

# Intelligent Reactive Compensation Controller

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# Controller



## JKW series Intelligent Reactive Compensation Controller



### General Description

JKW series intelligent low voltage reactive auto compensation controller (abbr. Controller) is the special device for compensating reactive power for low voltage distribution system. Its sampling physical quantity is reactive power, with various specifications of 1~16 step dynamic output (JKWD15, JKWD2C) and static output (JKW15, JKW2C, JKW1BF, JKW1BJ, JKW3B, JKW2B) etc, as well as with characteristics of novel design, multifunction, fine control performance and high reliability etc. It is at the leading position among similar products in domestic market and supplies a brand new device for distribution automation. This series product showing type face "3888" when power on denotes the program version of product.

### Functional characteristics

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

### Service condition

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

## JKW series Intelligent Reactive Compensation Controller

### Basic technical parameters

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

### Ex-store setting value for each parameter

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

### Operation method for manual function

Click the set key  $\blacksquare$  to perform fast transfer between automatic and manual operation. AUTO/MAN signal lights flash frequently under manual state. Operate  $\blacktriangle$  can input one group. Operate  $\blacktriangledown$  can cut the group of input capacitor.

#### Brief instruction for choosing JKW series products

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



**JKWF series  
Intelligent Reactive Compensation Controller**



**General**

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

**Functional characteristics**

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

**JKWF series  
Intelligent Reactive Compensation Controller**

**Service condition**

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

**Basic technical parameters**

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

**Ex-store setting value for each parameter**

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





**Safety operation and installation**

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

**Service conditions**

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

**Technical parameters**

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

**Main functions**

1. PFC distribution monitoring controller is mainly used for auto controlling to capacitance reactive compensation devices in low voltage distribution system, to make the power factor of electric network be optimal.
2. Full big screen display (contain back light, the back light is bright by operating any key. If within 1min there is no operation, the back light will extinguish automatically), with friendly human machine interface and visual and simple Chinese present operation. Actual time calculation displays three-phase power factor, three-phase active power, three-phase reactive power, three-phase voltage, three-phase current, zero sequence current, three-phase voltage distortion rate, three-phase current distortion rate, 3-13 times voltage and current harmonic wave contain rate, real time clock, active electrical degree and reactive electrical degree etc.
3. PFC type distribution monitoring controller can widely store 24 integral points data and the daily statistical data reaching min 200 days, and also can be extended to 800 days according to user's requirement. Data includes the three-phase voltage, three-phase current, three-phase power factor, three-phase active power, three-phase reactive power, three-phase voltage distortion rate, three-phase current distortion rate, active electrical degree and reactive electrical degree of everyday integral hours. Calculate everyday max and min three-phase voltage and the time of occurrence, daily max and min three-phase current and the time of occurrence, daily min three-phase power factor and the time of occurrence, daily max and min three-phase active power and the time of occurrence, daily max and min three-phase reactive power and the time of occurrence, daily max and min three-phase voltage distortion rate and the time of occurrence, daily max and min three-phase current distortion rate and the time of occurrence, daily three-phase voltage on the high and low side time, daily three-phase voltage percent of pass, daily three-phase voltage distortion rate standard-exceeding time, daily three-phase current distortion rate standard-exceeding time, daily three-phase power factor less than 0.95 time, load unbalance rate standard-exceeding time, running total time of 1-6 step capacitor, input-reset times of 1-6 step capacitor, power failure moment, incoming power moment, power failure times incoming power times, daily max current value for 15 min and the time of occurrence.
4. Various control parameter functions of full digital pre-set, password, ID number (for communication), PT transformation ratio, CT transformation ratio, over voltage threshold, under voltage threshold, target power factor threshold, input-reset delay, distortion rate threshold, clock, compensation schemes, input-reset codes and capacitor capacity etc can be set.
5. Communication functions: with RS232 and RS485 communication port of hardware conventions, adopting 101 or MODEBUS-RTU communication conventions, on site or long-distance communication can be executed. Can realize real time, summon various electric parameter by timing, modify control parameter and input-reset capacitance through long-distance. On site operation through short-distance (30-50m) wireless communication function and portable computer data can be performed.
6. With manual input-reset capacitance function, manual input and reset capacitor under the condition without voltage and current signal. Integrated protection function. PFC distribution monitoring compensator has functions of protecting against over voltage, phase loss, under voltage, harmonic wave overflow etc. and it can allow or forbid alarm relay drawing and closing through control parameters.

