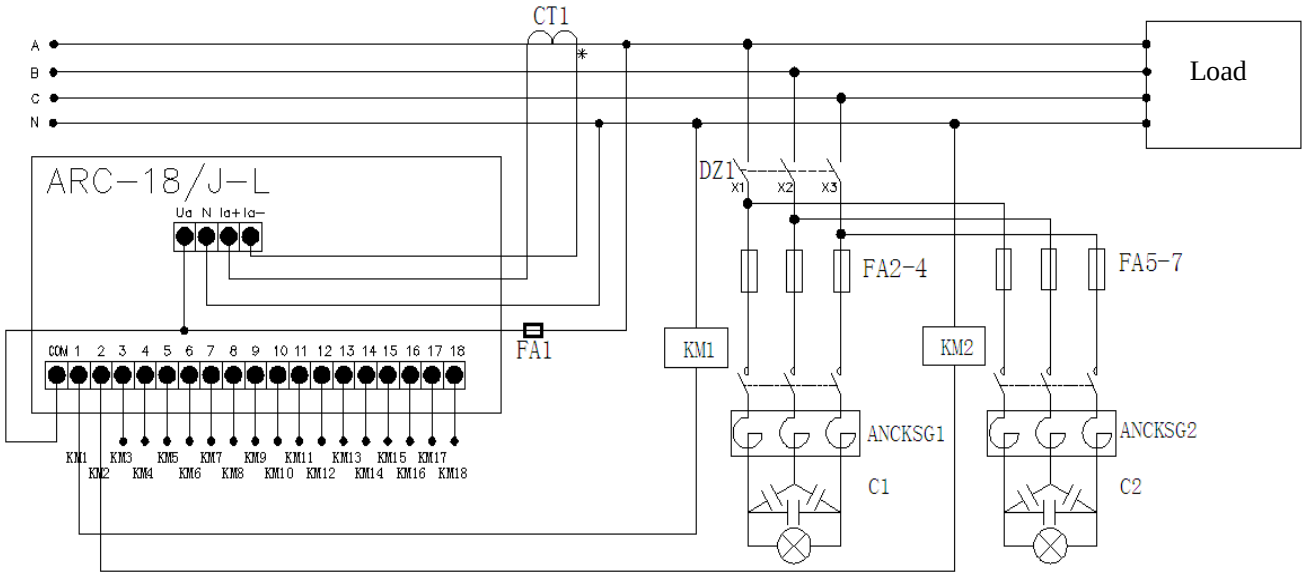
5.2.2.3 Common compensation wiring diagram with gate switch



