BSMJ
自愈式低电压并联电容器
Low Voltage Shunt Power Capacitor of the self-healing type

适用范围 Application

自愈式低电压并联电容器适用于频率50Hz或60Hz低压电力系统，主要用于提高功率因素、减少无功损耗、改善电压质量，挖掘变压器容量等。是国家大力推荐使用的最佳节电产品。

本产品符合：国家标准GB/T 12747-2017，IEC60831-1996。

Self healing low voltage shunt power capacitor was used in 50Hz and 6oHz power system it mainly improver power factor, reduce reactive power loss, improve voltage quality. Encavate transformer quantity and so on. It is best saving power products which company strong recommend and work.

This product meets the standard: GB/T 12747-2017, IEC60831-1996

型号及其含义 Coda and implication

B S MJ 0.45－15－3

- 相数 (3表示三相，1表示单相) phase(3 indicated that three-phase, one that single-phase
- 额定容量(kvar) Rated capacity(Kvar)
- 额定电压(0.45 kV) Rated voltage (0.45 kV)
- 介质代号(金属化聚丙烯薄膜) Media code (metallized polypropylene film)
- 浸渍剂代号(S表示微晶蜡，Z表示菜籽油，G表示硅油、C表示蓖麻油，K表示环保型) Impregnating agent code-named(S: wax ,Z: seeds oil ,G: silicon oil , C: castor oil , K: Environmentally friendly)
- 系列代号(B并联电容器；M储能电容器；C串联电容器) Series Code (B shunt capacitor; M storage capacitor; C Series Capacitor)

结构特征

- 体积小、重量轻、安装方便
  采用优质金属化聚丙烯薄膜新材料作为介质，以及独特的结构设计使电容器体积，重量仅为老产品的1/4和1/5。
- 损耗低、发热少、温升低
  采用新型喷金工艺和独特的金属化膜边缘加厚技术，使电容器抗涌流能力大大加强，性能稳定，工作寿命大大延长，电容器自身能耗降低，实际值低于0.08%，发热少、温升低，节能效果佳。
- 优良的自愈性能
  介质局部击穿能迅速自愈，恢复正常工作，使可靠性大为提高。
- 安全性
  内装自放电电阻和保险装置，使用安全可靠。
- 不漏油，绿色环保
  采用微晶蜡作为浸渍剂，常温呈固态，滴溶点高于70℃，使用过程中不漏油，避免了环境污染，不但具有干式的结构特点，而且具有浸渍电容器的优点。此外，独特的浸渍工艺使电容器运行更为可靠。
- 耐腐蚀防伪外壳，美观牢固
  印铁外壳经特殊双防腐处理，抗腐蚀性大大提高，独特防伪设计，精细美观。

工作条件 Working conditions

- 电容器从电源切除后一定要保证电容器剩余电压降至10%额定电压才允许再次投入，通常情况这个时间约需200s，所以控制器要选用带有切除后再投入有再投锁定时间功能的控制器。如果采用一般控制器，要另装快速放电设施。对于采用等电位投切开关的可以不受此限。
- 海拔高度不超过2000m。
- 环境温度类别-25/C，最低温度-25℃，最高温度C类，(最高不超过50℃，24小时内温度平均值不超过40℃，一年内温度平均值不超过30℃)。电容器应保证在良好的通风条件下工作，不允许在密闭不通风环境下工作。

- Power capacitor should confirm left voltage reduce to rated voltage 10% to input again after the power was cut off ,normally it will need 200s almost. so it would choose the power controller which has input and reput lock time function after cut off the power. If choose normally power controller, it must install speediness discharge power equipment .it would not limited which use adopting same electric factor input and chip switch.
- Altitude level is not more than 2000m.
- Temperature type: -25/C low temperature, highest temperature is C type (it would not more than 50℃ the average of temperature is not more than 40℃ within 24 hours, one year average of temperature is not more than 30℃),power capacitor will work within good ventilate condition. It would not permit within sealing and installation condition

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Structure features

- Volume is small ,weight is light easy installation
  Metalized PPA thin film was adopt for medium ,it only have 1/4 old products ' volume and 1/5 old products ' weight
- Low loss little heating small change the temperature
  New type spray golden craftsmanship and special metalized edge thickness technology was adopted ,it can strength the power capacitor anti surge capacity .property stability ,working life will prolong ,power capacitor itself power lost will reduce .practice value is low than 0.08%, little heating small change the temperature and good saving power effect
- Excellence self healing property
  When medium parts was puncture ,it can self heal quickly and recover normally work ,improving the reliability
- Safety
  There are discharge resister and insure equipment was inside capacitor .it is reliability to use
- No leakage oil. Green no pollution
  Wax was immersed liquid ,normally it is state .when the temperature is high 70℃ ,it will unfreeze , there is no leakage oil and no pollution when you use this products . not only have try type 's instruction characteristic but also have immersed capacitor advantage .moreover it can make power capacitor work reliability within special immerse craftsmanship
- Anti corrupt and preventing fake cover ,beautiful and substance
  Pressing metal cover we use special double anti corrupt craftsmanship , so it improve the products anti corruption ,special anti fake design ,exquisite artistic.

主要技术参数 Main Technical data

- 额定电压：230V，250V，400V，450V，525V，690V，750V，1050V，1200V，其它电压可特殊定货。
- 额定容量：0.4~0.69kV的1~60kvar，其它电压等级的容量另定。
- 额定频率：50Hz或60Hz。
- 容量允差：-5%~+10%。
- 损耗角正切值：20℃时tanδ0.1%。
- 耐电压：极间2.15倍额定电压10秒钟，极壳间3kV，取较高值，10秒，无永久性击穿或闪络。
- 最高允许过电压：1.1倍额定电压时，每24小时中不超过8小时；1.15倍额定电压时，每24小时中不超过30分钟；1.2倍额定电压时，不超过5分钟；1.3倍额定电压时，不超过1分钟。
- 最大允许电流：允许电流不超过1.3倍额定电流下运行。过渡过电流，考虑过电压，电容正偏差以及谐波的影响，过渡过电流最大不超过1.43倍额定电流。
- 接法：△角接，Y星接，-Y星接中性点引出，Ⅲ三节段式，单相式等各种接法，其它接法根据用户需要商定。
- 自放电性能：电容器断电后3分钟剩余电压从$\sqrt{2}$Un降至50V以下。
- 符合标准：GB/T12747-2017，IEC60831：212002。

- Rated voltage: 230V, 250V, 400V, 450V, 525V, 690V, 750V, 1050V, 1200V, other special voltage please notice it .
- Rated capacity: 0.4~0.69kV 1~60kvar, other voltage class's capacity ,please notice it .
- Rated frequency: 50Hz or 60Hz.
- Capacity tolerance: -5%~+10%.
- Loss angle tan δ 0.1% when the temperature is 20℃.
- Anti voltage：between two pole 2.15 time rated voltage is 10 s, between two pole 3kV please choose highest value 10 s , there is noperpetuity puncture and flash over.
- Max permit over voltage: 1.1 time rated voltage ,the high permit over voltage is not more than 8 hours within 24 hours . 1.15 time rated voltage ,it is not more than 30 minute within 24 hours ,1.2 time rated voltage it is not more than 5 minute ,1.3 times rated voltage ,it would not more than 1 minute
- Max permit over current: it is permit that the over current is not more than 1.3 time rated current ,interim over current it should consider over voltage, capacity positive tolerance and harmonic effect .interim over current is not more than 1.43 time rated current .
- Connection: △ Y type ,Y type should draw out through neuter ,III three section ,single phase type ,and all kind of connection way .other connection way it will notice when you order it
- Discharge property: the-left voltage will reduce from$\sqrt{2}$Un to below 50V within 3 minutes when the power cut off.
- Standard: GB/T12747-2017, IEC60831: 212002.

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自愈式低电压并联电容器(三相系列)
Low Voltage Shunt Power Capacitor of the self-healing type

主要型号规格、数据及外形尺寸（三相） Main technical data&outline dimensions data （Three-phase)

产品型号Model BSMJ、BCMJ、BZMJ	额定电压 Rated Volt. (KV)	额定容量 Rated Capacity (Kvar)	额定电容 Rated Capacity (μF)	额定电流 Rated Current (A)	高度 H (mm)	出线端子 Outgoing terminal	图号 Drawing No.
0.4-4-3	0.4	4	79.6	5.8	105	M6	1
0.4-5-3	0.4	5	99.5	7.2	105	M6	1
0.4-6-3	0.4	6	119.4	8.7	105	M6	1
0.4-7.5-3	0.4	7.5	149.2	10.8	125	M6	1
0.4-8-3	0.4	8	159.2	11.6	125	M6	1
0.4-10-3	0.4	10	198.9	14.4	180	M6	1
0.4-12-3	0.4	12	238.7	17.3	180	M6	1
0.4-14-3	0.4	14	278.5	20.2	210	M6	1
0.4-15-3	0.4	15	298.4	21.7	210	M6	1
0.4-16-3	0.4	16	318.3	23.1	210	M6	1
0.4-18-3	0.4	18	358.1	26.0	245	M6	1
0.4-20-3	0.4	20	397.9	28.9	245	M6	1
0.4-22-3	0.4	22	437.7	31.8	210	M6	2
0.4-24-3	0.4	24	477.4	34.6	210	M6	2
0.4-25-3	0.4	25	497.4	36.1	210	M6	2
0.4-28-3	0.4	28	557.3	40.4	260	M8	2
0.4-30-3	0.4	30	596.8	43.3	260	M8	2
0.4-35-3	0.4	35	696.3	50.5	260	M8	2
0.4-40-3	0.4	40	796.2	57.7	330	M8	2
0.4-45-3	0.4	45	895.2	65.0	345	M10	5
0.4-50-3	0.4	50	995.2	72.2	345	M10	2
0.4-55-3	0.4	55	1094.2	79.4	220	M10	3
0.4-60-3	0.4	60	1194.3	86.6	220	M10	3
0.45-1-3	0.45	1	15.7	1.3	105	-	-
0.45-2-3	0.45	2	31.4	2.6	105	-	-
0.45-3-3	0.45	3	47.2	3.8	105	-	-
0.45-4-3	0.45	4	62.9	5.1	105	M6	4
0.45-5-3	0.45	5	78.6	6.4	105	M6	1
0.45-6-3	0.45	6	94.3	7.7	105	M6	1
0.45-7.5-3	0.45	7.5	117.9	9.6	105	M6	1
0.45-8-3	0.45	8	125.8	10.3	105	M6	1
0.45-10-3	0.45	10	157.2	12.8	125	M6	1
0.45-12-3	0.45	12	188.6	15.4	180	M6	1
0.45-14-3	0.45	14	220.1	18.0	210	M6	1
0.45-15-3	0.45	15	235.8	19.2	210	M6	1
0.45-16-3	0.45	16	251.5	20.5	210	M6	1
0.45-18-3	0.45	18	282.9	23.1	210	M6	1
0.45-20-3	0.45	20	314.4	25.7	210	M6	1
0.45-22-3	0.45	22	345.8	28.3	245	M6	1
0.45-24-3	0.45	24	377.3	30.8	245	M6	1
0.45-25-3	0.45	25	393.2	32.1	210	M6	1
0.45-28-3	0.45	28	440.3	35.9	210	M6	2
0.45-30-3	0.45	30	471.8	38.5	210	M6	2
0.45-35-3	0.45	35	550.2	44.9	260	M8	2
0.45-40-3	0.45	40	629.1	51.3	260	M8	2
0.45-45-3	0.45	45	707.7	57.7	330	M10	2

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主要型号规格、数据及外形尺寸（三相） Main technical data&outline dimensions data （Three-phase)

产品型号Model BSMJ、BCMJ、BZMJ	额定电压 Rated Volt. (KV)	额定容量 Rated Capacity (Kvar)	额定电容 Rated Capacity (μF)	额定电流 Rated Current (A)	高度 H (mm)	出线端子 Outgoing terminal	图号 Drawing No.
0.45-50-3	0.45	50	786.3	64.2	330	M8	2
0.45-55-3	0.45	55	864.5	70.6	330	M10	2
0.45-60-3	0.45	60	943.6	77.5	345	M10	5
0.525-5-3	0.525	5	57.7	5.5	125	M6	1
0.525-10-3	0.525	10	115.5	11.0	180	M6	1
0.525-15-3	0.525	15	173.2	16.5	210	M6	1
0.525-16-3	0.525	16	184.8	17.6	210	M6	1
0.525-18-3	0.525	18	207.9	19.8	210	M6	2
0.525-20-3	0.525	20	231.0	22.0	210	M6	2
0.525-25-3	0.525	25	288.9	27.5	210	M6	2
0.525-30-3	0.525	30	346.6	33.0	260	M8	2
0.525-40-3	0.525	40	462.2	44.0	330	M8	2
0.525-50-3	0.525	50	577.7	55.0	345	M10	2
0.525-60-3	0.525	60	693.3	66.0	220	M10	3
0.69-5-3	0.69	5	33.4	4.2	125	M6	1
0.69-10-3	0.69	10	66.9	8.4	180	M6	1
0.69-15-3	0.69	15	100.3	12.6	210	M6	1
0.69-16-3	0.69	16	107.0	13.4	210	M6	1
0.69-20-3	0.69	20	133.8	16.7	210	M6	2
0.69-25-3	0.69	25	167.2	20.9	210	M6	2
0.69-30-3	0.69	30	200.7	25.1	260	M8	2
0.69-40-3	0.69	40	267.4	33.5	330	M8	2
0.69-50-3	0.69	50	334.3	41.9	345	M10	3
0.69-60-3	0.69	60	401.4	50.2	220	M10	3
1.2-5-3	1.2	5	11.0	2.4	180	M6	1
1.2-10-3	1.2	10	22.0	4.8	210	M6	1
1.2-15-3	1.2	15	33.2	7.2	220	M6	1
1.2-20-3	1.2	20	44.2	9.6	260	M6	2
1.2-25-3	1.2	25	55.3	12	260	M6	2

注：其他特殊规格型号产品根据用户要求供货

Note：Other special specification models supply according to user requirements

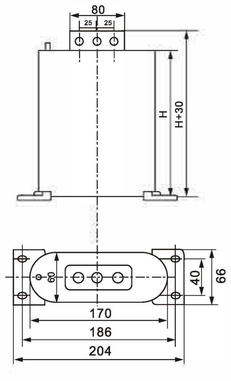


图1

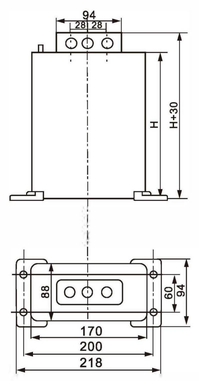


图2

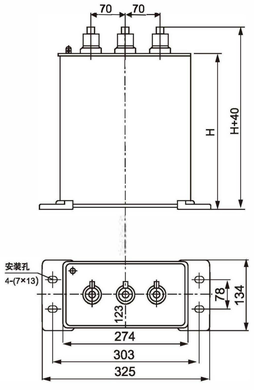


图3

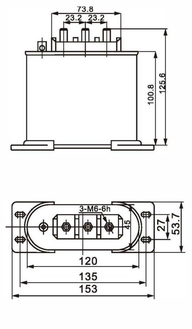


图4

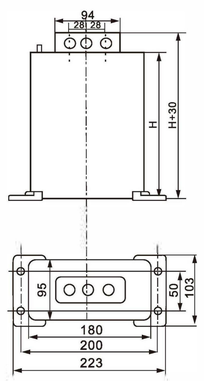


图5

BSMJ
分相补偿并联电容器（分相系列）
Split Phase Compensation Shunt Capacitor (Split-phase series)

适用范围 Application

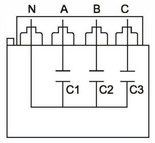
随着无功补偿技术的发展，对于三相不平衡负载，可采用三相分别投切电容器的方式，分相补偿无功功率。这样使补偿精度更高，节电效果更佳。为此，我公司开发出分相补偿并联电容器，其外壳设有中性点引出接线端子，可方便地实现电容器的分相投切。该产品的结构特征，主要技术参数，订货须知等均参见本公司自愈式低压并联电容器的技术说明。

Power reactive compensate technology develop, for three phase unbalance load , you can adapt three phase input cut capacitor way, sub compensate reactive power, so it can make the compensate accuracy is high, saving electric impression is best, so our company develop sub compensate shunt power capacitor,his cover setting neuter lead to terminal block, it can convenient make power capacitor sub cut and input. This product instruction characteristic ,mainly technology data .

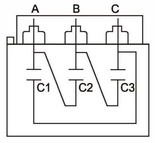
型号及其含义 Code and implication

B S MJ 0.25 – 5×3 1

- 相数（单相）Phase(Single-phase)
- 额定容量(3相总容量) Rated capacity (The total capacity of three-phase)
- 相电压0.25kV Phase voltage 0.25kV
- 金属化薄膜电容器 Metallized film capacitor
- 浸渍剂种类：Soak firmly type (S表示蜡、Z表示菜籽油，G表示硅油、C表示蓖麻油，K表示环保型) (S: wax, Z: seeds oil, G: silicon oil, C: castor oil, K: Environmentally friendly)
- 并联电容器 Shunt power capacitor



分相电容器接法
Split-phase Capacitor Connection



相间电容器接法
Interphase Capacitor Connection

工作条件 Working conditions

- 电容器从电源切除后一定要保证电容器剩余电压降至10%额定电压才允许再次投入，通常情况这个时间约需200s，所以控制器要选用带有切除后再投入有再投锁定时间功能的控制器。如果采用一般控制器，要另装快速放电设施。对于采用等电位投切开关的可以不受此限。
- 海拔高度不超过2000m。
- 环境温度类别-25/C，最低温度-25℃，最高温度C类，(最高不超过50℃，24小时内温度平均值不超过40℃，一年内温度平均值不超过30℃)。电容器应保证在良好的通风条件下工作，不允许在密闭不通风环境下工作。

结构特征 Structure feature

- 三个单相电容器、接成Y-接中性点引出(标注N端子)，即构成三个单相共体电容器。使用时，AN、BN、CN各为独立单元。
- 各独立单元各自接有放电电阻，使用更加安全。
- 任意独立单元的损坏都接有过压力隔离装置可以可靠断开。

- Three pcs single phase power capacitor, connect Y-neuter make out (N terminal),so it make three pcs single phase common body capacitor ,when you use it , AN BN CN is separate units.
- Absolute unit connect to discharge register, using is very safe.
- Any absolute unit damage has over press isolation equipment ,then it can break off.
- Power capacitor should confirm left voltage reduce to rated voltage 10% to input again after the power was cut off ,normally it will need 200s almost. so it would choose the power controller which has input and reput lock time function after cut off the power. If choose normally power controller, it must install speediness discharge power equipment ,it would not limited which use adopting same electric factor input and chip switch.
- Altitude level is not more than 2000m.
- Temperature type: -25/C low temperature, highest temperature is C type (it would not more than 50℃ the average of temperature is not more than 40℃ within 24 hours, one year average of temperature is not more than 30℃), power capacitor will work within good ventilate condition. It would not permit within sealing and installation condition

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分相补偿并联电容器（分相系列）
Split Phase Compensation Shunt Capacitor (Split-phase series)

主要型号规格、数据及外形尺寸（分相系列） Main technical data&outline dimensions data （Split-phase series)

产品型号Model BSMJ、BCMJ、BZMJ	额定线电压 Rated line voltage (KV)	额定相电压 Rated phase voltage (KV)	三相容量 Three-phase capacity (Kvar)	额定电容 Rated Capacity (μF)	额定电流 Rated Current (A)	高度 H (mm)	出线端子 Outgoing terminal	图号 Drawing No.
0.23-1×3-1	0.4	0.23	3	180.6	4.3×3	105	M6	1
0.23-1.67×3-1	0.4	0.23	5	301.0	7.2×3	125	M6	1
0.23-2×3-1	0.4	0.23	6	361.2	8.7×3	130	M6	1
0.23-2.5×3-1	0.4	0.23	7.5	451.5	10.9×3	160	M6	1
0.23-3.33×3-1	0.4	0.23	10	602.0	14.5×3	210	M6	2
0.23-4×3-1	0.4	0.23	12	722.0	17.4×3	210	M6	2
0.23-5×3-1	0.4	0.23	15	903.0	21.7×3	210	M6	2
0.23-6.67×3-1	0.4	0.23	20	1204.0	29.0×3	260	M8	2
0.23-8.33×3-1	0.4	0.23	25	1505.0	36.2×3	270	M8	4
0.25-1×3-1	0.43	0.25	3	152.8	4.0×3	105	M6	1
0.25-1.67×3-1	0.43	0.25	5	254.8	6.7×3	125	M6	1
0.25-2×3-1	0.43	0.25	6	305.7	8.0×3	125	M6	1
0.25-2.5×3-1	0.43	0.25	7.5	382.1	10.0×3	180	M6	1
0.25-2.67×3-1	0.43	0.25	8	407.6	10.7×3	180	M6	1
0.25-3.33×3-1	0.43	0.25	10	509.5	13.3×3	180	M6	1
0.25-4×3-1	0.43	0.25	12	611.5	16.0×3	210	M6	1
0.25-5×3-1	0.43	0.25	15	764.3	20.0×3	210	M6	2
0.25-5.33×3-1	0.43	0.25	16	815.3	21.3×3	210	M6	2
0.25-6.67×3-1	0.43	0.25	20	1019.0	26.7×3	210	M6	2
0.25-8.33×3-1	0.43	0.25	25	1273.9	33.3×3	260	M8	2
0.25-10×3-1	0.43	0.25	30	1528.7	40.0×3	270	M8	4
0.28-3.33×3-1	0.43	0.28	10	406.0	11.9×3	160	M6	1
0.28-4×3-1	0.43	0.28	12	488.0	14.3×3	210	M6	2
0.28-5×3-1	0.43	0.28	15	609.0	17.9×3	210	M6	2
0.28-6.67×3-1	0.43	0.28	20	812.0	23.8×3	210	M6	2
0.28-8.33×3-1	0.43	0.28	25	1016.0	29.8×3	210	M6	2
0.28-10×3-1	0.43	0.28	30	1219.0	35.7×3	260	M6	2
0.45-9-6	0.45	0.45	9	141.0	6.67	120	M6	2
0.45-21-6	0.45	0.45	21	329.7	15.5	160	M6	2

注：其他特殊规格型号产品根据用户要求供货

Note：Other special specification models supply according to user requirements

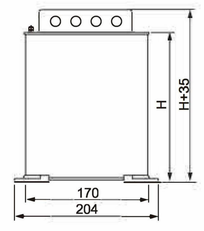


图1

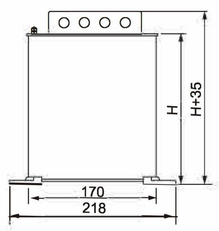


图2

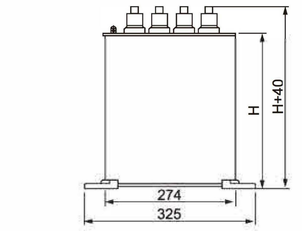


图3

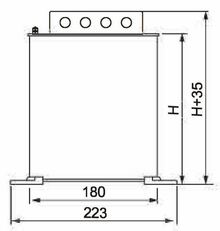


图4

BSMJ
圆柱形自愈式低压并联电容器
Low Voltage Shut Capacitor of the Self-Healing Type

适用范围 Application

BSMJ圆柱形自愈式低压并联电容器用于频率50Hz或60Hz低压电力系统设备的功率因数校正，适用于常规就地补偿和集中自动补偿，能够减少无功损耗、改善电压质量，是国家大力推荐的节能产品。

本产品符合标准：GB/T 12747，IEC831-1/2。

BSMJ cylinder self healing shunt power capacitor was used in 50Hz or 60Hz low voltage system equipment, it has power factor adjust ,it was suitable in normally field compensator and centralize auto compensate, it can reduce reactive power loss, improve voltage quality, it is national recommend saving electric products.

This product meets the standard: GB/T 12747, IEC831-1/2.

型号及其含义 Code and implication

BSMJ 0.48 - 15 - 3

- 3 — 相数 (3表示三相，1表示单相) Phase: 3: three phase 1: single phase
- 15 — 额定容量(三相时表示三相总容量)(kvar) rated capacity (three phase stand for three phase total capacity)
- 0.48 — 线电压kV Line voltage kV
- BSMJ — 金属化薄膜电容器 Metallized film capacitor

结构特征 Structure features

- 采用圆柱形铝罐封装。
- 浸渍剂为无公害绝缘油。
- 内置压力分离装置及放电电阻。
- 电容芯子采用自愈式优质金属化聚丙烯薄膜。
- 电容器顶部为防触电接线端子。
- 电容器底部为M12或M16安装及接地螺栓。
- 三相电容器内部均为△接法。

- Taking cylinder aluminum case.
- Immerse liquid: no social effects of pollution dielectric oil.
- Inseting press detaching equipment and discharge electric resister
- Capacitor core is healing good quality metallized film.
- Capacitor top is anti touching electric terminal block.
- Bottom is M12 or M16 install ground bolt.
- Three phase capacitor is inside △ connection way.

主要技术参数

- 额定电压：0.23kV、0.25kV、0.4kV、0.415kV、0.45kV、0.48kV、0.525kV等；
- 额定容量：1~30kvar；
- 电容量容差：-5%~+10%；
- 损耗角正切：tanδ≤0.1%；
- 极间耐压：2.15倍额定电压5秒，无永久性击穿或闪络；
- 绝缘水平：极壳间加电压：2倍额定电压加2kV或3kV取较高者，历时10妙，无击穿或闪络。
- 最高允许电压：1.1倍电压时，每24小时中不超过8小时；1.15倍电压时，每24小时中不超过30分钟；1.2倍电压时，不超过5分钟(持续);1.3倍电压时，不超过1分钟。
- 最大允许电流：允许不超过1.3倍额定电流下运行，考虑到过电压、电容正偏差及谐波的影响，过渡电流不超过1.43倍额定电流。
- 放电器件：内置放电电阻，电容器切断电源后放电3分钟降压至50V以下。
- 符合标准：GB/T12747-2017，IEC60831-2002。

工作条件 Working conditions

- 电容器从电源切除后一定要保证电容器剩余电压降至10%额定电压才允许再次投入，通常情况这个时间约需200s，所以控制器要选用带有切除后再投入有再投锁定时间功能的控制器。如果采用一般控制器，要另装快速放电设施。对于采用等电位投切开关的可以不受此限。
- 海拔高度不超过2000m。
- 环境温度类别-25/C，最低温度-25℃，最高温度C类，(最高不超过50℃，24小时内温度平均值不超过40℃，一年内温度平均值不超过30℃)。电容器应保证在良好的通风条件下工作，不允许在密闭不通风环境下工作。

- Power capacitor should confirm left voltage reduce to rated voltage 10% to input again after the power was cut off ,normally it will need 200s almost. so it would choose the power controller which has input and reput lock time function after cut off the power. If choose normally power controller, it must install speediness discharge power equipment .it would not limited which use adopting same electric factor input and chip switch.
- Altitude level is not more than 2000m.
- Temperature type: -25/C low temperature, highest temperature is C type (it would not more than 50℃ the average of temperature is not more than 40℃ within 24 hours, one year average of temperature is not more than 30℃), power capacitor will work within good ventilate condition. It would not permit within sealing and installation condition

BSMJ
圆柱形自愈式低压并联电容器
Low Voltage Shut Capacitor of the Self-Healing Type

Main Technical data

- Rated voltage: 0.23kV、0.25kV、0.4kV、0.415kV、0.45kV、0.48kV、0.525kv and so on.
- Rated capacity: 1~30kvar
- Capacitance tolerance: -5%~+10%
- Power loss tan δ ≤0.1%
- Between pole voltage: 2. 15 times rated voltage is 5 second ,no permanence puncture or shine
- Dielectric level: between cover add the voltage : 2 times rated voltage plus 2KV or 3KV ,please take height continue 10 second ,no puncture and shine
- Max permit voltage: 1.1 times voltage ,every 24 hours is not more than 8 hours ,1.15 times voltage ,every 24 hours is not more than 30 munites 1.2 times voltage ,it would not more than 5second (continue)1.3 times voltage ,not more than 1 minutes.
- High permit current : it is permit to work within less than 1.3 times rated current ,as there are over voltage and capacitor positive deviation and harmonic the over current is not than 1.43 times rated current
- Discharge component : inside put discharge register ,capacitor cut off power ,than discharge 3 munites electric ,so the voltage reduce to 50v
- Standard: GB/T12747-2017，IEC60831-2002

主要型号规格 Main technical data

三相电容器主要规格 Three-phase capacitors Specifications

产品型号 Model BSMJ	额定电压 Rated Volt. (V)	额定容量 Rated Capacity (kvar)	额定电容值 Rated Capacitance (μF)	额定电流 Rated Current (A)	额定频率 Rated Frequencies Hz	外形尺寸 Dimension 外径x高度	连接方式 Connection	底部螺栓 Bottom Bolt	图号 Drawing No.
0.25-2.5-3	250	2.5	127.4	5.8	50	76×180	△	M12×16	1
0.25-3-3	250	3	152.8	6.9	50	76×180	△	M12×16	1
0.25-4-3	250	4	203.8	9.2	50	76×240	△	M12×16	1
0.25-5-3	250	5	254.7	11.7	50	76×240	△	M12×16	2
0.25-6-3	250	6	305.7	13.9	50	76×240	△	M12×16	2
0.25-7.5-3	250	7.5	382.1	17.3	50	76×240	△	M12×16	2
0.25-8-3	250	8	407.6	18.5	50	96×240	△	M16×25	2
0.25-10-3	250	10	509.4	23.1	50	96×240	△	M16×25	2
0.25-12.5-3	250	12.5	636.8	28.9	50	106×240	△	M16×25	2
0.28-2.5-3	280	2.5	101.5	5.2	50	76×180	△	M12×16	1
0.28-3-3	280	3	121.8	6.2	50	76×180	△	M12×16	1
0.28-4-3	280	4	162.4	8.2	50	76×240	△	M12×16	1
0.28-5-3	280	5	203	10.3	50	76×240	△	M12×16	2
0.28-6-3	280	6	243.7	12.4	50	76×240	△	M12×16	2
0.28-7.5-3	280	7.5	304.6	15.5	50	76×240	△	M12×16	2
0.28-8-3	280	8	325	16.5	50	76×240	△	M12×16	2
0.28-10-3	280	10	406.1	20.6	50	96×240	△	M16×25	2
0.28-12.5-3	280	12.5	507.6	25.8	50	96×240	△	M16×25	2
0.45-1-3	450	1	15.7	1.3	105	60×110	△	M10×16	3
0.45-2-3	450	2	31.4	2.6	105	60×110	△	M10×16	3
0.45-3-3	450	3	47.2	3.8	105	65×110	△	M10×16	3
0.45-4-3	450	4	62.8	5.1	50	76×180	△	M12×16	1
0.45-5-3	450	5	78.5	6.4	50	76×180	△	M12×16	1
0.45-6-3	450	6	94.2	7.7	50	76×180	△	M12×16	1
0.45-7.5-3	450	7.5	117.8	9.6	50	76×180	△	M12×16	1
0.45-8-3	450	8	125.6	10.2	50	76×240	△	M12×16	1
0.45-10-3	450	10	157	12.8	50	76×240	△	M12×16	1
0.45-12.5-3	450	12.5	196.3	16	50	76×240	△	M12×16	1
0.45-15-3	450	15	235.5	19.2	50	96×240	△	M16×25	2
0.45-16-3	450	16	251.2	20.5	50	96×240	△	M16×25	2
0.45-20-3	450	20	314	25.6	50	96×240	△	M16×25	2
0.45-25-3	450	25	392.5	32	50	106×240	△	M16×25	2
0.45-30-3	450	30	471	38.5	50	106×290	△	M16×25	2

BSMJ
圆柱形自愈式低压并联电容器
Low Voltage Shut Capacitor of the Self-Healing Type

产品型号 Model BSMJ	额定电压 Rated Volt. (V)	额定容量 Rated Capacity (kvar)	额定电容值 Rated Capacitance (μF)	额定电流 Rated Current (A)	额定频率 Rated Frequencies Hz	外形尺寸 Dimension 外径x高度	连接方式 Connection	底部螺栓 Bottom Bolt	图号 Drawing No.
0.48-2.5-3	480	2.5	34.5	3.0	50	76×180	△	M12×16	1
0.48-3-3	480	3	41.4	3.6	50	76×180	△	M12×16	1
0.48-4-3	480	4	55.2	4.8	50	76×180	△	M12×16	1
0.48-5-3	480	5	69	6.0	50	76×180	△	M12×16	1
0.48-6-3	480	6	82.8	7.2	50	76×180	△	M12×16	1
0.48-7.5-3	480	7.5	103.5	9.0	50	76×240	△	M12×16	1
0.48-8-3	480	8	110.4	9.6	50	76×240	△	M12×16	1
0.48-10-3	480	10	138	12	50	76×240	△	M12×16	1
0.48-12.5-3	480	12.5	172.5	15	50	96×240	△	M16×25	2
0.48-15-3	480	15	207	18	50	96×240	△	M16×25	2
0.48-16-3	480	16	220.8	19.2	50	96×240	△	M16×25	2
0.48-20-3	480	20	276	24.1	50	96×240	△	M16×25	2
0.48-25-3	480	25	345	30.1	50	106×290	△	M16×25	2
0.48-30-3	480	30	414.6	36	50	106×290	△	M16×25	2
0.525-5-3	525	5	57.8	5.5	50	76×180	△	M12×16	1
0.525-7.5-3	525	7.5	86.6	8.3	50	76×180	△	M12×16	1
0.525-10-3	525	10	115.5	11	50	76×180	△	M12×16	1
0.525-12.5-3	525	12.5	144	13.8	50	76×240	△	M12×16	1
0.525-15-3	525	15	173.3	16.5	50	96×240	△	M16×25	2
0.525-20-3	525	20	231	22	50	106×240	△	M16×25	2
0.525-25-3	525	25	288.8	27.5	50	106×290	△	M16×25	2

安装及外形尺寸图 Installation and Dimension Chart

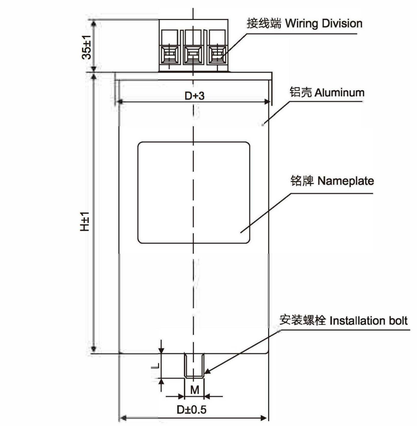


图1

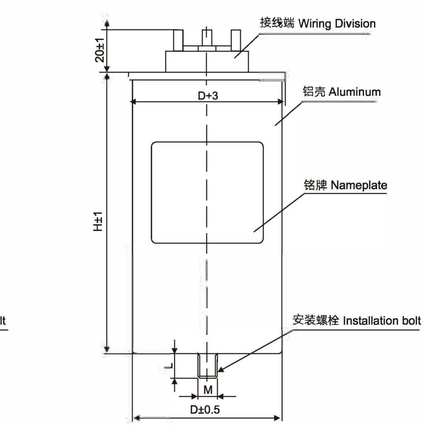


图2

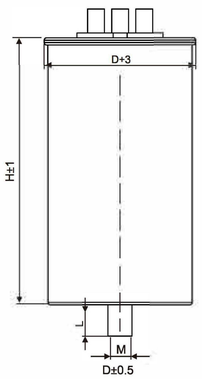
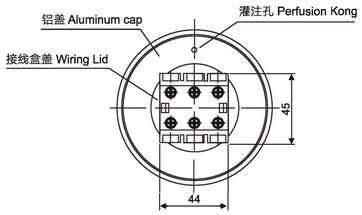
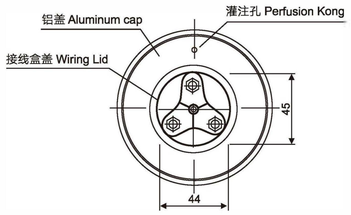
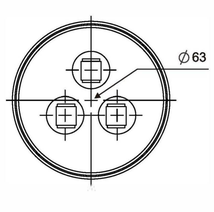


图3







BSMJ
自愈式低电压并联电容器（单相、矿热炉专用系列）
Self-healing low voltage shunt capacitor(single phase,for mineral thermal oven)

适用范围 Application

自愈式低电压并联电容器适用于频率50Hz或60Hz低压电力系统，主要用于提高功率因素、减少无功损耗、改善电压质量，挖掘变压器容量等。是国家大力推荐使用的最佳节电产品。

本产品符合：国家标准GB/T 12747-2017，IEC60831-1996。

Self healing low voltage shunt power capacitor was used in 50Hz and 6oHz power system , it mainly improver power factor, reduce reactive power loss, improve voltage quality. Encavate transformer quantity and so on. It is best saving power products which company strong recommend and work.

This product meets the standard: GB/T 12747-2017, IEC60831-1996

主要型号规格 Main technical data

产品型号Model BSMJ、BCMJ、BZMJ	额定电压 Rated Volt. (KV)	额定容量 Rated Capacity (Kvar)	额定电容 Rated Capacity (μF)	额定电流 Rated Current (A)	高度 H (mm)	出线端子 Outgoing terminal	图号 Drawing No.
0.18-10-1	0.18	10	983.0	55.6	220	M6	2
0.18-15-1	0.18	15	1475.0	83.3	220	M8	3
0.18-20-1	0.18	20	1966.0	111.0	220	M8	3
0.18-25-1	0.18	25	2458.0	139.0	290	M8×2	3
0.25-5-1	0.25	5	255.0	20	130	M6	1
0.25-7.5-1	0.25	7.5	382.0	30	180	M8	1
0.25-10-1	0.25	10	510.0	40	210	M8	1
0.25-15-1	0.25	15	764.0	60	260	M8	2
0.25-20-1	0.25	20	1019.0	80	330	M10	2
0.25-25-1	0.25	25	1274.0	100	345	M10	2
0.25-30-1	0.25	30	1529.0	120	220	2×M10	3
0.4-10-1	0.4	10	198.9	25	180	M6	2
0.4-12-1	0.4	12	238.7	30	180	M6	2
0.4-15-1	0.4	15	298.4	37.5	210	M8	2
0.4-16-1	0.4	16	318.3	40	210	M8	2
0.4-18-1	0.4	18	358.1	45.0	245	M8	2
0.4-20-1	0.4	20	397.9	50	245	M8	2
0.4-25-1	0.4	25	497.4	62.5	210	M8	2
0.4-30-1	0.4	30	596.8	75	260	M8	2
0.4-35-1	0.4	35	696.3	87.5	260	M8	2
0.4-40-1	0.4	40	796.2	100	330	M10	2
0.4-45-1	0.4	45	895.2	112.5	220	2×M10	2
0.4-50-1	0.4	50	995.2	125	220	2×M10	2
0.4-60-1	0.4	60	1194.3	150	220	2×M10	2

XIKAI®

BSMJ
自愈式低电压并联电容器（单相、矿热炉专用系列）
Self-healing low voltage shunt capacitor(single phase,for mineral thermal oven)

主要型号规格、数据及外形尺寸（单相） Main technical data&outline dimensions data （Single-Sphase）

产品型号Model BSMJ、BCMJ、BZMJ	额定电压 Rated Volt. (KV)	额定容量 Rated Capacity (Kvar)	额定电容 Rated Capacity (μF)	额定电流 Rated Current (A)	高度 H (mm)	出线端子 Outgoing terminal	图号 Drawing No.
0.45-10-1	0.45	10	157.2	22.2	180	M6	2
0.45-12-1	0.45	12	188.6	26.7	180	M6	2
0.45-15-1	0.45	15	235.8	33.3	210	M8	2
0.45-16-1	0.45	16	251.5	35.6	210	M8	2
0.45-18-1	0.45	18	282.9	40	210	M8	2
0.45-20-1	0.45	20	314.4	44.4	210	M8	2
0.4-25-1	0.45	25	393.2	55.6	210	M8	2
0.45-30-1	0.45	30	471.8	66.7	210	M8	2
0.45-35-1	0.45	35	550.2	77.8	260	M10	2
0.45-40-1	0.45	40	629.1	88.9	260	M10	2
0.45-45-1	0.45	45	707.4	100.0	220	M10	3
0.45-50-1	0.45	50	786.3	111.1	220	2×M10	3
0.45-60-1	0.45	60	943.6	133.3	220	2×M10	3

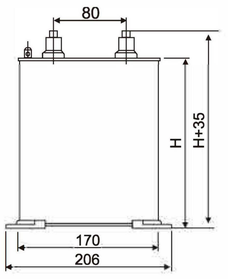


图1

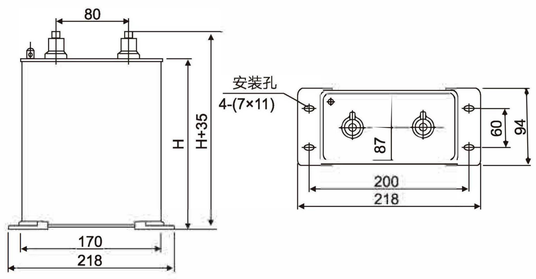
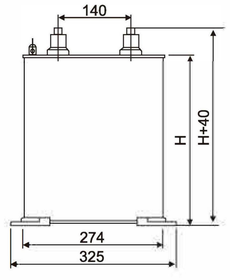


图2



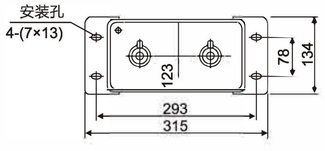
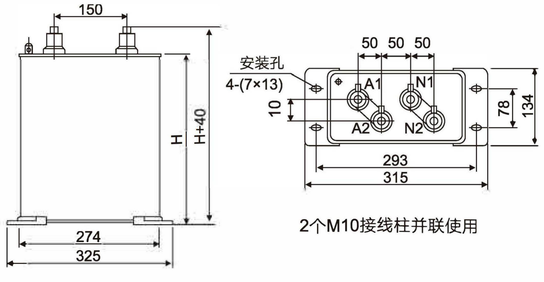


图3



2个M10接线柱并联使用

图4

注：其他特殊规格型号产品根据用户要求供货

Note：Other special specification models supply according to user requirements

XIKAI®

ZMK
系列抗谐波型低压并联电容器
Anti-harmonic Low Voltage Shunt Capacitor

用途 Purposes

- 用于低压配电系统，补偿低压电网感性无功功率，提高配电系统的功率因数，降低线路损耗；
- 用于低压电力设备，实现就地补偿，提高设备的功率因数和利用率；
- 用于低压无源滤波装置中，消除谐波，改善供电质量，提高功率因数；
- 用于风力发电、光伏发电等新能源领域，起无功补偿和滤波作用。

- Used on low-voltage distribution system to compensate for the inductive reactive power, enhance the power factor of the distribution system and lower transmission loss.
- Used on low-voltage electrical equipment. Compensate on site to enhance the power factor and the availability of the equipment.
- Used on low-voltage passive filter to eliminate harmonic wave, improve the power supply quality and enhance the power factor.
- Used on wind power generation, photovoltaic power generation and other new energy for reactive compensation and filtering.

