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Corporate ID

Offcial website

CNBYG BAOYU HOLDING

Product Selection Manual

BAOYU HOLDING CO.,LTD.

Joint research and development of power quality
at Shanghai Jiao Tong University

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Reactive power compensation and harmonic control

New solution

Product Selection Manual

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Joint research and development of power quality at Shanghai Jiao Tong University

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COMPANY PROFILE

Development strategy: institutional sustainable development strategy, innovative sustainable development strategy, core competition strategy

Business principles: standardized management, continuous innovation, user first, and survival based on quality

Service tenet: Professional, high-quality, fast, and sincere

Baoyu Holdings Co., Ltd. specializes in the production of intelligent fully controlled power quality products such as active power filters, static var generators, intelligent capacitors, power capacitors, reactive power compensators, composite switches, capacitor contactors, thyristor switches, reactors, etc. High quality products have cultivated an international market and are exported to more than ten countries such as Europe, America, Southeast Asia, and the Middle East. The products are widely used in reactive power compensation and harmonic control situations such as factories, petrochemicals, coal mines, metallurgy, ships, airports, solar and wind power generation. It has been operating well in multiple key projects in China for a long time.

The company has a modern mold center and technology research and development center, as well as various advanced intelligent digital testing equipment, and its products have obtained multiple national patents. Jointly established a joint research and development center for power quality with Shanghai Jiao Tong University to conduct product research and technological breakthroughs, dedicated to new solutions for reactive power compensation and harmonic control.

Our technical experts continuously improve design and production processes, pay attention to the latest technological trends and apply them to our products. We have effectively solved the harm of harmonics in the system. We are not only the supplier of products, but also the first choice to provide you with new solutions for reactive power compensation and harmonic control.

COMPANY EQUIPMENT

Quality driven,
innovation driven success

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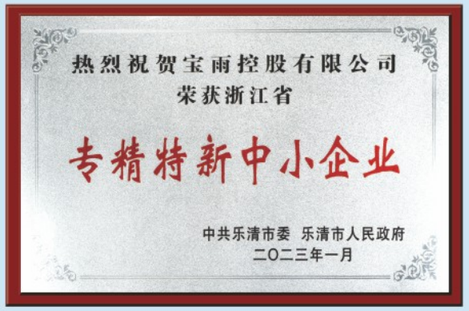
APPLICATION SITE

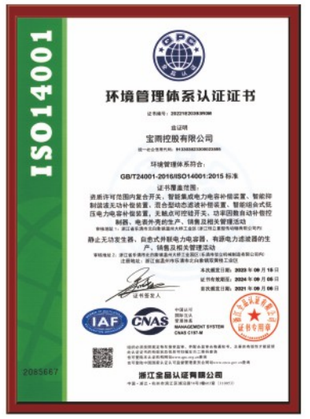
Factory › Petrifaction › Coal Mine › Metallurgy

Wind Power Generation ‹ Solar Energy ‹ Aviation ‹ Vessel

QUALIFICATION CERTIFICATES

The company's quality policy: to establish the company's reputation with high-quality products and satisfactory services; Continuously meeting user requirements is our pursuit.
Company quality goal: 100% customer satisfaction.
Equipped with sophisticated quality testing equipment, it provides precise assurance for the quality of products.





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Registration Certificate for Scientific and Technological Achievements


科学技术成果登记证书


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Utility Model Patent Certificate


实用新型专利证书


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Appearance Design Patent Certificate


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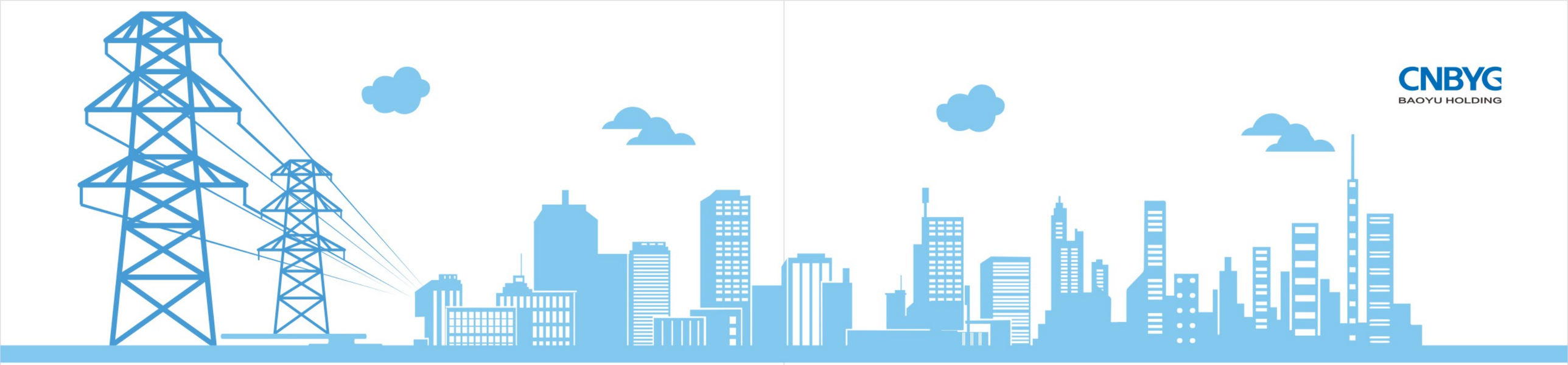
Product Certification Certificate

CQC Product Certification Certificate / Product Inspection Report



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CONTENTS

BY91-APF

Active power filter

Overview

The BY91-APF active power filter can effectively monitor harmonics and extract harmonic currents from them. The device emits inverse harmonic currents through GBT, completely suppressing harmonics at the device connection point, and avoiding greater losses caused by harmonics flowing into circuit breakers or transformers. At the same time, the device can also manage reactive power and three-phase imbalance phenomena, truly achieving intelligent integrated power quality management. BYAPF can effectively filter out 2-50 harmonics.

- Improve the quality of power supply, improve the reliability of equipment operation, and reduce economic losses caused by equipment malfunctions
- Reduce the resonance probability of compensation capacitors and improve electricity safety; Meet the requirements of national standards
- Reduce line heating, reduce insulation aging, and improve electrical safety and reliability
- Reduce electromagnetic interference caused by harmonics and ensure the normal operation of the communication system

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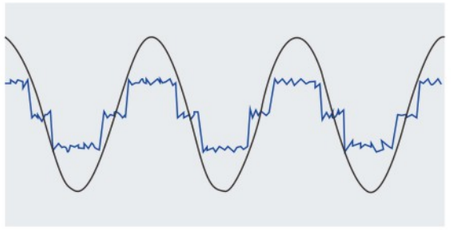
Significance of harmonic control

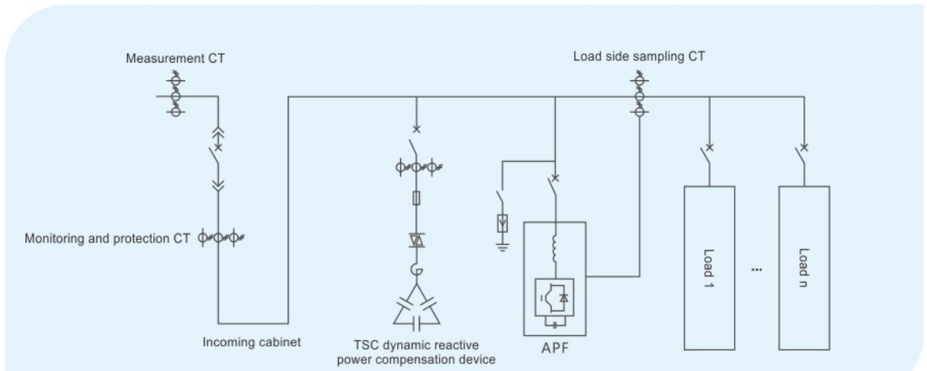


Nonlinear loads generate high-order harmonic currents, leading to distortion and distortion of current waveforms

APF emits harmonic currents of equal magnitude and opposite phase that cancel each other out

APF Centralized Compensation Capacity Selection Query Table

Transformer capacity /KVA	Industry current distortion rate					
	Subways, tunnels, high-speed trains, airports 15%	Communication, commercial construction, metallurgy, banking 20%	Medical industry 25%	Automobile manufacturing and shipbuilding 30%	Chemical, Petroleum 35%	Metallurgical industry 40%
200	50A	50A	100A	100A	100A	100A
250	50A	50A	100A	100A	150A	150A
315	100A	100A	150A	150A	150A	200A
400	100A	100A	150A	200A	200A	250A
500	100A	150A	200A	200A	250A	300A
630	150A	200A	250A	300A	350A	400A
800	200A	250A	300A	350A	450A	500A
1000	200A	300A	400A	450A	550A	600A
1250	300A	350A	450A	550A	650A	750A
1600	350A	500A	600A	700A	850A	850A
2000	450A	600A	750A	900A	1050A	1200A
2500	550A	750A	900A	1500A	1300A	1500A



BY92-SVG

Static reactive power generator

Overview

The BY92-SVG static var generator uses the principle of power electronics to separate the reactive power in the circuit through algorithms, and emits inductive or capacitive currents that are opposite to them, achieving -1~+1 level compensation. At the same time, BYSVG can also control 2-13 harmonics, achieving intelligent power quality control.

- Reduce users' own electricity expenses
- Ensure that the power factor meets the requirements of the power supply department and avoid fines for power regulation fees
- Reduce losses and voltage fluctuations
- Improve the actual utilization rate of power generation equipment and power supply transformers
- Save users the capacity of substation equipment and switchgear, thereby saving construction costs
- Ensure the normal and effective operation of power equipment

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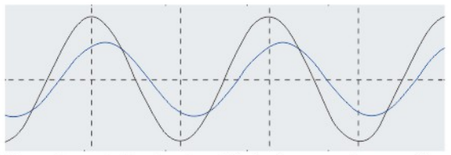
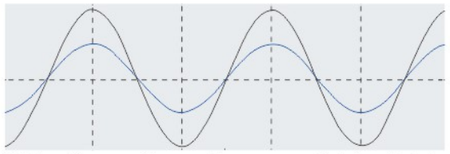
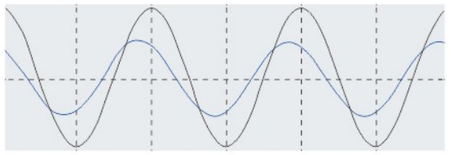
Significance of reactive power compensation



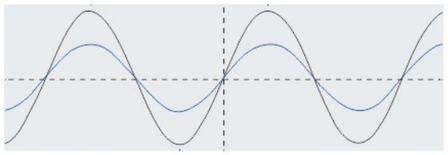
The motor and other loads emit inductive current, generating inductive reactive power, and the current phase lags behind the voltage



SVG emits capacitive reactive power, which is offset by inductive reactive power, and the voltage and current are in phase



Capacitive load emits capacitive current, generates capacitive reactive power, and the current phase leads the voltage



SVG emits inductive reactive power, which is offset by capacitive reactive power, and the voltage and current are in phase

SVG Centralized Compensation Capacity Selection Query Table

Transformer capacity /KVA	Industry current distortion rate					
	Subways, tunnels, high-speed trains, airports 15%	Communication, commercial construction, metallurgy, banking 20%	Medical industry 25%	Automobile manufacturing and shipbuilding 30%	Chemical, Petroleum 35%	Metallurgical industry 40%
200	50kvar	50kvar	50kvar	100kvar	100kvar	100kvar
250	50kvar	100kvar	100kvar	100kvar	100kvar	100kvar
315	100kvar	100kvar	100kvar	100kvar	100kvar	100kvar
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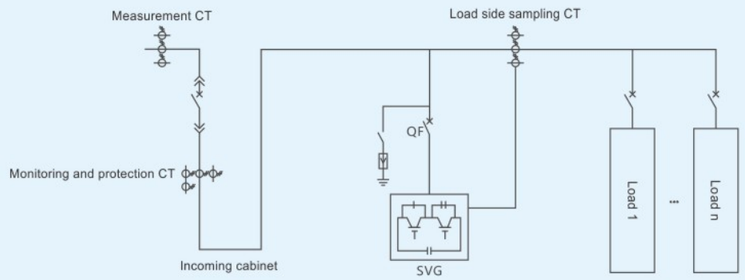
630	150kvar	150kvar	200kvar	200kvar	200kvar	250kvar
800	200kvar	200kvar	250kvar	250kvar	250kvar	300kvar
1000	250kvar	250kvar	300kvar	300kvar	350kvar	350kvar
1250	300kvar	300kvar	350kvar	400kvar	400kvar	450kvar
1600	350kvar	400kvar	450kvar	500kvar	500kvar	550kvar
2000	450kvar	500kvar	550kvar	600kvar	650kvar	700kvar
2500	550kvar	650kvar	700kvar	700kvar	800kvar	900kvar



BY92-SVG

Static reactive power generator (small)

Overview

The Baoyu BY92 series SVG is an ultra-thin and ultra-light power quality management device, with a body thickness of only 88mm and a weight of less than 15kg. It supports plug-in replacement, multi machine parallel operation, or SVG+capacitor parallel operation.

Compensation principle

SVG collects the load current based on CT, extracts the reactive power compensation component through discrete Fourier transform and Parker transform, and generates a current equal in size and opposite in phase to the component to be compensated through the rectifier circuit, compensating the system current to a high-quality current that meets the PF index.

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Main features

Lightweight -- single module 15kg, can be replaced by one person;
Thin -- 2U height, high power density, saving installation space;
Plug and replace -- on-site maintenance supports plug and unplug without the need to remove screws.

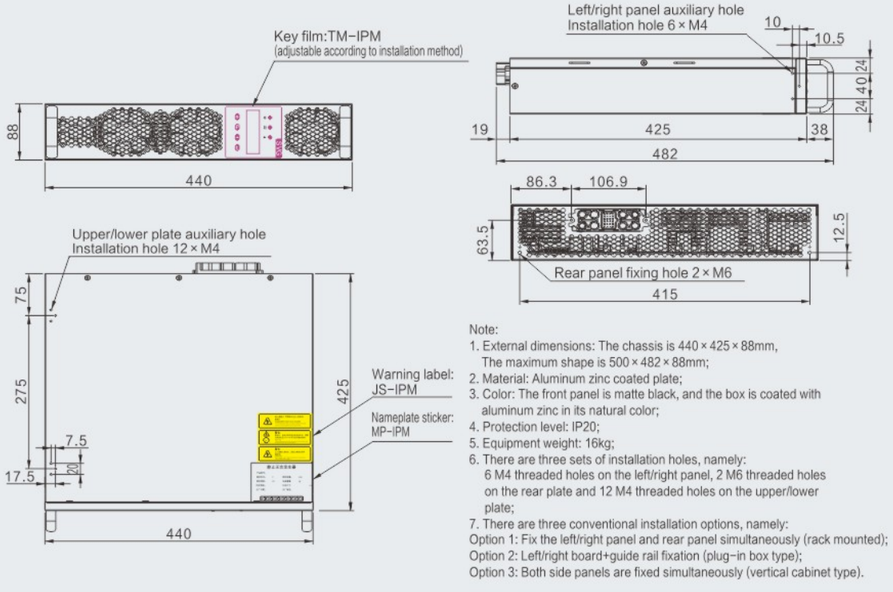
Key Features:
Compensation method -- simultaneous compensation of reactive/unbalanced/N line current, with multiple functions for one machine;
Parallel operation mode -- multiple machines in parallel support network side CT sampling, and support parallel operation with intelligent capacitors;
Debugging method -- supports near-end WiFi communication, facilitating on-site debugging of column mounted devices;
Remote scheduling -- supports remote scheduling of reactive power output.

Advanced software and hardware technology:
Double frequency sampling control -- high current control accuracy and stability;
Two point reactive power calculation -- greatly improving the response speed of reactive power compensation;
Resonant harmonic suppression -- effectively reducing the distortion rate of output current;
Closed loop temperature control -- precise temperature control and load limiting at high temperatures, without capacity waste;
Resonant damping filter -- balancing the power consumption and stability of the filter.

General parameters

Project		Parameter
Module parameters	Module specifications	SVG-30kvar
	Module volume	400×425×88mm
	Overall weight	16kg
Technical indicators	Rated grid voltage	400V
	Grid voltage range	±20%
	Rated grid frequency	50Hz
	Grid frequency range	±5Hz
	switching frequency	≥20kHz
	Module noise	<60dB
	Overall loss	<3%
Environmental requirements	Storage temperature	-25℃~+55℃
	Storage humidity	5%~90%RH
	working temperature	-10℃~+40℃
Communication protocol	RS485 communication	Support
	GPRS backend communication (optional)	Support
	WIFI near end communication (optional)	Support

Introduction to Principles

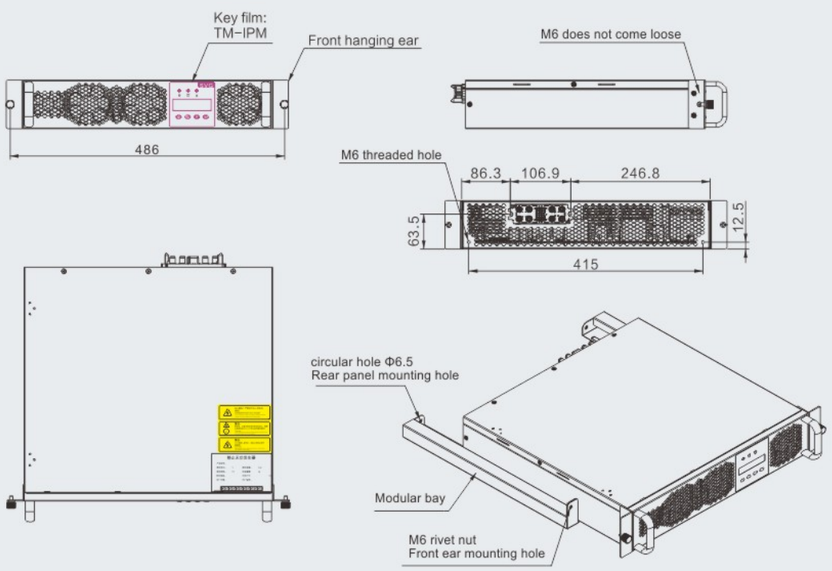


Note:
1. External dimensions: The chassis is 440×425×88mm,
   The maximum shape is 500×482×88mm;
2. Material: Aluminum zinc coated plate;
3. Color: The front panel is matte black, and the box is coated with aluminum zinc in its natural color;
4. Protection level: IP20;
5. Equipment weight: 16kg;
6. There are three sets of installation holes, namely:
   6 M4 threaded holes on the left/right panel, 2 M6 threaded holes on the rear plate and 12 M4 threaded holes on the upper/lower plate;
7. There are three conventional installation options, namely:

Option 1: Fix the left/right panel and rear panel simultaneously (rack mounted);
Option 2: Left/right board+guide rail fixation (plug-in box type);
Option 3: Both side panels are fixed simultaneously (vertical cabinet type).

Installation plan

Rack



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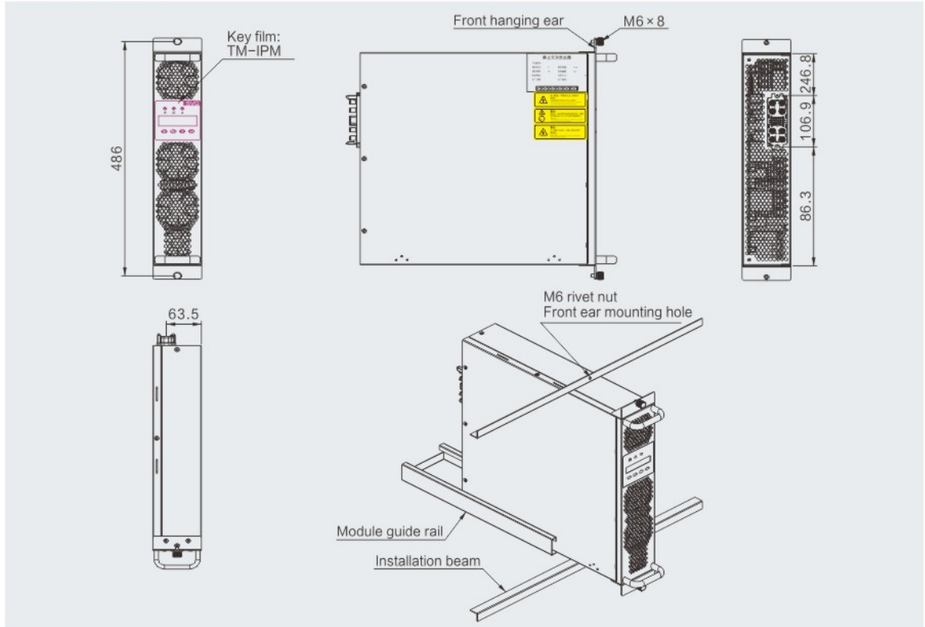
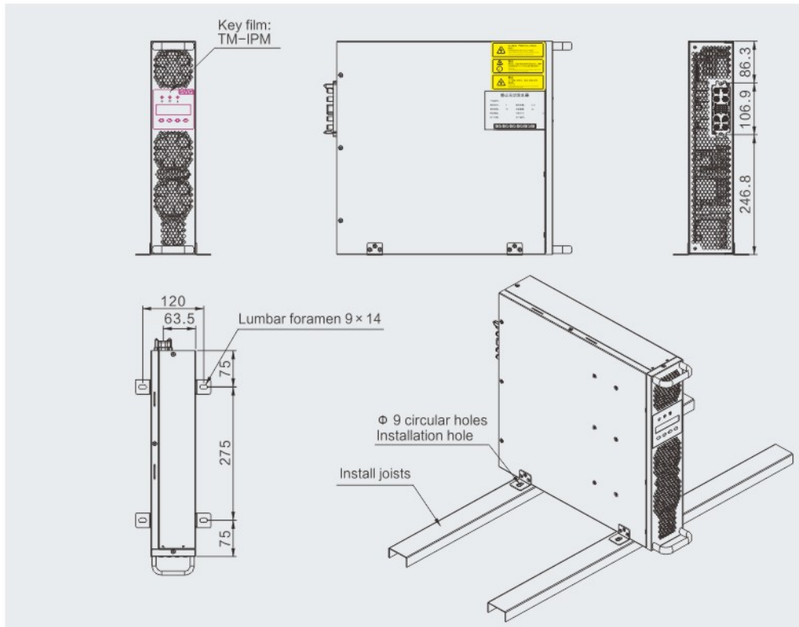
Plug-in box type



Vertical cabinet type



BY95-ASVGC

Hybrid dynamic filtering compensation device

Structure diagram

ASVGC system composition=Controller (ICMS)+SVG module+General LC

CMS Integrated Control and Monitoring System

Set the working mode and related parameters of LC and SVG
Real time display of power information, data before and after compensation, waveform diagram, control and monitoring
SVG+LC working state transition
Equipped with eighteen IO ports, flexibly implementing different SVG+LC combination modes
SVG module
Quickly respond to system reactive power changes and respond to L Reactive compensation for over or under compensation of C to 0.99 to achieve zero pole switching and compensate for rapid changes in reactive power

General LC

Compensate for most stable and less variable reactive power of the load

- Solution for reactive power compensation and three-phase imbalance compensation with the highest cost-effectiveness
- Perfect combination of universal LC compensation and the latest SVG compensation technology
- ICMS has eighteen IO ports, flexibly implementing multiple combination applications of LC and SVG
- 0.99 level compensation, no over compensation or under compensation

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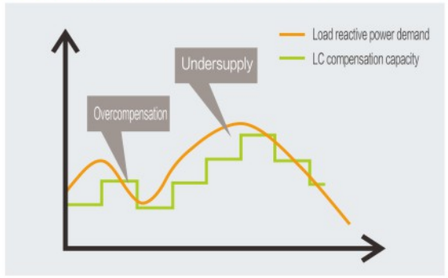
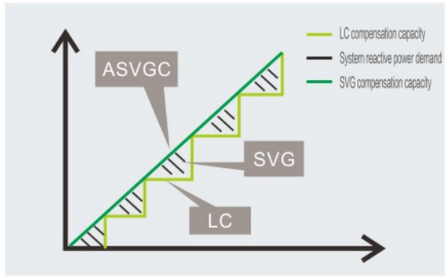
Product Features

Good compensation characteristics



Traditional reactive power compensation is prone to overcompensation or undercompensation.



In the ASVGC scheme:
△ LC for staged switching compensation
△ SVG module for blind spot coverage, achieving stepless switching

Fast response time

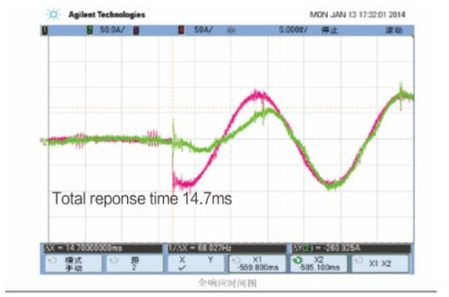
Table 6.4.1.9a: Dynamic Response Test

Quick response time		
Oscilloscope collects signals	Quick response time (us)	Required value (ms)
Reactive current and output compensation current	33.4	50 (± 2.5)

Table 6.4.1.9b: Dynamic Response Test

Full response time		
Oscilloscope collects signals	Full response time (us)	Required value (ms)
Load current and output compensation current	14.7	15

Note:
1. The red curve represents the sudden load reactive current curve, while the green curve represents the SVG compensation current curve.
2. The fast response time is the time from the sudden loading of reactive current to the increase of SVG output compensation current.



Note:
1. The red curve represents the sudden load reactive current curve, while the green curve represents the SVG compensation current curve.
2. The full response time is between the time when the reactive current is suddenly loaded and the time when the SVG compensation current reaches about 90% of the loaded reactive current.

In the SVG scheme:
Fast response is achieved by the SVG module. SVG fast response time<50us, full response time<15ms;
The SVG in ASVGC reflects the advantages of power electronic switches. In traditional SVG, thyristors only serve as fast switches and cannot reflect the value of "high-frequency fast switching".
(Usually switching for more than 100ms once, while IGBTs in SVG can switch more than 15000 times per second)

Flexible application

By combining any power component (SVG module or LC) in the ASVGC scheme, it is possible to achieve:

Performance tuning of ASVGC scheme: ASVGC compensation range from −1 to 1

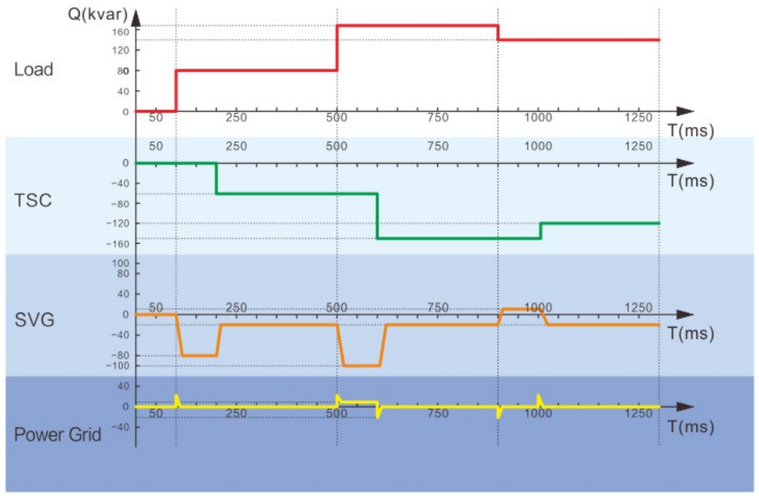
Price Adjustment of ASVGC Scheme

Application Industry Coverage of ASVGC Solution

Taking 300kvar compensation capacity as an example:

	ASVGC Scheme 1	ASVGC Scheme 2	ASVGC Scheme 3
LC	50×5	50×4	30×9
SVG	50	100	30
Compensation capacity	−50~300	−100~300	−30×300

Good compensation effect



Timing chart of compensation effect when LC and SVG are used together
(LC compensation capacity 30kvar per set, SVG−100kvar)

△ 100−200ms:

The reactive power of the load suddenly increases, and LC cannot act in time. SVG will respond in real−time to compensate for system reactive power;

△ 200−500ms:

LC response input compensation, at which point SVG will reduce the compensation capacity in real−time;

△ 900−1000ms:

When the reactive power of the load suddenly decreases, if there is no time for LC to cut off the input capacitor, SVG will send out a reverse compensated reactive power in real time to compensate for the excess capacity of LC;

△ 1000ms~:

LC removes the excess compensation capacity, and at this time, SVG will track the changes in system reactive power in real−time, eliminating the remaining reactive power in the system.