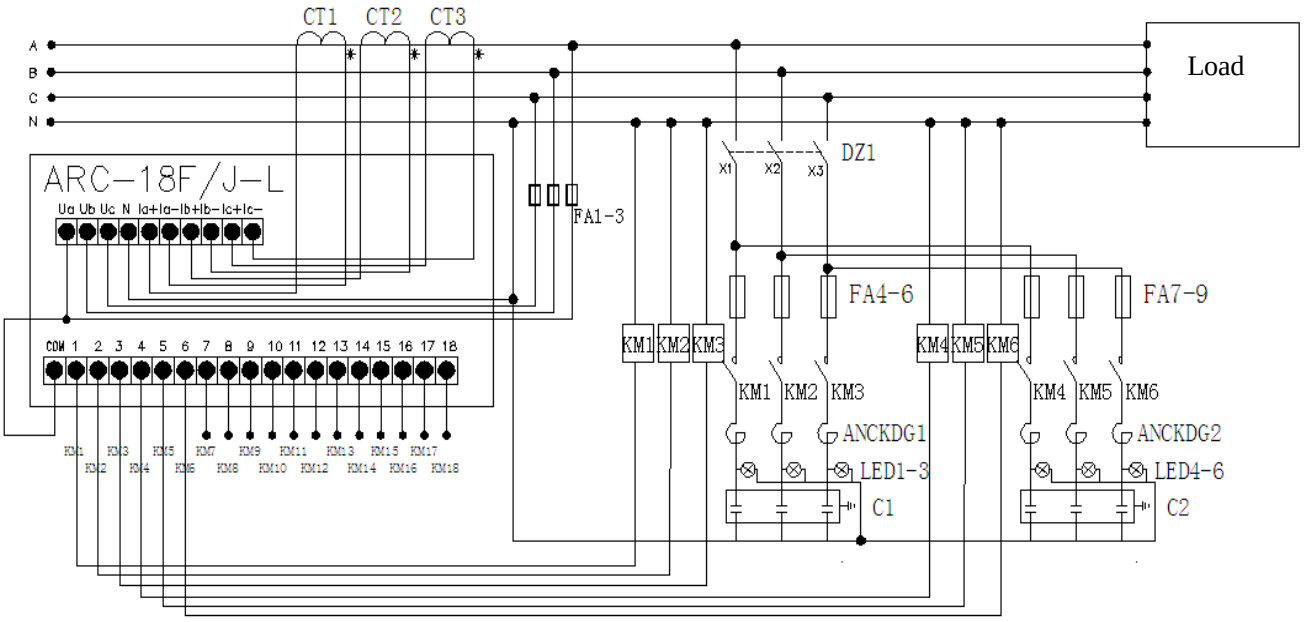
5.2.2.4 Separate compensation wiring diagram with gate switch



5.2.2.5 Common compensation wiring diagram with special contactor



5.2.2.6 Separate compensation wiring diagram with special contactor



6 Operational instruction (Type R-C-L)

6.1 Display panel

6.2 Method of operation

Before starting operation, please check in turn whether the wiring is correct, whether it is grounded, whether there is a short circuit between the terminals, whether the terminals, screws and so on are loose; then send electricity to the controller.

The main menu is as follows:

Power Parameters
Control Parameters
System Information

Power parameters: real-time display of power grid parameters. Including: integrated parameters (voltage, current, power factor, network capacitor), power, electricity, compensation, distortion, harmonic submenu.

Control parameters: terminal configuration parameters can be set. Including: system, compensation, communication, acquisition, recording, clock and other submenu.

System information: display the controller's current manufacturer information.

6.2.1 Power Parameters menu

Composite	Compensation
Power	Distortion
Test	Harmonic

Press "ESC" key to return to the previous menu; press "↑", "→" key select the menu up and down, left and right; press "↵"to confirm the settings made.

6.2.2 Composite

6.2.2.1 Common compensation panel

PF	1.00	THDu	0.23%
U	220.2	THDi	0.79%
I	50.73	FREQ	50Hz

Number of networking capacitor: 00

PF: phase power factor; V: phase voltage; I: phase current; FREQ: grid frequency; THDu: voltage distortion rate; THDi: current distortion rate; input capacitor: current system input capacitor; press "ESC" key to return to the previous menu.

6.2.2.2 Separate compensation panel

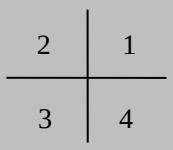
	PF	U	I
A	1.00	220.1	0.000
B	1.00	220.2	0.000
C	1.00	220.3	0.000

Number of networking capacitor

PF: A, B, C phase power factor; U: A, B, C phase voltage; I: A, B, C phase current; number of input capacitors; press ESC" key to return to the previous menu.

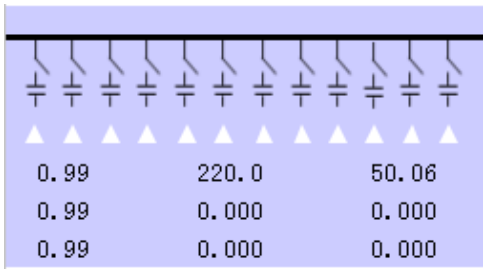
6.2.3 Power factor

A	8.81KW	11.02KVA
B	8.81KW	11.02KVA
C	8.81KW	11.02KVA
T	26.35KW	32.97KVA
A	6.81KVar	
B	6.82KVar	
C	6.83KVar	
T	19.84KVar	



Three-phase active power, three-phase reactive power, three-phase apparent power, power quadrant diagram; press "ESC" key to return to the previous layer menu.