**Analysis system software for upper position computer**

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



## JKW18G Series High Voltage Reactive Power Compensation Controller



### General Description

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

### Service conditions

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

### Main specification model

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

### Technical parameters

#### 1. Basic parameter

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

## JKW18G Series High Voltage Reactive Power Compensation Controller

### Technical parameters

#### 2. Measure precision

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

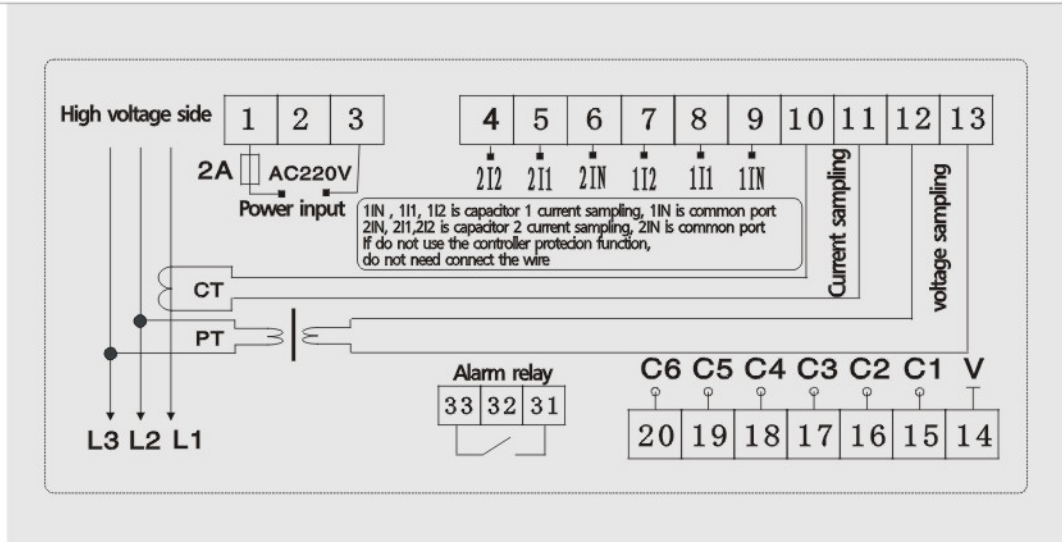
### Function characteristic

1. suitable for controlling the high voltage power network system, to make the power factor of electric network to be optimal.
2. Full big screen display (contain back light. The back light is bright by operating any key. If within 1min there isn't any operation, the back light will extinguish automatically), with friendly human machine interface and visual and simple Chinese present operation. Actual time calculation displays three-phase power factor, three-phase active power, three-phase reactive power, three-phase voltage, three-phase current, zero sequence current, three-phase voltage distortion rate. Three-phase current distortion rate, 3-13 times voltage and current harmonic wave contain rate, real time clock, active electrical degree and reactive electrical degree etc.
3. JKW18G type distribution monitoring controller can widely store 24 integral points data and the daily statistical data reaching min 200 days. And also can be extended to 800 days according to user's requirement, Data includes the three-phase voltage, three-phase current, three-phase power factor, three-phase active power, three-phase reactive power, three-phase voltage distortion rate, three-phase current distortion rate. active electrical degree and reactive electrical degree of everyday integral hours. Calculate everyday max and min three-phase voltage and the time of occurrence, daily max and min three-phase current and the time of occurrence. daily min three-phase power factor and the time of occurrence, daily max and min three-phase active power and the time of occurrence, daily max and min three-phase reactive power and the time of occurrence, daily max and min three-phase voltage distortion rate and the time of occurrence, daily max and min three-phase current distortion rate and the time of occurrence. daily three-phase voltage on the high and low side time. daily three-phase voltage percent of pass. daily three-phase voltage distortion rate standards exceeding time. daily three-phase current distortion rate standard-exceeding time, daily three-phase power factor less than 0.95 time, load unbalance rate standard-exceeding time. running total time of 1-6 step capacitor, input-reset times of 1-6 step capacitor, power failure moment, incoming power moment. Power failure times, incoming power times. daily max current value for 15min and the time of occurrence.
4. Various control parameter functions of full digital pre-set, password, ID number (for communication), PT transformation ratio, CT transformation ratio, over voltage threshold, under voltage threshold, target power factor threshold, input-reset delay, distortion rate threshold. Clock. Compensation schemes. Input-reset codes and capacitor capacity etc can be set.
5. Communication functions: with RS232 and RS485 communication port of hardware conventions. Adopting 101 or MODEBUS-RTU communication conventions. On site or long-desiance communication can be executed. Can realize real time, summon various electric parameter by timing, modify control parameter and input-reset capacitance through long-distance. On site operation through short-distance (30-50m) wireless communication function and portable computer data can be performed.
6. With manual input-reset capacitance function, manual input and reset capacitor under the condition without voltage and current signal. Integrated protection function. JKW18G distribution monitoring compensator has functions of protecting against over voltage. Phase loss. under voltage. Harmonic wave overflow etc. And it can allow or forbid alarm relay drawing and closing through control parameters.