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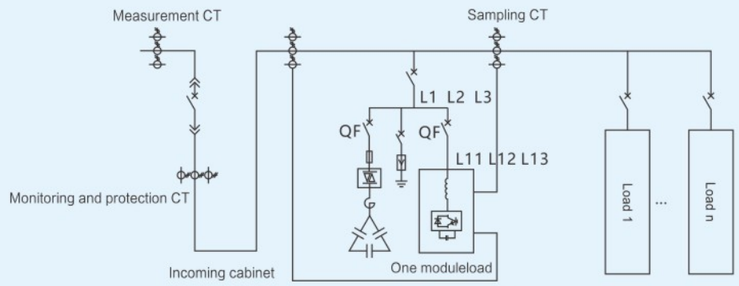
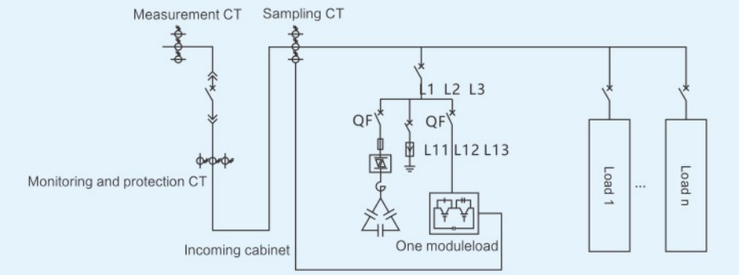
SVG Centralized Compensation Capacity Selection Query Table

Transformer capacity	Reactive power compensation capacity (cos Φ= 0.7)	Extended System	SVG module	Co complementary LC module	Dividing and supplementing LC module
315kVA	100kVA	Expansion of reactive power compensation capacitors	BY91−SVG−380−30×1	BY−C−450−30×2	BY−S−250−30×1
500kVA	200kVA		BY91−SVG−380−50×1	BY−C−450−30×3	BY−S−250−30×2
630kVA	250kVA		BY91−SVG−380−50×1	BY−C−450−50×3	BY−S−250−30×2
800kVA	300kVA		BY91−SVG−380−50×1	BY−C−450−50×4	BY−S−250−30×2
1000kVA	350kVA		BY91−SVG−380−70×1	BY−C−450−50×5	BY−S−250−30×2
1250kVA	450kVA		BY91−SVG−380−70×1	BY−C−450−100×3	BY−S−250−30×3
1600kVA	550kVA		BY91−SVG−380−100×1	BY−C−450−100×3	BY−S−250−50×3
2000kVA	700kVA		BY91−SVG−380−100×2	BY−C−450−100×4	BY−S−250−50×3
2500kVA	900kVA		BY91−SVG−380−100×2	BY−C−450−100×5	BY−S−250−50×4



Schematic diagram of
APF+capacitor compensation installation location and sampling transformer



Schematic diagram of
SVG+capacitor compensation installation location and sampling transformer

BY96-SPC

Three phase imbalance correction device

Overview

The BY96-SPC three-phase imbalance correction device can effectively control three-phase imbalance phenomena, save a large amount of transformer capacity for users, and save power grid construction costs and user electricity costs. It is also possible to simulate the current characteristics of reactors or capacitors by emitting inductive or capacitive currents, suppress voltage fluctuations and compensate for reactive power. It also has the ability to filter 2-13 harmonic currents.

- Avoiding overload, heating, and aging of the central line, reducing the risk of fire caused by burning out
- Avoiding equipment false alarms caused by local voltage imbalance
- Reduce the risk of equipment and devices in weak current control systems burning down due to high zero to ground voltage
- Effectively avoiding excessive operation of transformers caused by single-phase overcurrent is beneficial for improving transformer operation efficiency

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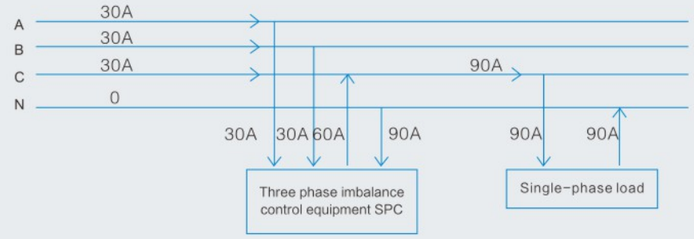
Introduction to Principles



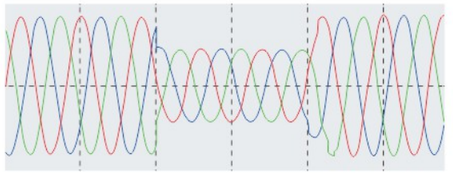
Through the example in the figure below, it can be seen that the load current of phase C is the highest, and there is no load on phase AB. At this time, if there is no SPC, the three-phase currents on the grid side are A0, B0, and C90, which are directly sent from the substation to the load side. Now an SPC device has been added to achieve three-phase current balance on the grid side. The device absorbs 30A current from phase A and 30A current from phase B. Through the AC-DC-AC transformation of the current, the excess energy of phases A and B is supplied to the C-phase load with high energy demand. In this way, the grid side senses changes in three-phase current, and phase A outputs more than 30A; B-phase multi output 30A; The output of phase C is 60A less, achieving the goal of evenly balancing the three-phase current transmitted to the transformer over this distance.

Solution

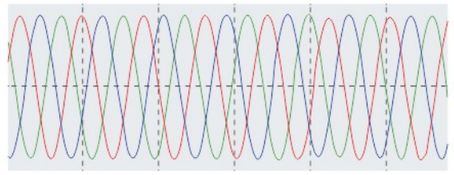
Rectification plan for three-phase imbalance: A solution is proposed to address the issue of three-phase current and voltage imbalance in the power grid. Our company's SPC device is installed on the secondary side of the substation transformer with imbalance. When the device is connected to the grid for operation, the imbalance phenomenon disappears immediately. The three-phase imbalance correction plan is mainly aimed at power supply companies such as State Grid and Southern Power Grid to carry out three-phase imbalance transformation projects in the distribution station area. Our equipment has been applied in practical applications in Beijing, Shanghai, Shandong, Sichuan, Chongqing, and other places.

The significance of suppressing voltage fluctuations

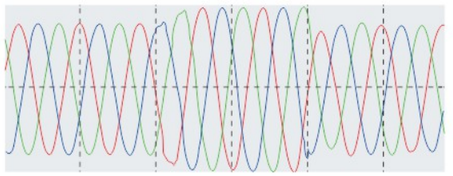
Avoid damage to equipment caused by high or low voltage



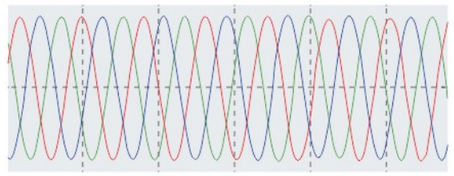
Sudden voltage drop in the power grid



SPC emits capacitive current, simulates capacitor characteristics, increases grid capacity, raises reduced voltage, and stabilizes the grid



Sudden increase in grid voltage



SPC emits inductive current, simulates reactor characteristics, reduces the raised voltage, and stabilizes the power grid

SPC Capacity Quick Reference Table

Transformer capacity (kVA)	Three-phase current imbalance (%)	Secondary side rated current (A)	Need to compensate for unbalanced current (A)	Configuration capacity (kvar)
80	30	115	35	30
100	30	144	44	30
125	30	180	55	50
160	30	230	70	50
200	30	288	87	70
250	30	360	99	70
315	30	454	138	100
400	30	577	175	130
500	30	721	218	150
630	30	909	275	200

General parameters

General parameter table for W/N/H/B/T type products

Project		Parameter
System parameter	Rated line voltage	AC380 ± 20%
	Electrical wiring	Three phase three wire/three phase four wire
	Take electric wires	C-phase line/DC bus (customizable)
	Grid frequency	50Hz/60Hz
	Circuit topology	Three phase three-level
	Full response time	Compensated reactive power: <5ms; Full compensation: <15ms
	Reactive power compensation	-1~1 adjustable
	Correction rate of three-phase imbalance	100%
	Harmonic filtering rate	>97%
	Overall efficiency	>97.5%
	switching frequency	50kHz
	Cooling method	Intelligent air cooling/forced air cooling/T-type natural air cooling
	noise	<60dB@1m / <50dB@1m (T-shaped)
	Installation method	Module, rack, cabinet, wall mounted, box mounted
Exterior	colour	Aluminum zinc coated board, white, black, gold primary colors, etc. (customizable)
Communication monitoring capability	communication interface	RS-232, RS485 bus (optional Ethernet, WLAN, USB2.0)
	Communication protocol	Modbus protocol
	Fault alarm	Have
	Background monitoring	Optional GPRS remote monitoring; Optional Bluetooth and NFC installed in the module
	On site display	7-inch Chinese color touch screen (optional)
		Display current, voltage, three-phase power, power factor, harmonic content, etc
Environmental requirements	ambient temperature	-20℃~+50℃
	relative humidity	≤ 90% RH without condensation
	Installation altitude	≤ 2000m rated capacity, greater than 2000m reduced capacity operation
	Protection level	

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Model Meaning

BY91-APF / 150A - 0.4 / 4L - W

- W: Module with a width of 680mm (dedicated for 660V~850V)
- N: Module with a width of 450mm
- B: Wall mounted module
- T: IP65 module
- 3L: three-phase three-wire system
- 4L: three-phase four wire system
- 0.4:380V voltage level
- 0.66: 660V voltage level
- 0.8:800V voltage level
- APF: 30-150A
- SVG: 30-100kvar
- ASVG: 30-100kvar
- ASVGC: Based on actual configuration
- SPC: 30-100kvar
- BY91-APF Active Power Filter
- BY92-SVG Static Var Generator
- BY93-ASVG Enhanced Static Reactive Power Generator
- BY95-ASVGC Hybrid Reactive Power Compensation Device
- BY96-SPC three-phase imbalance correction device

Product specifications

Rack mounted specification table

No.	Product name	Model specifications	Capacity	Type-N size
1	APF	BY91-APF/30A-0.4/4L-N	30A	450×580×110
		BY91-APF/50A-0.4/4L-N	50A	450×580×110
		BY91-APF/75A-0.4/4L-N	75A	450×580×110
		BY91-APF/100A-0.4/4L-N	100A	450×580×220
		BY91-APF/150A-0.4/4L-N	150A	450×580×250
2	SVG	BY92-SVG/30kvar-0.4/4L-N	30kvar	450×580×110
		BY92-SVG/50kvar-0.4/4L-N	50kvar	450×580×110
		BY92-SVG/70kvar-0.4/4L-N	70kvar	450×580×220
		BY92-SVG/100kvar-0.4/4L-N	100kvar	450×580×250
3	SPC	BY96-SPC/30kvar-0.4/4L-N	30kvar	450×580×110
		BY96-SPC/50kvar-0.4/4L-N	50kvar	450×580×110
		BY96-SPC/70kvar-0.4/4L-N	70kvar	450×580×220
		BY96-SPC/100kvar-0.4/4L-N	100kvar	450×580×250

No.	Product name	Model specifications	Capacity	Type-W size
1	APF	BY91-APF/100A-0.66/3L-W	100A	680×530×200
		BY91-APF/100A-0.8/3L-W	100A	680×530×200
2	SVG	BY92-SVG/120kvar-0.66/3L-W	120kvar	680×530×200
3	SPC	BY96-SPC/140kvar-0.8/3L-W	140kvar	680×530×200

Wall mounted specification table

No.	Product name	Model specifications	Capacity	Dimensions of wall mounted modules
1	APF	BY91-APF/30A-0.4/4L-B	30A	450×580×110
		BY91-APF/50A-0.4/4L-B	50A	450×580×110
		BY91-APF/75A-0.4/4L-B	75A	450×580×110
		BY91-APF/100A-0.4/4L-B	100A	450×580×220
		BY91-APF/150A-0.4/4L-B	150A	450×580×250
2	SVG	BY92-SVG/30kvar-0.4/4L-B	30kvar	450×580×110
		BY92-SVG/50kvar-0.4/4L-B	50kvar	450×580×110
		BY92-SVG/70kvar-0.4/4L-B	70kvar	450×580×220
		BY92-SVG/100kvar-0.4/4L-B	100kvar	450×580×250
3	SPC	BY96-SPC/30kvar-0.4/4L-B	30kvar	450×580×110
		BY96-SPC/50kvar-0.4/4L-B	50kvar	450×580×110
		BY96-SPC/70kvar-0.4/4L-B	70kvar	450×580×220
		BY96-SPC/100kvar-0.4/4L-B	100kvar	450×580×250

External specification table

No.	Product name	Model specifications	Capacity	Type-T size
1	APF	BY91-APF/30A-0.4/4L-T	30A	700×708×240
		BY91-APF/50A-0.4/4L-T	50A	700×708×240
		BY91-APF/75A-0.4/4L-T	75A	700×708×240
		BY91-APF/100A-0.4/4L-T	100A	700×708×240
		BY91-APF/150A-0.4/4L-T	150A	700×708×240
2	SVG	BY92-SVG/30kvar-0.4/4L-T	30kvar	700×708×240
		BY92-SVG/50kvar-0.4/4L-T	50kvar	700×708×240
3	SPC	BY96-SPC/30kvar-0.4/4L-T	30kvar	700×708×240
		BY96-SPC/50kvar-0.4/4L-T	50kvar	700×708×240

Note: 1. W-type is specifically designed for 660V to 850V power grids;
The N-type can be suitable for various installation situations: centralized installation of N-type indoor cabinets, B-type wall mounted installation, etc., with small and flexible volume.
2. The T-type outdoor type has a protection level of up to IP65 and can be directly installed in various harsh working environments, providing users with more choices.
3. The order of size listing is: long × deep × High.

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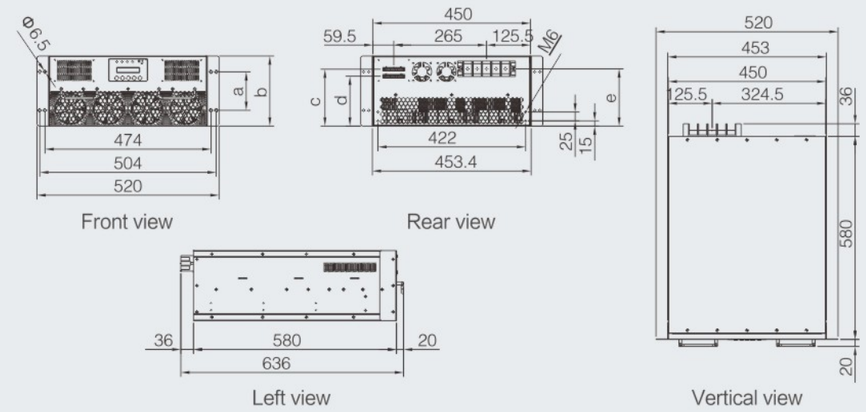
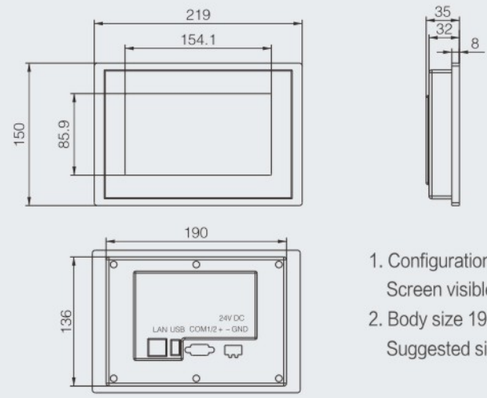
Module size

Type N

Outline dimensional drawing



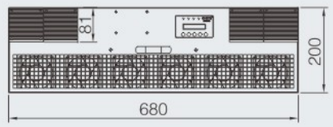
Outline dimension diagram of display screen



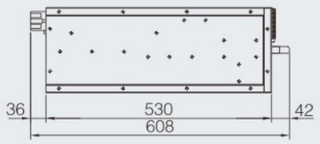
1. Configuration screen appearance size 219×150×35mm,
Screen visible area 154.1×85.9mm
2. Body size 190×136mm,
Suggested size for sheet metal openings 192×138mm

Model	a	b	c	d	e
SVG-30kvar	50	110			85.5
SVG-50kvar	72	110			85.5
SVG-70kvar	130	220	182.3	162.3	183.5
SVG-100kvar	160	250	212.3	192.3	213.5
APF-30~50A	50	110			85.5
APF-75A	72	110			85.5
APF-100A	130	220	182.3	162.3	183.5
APF-150A	160	250	212.3	192.3	213.5

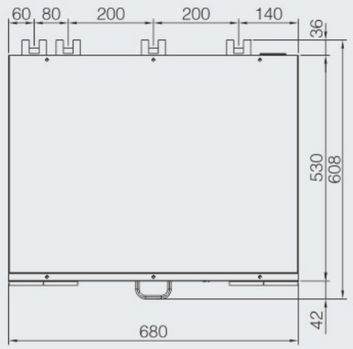
Type-W (600V~800V dedicated)



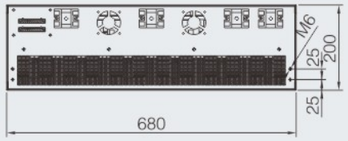
Front view



Left view

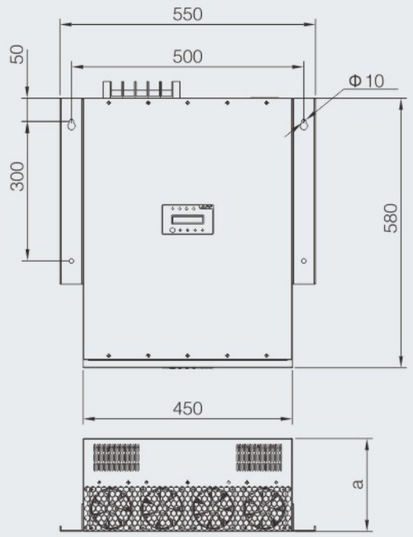


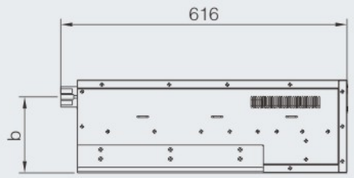
Vertical view



Rear view

Type-B





Model	a	b
SVG-30kvar	110	85.5
SVG-50kvar	110	85.5
SVG-70kvar	220	183.5
SVG-100kvar	250	213.5
APF-30~50A	110	85.5
APF-75A	110	85.5
APF-100A	220	183.5
APF-150A	250	213.5

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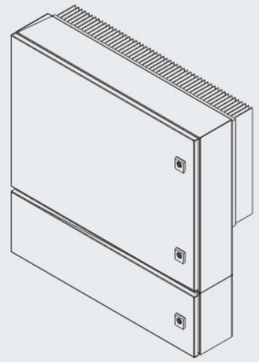
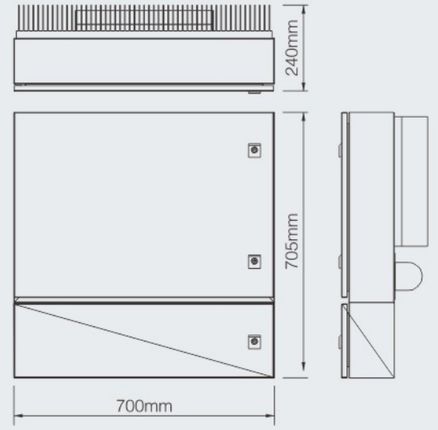
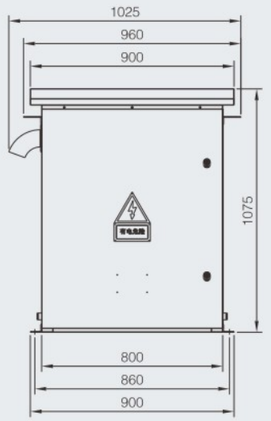
Type-T



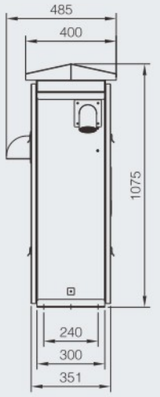


700 × 705 × 240 APF 30/35/50/75A;
SVG/SPC 30/50kvar
IP65P65 chassis, suitable for various harsh operating environments。

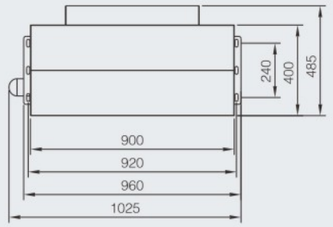
Outdoor-cabinet



Front view



Left view

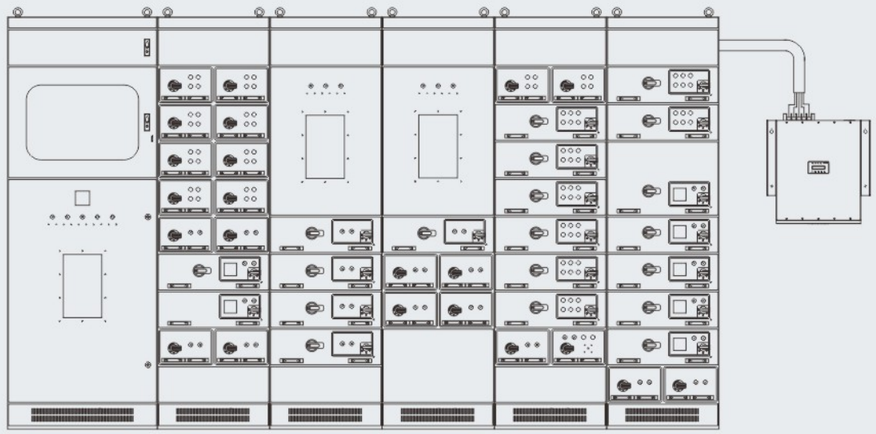


Vertical view

Note:
1. Overall dimensions: The cabinet body is 800 × 300 × 1075, with a maximum appearance of 1025 × 485 × 1075
2. Material: stainless steel 304
3. Color: Stainless steel natural color
4. Protection level: IP44
5. The cabinet can be equipped with one 100kvar power module at the most
6. Can be paired with installation brackets (made of cold-rolled steel plate, hot-dip galvanized)

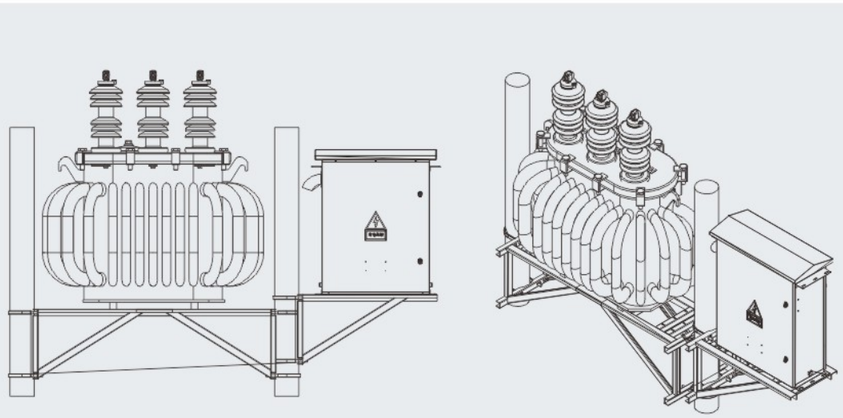
Complete solution

Wall mounted



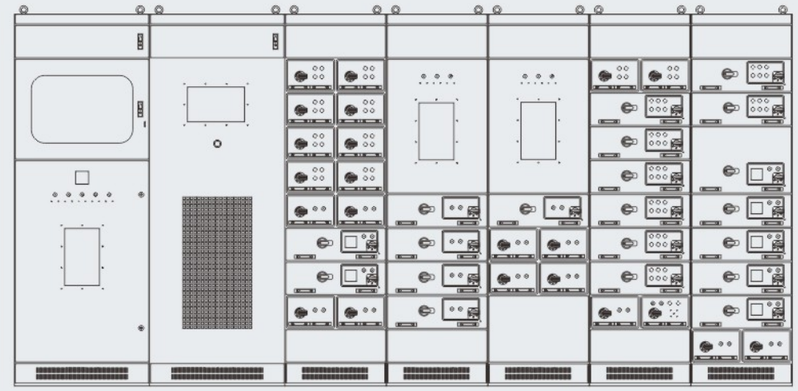
The module is directly hung on the wall through hanging ears, and is equipped with a configuration touch screen *, Bluetooth module * or GPRS module *, WiFi module *, which is convenient for control and monitoring, occupies a small area, and is flexible to install. It is suitable for on-site compensation solutions.

Outdoor cabinet type



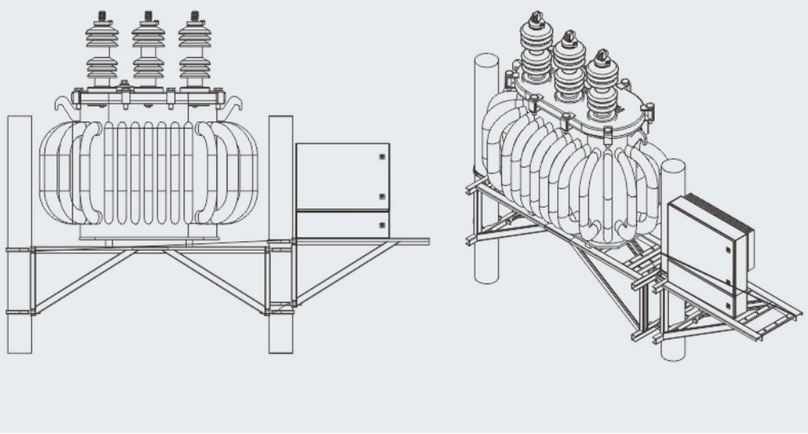
The module is installed in an outdoor cabinet and installed on the substation column or near the substation. The cabinet also integrates required components such as molded case circuit breakers, GPRS * modules, WiFi modules *, lightning arresters, fans, etc., which are convenient for decentralized and centralized compensation. The maximum design capacity of the outdoor cabinet is 150kvar.