6.2.4 Test



Press "↑" cursor to the left, press "→" key cursor to the right, select the capacitor circuit to be cut; press "↵"key to switch capacitor operation;

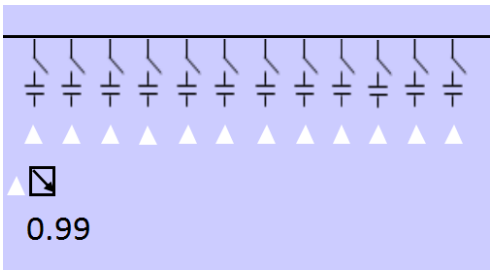
Press ESC" to return to the previous menu.

6.2.5 Compensation

Automatic Manual

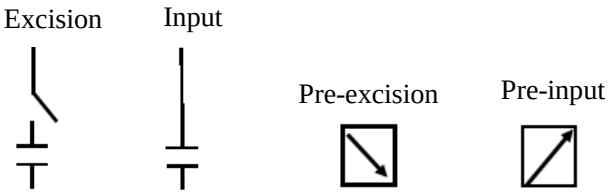
Click the "↵" button to select automatic / manual to enter the capacitive switching interface:

Automatic compensation



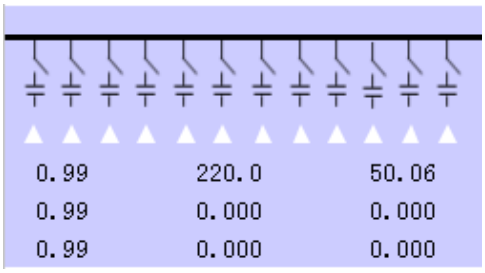
In automatic mode, the controller switches the capacitor according to the real-time power factor.

Symbol:



Press ESC" to return to the previous level menu.

Manual compensation



Press "↑" cursor to the left, press "→" key cursor to the right, select the capacitor circuit to be cut; press "↵" key to switch capacitor operation; press "ESC" key to return to the previous level menu.

6.2.6 Distortion:

	ThDu	THDi
A	0.21%	0.00%
B	0.31%	0.00%
C	0.07%	0.00%

A, B, C phase voltage total distortion rate; A, B, C phase current total distortion rate; press "ESC" key to return to the previous level menu.

6.2.7 Harmonic

6.2.7.1 Common compensation harmonic panel display

	THDu(%)	THDi(%)
03	0.43	0.53
05	0.99	0.81
07	0.66	0.62
09	0.29	0.50
11	0.38	0.69

Three-phase voltage harmonic rate; three-phase current harmonic rate;

Press "ESC" key to return to the previous layer menu, press "↑", "→" button for the number of harmonics

(voltage/current harmonics) up and down selection.

6.2.7.2 Separate compensation harmonic panel display

THDu(%)			
	A	B	C
03	0.43	0.53	0.76
05	0.99	0.81	0.91
07	0.66	0.62	0.89
09	0.29	0.50	0.41
11	0.38	0.69	0.58

A, B, C phase voltage harmonic content rate; A, B, C phase current harmonic content rate;

Press "ESC" key to return to the previous layer menu, press "↑", "→" key to select the number of harmonics (voltage/current harmonics) up and down (up to 21 harmonics) up and down.

6.3 Control parameters

Select the "control parameter" in the main menu, press the "↵"key and display "please enter the user password ". When you enter the correct 5-bit password, you can enter the parameter setting, otherwise you will display" password error "(factory default value is : 00001).