## JKW18G Series

### High Voltage Reactive Power Compensation Controller

#### Connection drawing



1.3: Power input

2: Earth the ground(can not connect)

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

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

10.11 Sampling current signal input AC0-5A

12.13 Sampling voltage signal

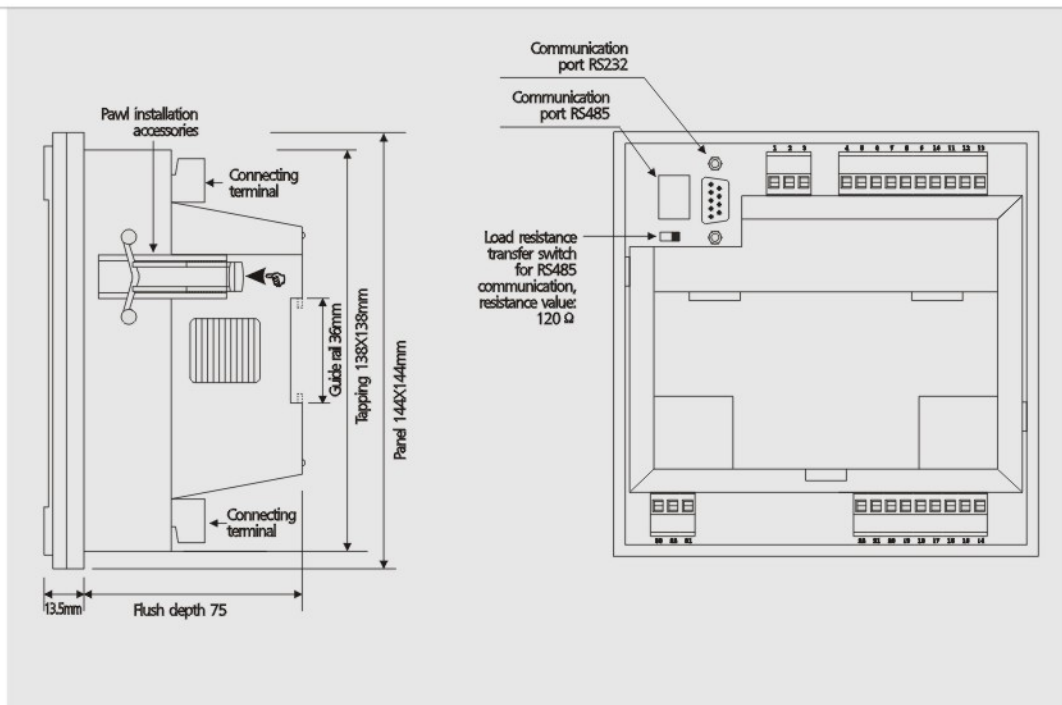
14: The common port of output control signal

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

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

#### Installation mode

##### Flush type and guide rail type





# Switch-over Capacitor Contactor

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## CJ19 Series Switch-over Capacitor Contactor



### General Description

CJ16(19) switch-over capacitor contactor is new type of components for electric appliances, which is developed and produced on the basis of the introduced foreign technology of the same kind. The device is widely applied to the low voltage reactive power compensation screen to replace the subassembly composed of three Xd1 current-limiting reactors and a CJ10 contactor, and it is also can be used in the general control circuit to limit flashy flow.

### Work condition

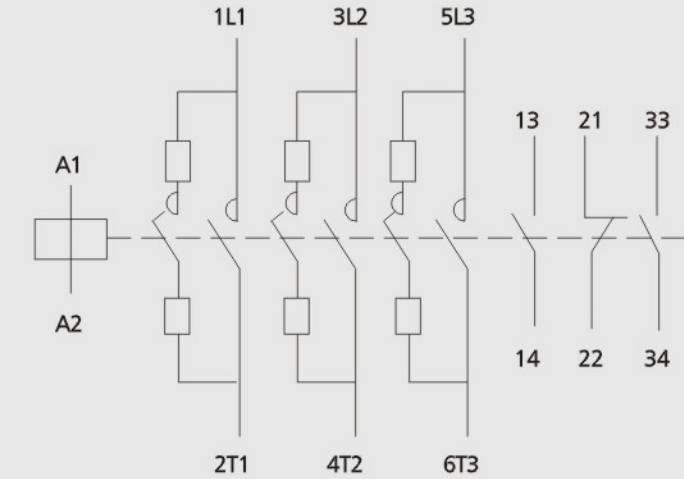
1. The altitude of installation place can not exceed 2000m
2. The air temperature around can not exceed 40°C, not lower than -5°C
3. Humidity: 50% at 40 °C, 90% at 20°C
4. Install condition: can not incline 5° to vertical plane
5. Class of pollution: 3degree
6. No impact and shake