型号及其含义 Code and implication

ZM □□ □ -□-□-3

- 相数 (3:三相，1:单相) 3: Three-phase, 1: Single-phase
- 额定容量(kvar) Rated capacity(Kvar)
- 额定电压(kV) Rated voltage (kV)
- KX-适用于谐波电流畸变率(THDI)10%~20%场合运行
  KX-Harmonic current Distortion rate (THDI) 10%~20%Occasion operation
- KG-适用于谐波电流畸变率(THDI)20%~50%场合运行
  KG-Harmonic current Distortion rate (THDI) 20%~50%Occasion operation
- KQ-适用于谐波电流畸变率(THDI)50%~100%场合运行
  KQ-Harmonic current Distortion rate (THDI) 50%~100%Occasion operation
- 企业代号 Enterprise code

主要性能参数 Main specification

额定电压:0.1-1kV	Rated voltage: 0.1-1kV.
额定容量:1~60kvar	Rated capacity: 1-60kvar.
介质损耗:tgδ≤0.002	Dielectric loss: tgδ≤0.002
环境温度:-25~+50°C	Temperature: -25~+50°C
海拔高度:≤2000m	Altitude:≤2000m.

主要型号规格 Main technical data

产品型号 Model	额定电压 Rated Volt.(KV)	额定容量 Rated Capacity(Kvar)	额定电流 Rated Current(A)	额定电容 Rated Capacity(μF)
ZMKX0.48-10-3	0.48	10	12.0	138.2
ZMKX0.48-15-3		15	18.0	207.3
ZMKX0.48-20-3		20	24.1	276.5
ZMKX0.48-25-3		25	30.1	345.6
ZMKX0.48-30-3		30	36.1	414.7
ZMKX0.48-40-3		40	48.1	552.9
ZMKG0.525-10-3	0.525	10	11. 0	115. 6
ZMKG0.525-15-3		15	16. 5	173. 3
ZMKG0.525-20-3		20	22. 0	231. 1
ZMKG0.525-25-3		25	27. 5	288. 9
ZMKG0.525-30-3		30	33. 0	346. 6
ZMKG0.525-40-3		40	44. 0	462. 2
ZMKQ0.69-10-3	0.69	10	8. 4	66. 9
ZMKQ0.69-15-3		15	12. 6	100. 3
ZMKQ0.69-20-3		20	16. 7	133. 8
ZMKQ0.69-25-3		25	20. 9	167. 2
ZMKQ0.69-30-3		30	25. 1	200. 7
ZMKQ0.69-40-3		40	33. 5	267. 6

注：1.带温控开关产品与无温控开关产品外形尺寸相同；2.内置电感线圈和无线圈产品外形尺寸相同；
3.其它规格产品可按客户要求订做。

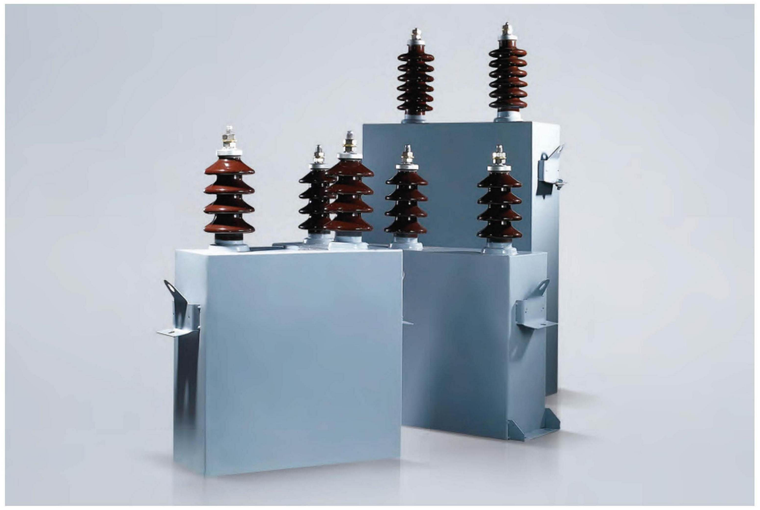
产品特点 Product features

- 采用优质材料和先进的工艺，产品容量精度高、损耗小、过电流能力强；
- 产品运行时温升低，寿命长，正常条件下使用，预期寿命10年以上；
- 全干式结构，永不漏油，环保无污染；
- 产品内部填充干式阻燃材料；
- 产品内置不同的保护方式，例如过压力、过温度、过电流等不同保护方式；
- 产品安全可靠，无爆裂、无燃烧隐患；
- 产品结构多样，可以满足不同用户不同场合的安装使用。

- Qualitative material and advanced process are adopted. The product capacity is precise with low wastage and strong over-current ability.
- The temperature is low while the product is running.
- Expected life can be over 10 years with proper use.
- All-dry structure can prevent oil leakage and pollution.
- Dry fir-resistant material is stuffed inside the product.
- Different protections are built in, including overpressure, over temperature and over current.
- Products are reliable and with no potential hazard like cracking or burning.
- Various product structures can satisfy different purposes for different customers

BAM(BFM)

高压并联电容器



适用范围 Application

高电压并联电容器主要适用于50Hz或60Hz交流电力系统中，提高功率因数。减少无功损耗，改善电压质量，充分发挥发电、供电设备效率等。是国家推荐的节能产品。

High voltage shunt power capacitor mainly use in 50Hz or 60Hz Ac power system .improve power factor, reduce reactive power loss ,mend voltage quality ,plenitude elaborate generate power 's equipment and supply power equipment efficiency. it is national recommend save power products

型号及其含义 Code and implication

B F M R 11/√3 - 100 - 1 W

- 尾注号 No. Endnotes: W — 户外型 outdo type; G 高原型 highland type; H — 湿热型 humidity and hot type
- 相数 (3表示三相，1表示单相) Phase: 3: three phase 1: single phase
- 额定容量(kvar) rated capacity
- 额定电压(kV) rated voltage
- 设计代号desig: r 内熔丝 inner fuse; R — 放电电阻 Discharge resister
- 固体介质代号 Solid media code: F— 膜纸复合介质 Film and paper compound medium; M — 全膜介质 Full film medium; W — 十二烷基苯 Dodecylbenzene
- 液体介质代号 Liquids Code: F 二芳基乙烷 Pxe; A— 苄基甲苯M/dbt
- 系列代号B—并联电容器 Series No. B—shunt capacitor

结构特征 Structure features

电容器由箱壳和芯子组成，箱壳用薄钢板密封焊接制成，箱壳上焊有出线瓷套，箱壁两侧焊有供安装用的吊攀，一侧吊攀装有接地螺栓。

电容器芯子由若干个元件和绝缘件迭压而成，元件由作为极板的两张铝箔中间夹膜纸复合介质或全膜介质经绕卷压扁而成。芯子中的元件按一定的串、并联方式联接，以满足不同电压和容量的要求。

有内熔丝的电容器，每个元件均串有一根熔丝，当某个元件击穿时，与其并联的完好元件即对其放电，使熔丝在毫秒级的时间内迅速熔断，将故障元件切除，从而使电容器继续运行。

三相电容器为星形接线。

液体介质在电容器中，用以浸渍固体介质和填充电容器内部的空隙，采用具有优良电气物理性能，并与电容器中其它材料具有良好的相溶性。

Power capacitor is made up by case and core , the case is made up by thin steel sheet weld, output porcelain was welded on the case top ,the case beside was welded hook ,one side hood was put ground bolt.

Power capacitor core is made up by some component and isolation together 。component is made by two piece aluminum foil centre clip film paper compound media or full film media press wind and staved .core 's component connect by fixed strand and shunt way ,so can satisfied different voltage and capacity

The power capacitor with inside fuse ,every component have one fuse ,when any component was punctured ,other component will well and it can discharge ,so it can make the fuse off in very short time .you take off the faulty component, then the capacitor still work

Three phase power capacitor is star connection

Liquid medium was in power capacitor ,immerse liquid fill up the inside gap .and it take excellent electric physic property ,it has good solubility with other material

工作条件 Working conditions

海拔不超过1000m，环境温度-40/B，B类最高温度为+45℃。

安装场所无剧烈的机械振动、无有害气体及蒸汽、无导电性或爆炸性尘埃。

电容器应保证在良好通风条件下运行，不允许在密闭不通风的条件下运行。

电容器的接线应采用软导线，且整个回路应接触良好。

Altitude is not more than 1000m ,ambient temperature: -40/B ,B type is most temperature is +45℃。

Installation condition: there is no strong vibration, no harmful gas and vapor, no conductive or explosive dust。

Power capacitor will work in the good ventilate condition, it would not permit to work in sealing and no ventilate condition。

Power capacitor connection wire should take soft conductive wire ,the whole circuit connect well。

主要技术参数 Main Technical data

额定电压：6.3kV、6.6kV、6.6/√3kV、10.5kV、11kV、11/√3kV、12kV、12/√3kV、19kV等；

额定容量：30~334kvar，其它电压等级和容量可特殊定货。

容量允许偏差：-5%~+10%；

损耗角正切值：膜纸复合介质tanδ≤0.08%、全膜介质tanδ≤0.05%；

耐电压：电容器极间应能承受交流2.15倍或直流4.3倍额定电压，历时10s无击穿或闪络；

绝缘水平：6kV等级30kV、10kV等级42kV交流试验历时1min无击穿或闪络。

自放电性能：内部装有放电电阻的电容器，断电后10min内剩余电压从√2Un峰值降至75V以下；

最高允许过电压：1.1倍额定电压时，每24小时中不超过8小时，1.15倍额定电压时，每24小时中不超过30分钟，1.2倍额定电压时不超过5分钟。1.3倍额定电压时不超过1分钟。

最大允许电流：允许电流不超过.3倍额定电流下运行，过渡过电流考虑过电压，电容正偏差以及谐波的影响最大不得超过1.43倍额定电流。

符合标准：产品符合国际GB/T 11024.1-2009及国际IEC60871-1：2005。

Rated voltage: 6.3kV、6.6kV、6.6/√3kV、10.5kV、11kV、11/√3kV、12kV、12/√3kV、19kV and so on

Rated capacity: 30~334kvar other voltage and capacity will make according to the client demanding.

Capacity tolerance: -5%~+10%.

Power loss tan δ film and paper compound medium tan δ ≤0.08%, full film medium tan δ ≤0.05%.

Withstand voltage: between power capacitor ,every pole can afford AC 2.15 times voltage or direct 4.3 times rated voltage ,it will over 10 s ,there is no puncture and flash

Dielectric level: 6KV 30kv 10kv 42kv testing AC ,it will over 1 min there is no puncture and flash

Discharge property: the power capacitor with inside put discharge register . it can reduce the left voltage from √2Un peak va ue to below 75V within 10 minute when the power is off

Max permit over voltage: 1.1 times rated voltage the most permit voltage would not more than 8 hours with in 24 hours, 1.15 time rated voltage ,the most permit over voltage would not not more than 30 minute within 24 hours 1.2time rated voltage would not more than 5 minute within 24 hours ,1.3 time rated voltage would not more 1 minute within 24 hours.

Max permit over current . over current is not more than 3 time rated current ,it can work ,,if over current transition ,you should consider over voltage .capacitytolerance and harmonic affection would not more than 1.43 times rated current

Confirm standard : GB/T 11024.1-2009 or IEC60871-1:2005

主要型号规格 Main technical data

产品型号 Model	额定值 Rating			
	额定电压 Rated voltage(V)	容量Capacity (kvar)	电容量 Capacitance(μF)	额定电流Rated Current(A)
BWF6.3-25-1W	6.3	25	2.006	3.986
BWF6.3-30-1W	6.3	30	2.406	4.762
BWF6.6/√3-30-1W	6.6/√3	25	5.481	6.561
BWF6.3/√3-30-1W	6.3/√3	30	6.577	7.873
BWF6.3/ 3-50-1W	6.3/√3	50	10.96	13.12
BWF10.5-25-1W	10.5	25	0.722	2.38
BWF10.5-30-1W	10.5	30	0.886	2.857
BWF10.5-50-1W	10.5	50	1.444	4.762
BWF11/√3-30-1W	11/√3	30	2.368	4.724
BWF11/√3-50-1	11/√3	50	3.946	7.837
BFF6.3-30-1W	6.3	30	2.4	4.9
BFF6.3-50-1W	6.3	50	4.0	7.9
BFF6.3-100-1W	6.3	100	8.0	15.9
BFF6.3-200-1W	6.3	200	16.0	31.7
BFF6.3-300-1W	6.3	300	24.0	47.6
BFF6.3-334-1W	6.3	334	26.8	53.0
BFF10.5-50-1W	10.5	50	1.44	4.8
BFF10.5-100-1W	10.5	100	2.9	9.5
BFF10.5-150-1W	10.5	150	4.3	14.3
BFF10.5-200-1W	10.5	200	5.8	19.0
BFF10.5-300-1W	10.5	300	8.67	28.60
BFF10.5-334-1W	10.5	334	9.65	31.8
BFF11/√3-50-1W	11/√3	50	3.95	7.87
BFF11/√3-100-1W	11/√3	100	7.89	15.75

BAM(BFM)
高压并联电容器
High Voltage Shunt Capacitor(High Series)

产品型号 Model	额定值 Rating			
	额定电压 Rated voltage(V)	容量Capacity (kvar)	电容量 Capacitance(μF)	额定电流Rated Current(A)
BFF11/√3-150-1W	11/√3	150	11.84	23.60
BFF11/√3-200-1W	11/√3	200	15.78	31.5
BFF11/√3-300-1W	11/√3	300	23.68	47.2
BFF11/√3-334-1W	11/√3	334	26.36	52.6
BFF6.6/√3-50-1W	6.6/√3	50	10.96	13.12
BFF6.6/√3-100-1W	6.6/√3	100	21.9	26.24
BFF6.6/√3-150-1W	6.6/√3	150	32.9	39.36
BFF6.6/√3-200-1W	6.6/√3	200	43.8	52.48
BFF6.6/√3-300-1W	6.6/√3	300	65.8	78.7
BFF6.6/√3-334-1W	6.6/√3	334	73.2	87.6
BFM11-100-1W	11	100	2.63	9.1
BFM11-150-1W	11	150	3.95	13.6
BFM11-200-1W	11	200	5.26	18.2
BFM11-300-1W	11	300	7.89	27.3
BFM11-334-1W	11	334	8.79	30.4
BFM12-100-1W	12	100	2.2	8.33
BFM12-150-1W	12	150	3.3	12.5
BFM12-200-1W	12	200	4.4	16.7
BFM12-300-1W	12	300	6.64	25.0
BFM12-334-1W	12	334	7.39	27.8
BFM12/√3-100-1W	12/√3	100	6.63	14.4
BFM12/√3-150-1W	12/√3	150	9.95	21.7
BFM12/√3-200-1W	12/√3	200	13.3	28.9
BFM12/√3-300-1W	12/√3	300	19.9	43.3
BFM12/√3-334-1W	12/√3	334	22.1	48.2
BFM12/√3-400-1W	12/√3	400	26.54	57.74
BFM6.3-100-1W	6.3	100	8.0	15.9
BFM6.3-150-1W	6.3	150	12.0	23.8
BFM6.3-200-1W	6.3	200	16.0	31.7
BFM6.3-300-1W	6.3	300	24.0	47.6
BFM6.3-334-1W	6.3	334	26.8	53.0
BFM6.6-100-1W	6.6	100	7.3	15.2
BFM6.6-150-1W	6.6	150	11.0	22.7
BFM6.6-200-1W	6.6	200	14.6	30.3
BFM6.6-300-1W	6.6	300	22.0	45.5
BFM6.6-334-1W	6.6	334	24.4	50.6
BFM6.6/√3-100-1W	6.6/√3	100	21.9	26.24
BFM6.6/√3-150-1W	6.6/√3	150	32.9	39.36
BFM6.6/√3-200-1W	6.6/√3	200	43.8	52.48
BFM6.6/√3-300-1W	6.6/√3	300	65.8	78.7
BFM6.6/√3-334-1W	6.6/√3	334	73.2	87.6
BFM11/√3-100-1W	11/√3	100	7.89	15.75
BFM11/√3-150-1W	11/√3	150	11.84	23.60
BFM11/√3-200-1W	11/√3	200	15.78	31.5
BFM11/√3-300-1W	11/√3	300	23.68	47.2
BFM11/√3-334-1W	11/√3	334	26.36	52.6
BFF11-100-3W	11	100	2.63	5.25
BFF11-150-3W	11	150	3.95	7.87
BFF11-200-3W	11	200	5.26	10.5
BFF11-300-3W	11	300	7.90	15.75

注：其他特殊规格型号产品根据用户要求供货Note：Other special specification models supply according to user requirements

BAM(BFM)
高压并联电容器
High Voltage Shunt Capacitor(High Series)

主要型号规格 Main technical data

产品型号 Model	额定值 Rating			
	额定电压 Rated voltage(V)	容量Capacity (kvar)	电容量 Capacitance(μF)	额定电流Rated Current(A)
BFM11-100-3W	11	100	2.63	5.25
BFM11-150-3W	11	150	3.95	7.87
BFM11-200-3W	11	200	5.26	10.5
BFM11-300-3W	11	300	7.90	15.75
BFF12-100-3W	12	100	2.2	4.8
BFF12-150-3W	12	150	3.3	7.2
BFF12-200-3W	12	200	4.4	9.6
BFF12-300-3W	12	300	6.64	14.45
BFM12-100-3W	12	100	2.2	4.8
BFM12-150-3W	12	150	3.2	7.2
BFM12-200-3W	12	200	4.4	9.6
BFM12-300-3W	12	300	6.64	14.45
BAM11/√3-200-1W	11/√3	200	15.78	31.5
BAM11/√3--334-1W	11/√3	334	26.36	52.6
BAM12/√3-200-1W	12/√3	200	13.3	28.9
BAM12/√3-334-1W	12/√3	334	22.1	48.2
BAM12-200-1W	12	200	4.4	16.7
BAM12-334-1W	12	334	7.39	27.8
BAM10.5-200-1W	10.5	200	5.8	19.0
BAM10.5-334-1W	10.5	334	9.65	31.8

注：其他特殊规格型号产品根据用户要求供货Note：Other special specification models supply according to user requirements

订货须知 Ordering Information

- 电容器额定电压的选择一定要根据网路电压，考虑电容器投入会抬高电压，因此在选择电容器额定电压时至少比网路电压高5%；当电容器回路中串有电抗器时，电容器的端子电压地随所串电抗器的电抗率而相应提高，因此在选择电容器额定电压时应根据所串电抗器的电抗率经计算后确定。
- 电容器是谐波的低阻抗通道，在谐波下大量的谐波会注入电容器使电容器过电流或过电压，另外，电容器还会使谐波放大，到期发生谐振，危及电网安全并使电容器寿命大缩短，因此，在谐波大的电容器一定要在抑制谐波的电抗器下使用。
- 电容器合闸时的涌流可高达电容器额定电流的数百倍，所以，投切电容器的开关应选择无重击穿的开关，为抑制合闸涌流也可串接抑制涌流的电抗器。
- 内部装有放电电阻的电容器与电源断开后，能在10分钟内由额定电压峰值降至75V以下，若要求在断开电源后5分钟内由额定电压峰值降至50V以下，则应在订货时加以说明。
- 用于线路补偿的电容器，一处安装以150~200kvar为宜，并且注意电容器不要和变压器同台安装，不得使用同一组跌落，以防止线路非全相运行时有可能发生铁磁谐振引起的过电流过电压而损坏电容器和变压器。
- 选用保护操作过电压的氧化锌避雷器应选用电容器专用的氧化锌避雷器，且最好装在电容器极间。
- 速断选用电容器专用 的熔断器，额定电流应按电容器额定电流的1.42~1.5倍选取为宜。
- 当电容器直接于高压电动机并接时，为防止电动机从电源断开时发生自激，引起电容器端子的电压升高大于额定值，必须使电容器的额定电流小于电动机的空载电流的90%；当电动机采用Y/△接线时，不允许将电容器直接并接在电动机上，应采取特殊的接线方式。
- 当电容器使用在海拔高于1000米或电容器使用在湿热带时，订货时应回以说明。
- 特种规格或对电容器有特殊要求时，订货时应加以说明。

- Power capacitor rated voltage choosing should consider net circuit voltage ,and consider power capacitor input can increase the voltage ,so choose the rated capacitor voltage less than 5% of net circuit voltage ;when power capacitor circuit have strand reactor ,capacitor terminal voltage will increase according to relative reactor radio .so when you choose the power capacitor rated voltage you should calculate the reactor ratio .
- Power capacitor is channel which harmonic is low resister .when the harmonic enter the power capacitor ,it make power capacitor to over current and over voltage. In addition power capacitor will make harmonic enlarge then will happen resonance ,it will effect electric net safe and it will shorten the power capacitor life ,so there is big harmonic condition, power capacitor will connect with reactor to use together
- When power capacitor cut off ,the surge current is hundred times of rated current .so choose power capacitor switch ,you should choose no puncture switch .it can restraint cut surge ,and connect reactor which has restraint .
- When the capacitor which has discharge resister inside cut off the power ,it can reduce the rated voltage from peak to below75V within 10 minute .if you need cut off the power the rated voltage from peak to below 50V, please notice it in the order
- The capacitor was used in circuit compensate ,150-200kvar is suitable in any place ,please notice the power capacitor and transformer would not mix install .it not permit use the same line fuse cut out avoiding no full phase wok which it make magnetic resonance to create over voltage and over current to damage the power capacitor and transformer
- Choosing protect operate over voltage surge arrester: power capacitor special surge arrester ,and it should put the centre of the power capacitor pole
- Choosing power capacitor special fuse cut out ,rated current is 1.42~1.5 time rated current which is better
- When power capacitor was connect with high voltage electromotor ,leading up the capacitor terminal voltage is high than rated voltage in order to protect the electromotor self exciting after cut off the power .so capacitor rated current is less than neuter current 90% of electromotor ,when the electromotor take Y/△ connection way ,it is not permit which put the capacitor on the electromotor directly ,you should take special connection way
- When the power capacitor was use in more altitude 1000 or capacitor using in wet and hot place ,you should notice when you order it
- Special type or special requirement capacitor ,you should notice when you order it

XIKAI®

ZMZ-B
系列被控集成电力电容器
series integration power capacitor

型号及其含义 Code and implication

ZMZ -□ □ □ / □-□-□

- B-被控式 was accused of type
- 额定容量(kvar) rated capacity (kvar)
- 额定电压(V) rated voltgae (V)
- 要求分类 Demanding classify
  - 空，普通型 empty: normally
  - 1-9，A-Z，特殊要求类 1-9 A-Z special demanding
- 补偿方式 Compensate way
  - S-三相补偿 S-Three-phase compensation
  - F-分相补偿 F-Split-phase compensation
- 产品分类 Products classify
  - D-单台 D-Single
- 企业代号 Company code

表1 Table1

补偿方式 Compensation mode	型号规格 Model Specification	容量 Capacity(kvar)	电压 Voltage(V)	高度H (mm)
三相补偿 Three-phase compensation	ZMZ-DS/450-5-B	5	450	240
	ZMZ-DS/450-10-B	10	450	240
	ZMZ-DS/450-15-B	15	450	290
	ZMZ-DS/450-20-B	20	450	290
	ZMZ-DS/450-25-B	25	450	340
	ZMZ-DS/450-30-B	30	450	340
分相补偿 Split-phase compensation	ZMZ-DF/280-5-B	5	250	240
	ZMZ-DF/280-10-B	10	250	290
	ZMZ-DF/280-15-B	15	250	340
	ZMZ-DF/280-20-B	20	250	390

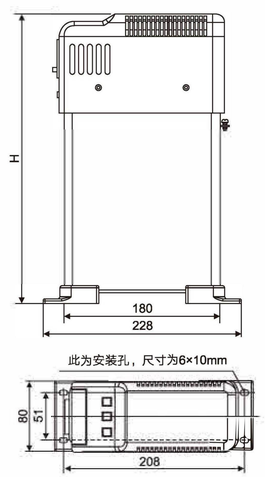
适用范围 Application

ZMZ-B系列被控智能集成电力电容器是0.4kV低压配电网高效节能、降低线损、提高功率因数和电能质量的新一代无功补偿设备。它由智能测控单元、过零投切开关电路、保护单元、1台(△型)或1台(Y型)低压电力电容器构成。替代常规由智能控制器、熔丝、复合开关或机械式接触器、热继电器、低压电力电容器、指示灯等散件在柜内和柜面由导线连接而组成的自动无功补偿装置。改变了传统无功补偿装置体积庞大和笨重的结构模式，从而使新一代低压无功补偿设备具有补偿效果更好，体积更小，功耗更低，价格更廉，节约成本更多，使用更加灵活，维护更加方便，使用寿命更长，可靠性更高的特点，适应了现代智能电网对无功补偿的更高要求。

ZMZ-B series intellect integration power capacitor is new reactive compensation equipment which is 0.4 kv low voltage distribution electric net, high save power, reduce wire loss, improve power factor and power quality .it make up by intellect testing unit over zero input switch circuit and protect unit, 1 pcs (△) or 1 pcs(Y) low voltage capacitor. this capacitor replace for low voltage power capacitor which is make up by intellect controller fuse and combine switch or contactor, thermal relay .low voltage power capacitor indicate lighting and other component of bank which connetc one conductor make up to auto reactive compensate equipment . It change tradition reactive compensate big volume and very strong instruction mode. So new power capacitor has good compensate function, low volume, low power loss, good price, save cost, and using convenient, maintain is easy and long life, reliability is best, it suitable modern intellect electric net reactive compensate demanding.

安装及外形尺寸图
Installation & Dimension Chart

高度尺寸H见表1 Product size H in Table 1



XIKAI®

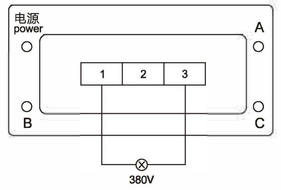
ZMZ-B
系列被控集成电力电容器
series integration power capacitor

接线端子排列与定义 Terminal block aline and definition

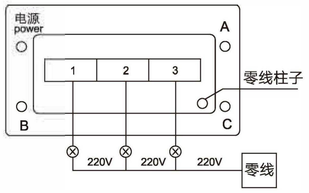
产品的接线端子分电源端子和测控联机端子，三相补偿电源端子有“UA, UB, UC”，分相补偿电源端子有：“UA, UB, UC, UN”测控联机端子使用插拔件，便于现场调试和调换。

Terminal block will devide power terminal and testing machine terminal, three phase compensate power terminal have UA, UB, UC, sub phase compensate power terminal have "UA, UB, UC, UN, testing machine terminal was used in insert and pull component ,so it is easy to test and replace .

三相补偿接线示意图
Three phase common compensate connect diagram



分相补偿接线示意图
Split-phase compensate connect diagram



工作条件 Working conditions

- 使用条件：海拔2000米以下，环境温度-25℃+50℃；相对湿度20℃，≤90%。
- 额定电压：250VAC、50Hz。
- 额定容量：共补5-30kvar，分补5-30kvar。
- 电容允差：-5+10%。
- 最高允许过压：110%额定电压。

- Condition: altitude 2000 m, temperature -25℃+50℃; Relative humidity 20℃,≤90%
- Rated voltage: 250VAC、50Hz
- Rated capacity: share compensate: 5-30kvar sub compensate: 5-30kvar
- Capacity tolerance : -5+10%
- Most permit over voltage: 110% rated voltage

产品应用电气连接及接线示意 Connection products and diagram

产品的配线要求

产品与电源端的连接导线规格：一般情况，单台总容量为30kvar以上的共补和总容量为30kvar分补电容器，应采用标准16mm²截面积的多芯铜导线，其余规格的产品采用标准10mm²截面积的多芯铜导线。

产品与产品间的信号线连接导线规格：RS-485网线、指示灯线，一般采用截面积为0.75mm²左右的多芯铜导线。

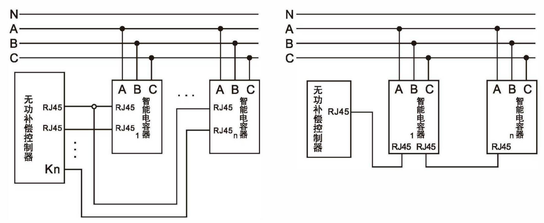
各台之间RS-485通信线并接。

Products match the wire demanding

Products match power terminal connection conductor specification: normally ,each pc total capacity is more than 30kvar of common compensate and total capacity is more than 30kvar sub compensate power capacitor ,it should take standard 16mm² more core copper conductor wire ,other specification capacitor should take 10mm² more core copper conductor wire

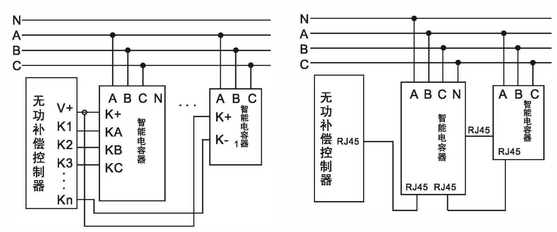
Between product's signal connection conductor type : RS 485 communication wire ,indicate light wire, Should choose suitable copper conductor wire ,normally take 0.75mm² RS485 connect each products.

三相共补带信号指示灯接线图
Three phase common compensate with signal indicate lighting diagram



直流控制接线图　　通讯控制接线图

混合补偿带信号指示灯接线图
Mix compensate with signal indicate lighting diagram



直流控制接线图　　通讯控制接线图

ZMZ-C
系列智能集成电力电容器
series intellect integration power capacitor

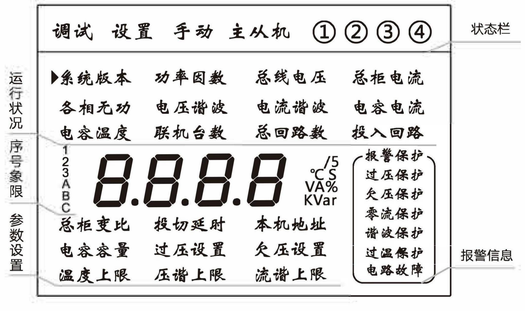
型号及其含义 Code and implication

ZMZ - □ □ □ (□ + □) □

- 特殊规格代码(常规型号无标识，特殊代码:A~Z 或 00~99)
  Special Specification Code (conventional models unmarked, special code: A ~ Z or 00 to 99)
- 第二台的容量(kVar) Second power capacitor capacity(kvar)
- 第一台的容量(kVar) First power capacitor capacity(kvar)
- 耐受电压(kV) Withstand voltage
  - 0.45:三相补偿或混合补偿 Three-phase or mixed compensation
  - 0.25:单相补偿 Single-phase compensation
- 补偿方式 Compensate way
  - S: 三相补偿 S:Three-phase compensation
  - F:分相补偿 F: Split-phasecompensation
  - H:混合补偿 H:Mixed compensation
- 设计序号 (A:第一代；B:第二代；C:第三代；后续以此类推)
  Design No. (A: the first generation; B: The second generation; C: The third generation; follow and so on)
- 企业代号(指明智能集成电力电容器) Company code

主界面显示内容 Interface display

开启电源，系统初始化及网络自动组建，进入运行界面；
Turn on the power, the system initialization and set up a network automatically, entering the operational interface;



功能特性

智能测控系统

电流、电压的采集，采用Corex-M4内核的32位嵌入式平台的MCU开发而成，快速实时采样，实现三相电流、三相电压、三相有功、无功、视在功率等电网参数的高精度测量、运算及谐波分析。

人机对话系统

显示屏采用段码液晶屏，中文界面，实时显示当前电容器温度，电流电压及谐波参数，通过按键查询各种参数及设备运行状态，还可设置过电压、欠电压、欠电流、过温度、过、欠补偿等各行参数并存储，掉电数据不丢失；

智能组网系统

485通讯接口，内置 MODBUS-RTU协议；可实现远程监控。产品多台联机使用时，自动产生主机，其余为从机，构成无功 自动控制系统；个别从机出现故障时自动退出，不影响其他机器工作。主机故障时自动退出，网络内再自动产生新的主机，组成新的系统工作，智能化程度极高。

智能投切系统

真正的零投切，无需晶闸管辅助电路，本系统采用CPU处理过零信号后的投切动作，实现过零投切、无涌流、无电弧、响应快，提高了设备的可靠性和使用寿命。

电力电容器

匹配高性能电力电容器，散热好、体积小、寿命长，从而 保证了整机的安全性和可靠性。

Intelligent measuring and control system

The sampling system of current and voltage adopts 32-bit built-in MCU made by Corex-M4, able to collect the signals quickly, it can realize the high accuracy of measuring three-phase current, voltages, active power, reactive power, transparent power and etc system parameters, calculating and analysis of harmonic waves

Human and machine exchange system

Displaying monitor adopts LCD panel, Chinese menu, display the inner temperature, current, voltage and harmonic parameters at real time, push keys to seek the parameters and running status, also able to set over-voltage, under-voltage, under-current, over-temperature, over/under compensation data, can be saved in case of power failure.

Intelligent connecting with system

Rs485 comm port, built-in MODBUS-RTU protocol, able to realize remotely monitoring and controlling. When several products are connected with system in parallel, they will automatically produce one master machine, the others become the slave machines, forming a reactive power compensation system; if one of machine is out of service it does not influence on others operating, if the master machine exit the working, the system will auto produce a new master machine, highly intelligent operation.

Intelligent switching system

Really switching through zero current, auxiliary transistor circuit is not needed, this system adopts the independent CPU to control the switching operation at passing zero, switching at zero, no surging current, no arcing, fast response, improve the reliability and service life of the equipment.

Power capacitors

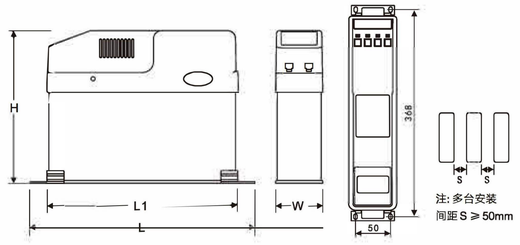
Cooperated with high performance power capacitors, good radiation, small size, long service life, consequently it can ensure the complete-set equipment with high safety and reliability

ZMZ-C
系列智能集成电力电容器
series intellect integration power capacitor

主要技术参数 Technical parameters

电源参数 Power Parameters	额定电压 Rated voltage	AC 400V(偏差≤±10%，正弦波且总畸变＜5%) AC 400V (deviation ≤±10%, distortion sine wave <5%)		
	额定电流 Rated current	AC 0~5A(电流谐波＜10%, 电流输入阻抗≤0.02 Ω) AC 0~5A (current harmonics <10%, Current input impedance ≤0.02 Ω)		
	工作频率 Frequency	50Hz	待机功耗 Power consumption	＜0.5W
测量精度 Measurement accuracy	电压 Voltage	≤ 0.5%	电流 Current	≤ 0.5%
	功率 Power	≤ 0.5%	功率因数 Power Factor	± 0.01%
	时间 Time	≤ 100ms	温度 Temperature	±1℃
网络 Network	组网数量 Networking Number	≤ 128 回路	初始化组网时间 Networking initialization time	≤ 10s
环境 Environment	环境温度 Temperature	-30~+ 60℃		
	相对湿度 Relative humidity	90 % RH(20°C时，无凝露) 90% RH (when 20°C non-condensing)		
投切间隔时间 Switching interval		单台 ≥ 20s(多台组网使用时有所增加) Single ≥20s (increased when more than one network use)		
电容器单台最大容量 Capacitors single maximum capacity		三相补偿(30+30) kVar； 单相补偿 30kVar Three-phase compensation (30 + 30kVar; single-phase compensation 30kVar		
电容器衰减率 Capacitors decay rate		≤0.5%/年		
电容器失效率 Capacitor failure rate		≤5%/年(运行60000h)		
允许投切次数 Allows switching frequency		≥100万次		
通讯接口 Communication Interface		RS 485, CAN		

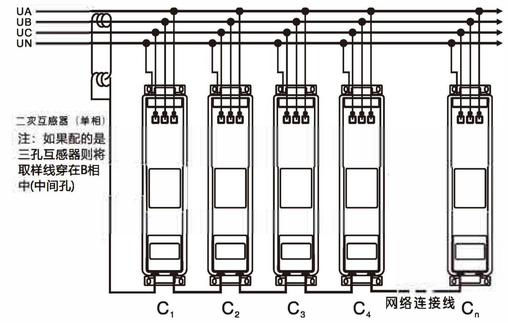
外形及安装尺寸 Outline & installation sizes



补偿方式 Compensation mode	型号规格 Model Specification	外形尺寸(mm) Dimensions L	L1	W	H
三相补偿(单组) Three-phase compensation (Single)	ZMZ-CS0.45(5)	383	350	85	230
	ZMZ-CS0.45(10)	383	350	85	230
	ZMZ-CS0.45(15)	383	350	85	230
	ZMZ-CS0.45(20)	383	350	85	230
	ZMZ-CS0.45(25)	383	350	85	290
	ZMZ-CS0.45(30)	383	350	85	290
三相补偿(双组) Three-phase compensation (Dual)	ZMZ-CS0.45(5+5)	383	350	85	230
	ZMZ-CS0.45(10+5)	383	350	85	230
	ZMZ-CS0.45(10+10)	383	350	85	230
	ZMZ-CS0.45(15+10)	383	350	85	290
	ZMZ-CS0.45(15+15)	383	350	85	290
	ZMZ-CS0.45(20+15)	383	350	85	290
	ZMZ-CS0.45(20+20)	383	350	85	290
单相分补 Single-phase compensation	ZMZ-DF0.25(10)	383	350	85	230
	ZMZ-DF0.25(15)	383	350	85	290
	ZMZ-DF0.25(20)	383	350	85	290
	ZMZ-DF0.25(30)	383	350	85	330
混合补偿 Mixed compensation	ZMZ-CH/450/5+250/5	383	350	85	230
	ZMZ-CH/450/10+250/5	383	350	85	230
	ZMZ-CH/450/10+250/10	383	350	85	290
	ZMZ-CH/450/15+250/15	383	350	85	290

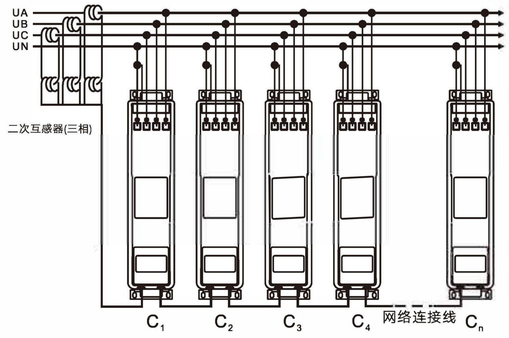
接线图 Wiring Diagram

三相补偿接线图 Wiring diagram of three-phase compensated



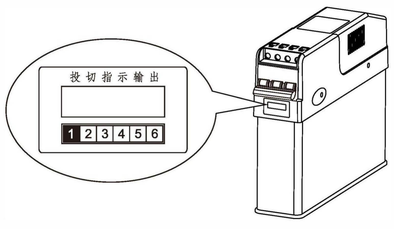
三相共补接线图

分相补偿与混合补偿接线图 Wiring diagram of respective compensation and mixed model



分相补偿接线图

外接投切指示接线图 External switching instructions wiring diagram



投切状态输出指示接线示意图

分相补偿接线图　三相共补接线图　分相三相混合补偿接线图

注：指示灯线采用0.75mm²截面积的多芯铜导线连接。

ZMZ-J
系列智能集成抗谐波电力电容器（经济型）
series intelligent integrated low-voltage fiitering power capacitor

产品概述 Products overview

产品特点与应用：

ZMZ-J型智能集成抗谐波电容器(下称产品)是针对电网络谐波含量一定，普通电力电容器不能正常运行的情况下而设计，主要特点如下：

- 主要高品质型低压电容器，无油化设计，安全性高；
- 采用无涌流投切开关，技术先进，性能稳定可靠；
- 采用特殊的技术与工艺，能有效的抑制高次谐波和涌流，抑制3、5、7、9次以上谐波效果明显；
- 模块化结构，组合灵活，扩容方便，安装简单，便于维护；
- 智能网络，485通讯接口，可以接入后计算机，进行配电综合管理；
- 采用分散控制模式，20万次无故障投切，高可靠性；
- 人性化的人机界面，操作简单，维护方便，利于现场故障查找；
- 内加SH 防爆器及温控装置，提高严重谐波场所下运行可靠性；
- 节能效果显著，有效提高功率因数，降低电能功耗，改善电能质量。

ZMZ-J型智能集成抗谐波电容器主要应用在谐波电流为40%以下的场所(如变频器等设备)，既能满足无功补偿，改善功率因数，又能消除高次谐波对系统的影响，提高用电质量。

ZMZ-J type intelligent integrated low-voltage filtering capacitor (hereinafter referred to as product) is designed for situations where the power grids have certain harmonic content, but the common type power capacitor is failed to run normally, its main characteristics as follows:

- High quality type low-voltage capacitor, oil-free design, high safety;
- Adoption of no-surge switching switch, with advanced technology, stable and reliable performances;
- Adoption of special technology and process, effectively suppress high-order harmonic and surge, has obvious efficiency in suppressing harmonic of order 3, 5, 7, 9 and above;
- Modular structure, flexible combination, convenient capacity expansion, simple installation, convenient for maintenance;
- Intelligent network, 485 communication interface, can switch in backstage computer, to carry out integrated management of distribution;
- Adoption of decentralized control mode, 200,000 times of fault-free switching, with high reliability;
- Humanized human-machine interface, simple operation, convenient maintenance, it is convenient for fault shooting on site;
- It is equipped with SH explosion-proof device and temperature control device inside, which improves the running reliability in severe harmonic locations;
- Outstanding energy-saving efficiency, it effectively increases the power factor, reduces electric power consumption and improves the electric energy quality.