User input password
00000

Press "↑", "→" key, can increase, reduce the number; long press "↑", "→", can quickly add and subtract the number key; press "↵" key to confirm the number input.

When the password is entered correctly, enter the control parameter menu:

System Setting
Compensation Setting
Capacitor Parameters

6.3.1 System setting

Select system Settings in Control parameters and press "↵" to enter the system Settings menu:

CT Ratio	0100
User Password	00001
Backlight Delay	099Sec
Terminal Address	02

Press ESC" to return to the previous layer menu, press "↑", "→"to change.

6.3.2 Compensation setting

Select Compensation Settings in Control parameters and press "↵"to enter the compensation Settings menu:

Power Factor	0.940
Excision Kvar	0.00
Output Delay	099Sec
Excision Delay	040s

Three-phase Road Number	18
Under Voltage Setting	180V
Over Voltage Setting	265V
Voltage Distortion	20.0%

Press "ESC" key to return to the previous menu, press "↑", "→" to page and corresponding compensation settings.

6.3.3 Capacitor parameters

Select Capacitor Parameters in Control Parameters and press "↵" to enter the Capacitor Parameters menu:

01Road three-phase	020.0
02Road three-phase	020.0
03Road three-phase	020.0
04Road three-phase	020.0

Press "ESC" key to return to the previous menu, press "↑", "→" to page and each compensation loop capacity settings.

6.4 System Information View

```
Hardver：A001
Softver：S002
Sn：201412010001
Edition：1.0.0.1
```

Hardver: hardware version; Softver: software version; Sn: product serial number; Edition: version

Alarm Instructions:

 : Undress voltage icon

 : Over voltage alarm icon

 : Under current alarm icon

 : Harmonic alarm icon

7 Operating instruction (Type J(R)-L)

7.1 Display Panel

7.2 Operating method

Before starting operation, please check whether the wiring is correct, grounding, short circuit between terminals, loosening of terminals, screws, etc. After confirmation, send power to the controller

A. Automatic Mode

After power on, enter the automatic state.

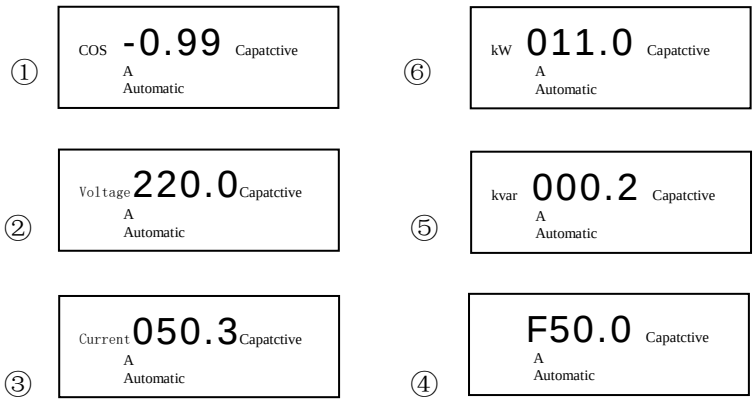
Press the "↑" key to display: a phase of COS; voltage (V); current (A) F (frequency Hz); thousand (reactive power kvar);

kW (active power kw); harmonic content (%).

Perceptual or capacitive: shows the nature of the load.

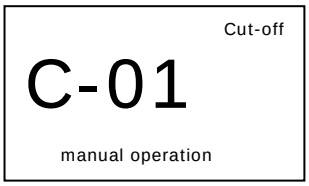
Overvoltage or under voltage: the voltage exceeds the upper or lower limit set and is an alarm state.

Input or excision: the state in which the capacitor is being put into or removed.