Indoor integrated cabinet



The modules are placed flat inside the cabinet, which is equipped with molded case circuit breakers, copper bars, cables, configuration touch screens, Bluetooth modules, GPRS modules, WiFi modules, etc., which is conducive to the centralized installation of a large number of modules and is perfect for centralized compensation in substations. The maximum capacity of a single cabinet is 600kvar/900A and can be expanded.

Diversified installation of T-shaped modules



The T-shaped module can be directly installed in various areas, including outdoor, dust pollution workshops, areas with frequent sand and dust, and is specially developed to adapt to harsh working conditions. There are also molded case circuit breakers, GPRS modules *, WiFi modules *, configuration touch screens *, Bluetooth modules *, etc. inside the module, making it convenient for close and remote control and monitoring.

[Note] The above components with "*" are optional for users.

BY81

Series intelligent capacitors

Overview

The BY81 series intelligent capacitors are mainly composed of two (△ type) or one (Y type) low-voltage power capacitors. They adopt the latest technological achievements such as microelectronics software and hardware technology, micro sensing technology, micro network technology, and electrical manufacturing technology to intelligentize, miniaturize, and modularize them. It is a major breakthrough in low-voltage power reactive power automatic compensation technology, which can be flexibly used in various occasions of low-voltage reactive power compensation, changing the structural mode of traditional reactive power automatic compensation equipment. It has many advantages such as simple structure, simple production, cost reduction, improved performance, and easy maintenance.

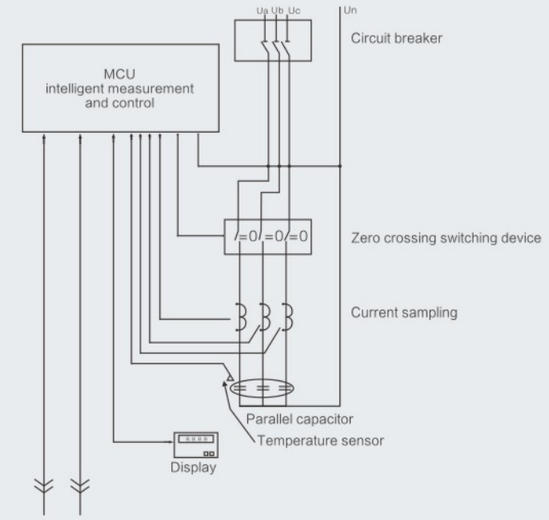
Model Meaning

BY81J □ □ / □ – □ + □

- Second circuit capacitor capacity (Kvar)
- First circuit capacitor capacity (Kvar)
- Rated voltage (V)
- Capacitor filling material department: Not marked – microcrystalline wax; G–dry type
- Compensation method: S–three-phase compensation; F–split phase compensation
- Baoyu Conventional Intelligent Capacitor

Working principle of the entire machine

The product consists of intelligent components, synchronous switching switch electrical components, current sampling components, and low-voltage power capacitors



Working principle diagram (split phase compensation method)

Quick circuit breaker, main power supply access terminal, main switch, voltage quick switch main protection
Intelligent measurement and control part
Voltage sampling for distribution voltage measurement and power factor measurement, as well as sampling for overvoltage, undervoltage, and voltage loss protection
Zero on/off switch components, power off container switches, and capacitor overvoltage, undervoltage, loss of voltage, short circuit, overcurrent, phase failure, over harmonic, and over temperature protection outlets
Current sampling
Temperature sensors are installed in the control room to achieve capacitor over temperature protection
Parallel capacitors for reactive power compensation
Display device, human–machine dialogue
RS485 online plug–in, used for mutual connection and peripheral controller, constitutes the power distribution current input of the system working machine

Product Features

The perfect combination of measurement and control technology with synchronous switches has been achieved, controlling the movement speed of the switching switch, eliminating bounce, improving lifespan, tracking and correcting the closing phase angle, and achieving a switching lifespan of millions of times. Compared with existing intelligent power capacitors of the same type, it has many advantages such as high reliability, low fault, low power consumption, and long service life.

Closing without inrush current, achieving zero voltage switching and zero current switching of capacitors, synchronous switching completely avoiding switching overvoltage, no overvoltage breakdown, no arc pulling and reignition.

Compensate in the most appropriate way, with complete control functions and high-end power analyzer functions. It has complete functions and good performance, and can also be configured with various peripherals to meet different customer needs.

The product has complete measurement and protection functions, with special protections such as temperature inside the control room, harmonic content in the power grid, phase failure, and three-phase imbalance.

The product can be used with multiple building blocks, and when used, the main machine is automatically generated, while the rest are slave machines, forming a reactive power automatic control system.

Individual faults will automatically exit from the slave machine, without affecting the operation of other machines. The host automatically exits due to a malfunction, generating a new host and forming a new system for operation, with a high level of intelligence. The individual capacitor displays the product's operating conditions and electrical circuit conditions, and the human-machine dialogue is concise and intuitive.

Action principle of each component

MCU intelligent measurement and control part

All electronic components in the intelligent measurement and control components are of wide temperature and industrial grade, which can adapt to harsh environments with large temperature changes and severe electromagnetic interference. They can work continuously and reliably for a long time, with a high degree of intelligence and stable control performance.

Zero crossing switching synchronous switch technology based on mechanical contacts

The company has summarized the characteristics and drawbacks of mechanical contactors, contactless thyristors, and composite switches, and combined years of development and practical operation experience, independently developed a new generation that uses microelectronic software and hardware technology to effectively control the contacts of mechanical electromagnetic relays; Implement synchronous switching technology for zero crossing and switching low-voltage power capacitors based on mechanical contacts; When the AC current at both ends of the contact is zero, it closes, and when the contact is closed, it opens when the AC voltage at both ends is zero. Avoid the impact of inrush current generated during capacitor input on system voltage. Reduce equipment losses and improve the service life of capacitors.

Low voltage power capacitors

The low-voltage power capacitor in the product adopts a self-healing low-voltage parallel compensation capacitor, and the capacitor uses a gradually thickened zinc aluminum metallized polypropylene film as the dielectric, which has extremely high stability and reliability. In capacitors of the same brand, the larger a single capacitor, the longer its core components and thicker its diameter. The length of the component leads to an increase in resistance loss, while the thickness of the component leads to a larger surface conductive layer area and an increase in temperature difference between the inside and outside of the component, making it easier for the conductive layer to detach from the electrode plate. Therefore, using a single large capacity capacitor in parallel is not as reliable as using a small capacity capacitor, and the number of switching stages of the capacitor can also be effectively increased. At the same time, the capacitor is equipped with a temperature sensor, which reflects the internal heating degree of the capacitor in situations such as overvoltage, harmonic, leakage current, and high environmental temperature, achieving over temperature protection.

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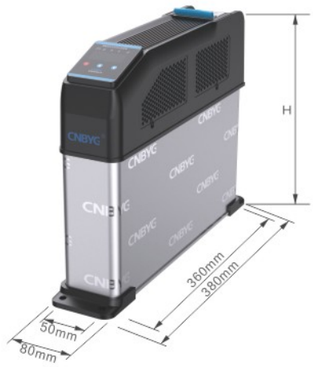
Technical indicators of the product

Project		Parameter
Power supply conditions	Rated voltage	~220V/380V
	Voltage deviation	±20%
	Voltage waveform	Harmonics ⩽ 5%
		Sine wave, total distortion rate ⩽ 5%
	Power frequency	48.5~51.5Hz
	Power consumption	＜1W(When cutting off the capacitor)
		＜1W(When investing two capacitors)
Measurement and error	Voltage	⩽0.5%
	Current	⩽1%
	Power factor	⩽ ±1.5%
	Temperature	±1℃
Protection error	Voltage	⩽0.5%
	Current	⩽1%
	Temperature	±1℃
Environment condition	Ambient temperature	-40℃~+40℃
	Relative humidity	40℃，20~90%
	Altitude	⩽2000m
Reliability parameters	Control accuracy	100%
	Control allowable frequency	2 million times
Electrical safety	The electrical clearance and creepage distance, insulation strength, safety protection, short-circuit isolation, and adoption and control circuit protection all comply with the corresponding clauses in the Chinese power industry standards DL/T842-2003 "Conditions for Use of Low Voltage Parallel Capacitor Devices" and GB/T22582-2008 " Power Factor Compensation Devices for Low Voltage Power Capacitors".	

Application in complete cabinets

Maximum compensation capacity of 1000mm wide reactive power compensation cabinet: 800Kvar; Installed units: ⩽ 20 units
Maximum compensation capacity of 800mm wide reactive power compensation cabinet: 600Kvar; Installed units: ⩽ 16 units

Appearance and installation dimensions

Outline dimensional drawing	Compensation method	Model	H(mm)
	Three-phase co compensation	BY81JS/450-30+30	330
		BY81JS/450-25+25	310
		BY81JS/450-20+20	310
		BY81JS/450-20+15	310
		BY81JS/450-20+10	310
		BY81JS/450-15+15	270
		BY81JS/450-15+10	270
		BY81JS/450-15+5	270
		BY81JS/450-10+10	240
		BY81JS/450-10+5	240
		BY81JS/450-5+5	240
		BY81JS/450-2.5+2.5	240
	Three-phase compensation	BY81JF/250-30	310
		BY81JF/250-25	270
		BY81JF/250-20	270
		BY81JF/250-15	240
		BY81JF/250-10	240
		BY81JF/250-5	240

Note: The width and depth of smart capacitors are consistent among different capacities, but there are only differences in height.

Online attachments

RS-485 online connector

No.	Type	Length	Physical photos	Purpose
1	Type-A	30cm		Used for connecting two adjacent products
2	Type-B	80cm		Used for connecting products between upper and lower floors
3	Type-C	260cm		Used for connection between main and auxiliary cabinets, controllers, status indication products, and products

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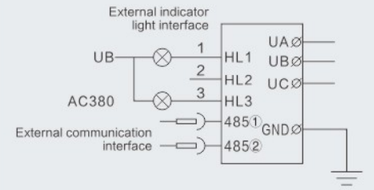
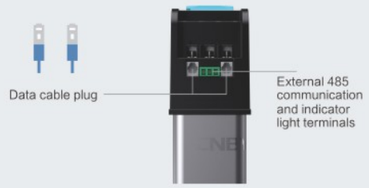
Product terminal diagram

Three-phase compensation

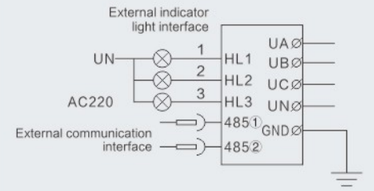


Terminal diagram and its meaning



Physical image

Split phase compensation



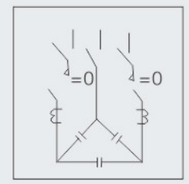
Terminal diagram and its meaning

Physical image

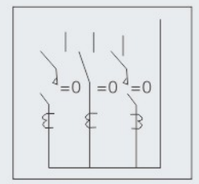
Product design application scheme

Product electrical symbols

According to GB5465.1, GB5465.2, and GB7159, the graphic symbols of BY81J series smart capacitors are determined as shown in the right figure, with the text symbols "S" and "Y"



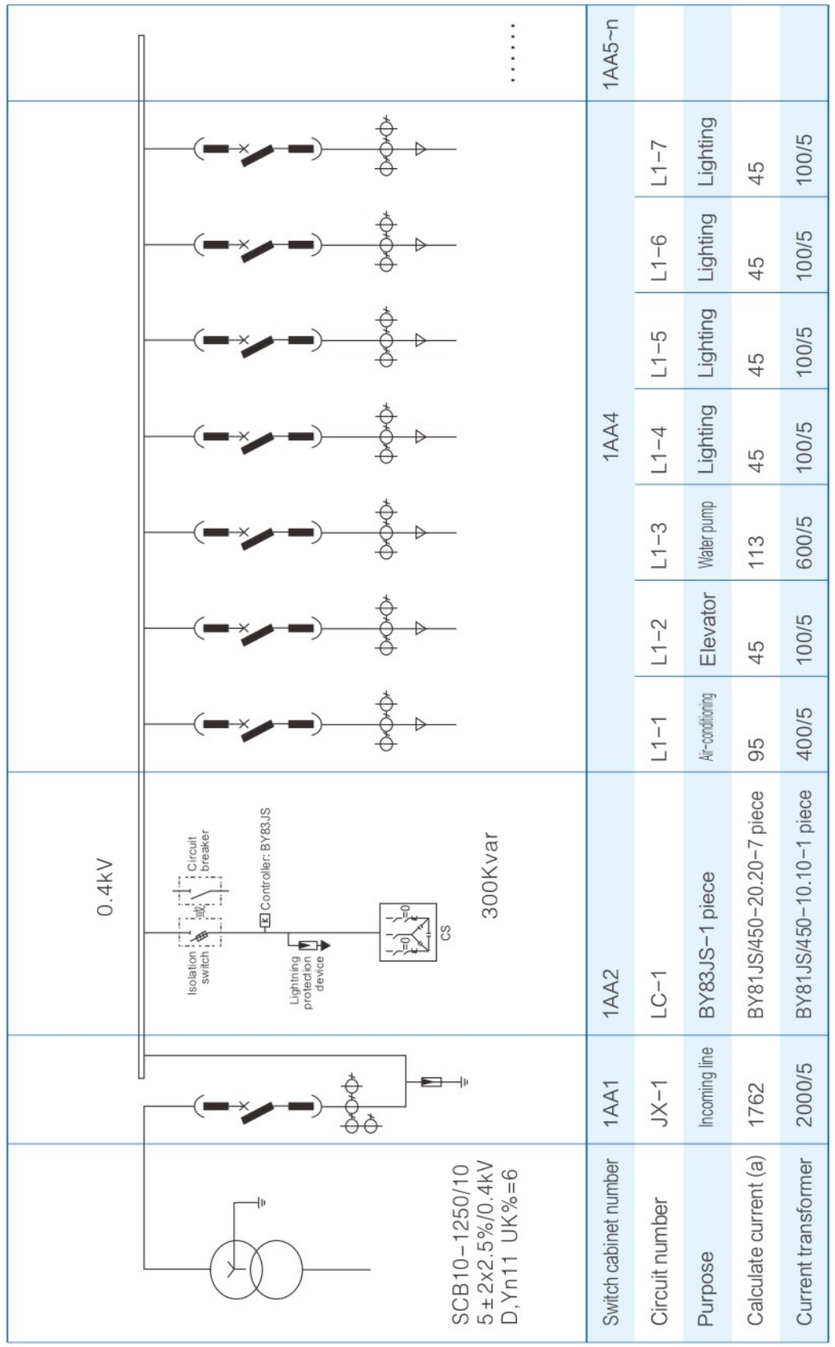
Three phase compensation (S)



Split phase compensation (Y)

空调
电梯
水泵
照明

Legend reference for centralized compensation mode design



			1AA5~n			
			1AA4	L1-7	Lighting	45	100/5
				L1-6	Lighting	45	100/5
				L1-5	Lighting	45	100/5
				L1-4	Lighting	45	100/5
				L1-3	Water pump	113	600/5
				L1-2	Elevator	45	100/5
				L1-1	Air-conditioning	95	400/5
0.4kV	300Kvar	SCB10-1250/10 5±2x2.5%/0.4kV D,Yn11 UK%=6	1AA2	LC-1	BY83JS-1 piece	BY81JS/450-20.20-7 piece	BY81JS/450-10.10-1 piece
			1AA1	JX-1	Incoming line	1762	2000/5
			Switch cabinet number	Circuit number	Purpose	Calculate current (a)	Current transformer

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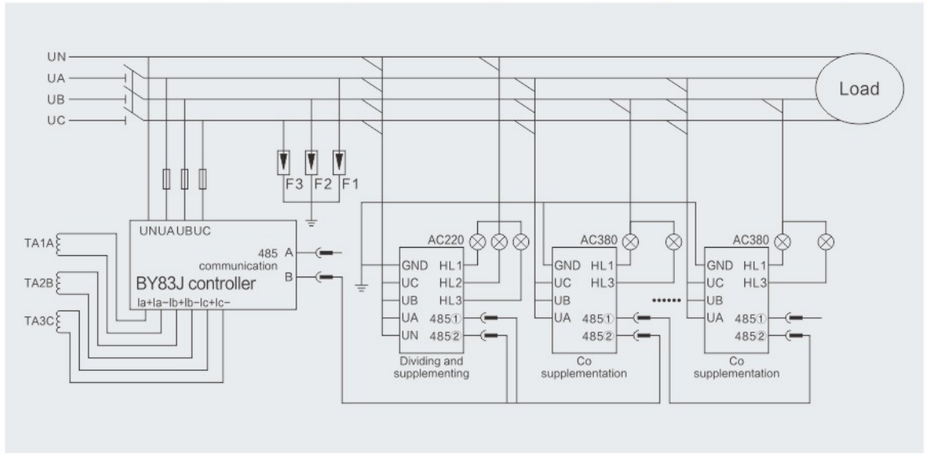
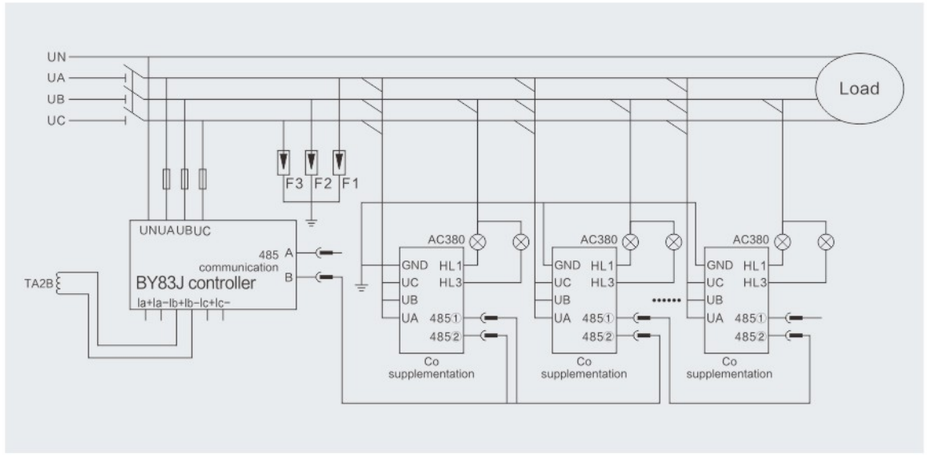
External controller diagram of the product

Electrical schematic diagram of three-phase mixed compensation (co compensation+sub compensation)



Electrical schematic diagram of three-phase co compensation



BY82J

Series anti harmonic intelligent capacitors

Overview

The BY82J series anti harmonic intelligent capacitor is mainly composed of a (△ type) or (Y type) voltage power capacitor. It adopts the latest technological achievements such as microelectronics software and hardware technology, micro sensor technology, micro network technology, and electrical manufacturing technology to intelligentize it, achieve low-voltage reactive power compensation function, and enable it to work reliably and conveniently in a series of fields such as zero switching, protection, measurement, signal, and online, It is a major breakthrough in low-voltage reactive power automatic compensation and filtering technology, mainly applied to reactive power compensation in situations where harmonics are very serious. It can operate reliably without resonance, has no amplification effect on harmonics, and has the function of absorbing and eliminating harmonics to a certain extent. The products connected in series with a 7% reactor are used in electrical environments with a main harmonic of 5th order, while the products connected in series with a 14% reactor are used in electrical environments with a harmonic of 3rd order.

The products are mainly suitable for industrial fields such as chemical industry, building materials, papermaking, textile, coal, electricity, telecommunications, aluminum industry, shipping ports, tobacco, brewing, automobile manufacturing, precision electronics, precision machinery, etc. At the same time, it can also be applied to commercial power systems such as communication industry power supply systems, securities trading power supply systems, airport and port backup power supply systems, large-scale medical systems, various UPS generator sets, exhibition venues, commercial office buildings, etc.

Model meaning

BY82J □/□-□ □ □

- Reactance rate: P7-7% Reactance rate; P14-14% Reactance rate
- Capacity of the second group of capacitors (Kvar) (not marked as a single group of capacitors)
- Capacity of the first group of capacitors (Kvar)
- Rated voltage (V)
- Compensation method: S-Co supplementation; F-Dividing and supplementing
- Baoyu Antiharmonic Intelligent Capacitor

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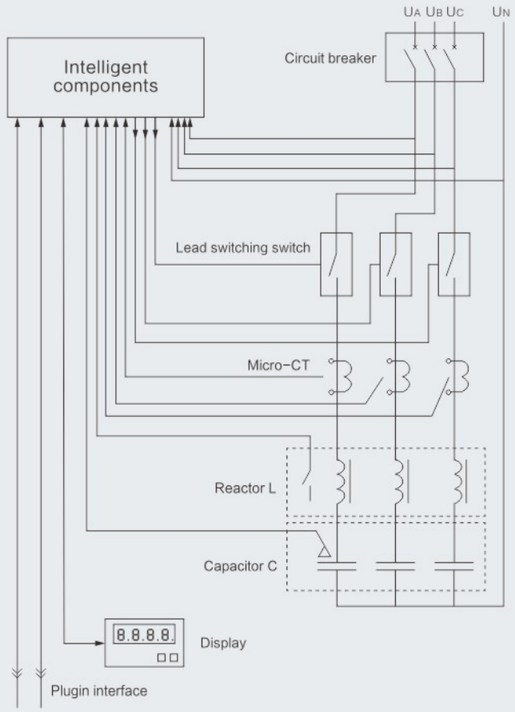
Working principle of the entire machine

The product consists of intelligent components, zero switching switches, current sampling, temperature sampling, dry series reactors, and low-voltage filtering power capacitors. The following figure is the working principle block diagram of the split phase compensation method product in the product series.



Working principle diagram

Quick circuit breaker, main power supply access terminal, main switch, power supply quick cut main protection
Intelligent components and intelligent carriers
Voltage sampling for distribution voltage measurement and power factor measurement, as well as overvoltage, undervoltage, voltage loss, and protection sampling
Zero switching switch components, on/off container switches, and capacitor overvoltage, undervoltage, loss of voltage, short circuit, overcurrent, phase failure, and over harmonic overtemperature protection outlets
Sampling for current measurement of micro CT capacitors and sampling for capacitor overcurrent, phase failure, and three-phase imbalance protection
The reactor is equipped with a built-in temperature sensor for capacitor overtemperature protection
Dry series reactor, filtering component
The capacitor is equipped with a built-in temperature sensor for capacitor overtemperature protection
Capacitor capacitive load for reactive power compensation
Display device, human-machine dialogue
Online plugins, used for interconnecting and peripheral controllers, form the system's operation and distribution current input

Action principle of each component

Intelligent components

All electronic components in intelligent components adopt wide temperature and industrial grade, which can adapt to harsh environments with large temperature changes and severe electromagnetic interference, and can work reliably for a long time without interruption.

Zero crossing switching synchronous switch technology based on mechanical contacts

The company has summarized the characteristics and drawbacks of mechanical contactors, contactless thyristors, and composite switches, and combined years of development and practical operation experience, independently developed a new generation that uses microelectronic software and hardware technology to effectively control the contacts of mechanical electromagnetic relays; Implement synchronous switching technology for zero crossing and switching low-voltage power capacitors based on mechanical contacts; When the AC voltage at both ends of the contact is zero, it closes, and when the contact is closed, it opens when the AC current at both ends is zero. Avoid the impact of inrush current generated during capacitor input on system voltage. Reduce equipment losses and improve the service life of capacitors.

Dry series reactor

The dry series reactor in the product uses high magnetic flux imported materials, which is lightweight, small in size, low in power consumption, low in temperature rise, and low in noise. It is internally equipped with a thermal relay that monitors its temperature and sends a signal when the set temperature is exceeded.

Micro current sampling transformer

The current sampling of the capacitor adopts a micro transformer with permalloy core, which has good linearity, high frequency characteristics, and small difference, ensuring the accuracy and stability of current and current type protection.

Quick circuit breaker

The fast circuit breaker adopts a molded case circuit breaker, which opens within 100ms at 10 times the rated current. It is used for current fast switching main protection to avoid tripping the upper switch, and also serves as the power connection terminal and power main switch.

Main functions of the product

△ Harmonic suppression function: Effectively suppress high-order harmonics and inrush currents, and reject harmonics from entering the capacitor device. It can eliminate the impact of high-order harmonics on capacitors, protect circuits and capacitors from overload, prevent capacitor overheating, aging of insulation media, decline in self-healing performance, and reduce service life.

△ Synchronous switching function: In conjunction with a dedicated controller, it has fast response time, can achieve dynamic tracking, and can accurately switch when the current and voltage are zero, with little impact from harmonics.

△ Split phase compensation function: Split phase compensation type product, each phase capacitor can be switched separately, improving the accuracy of reactive power compensation and providing good compensation for three-phase reactive power imbalance.

△ Measurement function: distribution voltage, current, reactive power, power factor measurement, CT phase and transformation ratio automatic measurement, correction; Measurement of three-phase current and internal temperature of each capacitor.

△ Protection function: circuit current quick switching and overcurrent protection; Capacitor overvoltage and undervoltage protection; Capacitor over temperature, phase failure, and three-phase imbalance protection. When the temperature of the capacitor exceeds 65 degrees, the entire capacitor will be shut down for protection, improving its service life and ensuring the safe operation of the system.

△ Signal function: the switching status, over/under compensation status, and over/under voltage status signals of capacitors; Protection action type and self diagnosis fault type signal.

△ Communication function: RS-485 communication connection is used between the capacitor and the controller, which facilitates the uploading of a large amount of sampling data and the exchange of information with external monitoring terminals, forming the system's work.

△ Intelligent network control: It can automatically detect and track changes in system reactive power, and automatically switch capacitor banks. Capacitors with the same capacity are switched according to the principle of cycling, while capacitors with different capacities are switched according to the principle of adaptation. Capacitors are first in, first out, and first out, first in; Capacitors with low operating temperature shall be put into operation first, while those with high temperature shall be put out first; The compensation working condition is constant, and the capacitor is switched on and off periodically to avoid long-term operation of a single capacitor.

△ Fault self-diagnosis function: The intelligent control component of the capacitor can self diagnose the operating parameters of each phase of the body. Once a self check fault occurs, the entire machine responds quickly and exits operation.

Main features of the product

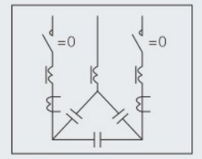
△ Adopting high-quality industrial low-voltage filtering power capacitors with high safety;
△ Synchronous switch technology is adopted, with advanced technology and stable and reliable performance;
△ Adopting a closed-loop circuit, the magnetic circuit is not saturated, there is no energy consumption, and there is no electromagnetic radiation;
△ Adopting special technologies and processes, it can effectively suppress high-order harmonics and inrush currents, and has a significant effect on suppressing harmonics of 3-13 or more;
△ Modular structure, flexible combination, convenient expansion, simple installation, and easy maintenance;
△ Intelligent network, 485 communication interface can be connected to the backend computer for comprehensive power distribution management;
△ Adopting decentralized control mode, with 1 million faultless switching, high reliability;
△ The interface is displayed in Chinese, with simple operation and easy maintenance, which is conducive to on-site fault finding;
△ Add SH explosion-proof device and temperature control device inside to improve the reliability of operation in severe harmonic situations;
△ The energy-saving effect is significant, effectively improving power factor, reducing power consumption, and improving power quality.