ZMZ-J type intelligent integrated low-voltage filtering capacitor is mainly applied to locations where the harmonic current is 40% below (such as frequency converter, and other equipment), it not only meets the requirements of reactive compensation and improving power factor, but also eliminates influence of high -order harmonic to the system, improves the electricity quality.

技术参数 Technical parameters

- 环境条件
  环境温度：-25～55℃；
  相对温度：40℃，20～90%；
  海拔高度：≤2000m(特殊情况订货时说明)。
- 电源条件
  额定电压：-220V/～380V；
  电压偏差：±20%；
  电压波形：正弦波，总畸变率不大于7%；
  额定频率：50Hz±5%；
  功率消耗：＜2W。
- 电气安全
  电气间隙与爬电距离、绝缘强度、安全防护、短路强度、采样与控制电路　防护均符合中华人民共和国电力行业DL/T842-2003《低压并联电容器装　置使用技术条件》中对应条款要求。
- 测量误差
  电压：≤0.5%(在80～120%额定电压范围内)；
  电流：≤1%(在5%～20%额定电流范围内)，
  　　≤1%(在5%～20%额定电流范围内)；
  功率因数：±1.5%；
  温度：±1℃。
- 保护误差
  电压：≤0.5%；
  电流：≤1%；
  温度：±1℃。
  时间：±0.01s。
- 无功补偿参数
  电容器投切时隔：＞10s(1s~10s定制)；
  无功容量：共补≤40kvar，分补≤20kvar；
  联机路数：≤120路。
- 可靠性能参数
  控制准确率：100%；
  投切允许次数：100万次；
  电容器容量运行时间衰减率：≤1%/年；
  电容器容量投切衰减率：≤0.1%/万次；
  年故障率：≤1%；

- Ambient conditions
  Ambient temperature: -25～55℃;
  Relative temperature: 40℃, 20～90%;
  Altitude: ≤2000m (give clear indications when placing an order if there is any special situation).
- Power supply conditions
  Rated voltage: -220V/～380V;
  Voltage deviation: ±20%;
  Voltage waveform: sine wave, total distortion rate not exceed 7%;
  Rated frequency: 50Hz±5%;
  Power consumption: ＜2W.
- Electrical safety
  Electrical clearance, creepage distance, insulation strength, safety protection, short-circuit strength, sampling and control circuit protection should all be in conformity with the corresponding clauses of standard DL/T842-2003 Ordering specification for low-voltage shunt capacitor installation.
- Measurement error
  Voltage: ≤0.5% (within 80～120% of rated voltage);
  Current: ≤1% (within 5%～20% of rated current),
  Power factor: ±1.5%;
  Temperature: ±1℃.
- Protection error
  Voltage: ≤0.5%;
  Current: ≤1%;
  Temperature: ±1℃.
  Time: ±0.01s.
- Reactive compensation parameters
  Switching interval of capacitor: ＞10s
  (1s~10s customized);
  Reactive capacity: common compensation≤40kvar, separate compensation≤20kvar;
  Online quantity: ≤120pcs.
- Reliability
  Control accuracy: 100%;
  Permissible switching times: 200,000 times;
  Attenuation rate of running time of capacitor capacity: ≤1%/year;
  Attenuation rate of switching of capacitor capacity: ≤0.1%/ten thousand times;
  Annual fault rate: ≤1%.

XIKAI®

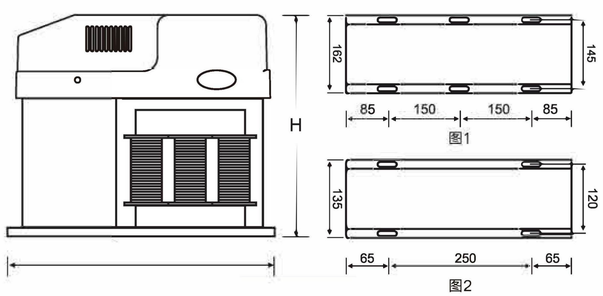
ZMZ-J
系列智能集成抗谐波电力电容器（经济型）
series intelligent integrated low-voltage fiitering power capacitor

产品功能 Product function

- 滤波功能
  有效的抑制高次谐波和涌流，对高次谐波形成低阻通路。对谐波具有吸收泄放作用，能消除高次谐波对电容器的影响，保护电路及电容器过载，防止电容器过热、绝缘介质的老化。自愈性能下降，使用寿命降低。
- 无涌流投切功能
  与专用电容投切开关配合，无投切涌流。
- 分相补偿功能
  分相补偿型产品，各相电容可以分别投切，提高无功补偿精度，使三相无功不平衡得到良好补偿。
- 测量功能
  配电电压、电流、无功功率、功率因数测量；CT相位与变化自动测量、校正各台电容器三相电流、体内温度测量。
- 保护功能
  回路电流速切、过流保护；电容器过压、欠压保护；电容器过温、断相、三相不平衡保护，当电容器温度超过65℃，电容器整机退运保护，提高使用寿命，确保系统安全运行。
- 信号功能
  电容器投切状态、过欠补状态、过欠压状态信号；保护动作类型、自诊断故障类型信号。
- 通信功能
  电容器和控制器之间采用RS-485通信联结，便于大量采样数据上传及与外设监控终端进行信息交换，构成系统工作。
- 联机功能
  具有有线网络通信和无线网络通信功能。
- 智能网络控制
  可自动检测及跟踪系统无功的变化，自动投发电容器组。容量相同的电容器按循环投切原则，容量不同的电容器按适补原则投切。电容器先投先退、先退先投；电容器运行温度低的先投，运行温度高的先退；补偿情况恒定时，电容器每十五分钟循环投切，避免单只电容器长时间投运。
- 故障自诊断功能
  电容器智能控制元件能对本体各项运行参数进行自诊断，一旦出现自检故障，整机快速响应，退出运行。

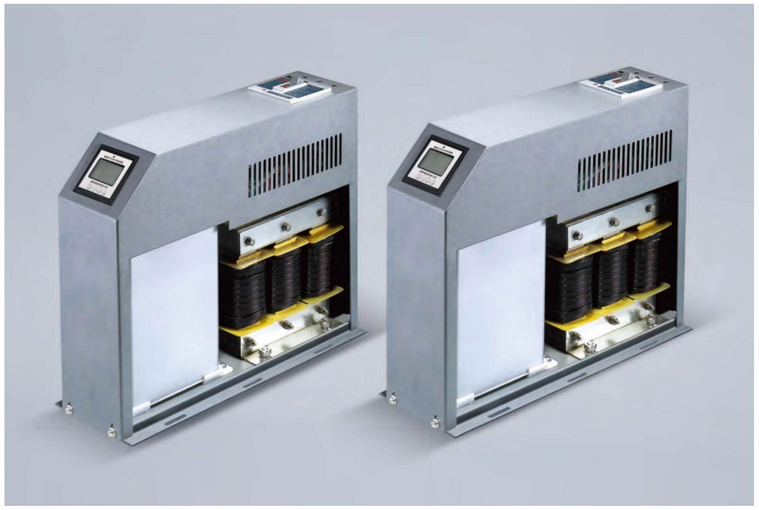
- Filtering
  It effectively suppresses high-order harmonic and surge, forms low-resistance channel for high-order harmonic. It absorbs and releases the harmonic, eliminates influence of high-order harmonic to the capacitor, protects circuits and capacitors from overload, prevents capacitors from superheating, insulating medium from aging, avoids reduction of self healing performance, or reduction of service life.
- No-surge switching
  Matched with special capacitor switching switch, no switching surge.
- Separate-phase compensation
  Capacitor of each phase of separate-phase compensation type product can be switched separately, which improves the reactive compensating accuracy, enables the three-phase reactive unbalance to be well compensated.
- Measurement
  Measurement of distribution voltage, current, reactive power, power factor; automatic measurement and correction of CT phase and change; measurement of three-phase current and inside temperature of each capacitor.
- Protection
  Quick current switching and over-current protection of circuit; over-voltage and under-voltage protection of capacitor; over-temperature, open-phase and three-phase unbalance protection of capacitor, when the temperature of capacitor exceed 65℃, the whole machine of capacitor would exit operation, which improves its service life, and guarantees safety running of system.
- Signal
  Switching state, over, under and compensation state, over and under-voltage state signals; protection operation type and self-diagnose fault type signals.
- Communication
  Adoption of RS-485 communication coupling between capacitor and controller, which is convenient for uploading of mass of sampling data as well as information exchanging with external monitor terminal, forms system work.
- Online
  Functions of wire network communication and radio network communication.
- Intelligent network control
  It is able to detect and track the reactive variation of system automatically, and switch in capacitor bank automatically. Carry out switching circularly for capacitors with same capacitance, and carry out switching according to the vacancy for capacitors with different capacitance. The capacitor that is switched in earlier should exit first, that exits earlier should be switched in first; capacitor whose running temperature is lower should be switched in first, whose running temperature is higher should exit first; when the compensation situation is stable, the capacitors should be switched in circularly every fifteen minutes, avoid long time running of any one capacitor.
- Self-diagnose of faults
  Intelligent control element of capacitor will carry out self-diagnose to the running parameters of the body, once there is self-inspection fault, the whole machine responses quickly and exit running.

外形及安装尺寸
Outline and mounting sizes



型号规格		外形尺寸（深×宽×高）
共补	5kVar	380×135×310
	10kVar	
	15kVar	
	20kVar	470×162×410
	25kVar	
	30kVar	
	35kVar	
	40kVar	
分补	5kVar	380×135×310
	15kVar	
	20kVar	470×162×410
	30kVar	

ZMZ-X
系列智能集成抗谐波电力电容器
series intelligent integrated low-voltage filtering power capacitor



技术参数 Technical parameters

- 环境条件
  环境温度：-25～55℃；
  相对温度：40℃，20～90%；
  海拔高度：≤2000m(特殊情况订货时说明)。
- 电源条件
  额定电压：-220V/～380V；
  电压偏差：±20%；
  电压波形：正弦波，总畸变率不大于7%；
  额定频率：50H z±5%；
  功率消耗：＜2W。
- 电气安全
  电气间隙与爬电距离、绝缘强度、安全防护、短路强度、采样与控制电路　防护均符合中华人民共和国电力行业DL/T842-2003《低压并联电容器装　置使用技术条件》中对应条款要求。
- 测量误差
  电压：≤0.5%(在80～120%额定电压范围内)；
  电流：≤1%(在5%～20%额定电流范围内)，
  　　≤1%(在5%～20%额定电流范围内)；
  功率因数：±1.5%；
  温度：±1℃。
- 保护误差
  电压：≤0.5%；
  电流：≤1%；
  温度：±1℃。
  时间：±0.01s。
- 无功补偿参数
  电容器投切时隔：＞10s(1s~10s定制)；
  无功容量：共补≤40kvar，分补≤20kvar；
  联机路数：≤120路。
- 可靠性能参数
  控制准确率：100%；
  投切允许次数：100万次；
  电容器容量运行时间衰减率：≤1%/年；
  电容器容量投切衰减率：≤0.1%/万次；
  年故障率：≤1%；

- Ambient conditions
  Ambient temperature: -25～55℃;
  Relative temperature: 40℃, 20～90%;
  Altitude: ≤2000m (give clear indications when placing an order if there is any special situation).
- Power supply conditions
  Rated voltage: -220V/～380V;
  Voltage deviation: ±20%;
  Voltage waveform: sine wave, total distortion rate not exceed 7%;
  Rated frequency: 50Hz±5%;
  Power consumption: ＜2W.
- Electrical safety
  Electrical clearance, creepage distance, insulation strength, safety protection, short-circuit strength, sampling and control circuit protection should all be in conformity with the corresponding clauses of standard DL/T842-2003 Ordering specification for low-voltage shunt capacitor installation.
- Measurement error
  Voltage: ≤0.5% (within 80～120% of rated voltage);
  Current: ≤1% (within 5%～20% of rated current),
  Power factor: ±1.5%;
  Temperature: ±1℃.
- Protection error
  Voltage: ≤0.5%;
  Current: ≤1%;
  Temperature: ±1℃.
  Time: ±0.01s.
- Reactive compensation parameters
  Switching interval of capacitor: ＞10s
  (1s~10s customized);
  Reactive capacity: common compensation≤40kvar, separate compensation≤20kvar;
  Online quantity: ≤120pcs.
- Reliability
  Control accuracy: 100%;
  Permissible switching times: 200,000 times;
  Attenuation rate of running time of capacitor capacity: ≤1%/year;
  Attenuation rate of switching of capacitor capacity: ≤0.1%/ten thousand times;
  Annual fault rate: ≤1%.

产品概述 Products overview

产品特点与应用：
　　ZMZ-X型智能集成抗谐波电容器(下称产品)是针对电网络谐波含量一定，普通电力电容器不能正常运行的情况下而设计，主要特点如下：

- 主要高品质型低压电容器，无油化设计，安全性高；
- 采用无涌流投切开关，技术先进，性能稳定可靠;
- 采用特殊的技术与工艺，能有效的抑制高次谐波和涌流，抑制3、5、7、9次以上谐波效果明显；
- 模块化结构，组合灵活，扩容方便，安装简单，便于维护；
- 智能网络，485通讯接口，可以接入后计算机，进行配电综合管理；
- 采用分散控制模式，20万次无故障投切，高可靠性；
- 人性化的人机界面，操作简单，维护方便，利于现场故障查找；
- 内加SH防爆器及温控装置，提高严重谐波场所下运行可靠性；
- 节能效果显著，有效提高功率因数，降低电能功耗，改善电能质量。

ZMZ-X型智能集成抗谐波电容器主要应用在谐波电流为40%以下的场所(如变频器等设备)，既能满足无功补偿，改善功率因数，又能消除高次谐波对系统的影响，提高用电质量。

ZMZ-X type intelligent integrated low-voltage filtering capacitor (hereinafter referred to as product) is designed for situations where the power grids have certain harmonic content, but the common type power capacitor is failed to run normally, its main characteristics as follows:

- High quality type low-voltage capacitor, oil-free design, high safety;
- Adoption of no-surge switching switch, with advanced technology, stable and reliable performances;
- Adoption of special technology and process, effectively suppress high-order harmonic and surge, has obvious efficiency in suppressing harmonic of order 3, 5, 7, 9 and above;
- Modular structure, flexible combination, convenient capacity expansion, simple installation, convenient for maintenance;
- Intelligent network, 485 communication interface, can switch in backstage computer, to carry out integrated management of distribution;
- Adoption of decentralized control mode, 200,000 times of fault-free switching, with high reliability;
- Humanized human-machine interface, simple operation, convenient maintenance, it is convenient for fault shooting on site;
- It is equipped with SH explosion-proof device and temperature control device inside, which improves the running reliability in severe harmonic locations;
- Outstanding energy-saving efficiency, it effectively increases the power factor, reduces electric power consumption and improves the electric energy quality.

ZMZ-X type intelligent integrated low-voltage filtering capacitor is mainly applied to locations where the harmonic current is 40% below (such as frequency converter, and other equipment), it not only meets the requirements of reactive compensation and improving power factor, but also eliminates influence of high -order harmonic to the system, improves the electricity quality.

XIKAI®

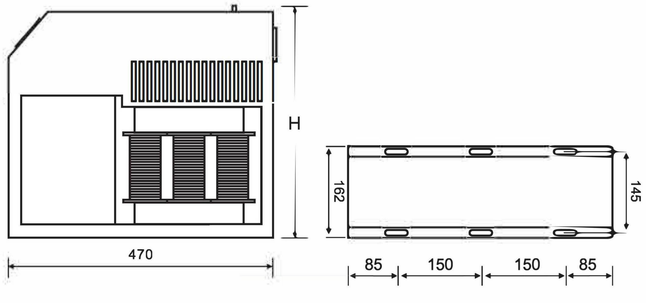
ZMZ-X
系列智能集成抗谐波电力电容器
series intelligent integrated low-voltage filtering power capacitor

产品功能 Product function

- 滤波功能
  有效的抑制高次谐波和涌流，对高次谐波形成低阻通路。对谐波具有吸收泄放作用，能消除高次谐波对电容器的影响，保护电路及电容器过载，防止电容器过热、绝缘介质的老化。自愈性能下降，使用寿命降低。
- 无涌流投切功能
  与专用电容投切开关配合，无投切涌流。
- 分相补偿功能
  分相补偿型产品，各相电容可以分别投切，提高无功补偿精度，使三相无功不平衡得到良好补偿。
- 测量功能
  配电电压、电流、无功功率、功率因数测量；CT相位与变化自动测量、校正各台电容器三相电流、体内温度测量。
- 保护功能
  回路电流速切、过流保护；电容器过压、欠压保护；电容器过温、断相、三相不平衡保护，当电容器温度超过65℃，电容器整机退运保护，提高使用寿命，确保系统安全运行。
- 信号功能
  电容器投切状态、过欠补状态、过欠压状态信号；保护动作类型、自诊断故障类型信号。
- 通信功能
  电容器和控制器之间采用RS-485通信联结，便于大量采样数据上传及与外设监控终端进行信息交换，构成系统工作。
- 联机功能
  具有有线网络通信和无线网络通信功能。
- 智能网络控制
  可自动检测及跟踪系统无功的变化，自动投发电容器组。容量相同的电容器按循环投切原则，容量不同的电容器按适补原则投切。电容器先投先退、先退先投；电容器运行温度低的先投，运行温度高的先退；补偿情况恒定时，电容器每十五分钟循环投切，避免单只电容器长时间投运。
- 故障自诊断功能
  电容器智能控制元件能对本体各项运行参数进行自诊断，一旦出现自检故障，整机快速响应，退出运行。

- Filtering
  It effectively suppresses high-order harmonic and surge, forms low-resistance channel for high-order harmonic. It absorbs and releases the harmonic, eliminates influence of high-order harmonic to the capacitor, protects circuits and capacitors from overload, prevents capacitors from superheating, insulating medium from aging, avoids reduction of self healing performance, or reduction of service life.
- No-surge switching
  Matched with special capacitor switching switch, no switching surge.
- Separate-phase compensation
  Capacitor of each phase of separate-phase compensation type product can be switched separately, which improves the reactive compensating accuracy, enables the three-phase reactive unbalance to be well compensated.
- Measurement
  Measurement of distribution voltage, current, reactive power, power factor; automatic measurement and correction of CT phase and change; measurement of three-phase current and inside temperature of each capacitor.
- Protection
  Quick current switching and over-current protection of circuit; over-voltage and under-voltage protection of capacitor; over-temperature, open-phase and three-phase unbalance protection of capacitor, when the temperature of capacitor exceed 65℃, the whole machine of capacitor would exit operation, which improves its service life, and guarantees safety running of system.
- Signal
  Switching state, over, under and compensation state, over and under-voltage state signals; protection operation type and self-diagnose fault type signals.
- Communication
  Adoption of RS-485 communication coupling between capacitor and controller, which is convenient for uploading of mass of sampling data as well as information exchanging with external monitor terminal, forms system work.
- Online
  Functions of wire network communication and radio network communication.
- Intelligent network control
  It is able to detect and track the reactive variation of system automatically, and switch in capacitor bank automatically. Carry out switching circularly for capacitors with same capacitance, and carry out switching according to the vacancy for capacitors with different capacitance. The capacitor that is switched in earlier should exit first, that exits earlier should be switched in first; capacitor whose running temperature is lower should be switched in first, whose running temperature is higher should exit first; when the compensation situation is stable, the capacitors should be switched in circularly every fifteen minutes, avoid long time running of any one capacitor.
- Self-diagnose of faults
  Intelligent control element of capacitor will carry out self-diagnose to the running parameters of the body, once there is self-inspection fault, the whole machine responses quickly and exit running.

外形及安装尺寸
Outline and mounting sizes



型号规格		外形尺寸（深×宽×高）
共补	10kVar	470×162×410
	15kVar	
	20kVar	
	25kVar	
	30kVar	
	35kVar	470×162×450
	40kVar	
分补	5kVar	470×162×410
	15kVar	
	20kVar	
	30kVar	470×162×450

ZMZ-XM
一体式智能电力电容器
Integrated intelligent power capacitor

型号及其含义 Code and implication

ZMZ-XM-0.45 - 10(△)x4 + 20(△)x4 + 20(Y)x2

- 额定容量分补20kvar,2路 Split-phase compensation 20kvar, 2 way
- 额定容量共补20kvar,2路 Common compensation 20kvar, 2 way
- 额定容量共补10kvar,4路 Common compensation 10kvar, 4 way
- 额定电压KV Rated voltage KV
- 智能低压无功补偿装置 Intelligent low voltage reactive power compensation device

产品型号、规格明细表 Product model, specification

最大总容量 Maximum total capacity	容量分配示例 Capacity allocation	最大回路数 Maximum loop	产品外形尺寸 Dimensions	安装尺寸 Installation size
180KVAR	20(△)×6+30(△)×2	8	490x270x470	310x242
180KVAR	20(△)×4+30(△)×2+20(Y)×2	8	490x270x470	310x242
180KVAR	20(△)×2+30(△)×2+20(Y)×4	8	490x270x470	310x242
120KVAR	10(△)×3+20(△)×3+10(Y)+20(Y)	8	490x270x470	310x242
120KVAR	10(△)+20(△)+30(△)×2+10(Y)+20(Y)	6	390x270x470	210x242
60KVAR	5(△)+10(△)×2+20(△)+5(Y)+10(Y)	6	390x270x470	210x242
60KVAR	10(△)+15(△)+20(△)+15(Y)	4	290x270x470	110x242

注：产品规格可以全共补或者共、分补混合，容量5-30KVAR都可以选择(30kvar最多两路)。
可以根据用户的容量需求,180KVAR 以内的容量任意组合。

Note: The product specifications can be fully supplemented or mixed, divided and supplemented, and the capacity can be selected from 5-30KVAR (30kvar up to two channels).
According to the user's capacity requirements, the capacity within 180KVAR can be combined arbitrarily.

产品概述 Products overview

ZMZ-XM系列一体化智能电力电容模组产品，是安装在低压配电系统无功补偿装置中的一款安全可靠、高效节能，其作用是降低变压器的变损、供电线路的线损，提高用电系统的功率因数及改善电网电能质量的新一代无功补偿设备的核心器件。也可以作为独立的自动控制功能的小型补偿设备。

该系列产品是由：测量与控制单元，电容器投切开关（即智能电子开关）及灭弧单元，综合保护单元（具有：系统谐波电压/电流越限、过压/欠压、小电流闭锁，补偿支路过流及不平衡，电容器内部过温度、过压力等数据信息的预警及保护功能），工作状态指示单元，低压并联电容器(最多8只电容)断路器，外壳及通讯端子等功能元器组件，经优化组合后构成的机电一体的高度智能化产品。

该产品的应用，改变了传统无功补偿装置体积庞大和笨重的结构模式及组装工艺，从而使新一代低压无功补偿装置具有：补偿效果更好、体积更小、功耗更低、使用更加灵活、组装及维护更加方便、运行可靠性更高、使用寿命更长等的特点，更加适应现代智能电网对无功补偿设备提出的新的要求。

This series of integrated intelligent power capacitors is a safe, reliable, high-efficiency and energy-saving installation installed in the reactive power compensation device. Its function is to reduce the transformer loss, the line loss of the power supply line, improve the power factor of the power system and improve the grid power The core component of a new generation of high-quality reactive power compensation equipment. It can also be used as a small compensation device with independent automatic control function.

The product is composed of: measurement and control unit, capacitor switching switch and arc extinguishing unit, comprehensive protection unit (with: system harmonic voltage/current limit, overvoltage/undervoltage, small current blocking, compensation for branch overcurrent and unbalance , Pre-warning and protection functions of data information such as over-temperature and over-pressure inside the capacitor), working status indicator unit, low-voltage parallel capacitor (up to 8 capacitors), circuit breaker, housing and communication terminals and other functional components, which are formed after optimized combination A highly intelligent product with integrated mechatronics.

The application of this product has changed the bulky and cumbersome structure and assembly process of the traditional reactive power compensation device, so that a new generation of low-voltage reactive power compensation device has: better compensation effect, smaller size, lower power consumption, and more use Flexibility, easier assembly and maintenance, higher operational reliability, longer service life, etc.

ZMZ-XM
一体式智能电力电容器
Integrated intelligent power capacitor

主要技术参数 Technical parameters

环境条件
- 环境温度：-25/B(-25～45℃)；
- 相对湿度：RH≤90%，(在40℃时)；
- 海拔高度：≤2000M；
- 周围环境：无化学腐蚀性气体、无导电尘埃、无易燃易爆的介质存在；
- 安装地点：无剧烈振动，无雨雪侵蚀；

电源条件
- 额定电压：～220V/～380V；
- 电压偏差：±20%；
- 电压波形：正弦波，总畸变率＜5%；
- 工频频率：47～53Hz；
- 功率消耗：＜0.5W
- 通讯接口：RS-485,MUDBUS通讯协议,9600bps(无校验位)

电气安全
- 电气间隙与爬电距离、绝缘强度、安全防护、短路强度、采样与控制电路防护均符合中华人民共和国电力行业标准DL/T842-2003《低压并联电容器装置使用技术条件》中对应条款要求。

使用范围
- 电压：(在80～120%额定电压范围内)；
- 电流：(在20%～120%额定电流范围内)；

无功补偿参数
- 电容器投切时隔：1-240s；
- 无功容量：每台最多6/8路最大30kvar；共补分补混合。

可靠性参数
- 控制准确率：100%；
- 投切允许次数：100万次；
- 电容器容量运行时间衰减率：≤1%/年；
- 电容器容量投切衰减率：≤0.1%/万次；
- 年故障率：≤0.1%。

Environmental conditions
- Ambient temperature: -25/B (-25~45°C);
- Relative humidity: RH≤90%, (at 40°C);
- Altitude: ≤2000M;
- Surrounding environment: no chemical corrosive gas, no conductive dust, no flammable and explosive media;
- Installation location: no severe vibration, no rain and snow erosion;

Power condition
- Rated voltage: ~220V/~380V;
- Voltage deviation: ±20%;
- Voltage waveform: sine wave, total distortion rate <5%;
- Power frequency: 47～53Hz;
- Power consumption: <0.5W
- Communication interface: RS-485, MUDBUS communication protocol, 9600bps (no parity bit)

Electrical Safety
- Electrical clearance and creepage distance, insulation strength, safety protection, short-circuit strength, sampling and control circuit protection are in line with the requirements of the corresponding clauses in the People's Republic of China
- Electric Power Industry Standard DL/T842-2003 "Technical Conditions for the Use of Low-Voltage Shunt Capacitor Installations".

Scope of use
- Voltage: (within 80～120% of rated voltage range);
- Current: (within the range of 20%~120% of rated current);

Reactive power compensation parameters
- Capacitor switching time interval: 1-240s;
- Reactive power capacity: up to 6/8 channels per unit, up to 30kvar; a total of supplementary points and mixing.

Reliability parameter
- Control accuracy: 100%;
- Allowed switching times: 1 million times;
- Attenuation rate of capacitor capacity running time: ≤1%/year;
- Capacitor capacity switching attenuation rate: ≤0.1%/10,000 times;
- Annual failure rate: ≤0.1%.

产品特点 Features

1. 监控单元
采用智能控制器及传感元器件，对用电系统及补偿支路和电容器内部的各种数据信息，进行采集、计算、分析、判断，并发出电容器投、切及各种保护预警、动作等的操作指令。

2. 温度采集单元
采用温度传感器件对电容器内部温度进行采集，为监控单元判断电容器的运行状态提供依据。

3. 电压采集单元
采用高精度电压互感器对系统电压数据进行采集，为监控单元进行功率、功率因数等参数的计算，过/欠电压保护提供依据。

4. 电流采集单元
采用高精度电流互感器对系统电流及电容器工作电流数据进行采集，为监控单元进行功率、功率因数等参数的计算，过电流/不平衡保护提供依据。

5. 投切开关
投切电容器时，专用的灭弧装置可降低拉弧的强度，以减小对开关的损伤，故机械寿命可达到数百万次投切的可靠性，延长了投切开关的使用寿命。

6. 断路器
采用微型断路器作为过电流总保护和电源进线接入端子。

7. 低压电力电容器
采用优质的聚丙烯基膜和独特的金属化材料及工艺，保证了电容器产品的高品质，满足了高可靠性的要求。并采用先进的过温度、过压力装置及二次保护技术，使之在运行过程中更加安全、可靠。其和传统的电容器相比，具有重量轻、体积小、耐温特性好的特点。

1. Monitoring unit
Using intelligent controllers and sensing components, collect and calculate various data information in the power system, compensation branches and capacitors, and issue operating instructions for capacitor switching and switching.

2. Temperature acquisition unit
The temperature sensor device is used to collect the internal temperature of the capacitor.

3. Voltage acquisition unit
The high-precision voltage transformer is used to collect system voltage data, which provides a basis for the monitoring unit to calculate power, power factor and other parameters, and provide a basis for over/under voltage protection.

4. Current acquisition unit
High-precision current transformers are used to collect system current and capacitor operating current data, to provide a basis for the monitoring unit to calculate power, power factor and other parameters, and to provide a basis for overcurrent/unbalance protection.

5. Switching switch
When switching capacitors, the arc extinguishing device can reduce the strength of the arc to reduce the damage to the switch, so the mechanical life can reach millions of switching times, which extends the life of the switching switch.

6. Circuit Breaker
The miniature circuit breaker is used as the over-current protection and the power inlet terminal.

7. Low voltage power capacitor
The use of polypropylene base film and metallized materials and processes ensures the high quality and high reliability requirements of capacitors. And adopt over-temperature, over-pressure device and secondary protection technology to make it safer and more reliable during operation.

XIKAI®

ZMZ
系列高分断智能集成电力电容器
Series high break intellcet integration power capacitor

型号及其含义 Code and implication

ZMZ - □ □ □ (□ + □) □

- 特殊规格代码(常规型号无标识，特殊代码:A~Z 或 00~99) Special Specification Code (conventional models unmarked, special code: A ~ Z or 00 to 99)
- 第二台的容量(kVar) Second power capacitor capacity(kvar)
- 第一台的容量(kVar) First power capacitor capacity(kvar)
- 耐受电压(kV) Withstand voltage
  - 0.45:三相补偿或混合补偿 Three-phase or mixed compensation
  - 0.25:单相补偿 Single-phase compensation
- 补偿方式 Compensate way
  - S: 三相补偿 S:Three-phase compensation
  - F:分相补偿 F:Split-phase compensation
  - H:混合补偿 H:Mixed compensation
- 设计序号 (A:第一代；B:第二代；C:第三代；后续以此类推) Design No. (A: the first generation; B: The second generation; C: The third generation; follow and so on)
- 企业代号(电力电容器) Company code

主界面显示内容 Interface display

开启电源，系统初始化及网络自动组建，进入运行界面；

Turn on the power, the system initialization and set up a network automatically, entering the operational interface;

功能特性

智能测控系统

电流、电压的采集，采用Corex-M4内核的32位嵌入式平台的MCU开发而成，快速实时采样，实现三相电流、三相电压、三相有功、无功、视在功率等电网参数的高精度测量、运算及谐波分析。

人机对话系统

显示屏采用段码液晶屏，中文界面，实时显示当前电容器温度，电流电压及谐波参数，通过按键查询各种参数及设备运行状态，还可设置过电压、欠电压、欠电流、过温度、过、欠补偿等各行参数并存储，掉电数据不丢失；

智能组网系统

485通讯接口，内置 MODBUS-RTU协议；可实现远程监控。产品多台联机使用时，自动产生主机，其余为从机，构成无功自动控制系统；个别从机出现故障时自动退出，不影响其他机器工作。主机故障时自动退出，网络内再自动产生新的主机，组成新的系统工作，智能化程度极高。

智能投切系统

真正的零投切，无需晶闸管辅助电路，本系统采用CPU处理过零信号后的投切动作，实现过零投切、无涌流、无电弧、响应快，提高了设备的可靠性和使用寿命。

电力电容器

匹配高性能电力电容器，散热好、体积小、寿命长，从而 保证了整机的安全性和可靠性。

Intelligent measuring and control system

The sampling system of current and voltage adopts 32-bit built-in MCU made by Corex-M4, able to collect the signals quickly, it can realize the high accuracy of measuring three-phase current, voltages, active power, reactive power, transparent power and etc system parameters, calculating and analysis of harmonic waves

Human and machine exchange system

Displaying monitor adopts LCD panel, Chinese menu, display the inner temperature, current, voltage and harmonic parameters at real time, push keys to seek the parameters and running status, also able to set over-voltage, under-voltage, under-current, over-temperature, over/under compensation data, can be saved in case of power failure.

Intelligent connecting with system

Rs485 comm port, built-in MODBUS-RTU protocol, able to realize remotely monitoring and controlling. When several products are connected with system in parallel, they will automatically produce one master machine, the others become the slave machines, forming a reactive power compensation system; if one of machine is out of service it does not influence on others operating, if the master machine exit the working, the system will auto produce a new master machine, highly intelligent operation.

Intelligent switching system

Really switching through zero current, auxiliary transistor circuit is not needed, this system adopts the independent CPU to control the switching operation at passing zero, switching at zero, no surging current, no arcing, fast response, improve the reliability and service life of the equipment.

Power capacitors

Cooperated with high performance power capacitors, good radiation, small size, long service life, consequently it can ensure the complete-set equipment with high safety and reliability

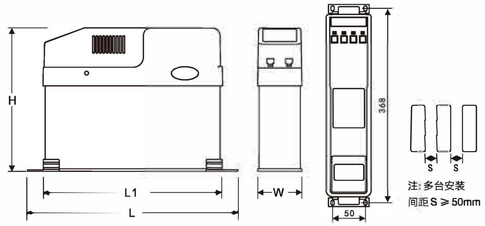
XIKAI®

ZMZ
系列高分断智能集成电力电容器
Series high break intellcet integration power capacitor

主要技术参数 Technical parameters

电源参数 Power Parameters	额定电压 Rated voltage	AC 400V(偏差≤±10%，正弦波且总畸变＜5%) AC 400V (deviation ≤±10%, distortion sine wave <5%)		
	额定电流 Rated current	AC 0~5A(电流谐波＜10%，电流输入阻抗≤0.02 Ω) AC 0~5A (current harmonics <10%, Current input impedance ≤0.02 Ω)		
	工作频率 Frequency	50Hz	待机功耗 Power consumption	＜0.5W
测量精度 Measurement accuracy	电压 Voltage	≤ 0.5%	电流 Current	≤ 0.5%
	功率 Power	≤ 0.5%	功率因数 Power Factor	± 0.01%
	时间 Time	≤ 100ms	温度 Temperature	±1℃
网络 Network	组网数量 Networking Number	≤ 128 回路	初始化组网时间 Networking initialization time	≤ 10s
环境 Environment	环境温度 Temperature	-30~+ 60℃		
	相对湿度 Relative humidity	90 % RH(20°C时，无凝露) 90% RH (when 20°C non-condensing)		
投切间隔时间 Switching interval		单台 ≥ 20s(多台组网使用时有所增加) Single ≥20s (increased when more than one network use)		
电容器单台最大容量 Capacitors single maximum capacity		三相补偿(30+30) kVar； 单相补偿 30kVar Three-phase compensation (30 + 30kVar; single-phase compensation 30kVar		
电容器衰减率 Capacitors decay rate		≤0.5%/年		
电容器失效率 Capacitor failure rate		≤5%/年(运行60000h)		
允许投切次数 Allows switching frequency		≥100万次		
通讯接口 Communication Interface		RS 485, CAN		

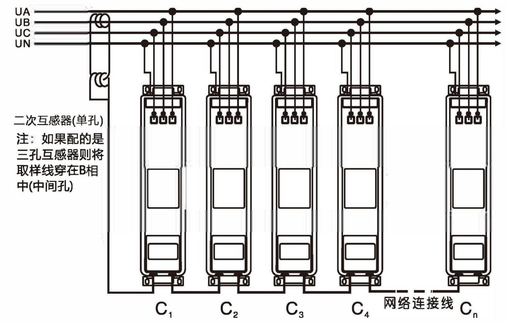
外形及安装尺寸 Outline & installation sizes



补偿方式 Compensation mode	型号规格 Model Specification	外形尺寸(mm) Dimensions L	L1	W	H
三相补偿(单组) Three-phase compensation (Single)	ZMZ-CS0.45(5)	383	350	85	230
	ZMZ-CS0.45(10)	383	350	85	230
	ZMZ-CS0.45(15)	383	350	85	230
	ZMZ-CS0.45(20)	383	350	85	230
	ZMZ-CS0.45(25)	383	350	85	290
	ZMZ-CS0.45(30)	383	350	85	290
三相补偿(双组) Three-phase compensation (Dual)	ZMZ-CS0.45(5+5)	383	350	85	230
	ZMZ-CS0.45(10+10)	383	350	85	230
	ZMZ-CS0.45(10+20)	383	350	85	230
	ZMZ-CS0.45(20+20)	383	350	85	290
	ZMZ-CS0.45(20+30)	405	375	105	375
	ZMZ-CS0.45(30+30)	405	375	105	375
	ZMZ-CS0.45(30+40)	405	375	105	500
单相分补 Single-phase compensation	ZMZ-DF0.25(10)	383	350	85	230
	ZMZ-DF0.25(15)	383	350	85	290
	ZMZ-DF0.25(20)	383	350	85	330
	ZMZ-DF0.25(30)	383	350	85	330
混合补偿 Mixed compensation	ZMZ-CH/450/5+250/5	383	350	85	230
	ZMZ-CH/450/10+250/5	383	350	85	230
	ZMZ-CH/450/10+250/10	383	350	85	290
	ZMZ-CH/450/15+250/15	383	350	85	290
	ZMZ-CH/450/20+250/20	383	350	85	290

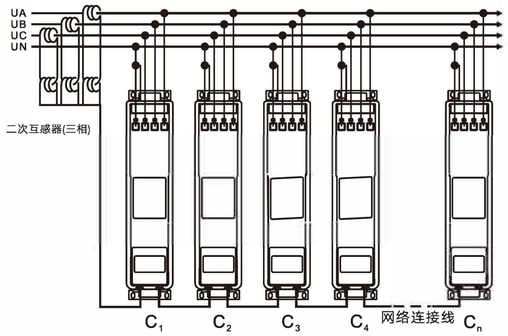
接线图 Wiring Diagram

三相补偿接线图 Wiring diagram of three-phase compensated



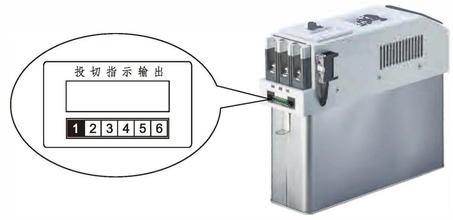
三相共补接线图

分相补偿与混合补偿接线图 Wiring diagram of respective compensation and mixed model

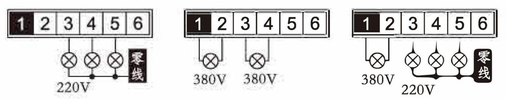


分相补偿接线图

外接投切指示接线图 External switching instructions wiring diagram



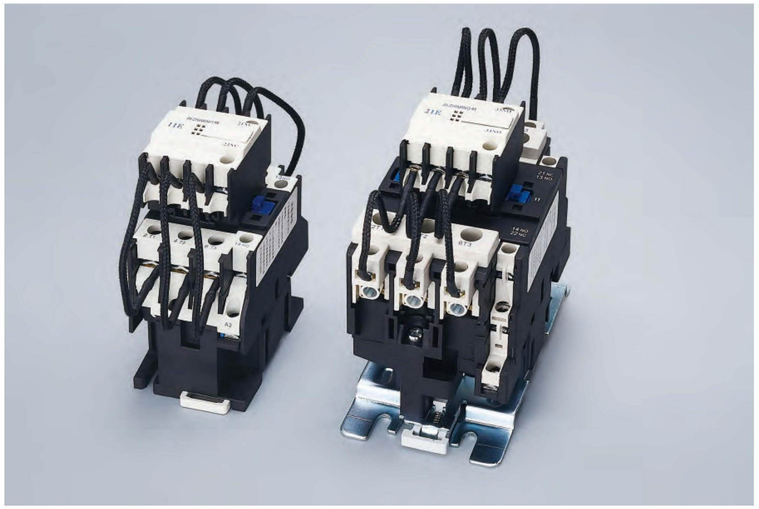
投切状态输出指示接线示意图



分相补偿接线图　三相共补接线图　分相三相混合补偿接线图

注：指示灯线采用0.75mm²截面积的多芯铜导线连接。

CJ19
系列切换电容器接触器
Series AC contactor for switching shunt capacitor



适用范围 Application

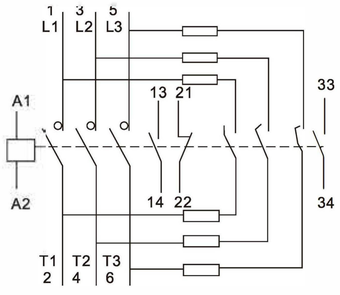
CJ19系列切换电容器接触器(以下简称接触器)主要用于交流50Hz或60Hz、额定工作电压至380V的电力线路，供低压无功功率补偿设备投入或切除低压并联电容器之用。接触器带有抑制涌流装置，能有效地减小合闸涌流对电容的冲击和抑制开断时的过电压。

CJ19 series AC contactor for switching shunt capacitor (hereinafter call -contactor) is mainly used in the system of Ac 50 or 60Hz, rated voltage up to 380V, for switching on/off shunt capacitor in the low voltage reactive compensating bank. If the contactor with surge restrained device, it can effectively prevent surging current when closing and over voltage during opening.