### Structure characteristics

1. The contactor has install current-limited resistor, can restrain the switch on inrush current.
2. The contactor is direct-acting and double-break structure, operation flexible, conveniently manual operation inspect.
3. The contactor connection terminal has insulating boot, very safe.
4. The contactor can be instal by screw, also can instal in the bus bar.

## CJ19 Series Switch-over Capacitor Contactor

### Connection Drawing



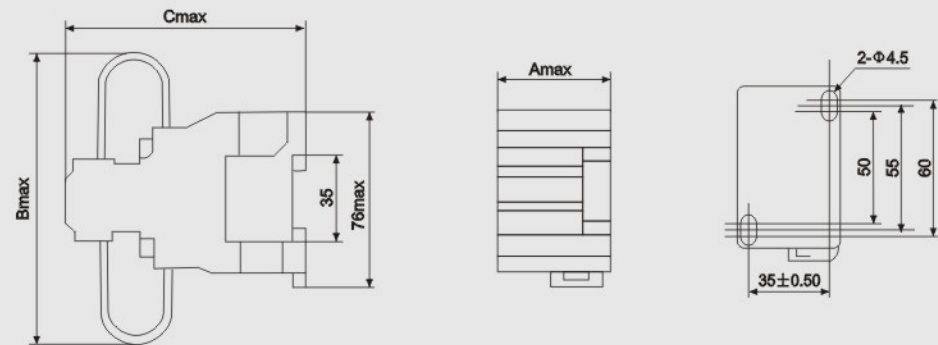
### Main technical data

Model	CJ19-25	CJ19-32	CJ19-43	CJ19-63	CJ19-95	CJ19-115	CJ19-150	CJ19-170
Conventional thermal current Ith A	25	32	43	63	108	250	250	250
Rated current(A) AC-6b A	17	25	29	43	74	87	115	130
Controlled capacitor kvar	230V-250V	6	9	10	15	29	35	45
	400V-450V	12	15	20	30	50	60	80
	690V	10	15	20	30	45	55	65
Capability to restrain surge	20In							
Working voltage Us 50Hz V	220、380 according to the customer's requirement							
Coil	Operating range 0.85~1.1Us							
	Consumed power VA	Start		200		300		
	holding		20		22			
Electrical endurance10 <sup>4</sup> times	10		8		6		2	
Mechanical life10 <sup>4</sup> times	100		80		60		20	
The max operation frequency times/h	300				120			
insulation voltage (V)	500V				660V		1000V	
Auxiliary contact	Convention thermal current (A)				10			
	Electrical endurance AC-15 360VA				12			
	10 <sup>4</sup> times DC-13 33W				12			
	The smallest load to connect current-limited resistor input time(ms)				6V × 10mA 7~9			