Technical indicators of the product

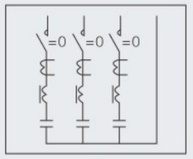
Project		Parameter
Power supply conditions	Rated voltage	~220V/380V
	Voltage deviation	±20%
	Power frequency	47.5~52.5Hz
	Power consumption	<5W(When cutting off the capacitor)
Measurement error	voltage	≤0.5%(Within the range of 80-120% rated voltage)
	current	≤1%
	temperature	±1℃
Reactive power compensation parameters	Capacitor switching interval	>10S
	Reactive capacity	Single unit ≤50Kvar (three-phase), ≤30Kvar (split phase)
	online	≤31 units
Reliability parameters	Control accuracy	100%
	Control allowable frequency	1 million times
	Attenuation rate of operating time of capacitor capacity	≤1%/year
	Attenuation rate of capacitor capacity switching	≤0.1%/10000 times
	Annual failure rate	≤0.1%
Environment condition	ambient temperature	-40℃~+40℃
	relative humidity	40℃，20~90%
	Altitude	≤2000m
Electrical safety	The electrical clearance and creepage distance, insulation strength, safety protection, short-circuit isolation, and adoption and control circuit protection all comply with the corresponding provisions of the Chinese power industry standard DL/T842-2003 "Conditions for Use of Low Voltage Parallel Capacitor Devices".	

Product design application scheme

Product electrical symbols

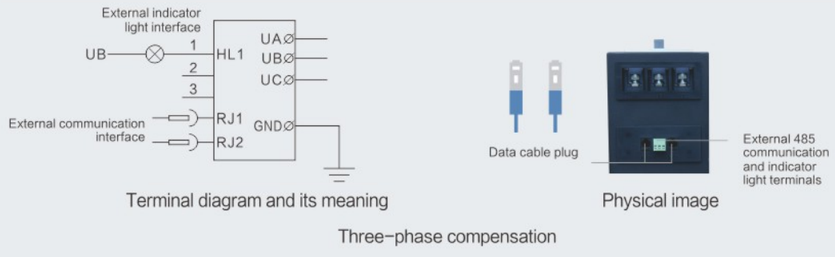


S (Three-phase compensation)

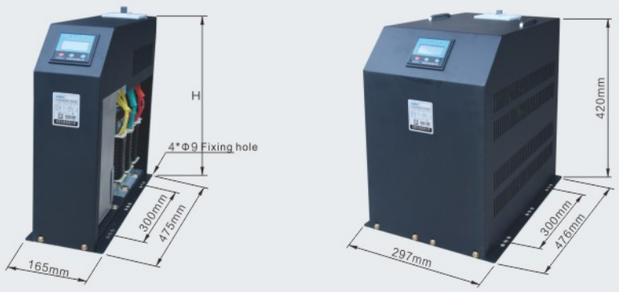


F (Split phase compensation)

Product terminal diagram



Appearance and installation dimensions



Capacitor model	Capacity	H(mm)	Capacitor model	Capacity	H(mm)
BY82JS/480-50/P7	50	485	BY82JF/280-40/P7	40	425
BY82JS/480-40/P7	40	425	BY82JF/280-30/P7	30	425
BY82JS/480-30/P7	30	425	BY82JF/280-20/P7	20	385
BY82JS/480-25/P7	25	425	BY82JF/280-10/P7	10	385
BY82JS/480-20/P7	20	385	BY82JS/480-25+25	25	420
BY82JS/480-15/P7	15	385	BY82JS/480-30+30	30	420
BY82JS/480-10/P7	10	385			

Note: 1. The standard reactance rates for the above products are P7 and P14, and other reactance rates can be selected according to customer needs.
2. The table only lists commonly used product models and specifications, and other models can be consulted for details.
3. The rated voltage of the P14 co compensation type product is 525V, and the rated voltage of the sub compensation type product is 300V.

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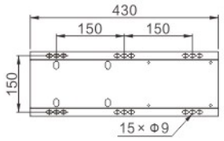
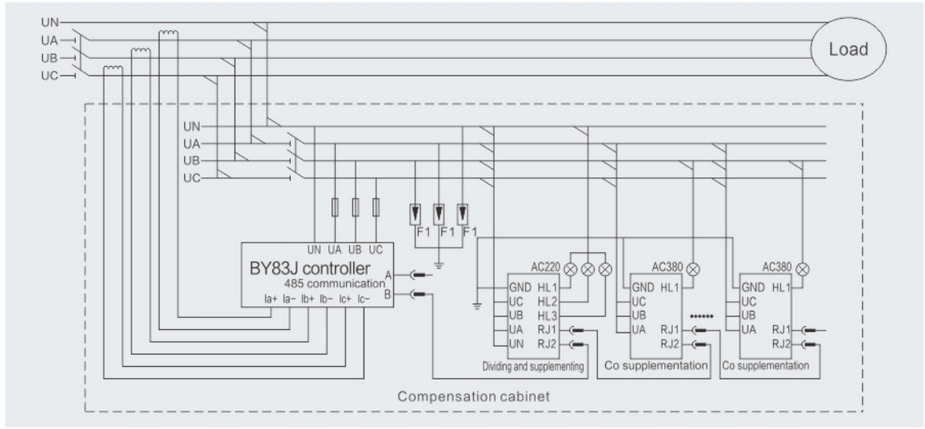
Simple anti harmonic intelligent capacitor

Outline dimensional drawing	Installation dimension diagram	Compensation method	Model	H(mm)
		Three phase co compensation	BY82DS/480-40	405
			BY82DS/480-30	375
			BY82DS/480-20	355
			BY82DS/480-10	355
		Three-phase compensation	BY82DF/280-30	405
			BY82DF/280-20	355
			BY82DF/280-10	355

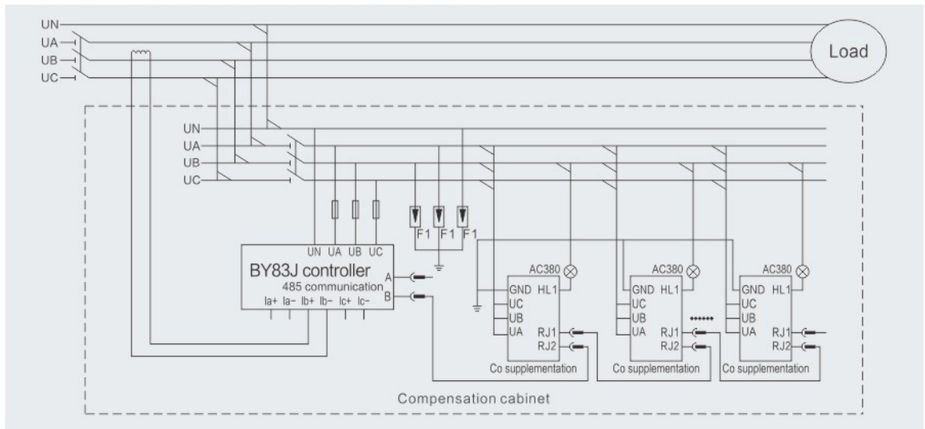
Note: The width and depth of smart capacitors are consistent among different capacities, but there are only differences in height.

Typical electrical connection schematic diagram inside the cabinet

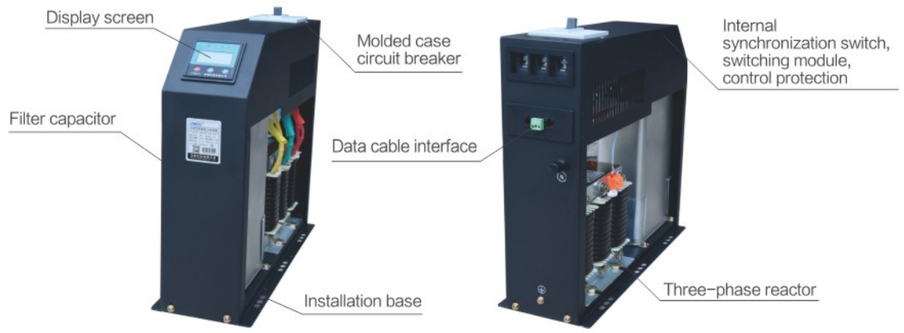
Mixed compensation (co compensation+sub compensation)+controller scheme wiring diagram



Co compensation+controller scheme wiring diagram



Product appearance diagram



Product application electrical connection and wiring diagram

Product wiring requirements

Specification of the connecting wire between the product and the power supply end:
Primary wiring: power cord, requiring sufficient standard multi-core copper wires;
Secondary wiring: external indicator light wire, connected to controller wire;
Data cable: product to product data cable;
Grounding wire: The product is connected to the external grounding terminal using a single stranded copper wire.

Capacity	Capacity ≤30Kvar	30Kvar < Capacity≤50Kvar
Primary wiring	10mm² copper conductor	16mm² copper conductor
Utility hook-up	1mm² copper conductor	
Data cable	Delivery with product	
Grounding wire	2.5mm² copper conductor	

Electrical wiring requirements

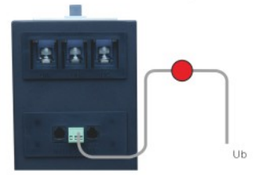
The production of the power cord is as shown in the figure: the power cord must be tightened with screws, and the power cord must be forcefully pulled to prove that it is very firm. Otherwise, it will cause excessive heating in the area and damage the product.

Three phase co compensation

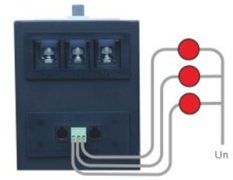
Single-phase compensation

Controller and product wiring: The secondary wiring needs to be connected from the first or last external 485 port in the cabinet product to the corresponding controller 485 port,
As shown in the figure:

When there is an external indicator light, select the appropriate voltage level status indicator light based on the capacitor model, and the indicator light for the co compensating capacitor is 380V; The indicator light of the compensating capacitor is 220V, and terminal 5 of the compensating capacitor is connected to one indicator light. The other end of the light must be connected to the power supply UB; Terminals 34 and 5 of the compensating capacitor must be connected to the indicator light respectively, and the other end of the light must be connected to the neutral line UN (product indicator lights cannot be short circuited or shared).



Co supplementation



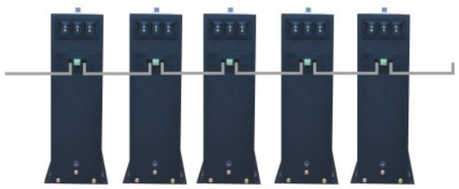
Dividing and supplementing

Online attachments

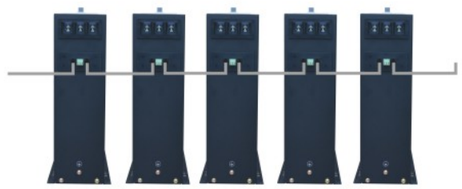
RS-485 online connector

No.	Type	Length	Physical photos	Purpose
1	Type-A	30cm		Used for connecting two adjacent products
2	Type-B	80cm		Used for connecting products between upper and lower floors
3	Type-C	260cm		Used for connection between main and auxiliary cabinets, controllers, status indication products, and products

The product and product networking, as well as the current signal acquisition line, use the plug-in data cable configured by our company.



The grounding wire terminal is located on the back of the product (marked), and the grounding wire connection should be very reliable and truly connected to the external grounding terminal.



BYKXG/F

Series anti harmonic intelligent capacitors

Overview

The BYKXG/F series anti harmonic intelligent capacitor is mainly composed of a (△ type) or (Y type) voltage power capacitor. It adopts the latest technological achievements such as microelectronics software and hardware technology, micro sensor technology, micro network technology, and electrical manufacturing technology to intelligentize it, achieve low-voltage reactive power compensation function, and enable it to work reliably and conveniently with zero switching, protection, measurement, signal, online and other functions, It is a major breakthrough in low-voltage reactive power automatic compensation and filtering technology, mainly applied to reactive power compensation in situations where harmonics are very serious. It can operate reliably without resonance, has no amplification effect on harmonics, and has the function of absorbing and eliminating harmonics to a certain extent. The products connected in series with a 7% reactor are used in electrical environments with a main harmonic of 5th order, while the products connected in series with a 14% reactor are used in electrical environments with a harmonic of 3rd order.

The products are mainly suitable for industrial fields such as chemical industry, building materials, papermaking, textiles, coal, electricity, telecommunications, aluminum industry, shipping ports, tobacco brewing, automobile manufacturing, precision electronics, precision machinery, etc. At the same time, it can also be applied to commercial power systems such as communication industry power supply systems, securities trading power supply systems, airport and port backup power supply systems, large-scale medical systems, various UPS generator sets, exhibition venues, commercial office buildings, etc.

Model meaning

BYKXG / □ / □ - □ □ □

- Reactance rate: P7-7% Reactance rate / P14-14% Reactance rate
- Capacity of the second group of capacitors (Kvar) (not marked as a single group of capacitors)
- Capacity of the first group of capacitors (Kvar)
- Rated voltage (V)
- Compensation method: S-Co supplementation / F-Dividing and supplementing
- Baoyu Antiharmonic Intelligent Capacitor

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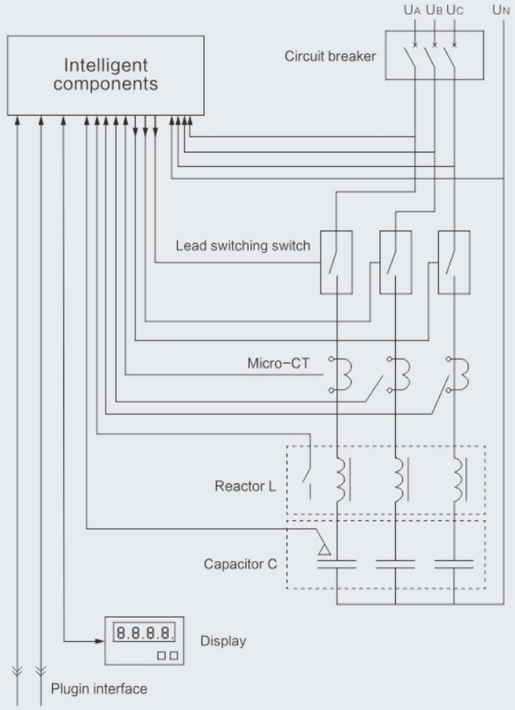
Working principle of the entire machine

The product consists of intelligent components, zero switching switches, current sampling, temperature sampling, dry series reactors, and low-voltage filtering power capacitors. The following figure is the working principle block diagram of the split phase compensation method product in the product series.



Working principle diagram

Quick circuit breaker, main power supply access terminal, main switch, power supply quick cut main protection
Intelligent components and intelligent carriers
Voltage sampling for distribution voltage measurement and power factor measurement, as well as overvoltage, undervoltage, voltage loss, and protection sampling
Zero switching switch components, on/off container switches, and capacitor overvoltage, undervoltage, loss of voltage, short circuit, overcurrent, phase failure, and over harmonic overtemperature protection outlets
Sampling for current measurement of micro CT capacitors and sampling for capacitor overcurrent, phase failure, and three-phase imbalance protection
The reactor is equipped with a built-in temperature sensor for capacitor overtemperature protection
Dry series reactor, filtering component
The capacitor is equipped with a built-in temperature sensor for capacitor overtemperature protection
Capacitor capacitive load for reactive power compensation
Display device, human-machine dialogue
Online plugins, used for interconnecting and peripheral controllers, form the system's operation and distribution current input

Action principle of each component

Intelligent components

All electronic components in intelligent components adopt wide temperature and industrial grade, which can adapt to harsh environments with large temperature changes and severe electromagnetic interference, and can work reliably for a long time without interruption.

Zero crossing switching synchronous switch technology based on mechanical contacts

The company has summarized the characteristics and drawbacks of mechanical contactors, contactless thyristors, and composite switches, and combined years of development and practical operation experience, independently developed a new generation that uses microelectronic software and hardware technology to effectively control the contacts of mechanical electromagnetic relays; Implement synchronous switching technology for zero crossing and switching low-voltage power capacitors based on mechanical contacts; When the AC voltage at both ends of the contact is zero, it closes, and when the contact is closed, it opens when the AC current at both ends is zero. Avoid the impact of inrush current generated during capacitor input on system voltage. Reduce equipment losses and improve the service life of capacitors.

Dry series reactor

The dry series reactor in the product uses high magnetic flux imported materials, which is lightweight, small in size, low in power consumption, low in temperature rise, and low in noise. It is internally equipped with a thermal relay that monitors its temperature and sends a signal when the set temperature is exceeded.

Micro current sampling transformer

The current sampling of the capacitor adopts a micro transformer with permalloy core, which has good linearity, high frequency characteristics, and small difference, ensuring the accuracy and stability of current and current type protection.

Quick circuit breaker

The fast circuit breaker adopts a molded case circuit breaker, which opens within 100ms at 10 times the rated current. It is used for current fast switching main protection to avoid tripping the upper switch, and also serves as the power connection terminal and power main switch.

Main functions of the product

△ Harmonic suppression function: Effectively suppress high-order harmonics and inrush currents, and reject harmonics from entering the capacitor device. It can eliminate the impact of high-order harmonics on capacitors, protect circuits and capacitors from overload, prevent capacitor overheating, aging of insulation media, decline in self-healing performance, and reduce service life.

△ Synchronous switching function: In conjunction with a dedicated controller, it has fast response time, can achieve dynamic tracking, and can accurately switch when the current and voltage are zero, with little impact from harmonics.

△ Split phase compensation function: Split phase compensation type product, each phase capacitor can be switched separately, improving the accuracy of reactive power compensation and providing good compensation for three-phase reactive power imbalance.

△ Measurement function: distribution voltage, current, reactive power, power factor measurement, CT phase and transformation ratio automatic measurement, correction; Measurement of three-phase current and internal temperature of each capacitor.

△ Protection function: circuit current quick switching and overcurrent protection; Capacitor overvoltage and undervoltage protection; Capacitor over temperature, phase failure, and three-phase imbalance protection. When the temperature of the capacitor exceeds 65 degrees, the entire capacitor will be shut down for protection, improving its service life and ensuring the safe operation of the system.

△ Signal function: the switching status, over/under compensation status, and over/under voltage status signals of capacitors; Protection action type and self diagnosis fault type signal.

△ Communication function: RS-485 communication connection is used between the capacitor and the controller, which facilitates the uploading of a large amount of sampling data and the exchange of information with external monitoring terminals, forming the system's work.

△ Intelligent network control: It can automatically detect and track changes in system reactive power, and automatically switch capacitor banks. Capacitors with the same capacity are switched according to the principle of cycling, while capacitors with different capacities are switched according to the principle of adaptation. Capacitors are first in, first out, and first out, first in; Capacitors with low operating temperature shall be put into operation first, while those with high temperature shall be put out first; The compensation working condition is constant, and the capacitor is switched on and off periodically to avoid long-term operation of a single capacitor.

△ Fault self-diagnosis function: The intelligent control component of the capacitor can self diagnose the operating parameters of each phase of the body. Once a self check fault occurs, the entire machine responds quickly and exits operation.

Main features of the product

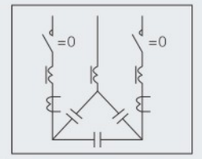
△ Adopting high-quality industrial low-voltage filtering power capacitors with high safety;
△ Synchronous switch technology is adopted, with advanced technology and stable and reliable performance;
△ Adopting a closed-loop circuit, the magnetic circuit is not saturated, there is no energy consumption, and there is no electromagnetic radiation;
△ Adopting special technologies and processes, it can effectively suppress high-order harmonics and inrush currents, and has a significant effect on suppressing harmonics of 3-13 or more;
△ Modular structure, flexible combination, convenient expansion, simple installation, and easy maintenance;
△ Intelligent network, 485 communication interface can be connected to the backend computer for comprehensive power distribution management;
△ Adopting decentralized control mode, with 2 million faultless switching, high reliability;
△ The interface is displayed in Chinese, with simple operation and easy maintenance, which is conducive to on-site fault finding;
△ Add SH explosion-proof device and temperature control device inside to improve the reliability of operation in severe harmonic situations;
△ The energy-saving effect is significant, effectively improving power factor, reducing power consumption, and improving power quality.

Technical indicators of the product

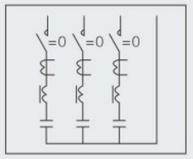
Project		Parameter
Power supply conditions	Rated voltage	~220V/380V
	Voltage deviation	±20%
	Power frequency	47.5~52.5Hz
	Power consumption	<5W(When cutting off the capacitor)
Measurement error	voltage	≤0.5%(Within the range of 80-120% rated voltage)
	current	≤1%
	temperature	±1℃
Reactive power compensation parameters	Capacitor switching interval	>10S
	Reactive capacity	Single unit ≤50Kvar (three-phase), ≤30Kvar (split phase)
	online	≤31 units
Reliability parameters	Control accuracy	100%
	Control allowable frequency	1 million times
	Attenuation rate of operating time of capacitor capacity	≤1%/year
	Attenuation rate of capacitor capacity switching	≤0.1%/10000 times
	Annual failure rate	≤0.1%
Environment condition	ambient temperature	-40℃~+40℃
	relative humidity	40℃，20~90%
	Altitude	≤2000m
Electrical safety	The electrical clearance and creepage distance, insulation strength, safety protection, short-circuit isolation, and adoption and control circuit protection all comply with the corresponding provisions of the Chinese power industry standard DL/T842-2003 "Conditions for Use of Low Voltage Parallel Capacitor Devices".	

Product design application scheme

Product electrical symbols



S (Three-phase compensation)



F (Split phase compensation)

Product terminal diagram

Appearance and installation dimensions

Capacitor model	Capacity	H(mm)	Capacitor model	Capacity	H(mm)
BYKXG/S/480-50/P7	50	485	BYKXG/F/280-40/P7	40	425
BYKXG/S/480-40/P7	40	425	BYKXG/F/280-30/P7	30	425
BYKXG/S/480-30/P7	30	425	BYKXG/F/280-20/P7	20	385
BYKXG/S/480-25/P7	25	425	BYKXG/F/280-10/P7	10	385
BYKXG/S/480-20/P7	20	385	BYKXG/S/480-25+25	25	420
BYKXG/S/480-15/P7	15	385	BYKXG/S/480-30+30	30	420
BYKXG/S/480-10/P7	10	385			

Note: 1. The standard reactance rates for the above products are P7 and P14, and other reactance rates can be selected according to customer needs.
2. The table only lists commonly used product models and specifications, and other models can be consulted for details.
3. The rated voltage of the P14 co compensation type product is 525V, and the rated voltage of the sub compensation type product is 300V.

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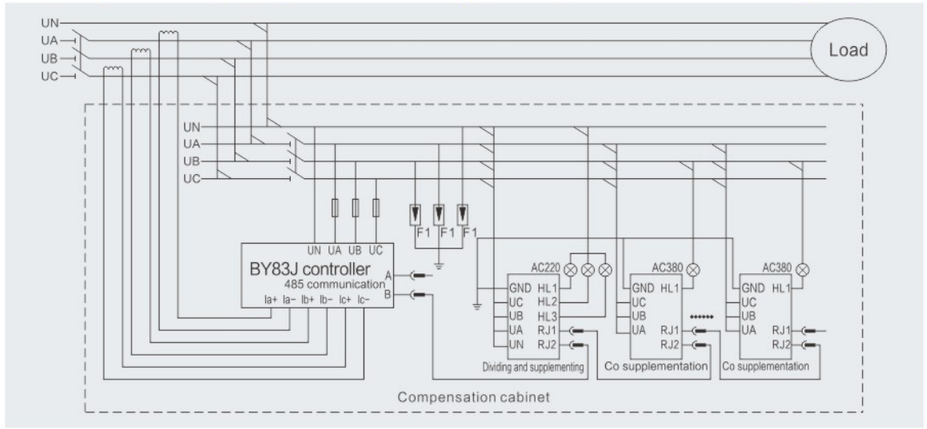
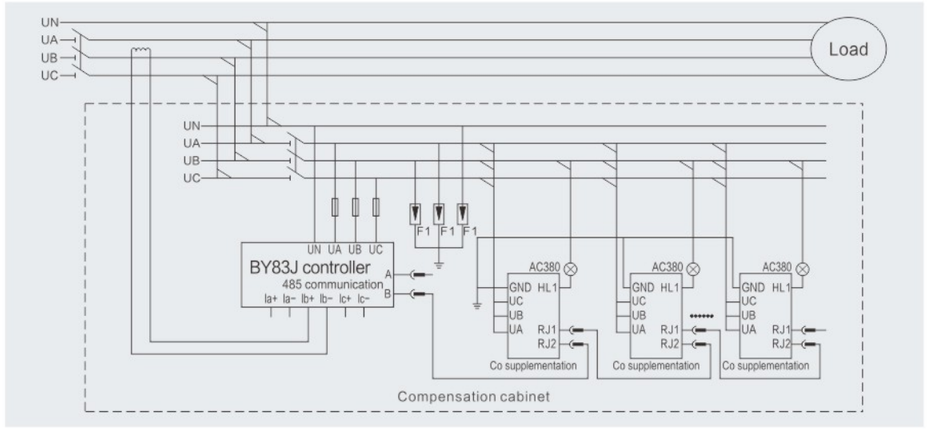
Typical electrical connection schematic diagram inside the cabinet

Mixed compensation (co compensation+sub compensation)+controller scheme wiring diagram



Co compensation+controller scheme wiring diagram



Product application electrical connection and wiring diagram

Product wiring requirements

Specification of the connecting wire between the product and the power supply end:
Primary wiring: power cord, requiring sufficient standard multi-core copper wires;
Secondary wiring: external indicator light wire, connected to controller wire;
Data cable: product to product data cable;
Grounding wire: The product is connected to the external grounding terminal using a single stranded copper wire.

Capacity	Capacity ≤30Kvar	30Kvar < Capacity≤50Kvar
Primary wiring	10mm² copper conductor	16mm² copper conductor
Utility hook-up	1mm² copper conductor	
Data cable	Delivery with product	
Grounding wire	2.5mm² copper conductor	

Electrical wiring requirements

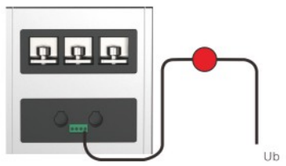
The production of the power cord is as shown in the figure: the power cord must be tightened with screws, and the power cord must be forcefully pulled to prove that it is very firm. Otherwise, it will cause excessive heating in the area and damage the product.

Three phase co compensation

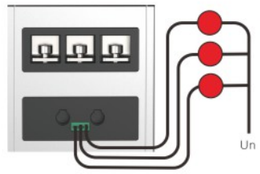
Single-phase compensation

Controller and product wiring: The secondary wiring needs to be connected from the first or last external 485 port in the cabinet product to the corresponding controller 485 port,
As shown in the figure:

When there is an external indicator light, select the appropriate voltage level status indicator light based on the capacitor model, and the indicator light for the co compensating capacitor is 380V; The indicator light of the compensating capacitor is 220V, and terminal 5 of the compensating capacitor is connected to one indicator light. The other end of the light must be connected to the power supply UB; Terminals 34 and 5 of the compensating capacitor must be connected to the indicator light respectively, and the other end of the light must be connected to the neutral line UN (product indicator lights cannot be short circuited or shared).



Co supplementation



Dividing and supplementing

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Online attachments

RS-485 online connector

No.	Type	Length	Physical photos	Purpose
1	Type-A	30cm		Used for connecting two adjacent products
2	Type-B	80cm		Used for connecting products between upper and lower floors
3	Type-C	260cm		Used for connection between main and auxiliary cabinets, controllers, status indication products, and products

The product and product networking, as well as the current signal acquisition line, use the plug-in data cable configured by our company.