型号及其含义 Code and implication

CJ 19 - □□ / □□

- 辅助触头数量，用数字表示
  - 20表示两常开，11表示一常开一常闭
  - 02表示两常闭(以上为25A~43A)
  - 21表示两常开一常闭，12表示一常两常闭(以上为63A~95A)
  - Nos of auxiliary contact, digit indication
  - 20 means 2 NO, 11 means 1NO and 1NC; 02 means 2 NC (these for 25 ~ 43A)
  - 21 means 2NO and 1NC; 12 means 1 NO and 2 NC (these for 63A ~ 95A)
- 基本规格代号，以约定发热电流表示
  - Basic design code, nominal thermal current
- 设计序号
  - Design code
- 交流接触器
  - AC contactor



结构特点 Structure

接触器为直动式双断点结构，触头系统分上下两层布置，上层有三对触头与限流电阻构成抑制涌流装置，当合闸时它先接通经数毫秒之后工作触头接通，限流触头中永久磁块在弹簧反作用下释放，断开限流电阻，使电容器正常工作，接触器内部电路连接图(见图)。

CJ19-25-43的接触器有两对辅助触头，CJ19-63-95的接触器有三对辅助触头。接触器接线端有绝缘罩覆盖，安全可靠，线圈接线端带有标出电压数据可防止接错。CJ19-25-43接触器可用螺钉安装，也可借底部的滑块扣装在35mm标准卡轨上。面罩上有一个可拆卸的长方形小牌，用户可用它打印项目代号等。CJ19-63-95可用35mm或75mm标准卡轨安装。

The contactor is of direct-action double break structure, the contact system consists of upper and downward layout, upper part has 3pairs of contacts and current limiting resistance what become surge restrained device, when closing current limiting contacts will make several milliseconds at firstly, then working contact is made closed later, current limiting contact will be released under the action of everlasting magnet and spring, current limiting resistance is switched off, capacitor then operate normally, inner wiring diagram as Drawing 4
CJ19 25~43 contactor has 2 pairs of auxiliary contacts, CJ19 63~95 contactors have 3 pairs of auxiliary contacts, the terminals have provided insulating cover for safety, coil terminals have been marked clearly. CJ19 25~43 can be mounted by screw or by 35mm railway, a dismount able square blank card in cover is provided for spare when required to print something as user. CJ19 63~95 can be mounted on 35 or 75 mm railway.

CJ19
系列切换电容器接触器
Series AC contactor for switching shunt capacitor

主要技术参数 Main Technical data

参数名称 Item		CJ19-25	CJ19-32	CJ19-43	CJ19-63	CJ19-95
电寿命(万次) Electrical life (10^4)		10	10	10	10	10
额定电流Ie(380V)A Rated current (380V) A		17	23	29	43	63
可控电容器容量(kvar) Controllable capacity (kvar)	220V	6	9	10	15	22
	380V	12	18	20	30	44
额定绝缘电压(V) Rated insulating voltage (V)		500	500	500	500	500
抑制涌流能力 Surge limiting capacity		20Ie	20Ie	20Ie	20Ie	20Ie
动作条件 Operating conditions	吸合Absorbing：(85%~110%)Us; 释放releasing：(20%~75%)Us					
线圈功率(VA) 起动/保持 Coil burden (startup/lasting) (VA)		70/8	110/11	110/11	200/20	200/20
辅助触头控制容量 Control capacity of auxiliary contact	AC-15 360VA；DC-13 33W					
质量(kg) Weight (kgs)		0.44	0.63	0.64	1.4	1.5

主要型号规格及数据 Main model and specifications

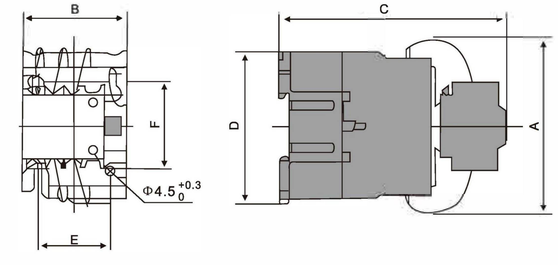
接触器型号 Contactor model	Amax	Bamx	Cmax	Dmax	E	F	备注 Notes
CJ19-25	80	47	124	76	34/35	50/60	除镙钉安装外，还可用35mm安装轨安装 Screw mounting and 35mm railway available
CJ19-32	90	58	132	86	40	48	
CJ19-43	90	58	136	86	40	48	
CJ19-63	132	79	150	126.5	40	43	除镙钉安装外，还可用35mm、75mm安装轨安装 Screw mounting and 35 or 75mm railway available
CJ19-95	135	87	158	126.5	40	43	
CJ19-115	200	120	156	155	40	43	
CJ19-150	200	120	156	155			
CJ19-170	200	120	156	155			

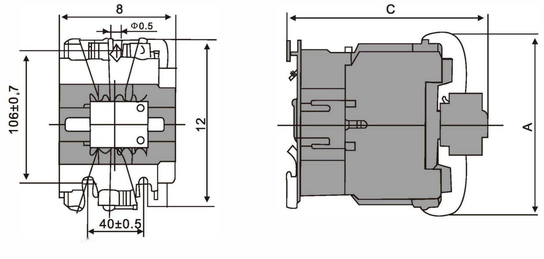
正常工作条件
Normal working condition and mounting conditions

- 周围空气温度为：-5℃~+40℃，24小时内其平均值不超过+35℃；
- 海拔高度：不超过2000m；
- 大气条件：在+40℃时空气相对湿度不超过50%；在较低温度下可以有较高的相对湿度，最湿月的月平均最低温度不超过+25℃，该月的月平均最大相对湿度不超过90%，并考虑因温度变化发生在产品上的凝露；
- 污染等级：3级；
- 安装类别：3级；
- 安装条件：安装面与垂直面倾斜度不大于±5°；
- 冲击振动：产品应安装和使用在无显著摇动、冲击和振动的地方；
- 主要参数及技术性能

- Ambient temperature: -5℃ ~ 40℃, daily average over 35℃
- Altitude not more than 2000m;
- Ambient conditions: relative humidity not more than 50% at 40, if lower temperature humidity can be higher, on the month when maxi average humidity occurs the temperature shall be not more than 25℃, on this month the maxi average humidity shall not more than 90%, and there has considered the mist covering the product
- Polluted class: 3 grade
- Installation class: 3 grade
- Mounting conditions: the mounting inclined angle shall not more than±5°
- Impact vibration: there shall have no severe vibration, impact and vibration.
- Main technical data

外形及安装尺寸
Outline and mounting sizes





ZMKCS
系列无触点开关
Series Capacitive Non-contact-point Switch

型号及其含义 Model and implication

ZMKCS □-□-□-□

- 1 单相用 Single-phase
- 3 三相用 Three-phase
- 能控制的最大无功功率 如：10(kvar)
  Maxi controllable reactive power as 10KVAR
- 电压等级 如0.4(KV)或0.25(KV)
  Voltage class: as 0.4KV or 0.25KV
- 1A一只产品能控制一组三相电容
  A one control 1 pc three phases capacitor
- 3F一只产品能控制三组单相电容
  F one control 3 pcs single phase capacitor
- 产品类别代号 Product code

主要技术参数 Main Technical data

额定电压：380V(220V)
额定频率：50Hz
控制容量：380V级：1Kvar~40Kvar
220V级：1Kvar~10Kvar

Rated voltage: 380V(220V)
Rated frequency: 50Hz
Controlled capacity: at 380V: 1Kvar ~ 40Kvar,
at 220V: 1Kvar ~ 10Kvar

工作条件 Working conditions

- 周围空气温度：-25℃~+50℃,并且24h内其平均温度不高+35℃；
- 温度为+25℃时，相对湿度短时可达100%；
- 海拔高度不超过1000m；
- 安装场所空气清洁，无爆炸及可燃危险品；无足以损坏绝缘及腐蚀金属的气体；无导电尘埃；无雨雪侵袭及严重霉菌存在。
- 安装场所无明显超限谐波份量存在的场合。

- Ambient temperature: -25℃ ~50℃, and within 24 hours the average temperature: not more than 35℃.
- The relative humidity can be 100% at 25℃.
- Altitude not more than 1000m.
- Mounting site shall be clean air, have no explosive or flammable things, and no gas to damage the insulating layer and corrode the metal, no conductive dust, no snow and rain access, and bacterium existing
- The mounting site shall avoid the over-limiting harmonic wave existing.

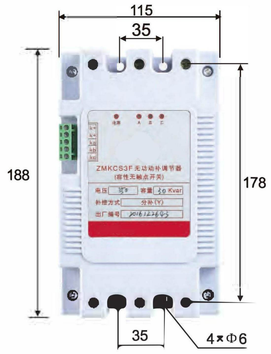
产品概述 General

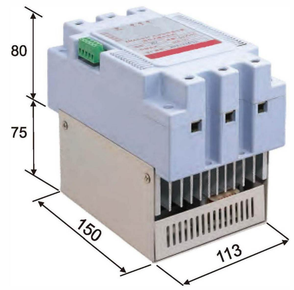
ZMKCS系列无触点开关是一种能够对电力并联电容器进行快速投切的电子型功率器件模块，其电气结构主要由大功率反并联晶闸管模块、隔离电路、触发电路、同步电路保护电路及驱动电路组成，并配有控制开关导通或截止的接线端子，控制逻辑电压0V(截止)、12V(导通)。本开关具有安装简单、维护方便、响应速度快、投切无涌流、工作无噪声运行稳定可靠、缺相保护等特点。是无功功率动态补偿装置用投切电容器组的理想器件。

ZMKCS series reactive power dynamic compensating controller is powerelectronic module able to quickly switch the power capacitors, the electrical structure consists of large power inverse shunt transistors module, isolating circuit, burst circuit, synchronous circuit protection and driving circuit, and provided with the terminals of control switch on/off, controlling logic voltage 0V (OFF), 12 V(ON). This switch has such advantages as easy installation, maintenance, quick response, no surge at switching, no noise at working,securely working, phase-failure protection, it is the ideal one that it is used to switch the capacitor group.

ZMKCS
系列无触点开关
Series Capacitive Non-contact-point Switch

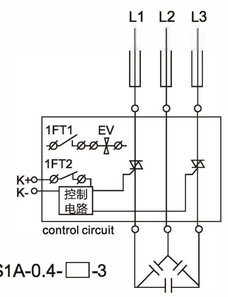
外形及安装尺寸 Outline and Mounting sizea



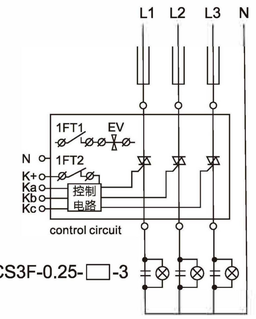


ZMKCS3F外形尺寸
ZMKCS3F outline size

接线原理图（一次方案）Wiring diagram（Primary layout）



ZMKCS1A-0.4-□-3



ZMKCS3F-0.25-□-3

1FT1 温度开关55度以下常开
1FT2 温度开关75度以下常闭
EV 风机
Ka Kb Kc 来自控制器的控制信号
K+ 控制信号公共端+12V

1FT1 Temperature switch, Normal Open below 55℃
1FT2 Temperature switch, Normal close below 75℃
EV fan
K- Control signal from controller
K+ Public terminal of control signal + 12V

维护 Maintenance

调节器在使用过程中，应根据现场环境进行定期检查，清除灰尘或污垢，线路是否有缺相现象，本调节器带有缺相保护功能，所以敬请用户注意，若此路无投入清检查是否缺相。如果在使用过程中一年内出现制造质量问题，不包括其它器件故障引起对本产品的损坏，用户应将调节器送回本公司进行维修。用户私自打开盖板进行维修后我厂概不负责。

During the operation, the controller shall be periodically checked, to clean off dirt and defilement, if phase failure occur, due this controller has the function of phase-failure protection, so please check the phase failure if the circuit is out of use. If the product has happened to faults within one year, except for the case of fault coming from other appliances, the user shall be please to send it our company for repair. Unauthorized dismantling and repairing will not beresponsible by us.

XD1
型限流电抗器
Type Limited reactor

产品概述 General

XD1型限流电抗器是采用不饱和聚酯脂浇注成型的干式电抗器。用于低压无功功率成套装置中作为限制低压电容器的合闸涌流和增加合闸开关的开断能力。

XD1 type Limited reactor is dry reactor which take unsaturated selectron irrigate pour low voltage capacitor joint switch current and increase joint brake switch breaking capacitor voltage power whole set equipment.

型号及其含义
Model and implication

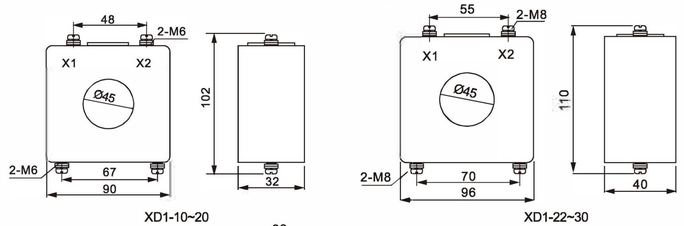
XD 1- □ /0.4

- 系统额定电压 Rated voltage
- 配用电容器容量 Match capacitor capacity
- 设计序号 Designing number
- 限流电抗器 Limited rector

主要技术参数 Main Technical data

型号规格 Type		所配电容器容量KVAR Capacitor Capacity	额定工作电压V Rated operating voltage	额定电流A Rated Current	限流倍数 Limiting multiple
XD1-	10	10	400V	18.8	≥50
	12	12		22.5	
	14	14		26.3	
	15	15		28	
	16	16		30.2	
	18	18		33.5	
	20	20		37.5	
	24	24		45	
	25	25		49	
	30	30		56	
	35	35		65.7	
	40	40		75	
	50	50		94	
	60	60		112	

外形及安装尺寸 Outline and Mounting sizes

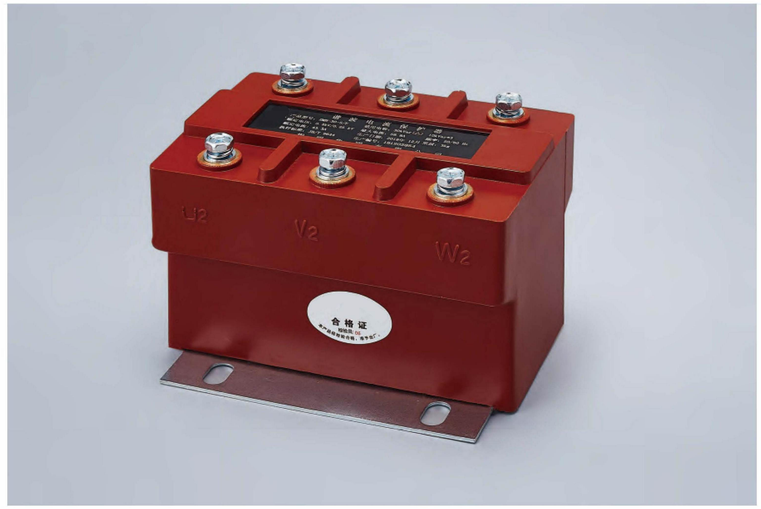


使用环境条件 Usage condition

- 海拔高度不超过1000m
- 周围空气温度：-5℃~+40℃，24小时内平均温度不高于+35℃
- 周围介质无爆炸及易燃危险，无足以损坏绝缘及腐蚀金属的气体，无导电尘埃
- 空气相对温度不大于80%
- 安装地点无剧烈振动及颠簸，安装倾斜度不大于5°
- 安装地点不受阳光直接辐射，无雨雪侵袭及严重霉菌存在。

- Altitude not more than 1000m.
- Ambient temperature; -5℃~+24°, averagre temperature not more than +35℃ within 24 hours.
- Ambient medium: there is no explode combustible, there is no air which can damage and corrode metal, no dust of conduction.
- The relative humidity not more than 80%.
- There is no heavy vibrate and welter, installation gradient not more 5 degree.
- Installation place no sun indicate radiate, no snowing and virus.

ZMB
谐波电流保护器
Harmonic current protector



适用范围 Application

ZMB系列谐波电流保护器是用于交流50/60Hz，标称电压为0.4kV或 0.25kV的电力系统中，与电容器相串联，以达到限制并联电容器组的合闸涌流，减少谐波电流对电容器件影响，及消除电力系统短路时电容器放电电流的助增影响。

ZMB系列谐波电流保护器采用环氧树脂灌封而成，整体外观美观，安装方便、整体绝缘强度理想及防潮湿性能优良，保护内部器件不受大湿度环境的影响。

ZMB series harmonic current protector is used in the system of AC50/60Hz, nominal voltage 0.4KV or 0.5KV, series connected with capacitor, to restrict the surge of switching capacitor bank, reduce the interference of harmonic current to capacitors, and eliminate the reinforcement of capacitor discharging current when the system has short circuit fault.

ZMB series harmonic current protector enclosed by epoxy resin, good figure, easy to install, high insulation level and anti damp, protect inner components from access of moisture and weather.

技术指标 The performance parameters

产品型号 Specification	额定电压(kV) Rated voltage	额定电流(A) Rated current	最大电流(A) Max. current	重量(kg) Weight	适用电容器 Rated voltage
ZMB-5-S/F	0.4/0.25	14.4	19.5	3.0	5Kvar(△)/1.6Kvar×3
ZMB-10-S/F	0.4/0.25	14.4	19.5	3.0	10Kvar(△)/3.3Kvar×3
ZMB-15-S/F	0.4/0.25	21.7	29.3	3.0	15Kvar(△)/5Kvar×3
ZMB-20-S/F	0.4/0.25	28.9	39	3.0	20Kvar(△)/6.6Kvar×3
ZMB-30-S/F	0.4/0.25	43.3	58.8	3.0	30Kvar(△)/10Kvar×3
ZMB-40-S/F	0.4/0.25	57.7	77.9	3.0	40Kvar(△)/13.3Kvar×3
ZMB-45-S/F	0.4/0.25	68	95	3.0	45Kvar(△)/15Kvar×3

- 产品执行标准：JB/T9644
- 温升不大于70K
- 最大瞬间电流能承受与其配套的最大容量的电容器组合闸涌流的冲击，而不发生电气绝缘闪络击穿和机械损伤
- 电抗器在通过基波电流和谐波电流均方根的合成电流(有效值)不超过1.3倍额定电流，电抗器可连续运行。

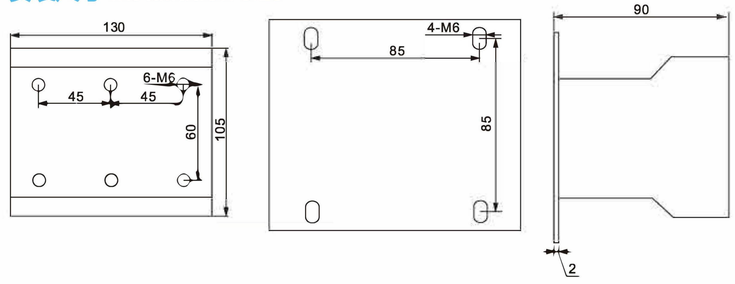
- The product complies with JB/T9644 standard
- Temperature rise not more than 70K
- It can withstand the combined impact of surging current at the maxi capacity of capacitor banks that the protector matches, without electric flashover and mechanical damage.
- The reactor can carry the combined current (RMS) of basic current and harmonic current not exceeding 1.3 times of rated current continuously.

型号及其含义
Code and implication

ZMB - □ - □ / □

- 电容器方式： Capacitor operating modes: S为三相共补 S: three-phase simultaneous compensation; F为分相 F Respective compensation
- 产品规格 Product specification
- 谐波电流保护器 Harmonic current protector

安装尺寸 Installation size



工作条件 Working conditions

- 环境温度：-25℃~55℃
- 空气相对湿度：20%~90%(40℃)
- 海拔高度：≤2000m
- 环境条件：适用于箱体内安装

- Ambient air temperature: -25℃~+55℃,
- Relative humidity: 20%~90%(40℃)
- Altitude: ≤ 2000m;
- Environmental conditions: For cabinets installed

CKSG
型滤波电抗器
Type shunt reactor

适用范围 Application

电容器在补偿容性无功率的时候，往往会受到谐波电流，合闸通流及操作过程电压的影响。造成电容损坏和功率因数降低，为此需要在电容器前端加装串联电抗器，用以抑制和吸收谐波，保护电容器，避免谐波电压电流及冲击电压电流影响，改善电能质量提高系统功率因数，延时电容器使用寿命。

During compensating reactive power, the capacitors will be influenced by harmonic waves, closing surge, operating over-voltage and etc, and may lead capacitors being damaged or power factor decreasing, consequently series-connected reactors shall be used to connect in front of capacitors, to restrict harmonics, protect capacitors, prevent the influences of harmonic voltage, current or surging voltage/current, improve power factor, extend service life of capacitors.

型号及其含义 Model and implication

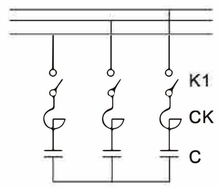
CK □ G -□/□-□

- 额定电抗率XL/Xc(%) Percentage of react
- 配用电容器额定线电压(kV) Rated voltage
- 电抗器三相容量(kvar) Rated Capacity
- 干式空气冷却 Dry type air cooler
- S:三相；D：单相 S: Three phase D: Single phase
- 串联电抗器 Shunt reactor

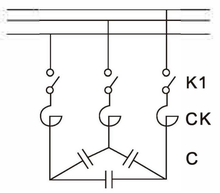
使用环境条件 Usage condition

- 海拔高度不超过2000米；
- 运行环境温度-25℃~+45℃，相对湿度不超过90%；
- 周围无有害气体，无易燃易爆物品；
- 周围环境应有良好的通风条件，如装在柜内，应加装通风设备。
- Altitude: ≤ 2000m
- Working temperature：-25~55℃
- Relative humidity: ≤90%
- Mounting site has not fire risk, explosion, water flood, strong chemical corrosion and etc.

接线方式 wire drawing



Y形连接
Y type Connection



△形连接
△ type Connection

结构特点 Structure

- 该产品分为三相、单相两种，为铁芯干式；
- 铁芯采用优质冷轧硅钢片，经高速冲床冲剪，具有毛刺小、规则均匀、叠片整齐优美，确保电抗器运行低温低噪声的性能。
- 线圈采用优质绝缘导线，经专用机器绕制，具有平整度好，外形美观的优点；
- 电抗器装配过程中，所有夹件经过腐蚀处理，关键夹件采用无磁性材料，并经预烘-真空浸漆-流程，使电抗器线圈及铁芯牢固成为一体，大大减少了运行时温升及噪声，有效提高了电抗器品质因数及减少谐波的效果。
- 电抗器外形尺寸参考标准柜体尺寸设计，体积小、接线方便，大大节约用户柜体成本投资。

- This product divided into two types: three-phase, single phase, dry type iron core.
- The iron core made of high quality cold rolled silicone steel sheet, sheared by high speed punching machine, without furs, even, good piled, to ensure low temperature rise low noise during operating.
- Coil made of good insulated conductors, wound by special machine: flat, smoothly, good looking.
- During assembling, all clamps are provided with anti-corrosion treatment, the critical clamps made of non-magnetic material, then preheating on oven, vacuum immersed, make coil and core form a tight body, this can reduce temperature rise and noise, improve quality factory and eliminate harmonics.
- Outline of reactor has referred to standard panels, small size, easy to connect with cables, save cost.

CKSG
型滤波电抗器
Type shunt reactor

性能指示及技术参数 performance parameters

- 可用于电容电压为：0.4KV, 0.45KV, 0.48KV, 0.525KV, 0.66KV, 0.69KV；
- 电抗率为：1%,4.5%,5%, 5.67%,6%,7%,12%,13%,14%；
- 耐压等级为：5KV/min绝缘等级：B极、F极、H极，噪声≤30dB，过载能力≤1.35倍以内连续工作；
- 加装串联电抗器后引起系统电压升高，计算公式为：

$$Ug=(\frac{n}{n^2-1})Un$$

(电容器组工作电压：Ug系统额定工作电压；Un电抗器调谐次数：n)

- 电抗器容量、电容容量、电抗率、电感量之间换算公式为：

$$U_L=Uc相 \times \frac{X_L}{Xc}\quad U_L=\frac{X_L}{1x0.314}\quad Qc=Qc相 \times \frac{X_L}{Xc}\quad 电抗率 \times \frac{X_L}{Xc}$$

(电容容量：Qc电抗器容量；Qw电抗率端高压：UL电感量；L电抗器电流；I电容器相电压；Uc相电感感抗；XL电容容抗：Xc)

- Voltage of operated capacitors:0.4KV, 0.45KV, 0.48KV, 0.525KV, 0.66KV, 0.69KV;
- Reactance rate: 1%, 4.5%, 5%, 5.67%, 6%, 7%, 12%, 13%, 14%;
- Voltage withstand level: 5KV/min, insulation grade: B, F, H, noise level ≤30dB; overloading ability ≤1.35 times continuously.
- After series connected reactor is added, the system voltage will increase, calculation formula:

$$Ug=(\frac{n}{n^2-1})Un$$

(Operating voltage of capacitor bank: Ug-rated operating voltage system: Un-The power of harmonic tuning: n)

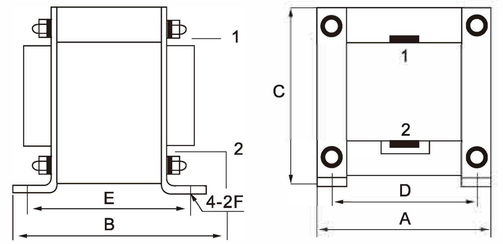
- Conversion formula between reactor capacity, capacitor capacity, reactance rate, inductance:

$$U_L=Uc \times \frac{X_L}{Xc}\quad U_L=\frac{X_L}{1x0.314}\quad Qc=Qc \times \frac{X_L}{Xc}\quad \text{Reactance rate} \times \frac{X_L}{Xc}$$

(Capacitor capacity: Qc-reactor capacity; Qw-reactance rate HV; UL-inductance; L-reactor current; I-Phase voltage of capacitor; Uc-Phase inductive reactance; XL-capacitive reactance: Xc)

规格与尺寸 Specification & Dimensions

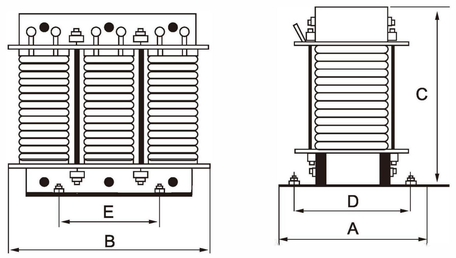
- CKDG系列单相滤波电抗器
  CKDG Series single phase shunt reactor



序号 No.	规格型号 Type	额定电抗率 Reactance rate	外形尺寸 (长x宽x高)mm Dimension LxWxH	安装尺寸mm Mounting dimension	孔径 Diameter
1	CKDG-5Kvar	1% 4.5% 5% 5.67% 6% 7% 12% 13% 14%	114x150x120	95x75	Ø6
2	CKDG-6.67Kvar		114x155x120	95x75	Ø6
3	CKDG-8Kvar		135x110x130	95x105	Ø6
4	CKDG-10Kvar		135x120x130	100x105	Ø6
5	CKDG-12Kvar		135x130x130	110x100	Ø6
6	CKDG-15Kvar		150x130x160	110x110	Ø6
7	CKDG-20Kvar		150x140x160	110x120	Ø6
8	CKDG-25Kvar		150x150x160	110x130	Ø6

以上为6%,7%电抗率尺寸。

- CKSG系列三相滤波电抗器
  CKSG Series Three phase shunt reactor



序号 No.	规格型号 Type	外形尺寸 (长x宽x高)mm Dimension LxWxH	安装尺寸mm Mounting dimension	孔径 Diameter
1	CKSG-5Kvar	130 X 95 X150	65 X70	6*10
2	CKSG-10Kvar	195 X 110 X190	110 X80	6*10
3	CKSG-12Kvar	195 X 110 X190	110 X80	6*10
4	CKSG-15Kvar	195 X 120 X190	110 X90	6*10
5	CKSG-16Kvar	195 X 120 X190	110 X90	6*10
6	CKSG-18Kvar	195 X 130 X190	110 X100	6*10
7	CKSG-20Kvar	230 X 130 X210	130 X90	8*20
8	CKSG-25Kvar	230 X 145 X210	130 X105	8*20
9	CKSG-30Kvar	230 X 150 X210	130 X110	8*20
10	CKSG-35Kvar	240 X 150 X230	130 X110	8*20
11	CKSG-40Kvar	240 X 150 X230	130 X110	8*20
12	CKSG-45Kvar	280 X 140 X280	145 X110	10*20
13	CKSG-50Kvar	280 X 140 X280	145 X110	10*20
14	CKSG-60Kvar	280 X 150 X280	145 X120	10*20
15	CKSG-80Kvar	320 X 170 X310	210 X130	10*20
16	CKSG-100Kvar	320 X 170 X310	210 X130	10*20

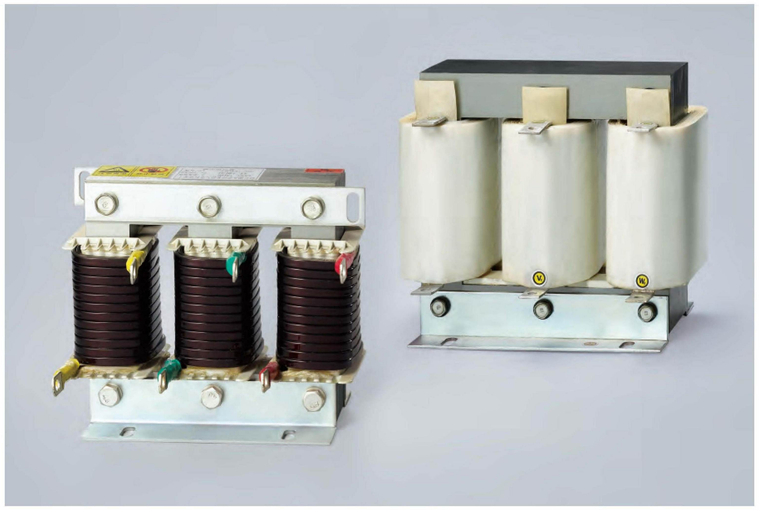
以上为6%,7%电抗率尺寸。

说明：不同容量，不同电抗率的电抗器可根据用户要求制造。
备注：以上参数仅供参考，可根据用户要求定做，我公司保留对数据的变更权利。

Remark: We can produce the reactors with different capacity or reactance rate other than herein.
Note: The above-mentioned data is only for reference, we can produce the product as user request, we reserve the right to modify the data.

XIKAI®

ACL
变频器进线电抗器
Inverter incoming reactor



产品概述 General

本产品采用优质进口矽钢片和优质铜线经先进的工艺精制而成，具有体积小，温升低、无噪音等特点。通常安装在变频器直流调速器的输入端，可以抑制变频器产生的谐波向电网传递，减少变频产生的谐波对其他元件的干扰，改善电网质量，提高功率因数，并限制电网电压的异常波动和电网上的冲击电流，平抑波形，减少对变频的影响。

This product adopted high quality foreign silicone steel sheet and copper wire being processed by use of advanced technology, with such features as small size, low temperature rise, no noise and etc. it is generally installed on the input side of inverter DC speed regulator, able to restrict the harmonic contents produced by inverter and entered into power network, and reduce the interference on other devices, improve the electricity quality and power factor, limit the abnormal fluctuation of system voltage and surging current, optimize wave and etc.

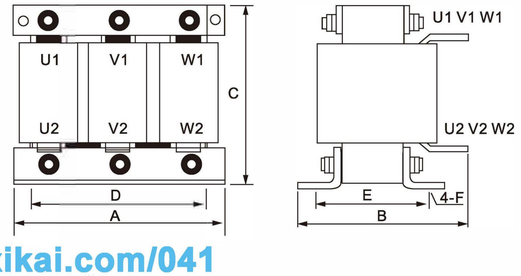
产品规格 Product Specifications

表1 Table 1

规格型号 Specification	适配功率(kW) Power Adapter	额定电流(A) Rated current	压降(MH) Pressure Drop	绝缘等级 Insulation grade	外形尺寸(mm) Dimensions	安装尺寸(mm) Mounting Dimensions	孔径 Aperture
ACL-8	0.75(1.5)	8	4% 2%	F.H	140x100x120	75x55	6
ACL-10	2.5(4.0)	10	4% 2%	F.H	140x100x120	75x55	6
ACL-15	5.5	15	4% 2%	F.H	140x100x120	75x55	6
ACL-20	7.5	20	4% 2%	F.H	140x100x120	75x55	6
ACL-30	11	30	4% 2%	F.H	170x130x145	80x65	6
ACL-40	15	40	4% 2%	F.H	170x130x145	80x65	6
ACL-50	18	50	4% 2%	F.H	170x130x145	80x65	10
ACL-60	22	60	4% 2%	F.H	210x130x170	110x65	10
ACL-80	30	80	4% 2%	F.H	210x130x170	110x65	10
ACL-110	37	110	4% 2%	F.H	210x130x170	110x65	10
ACL-120	45	120	4% 2%	F.H	210x150x170	110x85	10
ACL-150	55	150	4% 2%	F.H	210x160x215	110x95	10
ACL-200	75	200	4% 2%	F.H	210x160x215	110x95	10
ACL-250	90	250	4% 2%	F.H	210x160x215	110x95	10
ACL-380	110	280	4% 2%	F.H	250x180x260	133x110	10
ACL-300	132	300	4% 2%	F.H	250x180x260	133x110	10
ACL-400	160	400	4% 2%	F.H	280x190x260	170x115	10
ACL-450	187	450	4% 2%	F.H	280x190x260	170x115	10
ACL-500	200	500	4% 2%	F.H	280x190x260	170x115	10
ACL-600	250	600	4% 2%	F.H	280x210x260	170x135	12
ACL-800	315	800	4% 2%	F.H	320x230x290	200x120	12
ACL-1000	400	1000	4% 2%	F.H	320x260x290	200x130	12
ACL-1100	450	1100	4% 2%	F.H	350x260x320	200x130	12

备注：以上参数仅为典型参考，可根据用户要求定做，我公司保留对数据的变更权利。

Note: The above mentioned data is the reference of typical models, we can design and produce according to the special requirement by user, we would reserve the right to change the technical data.



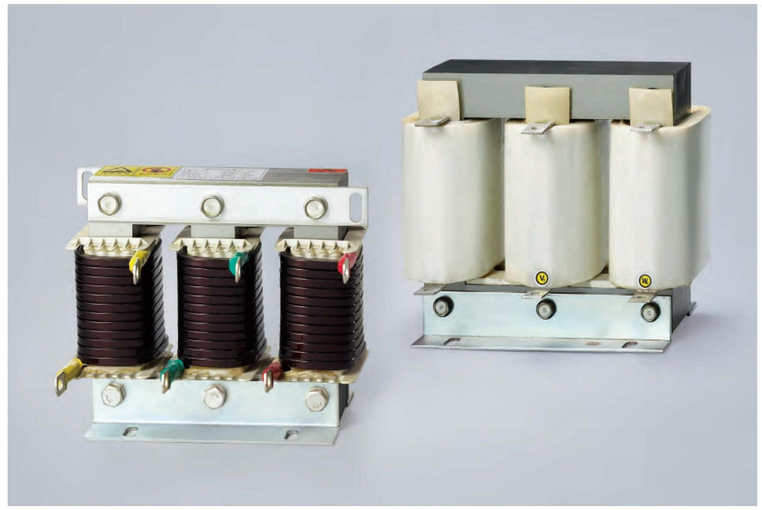
主要技术参数 Main Technical data

- 压降：2%-4%
- 额定工作电压：380V/50Hz
- 抗电强度：铁芯-绕组2500VAC/50Hz/10mA/60s无飞弧击穿；
- 绝缘电阻：铁芯-绕组500VDC，绝缘值≥100MV
- 电抗器噪音：小于35dB(与电抗器水平距离点1米测试)；
- 温升小于60K
- 产品执行标准：IEC289:1987电抗器 GB10229-88电抗器(eqv IEC289:1987) JB9644-1999半导体电气传动用电抗器

- Voltage drop: 2%-4%
- Rated operating voltage: 380V/50Hz
- Electric strength: iron core-winding 2500VAC/50Hz/10mA/60s no arcing no breakdown;
- Insulation resistance: iron core-winding 500VDC Insulation resistance ≥100MV
- Noise of reactor: less than 35dB (measured from 1 meter away in horizon from reactor)
- Temperature rise less than 60K
- Applicable standard: IEC289: 1987 "Reactors" GB10229-88(eqv IEC289:1987) GB10229-88"Reactors"(eqv IEC289:1987) JB9644-1999"Reactor for semi-conductive electric driving use"

XIKAI®

OCL
变频器输出电抗器
Inverter output reactor



产品概述 General

本产品采用优质进口矽钢片和优质铜线经先进的工艺精制而成，具有体积小，温升低、无噪音等特点。通常安装在变频器直流调速器的输出端，用于限制变频器与电机连接电缆的容性充电电流钝化变频器输出的PWM波的电压上升率。提高功率因数，改善电网质量，平抑波形，是变频与电机之间的重要元件之一。

This product adopted high quality foreign silicone steel sheet and copper wire being processed by use of advanced technology, with such features as small size, low temperature rise, no noise and etc. it is generally installed on the output side of inverter DC speed regulator, used to restrict voltage rising rate of PWM wave in the inverter output passivated by the capacitive charged current in the cable between inverter and motor. It can improve the electricity quality and power factor, optimize wave and etc. this reactor is one of important part between inverter and motor.

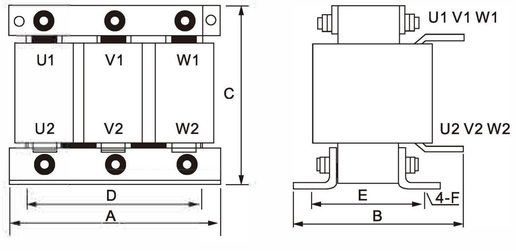
产品规格 Product Specifications

表1 Table 1

规格型号 Specification	适配功率(kW) Power Adapter	额定电流(A) Rated current	压降(MH) Pressure Drop	绝缘等级 Insulation grade	外形尺寸(mm) Dimensions	安装尺寸(mm) Mounting Dimensions	孔径 Aperture
OCL-8	0.75(1.5)	8	2% 1%	F.H	140x100x120	75x55	6
OCL-10	2.2	10	2% 1%	F.H	140x100x120	75x55	6
OCL-15	5.5	15	2% 1%	F.H	140x100x120	75x55	6
OCL-20	7.5	20	2% 1%	F.H	140x100x120	75x55	6
OCL-30	11	30	2% 1%	F.H	170x130x145	80x65	6
OCL-40	15	40	2% 1%	F.H	170x130x145	80x65	6
OCL-50	18	50	2% 1%	F.H	170x130x145	80x65	10
OCL-60	22	60	2% 1%	F.H	210x130x170	110x65	10
OCL-80	30	80	2% 1%	F.H	210x130x170	110x65	10
OCL-110	37	110	2% 1%	F.H	210x130x170	110x65	10
OCL-120	45	120	2% 1%	F.H	210x150x170	110x85	10
OCL-150	55	150	2% 1%	F.H	210x160x215	110x95	10
OCL-200	75	200	2% 1%	F.H	210x160x215	110x95	10
OCL-250	90	250	2% 1%	F.H	210x160x215	110x95	10
OCL-380	110	280	2% 1%	F.H	250x180x260	133x110	10
OCL-300	132	300	2% 1%	F.H	250x180x260	133x110	10
OCL-400	160	400	2% 1%	F.H	280x190x260	170x115	10
OCL-450	187	450	2% 1%	F.H	280x190x260	170x115	10
OCL-500	200	500	2% 1%	F.H	280x190x260	170x115	10
OCL-600	250	600	2% 1%	F.H	280x210x260	170x135	12
OCL-800	315	800	2% 1%	F.H	320x230x290	200x120	12
OCL-1000	400	1000	2% 1%	F.H	320x260x290	200x130	12
OCL-1100	450	1100	2% 1%	F.H	350x260x320	200x130	12

备注：以上参数仅为典型参考，可根据用户要求定做，我公司保留对数据的变更权利。

Note: The above mentioned data is the reference of typical models, we can design and produce according to the special requirement by user, we would reserve the right to change the technical data.