B. Manual mode

As shown below:



Press "ESC" key, you can see" automatic "flicker, then press "→" key until" manual "flicker, then press“↵”key, confirm to enter" manual "mode;

Press "↑" key to move all the way to the left, press "→" key to move all the way to the right, press“↵” key input, press “↵”key again to remove;

If the "input" is displayed, the flashing path is already in the input state, then press the “↵”key to remove;

If "resect" is displayed, indicating that the flashing path is in the resected state, then press the“↵” key into;

Press the ESC" key to exit the manual state, when all the input is removed and entered into the automatic state.

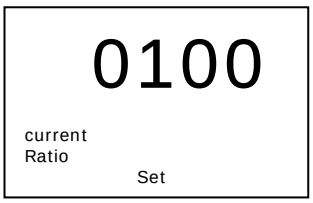
7.3 Parameters setting

Press "ESC"" to see" automatic "flicker, then press "→" key until" set "flicker, then press “↵”key to enter" set "mode, follow the following settings in turn:

7.3.1 Current rate setting

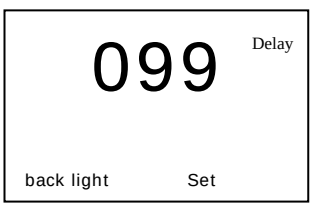
The current rate is the current transformer ratio sampled, first press the "→" key, when the number flashes, then press the "↑" key to gradually set the current rate, press the “↵”key to confirm. (Same settings below)

Factory set to 100/1000/5 set to 200.



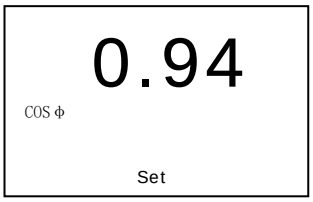
7.3.2 Backlight Delay Setting

The factory is set to 099 seconds.



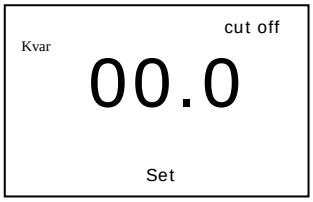
7.3.3 Target Power Factor Setting

The factory is set to 0.94. Set the range to perceptual 0.8-sensitivity 1.0.



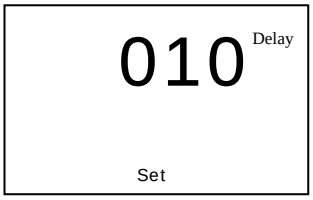
7.3.4 Kvar cut-off

Usually set to 00.0, that is, no overcompensation is allowed.



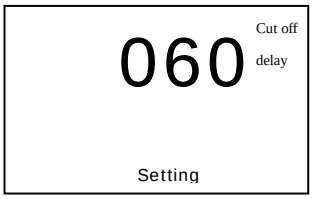
7.3.5 Delay setting

The factory is set to 10 seconds.



7.3.6 Cut off Delay Setting

Namely the repeated switching delay of the same group of capacitors, press "↑" key to gradually set the time of excision delay, press "key to confirm. The factory is set to 60 seconds.



7.3.7 Channel number setting

Press "↑" key to gradually increase the number of roads, the number of roads set will "flicker ", press "→" key number to move one bit to the right, press "↵"key to confirm the number of roads.

The number of ABC phase paths (the number of phase paths, a set of ABC phase divider to set up 3 channels) and the number of three-phase circuits, the maximum number of paths is 18.

When the total complement mode is 1: 1-18, the number of phase paths is set to 0.

Total phase compensation: 1-18 output, at this time, the total number of complementary roads set to 0;

1, 2, 3 is A, B, C phases in the first group;

4, 5, 6 is A, B, C phases in the second group;

.....

16, 17, 18 is the A, B, C phase of the sixth group.