The grounding wire terminal is located on the back of the product (marked), and the grounding wire connection should be very reliable and truly connected to the external grounding terminal.

BY83

Series intelligent capacitor controller

Overview

The BY83 series intelligent capacitor controller has full functionality, flexible installation, Chinese menu display, and convenient operation. It can be used in conjunction with the BY81 series intelligent capacitors, BY82 series harmonic resistant intelligent capacitors, BY86 series controlled intelligent capacitors, and BY89 series intelligent capacitors with molded case circuit breakers produced by our company. Using this product can replace the existing low-voltage reactive power compensation cabinet with one voltmeter, one voltage measurement conversion switch, one power factor meter, three ammeters, one low-voltage reactive power individual compensation control backup, and all capacitor status indicator lights, making it extremely simple and saving a lot of wiring.

Product model

BY83JS: Intelligent capacitor co compensation controller
BY83JF: Intelligent capacitor hybrid compensation (co compensation+sub compensation) controller

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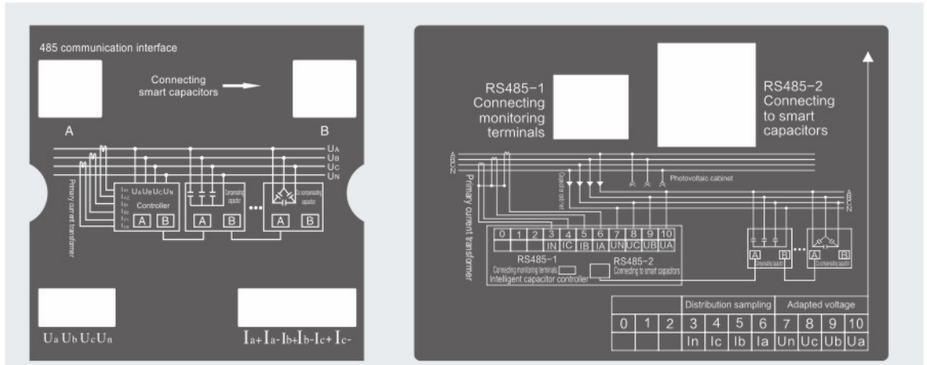
Technical indicators of the product

Project		Parameter
Work environment	Ambient temperature	-40℃~+55℃
	Relative humidity	20%~90% at 40℃
	Atmospheric pressure	79.5~106.0kpa
Working power supply	Working voltage	AC 50Hz，380V±20%
	Function consumption	＜30VA
Measurement accuracy	Voltage	Level 0.5
	Current	Level 0.5
	Power factor	Level 1.0
	Reactive power	Level 1.0
	Power factor	±0.01
Control accuracy	Power factor	±0.01
	Reactive power	±120% of minimum capacitor capacity
Mechanical parameters	Overall dimensions (W×H×D)	120×120×95mm
	Opening size (W ×H)	113×113mm

Wiring diagram



The electrical wiring terminals of the controller are defined as shown in the figure:
When installing the controller, refer to the electrical schematic diagram of the rear panel for wiring.
The specific wiring method is:
UA, UB, and UC are connected to A, B, and C three-phase voltages respectively, while UN is connected to the neutral line;
La+, Ia -, Ib+, Ib -, Ic+, and Ic - are connected to A, B, and C three-phase currents respectively;
A. B is an RS485 communication interface, which can be connected to the communication port of a low-voltage intelligent capacitor.
Note: When all smart capacitors are co compensating capacitors, only Ib+and Ib - can be connected to the B-phase current line.

Product functional features

Setting functions

CT ratio setting;
Protection setting;
Delay time setting;
Power factor setting.

Control function

Automatic and manual control;
Automatic switching control based on controlled physical quantities (reactive power, reactive current, power factor, time period);
Capacitors with the same capacity are controlled by cyclic switching, while capacitors with different capacities are controlled by reactive power deficiency selection;
Before switching the capacitor, predict the distribution reactive power and voltage changes generated by switching. If reverse operation is expected after switching, no switching control will be performed.

Measurement function

Distribution three-phase voltage, current, and power factor;
Distribution of three-phase active and reactive power.

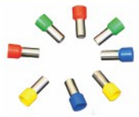
Signal function

Number and capacity of intelligent point capacitors in the system;
Capacitor operation and shutdown signal;
Product or peripheral fault signal.

Protection function

Overvoltage, undervoltage, and voltage loss protection;
Overvoltage acceleration protection;
Switching vibration protection.

Instructions for using wiring terminals

Specifications	Picture	Purpose
10mm^2		For 10mm^2 conductor (Single capacitor capacity below 30Kvar)
16mm^2		For 16mm^2 conductor (Single capacitor capacity below 30Kvar)

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Instructions for using RS485 communication cable

Specifications	Picture	Purpose
0.5m		Used for connecting two adjacent products
0.8m		Used for connecting products between upper and lower floors
2.6m		Used for connection between main and auxiliary cabinets, controllers, status indication products, and products

BY86

Series controlled intelligent capacitors

Overview

BY86 series controlled intelligent capacitors are a new generation of reactive power compensation equipment for 0.4kV low-voltage distribution network, which is efficient in energy conservation, reduces line losses, improves power factor, and improves power quality. It consists of an intelligent measurement and control unit, a zero crossing switching circuit, a protection unit, and one (O-type) or one (Y-type) low-voltage power capacitor. Replacing the conventional automatic reactive power compensation device composed of intelligent controllers, fuses, composite switches or mechanical contactors, thermal relays, low-voltage power capacitors, indicator lights, and other loose components connected by wires inside and on the cabinet surface. This has changed the traditional structure mode of large and bulky reactive power compensation devices, making the new generation of low-voltage reactive power compensation equipment more effective in compensation, smaller in size, lower in power consumption, cheaper in price, more cost saving, more flexible in use, more convenient in maintenance, longer in service life, and higher in reliability, adapting to the higher requirements of modern smart grids for reactive power compensation.

Model Meaning

BY86 D □ □ □

- Rated capacity
- Rated voltage
- S-co supplementation
- F-sub compensation
- Single group capacitor
- Code of Baoyu Holdings

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Function

△ Small size, easy installation, and can be randomly and intelligently compensated on site. Simply connect the signal input for automatic switching.
△ It can be automatically intelligent for one machine or networked for multiple machines, achieving automatic networked operation of multiple machines without the need for additional controller control.
△ The input power factor and cutoff voltage settings can be set according to the actual situation.

Terminal arrangement and definition

The wiring terminals of the product are divided into power supply terminals and measurement and control online terminals, both located at the rear of the product. The three-phase compensation power supply terminals have "UA, UB, UC", and the split phase compensation power supply terminals have "UA, UB, UC, UN" measurement and control online terminals that use plug-in components for on-site debugging and replacement.

Working conditions

△ Service conditions: altitude below 2000 meters;
△ Environmental temperature: -25℃~+50℃;
△ Relative humidity: 20℃, ≤90%;
△ Rated voltage: 250VAC, 50Hz;
△ Rated capacity: 5~30kvar in total and 5~20kvar in partial compensation;
△ Capacitance tolerance: -5+10%;
△ Maximum allowable overvoltage: 110% of rated voltage.

Main technical parameters

Compensation method	Model specifications	Capacity (kvar)	Voltage (V)	Height (mm)
Three-phase compensation	BY86DS/450-5	5	450	240
	BY86DS/450-10	10	450	240
	BY86DS/450-15	15	450	290
	BY86DS/450-20	20	450	290
	BY86DS/450-25	25	450	340
	BY86DS/450-30	30	450	340
Split phase compensation	BY86DF/250-5	5	250	240
	BY86DF/250-10	10	250	290
	BY86DF/250-15	15	250	340
	BY86DF/250-20	20	250	390

Product application electrical connection and wiring diagram

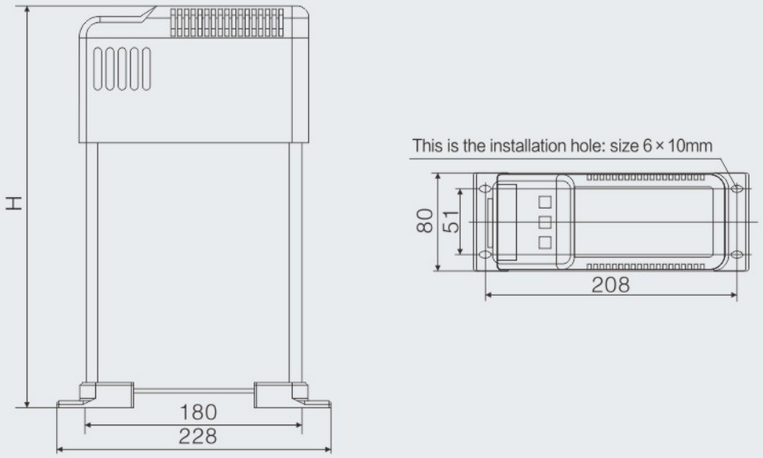
Product wiring requirements

Specification of the connecting wire between the product and the power supply end: Generally, for a single co compensating capacitor with a total capacity of over 30kvar and a sub compensating capacitor with a total capacity of 20kvar, a standard 16mm^2 cross-sectional area of multi-core copper wire should be used, while for other specifications, a standard 10mm^2 cross-sectional area of multi-core copper wire should be used.

Specification of signal wire connection between products: The signal wire includes current sampling wire, RS-485 communication wire, indicator light wire, external control signal input wire, etc. The current carried on the signal line is very small, so a copper wire with appropriate strength can be selected. Generally, a multi-core copper wire with a cross-sectional area of about 0.75mm^2 is used.

The RS-485 communication lines between each station are connected in parallel. Connect the current signal wire in parallel to the output terminal of the secondary current transformer.

Appearance and installation dimensions



Model specifications	Height (mm)	Model specifications	Height (mm)
BY86DS/450-5	240	BY86DF/250-5	240
BY86DS/450-10	240	BY86DF/250-10	290
BY86DS/450-15	290	BY86DF/250-15	340
BY86DS/450-20	290	BY86DF/250-20	390
BY86DS/450-25	340		
BY86DS/450-30	340		

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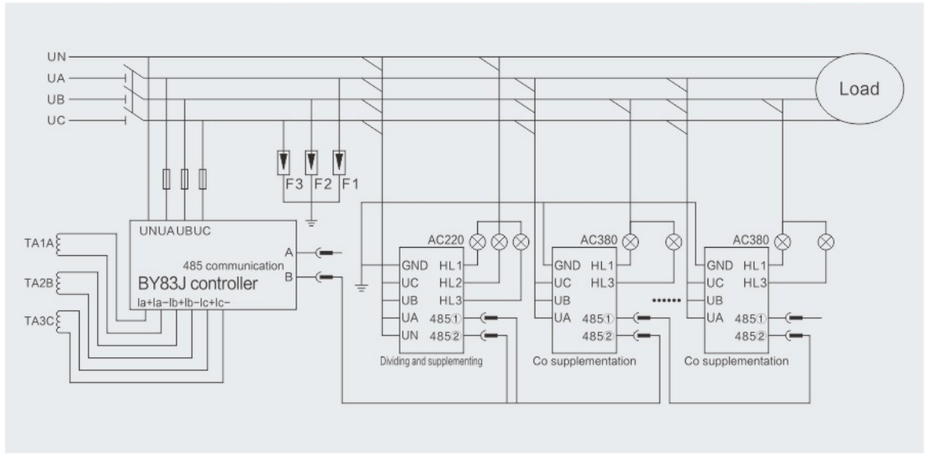
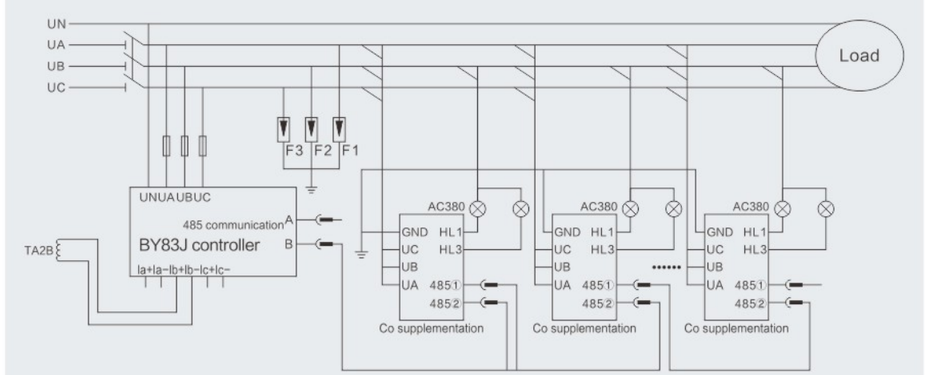
Product external controller diagram

Mixed compensation (co compensation+sub compensation)+controller scheme wiring diagram



Co compensation+controller scheme wiring diagram



BY89

Series intelligent capacitors

Overview

BY89 series intelligent capacitors are integrated reactive power compensation equipment applied to 0.4kV power grids. It consists of a CPU measurement and control module, a capacitor switching composite switch, a capacitor protection module, and a low-voltage self-healing power capacitor of △+△ or △+Y or Y+Y, forming an independent and complete intelligent compensation unit. The low-voltage reactive power compensation complete set device composed of BY89 series intelligent capacitors is equipped with a molded case circuit breaker, which has a 15KVA breaking capacity, flexible compensation methods (co compensation and sub compensation can be combined arbitrarily), convenient installation and maintenance, strong protection function, small device size, good compensation effect, low power consumption, and high reliability. It meets users' requirements for reactive power compensation, effectively improving power factor and voltage quality The actual demand for energy conservation and loss reduction.

Model Meaning

BY 89 □ □ / □ - □ / □

- Capacity of the second group of capacitors (kvar)
- Capacity of the first group of capacitors (kvar)
- Rated voltage of capacitor (V)
- Capacitor filling material: no microcrystalline wax; G-Thousand
- Compensation method: S-three-phase compensation; F-split phase compensation
- Product model
- Code of Baoyu Holdings

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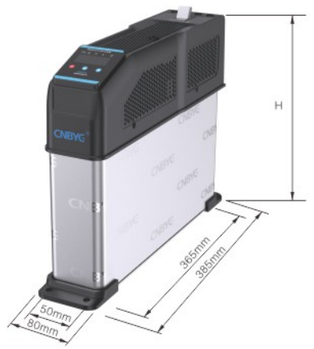
Model definition

According to the type of capacitor, the products are divided into dry type intelligent capacitors and oil immersed intelligent capacitors, and the model tables are shown in the table:

Compensation method	Capacity of each group of capacitors (total capacity) (kvar)	Model
Three-phase compensation	20+20(40)	BY89F/250-20+20
	10+20(30)	BY89F/250-10+20
	10+10(20)	BY89F/250-10+10
	10+5(15)	BY89F/250-10+5
Three-phase co compensation	40-40	BY89S/450-40+40
	40-30	BY89S/450-40+30
	40-20	BY89S/450-40+20
	30-30	BY89S/450-30+30
	30-20	BY89S/450-30+20
	20-20	BY89S/450-20+20
	20-10	BY89S/450-20+10
Co dividing and supplementing	40/20	BY89H/450-40+250-20
	40/15	BY89H/450-40+250-15
	20/20	BY89H/450-40+250-20
	20/15	BY89H/450-40+250-15

Appearance and installation dimensions

Outline dimensional drawing	Compensation method	Model	H(mm)
	Three-phase compensation	BY89F/250-20+20	350
		BY89F/250-20+10	350
		BY89F/250-10+10	290
		BY89F/250-10+5	290
	Three-phase co compensation	BY89S/450-40+40	410
		BY89S/450-40+30	410
		BY89S/450-40+20	350
		BY89S/450-30+30	350
		BY89S/450-30+20	350
		BY89S/450-20+20	290
		BY89S/450-20+10	290

Note: The width and depth of smart capacitors are consistent among different capacities, but there are only differences in height.

Technical standards met

DL/T 842−2003 Technical Conditions for the Use of Low Voltage Parallel Capacitor Devices
GB/T 22582−2008 Low Voltage Power Compensation Devices for Power Capacitors
GB/T 15576−2008 Low Voltage Complete Set Reactive Power Compensation Devices

Technical indicators of the product

Project		Parameter
Work environment	Ambient temperature	−25℃~+55℃
	Relative humidity	20%~90% at 40℃
	Altitude	⩽2000m
Working power supply	Rated voltage	AC250V/AC450V
	Voltage deviation	±20%
	Working frequency	50±1.5Hz
	Power consumption	⩽3VA
Measurement accuracy	Voltage and current	0.5%
	Power	1.0%
	Power factor	±0.01
	Temperature	±1℃
Protection time	Blocking time	5~60s
	Capacitor cutting time	1s
Reactive power compensation	Maximum number of connected capacitors	31 units with controller
		12 units without controller
Electrical safety	Insulation strength of the main circuit	Test voltage 2500V (1min)
	Protection circuit continuity	Reliable electrical connection between all grounding components and grounding screws
	Safety protection	There is a reliable electrical connection between the metal base of the device's shell, potentially live metal parts, and electrical components that require grounding, and the grounding screw
	Protection level	IP30
	Sampling and control circuit protection	The built−in sampling control current circuit of the device uses dedicated wiring terminals, and one end of the circuit is reliably grounded.

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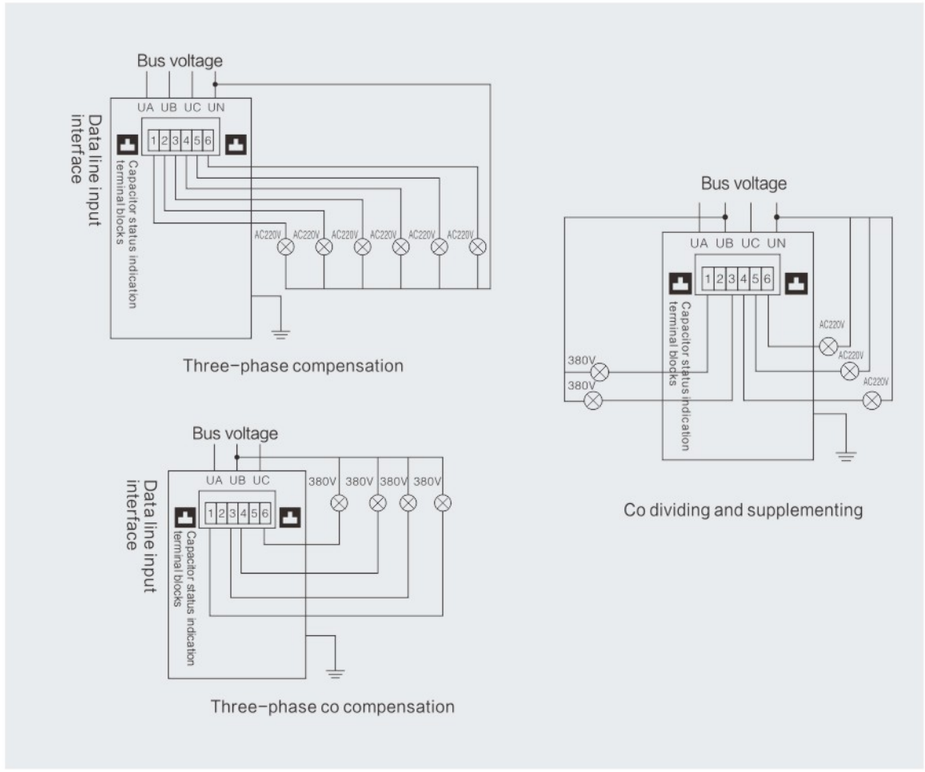
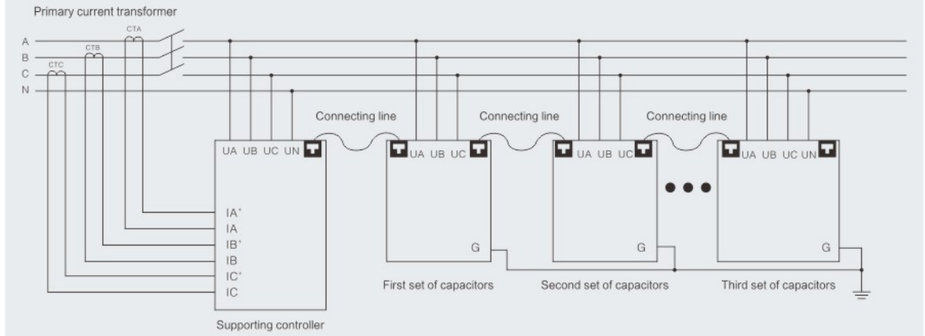
Terminal arrangement and definition



Product wiring diagram



BY

Series intelligent combined low-voltage power capacitor compensation device

Overview

The BY series intelligent combined low-voltage power capacitor compensation device is mainly composed of self-healing low-voltage power capacitors, with an intelligent measurement and control processor as the control center. It uses microelectronic software and hardware technology to achieve capacitor switching and reactive power compensation for 0.4kV low-voltage lines. It has functions such as overcurrent / overvoltage / undervoltage / undercurrent, voltage loss, phase loss, harmonics, temperature protection, measurement, control, communication, etc.

Model Meaning

BY □ □ □□ □□ / □ / □ (□ + □)

- Capacity of the second capacitor
- Capacity of the first capacitor
- Rated capacity
- Rated voltage of capacitor
- Program level
- Compensation method: FB split phase compensation
- automatic control
- Design serial number
- Enterprise Code

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Main technical parameters

Normal working and installation conditions

Project	Parameter
Ambient temperature	-25℃~+55℃
Relative humidity	⩽ 50% at 40℃, ⩽ 90% at 20℃
Altitude	⩽2000m
Environment condition	No harmful gases and vapors, no conductive or explosive dust, and no severe mechanical vibration

Power supply conditions

Project	Parameter
Working voltage	380V ± 20%
Grid frequency	50Hz (range: 45Hz~55Hz)
Harmonic voltage	The total distortion rate shall not exceed 5%
Harmonic current	Current harmonics not exceeding 20%

Performance index

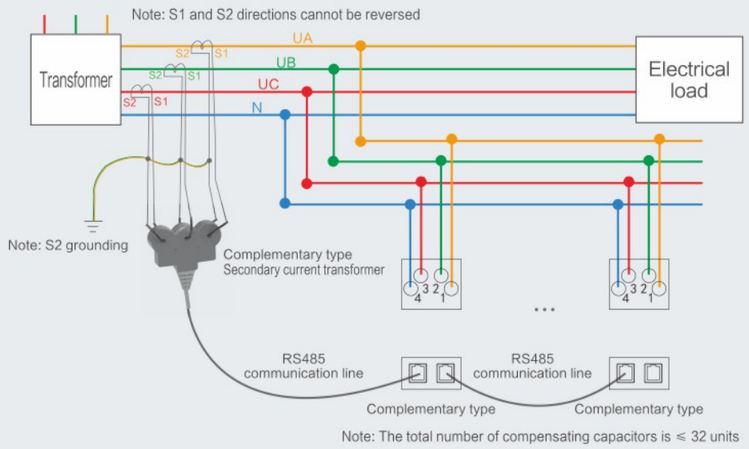
Project	Parameter
Measurement error	Voltage: ⩽ ± 0.5%(0.8~1.2Un)　Active power: ⩽ ± 2% Current: ⩽ ± 0.5%(0.2~1.2In)　Power factor: ⩽ ± 1% Temperature: ± 1 ℃
Protection error	Voltage: ⩽ ± 1%　Temperature: ⩽ ± 1℃ Current: ⩽ ± 1%　Time: ⩽ ± 1s
Reactive power compensation parameters	Reactive power compensation error: ⩽50% of the minimum capacitor capacity Capacitor switching time: ⩾10s, can be set between 10s and 180s by oneself
Reliability parameters	Control accuracy: 100% Permissible switching times: 1 million times Capacitor capacity operating time decay rate: ⩽ 1%/year Capacitor capacity switching attenuation rate: ⩽ 0.1%/10000 times
Protection function	Overvoltage protection, undervoltage protection, short circuit protection, overcurrent protection, harmonic protection, overvoltage protection, drive fault protection
Executive standards	The electrical clearance and creepage distance, insulation strength, safety protection, short-circuit strength, sampling and control circuits all comply with the requirements of the corresponding clauses in GB/T15576 "Low Voltage Complete Set Reactive Power Compensation Devices"

Communication monitoring capability (supporting distribution terminal type)

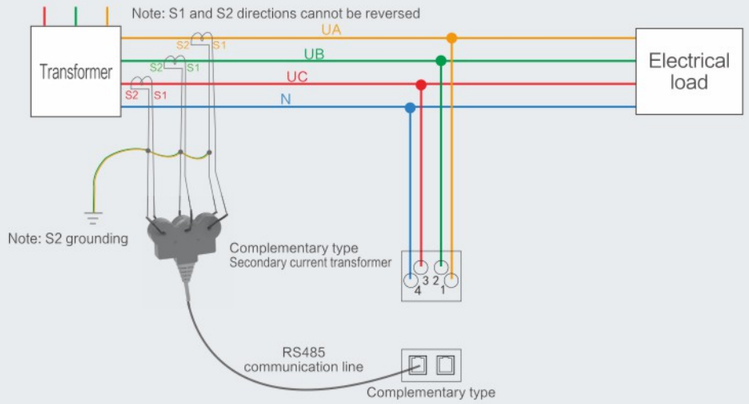
Project	Parameter
Communication interface	RS485
Communication protocol	Modbus protocol / DL645, etc

Wiring diagram

Wiring diagram of three-phase mixed compensation (without controller)



Schematic diagram of single sub compensation wiring



Power cord connection instructions

Total capacity	1~20kvar	21~40kvar	41~60kvar
Multi core copper wire	10mm²	16mm²	25mm²

It is important to note that:
Tighten the screws and pull the power cord firmly to ensure a secure connection before use.
Otherwise, the terminal will overheat excessively, leading to product damage.
The split compensation type must be connected to the neutral line, and the wire diameter specification is the same as the three-phase power supply incoming line.

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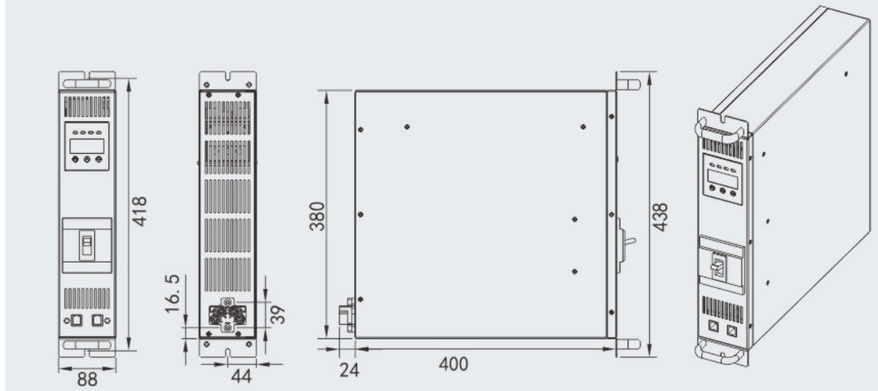
Appearance and installation dimensions



Note: There are two sets of series that can be supplemented.
When selecting a controller, it is only used in conjunction with the JKGHY-Z controller.

Online attachments

Standard configuration: 3 units per box, equipped with W30 type (3 pieces), and each controller is equipped with D300-W type (1 piece).