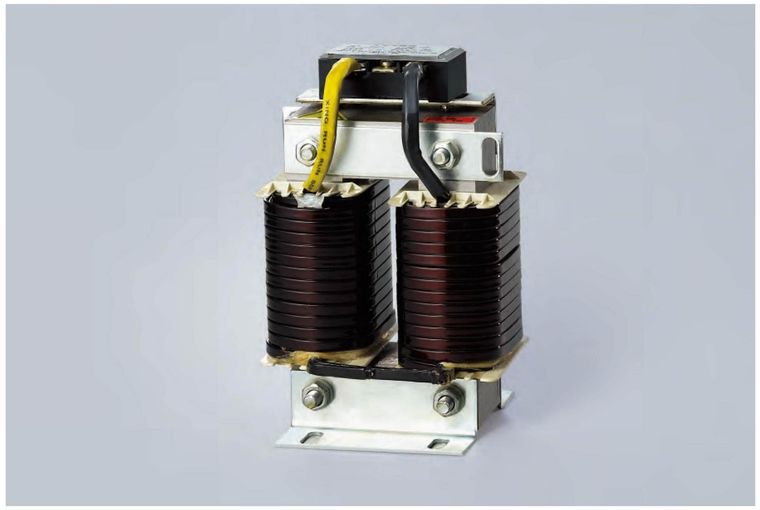
主要技术参数 Main Technical data

- 压降：1%-2%
- 额定工作电压：380V/50Hz
- 抗电强度：铁芯-绕组3000VAC/50Hz/10mA/60s无飞弧击穿；
- 绝缘电阻：1000VDC，绝缘值≥100MV
- 电抗器噪音：小于35dB(与电抗器水平距离点1米测试)；
- 温升小于60K
- 产品执行标准：IEC289:1987电抗器 GB10229-88电抗器(eqv IEC289:1987) JB9644-1999半导体电气传动用电抗器

- Voltage drop: 1%-2%
- Rated operating voltage: 380V/50Hz
- Electric strength: iron core-winding 3000VAC /50Hz/10mA/60s no arcing no breakdown;
- Insulation resistance: iron core-winding 1000VDC, Insulation resistance ≥100MV
- Noise of reactor: less than 35dB (measured from 1 meter away in horizon from reactor)
- Temperature rise less than 60K
- Applicable standard: IEC289: 1987 "Reactors" GB10229-88(eqv IEC289:1987) GB10229-88"Reactors"(eqv IEC289.1987) JB9644-1999"Reactor for semi-conductive electric driving use"

XIKAI®

DCL
变频器整流器用直流电抗器
DC reactor for inverter and converter



产品概述 General

- 改善电容谐波造成的输入电流波形畦变。
- 减少和防止因冲击电流造成整流桥损坏和电容过热。
- 提高功率因素，降低直流母线交流脉冲。
- 限制电网电压的瞬变。

- Improve the input current wave resulted by capacitor harmonics
- Reduce and prevent the rectification bridge being damaged and capacitor being overheating due to surging current.
- Improve power factor, reduce DC busbar AC pulse.
- Restrict the transient change of system voltage

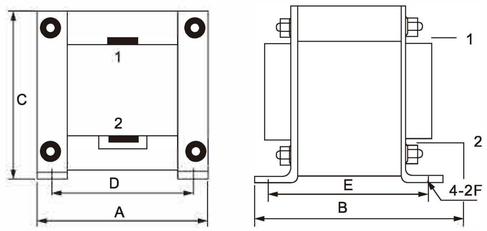
产品规格 Product Specifications

表1 Table 1

规格型号 Specification	适配功率(kW) Power Adapter	额定电流(A) Rated current	压降(MH) Pressure Drop	绝缘等级 Insulation grade	外形尺寸(mm) Dimensions	安装尺寸(mm) Mounting Dimensions	孔径 Aperture
DCL-8	0.75	8	10.6	F.H	100x120x85	84x70	5
DCL-10	4	10	6.37	F.H	100x120x85	84x70	5
DCL-15	5.5	15	4.25	F.H	100x120x85	84x70	5
DCL-20	7.5	20	3.18	F.H	100x120x85	84x70	5
DCL-30	11	30	2.12	F.H	140x110x170	70x65	6
DCL-40	15	40	1.6	F.H	140x110x170	70x65	6
DCL-50	18	50	1.27	F.H	140x110x170	70x65	6
DCL-60	22	60	1.06	F.H	140x110x170	70x65	6
DCL-80	30	80	0.79	F.H	140x110x170	70x65	6
DCL-110	37	110	0.56	F.H	140x150x170	70x85	8
DCL-120	45	120	0.53	F.H	140x150x170	70x85	8
DCL-150	55	150	0.42	F.H	140x150x170	70x85	8
DCL-200	75	200	0.32	F.H	140x160x215	70x95	8
DCL-250	93	250	0.25	F.H	140x160x215	70x95	8
DCL-280	110	280	0.22	F.H	140x160x215	70x95	8
DCL-300	132	300	0.21	F.H	160x160x215	84x110	10
DCL-400	160	400	0.16	F.H	160x170x260	84x110	10
DCL-450	187	450	0.14	F.H	160x170x260	125x120	10
DCL-500	200	500	0.127	F.H	160x170x260	125x120	10
DCL-600	250	600	0.11	F.H	210x210x290	125x120	10
DCL-800	315	800	0.08	F.H	210x210x290	125x120	10
DCL-1000	400	1000	0.063	F.H	210x230x290	125x130	12
DCL-1100	450	1100		F.H	230x250x320	125x130	12

备注：以上参数仅为典型参考，可根据用户要求定做，我公司保留对数据的变更权利。

Note: The above mentioned data is the reference of typical models, we can design and produce according to the special requirement by user, we would reserve the right to change the technical data.



主要技术参数 Main Technical data

- 额定工作电压：400V-1200V/50Hz
- 额定工作电流：3A至1500A@40℃
- 抗电强度：铁芯-绕组3000VAC/50Hz/5mA/60s无飞弧击穿(工厂测试)；
- 绝缘电阻：1000VDC绝缘值≥100MV
- 电抗器噪音：小于35dB(与电抗器水平距离点1米测试)；
- 防护等级：IP00
- 绝缘等级：F级以上
- 产品执行标准：IEC289:1987电抗器 GB10229-88电抗器(eqv IEC289:1987) JB9644-1999半导体电气传动用电抗器

- Rated operating voltage: 400V-1200V/50Hz
- Rated operating current: 3A to 1500A @ 40 ℃
- Electric strength: iron core-winding 3000VAC/50Hz/10mA/60s no arcing no breakdown;
- Insulation resistance: iron core-winding 1000VDC, Insulation resistance ⩾100MV
- Noise of reactor: less than 35dB (measured from 1 meter away in horizon from reactor)
- Degree of protection: IP00
- Degree of Insulation: F above
- Applicable standard: IEC289: 1987 "Reactors" GB10229-88(eqv IEC289:1987) GB10229-88"Reactors"(eqv IEC289:1987) JB9644-1999"Reactor for semi-conductive electric driving use"

XIKAI®

CKSC
系列高压串联电抗器
Series high voltage series reactor

适用范围 Application

产品用于0-63KV以下电力系统中，与系统串联连接，用以抑制电网电压波形畸变，从而改变电网电压质量和保证电力系统安全运行；限制系统发生故障时的短路电流。适用于电力系统，电气化铁道，冶金，化工，石油等防火要求较高，有电磁干扰要求和安装场地有限的城网变电站。

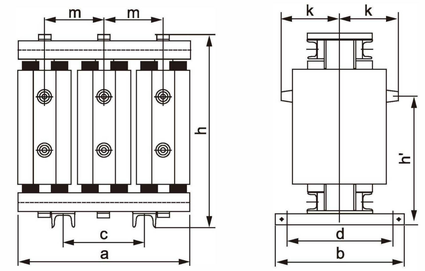
The products used in the power system of 0-63KV and below, series connected with the system, to eliminate voltage distortion, and improve the electric quality and ensure safe operation of the power system, limit the short current when system has fault. The products operates in substations of power system, electric railway, metallurgy, chemical industry, petroleum, and other places where high flameproof level, electromagnetic immunity is required, or installation place is limited.

型号及其含义 Code and implication

CK □ □-□/□-□

- 额定电抗率(%) Rated circuit reactance rate
- 配用电容器额定线电压(kV) Equipped with a capacitor rated line voltage
- 电抗器三相容量(kvar) Three-phase reactor capacity
- G:干式空气冷却；C:环氧浇注 G: dry air cooling; C: epoxy cast
- S:三相；D:单相 S: Three-phase; D: single-phase
- 串联电抗器 Series Reactor

外形及安装尺寸 Outline & installation sizes



产品型号 Type	外形尺寸 Dimension(mm)								重量 weight (kg)
	a	b	c	d	h	h'	m	k	
CKSC-(3~6)/10-6	600	400	270	300	580	300	205	195	110
CKSC-(9~12)/10-6	650	500	300	400	615	325	225	240	185
CKSC-(12~25)/10-6	740	550	350	450	665	355	255	265	330
CKSC-(27~36)/10-6	740	550	350	450	765	455	255	265	390
CKSC-(42~60)/10-6	740	550	350	450	865	555	255	265	460
CKSC-72/10-6	850	650	400	550	880	515	290	285	580
CKSC-90/10-6	850	650	400	550	1000	630	290	285	660
CKSC-108/10-6	850	650	400	550	1075	705	290	285	730
CKSC-120/10-6	850	650	400	550	1160	790	290	285	800
CKSC-144/10-6	980	720	450	620	1100	655	335	290	1100
CKSC-180/10-6	980	720	450	620	1230	790	335	290	1300

技术特点 Technical Features

1、线圈经环氧树脂浇注而成，具有阻燃、自熄、免维护、机械强度高、抗短路冲击能力强、绝缘强度好、局部放电量小、使用寿命长等优点；
2、铁芯制造采用了干式电抗器的制造技术、振动小、噪音低、漏磁小，对环境的电磁干扰小；
3、产品的整体结构紧凑，安装尺寸小，占用空间小；
4、产品的技术条件符合国际标准IEC288-88和部颁标准JB5346-98等要求，其技术性能达到当代国际同类产品的水平。

1.Coil cast by epoxy resin, with the features of flameproof, self-extinguish, free of maintenance, high mechanical strength, high short circuit withstand level, high insulation level, low partial discharging level, long service life and etc.
2.Iron core by use of production technology of dry type reactor, with the merits of small vibration, low noise, low magnetic leakage, small electromagnetic interference
3.Compact structure, small size, small installation space
4.The product complies with IEC288-88 and JB5346-98 standard issued by State Power Bureau, it reaches up to international latest level.

主要性能参数 The performance parameters

- 噪间水平：容量≤600kVA的55dB，容量为600 ~ 1200kVA的58dB
- 温升限值：90K
- 绝缘水平：LI75AC35
- 电抗偏差：工频额流时电抗偏差0 ~ +5%；每相电抗值与三相电抗平均值偏差±2%；1.8倍额流时电抗偏差-5%以内；

- Noise level: capacity less than 600kVA is 55dB, capacity 600~1200kVA is 58dB;
- Max temperature-rise: 90K;
- Insulation level: LI75AC35;
- Reactance deviation: Reactance deviation at powerfrequency rated current is 0~+5%; Reactance value of each phase has a deviation of ±2% with the three-phase reactance average value; Reactance deviation is within -5% at 1.8 times ofrated current;

CKSC
系列高压串联电抗器
Series high voltage series reactor

主要技术参数 Main Technical data

产品型号 Type	额定容量 Rated capacity kVA	额定电抗器率 Rated circuit reactance rate %	额定电压 Rated voltage V	额定电流 Rated current A	额定电抗 Rated circuit reactance Ω	配套电容器组 Capacitor bank cooperated	
						额定容量 Rated capacity	额定电压 Rated voltage
CKSC-3/10-6	3	6	381.05	2.62	145.20	50	11/√3
CKSC-6/10-6	6	6	381.05	5.25	72.60	100	11/√3
CKSC-9/10-6	9	6	381.05	7.87	48.40	150	11/√3
CKSC-12/10-6	12	6	381.05	10.50	36.30	200	11/√3
CKSC-15/10-6	15	6	381.05	13.12	29.04	250	11/√3
CKSC-15/10-5	15	5	317.54	15.75	20.17	300	11/√3
CKSC-18/10-6	18	6	381.05	15.75	24.20	300	11/√3
CKSC-17.5/10-5	17.5	5	317.54	18.37	17.29	350	11/√3
CKSC-21/10-6	21	6	381.05	18.37	20.74	350	11/√3
CKSC-20/10-5	20	5	317.54	20.99	15.12	400	11/√3
CKSC-24/10-6	24	6	381.05	20.99	18.15	400	11/√3
CKSC-22.5/10-5	22.5	5	317.54	23.62	13.44	450	11/√3
CKSC-27/10-6	27	6	381.05	23.62	16.13	450	11/√3
CKSC-25/10-5	25	5	317.54	26.24	12.10	500	11/√3
CKSC-30/10-6	30	6	381.05	26.24	14.52	500	11/√3
CKSC-30/10-5	30	5	317.54	31.49	10.08	600	11/√3
CKSC-36/10-6	36	6	381.05	31.49	12.10	600	11/√3
CKSC-72/10-12	72	12	831.38	28.87	28.80	600	11/√3
CKSC-42/10-6	42	6	381.05	36.74	10.37	700	11/√3
CKSC-40/10-5	40	5	317.54	41.99	7.56	800	11/√3
CKSC-48/10-6	48	6	381.05	41.99	9.07	800	11/√3
CKSC-96/10-12	96	12	831.38	38.49	21.60	800	12/√3
CKSC-45/10-5	45	5	317.54	47.24	6.72	900	11/√3
CKSC-54/10-6	54	6	381.05	47.24	8.07	900	11/√3
CKSC-108/10-12	108	12	831.38	43.30	19.20	900	12/√3
CKSC-50/10-5	50	5	317.54	52.49	6.05	1000	11/√3
CKSC-60/10-6	60	6	381.05	52.49	7.26	1000	11/√3
CKSC-120/10-12	120	12	831.38	48.11	17.28	1000	12/√3
CKSC-60/10-5	60	5	317.54	62.98	5.04	1200	11/√3
CKSC-72/10-6	72	6	381.05	62.98	6.05	1200	11/√3
CKSC-144/10-12	144	12	831.38	57.74	14.40	1200	12/√3
CKSC-75/10-5	75	5	317.54	78.73	4.03	1500	11/√3
CKSC-90/10-6	90	6	381.05	78.73	4.84	1500	11/√3
CKSC-180/10-12	180	12	831.38	72.17	11.52	1500	12/√3
CKSC-90/10-5	90	5	317.54	94.48	3.36	1800	11/√3
CKSC-108/10-6	108	6	381.05	94.48	4.03	1800	11/√3
CKSC-100/10-5	100	5	317.54	104.97	3.02	2000	11/√3
CKSC-120/10-6	120	6	381.05	104.97	3.63	2000	11/√3
CKSC-120/10-5	120	5	317.54	125.97	2.52	2400	11/√3
CKSC-144/10-6	144	6	381.05	125.97	3.02	2400	11/√3
CKSC-150/10-5	150	5	317.54	157.46	2.02	3000	11/√3
CKSC-180/10-6	180	6	381.05	157.46	2.42	3000	11/√3

QKSG/QKSC
启动电抗器
Type start shunt reactor

型号及其含义 Model and implication

QK S □-□ □

- 额定电压(kV) Rated voltage
- 启动容量(kvar) Start capacity
- G: 干式空气冷却 G: dry air cooling
- C: 环氧浇灌 C: Epoxy watering
- S:三相 S: Three phase
- 启动电抗器 Start shunt reactor

性能指示及技术参数 Technical parameters

- 干式起动电抗器比传统油浸电抗器、空心电抗器体积要小，具有重量轻、占空间小、结构简单、安装方便等特点；
- 耐温等级达到F级(155°C)；
- 干式铁芯起动电抗器损耗低于油浸电抗器的损耗；
- 干式铁芯起动电抗器的噪声不大于国家标准(65dB)。

使用环境 Normal ambient condition

- 海拔高度不超过1000米；
- 运行环境温度-25℃~+45℃。
- 安装于户内无剧烈震动，无任何有害气体或粉尘的场合，无易燃易爆物品。
- 一次起动后，应冷却6小时才可以再次起动。
- Altitude: ≤1000m
- Working temperature：-25~+45℃
- Mounting site has not fire risk, explosion, water flood, strong chemical corrosion and etc.
- After one start, it should be cooled for 6 hours before starting again.
- The dry start reactor is smaller than the traditional oil immersed reactor and air core reactor Small, light weight, small footprint, simple structure, easy installation Features;
- The temperature resistance level reaches F grade (155 ° C);
- The dry core starter reactor loss is lower than that of the oil immersed reactor;
- The noise of the dry core starter reactor is not greater than the national standard (65dB).

产品型号及尺寸 Specification & Dimensions

规格型号 Type	起动容量(kvar) Start capacity	额定电压(kV) Rated voltage	外形尺寸(mm) Dimension LxWxH	被启动电动机功率(kW) Driven motor power
QKSG-220	393	6kV 10kV 或客户指定	760x400x835	220
QKSG-250	445		760x400x835	250
QKSG-280	493		760x400x835	280
QKSG-315	553		805x450x875	315
QKSG-355	620		805x450x875	355
QKSG-400	700		805x450x875	400
QKSG-450	787		865x450x920	450
QKSG-500	854		865x450x920	500
QKSG-560	963		865x450x920	560
QKSG-630	1081		865x450x920	630
QKSG-710	1215		865x450x920	710
QKSG-800	1366		895x450x960	800
QKSG-900	1538		895x450x960	900
QKSG-1000	1844		895x450x960	1000
QKSG-1120	2040		955x450x1015	1120
QKSG-1250	2273		955x450x1015	1250
QKSG-1400	2543		955x450x1015	1400

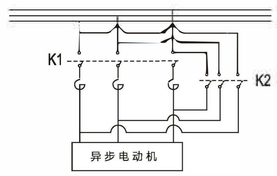
适用范围 Application

交流异步电动机在额定电压下起动时，初始起动电流是很大的，往往超过额定电流的许多倍(一般是5~7倍)，为了减少起动交流，不对电网造成影响，通常用降低电压的方法来起动交流异频电动机，常用的降压方法是采用电抗器或自藕变压器，交流电动机的起动过程很短(一般数秒至二分钟)，起动后就将降压起动用的电抗器或自藕变压器切除。该产品是根据高压异步电动机的启动特性设计的，匹配电动机功率220~2800kW。

When the AC asynchronous motor starts at rated voltage, the initial starting current is very large, often exceeding many times the rated current (usually 5~7 times). In order to reduce the starting AC, it does not affect the power grid. To start the AC multi-frequency motor, the commonly used step-down method is to use a reactor or a self-twisting transformer. The starting process of the AC motor is very short (generally several seconds to two minutes), and the reactor for step-down starting after starting is self-proclaimed. Transformer removal. The product is designed according to the starting characteristics of the high voltage asynchronous motor, matching the motor power 220~2800kW.

产品特点 Feature

- QKSG, QKSC型干式铁芯起动电抗器采用优质进口硅钢片，芯柱经多个气隙分成均匀小段，气隙采用环氧板作为隔绝，并采用高温高强粘接剂，以保证气隙在电抗器运行时不发生变化。
- 铁芯端面采用优质硅钢片端面胶，使硅钢片牢固地结合在一起，大大减小了运行中的口噪音，并具有较好的防腐蚀性。
- 线圈绕包式结构，线圈主绝热烘后在真空下浸以耐高温绝缘漆，该线圈不但绝缘性能好，而且机械强度高，能耐受电机启动时的大电流冲击和冷热冲击而不开裂。
- QKSG, QKSC dry core starter reactor adopts high quality imported silicon steel sheet, the core column is divided into uniform small sections through multiple air gaps, the air gap is insulated by epoxy board, and high temperature and high strength adhesive is used to ensure air gap The reactor does not change when it is running.
- The end face of the iron core is made of high-quality silicon steel sheet end face glue, which makes the silicon steel sheets firmly combined, which greatly reduces the noise of the port during operation and has better corrosion resistance.
- The coil is wrapped around the package, and the main insulation of the coil is immersed in a vacuum-resistant high-temperature insulating varnish under vacuum. The coil not only has good insulation performance, but also has high mechanical strength, and can withstand high current impact and thermal shock when the motor is started without cracking.



XIKAI®

空心电抗器

Hollow reactor

适用范围 Application

我公司专业生产的各种规格空心电抗器系列产品,产品电压范围从0~35kV,容量从0~3500KVAR，常用于无功补偿、滤除谐波、限流等场合，我公司生产的空心电抗器采用多层绕组并联的筒型结构。各包封间采用引拔撑条隔开形成通风气道，散热性好，同时采用小截面圆导线多股平行绕制，涡流损耗和漏磁损耗小，在绝缘方面我们采用每根导线表面采用聚酯薄膜多层半叠包，具有机械强度高，能耐受短路电流的冲击而不损坏，线圈表面有抗臭氧紫外线防护层，抗老化，耐各种恶劣气候。空心电抗器主要分为：1、串联电抗器；2、限流电抗器；3、滤波电抗器；4、并联电抗器；5、分裂电抗器；6、启动电抗器几个系列。

Our company specializes in the production of various types of hollow reactor series products, the product voltage range is from 0~35kV, the capacity is from 0~3500KVAR, often used in reactive power compensation, filtering harmonics, current limiting, etc., our company produces hollow reactance The device adopts a cylindrical structure in which a plurality of windings are connected in parallel. Each enclosing room is separated by drawing struts to form a ventilating air passage, which has good heat dissipation. At the same time, a plurality of parallel windings of small cross-section are used, and the eddy current loss and leakage magnetic loss are small. In terms of insulation, we adopt the surface of each wire. Polyester film multi-layer semi-stack, with high mechanical strength, can withstand the impact of short-circuit current without damage, the surface of the coil has anti-ozone UV protection layer, anti-aging, resistant to various harsh climates. Hollow reactors are mainly divided into: 1, series reactors; 2, current limiting reactors; 3, filter reactors; 4, shunt reactors; 5, split reactors; 6, start reactors several series.

型号及其含义 Model and implication

CK G K L □□□□

- 使用环境代号 Environment code
- 额定电抗率(%) Rated reactance rate
- 系统额定电压(kV) Rated voltage
- 电抗器额定容量(kVar) Rated capacity
- 铝质材质(铜质不标) Aluminum material (copper is not standard)
- 空心 Hollow
- 干式 Dry
- 串联电抗器 Series reactor

XK G K L □□□□

- 使用环境代号 Environment code
- 额定电抗率(%) Rated reactance rate
- 电抗器额定电流A Rated current
- 系统额定电压(kV) Rated voltage
- 铝质材质(铜质不标) Aluminum material (copper is not standard)
- 空心 Hollow
- 干式 Dry
- 限流电抗器 Current limiting reactor

LK G K L □□□

- 基波与谐波合成电流 Fundamental and harmonic synthesis current
- 电抗器额定电流A Rated current
- 系统额定电压(kV) Rated voltage
- 铝质材质(铜质不标) Aluminum material (copper is not standard)
- 空心 Hollow
- 干式 Dry
- 滤波电抗器 Filter reactor

BK G K L □□□

- 使用环境代号 Environment code
- 系统额定电压(kV) Rated voltage
- 电抗器额定容量(kVar) Rated capacity
- 铝质材质(铜质不标) Aluminum material (copper is not standard)
- 空心 Hollow
- 干式 Dry
- 并联电抗器 Shunt reactor

FK G K L □□□

- 额定电抗率(%) Rated reactance rate
- 电抗器额定电流A Rated current
- 系统额定电压(kV) Rated voltage
- 铝质材质(铜质不标) Aluminum material (copper is not standard)
- 空心 Hollow
- 干式 Dry
- 分裂电抗器 Split reactor

QK G K L □□□

- 额定电抗(Ω) Rated reactance
- 电抗器额定电流A Rated current
- 系统额定电压(kV) Rated voltage
- 铝质材质(铜质不标) Aluminum material (copper is not standard)
- 空心 Hollow
- 干式 Dry
- 启动电抗器 Start reactor

使用环境 Normal ambient condition

- 使用地点：户内或户外;
- 使用环境温度：-40°C~+45°C;
- 运行海拔高度：≤1000m;
- 安装场地应无有害气体、蒸汽及导电性或爆炸性尘埃;
- 相对湿度：≤90%;
- 最大风速: 35m/s;
- 地震烈度: ≤8度;
- 抗污能力: ≥25mm/kV;

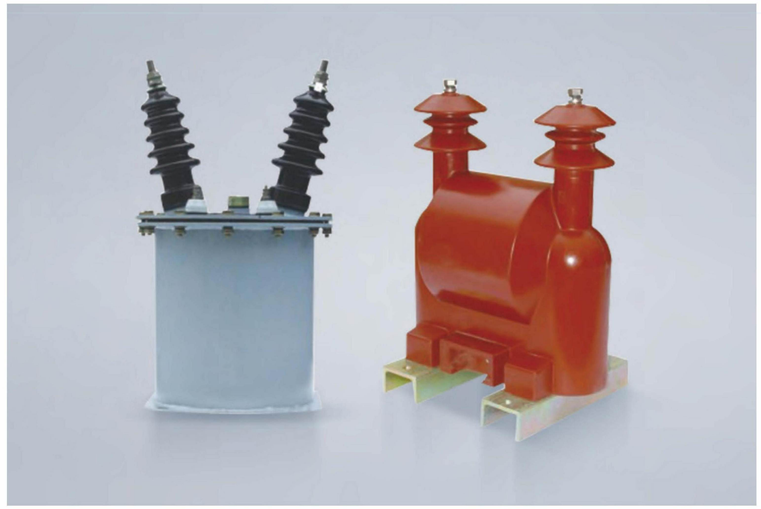
注: 若对使用环境条件有特殊要求，请在合同中提出。

- Use location: indoors or outdoors;
- Ambient temperature: -40°C ~ +45°C;
- Operating altitude: ≤1000m;
- The installation site should be free of harmful gases, vapors and conductive or explosive dust;
- Relative humidity: ≤90%;
- Maximum wind speed: 35m/s;
- Earthquake intensity: ≤ 8 degrees;
- Anti-fouling ability: ≥25mm/kV;

Note: If there are special requirements for the environmental conditions of use, please submit them in the contract.

XIKAI®

FD(G)2,FD(Z)2 型放电线圈 FD(G)2,FD(Z)2 Discharge coil



适用范围 Application

本型放电线圈系单相户内、户外装置，环氧树脂绝缘的全封闭产品与高压并联电容器组并联连接，当电容器组与系统断开后，能在5s内将电容器组上的剩余电压由$\sqrt{2}$Un降至50V以下。在正常运行时，二次绕组可以作电压指示，剩余绕组接成开口三角，当电容器极间局部发生故障时，会产生零序电压，驱动继电保护装置。本型放电线圈特点为体积小，重量轻、无局部放电、抗过电压能力强、空载损耗小，空载电流小、防污能力强、使用安装方便、免维护，是替代油浸式放电线圈的首选产品。

This type of discharge coil is single-phase, cast resin insulated used in doors or outdoors connected with high voltage parallel connection capacitor group. When the capacitor group is cut off from the system, it can take only five second to reduce the residual voltage of the capacitor group from$\sqrt{2}$Un to below 50V. When operating normal, the secondary winding is used as voltage indicator and the residual Winding is connected as split triangle. If the pole of capacitor partial breaks down, it would bring the zero sequence voltage to drive relay protection gear. The product is small, light, little partial discharge energy and high resistance to over voltage. It is a new product for superseding the oil type discharge coil.

型号及其含义 Code and implication

FD GZ 2/ $\frac{11}{\sqrt{3}}$ - 1.7 - 1 (W) (G)

- 改进设计 Improved design
- 户外装置 Outdoor device
- 单相 Single Phase
- 最大配套电容器容量Mvar (The Max. capacity of necessary capacitor)
- 额定一次电压 (kV) Rated primary voltage
- 设计序号 Design No.
- 干式绕注绝缘 Dry type cast-resin insulated
- 放电线圈 Discharge coil

结构 Structure

FD(G, Z)2/11/$\sqrt{3}$-1.7-1(W)型放电线圈为树脂绝缘全封闭结构，FD(G, Z)/2/11/$\sqrt{3}$-1.7-1WG为户外干式瓷绝缘结构，采用环一个铁芯柱上同心地装有一次、二次线圈。

The discharge coil, is casting resin insulated and fully enclosed type. the discharge coil is dry type and porcelain insulated. The are made up of annular core. the primary winding and secondary winding are installed concentrically on the same iron-core pole.

外形及安装尺寸 Outline & installation sizes

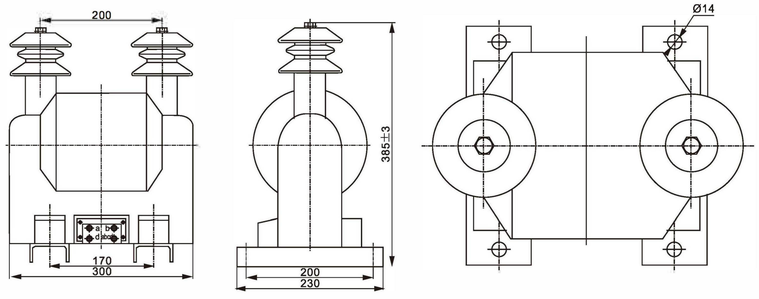


图1 FD(G, Z)2外形及安装尺寸图
Fig.1 Outline and installation dimension of FD(G, Z)2

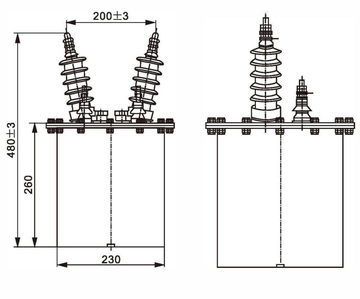


图2 FD2外形及安装尺寸图
Fig.2 Outline and installation dimension of FD2

CKJ5-80,125,160/1140
型交流低压真空接触器
Type AC low voltage vacuum contactor

适用范围 Application

CKJ5 系列低压真空接触器使用于交流50HZ，主回路额定工作电压到1140V，额定工作电流至600A的电流系统中，供远距离接通与开断电路及频繁地起动和控制交流电动机用。并适宜于与各种保护装置组成磁力启动器，具有电弧不外露等特点。特别适用于组成防爆磁力启动器。适用于煤矿或石油等行业。

CKJ5 Series AC Low voltage vacuum contactor is operated in the current system of AC50Hz, rated working voltage of main circuit up to 1140V, rated current up to 630A, used to remotely to make or break or frequently start and control AC motor. It can also be cooperated with various protective devices to form magnetic starter, the arc will not be exposed, specially it can be used to construct as explosion proof magnetic starter, suitable for coal or petroleum field.

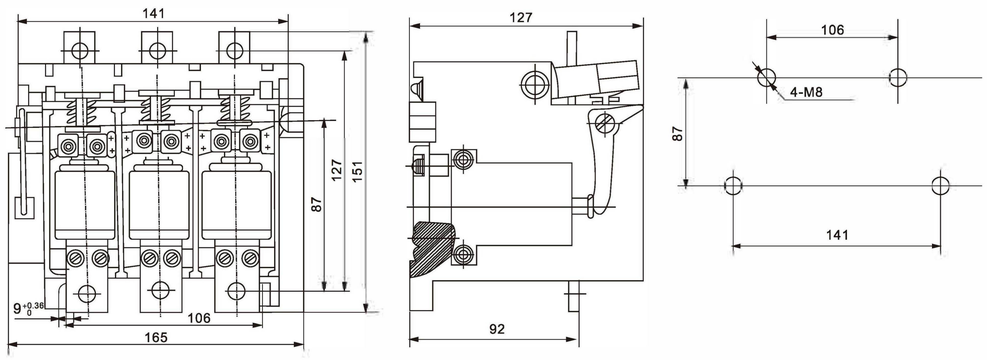
主要技术参数 Main Technical data

型号 Type	额定电压 (V) Rated voltage		额定电流主电路A Rated current of main circuit A	主触头参数 Data of main contacts			工频耐压V(有效值) Power frequency withstand voltage (virtual value)		
	主电路 Main circuit	控制电路 Control circuit		开距(mm) Opening distance	超程(mm) Over-travel distance	终压力(N) Final pressure	主电路 Main circuit	辅助电路 Auxiliary circuit	控制电路 Control circuit
CKJ5-80/1140	1140	36,110,220,380	80	1.8±0.2	>1	30±5	4200	2500	2000
CKJ5-125/1140	1140	36,110,220,380	125	1.8±0.2	>1	30±5	4200	2500	2000
CKJ5-160/1140	1140	36,110,220,380	160	1.8±0.2	>1	30±5	4200	2500	2000

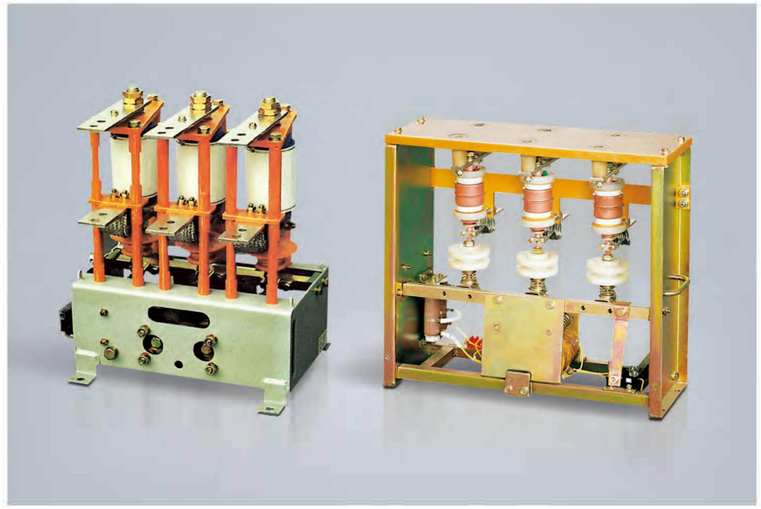
型号 Type	接通能 力 Making capacity	分断能 力 Breaking capacity	极限分断电流(KA) Ultimate breaking current	电寿命次数 Electrical endurances (cycles)		机械寿命次数 Mechanical endurances (cycles)	质量Kg Weight Kg
				AC3	AC4		
CKJ□-80/1140	10Ie，100次	8Ie，25次	2000,3次	60×10^4	6×10^4	300×10^4	3.8
CKJ□-125/1140	10Ie，100次	8Ie，25次	2000,3次	60×10^4	6×10^4	300×10^4	3.8
CKJ□-160/1140	10Ie，100次	8Ie，25次	2000,3次	60×10^4	6×10^4	300×10^4	3.8

注：Ie为主电路额定电流 Note: Ie is rated current of main circuit

外形及安装尺寸 Outline and mounting sizes



CKG3-6/160,250,400
型交流高压真空接触器
Type AC high voltage vacuum contactor



适用范围 Application

CKG3 型交流低压真空接触器使用于交流50Hz，主回路额定工作电压到1140V，额定工作电流至600A的电流系统中，供远距离接通与开断电路及频繁地起动和控制交流电动机用。并适宜于与各种保护装置组成磁力启动器，具有电弧不外露等特点。特别适用于组成防爆磁力启动器。适用于煤矿或石油等行业。

CK3 type AC high voltage vacuum contactor is operated in the current system of AC50Hz, rated working voltage of main circuit up to 1140V, rated current up to 600A, used to remotely to make or break or frequently start and control AC motor. It can also be cooperated with various protective devices to form magnetic starter, the arc will not be exposed, specially it can be used to construct as explosion proof magnetic starter, suitable for coal or petroleum field.

主要技术参数 Main Technical data

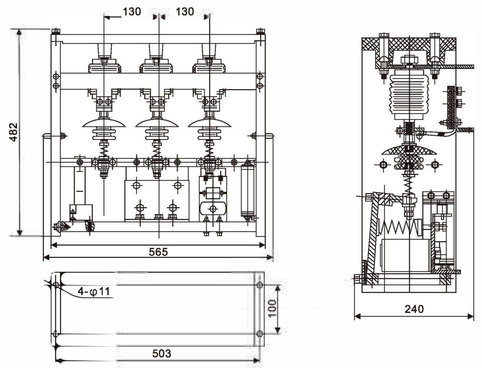
型号 Type	额定电压 (V) Rated voltage		额定电流主电路A Rated current of main circuit A	主触头参数 Data of main contacts			工频耐压V(有效值) Power frequency withstand voltage (virtual value)		
	主电路 Main circuit	控制电路 Control circuit		开距(mm) Opening distance	超程(mm) Over-travel distance	终压力(N) Final pressure	主电路 Main circuit	辅助电路 Auxiliary circuit	控制电路 Control circuit
CKG3-7.2/160	6000	220/110	160	3.5±0.3	2±0.2	> 85N	32000	2500	2000
CKG3-7.2/250	6000	220/110	250	3.5±0.3	2±0.2	> 85N	32000	2500	2000
CKG3-7.2/400	6000	220/110	400	3.5±0.3	2±0.2	> 85N	32000	2500	2000
CKG3-7.2/150	6000	220/110	150	4.5±0.3	2±0.2	> 85N	32000	2500	2000

型号 Type	接通能 力 Making capacity	分断能 力 Breaking capacity	极限分断电流(KA) Ultimate breaking current	机械寿命次数 Mechanical endurances (cycles)	质量Kg Weight Kg
CKG3-7.2/160	10Ie，100次	8Ie，25次	4	100×10^4	25.5
CKG3-7.2/250	10Ie，100次	8Ie，25次	4	100×10^4	25.5
CKG3-7.2/400	10Ie，100次	8Ie，25次	4.5	100×10^4	25.5
CKG3-7.2/150	10Ie，100次	8Ie，25次	3.8	100×10^4	27

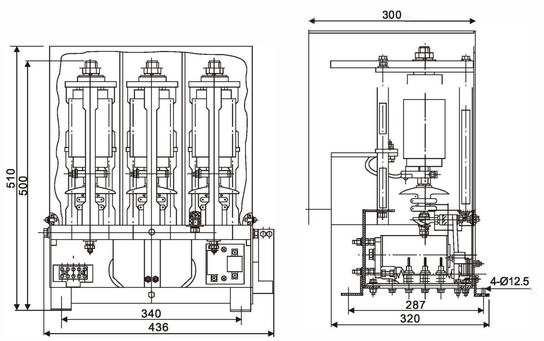
注：Ie为主电路额定电流 Note: Ie is rated current of main circuit

外形及安装尺寸 Outline and mounting sizes

CZG1型



ZN-6型



CKG-10/160,250,400,630
型交流高压真空接触器
Type AC high voltage vacuum contactor

适用范围 Application

CKG系列交流真空接触器用交流50HZ-60HZ，额定工作电压7.2KV、12KV，额定工作电流200A、400A、630A的三相户内电气系统中，可直接或远距离频繁操作电动机、变压器、容性负载等用电设备。该接触器最多可达六级，可根据客户要求配机械联锁装置，防止正向与反向接触器同时闭合。

CKG type AC high voltage vacuum contactor isoperated in the indoor powersystem of AC 50/60 Hz, rated working voltage7.2KV, or 12KV, rated current 200A, 400, 630A, used to remotely and frequently control AC motor, transformer, capacitive loads and etc equipment. This contactor can reach up to grade 6 at maxi, if required, mechanical interlock can be assembled to prevent positive and negative contactors being closed together.