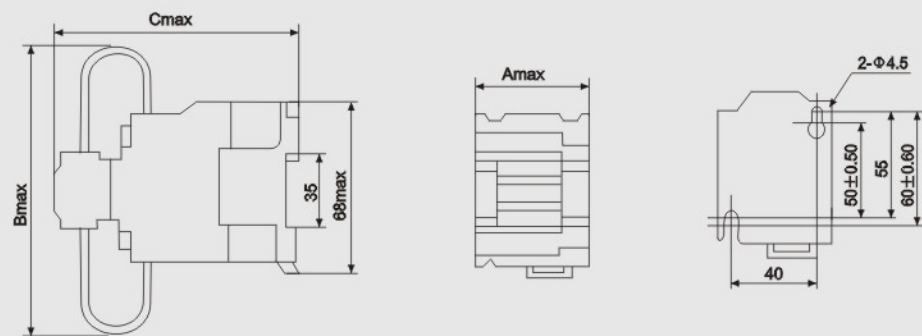


**CJ19 Series  
Switch-over Capacitor Contactor**

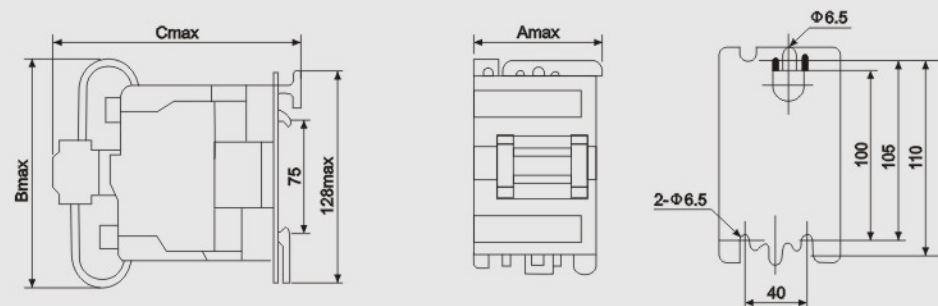
**Overall and  
installation size**



CJ19-25



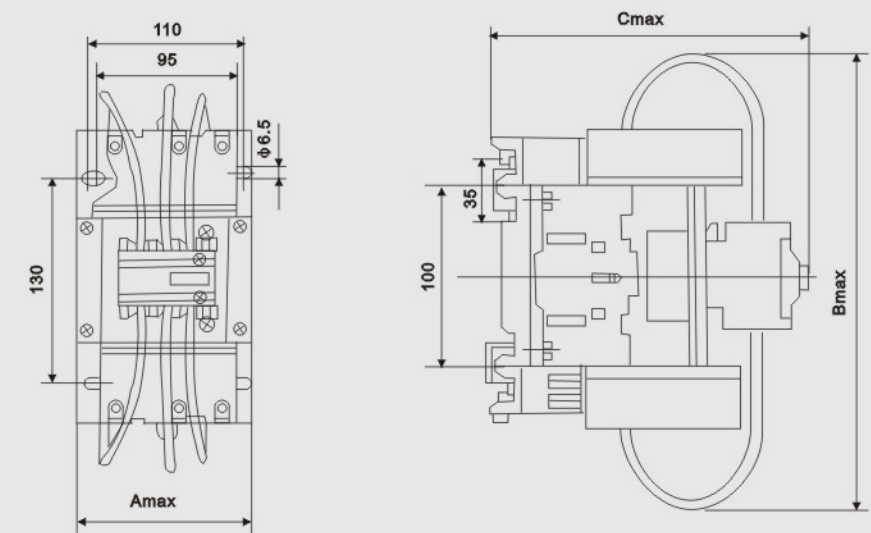
CJ19-32, 43



CJ19-63,95

**CJ19 Series  
Switch-over Capacitor Contactor**

**Overall and  
installation size**



CJ19-115,150,170

CJ19 Switch-over Capacitor Contactor	Amax	Bmax	Cmax
CJ19-25	47	80	124
CJ19-32	58	90	132
CJ19-43	58	90	136
CJ19-63	79	132	150
CJ19-95	87	132	160
CJ19-115	121	220	156
CJ19-150	121	220	156
CJ19-170	121	220	156

**ZUKCS Series**  
Dissolve switch w/o contact



**Brief introduction**

ZUKCS series reactive dynamic compensation regulator is an electronic type power device module that can be used for fast input-cutting for power shunt capacitor. Its electric structure is mainly composed of high-power inverse parallel thyristor module, isolating circuit, trigger circuit, sync circuit, protection circuit and drive circuit. It is equipped with the connecting terminals through control switch on and off, to control logical voltage 0V(off) and 12V(on). The switch has the characteristics of simple installation, convenient maintenance, quick response speed, no rush current for input-cut, no noise during working, running reliably and stably and with phase lack protection etc. It is the ideal device for input-cut capacitor groups used for reactive power dynamic compensation device.

**Working conditions**

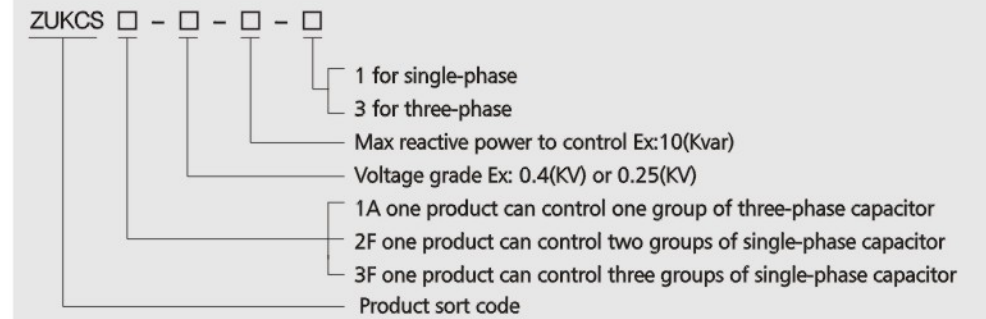
1. Ambient air temperature:-25°C to +50°C, the average temperature Should not exceed +30°C in 24h.
2. The relative humidity can reach 100% in short time at +25°C.
3. Altitude should not exceed 2000m.
4. The installation site should be with clean air, without explosive, flammable and dangerous articles and without the gas which may damage insulation and erode metals at a sufficient quantity, no conductive dust and rain and snow exist.
5. No obvious overrun harmonic wave company.