Model specifications	Length	Physical photos	Purpose
W30	30cm		Used for connecting two adjacent smart capacitors
W80	80cm		Used for the connection between the upper and lower layers of smart capacitors
W260	260cm		Used for connection between intelligent capacitors in the main and auxiliary cabinets
D300-W	300cm		Used for the connection between intelligent capacitors and controllers

Note: There are special requirements for the length of communication cables. Please contact sales personnel.

BSMJ

Series self-healing low-voltage parallel capacitors

Overview

Self healing low-voltage parallel capacitors are suitable for power systems with frequencies of 50Hz or 60Hz, mainly used to improve power factor, reduce reactive power loss, improve voltage quality, and tap into transformer capacity. It is the best energy-saving product strongly recommended by the country for use.

Model Meaning

B S MJ L 0.4 - 15 - 3

- Phase number: 3-Three-phase; 1-Single-phase
- Rated capacity (15kvar)
- Rated voltage (0.4kV)
- L-Charged reactance coil; None - without reactance coil
- Medium code (metallized polypropylene film)
- Impregnator code: S-Microcrystalline wax; Z-Rapeseed oil; G-Silicone oil
- Series code: B-Parallel capacitor; M-Energy storage capacitor; C-Series capacitor

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Working conditions

△ After the capacitor is cut off from the power supply, it is necessary to ensure that the remaining voltage of the capacitor drops to 10% of the rated voltage before allowing it to be put into operation again. Usually, this time takes about 200s. Therefore, the controller should choose a controller with the function of switching back on and locking time after cutting off. If a general controller is used, a fast discharge facility should be installed separately. For those using equipotential switching switches, this limitation is not applicable.

△ The altitude shall not exceed 2000m.

△ Environmental temperature category −25 ℃, minimum temperature −25 ℃, maximum temperature category C, (maximum not exceeding 50 ℃, average temperature within 24 hours not exceeding 40 ℃, average temperature within a year not exceeding 30 ℃). Capacitors should be ensured to operate under good ventilation conditions and are not allowed to operate in a closed and airtight environment.

Main features

Small size and light weight: Due to the use of metallized polypropylene film material as the medium, the volume and weight are only 1/4 and 1/5 of the old products.
Low loss: The actual value is less than 0.1%, so the capacitor itself has low energy consumption, less heat generation, low temperature rise, long working life, and good energy-saving effect.
Excellent self-healing performance: Local breakdown of the medium caused by overvoltage can quickly self-heal, restore normal operation, and greatly improve reliability.
Safety: Equipped with built-in self discharge resistor and safety device. The built-in discharge resistor can automatically discharge the electrical energy carried by the capacitor. When the capacitor malfunctions, the safety device can disconnect the power supply in a timely manner to avoid further development of the fault and ensure safe use.
No oil leakage: This capacitor uses advanced semi solid impregnating agent, with a melting point above 70 ℃. It does not leak oil during use, avoiding environmental pollution, and the capacitor will not fail due to oil loss.

Technical indicators of the product

Project		Parameter
Conditions of Use	Ambient temperature	−25℃~+50℃
	Relative humidity	≤85%
	Altitude	≤2000m
Rated voltage		250VAC、400VAC、450VAC、525VAC、690VAC、750VAC、1050VAC
Rated capacity		1-100kvar
Capacity tolerance		−5~+10%
Loss angle tangent value		At rated power frequency voltage, tg δ ≤0.1% at 20℃
AC withstand voltage		2.15 times the rated voltage between poles for 10 seconds, and 3kV between poles for 10 seconds
Maximum allowable overvoltage		1.1 times rated voltage
Maximum allowable overcurrent		1.30 times rated current
Self discharge characteristics		Add $\sqrt{2}$ Un DC voltage to the capacitor, disconnect the power supply for 3 minutes, and the remaining voltage decreases by 75V or less
Compliant with standards		GB12747-2017、IEC60831-2014

Main specifications

Product model	Rated voltage (kV)	Rated capacity (kvar)	Total electrical capacity (μF)	Rated current (A)	Boundary dimension L × W × H (mm)
0.25-3-3YN	0.25	3	153	4	170×60×125
0.25-5-3YN	0.25	5	255	6.7	170×60×125
0.25-7.5-3YN	0.25	7.5	382	10	170×60×125
0.25-10-3YN	0.25	10	509	13.3	170×60×125
0.25-15-3YN	0.25	15	764	20	170×89×200
0.25-20-3YN	0.25	20	1019	26.7	170×89×245
0.25-25-3YN	0.25	25	1273	33.3	170×89×300
0.25-30-3YN	0.25	30	1528	40	170×89×300
0.45-5-3	0.45	5	79	6.4	170×60×105
0.45-6-3	0.45	6	94	7.7	170×60×105
0.45-7-3	0.45	7	110	9	170×60×105
0.45-7.5-3	0.45	7.5	118	9.6	170×60×105
0.45-8-3	0.45	8	126	10.3	170×60×105
0.45-10-3	0.45	10	157	12.8	170×60×125
0.45-12-3	0.45	12	189	15.4	170×60×175
0.45-14-3	0.45	14	220	18	170×60×175
0.45-15-3	0.45	15	236	19.2	170×60×175
0.45-16-3	0.45	16	252	20.5	170×60×175
0.45-18-3	0.45	18	283	23.1	170×60×210
0.45-20-3	0.45	20	314	25.7	170×60×210
0.45-25-3	0.45	25	393	32.1	170×89×200
0.45-30-3	0.45	30	472	38.5	170×89×200
0.45-40-3	0.45	40	629	51.3	170×89×245
0.45-50-3	0.45	50	786	64.2	170×89×300
0.45-60-3	0.45	60	943	77	270×120×250
0.45-70-3	0.45	70	1100	89.8	270×120×300
0.45-80-3	0.45	80	1258	102.6	270×120×300

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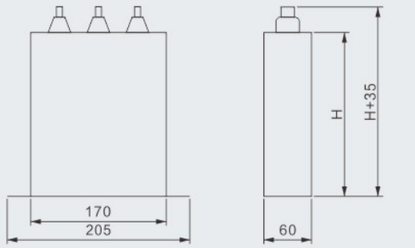
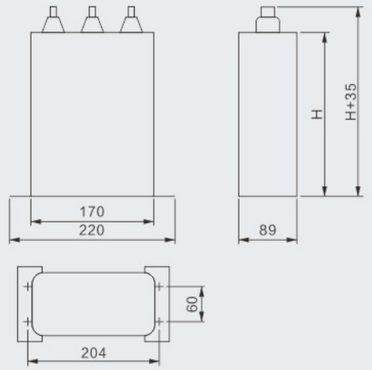
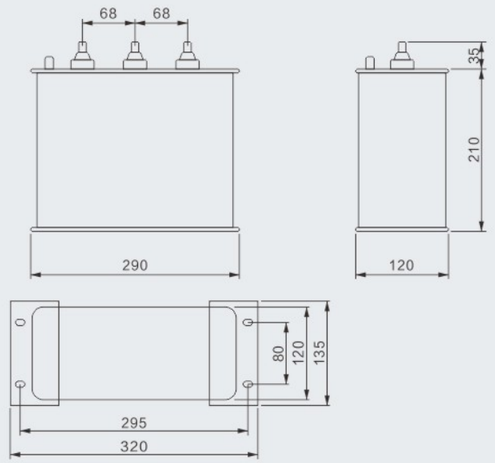
Product dimensions



Type A



Type B



0.45-60-3

BY71

Series cylindrical capacitors

Overview

The BY71 series cylindrical capacitors are suitable for power frequency AC power systems with a nominal voltage of 1000V and below, to improve power factor, reduce reactive power loss, and improve voltage quality.

Model Meaning

BY71 □ – □ – □

- Phase number
- Rated capacity (kvar)
- Rated voltage (kV)
- Cylindrical capacitor

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Main features

△ The high-quality oxidation treated aluminum material shell has a circular design, convenient installation, and small duty cycle.
△ The unique design ensures that the product can adapt to high ambient temperatures and places with significant system voltage fluctuations.
△ Install discharge resistor and safety device inside. When the internal pressure of the capacitor increases or a malfunction occurs, the safety device can automatically disconnect it from the power supply to prevent accidents from expanding.

Main technical parameters

Project		Parameter
Loss angle tangent value		Below 0.0012 at rated power frequency voltage
Capacitance deviation		The difference between the measured value and rated value of the capacitor shall not exceed 0~+10%, and the ratio of the maximum to minimum capacitance measured between any two line terminals in a three-phase capacitor shall not exceed 1.08
Withstand voltage	Interpolar	Power frequency 2.15Un, 2S
	Polar shell	Rated voltage of 600V and below, applied voltage of 3.6kV, 5S
		Rated voltage of 600V and below, applied voltage of 7.2kV, 5S
Maximum allowable overvoltage		1.1Un, not exceeding 8h every 24h
Maximum allowable overcurrent		1.3In
Self discharge characteristics		The capacitor is equipped with a discharge device, which can reduce the remaining voltage of the capacitor from 2Un to 75V or below within 3 minutes of disconnecting the power supply
Executive standards		IEC60831-2017，GB/T12747-2014

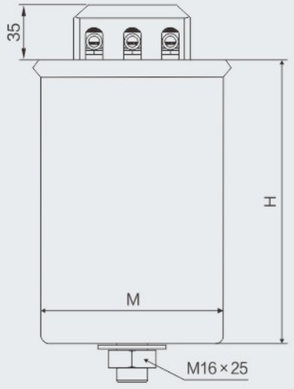
Instructions for use

△ Capacitors should be transported in their original factory packaging state as much as possible, and should be handled with care during transportation;
△ Capacitors should be stored indoors in a dry and non corrosive atmosphere;

User acceptance inspection

△ Before using capacitors, users should first check whether the nameplate model matches the purchased product model;
△ Capacity testing: It is required to perform according to 4.2, and instruments with a relative error of no more than 2% should be used for measurement;
△ Withstand voltage test: The applied test voltage is 75% of 4.3.

Main specifications and external dimensions



Specifications	Capacity (μF)	Current (a)	Body size (mm)		Installation sole (mm)
			A	B	
0.45−10−3	157.3	12.8	76	245	M12×17
0.45−15−3	235.9	19.2	96	245	M16×25
0.45−20−3	314.5	25.7	106	245	M16×25
0.45−25−3	393.2	32.1	116	245	M16×25
0.45−30−3	471.8	38.5	116	290	M16×25
0.45−40−3	629.1	51.3	126	290	M16×25
0.48−10−3	138.2	12.0	76	245	M12×17
0.48−15−3	207.3	18.0	96	245	M16×25
0.48−20−3	276.5	24.1	106	245	M16×25
0.48−25−3	345.6	30.1	116	245	M16×25
0.48−30−3	414.7	36.1	116	290	M16×25
0.48−40−3	552.9	48.1	126	290	M16×25
0.525−10−3	115.5	11.0	76	245	M12×17
0.525−15−3	173.3	16.5	96	245	M16×25
0.525−20−3	231.1	22.0	106	245	M16×25
0.525−25−3	288.9	27.5	116	245	M16×25
0.525−30−3	346.6	33.0	116	290	M16×25
0.525−40−3	462.2	44.0	126	290	M16×25
0.525−50−3	577.7	55.0	136	290	M16×25

Note: The external installation dimensions of single−phase products are the same as those of three−phase products of the same specification;
Our company can customize other specifications of products for users. If you have special requirements, please negotiate and place an order.

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Installation and operation

△ The capacitor is installed indoors and used at an altitude below 2000m;

△ The ambient air temperature during use is −25~+50℃, and the humidity is less than 85%;
Note: Products can be customized for low temperature environments of −40~+50℃ for users.

△ The installation plant should not be exposed to direct sunlight, should not be soaked in rain, and should avoid places with excessive dust and severe vibration. The distance between them should be greater than 30mm; When the ambient temperature is high in summer, effective measures should be taken to ensure good ventilation and heat dissipation;

△ Before installation, it is necessary to fully consider the factors of high voltage rise caused by capacitor input to prevent long−term operation of the capacitor under overvoltage; Before installing capacitors, attention must be paid to detecting voltage waveforms and network characteristics. If there are harmonic sources (such as installing large rectifiers, frequency converters, intermediate frequency furnaces, etc.), corresponding measures should be taken to limit the severity of harmonics;

△ When a capacitor is connected in parallel with an induction motor, it is recommended to select a distribution container based on the capacitor current being less than 90% of the motor's no−load current;

△ Flexible copper wire should be used as much as possible for the wiring at the capacitor line terminals and grounding terminals, and good contact should be ensured. It is recommended that users regularly inspect the capacitor wiring terminals to prevent damage outside the capacitor caused by poor contact;

△ The time interval between capacitor removal and re operation should be greater than 3 minutes (self discharge time), otherwise high overvoltage may occur and the capacitor may be damaged.

Ordering instructions

△ Users must provide product rated voltage, rated capacitance, number of phases, and other parameters.

△ Users should try their best to provide some characteristics of the place of use.

CKSG

Series low-voltage series reactor

Overview

When compensating for capacitive reactive power, capacitors are often affected by harmonic currents, closing inrush currents, and operating process voltages, resulting in capacitor damage and power factor reduction. Therefore, a series reactor needs to be installed at the front end of the capacitor to suppress and absorb harmonics, protect the capacitor, avoid the impact of harmonic voltage and current, improve power quality, improve system power factor, and extend the service life of the capacitor.

Model Meaning

CKSG－□/□－□

- Reactance rate XC/XL
- Rated voltage of capacitor (kV)
- Rated capacity (Kvar)
- Low voltage series reactor

Environmental conditions for use

△ The altitude does not exceed 2000 meters;
△ Operating environment temperature −25 ℃ to+45 ℃, relative humidity not exceeding 90%;
△ There are no harmful gases or flammable or explosive materials around;
△ The surrounding environment should have good ventilation conditions. If installed in a cabinet, ventilation equipment should be installed.

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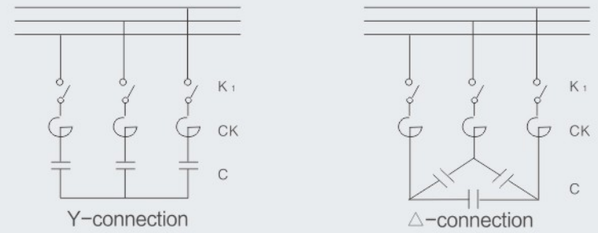
Product structure characteristics

△ The filtering reactor is divided into two types: three−phase and single−phase, both of which are iron core dry type.
△ The iron core adopts high−quality and low loss imported cold−rolled oriented silicon steel sheets, and the core column is divided into uniform small sections by multiple air gaps. The air gaps are separated by epoxy laminated glass cloth plates and bonded with special adhesives to ensure that the reactance air gap does not change during operation.
△ The coil is wound with H−grade or C−grade enameled flat copper wire, arranged tightly and evenly.
△ After assembling the coil and iron core of the reactor into one, it undergoes a process of pre drying, vacuum impregnation, and heat curing. H−grade impregnation paint is used to firmly bond the coil and iron core of the reactor.
△ The clamps and fasteners of the reactor are made of non−magnetic materials to ensure a high quality factor and good filtering effect.
△ The exposed components are all treated with anti−corrosion measures, and the outgoing terminals are made of tinned copper tube terminals.

Performance parameter

△ Can be used for 0.4KV, 0.45KV, 0.48KV, 0.525KV, 0.66KV, 0.69KV, 1.14KV;
△ Types of reactance rates: 1%, 4.5%, 5.6%, 6%, 7%, 12%, 13%, 14%;
△ Voltage withstand level: 3KV/min;
△ Insulation level: Class B, Class F, Class H;
△ Noise: ≤50dB;
△ Overload capacity: ≤1.35 times continuous operation.

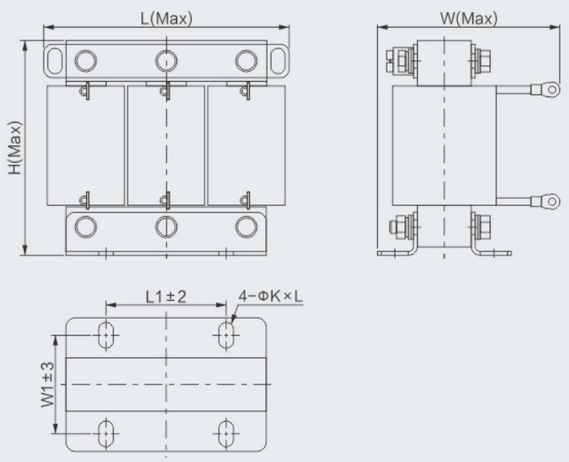
Connection



Ordering instructions

△ Product model
△ Rated current
△ Rated voltage (grid voltage)
△ Reactance rate (XC/XL)
△ Rated inductance
△ Insulation level
△ Other special requirements can be specified separately in the agreement

Boundary dimensions of shunt reactors



Test data

Specification and model	Rated current (A)	Rated inductance (Mh)	L	W	H	L1×W1	ΦK×L	Capacity
CKFG-0.3/0.25-6%	6.67	7.17	195	165	150	90×79	Φ11×20	5K
CKFG-0.6/0.25-6%	13.33	3.587	195	165	150	90×79	Φ11×20	10K
CKFG-0.9/0.25-6%	20	2.392	215	170	150	110×79	Φ11×20	15K
CKFG-1.2/0.25-6%	26.66	1.793	215	175	170	110×84	Φ11×20	20K
CKFG-1.5/0.25-6%	31.27	1.529	215	190	170	110×94	Φ11×20	25K
CKFG-1.8/0.25-6%	39.99	1.196	215	190	170	110×94	Φ11×20	30K
CKFG-2.4/0.25-6%	53.32	0.901	215	200	190	110×99	Φ11×20	40K
CKFG-3.0/0.25-6%	66.65	0.717	245	210	210	130×103	Φ11×20	50K
CKFG-0.3/0.28-6%	5.95	8.993	195	165	150	90×79	Φ11×20	5K
CKFG-0.6/0.28-6%	13.20	4.496	195	165	150	90×79	Φ11×20	10K
CKFG-0.9/0.28-6%	19.80	2.995	215	170	150	110×79	Φ11×20	15K
CKFG-1.2/0.28-6%	26.39	2.248	215	175	170	110×84	Φ11×20	20K
CKFG-1.5/0.28-6%	30.96	1.799	215	190	170	110×94	Φ11×20	25K
CKFG-1.8/0.28-6%	39.59	1.502	215	190	170	110×94	Φ11×20	30K
CKFG-2.4/0.28-6%	52.79	1.124	215	200	190	110×99	Φ11×20	40K
CKFG-3.0/0.28-6%	65.98	0.901	245	210	210	130×103	Φ11×20	50K

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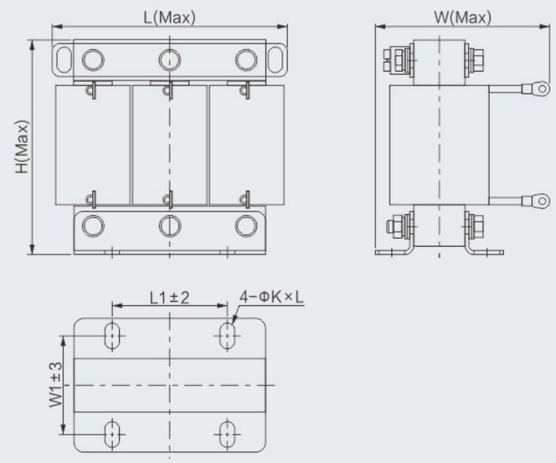
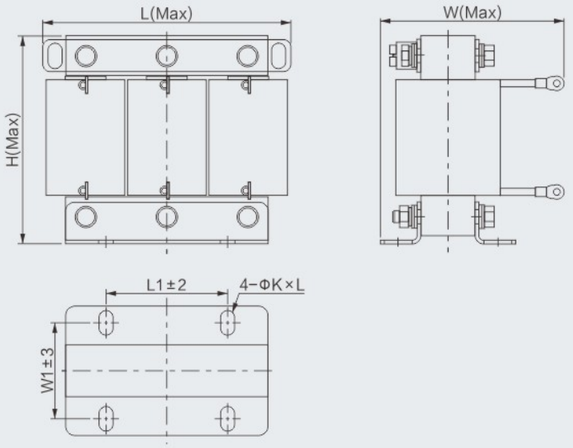
Boundary dimensions of shunt reactors



Test data

Specification and model	Rated current (A)	Rated inductance (Mh)	L	W	H	L1×W1	ΦK×L	Capacity
CKFG-0.35/0.25-7%	6.67	8.356	195	165	150	90×79	Φ11×20	5K
CKFG-0.7/0.25-7%	13.33	4.18	195	165	150	90×79	Φ11×20	10K
CKFG-1.05/0.25-7%	20	2.787	195	175	170	90×84	Φ11×20	15K
CKFG-1.4/0.25-7%	26.66	2.09	215	175	170	110×84	Φ11×20	20K
CKFG-1.75/0.25-7%	31.27	1.782	215	195	190	110×99	Φ11×20	25K
CKFG-2.1/0.25-7%	39.99	1.394	215	195	190	110×99	Φ11×20	30K
CKFG-2.8/0.25-7%	53.32	1.05	245	210	210	130×103	Φ11×20	40K
CKFG-3.5/0.25-7%	66.65	0.836	245	210	215	130×108	Φ11×20	50K
CKFG-0.35/0.28-7%	5.95	10.48	195	165	150	90×79	Φ11×20	5K
CKFG-0.7/0.28-7%	13.20	5.24	195	165	150	90×79	Φ11×20	10K
CKFG-1.05/0.28-7%	19.80	3.49	195	175	170	90×84	Φ11×20	15K
CKFG-1.4/0.28-7%	26.39	2.62	215	175	170	110×84	Φ11×20	20K
CKFG-1.75/0.28-7%	30.96	2.096	215	195	190	110×99	Φ11×20	25K
CKFG-2.1/0.28-7%	39.59	1.75	215	195	190	110×99	Φ11×20	30K
CKFG-2.8/0.28-7%	52.79	1.31	245	210	210	130×103	Φ11×20	40K
CKFG-3.5/0.28-7%	65.98	1.05	245	210	215	130×108	Φ11×20	50K

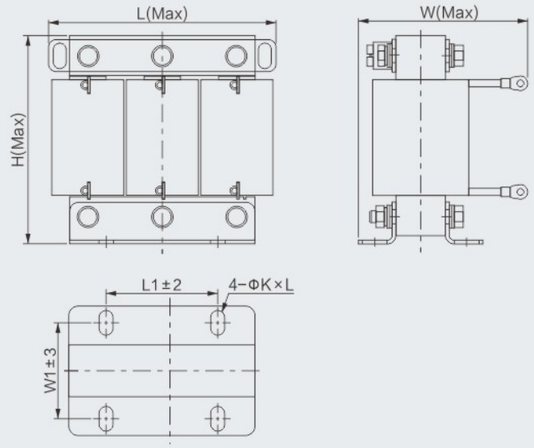
Boundary dimensions of shunt reactors



Test data

Specification and model	Rated current (A)	Rated inductance (Mh)	L	W	H	L1×W1	ΦK×L	Capacity
CKFG-0.6/0.3-12%	5.56	20.63	195	165	150	90×79	Φ11×20	5K
CKFG-1.2/0.3-12%	11.11	10.31	215	175	170	110×84	Φ11×20	10K
CKFG-1.8/0.3-12%	16.67	6.876	215	195	190	110×99	Φ11×20	15K
CKFG-2.4/0.3-12%	22.22	5.157	215	195	190	110×99	Φ11×20	20K
CKFG-3.0/0.3-12%	27.78	4.125	245	210	210	130×108	Φ11×20	25K
CKFG-3.6/0.3-12%	33.33	3.438	245	220	215	130×118	Φ11×20	30K
CKFG-4.8/0.3-12%	44.44	2.578	280	235	245	130×128	Φ11×20	40K
CKFG-6.0/0.3-12%	55.56	2.063	280	235	245	130×128	Φ11×20	50K
CKFG-0.7/0.3-14%	5.56	24.065	195	165	150	90×79	Φ11×20	5K
CKFG-1.4/0.3-14%	11.11	12.032	215	190	170	110×94	Φ11×20	10K
CKFG-2.1/0.3-14%	16.67	8.022	215	195	190	110×99	Φ11×20	15K
CKFG-2.8/0.3-14%	22.22	6.016	245	210	210	130×103	Φ11×20	20K
CKFG-3.5/0.3-14%	27.78	4.813	245	210	215	130×108	Φ11×20	25K
CKFG-4.2/0.3-14%	33.33	4.011	245	220	215	130×118	Φ11×20	30K
CKFG-5.6/0.3-14%	44.44	3.008	280	235	245	130×128	Φ11×20	40K
CKFG-7.0/0.3-14%	55.56	2.406	280	235	245	130×128	Φ11×20	50K

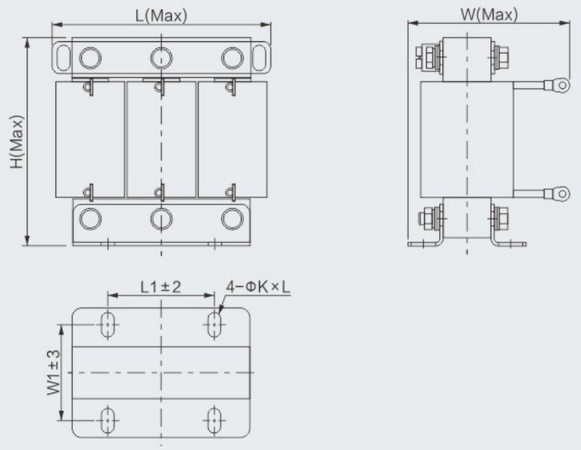
External dimensions of co compensating reactor



Test data

Specification and model	Rated current (A)	Rated inductance (Mh)	L	W	H	L1×W1	ΦK×L	Capacity
CKSG-0.3/0.45-6%	6.42	7.74	195	165	150	90×79	Φ11×20	5K
CKSG-0.6/0.45-6%	12.83	3.87	195	165	150	90×79	Φ11×20	10K
CKSG-0.9/0.45-6%	19.25	2.583	215	170	150	110×79	Φ11×20	15K
CKSG-1.2/0.45-6%	25.66	1.936	215	175	170	110×84	Φ11×20	20K
CKSG-1.5/0.45-6%	30.1	1.549	215	190	170	110×94	Φ11×20	25K
CKSG-1.8/0.45-6%	38.49	1.291	215	190	170	110×94	Φ11×20	30K
CKSG-2.4/0.45-6%	51.32	0.968	215	200	190	110×99	Φ11×20	40K
CKSG-3.0/0.45-6%	64.15	0.774	245	210	210	130×103	Φ11×20	50K
CKSG-0.3/0.48-6%	6.01	10.27	195	165	150	90×79	Φ11×20	5K
CKSG-0.6/0.48-6%	12.03	5.13	195	165	150	90×79	Φ11×20	10K
CKSG-0.9/0.48-6%	18.04	3.42	215	170	150	110×79	Φ11×20	15K
CKSG-1.2/0.48-6%	24.06	2.567	215	175	170	110×84	Φ11×20	20K
CKSG-1.5/0.48-6%	30.07	2.05	215	190	170	110×94	Φ11×20	25K
CKSG-1.8/0.48-6%	36.09	1.71	215	190	170	110×94	Φ11×20	30K
CKSG-2.4/0.48-6%	48.11	1.283	215	200	190	110×99	Φ11×20	40K
CKSG-3.0/0.48-6%	60.14	1.03	245	210	210	130×103	Φ11×20	50K