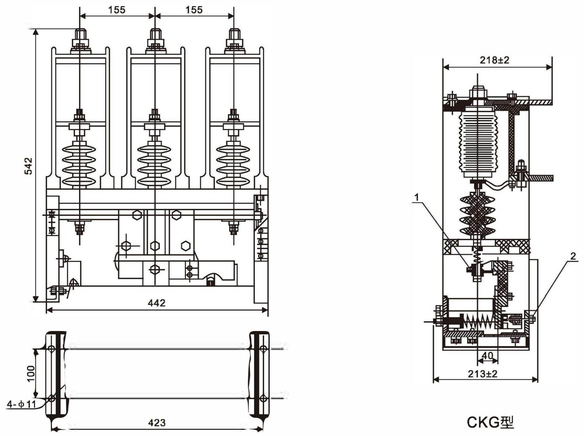
主要技术参数 Main Technical data

型号 Type	额定电压(V) Rated voltage		额定电流主电路A Rated current of main circuit A	主触头参数 Data of main contacts			工频耐压V(有效值) Power frequency withstand voltage (virtual value)		
	主电路 Main circuit	控制电路 Control circuit		开距(mm) Opening distance	超程(mm) Over-travel distance	终压力(N) Final pressure	主电路 Main circuit	辅助电路 Auxiliary circuit	控制电路 Control circuit
CKG10-/160	10000	110, 220, 380	160	5±0.5	2±0.2	>85N	42000	2500	2000
CKG10-/250	10000	110, 220, 380	250	5±0.5	2±0.2	>85N	42000	2500	2000
CKG10-/400	10000	110, 220, 380	400	5±0.5	2±0.2	>85N	42000	2500	2000
CKG10-/630	10000	110, 220, 380	630	5±0.5	2±0.2	>85N	42000	2500	2000

型号 Type	接通能力 Making capacity	分断能力 Breaking capacity	极限分断电流(KA) Ultimate breaking current	机械寿命次数 Mechanical endurances (cycles)	质量Kg Weight Kg
CKG10-/160	10Ie，100次	8Ie，25次	100Ie	100×104	30
CKG10-/250	10Ie，100次	8Ie，25次	100Ie	100×104	30
CKG10-/400	10Ie，100次	8Ie，25次	100Ie	100×104	30
CKG10-/630	10Ie，100次	8Ie，25次	100Ie	100×104	30

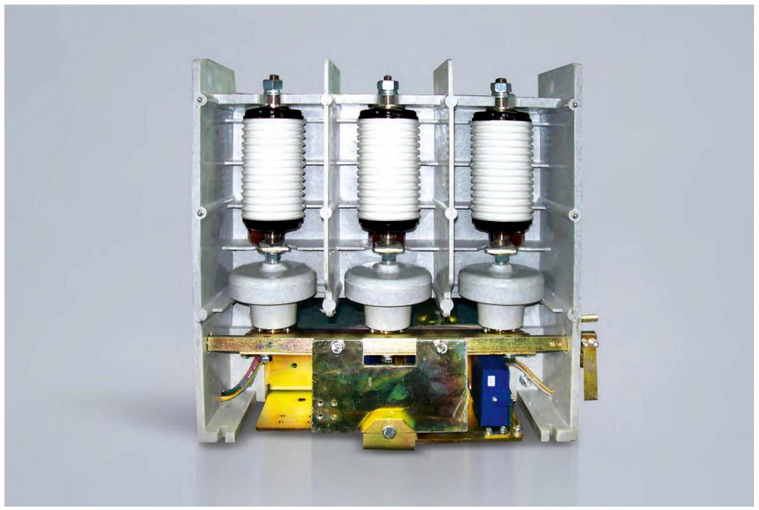
注：Ie为主电路额定电流 Note: Ie is rated current of main circuit

外形及安装尺寸 Outline and mounting sizes



CKG型

JCZ5
系列户内交流高压真空接触器
Series indoor AC high voltage vacuum contactor



适用范围 Application

JCZ5-7.2及JCZ2-12系列户内交流高压真空接触器(以一简称接触器)，分为合闸机械保持和电磁保持两种型式，该接触器适用于三相交流50HZ，额定电压7.2KV及12KV，额定电流到630A的电力系统中，供远距离接通与分断线路，控制高压电动机，变压器及容性负载等用电设备，尤为适用于各种频繁操作领域。

该接触器体积小，重量轻，采用当今国际流行的上下布置的组装式结构，使用维护方便，易于组成F-C回路成套设备。

JCZ5-7.2 and JCZ2-12 series indoor AC high voltage vacuum contactor (abbr. as Contactor), divided into two kinds: Mechanical holding or Electromagnetic holding at ON position. This contactor is operating in the power system of three-phase AC 50Hz, rated voltage 7.2KV and 12KV, rated current up to 630A, to remotely make and break the line, control high voltage motor, transformer, and capacitive loads, specially for where it need frequently switching.

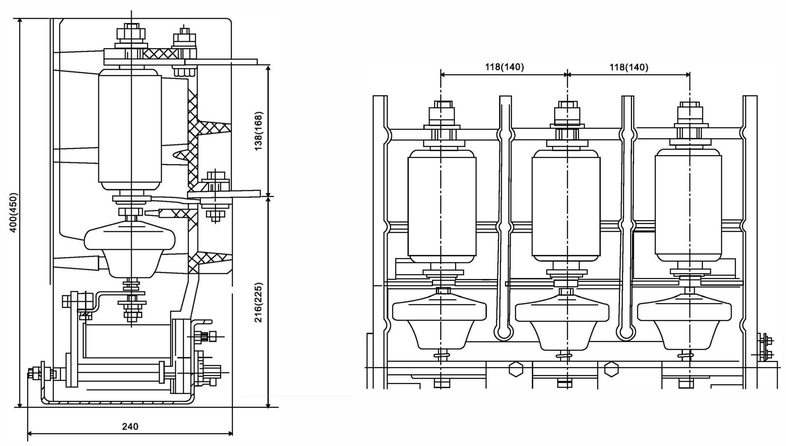
This contactors is very small, light weight, adopted the prevailing upper and downside assembled structure, convenient operation and maintenance, easy to be constructed as F-C loop switchgear.

正常使用条件 Normal working conditions

- 周围空气温度上限：+40℃，下限：-25℃。
- 海拔不超过2000M。
- 温度：相对湿度日平均值不大于95%，月平均值不大于90%；水蒸气压日平均值不大于2。2KPA，月平均值不大于1.8KPA。
- 周围空气应不受腐蚀性或可燃性气体、水蒸气明显污染。
- 无经常性的剧烈运动
- 接触器运行时，安装平面与水平的倾角不大于5°。
- 超出以上条件的要求，由用户同制造单位协定。

- Ambient temperature highest: +40℃, lowest -25℃;
- Altitude not more than 2000m
- Humidity: daily average not more than 95%, average per a month not exceed 90%, steam air pressure not more than 2.2KPA, average per a month not larger than 1.9KPA.
- The ambient atmosphere shall avoid the pollution from corrosive or flammable gas, steam.
- No frequently movement
- During contactor in service, the sloping angle between mounting surface to horizontal surface not more than 5°
- If the actual working conditions out of the above-mentioned scope, please discuss with manufacturer.

外形及安装尺寸 Outline and mounting sizes



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JCZ5
系列户内交流高压真空接触器
Series indoor AC high voltage vacuum contactor

主要技术参数 Main Technical data

序号 NO.	名称 Name		单位 Unit	数据 Data					
				JCZ5-7.2J/D-630/400/250			JCZ5-12J/D-630/400/250		
1	额定电压 Rated voltage		KV	7.2			12		
2	额定电流 Rated current		A	630	400	250	630	400	250
3	额定关合电流(有效值) Rated making current (virtual value)		A	6300	4000	2500	6300	4000	2500
4	额定最大分断电流 Rated maxi breaking current			5040	3200	2500	5040	3200	2500
5	4S热稳定电流 4s thermal stable current			6300	4000	2500	6300	4000	2500
6	极限开断电流 Ultimate breaking current			6300	4000	2500	6300	4000	2500
7	工频耐压 Power frequency withstand voltage		KV	32			42		
8	允许操作频率 Permissible operation frequency		次/h	300					
9	电气寿命 Electric endurance	AC-3	X10⁴次	25					
		AC-4		10					
10	机械寿命 Mechanical endurance		V	30					
11	额定操作电压 Rated operating voltage		A	AC110/220					
12	合闸线圈吸合电流 Pick up current of closing coil			≤DC6/3					
13	保持线圈保持电流 Current of holding coil			D:DC0.32/0.16					
14	分励线圈脱扣电流 Releasing current of shunt coil			J:DC2.5/1.3					

机械调整参数 Mechanical adjustment parameters

序号 NO.	名称 Name	单位 Unit	数据 Data	
			JCZ5-7.2J/D-630/400/250	JCZ5-12J/D-630/400/250
1	触头开距 Opening distance of contacts	mm	4.5+1.0/0.5	6+1.0-0.5
2	触头超程 Over-travel distance of contact		1.5±0.5	
3	平均合闸速度 Average closing speed	m/s	0.1~0.25	
4	平均分闸速度Average opening speed		0.3~0.6	
5	三相合分闸同期性 Asymmetry of three-phase opening	ms	≤2	
6	合闸时间/分闸时间Closing time/Opening time		≤150/≤150	
7	各相导电回路电阻(20℃) Resistance of each phase (20℃)	Ω	≤250	

XIKAI®

JKL
系列智能无功功率自动补偿控制器
Series Reactive power auto-compen sation controller

适用范围 Application

本系列控制器采用高性能单片机为基本软件，充分利用计算机的高速运算力和逻辑判断力，使全系列控制器真正做到了智能化、数字化。其技术先进功能完善，抗干扰能力强，支路稳定可靠，补偿精确，外型美观是电容屏厂家首选的产品。

This series of controllers adopt the high-performance single-chip micoco-mputer as the basic hardware, fully utilize high-speed operated strength and logic judgment of the computer to make them selves really been accomplished intelligent, digitally. It is the first-selected products for capacitance screen manufacture due to its advanced technology and perfect function, strong antii-nterference ability, reliable and stead uy branch exact compensation and aesthetic in look.

型号及其含义 Code and implication

JKL □□F - XX

- XX — 输出回路数 Number of output loops
- F — 设计代号 Design code
- JKL — 无功功率补偿控制器 Reactive power compensation controller

功能特点 Function characteristic

- 采用交流采样技术。
- 数字积分、滤波。
- 采用单片机控制技术，实现了电网无功功率自动补偿智能化。
- 抗干扰能力强，能抵御从电源直接输入的2000V干扰脉冲，不死机，不丢失数据，运行稳定可靠。
- 数码显示电网功率因数、过电压值、电流、等各种控制参数
- 具备随机自检功能无须提供电流互感器变比，补偿电容器容量。自动适应不同参数。
- 取样信号相序自动鉴别、转换。
- 具有手动运行和自动运行两种工作方式，方便用户安装调试。
- 具有过电压判断显示并快速切除电容器组的功能。
- 简明人机对话、操作、调试简单直观。
- 电流取样信号的输入电阻小于0.05Ω，可直接从计量回路中取出。

- Adopt AC sampling technology.
- Digital integration, filtration.
- Adopting the control technology of the single-chip microcomputer, has realized the intellectualized of electric network reactive auto matic compensation.
- Strong anti-interference ability can resist 2000V interference pulse from power direct, and not crashing, does not lose the data, it is reliable to run steady.
- Digital display electric network power factors, over-voltage values, current etc. Various kinds of control parameter.
- With self-checking functions, it needn offer current mutual inductors ratio to compensate capacitor capacity, is suitable for different parameter automatically.
- Sampling signal phase sequence is distinguished and changed automatically.
- With two working mode of manual and automatic, convenient for user to install and debug.
- With over-voltage judgment display function that can cut off the group of the capacitor quickly.
- Concise man-machine dialogue, operating, debugging, simplicity direct-view.
- The input resistance of current sampling signal is smaller than 0.05Ω, it can be taken out from measuring loops directly.

XIKAI®

JKL
系列智能无功功率自动补偿控制器
Series Reactive power auto-compen sation controller

使用条件 Service Conclitions

- 海拔高度不超过2500米;
- 环境温度-25℃~+55℃;
- 相对温度40℃时，≤50%，20℃时，≤90%;
- 周围环境无腐蚀气体，无导电性尘埃，无易燃易爆炸介质;
- 安装处无剧烈振动。

- Alitude not higher than 2500m.
- Ambient temperature-25℃~+55℃.
- Relative humidity≤50%, and 40℃≤90% at 20℃
- NO corrosive gas, inductive dust, and inflamm able and explosive mediumsin the ambient envionment.
- The mounting position should be protected against violent vibration.

主要规格 Main specification

项目 Items	型号 Type				
	JKL3CF	JKL2B/JKL5CF	JKG2BF/JKL2CF	JKL1CF	JKWD5
额定工作电压 Rated working voltage	380V±10%, 50Hz	380V±10%, 50Hz	220V±10%，50Hz	660V±10%，50Hz	380V±10%，50Hz
电流取样输入 Sampled input current	交流Li ≤5A AC(Li≤5A)	交流Li ≤5A AC(Li≤5A)	交流Li ≤5A AC(Li≤5A)	交流Li ≤5A AC(Li≤5A)	交流Li ≤5A AC(Li≤5A)
输出触点容量 Output contact capacity	380V×5A	380V×5A	380V×5A	660V×5A	DC12Vx30mA
介电强度 Dielectric strength	交流3000V(AC 3000V)	交流3000V(AC 3000V)	交流3000V(AC3000V)	交流3000V(AC3000V)	交流3000V(AC3000V)
工作方式 Working meteod	连续(Coutinuous)	连续(Coutinuous)	连续(Coutinuous)	连续(Coutinuous)	连续(Coutinuous)
投入门限 Switchoff threshold	0.80-0.99(可设置)	0.80-0.99(可设置)	0.80-0.99(可设置)	0.80-0.99(可设置)	0.80-0.99(可设置)
切除门限 Switchoff threshold	滞后0.91, 超前0.99(可设置)	滞后0.91, 超前0.99(可设置)	滞后0.91, 超前0.99(可设置)	滞后0.91, 超前0.99(可设置)	滞后0.91, 超前0.99(可设置)
投切延时 Switchoff time delay	1-150s可调 (adjustable)	1-150s可调 (adjustable)	1-150s可调 (adjustable)	1-150s可调 (adjustable)	1-150s可调 (adjustable)
过压保护 Overvolatge protection	400-500V可调 (adjustable)	400-500V可调 (adjustable)	220~300V可调 (adjustable)	660-690V可调 (adjustable)	400-500V可调 (adjustable)
取样信号相序 Phase sequence of sampling signal	自动鉴别 Automatic identifying	自动鉴别 Automatic identifying	自动鉴别 Automatic identifying	自动鉴别 Automatic identifying	自动鉴别 Automatic identifying
控制路数 Number of circuits controlled	1-12路(可设置)	1-12路(可设置)	1-12路(可设置)	1-12路(可设置)	1-12路(可设置)
整机功能 Overal function	10W	10W	10W	10W	10W
整机重量 Overall weight	1.35kg	1.8kg	1.35kg	1.35kg	1.35kg
安装开孔尺寸 Size mounting hole	72x72	162×102/113x113	162×102/113x113	113×113	113×113

XIKAI®

JKW
系列智能无功功率自动补偿控制器
Series Reactive power auto-compen sation controller

适用范围 Application

JKW 系列控制器采用高性能单片机为基本硬件和凝取了10年制造使用经验的专用控制程序构造，由于充分利用了计算机的高速运算力和逻辑判断力，使得本系列控制器真正做到了智能化。

JKW reactive power auto compensating controller is suitable for self-adjusting capacitor compensatine devices in low voltage distribution increase the efficiency of the power transformer, reduce line loss, and improve voltage quality. On final aim it will increase the economic and social benefits.

型号及其含义 Code and implication

JKW XX - (D)

- 输出方式: D-动态输出， 不标：静态输出
  Output mode: D-dynamic output, no standard: static output
- 输出回路数:16, 24
  Number of output loops: 16, 24
- 无功功率补偿控制器 Reactive power compensation controller

功能特点

- 采用交流采样技术。
- 数字积分、滤波、对谐波不敏感。
- 以无功功率为控制物理量，控制精度高，无投切震荡。
- 控制参数全数字操作，使用方便，一步到位。
- 采用自动寻扰的控制方案，减少投切次数，提高系统的使用寿命。
- 抗干扰能力强，能抵御从电源直接输入2000V干扰脉冲，不死机不丢失数据，运行稳定可靠。
- 数码显示电网功率因数，无功功率、电压、电流(一次侧)，控制参数。
- 具有手动运行和自动运行两种工作方式，方便用户的安装调试。
- 具有过压、欠电压判断显示并快速切除电容器组的功能，防止电容器组在过电压条件下运行。
- 具有可选的投切震荡功能。
- 具有可选的单组电容器从切除时刻到投入时刻延时200秒的功能，使电容器组切除后有充分的放电时间，减少电容器再次投入时对电网的冲击。
- 电流取样信号的输入电阻小于是0.05欧，可直接从计量回路中取出。
- 输出路数1-16路。

安装开孔尺寸 Size mounting hole

- JKW开孔尺寸：138×138mm

技术参数 Technical data

- **基本参数：**
  额定电压：AC 380±10%
  额定电流：AC 0-5A
  额定频率：50Hz±5%
- **控制参数**
  灵敏度：100mA 目标COSØ预置：0.70-0.99；
  步长0.01；出厂预置0.98
  投切延时：动态0.5~200s；静态2~200s
  CT变化：50/5A-3000/5A；步长1；出厂预置500/5A
  电容容量：0-99kvar 每支路出厂预制10kvar
  触点容量：动态输出每支路DC 12V×50mA
  静态输出每支路380V×7A/200V×5A
- **测量精度：**
  电压：±1.0% 电流：±1.0%
  功率因数 :±1.0% 无功功率:±2.0%

- **Basic Parameter**
  Rated voltage: AC 380±10%
  Rated current: AC 0-5A
  Rated frequency: 50Hz±5%
- **Control Parameter**
  Sensitivity: 100mA
  Targe COSØ Preset: 0.70-0.99; step length 0.01;
  Factory preset 0.98 input and
  cutoff time delay: dynamic state 0.5ms-200s;
  Static state 2~200s;
  CT variation: 50/5A-3000/5A: step length 1;
  Factory preset 500/5A
  Capacitance capacity: dynamic state output of each branch DC12V×50mA
  static state output of each branch 380V×7A/200V×5A
- **Measuring accuracy**
  Voltage: ±1.0% Current: ±1.0%
  Power factor: ±1.0% Reactive power: ±2.0%

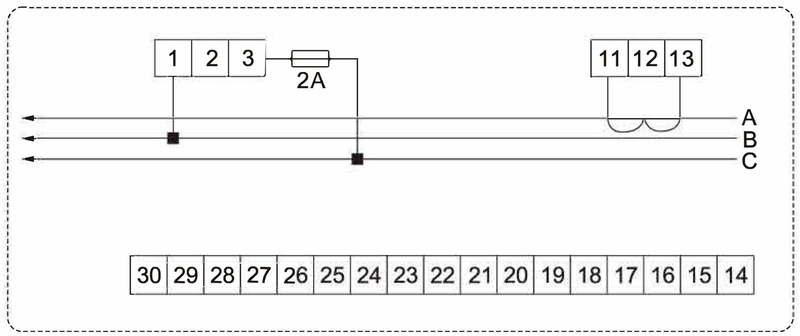
XIKAI®

JKW
系列无功功率动态补偿控制器
Series Reactive power auto-compen sation controller

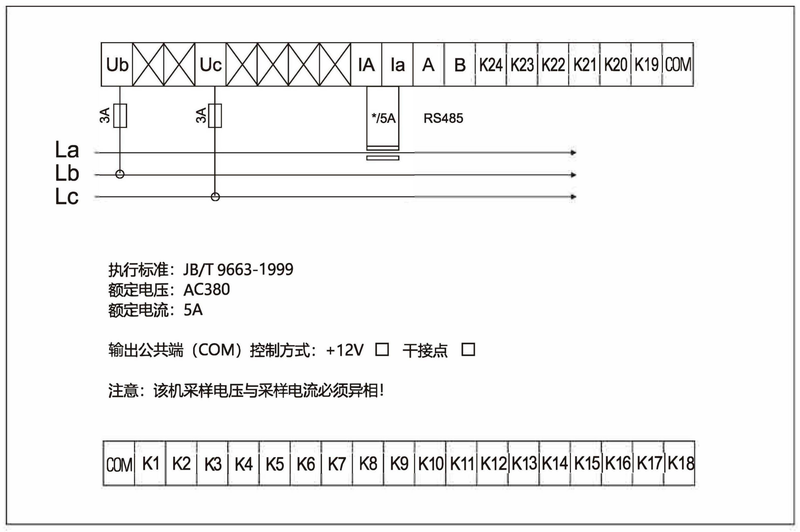
适用范围 Application

- Adopt AC sampling technology
- Digital integration, filtration, not sensitive to the harmony wave.
- Regard the reactive power as controlling physical quantity; it has high control precision.
- The operation of the full digital of control parameter, easy to use, put in right place in one step, and the data are not lost to have a power failure.
- Adopt and optimize the excellent control scheme automatically, reduce the times of input and cutoff, improve the service life of system.
- Strong anti-interference ability can resist 2000V interference pulse from power direct, and not crashing, does not lose the data, it is reliable to run steady.
- Digital display electric network power factors, reactive power, voltage, current (primary side) and control parameter.
- With two working modes of manual and automatic is convenient for user to install and debug.
- With the function of over-voltage, under-voltage judgment and display and fast cutoff capacitor group, prevent capacitor group from running under the over-voltage condition.
- With the function of available input and cutoff shocking and locking.
- With the function for the delay time of the selectable single group capacitor for 200 seconds from cutoff to input, makes capacitor have abundant discharging time after cutoff and reduce capacitor the impact in electric net when putting into again.
- The input resistance of current sampling signal is smaller than 0.05Ω; it can be taken out from measuring loops directly.
- Output Loops 1-12 Loop

接线原理图 Wiring diagram



JKW-16接线图



JKW-24接线图

XIKAI®

JKWF
系列无功功率分相补偿控制器（数码管）
Series Reactive power auto-compen sation controller

适用范围 Application

JKWF系列控制器，以8位单片机为核心，采用了分相取样分相补偿的控制方案，非常适用于交流50Hz，0.4kV三相负荷不平衡电力系统的无功补偿。

JKWF Series controller regards 8 single-chip microcomputer as core, adopts the control scheme of phase splitting sampling and compensation and common compensation and phase splitting compensated altogether, very suitable for reactive compensation with 50Hz, 0.4KV three-phase load imbalance power system.

型号及其含义 Code and implication

JKWF XX - (D)

- (D) 输出方式: D-动态输出， 不标：静态输出
  Output mode: D-dynamic output, no standard: static output
- XX 输出总回路:12, 16
  Number of output loops: 12, 16
- JKWF 无功功率补偿控制器 Reactive power compensation controller

技术参数 Technical data

- **基本参数：**
  额定电压：AC 220V±10%
  额定电流：AC 0-5A 额定频率：50Hz±5%
- **控制参数**
  灵敏度：100mA
  COSØ预置: 0.80-0.99; 步长0.01; 出厂预置0.98
  投切延时：2-250s；出厂预置30s。
  过压保护：230-260V; 步长1V;
  出厂预置253V
  CT变化：50/5A-3000/5A；步长1；
  出厂预置500/5A
  电容容量: 0-99kvar 每支路出厂预制10kvar
  触点容量: 动态输出每支路DC 12V×50mA
  静态输出每支路380V×7A/200V×5A
- **测量精度：**
  电压：±0.5%
  电流：±0.5% 功率因数 :±1.0%
  有功功率：±1.0% 无功功率:±1.0%

- **Basic Parameter**
  Rated voltage: AC 220V±10%
  Rated current: AC 0-5A Rated frequency:50Hz±5%
- **Control Parameter**
  Sensitivity: 100mA
  COSØ Preset: 0.80-0.99; step length 0.01;
  Factory preset 0.98 input and cutoff time
  delay: 2~250s, factory preset dynamic state 30s.
  Over-voltage protection: 230-260V; step length 1V;
  Factory prest 253V
  CT variation: 50/5A-3000/5A; step length 1;
  factory preset 500/5A
  Capacitance capacity: 0-99kvar factory preset
  of each branch 10kvar
  Contact capacity: dynamic state output of
  each branch DC12V×50mA
  Static state output of each branch 380V×7A/200V×5A
- **Measuring accuracy**
  Voltage: ±0.5% Current: ±0.5% Power factor: ±1.0%
  Active power: ±1.0%
  Reactive power: ±1.0%

安装开孔尺寸 Size mounting hole

JKWF-12型开孔尺寸 Opening dim：113×113mm
JKWF-16型开孔尺寸 Opening dim：138×138mm

XIKAI®

JKWF
系列无功功率分相补偿控制器（数码管）
Series Reactive power auto-compen sation controller

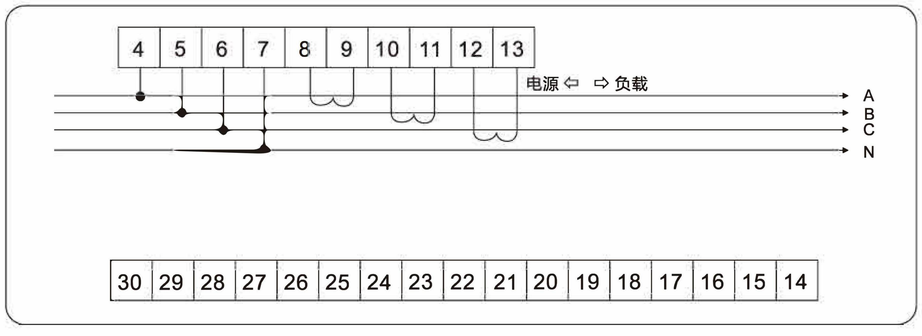
功能特点 Function characteristic

- LED 显示三相电压、电流、有功功率、无功功率、视在功率、功率因数及电网频率、控制参数等。(利用此系列控制器组装电容柜或补偿装置可以节省电流表、电压表、万用转换开关等。)
- 抗干扰能力强，能抵御从电源直接输入的2000V干扰脉冲，不死机不丢失数据，运行稳定可靠。
- 控制物理量为无功功率，控制精度高。
- 用户可根据自己的需要修改控制参数，停电控制参数不丢失。
- 具有自动识相功能(取样信号自动保持在同名状态)。
- 电流取样信号的输入电阻小于0.05欧，可直接从计量回路中取出。
- 具有过电压、欠电压、缺相保护功能。
- 补偿方式有分相补偿、分相补偿加三相补偿、三相补偿。
- 输出方式有静态、动态、复合等。
- JKWF-12输出路数1-12路，JKWF-16输出路数1-16路

- Liquid crystal display or LED shows three-phase voltage, current, active power, reactive power, power, power, power factor and power network frequency, control parameter, etc..(utilize this series of continuerollers to assemble the capacitance case or compensator can save ampere meter, voltmeter, universal change-over switch, etc.).
- Strong anti-interference ability can resist 2000V interference pulse from power direct, and not crashing, does not lose the data, it is reliable to run steady.
- Reactive power control physical quantity, high control precision;
- The suer can revise the control parameter according to his own need, the control parameter is not lost to have a power failure.
- With automatic discriminating phase function(sampling signal automatic be kept in the same state).
- The input resistance of current sampling signal is smaller than 0.05Ω; it can be taken out from measuring loops directly.
- With over-voltage, under-voltage, imperfect phase protective function.
- Compensation mode:phase splitting compensation, phase splitting splitting compensation and three-phase compensation, the three-phase compensation.
- Output mode:static state, dynamic state, compound etc.
- Output loops 1-12 Loop

接线原理图 Wiring diagram

JKWF-12接线图



JKWF-16接线图

XIKAI®

JKG
系列无功功率分相补偿控制器（液晶）
Series Reactive power auto-compen sation controller

JKG系列分相补偿控制器是集数据采集、无功补偿、电网参数分析等功能于一体的新型配电测控设备，适用于交流0.4KV、50Hz低压配电系统的监测及无功补偿控制。

JKG系列分相补偿控制器以高速数字信号处理器为核心，采用交流取样，人机界面为128X64点阵大屏幕液晶显示器，其具有配电监测、无功补偿、谐波分析，自适应频率算法，输入信号在45Hz~55Hz之间变化。

JKG series phase separation compensation controller as a new generation, integrate the functions of data acquisition, reactive power compensation, analysis of system parameters and etc, suitable for operating in the distribution system of AC0.4KV, 50Hz to monitor and control reactive compensation.

JKG series phase separation compensation controller adopted hi-speed digital signal processor, execute AC sampling. HMI is matrix 128x64 LCD, provided with supervision, reactive compensation, harmonic analysis, and adaptive freq calculation, the input signal change within 45Hz~55Hz

型号及其含义 Code and implication

JKG - XX - (D)

- (D) 输出方式: D-动态输出；不标：静态输出
  Output mode: D-dynamic output; no standard: static output
- XX 输出总回路:12, 24
  Number of output loops: 12, 24
- JKG 无功功率补偿控制器 Reactive power compensation controller

实时数据监测

- A、B、C各相电压、电流、功率因数;
- A、B、C各相所配电容器组投切状态;
- A、B、C各相有功功率、无功功率;
- A、B、C各相电压总谐波畸变率、电流总谐波畸变率，系统频率;
- A、B、C各相3、5、7、9、11、13次电压谐波含有率;
- A、B、C各相3、5、7、9、11、13次电流谐波含有率;

无功补偿

- 取样物理量为无功功率，无投切振荡。
- Y型补偿方式;
- △型补偿方式;
- Y+△综合补偿方式;

Real time data supervision

- A、B、C phase voltage, current, power factor
- A、B、C phase switching status (ON/OFF) of capacitors
- A、B、C phase active power, reactive power
- Total distortion of A、B、C phase voltage waves, current waves, system freq
- Contents of 3rd, 5th, 7th, 9th, 11th, and 13th power of voltage harmonics
- Contents of 3rd, 5th, 7th, 9th, 11th, and 13th power of current harmonics

Reactive compensation

- Sampling physical parameter is reactive power, no switching oscillation
- Y type compensation mode
- △type compensation mode
- Y+△combined type compensation mode

电源电压 Supply Voltage	AC 220V±20% / AC380V±20%
取样电压 Sampling voltage	AC 220V±20% / AC380V±20%
电源频率 Power frequency	50Hz±5%
取样电流 Sampling current	0~5A
整机最大功耗 Machine maximum power consumption	20W(视所控制的投切开关功率而定) Determined by the power of switch for control
控制输出接点 Control output contacts	24路 每路DC12V×30mA 24Loops, each loop DC12V×30mA

- 空气温度：空气温度不高于+65℃，不低于-25℃。
- 大气条件：空气湿度在20℃时不超过90%，在温度较低时，允许有较高的相对湿度。
- 海拔高度：不超过2500米。
- 环境条件：周围介质无燃爆危险，无腐蚀性气体，无导电尘埃及雨雪侵蚀，安装地点不能剧烈振动。

- Ambient air temperature：-25℃~+65℃。
- Relative humidity could be 90% at +20℃, higher relative humidity is allowable under lower temperature.
- Altitude not exceed 2500m
- The working site shall have no flammable, explosive medium, no conductive dust or corrosive gas

XIKAI®

JKG
系列无功功率分相补偿控制器（液晶）
Series Reactive power auto-compen sation controller

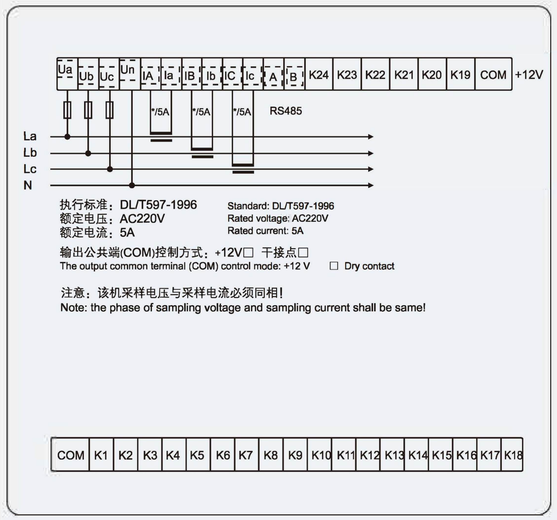
测量精度 Accuracy

电压 Voltage	±0.5%
电流 Current	±0.5%
有功功率 Active	±1.0%
无功功率 Reactive power	±1.0%
频率 Frequency	±0.5%
功率因数 Power Factor	±1.0%

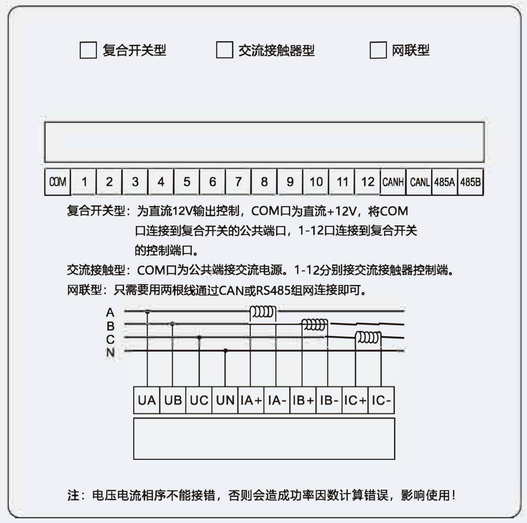
控制参数 Control parameters

控制灵敏度 Control sensitivity	30mA		
目标 Target COSΦ(1)	0.85~1.00	步长Step 0.01	出厂预置 default 1.00
目标 Target COSΦ(2)	0.00~0.60	步长Step 0.01	出厂预置 default 2.2
门限系数 Threshold coefficient	0.5~1.2	步长Step 0.1	出厂预置 default 1.00
投切延时(1) Delay for switching	00s~600s	步长Step 1/0.02	出厂预置 default 30s
投切延时(2) Delay for switching	00s~300s	步长Step 1	出厂预置 default 30s
过压保护 Overvoltage protection	230V~280V/400~480V	步长Step 1V	出厂预置 default 240V/430V
欠压保护 Undervoltage protection	210V~180V/300~360V	步长Step 1V	出厂预置 default 190V/330V
谐波电压超限 Harmonic voltage over-limit	00.0%~25.0%	步长Step 0.5%	出厂预置 default 00.0%
谐波电流超限 Harmonic current over-limit	00.0%~100.0%	步长Step 0.5%	出厂预置 default 00.0%

接线图 Wiring diagram



JKG-24 接线图



静态输出接线公共端为相线输入端；动态输出接线公共端为直流+12v输出端

JKG-12接线图

外形及安装尺寸 Outline & installation sizes

JKG-12型开孔尺寸 Opening dim：113×113mm
JKG-24型开孔尺寸 Opening dim：138×138mm

XIKAI®

JKG
系列相间补偿控制器
Series phase compensation controller

适用范围 Application

智能相间补偿控制器是集数据采集、无功补偿、电网参数分析等功能于一体的新型配电测控设备，适用于交流0.4KV、50Hz低压配电系统的监测及无功补偿控制并兼顾相间补偿功能，实现三相不平衡负载的有功转移。以高速数字信号处理器为核心，采用交流取样，人机界面为128X64点阵大屏幕液晶显示器，其具有配电监测、无功补偿、谐波分析，自适应频率算法，输入信号在45Hz~55Hz之间变化。

Phase reactive compensation controller as a new generation, integrate the functions of data acquisition, reactive power compensation, analysis of system parameters and etc, suitable for operating in the distribution system of AC0.4KV, 50Hz to monitor and control reactive compensation, and a phase compensation function. JKG-24 phase reactive compensation controller adopted hi-speed digital signal processor, execute AC sampling. HMI is matrix 128x64 LCD, provided with supervision, reactive compensation, harmonic analysis, and adaptive freq calculation, the input signal change within 45Hz~55Hz

使用条件 Normal service conditions

- 空气温度：空气温度不高于+65℃，不低于-25℃。
- 大气条件：空气湿度在20℃时不超过90%，在温度较低时，允许有较高的相对湿度。
- 海拔高度：不超过2500米。
- 环境条件：周围介质无燃爆危险，无腐蚀性气体，无导电尘埃及雨雪侵蚀，安装地点不能剧烈振动。

- Ambient air temperature：-25℃~+65℃。
- Relative humidity could be 90% at +20℃, higher relative humidity is allowable under lower temperature.
- Altitude not exceed 2500m
- The working site shall have no flammable, explosive medium, no conductive dust or corrosive gas

功能特点 Function

实时数据监测

- 电压、电流、功率因数
- 所配电容器组投切状态
- 有功功率、无功功率
- 电压总谐波畸变率,电流总谐波畸变率,系统频率
- 3,5,7,9,11,13,15,17,19次电压谐波含有率
- 3,5,7,9,11,13,15,17,19次电流谐波含有率

无功补偿

- 取样物理量为无功功率，无投切振荡。
- Y型补偿方式
- Δ型补偿方式
- “AB”“BC”“CA”补偿方式
- Y+Δ+“AB”“BC”“CA”综合补偿方式

Real-time data monitoring

- Voltage, current, power factor
- Switching state of the capacitor bank
- Active power, reactive power
- Voltage total harmonic distortion, current total harmonic distortion, system frequency,
- 3,5,7,9,11,13,15,17,19 times voltage harmonic content
- 3,5,7,9,11,13,15,17,19 times harmonic current content

Reactive power compensation

- The sampling physical quantity is the reactive power, has not cast to cut the oscillation.
- Y-type compensation
- Δ type compensation
- "AB" "BC" "CA" Compensation method
- Y + Δ + "AB" "BC" "CA" Synthesize the compensation way

XIKAI®

JKG
系列相间补偿控制器
Series phase compensation controller

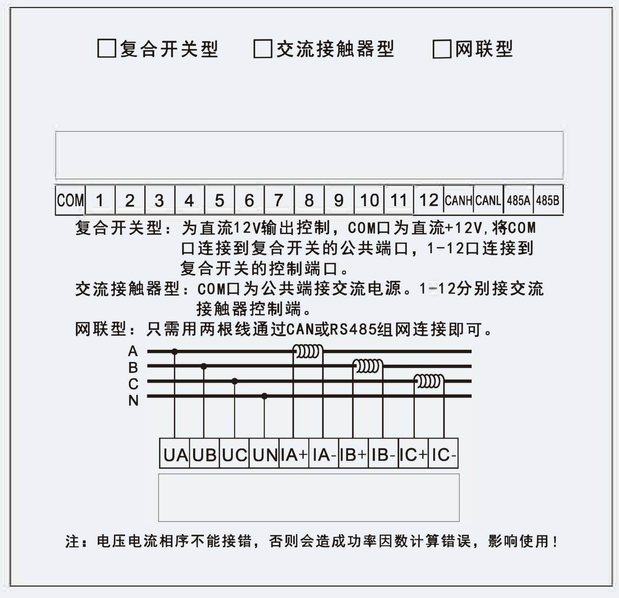
测量精度 Accuracy

电压 Voltage	±0.5%
电流 Current	±0.5%
有功功率 Active	±1.0%
无功功率 Reactive power	±1.0%
频率 Frequency	±0.5%
功率因数 Power Factor	±1.0%

控制参数 Control parameters

控制灵敏度 Control sensitivity	30mA		
目标 Target COSΦ(1)	0.85~1.00	步长Step 0.01	出厂预置 default 1.00
门限系数 Threshold coefficient	0.5~1.2	步长Step 0.1	出厂预置 default 1.00
投切延时(1) Delay for switching	00s~600s	步长Step 1/0.02	出厂预置 default 0s
投切延时(2) Delay for switching	00s~300s	步长Step 1	出厂预置 default 8s
过压保护 Overvoltage protection	400~480V	步长Step 1V	出厂预置 default 430V
欠压保护 Undervoltage protection	300~360V	步长Step 1V	出厂预置 default 330V
谐波电压超限 Harmonic voltage over-limit	00.0%~25.0%	步长Step 0.5%	出厂预置 default 00.0%
谐波电流超限 Harmonic current over-limit	00.0%~100.0%	步长Step 0.5%	出厂预置 default 00.0%

接线图 Wiring diagram



外形尺寸Outline size：144*144*95mm
开口尺寸 Opening size ：138*138mm
嵌入深度 Insertion depth：95mm

XIKAI®

JKWF-W
网联型无功补偿控制器
Network-connected reactive power compensation controller

型号及其含义 Code and implication

JKWF - W - L

L:液晶型 无:数码管型
L: liquid crystal No: Digital Tube Type
网联型控制方式，网线连接
Network connection control mode, network cable connection
无功功率补偿控制器 Reactive power compensation controller

技术参数 Technical data

环境条件：

- 海拔高度：≤2500mm
- 工作温度：-20℃~+60℃
- 存储温度：-40℃~+70℃
- 周围环境无腐蚀性气体，无导电尘埃，无易燃易爆的介质存在，安装地点无剧烈振动、无雨雪侵蚀。

测量数据：

- 测量电压：100V~290V
- 测量电流：0~6000A(一次)灵敏度：50mA(二次)
- 测量功率因数：滞后0.200~超前0.200
- 工作电源：220V±20%
- 测量频率：47~53Hz
- 显示有功功率：0~6553Kw
- 显示无功功率：0~6553Kvar
- 显示电压总谐波畸变率：0.0~100.0%
- 显示电流总谐波畸变率：0.0~100.0%

Ambient conditions:

- Altitude：≤2500mm
- Working temperature：-20℃~+60°C
- Storing temperature：-40℃~+70°C
- The working site shall have no corrosive gas, no conductive dust, no flammable or explosive medium, also nosevere vibration, and the snow, rain is not accessible.

Measurement data:

- Measuring voltage：100V~290V
- Measuring current: 0~6000A (primary) sensitivity: 50mA(secondary)
- Measuring power factor: Lag 0.200 ~ Forward 0.200
- Working source：220V±20%
- Measuring frequency：47~53Hz
- Display active power：0~6553Kw
- Display reactive power：0~6553Kvar
- Display the distortion rate of total voltage harmonics：0.0~100.0%
- Display the distortion rate of total current harmonics：0.0~100.0%

适用范围 Application

- 全数字化设计，交流采样，人机界面采用大屏幕LCD中文液晶显示器。
- 秉承以人为本的设计理念，模块化组装，外观流线设计。
- 可实时显示功率因数、电压、电流、有功功率、无功功率、电压总谐波畸变率、电流总谐波畸变率、频率的平均值及电容投切状态等信息。
- 设置参数中文提示，数字输入。
- 电容器控制方案支持三相补偿、综合补偿方案，可通过菜单操作进行设置控制方案。
- 具有手动补偿/自动补偿两种工作方式。
- 取样物理量为无功功率，具有谐波测量及保护功能。
- 控制器具有RS-485，MODBUS标准现场总线通讯接口中，方便接入智能开关柜系统。

- Full digital design, AC sampling, human machine interface is large LCD display.
- Designed with friendly human care, module assemblly,flow-line figure
- It can display power factor, voltage, current, active power, reactive power, distortion rate of total voltage harmonic waves, distortion rate of total current harmonic waves, frequency average value, and capacitor switching status and etc.
- Parameter setting, to be instructed in Chinese words and English, digit input.
- Capacitor control modes, two kinds: three-phase compensated together, combined compensation, you can set the control modes through the menu
- Two working modes: Hand compensation/Auto Compensation
- Parameter sampled is reactive power, it has the function of measuring harmonics and protections.
- The controller provides RS-485, MODBUS standard local bus and comm.. port, used to connect with intelligent switchgear system.