**Main technical parameters**

Rated voltage: 380V(220V)  
Rated frequency: 50Hz  
Control capacity: 380V Grade: 1kvar to 50kvar  
220V grade: 1kvar - 15kvar

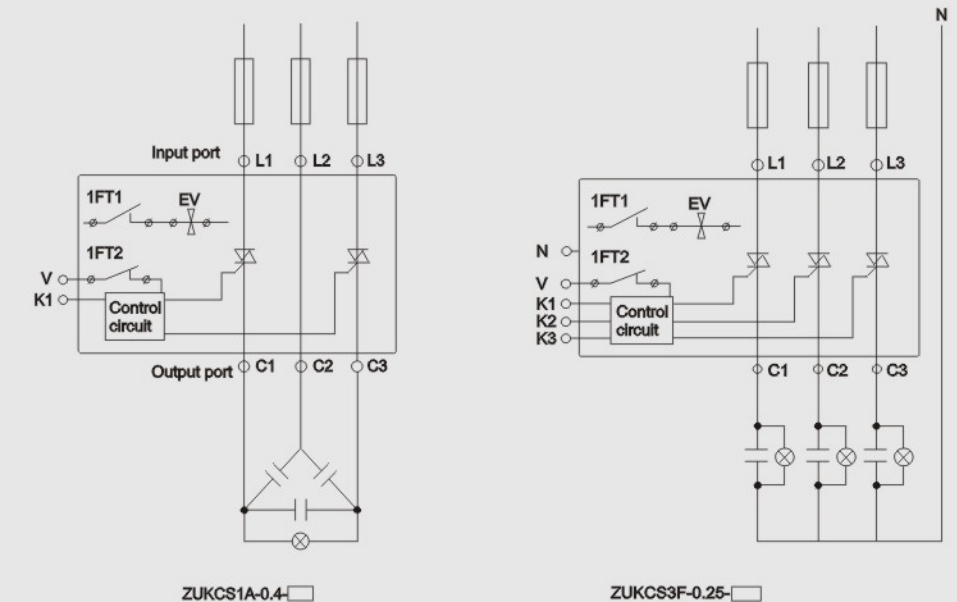
**ZUKCS Series**  
Dissolve switch w/o contact

**Model instruction**



Model	Can control capacitor
ZUKCS1A-0.4-20	(1-20)kvar three phase capacitor
ZUKCS1A-0.4-30	(21-30)kvar three phase capacitor
ZUKCS1A-0.4-40	(31-40)kvar three phase capacitor
ZUKCS1A-0.4-50	(41-50)kvar three phase capacitor
ZUKCS3F-0.25-10	3×(1-10)kvar split capacitor
ZUKCS3F-0.25-15	3×(11-15)kvar split capacitor

**Connection Drawing**



IFT1: NO when temperature switch below 55°C  
IFT2: NV when temperature switch below 75°C  
EV: Blower fan  
K1、K2、K3: Control signal from controller  
ZYKCS1A only connect K1  
ZYKCS3F: K1 control C1  
K2 control C2  
K3 control C3