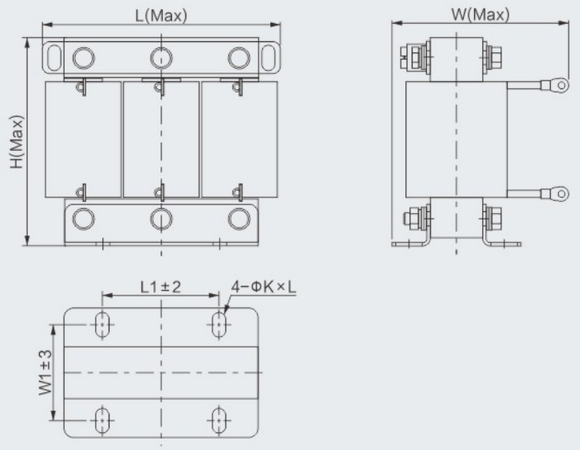
External dimensions of co compensating reactor



Test data

Specification and model	Rated current (A)	Rated inductance (Mh)	L	W	H	L1×W1	ΦK×L	Capacity
CKSG-0.35/0.45-7%	6.42	9.02	195	165	150	90×79	Φ11×20	5K
CKSG-0.7/0.45-7%	1.83	4.51	195	165	150	90×79	Φ11×20	10K
CKSG-1.05/0.45-7%	19.25	3.01	195	175	170	90×84	Φ11×20	15K
CKSG-1.4/0.45-7%	25.66	2.256	215	175	170	110×84	Φ11×20	20K
CKSG-1.75/0.45-7%	30.1	1.805	215	195	190	110×99	Φ11×20	25K
CKSG-2.1/0.45-7%	38.49	1.504	215	195	190	110×99	Φ11×20	30K
CKSG-2.8/0.45-7%	51.32	1.128	245	210	210	130×103	Φ11×20	40K
CKSG-3.5/0.45-7%	64.15	0.902	245	210	215	130×108	Φ11×20	50K
CKSG-0.35/0.48-7%	6.01	10.27	195	165	150	90×79	Φ11×20	5K
CKSG-0.7/0.48-7%	12.03	5.13	195	165	150	90×79	Φ11×20	10K
CKSG-1.05/0.48-7%	18.04	3.42	195	175	170	90×84	Φ11×20	15K
CKSG-1.4/0.48-7%	24.06	2.567	215	175	170	110×84	Φ11×20	20K
CKSG-1.75/0.48-7%	30.07	2.05	215	195	190	110×99	Φ11×20	25K
CKSG-2.1/0.48-7%	36.09	1.71	215	195	190	110×99	Φ11×20	30K
CKSG-2.8/0.48-7%	48.11	1.283	245	210	210	130×103	Φ11×20	40K
CKSG-3.5/0.48-7%	60.14	1.03	245	210	215	130×108	Φ11×20	50K

External dimensions of co compensating reactor



Test data

Specification and model	Rated current (A)	Rated inductance (Mh)	L	W	H	L1×W1	ΦK×L	Capacity
CKSG-0.6/0.525-12%	5.5	21.06	195	165	150	90×79	Φ11×20	5K
CKSG-1.2/0.525-12%	11	10.53	215	175	170	110×84	Φ11×20	10K
CKSG-1.8/0.525-12%	16.5	7.02	215	195	190	110×99	Φ11×20	15K
CKSG-2.4/0.525-12%	21.99	5.26	215	195	190	110×99	Φ11×20	20K
CKSG-3.0/0.525-12%	27.49	4.21	245	210	210	130×108	Φ11×20	25K
CKSG-3.6/0.525-12%	32.99	3.51	245	220	215	130×118	Φ11×20	30K
CKSG-4.8/0.525-12%	43.99	2.632	280	235	245	130×128	Φ11×20	40K
CKSG-6.0/0.525-12%	54.99	2.106	280	235	245	130×128	Φ11×20	50K
CKSG-0.7/0.525-14%	5.5	24.566	195	165	150	90×79	Φ11×20	5K
CKSG-1.4/0.525-14%	11	12.283	215	190	170	110×94	Φ11×20	10K
CKSG-2.1/0.525-14%	16.5	8.189	215	195	190	110×99	Φ11×20	15K
CKSG-2.8/0.525-14%	21.99	6.142	245	210	210	130×103	Φ11×20	20K
CKSG-3.5/0.525-14%	27.49	4.913	245	210	215	130×108	Φ11×20	25K
CKSG-4.2/0.525-14%	32.99	4.094	245	220	215	130×118	Φ11×20	30K
CKSG-5.6/0.525-14%	43.99	3.071	280	235	245	130×128	Φ11×20	40K
CKSG-7.0/0.525-14%	54.99	2.457	280	235	245	130×128	Φ11×20	50K

CKSC

Series high-voltage series reactor

Overview

The high-voltage series reactor is mainly connected in series with the high-voltage parallel capacitor to limit the closing inrush current during the switching process of the capacitor, suppress the distortion of the grid voltage waveform, control the harmonic component flowing through the capacitor, and eliminate the damage of harmonics and overcurrent to the capacitor. In addition, some power grids or electrical equipment also connect reactors for current limiting protection to limit sudden changes in current. With the continuous development of the power grid, as an indispensable equipment in reactive power compensation devices, high-voltage series reactors are increasingly widely used.

Product structure characteristics

Iron core

△ The material of the iron core is high-quality cold-rolled silicon steel sheets coated with mineral oxides.
△ The iron core column adopts epoxy resin vacuum casting, which seals the air gap between the iron cakes and forms a resin layer on the surface of the iron core column, effectively reducing vibration between the iron core cakes, thereby reducing noise, and enhancing the insulation strength between the iron core and the coil.
△ The surface of the iron core is sealed with F-grade epoxy resin, and anti-corrosion measures are taken to avoid corrosion.

Coil

△ The coil is an epoxy resin vacuum cast coil. Epoxy glass mesh cloth is laid inside and outside the coil for reinforcement, and F-grade epoxy resin is used for pouring under vacuum. This coil not only has good insulation performance, but also has high mechanical strength and can withstand high current and cold/hot impacts without cracking.
△ The epoxy cast coil is non absorbent, has good moisture resistance, and low partial discharge capacity, making it safe to operate under harsh environmental conditions.

Assembling

△ The end face of the iron core adopts high-quality silicon steel sheet end face adhesive, which firmly combines the iron core column with the iron chop, greatly reducing the noise during operation.
△ Use advanced pre assembly systems to detect the assembly results of various components during assembly.
△ Advanced vibration and noise reduction structural system, including strong compression of upper and lower clamps, elastic rubber pads between clamps and coils, and elastic rubber pads between clamps and bases.

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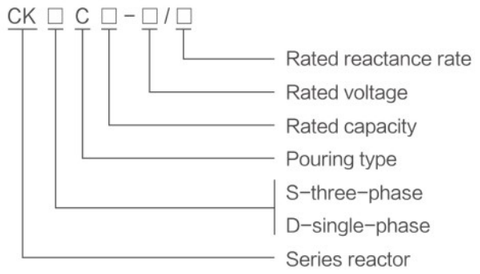
Model Meaning



Rated voltage: 6kV, 10kV
Rated frequency: 50Hz, 60Hz
Insulation level: Class F

Ordering instructions

△ Product model
△ Rated current
△ Rated voltage (grid voltage)
△ Rated inductance
△ Insulation level
△ Other special requirements can be specified separately in the agreement

Main technical parameters

Reactor model	Rated capacity (kvar)	Rated voltage (kV)	Reactance rate %	Rated current (A)	L (mm)	W (mm)	H (mm)	A (mm)	B (mm)
CKSC-30/6-5	30	6	5	52	930	590	1211	550	400
CKSC-36/6-6	36	6	6	52	930	590	1211	550	400
CKSC-45/6-5	45	6	5	79	960	590	1041	400	400
CKSC-54/6-6	54	6	6	79	960	590	1041	400	400
CKSC-60/6-5	60	6	5	105	970	590	1013	550	400
CKSC-72/6-6	72	6	6	105	910	740	1101	550	550
CKSC-75/6-5	75	6	5	131	910	740	1101	550	550
CKSC-90/6-6	90	6	6	131	940	740	1241	660	550
CKSC-120/6-5	120	6	5	210	1060	740	1261	550	550
CKSC-144/6-6	144	6	6	210	990	740	1261	550	550
CKSC-180/6-5	180	6	5	315	1120	740	1355	550	550
CKSC-200/6-5	200	6	5	350	1260	850	1281	660	660
CKSC-216/6-6	216	6	6	315	1200	740	1317	550	550
CKSC-240/6-6	240	6	6	350	1200	740	1317	550	550
CKSC-90/10-4.5	90	10	4.5	105	1050	740	1103	550	550
CKSC-108/10-4.5	108	10	4.5	126	1050	740	1163	550	550
CKSC-120/10-6	120	10	6	105	1030	740	1151	550	550
CKSC-135/10-4.5	135	10	4.5	157	1060	740	1163	550	550
CKSC-144/10-6	144	10	6	126	1060	740	1240	550	550
CKSC-162/10-4.5	162	10	4.5	189	1110	740	1181	550	550
CKSC-180/10-4.5	180	10	4.5	210	1210	740	1230	550	550
CKSC-180/10-6	180	10	6	157	1090	740	1240	550	550
CKSC-189/10-4.5	189	10	4.5	220	1210	740	1285	550	550
CKSC-216/10-4.5	216	10	4.5	252	1110	740	1286	550	550
CKSC-216/10-6	216	10	6	189	1360	740	1265	660	660
CKSC-225/10-4.5	225	10	4.5	262	1360	740	1381	660	660
CKSC-240/10-6	240	10	6	210	1330	740	1126	660	660
CKSC-240/10-12	240	10	12	96	1350	850	1266	660	660
CKSC-243/10-6	243	10	4.5	283	1360	740	1148	660	660
CKSC-252/10-6	252	10	6	220	1350	740	1186	660	660
CKSC-270/10-4.5	270	10	4.5	315	1290	740	1353	660	660

JKW

Series reactive power automatic compensation controller

Overview

The JKW series reactive power automatic compensation controller (referred to as the controller) is a specialized equipment for compensating reactive power in low-voltage distribution systems, designed according to the industry standard JBT9663-2013 of the People's Republic of China and the power industry standard DUT597-1996. Its sampling physical quantity is reactive power, which has the advantages of novel design, multiple functions, good control performance, and high reliability. It is in a leading position among similar products in China and provides a new equipment for distribution automation.

Working conditions

△ Power supply voltage: The rated value is AC 220V or 380V, and the fluctuation cannot exceed ±10%;
△ Environmental temperature: -25℃~+55℃;
△ Relative humidity: The maximum relative temperature is 90% (at 20℃)
△ Altitude: not exceeding 2000m;
△ Environmental conditions: No explosive or flammable hazardous medium, no corrosive gas to metals, and no conductive dust that damages electrical insulation.

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Functional characteristics

△ Adopting AC sampling technology;
△ Using fundamental power factor and fundamental reactive power as control physical quantities, high control accuracy, no switching oscillation, and insensitive to harmonics;
△ All digital operation of control parameters, easy to use, one step in place, without losing power outage data;
△ Adopting automatic optimization control to reduce switching frequency and improve the service life of the system;
△ Strong anti-interference ability, able to withstand 2000V interference pulses directly input from the power supply, without crashing or losing data, stable and reliable operation;
△ Digital display of power factor, reactive power, voltage, current (primary side), control parameters of the power grid;
△ There are two working modes: power factor mode and reactive power control mode, which are convenient for users to install and debug;
△ It has the function of judging and displaying overvoltage and undervoltage, and quickly cutting off the capacitor bank to prevent the capacitor bank from operating under overvoltage conditions;
△ With optional switching oscillation locking function (users need to indicate when ordering);
△ With the optional function of delaying a 200 second delay from the cutting off time to the input time of a single set of capacitors, there is sufficient discharge time after the capacitor bank is cut off, reducing the impact on the power grid when the capacitors are put into operation again (users need to specify when ordering);
△ The input resistance of the current sampling signal is less than 0.05 ohms and can be directly taken out of the metering circuit;
△ There are two compensation modes: power factor and reactive power;
△ The user manual provides a large number of troubleshooting methods for easy installation and debugging.

Main technical parameters

Basic parameters

Project	Parameter
Rated voltage	AC380/AC220V±10%
Rated current	AC0~5A
Rated frequency	50Hz±5%

Control parameters

Project	Parameter
Sensitivity	100mA
Target COS Φ preset	0.70~1.00; Step size 0.01; Factory preset 0.95
Switching delay	1~250s
Overvoltage protection	380~500/230~260V; Step size 1V; Return difference 6V
Undervoltage protection	340V/180V; Return difference 6V
CT changes	50/5A~4000/5A; Step size 1
Capacitive capacity	0-125Kvar, factory preset 5Kvar for each branch
Contact rating	380V * 5A/220V * 7A Per branch

Measurement accuracy

Project	Parameter
Voltage	±1.0%
Current	±1.0%
Power Factor	±1.0%
Reactive Power	±2.0%

Adjustable range and factory setting values of control parameters

Parameter code	Meaning	Setting	Adjustable range
PA−1	COS preset	Hysteresis 0.95	Lag 0.8−100
PA−2	Delay preset	30s	1−250s
PA−3	Overvoltage preset	430V	230~260V/380~500V
PA−4	Circuit preset	1−12	1−12 Circuits
PA−4*	CT Ratio preset	Actual configuration	50~4000
C−01	1st Circuit capacitor preset	Actual configuration	0~150Kvar
C−12	12th Circuit capacitor preset	Actual configuration	0~150Kvar
PA−5	Cut preset	1.00	0.70~0.70

Note: * In reactive power control mode

Main specifications

Model specifications	Dimension	Rated voltage (kV)	Signal frequency	loop	Output	Compensation method
JKW5C	113×113mm	AC220V/380V	50/60Hz	1−12 loop	Static state	Co supplementation
JKW5B	162×102mm	AC380V	50/60Hz	1−12 loop	Static state	Co supplementation
JKG2B	162×102mm	AC220V	50/60Hz	1−12 loop	Static state	Co supplementation
JKW1B	140×102mm	AC220V/380V	50/60Hz	1−12 loop	Static state	Co supplementation
JKW58	140×140mm	AC220V/380V	50/60Hz	1−12 loop	Static state	Co supplementation
JKWD5	113×113mm	AC220V/380V	50/60Hz	1−12 loop	DC12V	Co supplementation
JKWF−12	113×113mm	AC220V	50/60Hz	1−12 loop	Static state/ DC12V	Co compensation+ sub compensation
JKWF−16	113×113mm	AC220V	50/60Hz	1−16 loop	DC12V	Co compensation+ sub compensation
JKWF−16	140×140mm	AC220V	50/60Hz	1−16 loop	Static state	Co compensation+ sub compensation
RPCF−16	113×113mm	AC380V	50/60Hz	1−16 loop	Static state/ DC12V	Co supplementation

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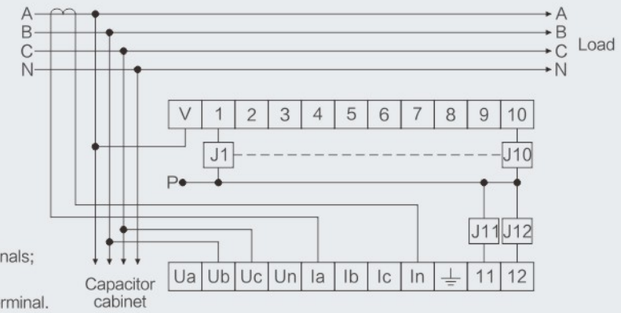
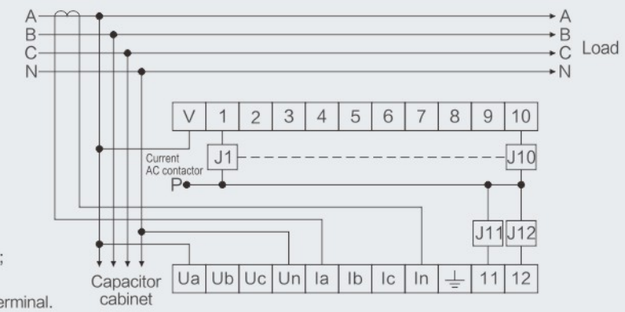
Wiring method

JKW5B−12 Wiring Diagram Hole Size: 162×102 (mm)
JKW5C−12 Wiring Diagram Hole Size: 113×113 (mm)
AC380V



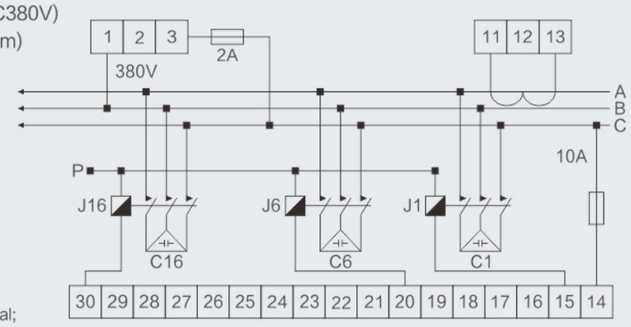
Ub and Uc voltage signal input terminals;
La, In current signal input terminal;
V control output terminal common terminal.

JKG2B−12 Wiring Diagram Hole Size: 162×102 (mm)
JKW5C−12 Wiring Diagram Hole Size: 113×113 (mm)
AC220V



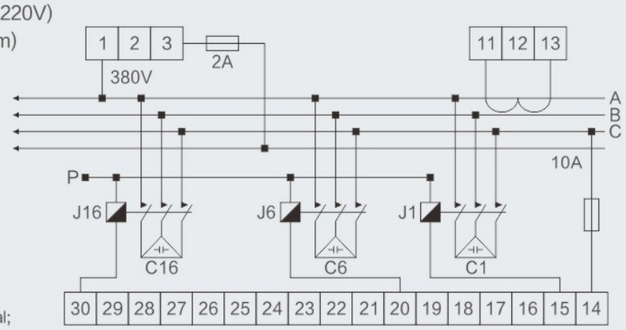
Ua, Un voltage signal input terminal;
La, In current signal input terminal;
V control output terminal common terminal.

JKW58 Wiring Diagram (AC380V)
Opening size: 140×140 (mm)



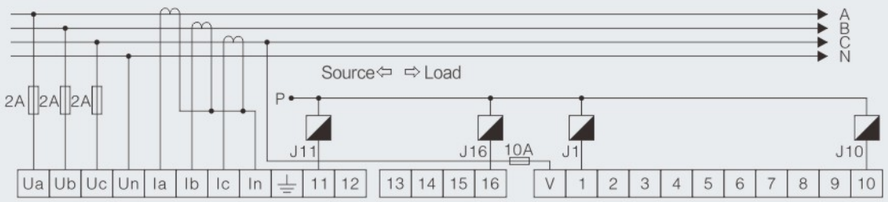
1. 3 voltage signal input terminal;
11. 13 Current signal input terminal;
14 Control output terminal common terminal.
If the contactor is 380V, connect point P to B or C;
If the contactor is 220V, the P point is connected to the N phase.

JKW58 Wiring Diagram (AC220V)
Opening size: 140 × 140 (mm)

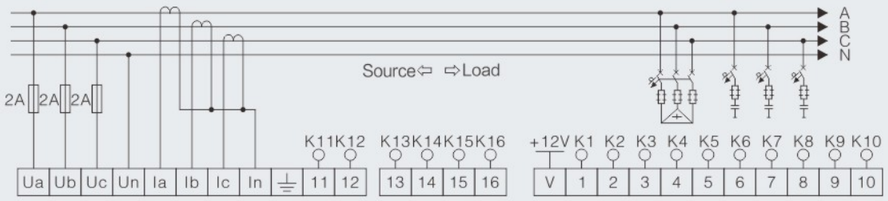


1. 3 voltage signal input terminal;
11. 13 Current signal input terminal;
14 Control output terminal common terminal.
If the contactor is 380V, connect point P to B or C;
If the contactor is 220V, the P point is connected to the N phase.

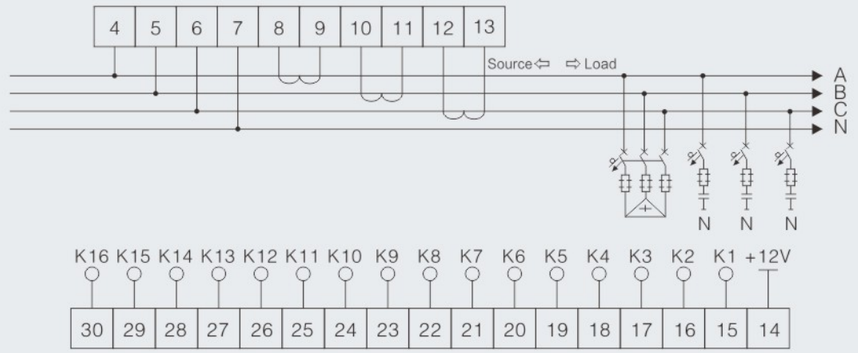
JKWF Type wiring diagram Static output
When the rated working voltage of the AC contactor is 380V, point P is connected to point B;
Connect N at 220V.



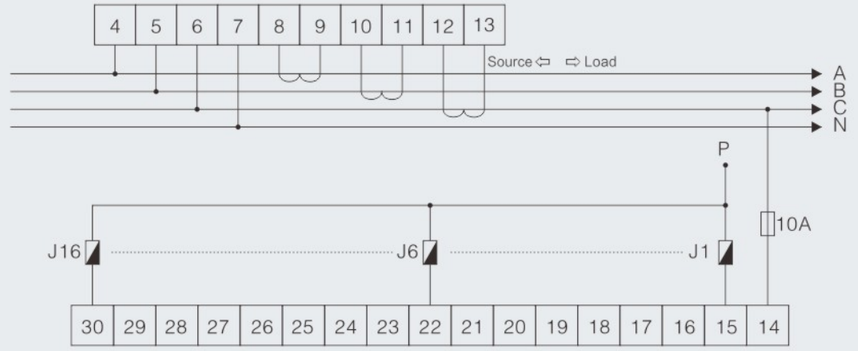
JKWF Type wiring diagram Dynamic output



JKWF−16 Type wiring diagram with a hole size of 140mm x 140mm Dynamic output



JKWF−16 Type wiring diagram with a hole size of 140mm x 140mm Static output



BY75

Series reactive power compensation controller

Overview

The BY75-24 reactive power compensation controller is a new type of distribution measurement and control equipment that integrates functions such as data collection, reactive power compensation, and power grid parameter analysis. It is suitable for monitoring and reactive power compensation control of AC 0.4KV and 50Hz low-voltage distribution systems.

The BY75-24 reactive power compensation controller is based on a high-speed digital signal processor and adopts AC sampling. The human-machine interface is a 128X64 dot matrix large screen LCD display. It has power distribution monitoring, reactive power compensation, harmonic analysis, adaptive frequency algorithm, and input signals that vary between 45Hz and 55Hz.

Working conditions

△ Air temperature: The air temperature shall not be higher than+65℃ and not lower than −25℃.
△ Atmospheric conditions: The air humidity should not exceed 90% at 20℃, and higher relative humidity is allowed at lower temperatures.
△ Altitude: not exceeding 2500 meters.
△ Environmental conditions: The surrounding medium is free from fire and explosion hazards, corrosive gases, conductive dust, and rain and snow erosion. The installation site should not be subjected to severe vibration.

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Main technical parameters

Basic parameters

Project	Parameter
Supply voltage	AC 220V/380V ±20%
Sampling voltage	AC 220V/380V±20%
Power frequency	50Hz±5%
Sampling current	0~5A
Maximum power consumption of the entire machine	14W (Depending on the power of the controlled switching switch)
Control output contact	24 Channels, Each DC12V × 30mA
Hole size	138×138mm

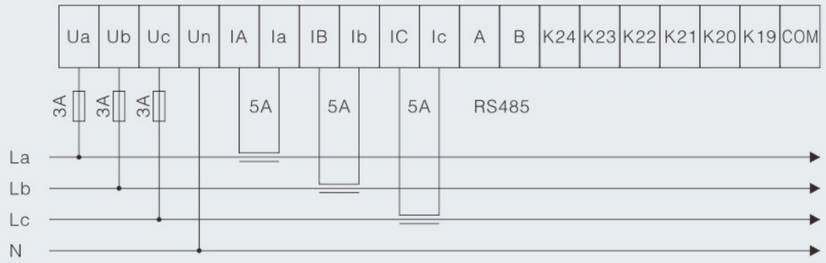
Measurement accuracy

Project	Parameter
Voltage	±0.5%
Current	±0.5%
Active Power	±1.0%
Reactive Power	±1.0%
Frequency	±0.5%
Power Factor	±1.0%

Control parameters

Project	Parameter		
Control sensitivity	30mA		
Target COS Φ (1)	0.85~1.00	Step 0.01	Factory preset 1.00
Target COS Φ (2)	0.00~0.60	Step 0.01	Factory preset 1.00
Threshold coefficient	0.5~1.2	Step 0.1	Factory preset 1.00
Switching delay (1)	00s~600s	Step 1/0.02	Factory preset 0s
Switching delay (2)	00s~300s	Step 1	Factory preset 8s
Overvoltage protection	230V~280V	Step 1V	Factory preset 240V
Undervoltage protection	210V~180V	Step 1V	Factory preset 190V
Harmonic voltage exceeding limit	00.0%~25.0%	Step 0.5%	Factory preset 00.0%
Harmonic current exceeding limit	00.0%~100.0%	Step 0.5%	Factory preset 00.0%

Wiring method



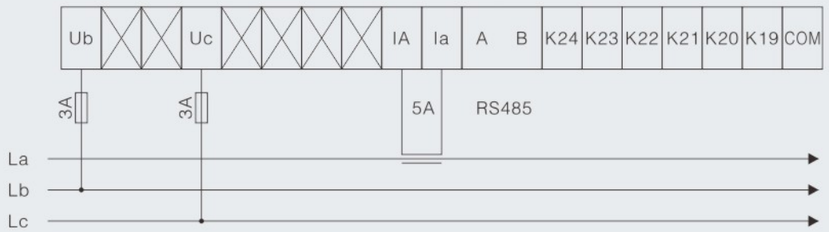
Executive standards: DL/T597-1996
Rated voltage: AC220V
Rated current: 5A

Output Common (COM) Control Method: +12V□ Dry junction□

Attention: The sampling voltage and current of this machine must be in phase!

COM	K1	K2	K3	K4	K5	K6	K7	K8	K9	K10	K11	K12	K13	K14	K15	K16	K17	K18

Mixed compensation wiring diagram



Executive standards: JB/T 9663-2013
Rated voltage: AC380V
Rated current: 5A

Output Common (COM) Control Method: +12V□ Dry junction□

Attention: The sampling voltage and current of this machine must be out of phase!

COM	K1	K2	K3	K4	K5	K6	K7	K8	K9	K10	K11	K12	K13	K14	K15	K16	K17	K18

Co complementary wiring diagram

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BYFK

Series intelligent low-voltage composite switch

Overview

BYFK composite switch is a combination of intelligent chips, digital circuits, and magnetic holding relays to achieve voltage zero crossing conduction and current zero crossing cutoff, allowing the switch to fully switch to zero crossing at the moment of turning on and off, without generating overvoltage. Switches have many advantages such as no inrush current, extremely low power consumption, high lifespan, and low fault rate, and are widely used in the field of low-voltage reactive power compensation.