外形及安装尺寸
Outline and mounting sizes

开孔尺寸 Opening dim：113×113mm

JKWF-W
网连型无功补偿控制器
Network-connected reactive power compensation controller

输入/输出信号：
- 取样电压：L1、L2、L3相电压
- 取样电流：母线相电流互感器二次0～5A
- 控制输出：
  继电器干结点5A/250V阻性 (静态)
  12V 30mA/支路 (动态)
- RS485组网控制
  补偿控制器取样电压与取样电流必须同相，且同名端一致。

显示性能：
- LCD液晶显示器数据显示刷新周期≤1s

通讯接口数据：
- 通讯接口：RS-485　　协议：MODBUS通讯协议
- 通讯速率：9600bps(无校验位)

测量精度：
- 电压：±0.5%　　有功功率：±1.0%
- 电流：±0.5%　　无功功率：±1.0%
- 功率因数：±1.0%　　频率：±0.1Hz

设置数据：
- 总柜变比：50～9999(/5)
- 投切延时：1-240s
- 投入门限：0.7～-0.7
- 切出门限：0.7～-0.7 (切出门限-投入门限>0.03)
- 过压设置：220V～260V
- 欠压设置：180V～220V
- 压谐上限：1%～99% (99%为关闭此保护项)
- 流谐上限：1%～99% (99%为关闭此保护项)
- 电容设置：电容设置步骤参考产品说明书

Input / output signal:
- Sampling voltage: L1, L2, L3 phase voltage
- Sampling current: Bus phase current transformer secondary 0 ~ 5A
- Control output:
  Relay dry junction 5A / 250V Resistive (static)
  12V 30mA / branch (dynamic)
- RS485 network control
  The compensation controller sampling voltage and sampling current must be the same, and the same name end.

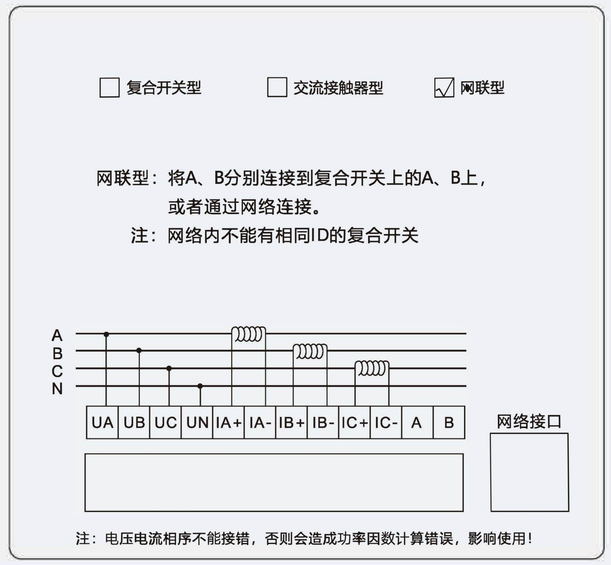
Display performance:
- LCD liquid crystal display data display refresh cycle ≤ 1s

Communication Interface Data:
- Communication Interface: RS-485
- Protocol: MODBUS communication protocol
- Communication speed: 9600bps (no parity bit)

Measurement accuracy:
- Voltage: ± 0.5%　　Active Power: ± 1.0%
- Current: ± 0.5%　　Reactive power: ± 1.0%
- Power factor: ± 1.0%　　Frequency: ± 0.1Hz

Setting data:
- Total counters ratio: 50 ~ 9999 (/ 5)
- Switch delay: 1-240s
- Input threshold: 0.7 ~ -0.7
- Cut-out threshold: 0.7 ~ -0.7(cut-out threshold-investment threshold>0.03)
- Overvoltage settings: 220V ~ 260V
- Undervoltage setting: 180V ~ 220V
- Tension upper limit: 1% ~ 99% (99% to turn off this protection)
- Fluffy ceiling: 1% ~ 99% (99% to turn off this protection)
- Capacitor setting: Refer to the product specification for the capacitor setting procedure

接线图 Wiring diagram



JKWF-W 接线图

ZMCF
系列抗谐波无功功率自动补偿控制器
Series Anti-harmonic reactive power automatic compensating controller

适用范围 Application

ZMCF系列抗谐波无功功率自动补偿控制器，使用于低压配电系统电容器补偿装置的自动调节(以下简称ZMCF)，使用功率因数达到用户预定状态，提高电力变压器的利用效率，减少线损，改善供电的电压质量

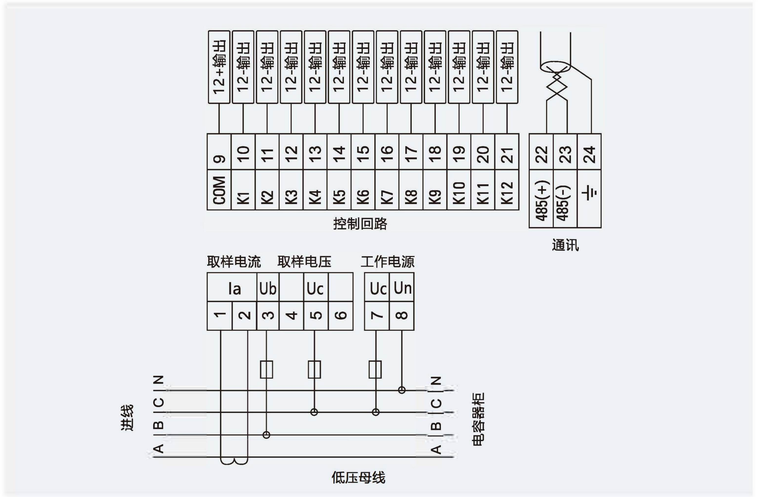
ZMCF series reactive power automatic compensating controller (hereinafter referred to as ZMCF) is applicable for the automatic adjustment of capacitor compensating device of low voltage distribution system. With power factor up to the user's presetting state, it can improve the utilization efficiency of electric power transformer, reduce the wire loss and improve the voltage quality.

功能特点 Function characteristic

- 以基波无功功率计算投切电容容量，可避免任何形式的投切震荡，并在有谐波的场合下能正确显示电网功率因数。
- 功率因数测量精度高，显示范围宽。
- 实时显示总功率因数(PF)。
- 实时显示电压畸变率及电流畸变率。
- 人机界面友好操作方便。
- 各种控制参数全数字可调直观使用方便。
- 具有自动运行与手动运行两种工作方式。
- 具有过电压和欠电压保护功能。
- 具有电压谐波超标保护功能。
- 具有掉电保护功能数据不丢失。
- 电流信号输入阻抗低≤0.01Ω。

- Calculate the capacitor capacitance by the fundamental wave reactive power, avoid the switching oscillation in any form. Correctly display the grid power factor under harmonic wave.
- High measurement accuracy of power factor, wide range of display.
- Real-time display of total power factor(PF).
- Real-time display of voltage distortion factor and current distortion factor
- Friendly human-machine interface, for convenient operation
- Various control parameters, by digital display, very visual and convenient to use.
- Two working modes: automatic and manual
- Over/under voltage protection
- Protection against the impermissibly high voltage harmonic wave
- Data is not lost due to the protection against the power failure
- Low input impendence of current signal: ≤0.01Ω

接线图 Wiring diagram



型号及其含义 Code and implication

ZMFD - XX - (D)

- (D)：输出方式：D-动态输出；不标：静态输出
  Output mode: D-dynamic output; no standard: static output
- XX：输出总回路
  Number of output loops
- ZMFD：无功功率补偿控制器
  Reactive power compensation controller

技术参数 Technical data

- 额定工作电压：AC220V
- 额定工作电流：AC 0-5A
- 额定工作频率：45Hz-65Hz
- 显示功率因数：滞后0.001-超前0.001
- 测量无功功率：0-9999Kva
- 测量有功功率：0-9999KWr
- 欠压保护值：AC300V
- 输出触点容量：AC220V 7A
- 灵敏度：20mA
- 整机消耗功率：10VA
- 显示：液晶显示
- 防护等级：外壳IP40

- Rated working voltage: AC220V
- Rated working current: AC 0-5A
- Rated working frequency:45Hz-65Hz
- Displaying power factor: Lag 0.001 and lead 0.001
- Measuring reactive power: 0-9999Kva
- Measuring active power: 0-9999KWr
- Under-voltage protection value: AC300V
- Output contact capacity: AC220V 7A
- Sensitivity: 20mA
- Consumption power of the whole machine: 10VA
- Display: LCD
- Protection degree: Enclosure IP40

安装开孔尺寸 Size mounting hole

开孔尺寸Opening dim：113mm×113mm

XIKAI®

ZMFD-2000
系列配电综合测控仪
Power Distribution Measurement and Control Instrument

型号及其含义 Code and implication

ZMFD - 2000

- 2000 — 设计序号 Design Number
- ZMFD — 配电综合测控仪 Power Distribution Measurement and Control Instrument

适用范围 Application

ZMFD-2000型配电综合测控仪是以数字采样信号为切入点，采用美国进口高性能快速反应微处理器(CPU)为核心，集交流采样、数据采集、电网参数分析、无功补偿、通讯等功能为一体而研发的的新一代配电测控设备。适用于低压电网系统的参数监测及无功补偿的控制。可为电网的安全经济运行、负荷的合理分配、电能质量的改善等提供完善而精确的数据依据。

ZMFD-2000 type power distribution measurement and control instrument, it is new generation distribution monitor device, which integrates the function of AC sampling technology, collecting data, parameter of power net analysis, reactive power compensating and communication. It is suitable for controlling parameter monitoring and reactive compensating of low voltage power net system. It can offer perfect and accurate data for safe running of power grid, reasonable distribution of load, improvement of electric energy quality.

功能特点 Function characteristic

- **实时显示功能：**
  全中文大屏幕液晶显示(含背光)，人机界面友好，中文提示操作直观简单。实时计算显示三相功率因数、三相有功功率、三相无功功率、三相电压、三相电流、三相电压畸变率、三相电流畸变率、2-16次电压电流谐波含有率、实时时钟等。
- **参数预置功能：**
  参数的预置可通过两种方式来完成。
  1：利用仪表提供的简易键盘输入，
  2：利用上位机分析系统软件与仪表通讯输入(四遥之遥调)。
- **通讯功能：**
  具有RS232和RS485硬件规约通讯口，用有线电缆实现有线通讯也可通过基于GSM网的通讯模块实现上位机与下位机远距离的无线通讯，可使用户在距仪表千里之外实现四遥功能。

- **Real-time indication function:**
  Large screen in Chinese LCD (including back light), friendly interface of human and machine, prompted in Chinese, simple operation, it can real-time indicate three-phase power factor, three-phase active power, three-phase reactive power, three-phase voltage, three-phase current, three-phase voltage distortion factor, three-phase current distortion factor, voltage and current relative harmonic content of 2-16 order, real-time clock.
- **Parameter preset function:**
  The presetting of parameter can be completed by two modes.
  1. Input by keyboard on the meter.
  2. Input by the analysis system software of upper machine and meter (remote control of four-remote).
- **Communication function:**
  With protocol communication interface of RS232 and RS 485 hardware, it realizes wire communication through wire cable, it also can realize remote radio communication between upper machine and lower machine through the communication module of GSM network, so it can realize four-remote function for user.

XIKAI®

ZMFD-2000
系列配电综合测控仪
Power Distribution Measurement and Control Instrument

- **无功补偿功能：**
  ZMFD-2000型配电综合测控仪输出最多16路(嵌入式12路)开关信号，以无功功率为控制物理量实时输出电容器投切控制信号，跟踪补偿电网无功功率的变化，达到改善电压质量、提高功率因数及变压器的利用率。
- **6种补偿方案：**
  ZMFD-2000型配电综合测控仪提供的6种补偿方案可利用控制参数任意选择。
- **手动投切功能：**
  利用此功能用户可强行投入或切除电容器并可无电压电流信号，为控制仪的安装调式提供了方便。

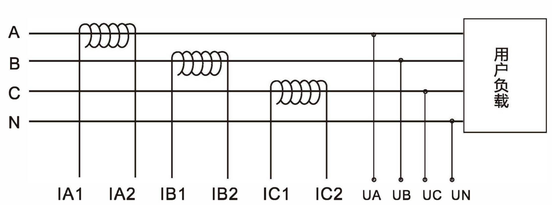
- **Reactive compensation function :**
  The controller outputs 16-way switch signal, the reactive power as the control physical quantity outputs switching control signal of capacitor in real time, traces the varieties of reactive power of compensating power grid to improve the voltage quality and increase power factor and availability of transformer.
- **Six compensating schemes:**
  Six compensating schemes supplied by ZMFD-2000 power distribution measurement and control instrument can be selected randomly with control parameters.
- **Manual switching function:**
  User can cut in or cut out the capacitor compulsorily with this function, it may not have voltage and current signal, so, it is convenient to install and adjust the controller.

接线图 Wiring diagram

- 电压电流输入接线端

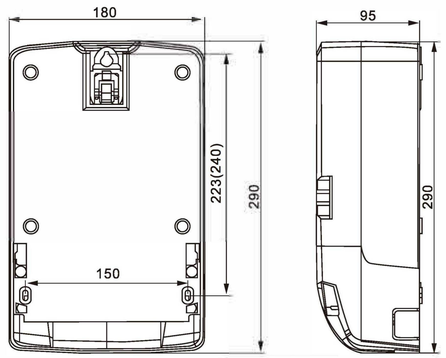
①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
A相电流 K1	A相电压	A相电流 K2	B相电流 K1	B相电压	B相电流 K2	C相电流 K1	C相电压	C相电流 K2	N线

终端接线端子板接线图



安装接线端子

外形及安装尺寸 Outline & installation sizes



注：如需其他功能我司可提供定制服务！

Note: if other functions require the company to customize

- 其他接线端子

13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
门接点 +	门接点 −	遥信 I +	遥信 I −	遥信 II +	遥信 II −	遥信 III +	遥信 III −	遥信 IV +	遥信 IV −	遥信 V +	遥信 V −	备用	备用	备用	备用	12V +	GND

外壳接线排端子接线图

13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
公共端 −	回路 1	回路 2	回路 3	回路 4	回路 5	回路 6	回路 7	回路 8	回路 9	回路 10	回路 11	回路 12	回路 13	回路 14	回路 15	回路 16	公共端 −

外壳接线排端子接线图

- 主板通讯功能：

①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
有功	无功	时钟	公共端	485 III A	485 II B	485 II A	485 II B	485 I A	485 I B

主板接线端接线图

D 无功补偿控制器

XIKAI®

ZMGY-2
高压无功补偿控制器
High voltage reactive compensation controller

适用范围 Application

ZMGY-2高压无功补偿控制器用于10kV、6kV线路无功自动补偿装置。它以电压无功、功率因数等电网参数进行实时监测，根据电压无功、功率因数或时间的变化，对高压线路进行动态补偿。对提高线路功率因数、电压、减少线损、改善电网供电质量起到了重要作用。

ZMGY-2高压无功补偿控制器采用高可靠微处理器，具有电容器自动投切控制，对电容器有过压、欠压、谐波。

ZMGY-2 high voltage reactive compensation controller is used for the reactive automatic compensating device at the circuit of 10kV and 6kV. It conducts the real-time monitoring and measuring with the power grid parameters like the reactive voltage, power factor. According to the change of reactive voltage, power factor or time, it fulfills the dynamic compensation for the high voltage circuit, plays an important role in improving the circuit power factor and voltage, reducing the wire loss, enhancing the quality of grid power grid, etc.

ZMGY-2 high voltage reactive compensation controller adopts the high-reliability microprocessor, with the functions of capacitor automatic switching control, capacitor protections against the over voltage, under voltage, harmonic wave.

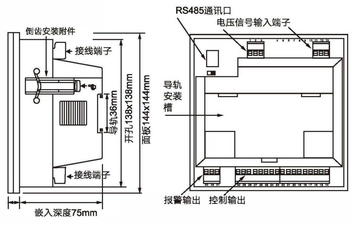
功能特点 Function characteristic

- ZMGY-2高压无功补控制器采用反时限与定时技术结合，并通过设定参数中电容容量与无功匹配运算自动控制电容器投切。
- 反时限技术可以有效保证电容器动作的平滑性，避免因电压波动，突变等引起的电器频繁投切或震荡投切。此外，为了更有效的避免电容器频繁动作，防止震荡投切，控制器会根据电容器容量进行预算，保证电容器动作后不会使系统进行在不正常的区域而造成电容器的相反动作。
- ZMGY-2 high voltage reactive compensation controller adopts the combination of inverse time lag and timing technology, controls the switching operation of capacitor through setting the capacitor capacity and reactive power calculation.
- Hereinto, the inverse time lag technology can effectively guarantee the smoothness of capacitor operation, to avoid the electric appliance frequent switching operation or concussive switching operation due to fluctuation and abrupt change of voltage. In addition, to further prevent the capacitor frequent operation and concussive switching operation, the controller will give the estimation according to the capacity of capacitor, to guarantee the capacitor can't conduct the opposite operation after it operates if the system is in the abnormal area.

外形及安装尺寸

Outline & installation sizes

侧视图 Side view　　背视图 Back elevation



主要技术指标 Main technical indicators

- 工作电压：AC100±20%
- 功耗：＜5VA
- 测量电压：110V　　精度0.5%
- 测量电流：0~5A　　精度1%
- 控制输出：7A AC220V
- 环境条件：温度-25℃~+65℃，
- 相对湿度25℃时小于90%
- 大气压力79.5kPa~106.0kPa(海拔2000m以下)
- 外形尺寸：138x138(mm)嵌入式

保护功能

- 电容器过压保护
- 电容器欠压保护
- 电容器电流谐波保护

闭锁功能

- 当电压小于额定值的75%或者大于额定值的125%时，闭锁电容器投切操作。
- 当电容器有任何保护动作后，闭锁电容器投切操作。
- 同一组电容器的两次动作时间间隔小于设定值，闭锁电容器投切操作。

- Working voltage: AC100±20%
- Power consumption: ＜5VA
- Measuring voltage: 110V　accuracy 0.5%
- Measuring current: 0~5A　　accuracy 1%
- Control output: 7A　AC220V
- Ambient conditions: Temperature: -25℃~+65℃
- Relative humidity: <90% at 5℃
- Air pressure: 79.5kPa~106.0kPa
(Altitude is lowerthan 2,000m)
- Outline dim.: 138x138(mm)Embedded

Protection function

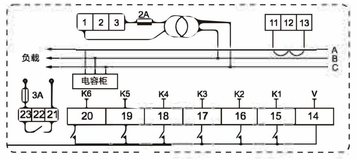
- Capacitor over-voltage protection
- Capacitor under-voltage protection
- Capacitor current harmonic protection

Latching function

- When the voltage is lower than 75% of rated value or higher than 125% of rated value, the latching capacitor performs the switching operation.
- After the capacitor performs any protection, the latching capacitor performsthe switching operation.
- When the time intervals of two operations of the same bank of capacitor, the latching capacitor performs the switching operation

与接触器接线参考图

Diagram of connection with the contactor



XIKAI®

JKG(ZMZ-CL)
低压无功补偿显示装置（配智能滤波电容器）
Low voltage reactive comprehensive control device(For Intelligent filter capacitor)

概述 General

低压无功补偿显示装置是西亚集团为适应低压无功自动补偿的发展需要，在吸收了国内外低压无功自动补偿技术的基础上研制与生产的新一代产品。可与本公司生产的ZMZ系列智能式无功补偿电容器配套使用，具备接线简洁，运行可靠等特点。使用本产品，可以替代现在低压无功补偿柜上的电压表3只、功率因数表3只、低压无功补偿控制器1台，以及所有电容器状态指示灯，使其极为简洁，同时可以节省大量接线。

Low voltage reactive power compensation device is new generation product researched and produced by our company, on basis of domestic and foreign latest technology of low voltage reactive automatic compensation, it can cooperate with our ZMZ series intelligent capacitors, simple wiring connection, reliable operation and etc. this device can substitute the voltmeter 3pcs, p.f. meter 3pcs, reactive controller 1pc, and all indicators for capacitor status, it can make compensation system very simple, and save lot of wire connection.

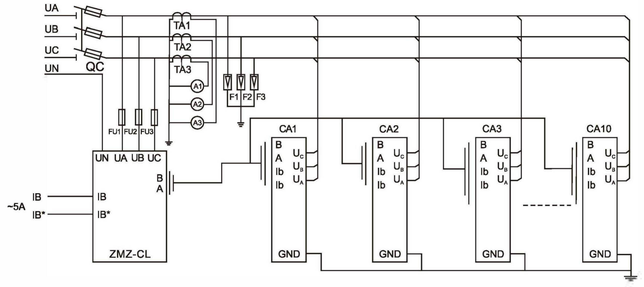
主要技术参数 Main Technical data

- 额定工作电压：交流50HZ，380V±20%；
- 功率消耗：小于3VA
- 电流取样：交流0~5A；
- 外形尺寸(宽×高×深)：120×120×100mm；
- 安装开孔尺寸：(宽×高)113×113mm。

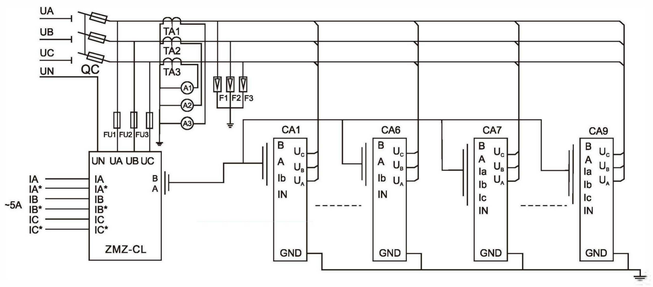
- Rated working voltage: AC50hz, 380V±20%
- Power consumption: less than 3VA
- Current sampling: AC 0~5A
- Outline size: (W x H x D)：120×120×100mm；
- Opening hole for mounting: (W x H): 113×113mm

应用电气原理图 Electric theory diagram

- 三相补偿应用电气原理图 Electric theory diagram for three-phase together compensation



- 混合补偿应用电气原理图 Electric theory diagram for combined compensation mode



功能特点 Function characteristic

- 动态显示电容器投运、退运路数配电功率因数、电压。
- 当电网电压超过过压设定值时，快速切除已投入的电容器。
- 自动判别校正取样电流极性，安装调试时可以不考虑电流互感器极性。
- 抗干扰能力强，能抵御雷击等干扰。
- Dynamically display the capacitor switching on/off status, power factor, voltage.
- When system voltage exceeds over-voltage setting, it will cut off the switched capacitors quickly.
- Self identify the polarity of the sampling current, consequently CT connected polarity is not considered during installing.
- High anti-interference, it can resist lightning impulse and etc.

使用环境 Working conditions

- 海拔高度：不超过2000M。
- 大气压力：79.5~106.0kpa
- 环境温度：-45℃~55℃。
- 空气相对湿度：40℃时20~90%；
- 周围环境，无易燃易爆的介质存在，无导电尘埃及腐蚀性气体存在。
- 电网电压波动范围不大于额定电压±20%。
- Altitude not exceed 2000m
- Air pressure：79.5~106.0kpa
- Ambient temperature：-45℃~55℃。
- Relative humidity at 40℃: 20~90%
- The working site shall have no flammable, explosive medium, no conductive dust or corrosive gas
- The fluctuation of system voltage not exceed rated voltage ±20%

XIKAI®

JKG(ZMZ-DZ)
智能无功补偿控制器
Intelligent type reactive controller

产品特点 Features

- 以无功功率计算投切电容器容量，补偿精度高；
- 显示屏采用128×64点阵大尺寸LCD屏，中文界面，美观大方；
- 实时显示当前时间机内温度，电流电压及谐波参数
- 可设置过电压、欠电压、欠电流、过、欠补偿等各行参数并存储，掉电数据不丢失；
- CAN与485通讯接口,内置MODBUS-RTU协议。
- 最大输出控制回路数128回路，能满足用户更多回路补偿要求。
- 自动寻优的控制方式，并可实现8421编码控制；
- 匹配本公司的ZMZ系列智能电容器，可实现共补、分补、混合补偿的控制方式。
- 电压畸变保护功能，实时检测谐波含量；
- 抗干扰能力强，能抑制谐波等干扰信号；
- 内置TF卡，可存储日电网参数、日投切信息、日报警信息，可保存5年数据；
- 支持U盘抄表、下载数据，以及软件更新。

- Using reactive power to calculate the capacity of the switching capacitor, high compensation accuracy;
- Display with 128 × 64 dot matrix large-size LCD screen, Chinese interface, beautiful and generous;
- Real-time display of the current time machine temperature, current and voltage and harmonic parameters
- Can set the over-voltage, under-voltage, under-current, over, under-compensation and other parameters and store, power-down data is not lost;
- CAN and 485 communication interface, built-in MODBUS-RTU protocol.
- The maximum output control circuit number 128 loop, to meet the user more loop compensation requirements.
- Automatic optimization of the control, and can achieve 8421 encoding control;
- Matching the company's ZMZ series of intelligent capacitors, can achieve total complement, sub-complement, mixed compensation control.
- Voltage distortion protection, real-time detection of harmonic content;
- Strong anti-interference ability, can restrain harmonic interference signal;
- Built-in TF card, can store the Japanese grid parameters, the daily switching information, daily alarm information, can save 5 years of data;
- Support U disk meter reading, download data, and software updates.

型号及其含义 Code and implication

ZMZ D Z

- 智能控制器 Intelligent controller
- 多功能 Multifunction
- 企业代码 Enterprise code

使用环境 Normal service conditions

- 环境温度为-20℃~50℃
- 湿度：≤90%(20℃)
- 海拔高度：≤2500m
- 无易燃易爆的介质存在，无导电尘埃及腐蚀性气体存在。
- Ambient air temperature：-20℃~+50℃
- Relative humidity could be 90% at +20℃
- Altitude: ≤2500m
- The working site shall have no flammable, explosive medium, no conductive dust or corrosive gas

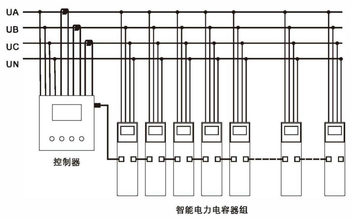
产品功能 Function

型式 Type	功能 Function	功能配置
测量显示 Measure-ments display	电压 Voltage	√
	电流 Current	√
	功率因数 Power factor	√
	有功功率 Active power	√
	无功功率 Reactive power	√
	电压波形 Voltage waveform	√
	电流波形 Current waveform	√
保护功能 Protection	投切次数 Switching frequency	√
	电压超限 Over voltage	√
	电压低限 Low voltage limit	√
	压谐超限 Pressure harmonic overrun	√
	流谐超限 Flowing beyond the limits	√
	零流保护 Zero-flow protection	√
	欠补偿保护 Under compensation protection	√
	过补偿保护 Over compensation protection	√
信息维护 Information Maintenance	时钟 Clock	√
	RS485接口 RS485 interface	√
	USB接口 USB interface	√
	CAN接口 CAN interface	√
	TF卡储存数据 TF card to store data	√
	支持128回路联机控制 Support 128 loop online control	√

主要技术参数 Main Technical data

电源参数 Power Parameters	额定电压 Rated voltage	AC 400V(偏差≤±10%，正弦波且总畸变＜5%) AC 400V (deviation ≤±10%, distortion sine wave <5%)		
	额定电流 Rated current	AC 0~5A(电流谐波＜10%, 电流输入阻抗≤0.02 Ω) AC 0~5A (current harmonics <10%, Current input impedance ≤0.02 Ω)		
	工作频率 Frequency	50Hz	待机功耗 Power consumption	＜0.5W
测量精度 Measurement accuracy	电压 Voltage	≤ 0.5%	电流 Current	≤ 0.5%
	功率 Power	≤ 0.5%	功率因数 Power Factor	± 0.01%
	时间 Time	≤ 100ms	温度 Temperature	±1℃
网络 Network	组网数量 Networking Number	≤ 128 回路	初始化组网时间 Networking initialization time	≤ 10s
环境 Environment	环境温度 Temperature	-30~+ 60℃		
	相对湿度 Relative humidity	90 % RH(20°C时，无凝露) 90% RH (when 20°C non-condensing)		
外形尺寸(mm) Overall dimensions (mm)		120X120(宽X高)		
安装尺寸(mm) Installation size (mm)		112X112		
防护等级 Degree of protection		外壳IP30		
灵敏度 Sensitivity		100MA		
控制方式 control method		自动寻优，并可实现编码投切		
通讯接口 Communication Interface		RS485, CAN, USB		

接线示意图 Wiring diagram



注:接线方式与ZMZ-CL一样。

XIKAI®

TBBX
低压无功功率就地补偿装置
Reactive field compensator

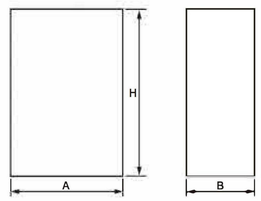
正常工作条件及安装条件 Normal working condition and mounting conditions

- 使用条件：海拔≤2000米，环境温度-25℃~+50℃，湿度35℃时，≤90%，
- 额定电压：400V，50Hz。
- 额定容量：1~100Kvar。
- 电容量允差：0~+15%。
- 损耗角正切值：≤0.2%。
- 最高允许过电压：110%额定电压。
- 最高允许过电流：130%额定电流。
- 绝缘性：极壳间大于1000MΩ。
- 自放电特性：切出3分钟后，剩余电压降至50V以下。

- Service conditions: Altitude ≤2000m; Ambient temperature -25℃~+50℃, humidity≤90% at 35℃.
- Rated voltage:400V,50Hz
- Rated output:1~100Kvar
- Capacitance Tolerance:0~+15%
- Tangent of the loss angle:≤0.2%
- Max allowable over voltage:110% rated voltage
- Max allowable over current:130% rated current
- Insulating property: More than 1000MΩ between the pole and the enclsure
- Self-discharging characteristics: After switching off for 3 minutes, the residual voltage decreases to less than 50V.

外形尺寸 Overall Dimension

规格Spec	A	B	H
1-10Kvar	220	100	300
11-16Kvar	220	100	400
17-22Kvar	230	140	400
23-40Kvar	300	230	400
45-60Kvar	300	250	550
65-100Kvar	500	250	550



适用范围 Application

“西亚牌”TBBX型无功就地补偿器是本公司采用自愈式并联电容器研制开发的一种节电产品。它安装在感性负载旁与感性负载就地并联，同步投运，直接作无功补偿，从根本上提高电网的功率因数，降低线损，改善末端负载的供电电压，挖掘电系统的供电潜力。该产品广泛应用于工矿企业，商场大厦，以及农村电网等低压配电系统中感性负载的就地无功补偿。

XIYA brand of TBBX type reactive field compensator is a kind of energy-saving product developed through the self healing type of shunt capacitor by the company. The device is mounted beside the in ductive load and shunted with it in field to operate synchronously so as to do reactive compensation directly. As a result, the power factor of the electric network is promoted, the line loss reduced, the supply voltage of the end load improved, and the supply potential of the distribution system developed fundamentally. The device is widely applied to the low voltage distribution system of industrial and mining enterprises, emporiums and buildings, and electric network of countries to do field reactive compensation for inductive load.

主要特点 Main Characteristics

- 补偿配置灵活，直接高效。
- 投资小，回报率高。一般使用半年所节约的电费就可收回投 资，经济效益显著。
- 体积小，重量轻。
- 安装方便，使用安全可靠。

- Flexible, direct and high efficient compensation layout
- Making high profit by small amount of investment. In general, theelectricity fees saved by using the device in half a year are equal to the investment amount, so the economic benefit is obvious.
- Small volume and light weight.
- Convenient installation and safe and reliable operation.

XIKAI®

DGAC
低压无功就地补偿装置（静态型）
DGAC reactive field compensator(static)

适用范围 Application

DGAC型系列装置采用计算机辅助设计(CAD)，引入微电脑控制，对无功量实行智能化跟踪补偿，其结构合理，技术先进，广泛应用于低压电网、提高功率因数，减少无功损耗，改善供电质量，是新一代的节电产品。

The DGAC series of devices are introduced the micro-computer control program by the computer aided Design(CAD)so as to trace and compensate the reactive electricity intelligently. With the reasonable construction and advanced techniques, these devices are widely applied to low voltage electric network to promote power factor, reduce reactive loss, and improve the quality of power supply, therefore they are the energy saving products of the new generation.

型号及其含义 Code and implication

DGAC□-□-□/□

- 投切路数 Total feeders no.
- 补偿容量(Kvar) Total capacity
- 额定电压(KV) Rated voltage(KV)
- T：综合柜体 T: Dehe type panel body.
  G：GGD型柜体 G: GGD type panel body
- 补偿装置 Compensating device
- A：采用电容接触器投切 A: capacitive contactor used
- 功率因数 Power factor
- 低压 Low voltage type

主要特点 Main Characteristics

- 体积小，便于安装维修。专用于额定电压380V，容量30-600kVA的三相变压器的无功就地补偿。
- 采用微电脑控制，功能齐全，性能可靠，补偿方式自动，LED数字显示电网功率因数，显示范围：滞后(0.00~0.99)，超前(0.00~0.99)。
- 通过面板键盘三个功能设定键完成数字显示COSΦ设定值、延时设定值、过压设定值的设定，简明的人机对话，使操作极为方便。
- 有超前、滞后过电压LED指示灯指示，LED提示编程输入。
- 使用安全、具有过电压保护功能；当电网电压超过本机电压设定值 (出厂时已调整到430V，用户可根据需要在400~450V范围内重新设定)时，数字COSΦ表自动转换显示为电网当前的电压值，同时自动快速逐级切除已投入的电容器。一旦电压恢复正常，本装置会自动恢复工作。
- 抗干扰能力强，高于国家专业标准。

- Small size facilitates installation and maintenance of equipment. It is designed specially for reactive local compensation of three-phase transformers with rated voltage 380V and capacity 30~600KVA.
- Controlled by microcomputer and adopting automatic compensation mode, it has complete functions and reliable performance. LED digital display shows the power factor of power line, ranging from lagging (0.00~0.99) to leadign(0.00~0.99).
- The set values of COSΦ, delay and over-voltage can be set through three functional set keys on the panel keyboard and shown on the digital display. Concise man-machine dialogue facilitates the operation.
- With pilot lamp indicating the lagging, leading to operate and over-voltage, LED hints program input.
- With over-voltage protection function, it is safe in operation. (The over-voltage set value has been set at 430V in factory. The user can reset is between 400V and 450V according to their own needs.) When power line voltage exceeds the set value, COSΦ digital meter is changed automatically and shows the present voltage value of power line. At the step by step. Once the voltage regains normally, This installation will work automatically again.
- Having strong anti jamming capability, it can resist nterference pulse of 2000V input directly through power line. The index exceeds national special standard.

XIKAI®

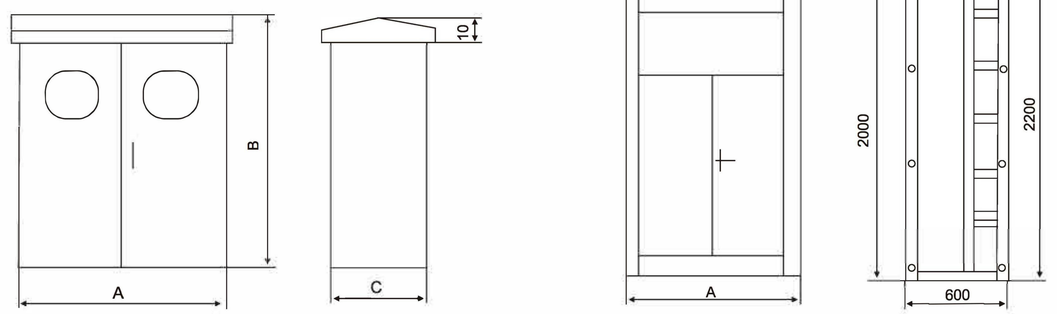
DGAC
低压无功就地补偿装置（静态型）
DGAC reactive field compensator(static)

主要技术指标 MainTechnical Characterstics

- 使用条件：海拔≤2000米，环境温度-25℃~50℃，湿度20℃，≤50%，安装倾斜≤5°。
- 额定电压：400VAC，50Hz。
- 额定容量：30、36、40、48、56、60、64、72、84、90、96、120、160、200、250、300、350、400、500、600kvar。
- 使用电压范围：(0.85~1.10)倍额定电压。
- 最大允许过电流：1.30倍额定电流。
- 控制路数：4路，6路，8路，10路，12路。
- 投切时间：1~150s/次，可调。
- 工作方式：自动，连续运行。
- 负载在5~100%间变化时，COSφ值保持在0.95以上。

- Service conditions: Altitude≤2000m, ambient temperature -25℃~50℃, humidity ≤90% at 20℃and ≤50% at 40℃, and mounting gradient ≤5°.
- Rated voltage: 400VAC, 50Hz.
- Rated output: 30、36、40、48、56、60、64、72、84、90、96、120、160、200、250、300、350、400、500、600kvar
- Operating voltage range: (0.85~1.10)times of rated voltage.
- Max allowable current: 1.30 times of rated current.
- Number of circuits controlled:4,6,8,10,12.
- Switching time:1~150s/time, adjustable.
- Operation method: Automatic, continuous operation.
- When the load varies from 5% to 100%, the COS ϕ value remains over 0.95.

外形尺寸 Overall dimension



□□ Kvar	A(mm)	B(mm)	C(mm)
30-64	700	900	400
64-96	700	900	400
96-240	700	950	550
200-600	PGL(GGD)型交流低压配电屏		

注：以订购时的实物尺寸为准，上述尺寸仅供参考
Note: the above mentioned size is for reference only, actual size based on the products.

DGFC
低压无功补偿装置（动态型）
Series Reactive power auto-compen sation controller(state)

型号及其含义Model and implication

DGFC□-□-□/□

- 投切路数 Total feeders no.
- 补偿容量(Kvar) Total capacity
- 额定电压(KV)
- T：综合柜体 T：Dehe type panel body.
- G：GGD型柜体 G：GGD type panel body
- 补偿装置 Compensating device
- Z：采用晶闸管投切，F：采用复合开关投切
  Z: Thyristor switch used, F: compound switch used
- 功率因数 Power factor
- 低压 Low voltage type

主要特点 Main Characteristics

- 体积小，便于安装维修。防雨水性能好、户内、户外两用。
- 控制参数全数字操作，使用方便、一步到位、停电数据不丢失。
- 数码显示电网功率因数、无功功率、电压、电流(一次侧)、控制参数。
- 具有过压、欠压判断显示并快速切除已补的电容器组的功能，确保电容器安全运行。
- 具有手动补偿功能和自动补偿两种工作方式。
- 具有按电容器组人工输入的结果，自动选择最佳模式进行投切补偿。
- 具有循环投切或导优投切两种工作方式，补偿器内含1:1:1:1，1:2:2:2，1:2:4:8控制方式，补偿器将人工分支回路容量值自动识别其编码工作方式，按相对应编方式工作。
- 补偿器可以用功率因数或无功功率两种方式工作。补偿方式：①分相补偿、②分相补偿加三相补偿、③三相补偿
- 控制方式：①晶闸管投切②复合开关投切

- Small volume, convenient for installing and maintenace, good water proof performance, and can be used for both outdoor and indoor.
- Controlling parameter full digital operation, convenient for using, the data cannot lose when power off.
- Digital display power network power factor, reactive power, voltage, current (one side), control parameter.
- With the function of over-voltage, under-voltage judgment displays and fast cut off the compensated capacitor group.
- With two working modes of manual and auto compensation.
- It has the function of auto selecting the best mode to input and cutoff compens ation according to the result of capacitor group manual input.
- With two working modes of cycle or optimizing input and cutoff, the compensation Includes controlling mode of 1:1:1:1, 1:2:2:2, 1:2:4:8, the compensator will automatically distinguish its code working mode of manual input duplexure capacitance value, it works according to the correspondence code mode.
- With two working modes of power factor or reactive power;
- Compensating mode: ①Phase splitting compensation ②Phase splitting and three-phase compensation ③Three-phase compensation.
- Control mode: ①Crystal braking-tube input and cutoff ②Compound switch input and cutoff

适用范围 Application

本系列装置以高性能单片机为基本硬件，采用交流取样、数字积分、滤波技术，对无功量智能化跟踪补偿；该方法避免了接触器投切电容所带来的问题，无触点开关复合开关 (晶闸管与接触器结合的投切方式) 过零投切，避免了电容器投入时“浪涌电流”的产生，无机械动作，无电弧，不产生谐波，补偿速度快，特别适用于投切频繁的场所，并能延长补偿装置的主要器件电容器的使用寿命。其结构合理，技术先进，广泛应用于低压电网，提高功率因数，减少无功损耗，改善供电质量，是新一代的节电产品，也是目前国内外最先进的补偿装置之一。

This series of devices regard high-performance single-chip micro computers the basic hardware, adopt AC sampling, digital integration, filtration technology, can trace and compensate the reactive electricity intelligently. This method has prevented the problem caused when contactor input and cut off the capacitor, through compounding switch (input and cutoff mode of combining with crystal braking-tube and contactor) and input and cutoff over-zero,so as to prevent the "surge current" caused while capacitor inputting. Three is no mechanical movement, and electric arc. No harmonic wave fast compensating speed that is especially suitable for using at the place of frequent inputting and cutting. And this method can lengthen the service life of the main device of capacitor. It has reason-able structure, modern techniques, mainly apples to the low-voltage power network to increase power factor and reduce reactive loss, improve power supply quality. It is the new generation economizing on electricity products and also is one of the advanced compensator both at domestic and inter-national at present.