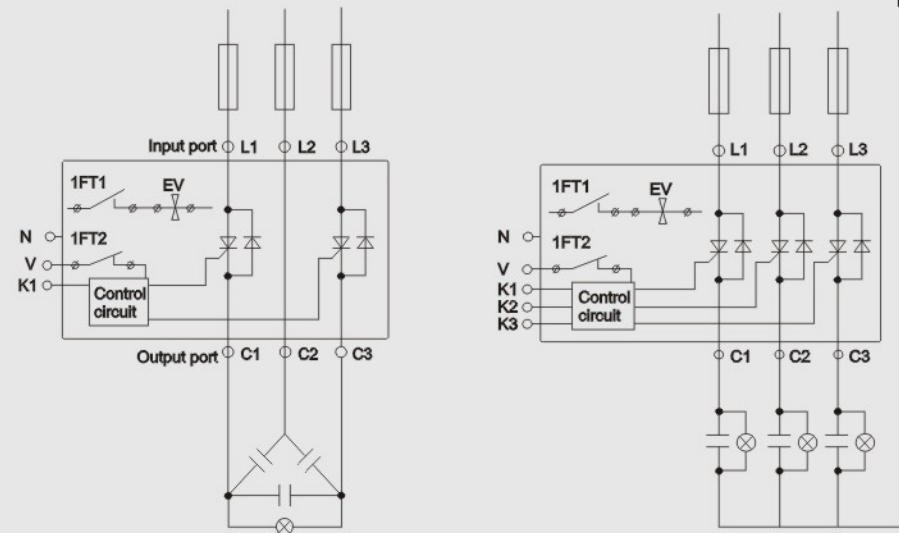
V: Common terminal of control signal+12V  
N: ZYKCS3F connect neutral  
ZYKCS1A disconnect

1、Whole control method drawing



**ZUKCS Series**  
Dissolve switch w/o contact

**Connection Drawing**



ZUKCS1A-0.4-H

ZUKCS3F-0.25-H

IFT1: NO when temperature switch below 55°C  
 IFT2: NV when temperature switch below 75°C  
 EV: Blower fan  
 K1、K2、K3: Control signal from controller  
 ZYKCS1A only connect K1  
 ZYKCS3F: K1 conral C1  
 K2 conral C2  
 K3 conral C3

V: Common terminal of control signal+12V  
 N: ZYKCS3F connect netrual  
 ZYKCS1A disconnect

2、Semi-control method drawing

**Overall and installation size**



ZUKCS1A、ZUKCS3F

**ZUFK Series**  
Intelligent Combination Switch



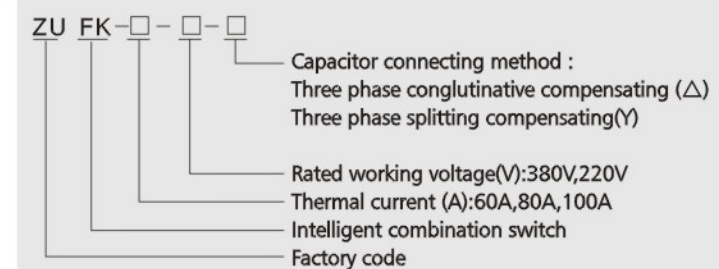
**General Description**

ZUFK series intelligent combination switch has two type switch, splitting compensating and conglutinative compensating. The songlutinative compensating switch is use for putting on and cutting off the three phase capacitor, they adopt connecting; splitting compensating switch is use for putting on and cutting off single phase capacitor, it adopts Y type connecting. The combination switch shunt operating thyristor switch and maintaining magnetic switch , it has the function across zero cutting and putting of thyristor when putting on or cutting off, and it also has the strong point of zero power dissipation of maintaining magnetic switch when normal connecting. The combination switch has the characteristic of no impact, low power dissipation, long lifespan, it can use for intending contactor or thyristor switch, is widely use in the low voltage reactive power compensation field.

**Working condition**

Working temperature: -25°C-55°C keeping and transfer temperature -40°C-85°C  
 Relative humidity: 5%-95%, no condensation , atmospheric pressure: 80kpa-110kpa  
 Altitude: below 2000m, earthquake intensity: <8 degree

**Model and meaning**



## ZUFK Series Intelligent Combination Switch

Product model	Can control capacitor	time interval between cut off and put on
ZUFK-60-380-Δ	(1-20)kvar three phase capacitor	At least 60s
ZUFK-80-380-Δ	(21-30)kvar three phase capacitor	At least 60s
ZUFK-100-380-Δ	(31-40)kvar three phase capacitor	At least 60s
ZUFK-60-220-Y	3×(1-7)kvar splitting compensation capacitor	At least 60s
ZUFK-80-220-Y	3×(7-10)kvar splitting compensation capacitor	At least 60s
ZUFK-100-220-Y	3×(11-15)kvar splitting compensation capacitor	At least 60s

### Indicator indicating instruction

1. SWITCH ON and SWITCH OFF light only lighten one in the same time to indicate the switch working state.
2. PHASE LACK light means there are at least one phase is not together, conglutinative compensating type has the function of cutting off when phase lack.
3. Delay indicator on means after the switch has putting on controller signal, the PUTTING ON indicator light, but if not reach the set capacitor discharge delay time, it can not putting on immediately, this time, the delay indicator flicker, after discharge delay time, the delay indicator off, and put on the switch.