When the three-phase and sub-phase compensation is mixed, the number of paths can be set by the user:

For example, if the number of phased paths is 9(three groups) and the total number of complementary paths is 5,

then:

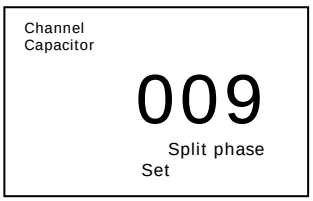
1, 2, 3 channels are the A, B, C phases of the first group;

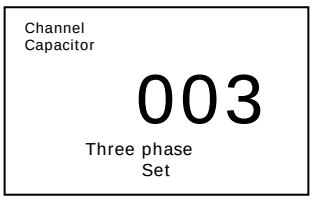
4, 5, 6 channels are the A, B, C phases of the second phase;

7, 8, 9 channels are the A, B, C phase of the third group;

Route 10-14 are three-phase.

Note: the number of output roads must be set according to the actual number of roads on the spot, otherwise it will cause the compensator to work abnormal.





Setting up the number of shunt paths Three-phase circuit number setting

7.3.8 Input Excision Code Setting

That is, coding mode, first press the "→" key, to be encoded beat, then press the "↑" key to gradually set the coding mode, press the "↵" key to confirm.

Coding mode: coding mode 1: 1111 cycle switching mode;

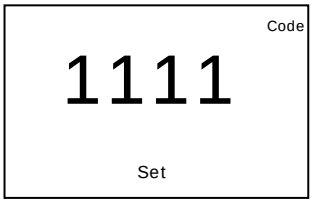
Coding mode 2: 8888 custom capacity mode.

Note : 1, 1111 cycle switching coding mode capacity settings: if the phase capacitor 5 kvar, three-phase capacitor 10 kvar, then all the number of sub-complement corresponding capacitor is 5 kvar, all the common number of complementary corresponding capacity is 10 kvar;

Action steps: in the "1111" coding mode, press the "↵" key to enter the capacitive phase separation setting or capacitive three-phase setting.

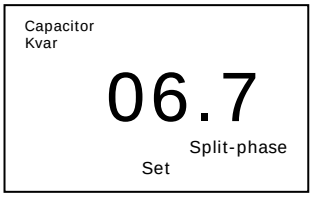
2.8888 Custom capacity coding mode capacity setting: press the "↑" key to enter the settings submenu, the default display 0 means not to enter the settings submenu, press the "↑" key to change 0 to 1 to enter the submenu, you can set the capacitor capacity of each way separately to achieve better compensation effect.

Operation steps: under "8888" coding mode, press "↵"key to select "C——0" phase separation (do not enter submenu), press "→" key , " C——0" phase separation flicker, press "↑" key to jump to" C——1" phase separation, then press "↵" key to enter capacitive phase separation settings; Press "ESC" key jump to" C——0" three-phase, press "→" key , " C——0" three-phase flash, press "↑" key jump to "C——1" three-phase, then press "↵" key to enter capacitor three-phase settings.



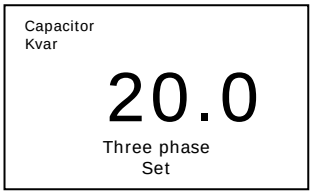
7.3.9 Phase-separated Capacitor Millimeter

Press "↑" key to gradually set a single capacity value, press "OBJ" key to confirm. The factory is set to 6.70.



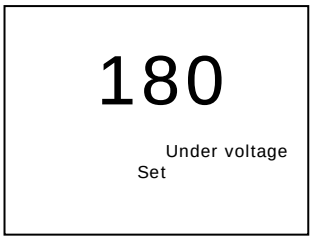
7.3.10 Three-phase Capacitor Thousand-Far

Press "↑" key to gradually set a single thousand capacity value, press "OBJ" key to confirm. The factory is set to 20.0.



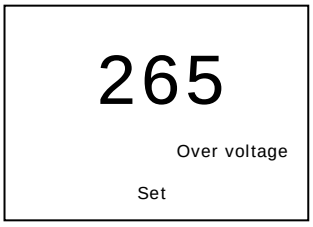
7.3.11 Under pressure setting

Generally set to 180V. When under voltage, the capacitor is removed at a speed of 0.5 seconds; there is no return voltage after under voltage, as long as the voltage is higher than the under voltage value, it is immediately re-entered.