Advantage

After receiving external control signals, through intelligent judgment, the optimal switching point is automatically found to ensure zero crossing switching, low inrush current, non sintering of contacts, low energy consumption, and has functions such as voltage anomaly protection, phase loss protection, component fault protection, and operation indication.
Compared with similar products, the BYFK series of intelligent low-voltage composite switches greatly improve their inrush current and safety reliability.

Classification

△ Three phase co compensation type: The wiring method of the compensation capacitor is triangular connection (represented by △)
△ Three phase compensation type: The wiring method of the compensation capacitor is star connection (represented by Y)

Main technical features

Protection function

△ Using a microprocessor to monitor the operation status of relays, input power, and loads in real-time, it has comprehensive protection functions.
△ Voltage fault phase loss protection: When the system voltage is in phase loss power supply, the switch refuses to close. If phase loss occurs after connection, it will automatically disconnect.
△ Power supply voltage phase loss protection: When the working power supply is phase loss, the switch refuses to close. If phase loss occurs after being connected, it will automatically disconnect.
△ Self diagnostic fault protection: The system automatically monitors the operating status of the relay. If a fault occurs, it refuses to shut down or automatically disconnects.
△ No load protection: When the load is not connected, the switch refuses to close.
△ Power outage protection: After being connected, if there is a sudden power outage, it will automatically disconnect.

Low power consumption

The relay only consumes electricity at the moment of switching, and does not consume electricity during normal times, thus achieving energy conservation and consumption reduction.

Job security

All control input signals and internal circuits are safely isolated, and advanced intelligent control technology and patented devices are adopted. Compared with similar products, it has extremely high performance advantages in surge current and safety reliability.

Specification

Project	Parameter
Ambient temperature	-20℃~+55℃
Relative humidity	At 40℃, 20%~90%
Rated voltage	380V/220V three-phase four wire AC 50Hz
Allowable deviation	The synchronous change of three-phase voltage shall not exceed ±20%
Voltage distortion rate	<5%
Rated frequency	50Hz
Rated current	<80A(Ordinary type)；<80A(With circuit breaker type)
Service life	500000 times
Phase number	△Delta connection method (three-phase); Y-shaped connection method (single-phase)
Three phase control capacity	<40Kvar
Single-phase control capacity	<10Kvar
power dissipation	<1.5VA
Contact pressure drop	<100mV
Contact withstand voltage	>1600V
Response time	<1000ms
Interval between each turn on and turn off	>5 Second
Interval between two consecutive connections	=35 Second
Control signal	DC12V±20%；Exchange/Communication (Optional)
Input impedance	>6.8K
Conduction impedance	<0.0032
Inrush current	Less than 1.5 times the rated current
Rated current of feedback contact	1A (put on as connected)

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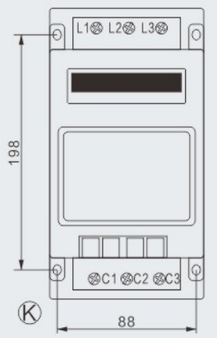
Appearance and installation dimensions

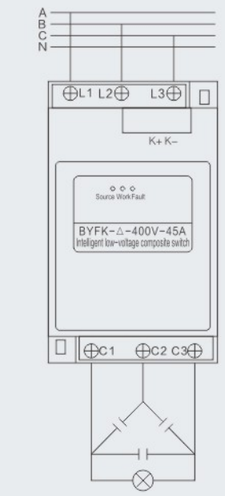
Overall dimensions：160×96×95mm
Fixed Size：142×80mm



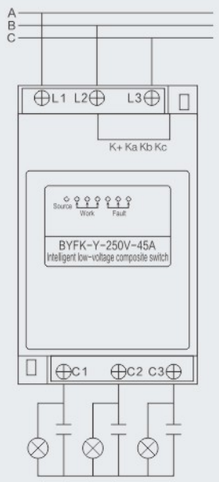
Installation dimensions of composite switches with circuit breakers

Overall dimensions：210×100×77mm
Fixed Size：198×88mm

Wiring method



K+: Common terminal+12V input
Ka, Kb, Kc: Negative terminal input of control signal



K+: Common supply end of switch trigger signal (+12V)
K -/Ka: Co compensation type is three-phase trigger terminal;
sub compensation type is L1 phase trigger terminal (effective at low level)
Kb: L2 phase triggering terminal of sub compensation type (effective at low level)
Kc: L3 phase triggering terminal of sub compensation type (effective at low level)

BYKCS
Series thyristor switch

Overview

This series of dynamic switching switches consists of high-power anti parallel thyristor modules, photoelectric isolation circuits, triggering circuits, protection circuits, heat dissipation devices, etc. Used for on/off control of capacitive loads in low-voltage 400V systems, without surge current, overvoltage, noise during operation, allowing for frequent switching, simple and convenient installation and wiring, especially suitable for supporting fast switching SVC low-voltage dynamic reactive power compensation devices.

Working conditions

△ Surrounding air temperature: -25℃~+50℃, and its average temperature within 24 hours shall not be higher than+30℃;
△ When the temperature is+25℃, the relative humidity is ≤90%;
△ The altitude does not exceed 2000m;
△ The installation site has clean air, no explosive or flammable hazardous materials, no gas that can damage insulation or corrode, no conductive dust or serious mold;
△ There are no significant exceeding harmonic components present in the installation site.

Model Meaning

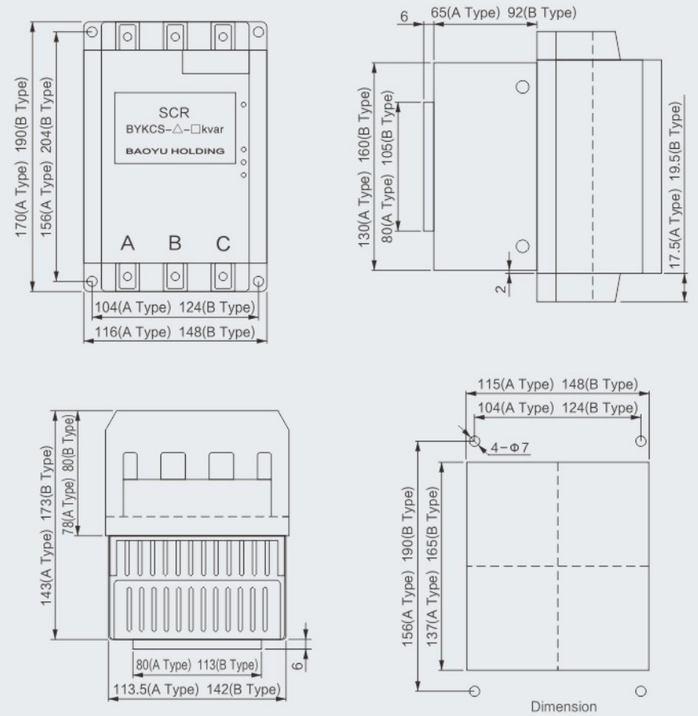
BYKCS - □ - □ kvar

- Control the maximum capacitor capacity
- Connection method: Y - sub compensation; △ - co supplementation
- Thyristor switch

Main technical parameters

Project	Parameter
Rated voltage	380V(220V)，50Hz
service life	＞ 1 million times
Response time of switch action	≤20ms
Time interval between reclosing after opening the switch	≥200ms
Switching withstand voltage	≥2000V
control voltage	5~24VDC
Input current	≤10mA
Control capacity	A Type：1-40Kvar　B Type：40-60Kvar

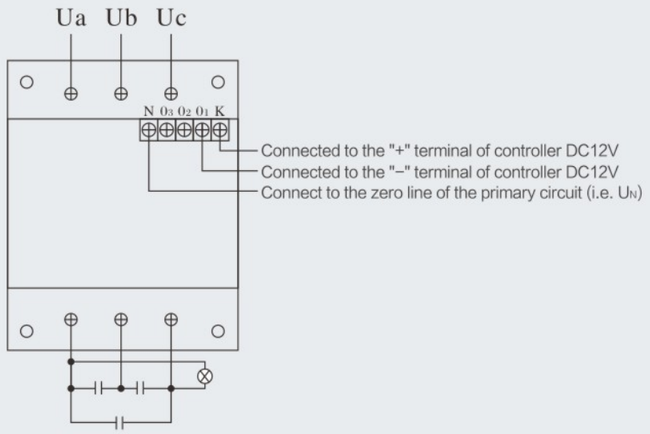
Appearance and installation dimensions



A-type overall dimensions (top view):
116 (long) × 170 (width) × 148mm high; Distance between 4 installation holes: 104 (long) × 156mm (width)
B-type overall dimensions (top view):
148 (long) × 204 (width) × 175mm high; Distance between 4 installation holes: 124 (long) ×* 190mm (width)

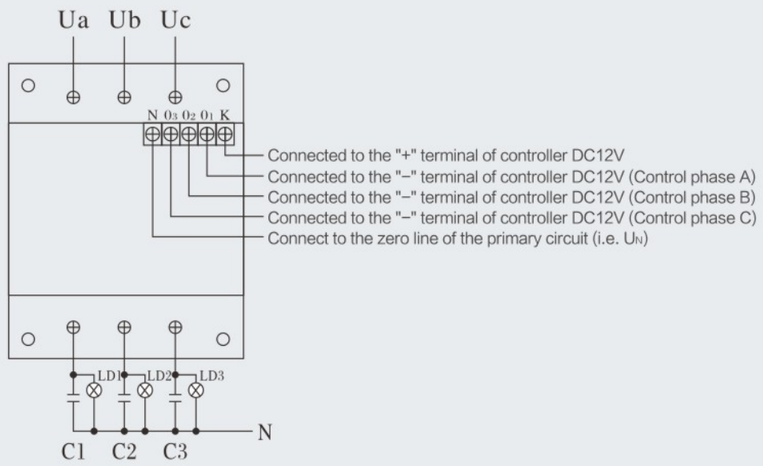
Wiring method

Three phase co compensation type (conventional delta connection method)



Secondary control wiring terminal: "N" is connected to the zero line of the primary circuit (i.e. Un);
Connect "K" to the+12V "+" terminal of the controller;
Connect "O1" to the controller output control terminal, i.e. the "−" terminal of+12V;
The "O2" and "O3" terminals are suspended and not connected.

Single phase split compensation type (Y−type connection method)



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CJ19

Series switching capacitor contactor

Overview

CJ19 series switching capacitor contactors (hereinafter referred to as contactors) are mainly used in power lines with AC 50Hz or 60Hz and rated working voltage up to 400V, for the use of low−voltage reactive power compensation equipment to input or remove low−voltage parallel capacitors. The contactor is equipped with a surge suppression device, which can effectively reduce the impact of closing surge on the capacitor and suppress overvoltage during opening and closing.

Model Meaning

CJ − 19 □□ − □□

- Number of auxiliary contacts, expressed in numbers
  - 20: Two normally open
  - 11: One normally open and one normally closed
  - 02: Two normally closed (25A~43A)
  - 21: Two normally open and one normally closed
  - 12: One normally open and two normally closed (63A~95A)
- Basic specification code, represented by the agreed heating current
- Design serial number
- Switching capacitor contactor

Working conditions

△ The ambient air temperature is −5℃~+40℃, and its average value within 24 hours does not exceed+35℃.
△ Altitude: not exceeding 2000m.
△ Atmospheric conditions: When the maximum temperature is+40℃, the relative humidity of the air does not exceed 50%; Higher relative humidity can be allowed at lower temperatures, such as reaching 90% at 20℃. Special measures should be taken for occasional condensation caused by temperature changes.
△ Installation conditions: The inclination between the installation surface and the vertical plane shall not exceed ±5° .
△ Impact vibration: The product should be installed and used in a place without significant shaking, impact, and vibration.

Specification

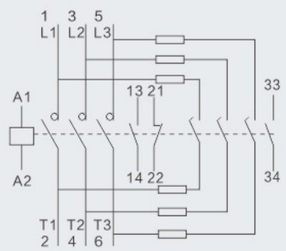
Product model name		CJ19−25	CJ19−32	CJ19−43	CJ19−63	CJ19−95
Electrical life (10000 cycles)		10	10	10	10	10
Rated current Ie (380V) A		17	23	29	43	63
Controllable capacitor capacity (kvar)	220V	6	9	10	15	22
	380V	12	18	20	30	40
Rated insulation voltage (V)		500	500	500	500	500
Surge suppression capability		20Ie	20Ie	20Ie	20Ie	20Ie
Action conditions		Actuation：(85%~110%)Us；Release：(20%~75%)Us				
Coil power (VA) start/hold		70/8	110/11	110/11	200/20	200/20
Auxiliary contact control capacity		AC−15 360VA；DC−3 33W				
Weight (kg)		0.44	0.63	0.64	1.4	1.5

Structural characteristics

The contactor is a direct acting double break point structure, and the contact system is arranged in two layers. The upper layer has three pairs of current limiting contacts and a current limiting resistor to form a surge suppression device. When it is closed, it is first connected for a few milliseconds before the working contact is connected. The permanent magnetic block in the current limiting contact is released under the reaction of the spring, disconnecting the current limiting resistor and allowing the capacitor to work normally. The internal circuit connection diagram of the contactor (see figure).

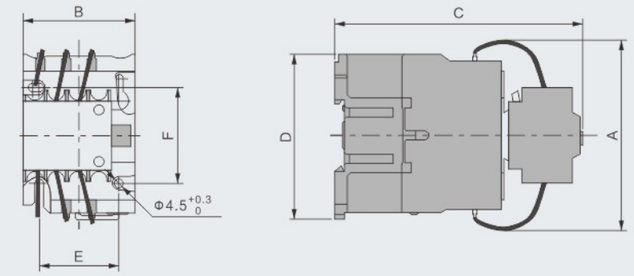
The contactors of CJ19−25−43 have two pairs of auxiliary contacts, while the contactors of CJ19−63−95 have three pairs of auxiliary contacts. The terminal of the contactor is covered with an insulation cover, ensuring safety and reliability. The coil terminals are marked with voltage data to prevent incorrect connections. The CJ19−25−43 contactor can be installed with screws or can be fastened onto a 35mm standard clamp rail using the slider at the bottom. There is a detachable rectangular white plaque on the mask, which users can use to print project codes, etc. CJ19−63−95 can be installed with 35mm or 75mm standard clamp rails.

Example：CJ19−63/21、95/21



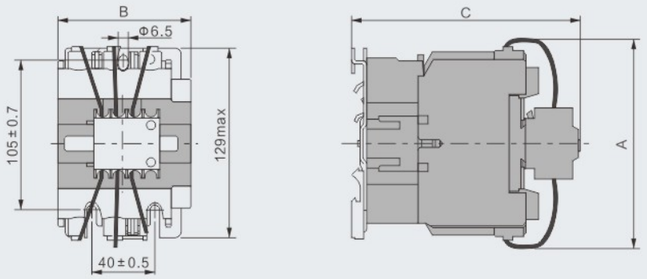
Appearance and installation dimensions

CJ19−25~43 Contactor appearance and installation dimensions



Model	Amax	Bmax	Cmax	Dmax	E	F	Notes
CJ19−25	80	47	124	76	34/35	50/60	In addition to screw installation, a 35mm mounting rail can also be used for installation
CJ19−32	90	58	132	86	40	48	
CJ19−43	90	58	136	86	40	48	

CJ19−63~95 Contactor appearance and installation dimensions



Model	Amax	Bmax	Cmax	Notes
CJ19−63	132	79	150	In addition to screw installation, 35mm and 75mm mounting rails can also be used for installation
CJ19−95	135	87	158	

Ordering Instructions

△ When ordering, it is necessary to indicate the complete name and model of the contactor; The rated control power supply voltage and frequency of the coil; Order quantity.
△ Ordering example: CJ19−43/11 Switching capacitor contactor coil voltage 220V 50Hz 10 units.

BY194

Series multifunctional power instruments

Overview

The BY194Z series multifunctional power instrument integrates programmable power measurement, digital display, digital communication, and various input and output functions. The BY194 series instrument can measure various commonly used power parameters, whether there is electricity or not, and the maximum demand. It also has multiple expansion function modules: digital communication module, digital switch module, electric energy pulse module, and analog transmission and output module, which can be flexibly selected according to needs. All transmitted data can be read through the RS-485 communication port using the MODBUS protocol, and the switch input can be used to monitor the status of the switch; The output of the switching value can be remotely controlled and alarmed when exceeding the limit; The analog transmission output function can replace traditional transmitters. The BY194Z series network (multifunctional) power instruments can adapt to all voltage levels and wiring methods, and meet the distribution and centralized installation requirements of various specifications of high and low voltage switchgear.

Model Meaning

BY19 4 □ - □ S □ / □

- Additional function: M-analog quantity; Di switch input; Do switch output; R-RS485
- Communication auxiliary code: indicates the display method 4-Three digital display of full battery parameters 7-Four quadrant electric energy three digital display 9-Three phase current active electric energy three digital display Y-full battery parameter LCD display
- Auxiliary code: Refers to multifunctional network power instruments
- Auxiliary code: represents the appearance of the instrument 2-120 × 120 square; 3-80 × 80 square; 9-96 × 96 square; A-72 × 72 square
- Function code: E-multifunctional power instrument
- Auxiliary code: represents the input method 4-AC signal input
- Product type number: Digital display instrument

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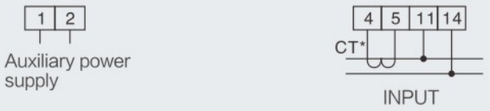
Main technical parameters

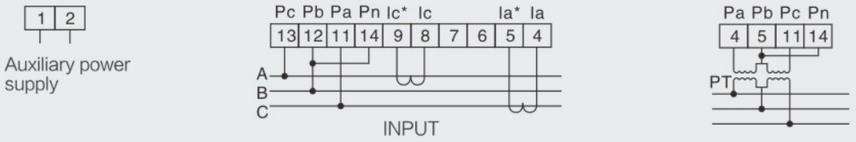
Product name	Model	Display method	Overall dimensions	Dimension
Single-phase ammeter	BY194I-D*1	Single row LED digital	48×48	45×45
	BY194I-A*1		72×72	67×67
	BY194I-3*1		80×80	76×76
	BY194I-9*1		96×96	92×92
	BY194I-2*1		120×120	111×111
Single-phase voltmeter	BY194U-D*1	Single row LED digital	48×48	45×45
	BY194U-A*1		72×72	67×67
	BY194U-3*1		80×80	76×76
	BY194U-9*1		96×96	92×92
	BY194U-2*1		120×120	111×111
Three-phase ammeter	BY194I-D*4	Three row LED digital	48×48	45×45
	BY194I-A*4		72×72	67×67
	BY194I-3*4		80×80	76×76
	BY194I-9*4		96×96	92×92
	BY194I-2*4		120×120	111×111
Three-phase voltmeter	BY194U-D*4	Three row LED digital	48×48	45×45
	BY194U-A*4		72×72	67×67
	BY194U-3*4		80×80	76×76
	BY194U-9*4		96×96	92×92
	BY194U-2*4		120×120	111×111
Three phase current and voltage combination meter	BY194UI-A*4	Three row LED digital	72×72	67×67
	BY194UI-3*4		80×80	76×76
	BY194UI-9*4		96×96	92×92
	BY194UI-2*4		120×120	111×111
Multifunctional power instrument	BY194E-AS4	Digital tube full charge measurement	72×72	67×67
	BY194E-3S4		80×80	76×76
	BY194E-9S4		96×96	92×92
	BY194E-2S4		120×120	111×111
Multifunctional power instrument	BY194E-ASY	LCD full charge measurement	72×72	67×67
	BY194E-3SY		80×80	76×76
	BY194E-9SY		96×96	92×92
	BY194E-2SY		120×120	111×111

Wiring method

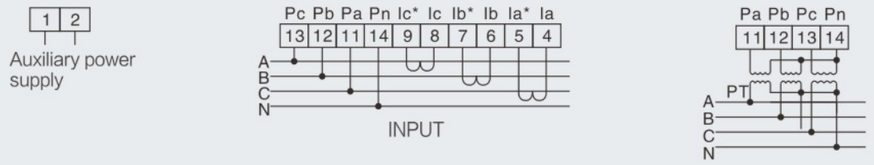
Single phase



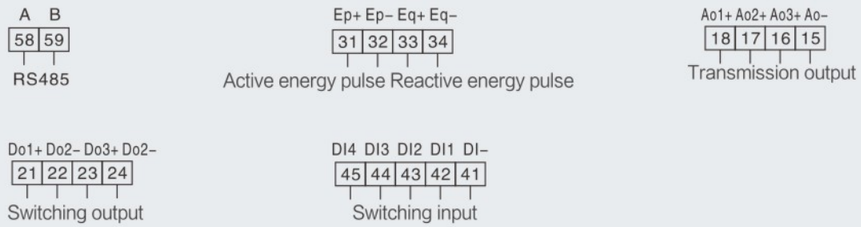
Three phase three wire (terminals with the same label should be connected together during wiring)



Three phase four wire (wiring requires connecting terminals with the same label together)



Functional module



Note: "*" refers to the specific wiring method of the current inlet terminal, please refer to the product's random wiring diagram.

Correct wiring is the first step in the correct use of an instrument. Pay attention to the matching of the external auxiliary power supply and input signal with the model of the ordered instrument (such as auxiliary power supply voltage exceeding 270V, do not use it as AC380V for 6kV/100V instruments). The wiring position should be correct, and special attention should be paid to not connecting strong current signals to weak current signals (such as communication, pulse output, etc.). Additionally, pay special attention to the input voltage The polarity of the current signal should be correct. When the polarity of the input signal is incorrect, it can lead to correct voltage and current measurement data but incorrect power, resulting in incorrect measurement of electrical energy. Therefore, it is necessary to pay attention to the wiring of the instrument.

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BY-310

Series intelligent control device for switchgear

Overview

Intelligent control device is a new multifunctional and intelligent dynamic simulation display and control device developed and designed based on the current development of medium and high voltage switchgear technology. It is suitable for various complete sets of devices such as central cabinets, handcart cabinets, fixed cabinets, ring network cabinets, etc. It integrates functions such as the simulation diagram of the primary circuit of the switchgear, the position of the handcart (isolation switch), the position of the circuit breaker (opening/closing status, spring energy storage status), the position light of the grounding switch, high-voltage live display (self inspection), live locking, phase loss alarm, inspection and fault display of the switchgear environment temperature and humidity, opening/closing, remote/local, manual/self storage control, cabinet lighting, RS485 communication, etc. This device not only has a beautiful and elegant appearance, but also optimizes the overall layout of the switchgear, making it an ideal replacement product for use in the new generation of switchgear. The product meets the requirements of DL/R538-2006 "Technical Conditions for High Voltage Live Display Devices".

Model Meaning

BY - □ / □

Auxiliary code
C: RS485 communication interface
M: Multi charge measurement
H: Verification of phase holes for electrical verification
V: High voltage live self inspection

Product code
310: Switch status comprehensive indicator
330: Intelligent control device for switchgear (digital type)
340: Intelligent control device for switchgear (LCD type)
350: Intelligent control device for switchgear (wireless temperature measurement)

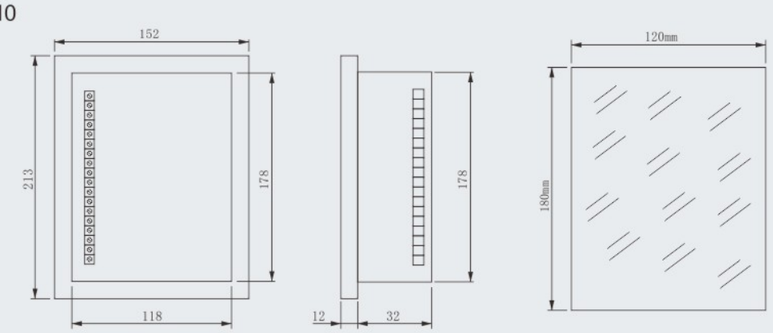
Enterprise code

Main technical parameters

Model		BY-310	BY-330	BY-340	BY-350
Display method		/	Digital display	Display	Display
Working voltage		AC/DC：80V~270V	AC/DC：80V~270V		
Operation temperature		-5℃~+50℃	-5℃~+50℃		
Working temperature limit		-10℃~+55℃	-10℃~+55℃		
Relative humidity		≤93%	≤93%		
Maximum power consumption		≤6W	≤15W		
Overall dimensions (L×W×H)		200×139×32mm	241×189×85mm		
Net weight		0.5kg	1.5kg		
Temperature parameters	Range	-20℃~+100℃	-20℃~+100℃		
	Accuracy	1℃	1℃		
	Response time	≤10s	≤10s		
	Low temperature heating start temperature	5℃	5℃		
	Temperature rise heating exit temperature	13℃	15℃		
	High temperature exhaust starting temperature	40℃	40℃		
	Exit exhaust temperature when temperature drops	25℃	30℃		
Humidity parameters	Range	1%~99%RH	1%~99%RH		
	Accuracy	3%RH	3%RH		
	Response time	≤10s	≤10s		
	Excessive humidity during heating start-up	85%	85%		
	Excessive humidity drops and heating exits humidity	75%	75%		

Appearance and installation dimensions

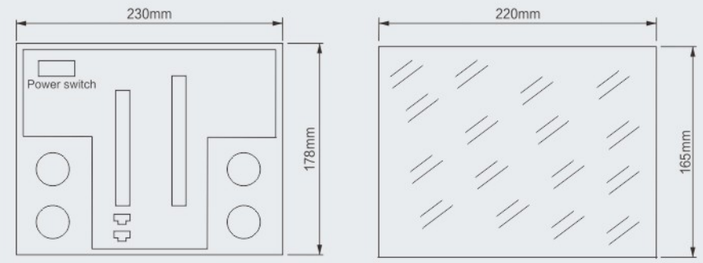
BY-310



Back Dimensional Drawing　Side Dimension Drawing　Hole size diagram

CNBYG
BAOYU HOLDING

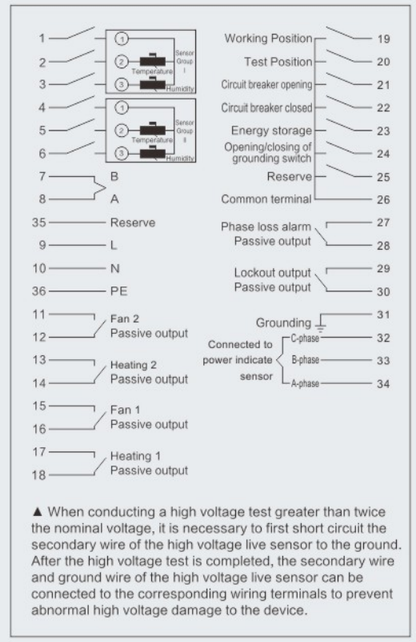
BY-330、BY-340、BY-350



Back Dimensional Drawing　Hole size diagram

Wiring diagram

BY-310



▲ When conducting a high voltage test greater than twice the nominal voltage, it is necessary to first short circuit the secondary wire of the high voltage live sensor to the ground. After the high voltage test is completed, the secondary wire and ground wire of the high voltage live sensor can be connected to the corresponding wiring terminals to prevent abnormal high voltage damage to the device.

BY-330、BY-340、BY-350