### Function characteristic

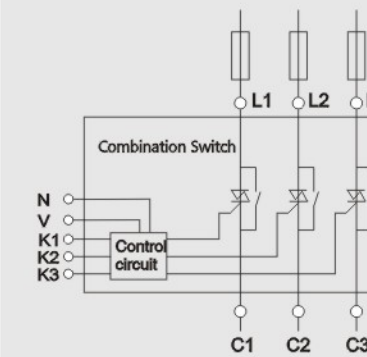
1. Voltage across zero put on, current across zero cut off, no harmonic current, do not appear over voltage.
2. Low power dissipation after power on, do not need add air-cooling fin.
3. Do not produce harmonic, do not need series connecting reactor.
4. Put in signal isolated with switching optical, high EMC protection, good capacity of resisting disturbance.
5. Can match with our dynamic compensation controller.
6. Built-in power, no need add outside power.
7. Switch operation state has two type, put on and cut off, has indicator for phase not together and delay.
8. Have strong compositive protection capacity, include system input voltage phase not together protection, power voltage phase not together protection, undervoltage protection, power off protection, and so on.

### Main technique data

1. Rated voltage 380V ± 20%, lifespan : 300 thousand times
2. Switch withstand voltage ≥2000V, switch power dissipation ≤2W
3. Switch pressure drop: ≤0.05V, put and cut alternation: ≥30S
4. Insulation strength: 2.5kv/1 min arrowd harmonic ≤10%
5. Control circuit control storge battery 5-24VDC input current < 10mA
6. Electromagnetic compatibility measurement, pulse group IEC255-22-1 2degree, Radiation field IEC 60255-22-3 2degree. electrostatic discharge IEC255-22-2 3 degree. Fast transient IC61000-4-4 3degree.

## ZUFK Series Intelligent Combination Switch

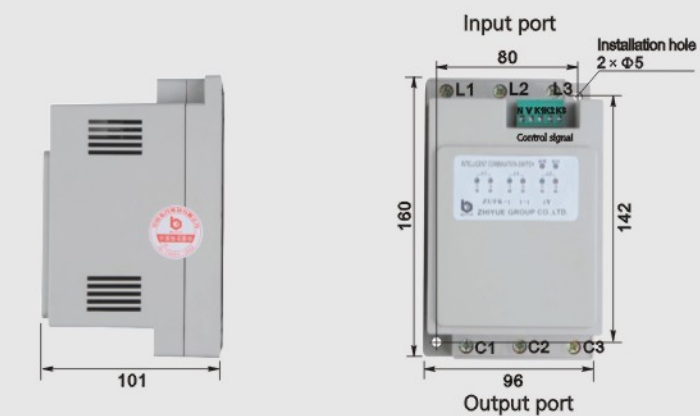
### Drawing



#### Drawing instruction:

L1,L2,L3: three phase input port, connect the power net  
C1,C2,C3:three phase output port, connect the capacitor or reactor  
K1,K2,K3: from the controller's negative electrode control signal, conglutinative compensation switch only need connect K1, control three phase output splite compensation switch K1 control C1 output, K2 control C2 output, K3 control C3output  
V: control signal common port positive pole input  
N: power net null line input port

### Outline dimension



Outline dimensions: 160(L) × 96(W) × 101(H)mm  
Ashing eye dimension: 142(L) × 80(W)mm Across corner install

### Attention

1. splitting compensation switch connect the capacitor by Y type connection, the three output of the switch connect one port of three pcs single phase capacitor, the other port of capacitor connect null line.
2. when use the switch in the condition of harmonic more than 5%, we suggest you adopt some harmonic solution.
3. the combination switch do not fit for frequently cut and put place, we suggest the cut and put alternation is more than 30 sec.
4. vertical installafion, across corners fixed. Use up and down two layer U type steel to fix, do not use iron for sealing fix.
5. when use combination switch, please choose the right capacity and specification, well connected. Usually can use MCB as the cut point, the capacity can choose 1.1-1.3 of capacitor's capacity.
6. when use single phase combination switch, please do well connect the single phase capacitor's null line, or will make the combination switch power null line overload, the null line will damage.

### Notice:

1. For the splitting compensation switch, the capacitor capacity means three pcs single phase capacitors' capacity together.
2. Splitting compensation switch has two control method: one adopt the controller use common positive pole port output. The other use common negative port output. If use our reactive power compensation controller, we adopt common positive pole port output.
3. Combination thermal current choose: usually, the capacity smaller than 20kvar, use 60A, 21kvar-30kvar use 80A, 31-40kvar use 100A.