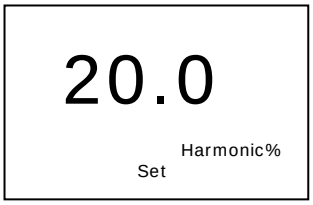
7.3.12 Overpressure setting

Generally set to 265V. When overvoltage, the capacitor is removed at intervals of 0.5 seconds; after overvoltage, the voltage will only be re-entered if it reaches 6V, below the overvoltage value (6V is the return voltage).



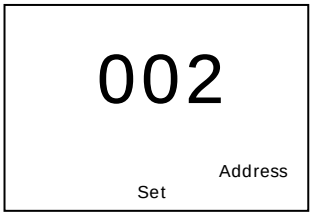
7.3.13 Harmonic

The factory is set to : 20.0%。



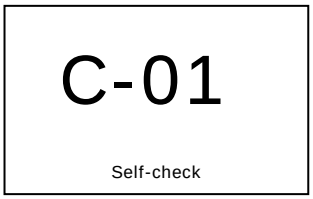
7.3.14 Communication address

Modbus address 02, factory setting: 002.



7.4 State of self-check

Press "esc" key, you can see" automatic "flicker, then press "→" key, until" self-test "flicker, press" key, confirm to enter "self-test" mode. As shown below:



At the self-test mode, the controller automatically circulates and resected every 5 s, which is used in the factory test of capacitor cabinet. The contactor shall not be connected to the capacitor, and the capacitor cabinet shall not enter the self-test state after the actual input, otherwise the capacitor will be damaged.

8 Common Fault Handling

Fault 1: display capacitor after power on, capacitor is not put into operation.

Solution: a, is usually caused by wiring errors, please check that the phase sequence of voltage and current is correct. (see 5 wiring diagrams)

b, there are other capacitive compensation equipment in operation on the power load side, resulting in the load is indeed capacitive load.

Fault 2: after the capacitor is put into operation, the power factor remains unchanged.

Solution: sampling current transformer installation position error, current transformer should be installed in the capacitor cabinet and load "front ", so that the current of the capacitor cabinet can also flow through the current transformer. (see 5 wiring diagrams)

Fault 3: after the capacitor is put into operation, the power factor does not rise and fall.

Solution: a, is usually caused by phase sequence error of wiring, please check that the phase sequence of voltage and current is correct.

b, turn off the capacitor cabinet, the controller power off after re-power.

Fault 4: after the capacitor is put into operation, the current of the capacitor circuit increases abnormally.

Reason: this is usually because there is a large harmonic current and harmonic voltage in the load. When the harmonic current enters the capacitor, it will lead to the increase of the current of the capacitor. At the same time, the capacitor has a negative effect on the harmonic amplification. Cause greater harm.

Solution: a, install anti-harmonic reactor in each capacitor circuit, generally iron core reactor, this way can prevent harmonic current from entering capacitor, at the same time can solve the harm of capacitor amplifying harmonic. This method can compensate the capacitor for normal operation, but it can’t filter the harmonics in the power grid.

b, configuration of harmonic filter device: for the situation where harmonics exceed the standard seriously, the

reactor alone can’t achieve the effect, only the filter device can filter the harmonics, and the filter device itself can compensate for reactive power. And eliminate all kinds of harm caused by harmonics, make power supply quality meet the requirements of national standards.

9 Ordering instruction

1. Please specify the product model name, quantity.
2. Supply address and time.
3. Please explain special requirements in advance.

Headquarters: Acrel Co., LTD.

Address: No.253 Yulv Road Jiading District, Shanghai , China

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Web-site: www.acrel-electric.com
E-mail: ACREL008@vip.163.com
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Manufacturer: Jiangsu Acrel Electrical Manufacturing Co., LTD.
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