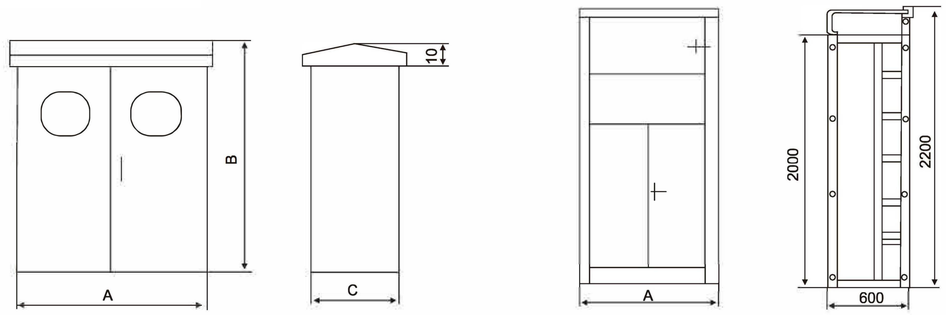
DGFC
低压无功补偿装置（动态型）
Series Reactive power auto-compen sation controller(state)

主要技术指标 MainTechnical Characterstics

- 使用条件：海拔≤2000米，环境温度-25℃~50℃，湿度20℃，≤90%，40℃时，≤50%，安装倾斜≤5°。
- 使用电压范围：(0.85~1.10)倍额定电压。
- 最大允许过电流：1.30倍额定电流。
- 控制路数：1~12路，(可设置)。
- 投切时间：动态100ms~30S,静态1~250S(可设置)。
- 欠压保护：340V/180V；回差6V。
- 过压保护：380-500/230-260V；回差6V；(可设置)
- CT变化：50/5A-3000/5A；(可设置)。
- 灵敏度：100mA。
- 测量精度L：
  电压：±1.0%
  电流：±1.0%
  功率因数：±1.0%
  无功功率：±2.0%

- Service conditions: Altitude≤2000m, ambient temperature -25℃~50℃, humidity ≤90% at 20℃; ≤90% at 40℃, Installing gradient ≤5°.
- Usage voltage range:(0.85~1.10)times rated voltage.
- Max. Allowable over-current: 1.3 times rated current.
- Control loop no: 1~12(settable).
- Input and cutofftime: dynamic state 100ms~30S, static state 1~250S(settable).
- under-voltage protection: 340V/180V; return difference 6V.
- Over-voltage protection: 380-500/230-260V; return difference 6V; (settable).
- CT variation: 50/5A-3000/5A; (settable).
- Sensitivity: 100mA
- Measurement precision:
  Voltage: ±1.0%
  Current: ±1.0%
  Power factor: ±1.0%
  Reactive power: ±2.0%

外形尺寸 Overall dimension



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200-600	PGL(GGD)型交流低压配电屏		

注：以订购时的实物尺寸为准，上述尺寸仅供参考
Note: the above mentioned size is for reference only, actual size based on the products.

ZM-JP
无功补偿计量综合配电箱
Reactive Power Metering Comprehensive Distribution Panel

适用范围 Application

ZM-JP 型综合配电箱适用于城网、农网、交流50Hz、额定电压400V、额定电流600A以下的配电系统中，做为动力，照明及配电设备的电能分配、控制、补偿与保护之用。

ZM-JP 型综合配电箱，是根据城网、农网建设、改造的需求，本着安全，经济、合理、可靠的原则而设计的集配电与无功补偿为一体的低压综合配电设备。产品具有分断能力强，热稳定性好，电气方案灵活、实用性强、结构新颖、防护等级高(IP33)等特点，可作为城网、农网低压成套电器设备更新换代产品使用。

ZMJP 型综合配电箱符合JB/DQ6141-86《低压无功补偿装置》，GB/T15576-1995《低压无功功率静态补偿装置总技　　件》的　准。

ZM-JP comprehensive distribution panel is suitable for urban and suburban electric network, AC 50Hz, rated voltage 400V, rated current 600A and below as to distribute energy, control, compensate and protect for motor, illuminating, and distribution equipment and etc. This panel is developed from the network innovation for safe, economic, reasonable, secure operation, it is the comprehensive panel integrated with power distribution and reactive power compensation. The panel has such advantages as high breaking capacity, good thermal stability, agile layout, practice, new structure, high protective degree (IP33), it is the new products in replace of old generation. ZM-JP panel meet with standard of JB/DQ6141-86 Low voltage reactive power compensation device 《GB/T15576 1995eneral technical regulations for Low voltage reactive powerstatic compensation device》

型号及其含义Model and implication

ZM-J P 2 - □

- 变压器容量(kvar) Transformer capacity (Kva)
- 自动补偿 Automatic compensation
- 综合配电箱 Comprehensive panel
- 计量补偿(带485接口) Metering and compensation
- 企业代号 Enterprise code

主要特点 Main Characteristics

- 基本电气参数
- 额定电压：400V
- 额定电流： 50-600A
- 额定频率 ： 50Hz
- 漏电继电器
  额定漏电动作电流：300mA
  额定脉冲动作电流：50mA
  额定分断时间： ＜0.2s
  延时重合闸时间：(20-60)S
- 电容补偿
  自动补偿：为变压器容量的30-60%
- 计量单元
  装置的计量采用DDS450型单相电度表或DTS450型三相电度表及0.5s级电流互感器加带485通讯接口。

- Basic electric data
- Rated voltage 400V
- Rated current 50-600A
- Rated frequency50Hz
- Leakage relay
  Rated leakage tripping current: 300mA
  Rated pulse tripping current: 50mA
  Rated breaking time: < 0.2s
  Time of re-closing: 20-60s
- Capacitor compensation
  Auto compensation: 30-60% rated capacity of transformer
- The metering device uses DD450 single phase KWH meter or DT450 3P KWH meter and 0.5s class CT with RS485 port

XIKAI®

ZM-JP
无功补偿计量综合配电箱
Reactive Power Metering Comprehensive Distribution Panel

使用条件 Working conditions

- 环境空气温度不高于+40℃，不低于-25℃，日平均气温不高于+35℃。
- 海拔高度不超过2000m。
- 日平均温度不大于95%。
- 设备安装时与垂直的倾度不超过5°
- 设备应安装在无剧烈震动和冲击的场所。

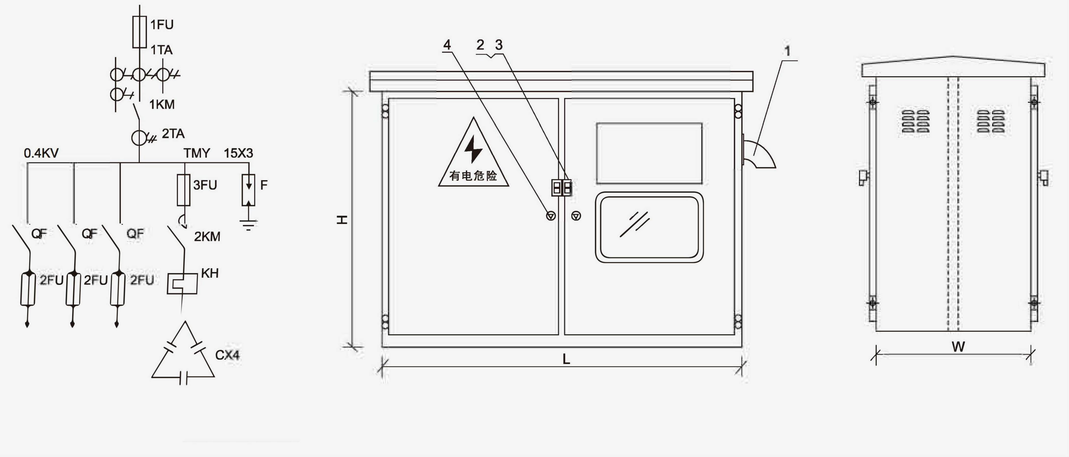
- Ambient temperature: from 25℃ to 40℃, daily average: <35℃
- Altitude not more than 2000m
- Daily average humidity: <95%
- Installation inclined angle within 5°
- The mounting site shall have no severe vibration and impact

结构特点 Structure

- 箱体采用冷轧钢板制作　　够的强度和刚度，能够承受短路时所产生的电动力。
- 电源进线直接进入计量室且与其它部分隔离，关闭计量室门后可用铅封封定，以防窃电。
- 考虑箱内温升问题该箱上部有通风孔。下部有百叶窗使其形成空气对流，以利散热。
- 箱体表漆采用环氧粉末喷涂，附着力强，质感好。防护等级达到IP33。
- 考虑到户外的工作环境箱体已采取防雨措施。

- The panel made of cold rolled steel plate with enough strength and rigidity, and can withstand the force come from short circuit
- Power source directly enter into metering compartment and separated from other parts, if closing rear door of the metering compartment, there can be Pb sealed to avoid electric theft.
- In consideration of temperature rise, the panel upside has ventilating hole, and downside has shutter, these will form air convection to cooling.
- The surface is epoxy dust painted, up to Ip33
- This panel is designed for outdoor use as well, rain proof

外形尺寸图及示意图 Outline and wiring diagram



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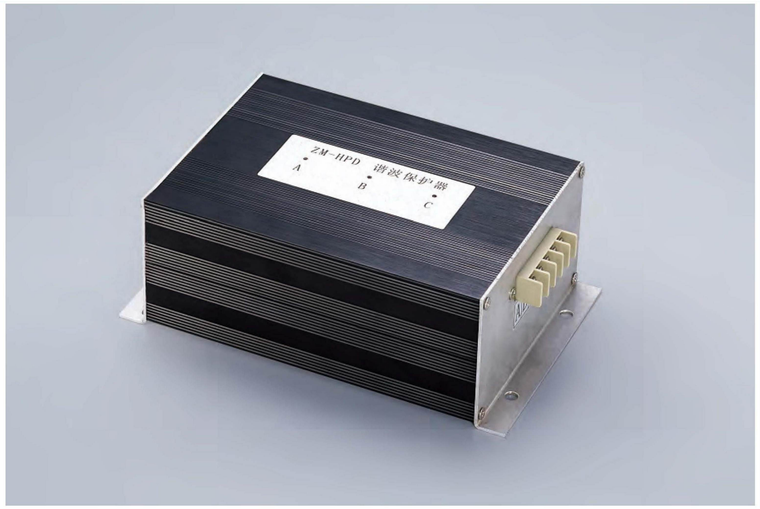
ZM-HPD
系列谐波保护器
Harmonic Protective Device



ZM-HPD简介 Introduction

理想的供电应是单一恒定频率与规定幅值的稳定电压。但随着各种新型、高效、多功能用电设备的不断更新，这些非线性电气设备使电网电压、电流波形实际上是不同程度畸变的非正弦波。非正弦波含有会直接对用户设备及人体产生危害的高次谐波。

由于电子计算机、微处理器以及其他电子仪器设备普遍存在对供电电源的谐波质量要求很高的特点，由于高次谐波的存在，使得这些高灵敏的电子系统中运行时，经常出现程序运行错误、数据错误、时间错误、死机、无故重新启动甚至造成用电设备永久性损坏，给人们的工作和日常生活造成了巨大损失。一般设备在“瞬变”发生频次20万次/小时状态下工作，电子设备寿命会缩短40%，电机设备寿命会缩短30%，照明设备寿命会缩短35%~45%。据统计，电子设备的故障有75%是由于瞬变和浪涌造成的。基本上每当一个电感性负荷被切断时，就会有比正常电压的峰值高很多倍的用户侧高次谐波产生。

ZM-HPD谐波保护器正是针对用户侧高次谐波(2kHz-10MHz)的污染，为用电设备提供谐波保护，改善越来越恶劣的电能质量的设备。ZM-HPD谐波保护器采用了超微晶合金材料与创新科技的特别电路，对用电设备产生的随即用户侧高次谐波和高频噪声、尖峰脉冲等干扰具有抑制和吸收作用；随时跟踪电源波形，瞬时滤除电源中的尖峰、用户侧谐波、杂波，矫正因谐波影响而产生畸变的电源波形；对噪声进行消化，改善电源波形，使电网电源波形变得光滑清洁，即提高了电网质量，又保证了仪器设备的正常运行。

The ideal power source shall have constant frequency and stable voltage with specified amplitude. But nowadays many new, high efficient multifunctional electric consumers come out, these non-linear devices make voltage, current waves of the system to be distorted at different degree. Non-sinusoidal waves contains high harmonics which will do hurt on other equipment and human body.

Because electronic computers, microprocessor and other electronic instrument and devices need high quality of power source, but harmonic waves exists, this will result the program run at error data error, time wrong, machine halted, restart suddenly, even lead to permanent damage, which is large loss. Generally if the equipment work under 2.0x105 times/hour transient freq fluctuation, its service life of electronic product will shorten about 40%, for machines the working life will be 30% shorter, lighting device will decrease 35%~45%, as to statistics report, about 75% fault of electronic equipment come from transient change and surging current. Almost while each inductive load is cut off, high harmonic wave of several times higher than normal voltage will occur at its user side

ZM-HPD harmonic protector will just provide the prevention against high times (2KHZ-10MHZ) harmonics at user side for electric consumers, improve the electric quality. ZM-HPD adopts ultrafine amorphous alloy materials and special circuits, can eliminate and absorb the high harmonics and hi-freq noise, peak pulse and etc interferences at user side, track the power input wave, filter the peak value, harmonics, clutter waves, correct the power source wave at user side, remove the noise, make the power source wave to be smooth and regular. Namely it improve the electric quality and ensure the equipment run at normal status

概述 General

ZM-HPD系列谐波保护器实现在谐波环境下保护各种精密控制设备，如电脑、PLC、传感器、无线设备、CT机、DCS等，使其免受谐波危害。

采用ZM-HPD谐波保护器减少了仪器设备的故障率和机器误操作，提高了设备的运行效率和使用寿命，全面克服了由于用户侧高次谐波造成的电能质量恶劣，导致设备损耗，性能失常，造成不必要的损失。

ZM-HPD完全符合IEC61000-4-5，IEC60939-1-2等标准。

ZM-HPD series harmonic protector can protect the precise equipments from being damaged by harmonics, such as computer, PLC, sensor, wirelesss equipment, CT machine, DCS and etc.

If ZM-HPD harmonic protector used, it can reduce the fault rate and wrong operation for device or machine, improve the service efficiency and life, overcome the electric quality problem resulted by high harmonics from end users, which may lead to power loss, abnormal performance or other unnecessary loss.

ZM-HPD complies with standards of IEC61000-4-5,IEC60939-1-2

型号及其含义Model and implication

ZM-HPD 1000 E

- E: 无;应用型 None: Application type / E:增强型 E: Enhanced
- 1000: 三相:1000 Three phase: 1000 / 三相:99-3 Three-phase: 99-3 / 单相:99-1 Single phase: 99-1
- ZM-HPD: ZM-HPD1000 谐波保护器 ZM-HPD Harmonic Protective Device

XIKAI®

ZM-HPD
系列谐波保护器
Harmonic Protective Device

ZM-HPD的应用场合 Application

- 计算机电子设备、PLC、电机、电器等芯片死机，寿命大幅缩水
- 电源净化、消除浪涌、尖峰电压、电路噪音和静电等干扰
- 可控硅整流装置
- 各类变频装置
- 电脑伺服器(包括流水生产线上的各类伺服马达等)
- 电子调光装置
- 电子镇流装置
- 各类高压灯具(碘钨灯、水银灯、节能灯、日光灯等)
- 电脑供电系统
- 不间断电源装置(UPS)
- 电梯、空调等
- 复印机、微波炉、录像机、电视机及各类充电器等日常办公生活用电器
- 电脑网络
- 数字通讯设备

- The chipset of Computer, electronic equipment, PLC, motor, electric devices and etc halted, their life shortened greatly.
- Purify the power source, eliminate the surges, peak voltage, circuit noise and electrostatic interferences.
- Controllable silicon filtration device
- Freq inversion device
- Computer server (including the servo motor in the assembly lines)
- Electronic dimming device
- Electronic ballast
- High pressure lamps (Tungsten iodine lamp, mercury lamp, energy - saving lamps, fluorescent lamps and etc)
- Power supply system for computers
- Uninterrupted power system (UPS)
- Elevator, air conditioner and etc
- Photocopier, micro-wave oven, video recorder, television, chargers and other electric appliances for office or household use
- Computer network
- Digital communication devices

技术参数 Main Technical data

性能Performance	参数 Data	ZM-HPD
基本参数 Basic parameters	额定电压/额定频率 Rated voltage / Rated frequency	110~690V ±20%； /50HZ 60HZ
	最大脉冲电流值 Maximum pulse current value	14000A
	钳位电压值 Clamp voltage value	对于 2500V 的浪涌电压，可限制 1000V 以下 For 2500V surge voltage can be limited to 1000V the following
	抗浪涌电流 Anti-surge current	对于 2500V 的浪涌电压，浪涌电流不超过 1200A For 2500V surge voltage, surge current does not exceed 1200A
	电路连接方式 Circuit connection	三相星行，三相三角行 Three-phase star lines, three-phase triangles
	绝缘电阻 Insulation resistance	>2MΩ
	耐压/接触点容量 Withstand voltage / contact point capacity	ZM-HPD 导电部分与外壳间承受 2000VAC，时间 0.1 秒，无击穿和闪络现象/120A ZM-HPD between the conductive part and the shell to withstand 2000VAC, time 0.1 seconds, no breakdown and flashover phenomenon / 120A
滤波性能 Filtering performance	保护频率 Protection frequency	2KHz-10MHz
	泄露电流 Leakage current	1.428mA
外部环境 External environment	温度范围 Temperature range	~35°C-75°C
	存贮温度 Storage temperature	~45°C-90°C
	相对温度 Relative humidity	<85%
	大气压力 Air pressure	52-108Kpa
	工作环境 Working environment	无爆炸无腐蚀性气体导电尘埃，无细菌，无震荡，无冲击，海拔4000M 以下 No explosive no corrosive gas conductive dust, no bacteria, no shock, no impact, altitude<4000M
安装 Installation	安装方式 Installation	悬挂安装 4mm 螺丝孔/导轨安装 Suspension installation 4mm screw hole / rail mounting
	安装尺寸 Installation dimensions	220mm*80mm(L*W)
	外形尺寸 Dimensions	236mm*145mm*80mm(L*W*H)
电磁兼容性测试 Electromagnetic Compatibility Testing	震荡波抗扰度 Oscillation wave immunity	IEC60225-22-4
	静电放电抗扰度 Electrostatic Discharge Immunity	
	射频电磁辐射抗扰度 Radio frequency electromagnetic radiation immunity	
	电快速瞬变脉 Electrical fast transient pulse	
	冲群抗扰度 Impulse immunity	
电源 Power	功耗 Power consumption	< 0.5W
	发热 Fever	<25°C(20°C)
维护方式 Maintenance mode		免维护 Maintenance-free
使用寿命 Service life		15年以上 ⩾15 years
接线方式 Wiring		接线柱连接 Terminal connection
重量 Weight		2.0kg
防护等级 Degree o f protection		IP44

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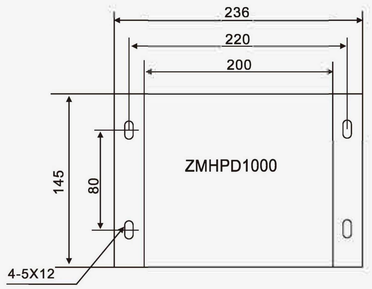
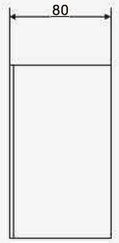
ZM-HPD
系列谐波保护器
Harmonic Protective Device

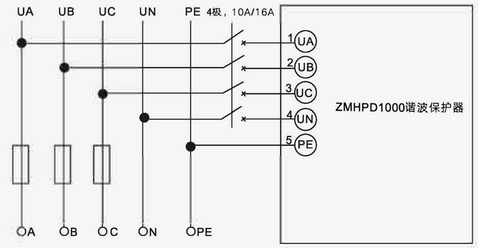
外形尺寸 Overall dimension



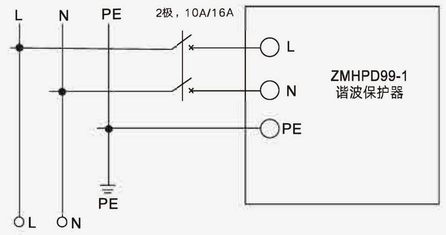


接线图 Wiring diagram

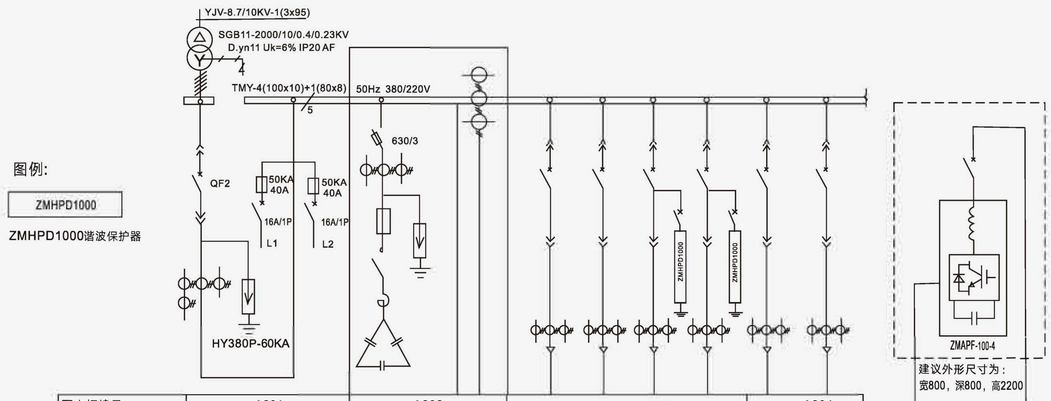
ZM-HPD1000谐波保护器典型接线图
Wiring diagram of ZM-HPD1000 Harmonic Protective Device



ZM-HPD99-1谐波保护器典型接线图
Wiring diagram of ZM-HPD99-1 Harmonic Protective Device



典型设计方案 Typical schematic diagram



配电柜编号		A201	A202	A203				A204	
柜宽(mm)		1000	800	800				800	
模数(高U=160 宽W=300)				1M	4M	2M	2M	4M	4M
回路编号				W204-1	W204-2	W204-4	W204-5	W205-1	W205-2
设备容量(kW)		2000KVA	250kvar	21.5	108	21	15.5	156	156
计算电流(A)			334	32.58	163.64	31.82	25.77	295.45	295.45
断路器	长延时Ir1(A)	Ir1=0.7xIn		50	225	50	50	400	400
	瞬动Ir3(A)	Ir2=4xIn(0.1s),Ir3=0FF		500	2250	500	500	4000	4000
用途		进线	无功补偿及谐波补偿电流注入	变频水泵1	变频水泵1	PLC1	PLC2	变频风机1	变频风机2

采样CT二次引出线宜采用RVSP屏蔽双绞线
谐波补偿电流注入电缆宜采用YJV交联电缆

XIKAI®

ZM-DDL
低压动态滤波补偿装置
Low voltage Dynamic Filtration Reactive Compensation Device

适用范围 Application

广泛应用于电力、冶金、铁道、军工、石油、机械、化工、港口、轻工、建材、矿山，造船等供配电系统中，要求动态无功补偿且同时需要抑制或治理谐波的场合。

It is widely use in the distribution system of power industry, metallurgy, railway, military, petroleum, machinery, chemical industry, light industry, building material, mineral, shipbuilding and etc, where both dynamic reactive compensation and harmonic filtration are required

概述 General

随着社会的进步技术的发展，大量的电力电子设备被投入到电网中广泛使用，使得动态无功补偿(快速跟踪无功补偿)与谐波治理的问题日益突出，ZM-DDL系列智能型动态无功补偿成套装置系列产品应用先进的电力电子技术、信息技术，智能控制技术，采用科学、有效、经济的技术手段， 一方面有效的解决了谐波无功干扰并联电容器投切补偿的问题，另一方面可根据用户实际要求抑制或治理谐波，清洁电网环境，为新一代智能化动态无功补偿及谐波治理的成套装置。

While technology developing, plenty of electronic and power equipment are put into use, so the conflict between dynamic reactive compensation (fast tracking reactive compensation) and harmonic treatment is more and more obvious, ZM-DDL series intelligent dynamic reactive compensation equipment adopted the advanced power and electronic technology, information technology, intelligent control technology, to solve the interference of harmonic waves to the switching of shunt capacitors, also eliminate the harmonics according to the actual requirement, purify the power network, as a new generation of smart type dynamic reactive compensation and harmonic filtration complete set equipment.

作用 Function

- 有效支撑系统电压、确保系统正常运行保障功率因数达标，避免罚款，同时有效提高设备利用率
- 有效抑制或治理谐波
- 降损节能

- Effectively support system voltage, ensure the system run in normal state and keep high power factor, avoid penalty, also improve the using rate of equipment
- Effectively restrict harmonics
- Lessen loss and save energy

型号及其含义Model and implication

ZM- DDL - X - XX / XX X

- △滤波器三角形接线 △ Filter Delta connection
- Y滤波器星形接线 Y Filter star connection
- H滤波器共分结合
  H Filter combination of respective and simultaneous compensation
- 容性基波无功容量 Reactive power of capacitive basic wave
- 电压等级 Voltage class
- K代表接触器 K stand for contactor
- D代表无触点开关 D stand for non-contact type switch
- 滤波补偿装置 Filtration compensation device
- 企业代号 Enterprise code

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ZM-DDL
低压动态滤波补偿装置
Low voltage Dynamic Filtration Reactive Compensation Device

主要技术参数 Main Technical data

- 额定电压：分为400V、660V、1100V 3个档级(特殊要求可定制)
- 动态响应时间：≤20ms
- 额定测量电流：5A
- 谐波测量范围：1-25次
- 精度：电压、电流0.5级；功率1.5级
- 基波无功补偿：功率因数可达到0.9-0.95以上
- 谐波滤除率：非标滤波型，满足GB/T14549-93Y的要求
- 标准调谐型：5次谐波的滤除率≥50%
- 稳定电压范围：满足GB 12326-90的要求，△U≤+2%
- 整机功耗：≤1%装置容量
- 结构形式：柜式结构，分立结构
- 防护等级：IP41，户外使用防护等级IP43（特殊要求可定制）
- 安装与施工：按一般电力配电柜的要求安装与施工。

- Rated voltage: three grades 400V, 660V, 1100V respectively (other value can be designed)
- Dynamic response time: ≤20ms
- Rated measured current: 5A
- Harmonic measurement scope: 1 ~ 25 times
- Accuracy: voltage, current: 0.5class, power: 1.5class
- Reactive compensation of basic wave: power factor up to 0.9~0.95
- Harmonic filtration rate: non-standard filtration type, complied with the requirement of GB/T14549-93Y standard
- Standard tuning type: filtration rate of 5th power of harmonics >50%
- Stabilized voltage scope: complied with the requirement of GB 12326-90 standard, △U≤+2%
- Whole power dissipation: ≤1% of rated capacity of device
- Structure figure: panel structure, free standing.
- Protection grade: IP41, outdoor use type: IP43 (others can be designed)
- Installation: execute in compliance with the requirement for general power panel and switchgears.

技术特点 Technical Features

零电流投切

先进的大功率晶闸管电流过零点投切技术，实现零电流投入、零电流切除，无涌流，无冲击。

快速动态响应

快速跟踪系统负荷无功变化，实时动态响应投切，系统响应时间≤20mS。

智能化

配置智能监控终端，将动态无功补偿滤波成套装置与配电自动化系统有机结合起来，实现瞬时投切控制，相关电能质量、配电参数的现场在线监控及远方遥测、遥信、遥控，同时具备过流、过压、欠压、三相不平衡、温度等多种数字化保护功能。

Switching at zero current

Large-scaled transistor current through-zero switching technology, can switch on/off capacitors at zero current, no surge, no impulse,

Fast dynamic response

Fast tracking the change of load in the system, correspond dynamically to switching on/off at real time, response time <20mS

Intellectualized

Assembled with smart detection terminal, combine the dynamic reactive compensation device with automatic system of the distribution network, realize the control of instantaneous switching, the local monitor of the related electricity quality, parameters, and remote operations as remote measurement, remote communication, remote control, meanwhile over-current, over-voltage, under-voltage, three-phase imbalance, temperature protections provided.

原理说明 Principle Description

标准调谐型：

主要适用于含有少量谐波，负荷变化较快的系统中。一般情况下，在这种系统中，单纯投切电容器组的无功补偿装置是不能直接使用的，危害有三：一为并联电容器组对谐波的放大，电容器组与电网形成并联谐振使谐波电流放大，以致于电压及电流的畸变更为严重；二为谐波对并联电容器的直接影响，谐波电流叠加在电容器的基波电容上，使电容器的电流有效值增大，温升增大，会降低电容器的使用寿命或使电容器损害；三为难以跟踪快速变化的负载，容易引起过补和欠补，导致网压波动。针对于此，谐波含量小于30%的系统中，无功补偿装置应该串接调谐电抗器，使此回路中的谐振频率调谐低于最低次谐波，使其在工频呈电容性，改善功率因数，在谐振频率时呈感性，防止谐振的发生，以防止谐波的放大，我们的调谐型ZM-DDL动补标准装置能吸收5次、7次谐波大于40%。

Standard tuning type:

It is mainly used in the system where has a little harmonics and the load change very quickly. Generally, the simple reactive compensation device can't be used for such system, because it has three problems: firstly shunt capacitors will amplify the harmonics, capacitor bank and system will form parallel resonance, make harmonic current to be enlarged, further the distortion of voltage and current will be more severe; Secondly the direct influence on shunt capacitors, harmonic current superimposed on basic wave, effective current rise up and lead to high temperature rise, this will shorten the service life of capacitors; thirdly it is difficult to track the quickly changed load, easy to over compensation or under compensation, then system voltage fluctuation happen. Regarding these problems, for the system with harmonic contents less than 30%, reactive compensation device shall be directly series connected with tuning reactor, make the resonance freq of this loop less than lowest power of harmonic wave, and make the current as capacitive value at power frequency namely improving power factor, and make current as inductive value at resonance freq, namely preventing resonance and amplification. Our tuning type standard ZM-DDL dynamic reactive compensation device can absorb more than 40% of 5th, 7th powers of harmonic waves

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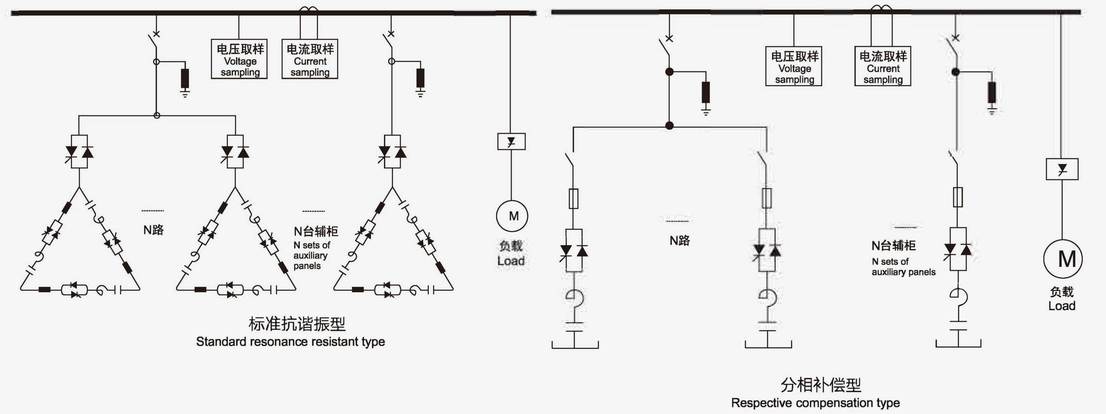
ZM-DDL
低压动态滤波补偿装置
Low voltage Dynamic Filtration Reactive Compensation Device

电气接线原理图： Electric wiring diagram

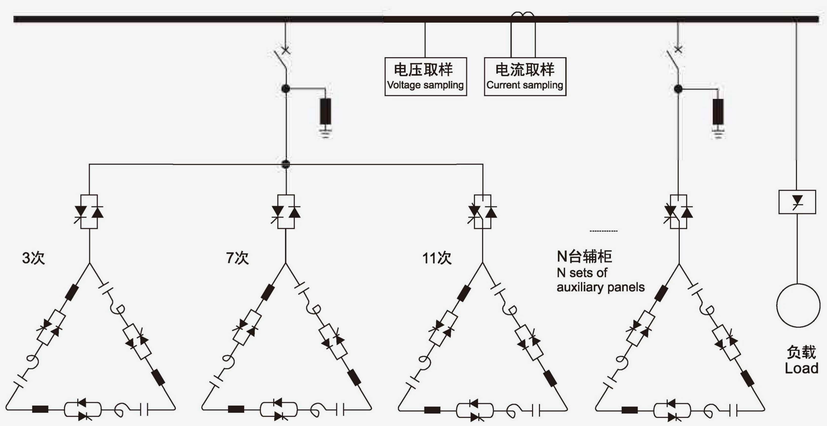


动态滤波型：

适用于含有较大量的谐波的系统中。ZM-DDL装置由电容器串联滤波电抗器组合而成，在工频呈电容性，改善功率因数，在所设计的谐振频率时形成串联谐振，使此L-C回路在此频率时形成非常低的阻抗，而能吸收大部分的谐波电流，从而改善系统中电压和电流的谐波畸变率。在实际工程中，用户的负载特性和容量不尽相同，我们会根据情况，设计不同用途（单调谐、双调谐、高通、组合等）、不同谐振频率（5次、7次、11次等）、不同容量的谐波滤波器，滤波型ZM-DDL一般需要非标准设计。

Dynamic filtration type:

It is suitable for the system with lots of harmonics. ZM-DDL device consists of capacitors and series connected filtration reactor, at power frequency its current is capacitive to improve power factor, while at the specified resonance freq it will form series resonance, make L-C loop at very low resistance, able to absorb most of harmonic current, namely improving the voltage and current distortion. In actual applications, the load features and capacity may be different, we will design the different type ZM-DDL device according to different applications (single tuning, dual tune, hi-pass, combination and etc), different resonance freq (5th, 7th, 11th and etc), the filters with different capacity. Generally each filtration type ZM-DDL shall be designed independently.



非标准抗滤波型
Non-standard filtration type

ZM-SPC
系列三相不平衡装置
Series Three phase unbalanced device

功能特点 Features

- **补偿三相不平衡**

  通过实时采样和控制器的分析处理，驱动IGBT动作，将不平衡电流从电流大的相转移到电流小的相，最后将三相不平衡控制在5%以内。

- **补偿无功电流**

  通过实时采样和控制器的分析处理，计算无功缺量，毫秒级响应，动态无功补偿电流，保证功率因数在0.98以上，避免线路无功电流产生的压降，降低损耗。

- **电压支撑**

  装置对补偿点电压进行采样，通过控制器的处理分析，判断电压是否在合格范围之内，通过调节输出电流，最终使各相电压稳定在正常范围内。

- **Compensate the three-phase unbalance current**

  To perform data acquisition and analyze by controller, drive IGBT to take action, transfer the unbalanced current from large current phase to small current phase, limit the unbalance rate of three phases within 5%.

- **Compensate the reactive current**

  To perform data acquisition and analyze by controller, calculate the shortage of reactive power, give response within ms, dynamically compensate the reactive current, to keep the power factor more than 0.98, avoid the voltage drop resulted by reactive current of line, reduce line loss.

- **Regulate the voltage**

  Sample the voltage from the compensation point, after analyzed by controller, identify the voltage is within the specified range or not, if not, adjust the output current to keep the phase voltage of each phase within the specified range.

概述 Overview

三相不平衡调节装置是经过我公司工程人员长时间自主研发生产的一种用于配电网台区线路线路首端来降低安装点前端的三相电流不平衡的新型产品(电流三相不平衡可降低到5%以内)。该装置集成了无功优化、台区运行状态监测等功能。该系统使用了国际先进的三电平技术。能用效提升电压，降低三相不平衡率，提升功率因数来达到节能降耗，改善供电质量的新型产品。装置运行稳定，免维护。

Three-phase unbalance regulation device, a new product researched by our company for long time and produced, is installed in the head of distribution line in region, used to lessen the unbalanced current of three phases in the front of installation point of the distribution lines (able to limit the unbalance rate within 5%). This device integrates with reactive power optimization, monitoring running status of the distribution zone and etc. this system adopted the international advanced three-potential level technology, able to raise the voltage, lessen three-phase unbalance rate, improve power factor, reduce power loss and save loss, improve electric quality. The device can run stably free from maintenance.

适用范围 Application

1.既存在三相不平衡又有较大无功缺量的台区；

2.三相动力负荷占比较高，负荷变比较频繁的台区；

3.电压在-20%~+50%的范围内波动(标准值220V/380V)的台区。

1.For the region that has three-phase unbalance current, also large shortage of reactive power
2.For the region that the load of three-phase is much, load change very frequently.
3.For the region that the voltage fluctuates within -20%~+50% (standard value: 220V/380V)

ZM-SPC
系列三相不平衡装置
Series Three phase unbalanced device

技术参数 Main Technical data

系统参数 System data	ZM-SPC30	ZM-SPC50	ZM-SPC100
额定电压等级 Rated voltage rating	400V		
输入相电压范围 Input phase voltage range	40%~20%		
电网频率 Grid frequency	50Hz/60Hz(范围45Hz-63Hz)		
整机效率 Efficiency	>97%		
网络结构 Network structure	三相三线、三相四线 Three-phase three-wire, three-phase four-wire		
电路拓补 Circuit topology	三电平 Three levels		
性能指标 Performance			
三相平衡补偿能力 Three-phase balance compensation	不平衡度补偿至50%以内 Unbalance compensation to 50% or less		
额定电流(或最大不平衡补偿电流) Rated current (or maximum unbalanced compensation current)	45A	75A	150A
无功补偿范围 Reactive compensation range	-1~1(可调Adjustable)		
无功补偿容量 Reactive power compensation capacity	30kvar	50kvar	100kvar
无功补偿率 Reactive power compensation rate	>99%		
响应时间 Response time	15ms		
保护功能 Protective function	过压保护、欠压保护、短路保护、逆变桥反向保护、过补偿保护、防雷双层保护等 Overvoltage protection, undervoltage protection, short circuit protection, reverse bridge reverse protection, over compensation protection, lightning protection double layer		
配电功能 Power distribution function	单路电能分析、带C级防雷功能 Single-channel power analysis, with C-class lightning protection function		两路电能分析，带C级防雷功能 Double-channel power analysis, with C-class lightning protection function
通讯监控功能 Communication monitoring function			
显示内容 Display content	电压、电流、频率、功率因数、运行温度等实时运行信息 Voltage, current, frequency, power factor, operating temperature and other real-time operating information		
通讯接口 Communication Interface	RS485/CAN/网口 RS485 / CAN / network port		
通讯协议 Protocol	Modbus协议/电总协议 Modbus protocol / power master protocol		
机械特性 Mechanical characteristic			
尺寸 Dimensions	W820xD350xH1180mm		W820xD400xH1180mm
颜色 Color	不锈钢本色 Stainless steel		
重量 Weight	58kg	72kg	135kg
安装方式 Installation	抱杆，H杆，F杆		
安装角 Mounting angle	<5度		
环境需要 Environment			
运行温度 Operating temperature	-10°C~55°C		
海拔高度 Altitude	<1500, 1500米以上按照GB/T3859.2请降额使用，或者联系经销商 <1500, 1500 meters or more in accordance with GB / T3859.2 please use the derating, or contact the dealer		
IP等级 Degree of protection	IP44		
抗震能力 Seismic capacity	7级		

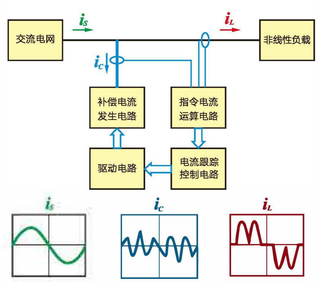
XIKAI®

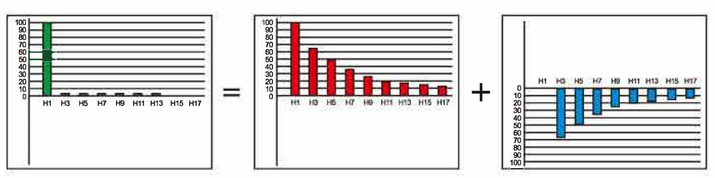
ZM-APF
系列有源电力滤波器
Series Active Power filter

型号及其含义 Model and implication

ZM - APF - xxx / xx / x x

- M:壁挂式，略去为柜式 M: Wall mounted type , Non: Cabinet type
- 工作方式: 3-三相三线 4-三相四线制
  Way of working: 3: three-phase three-wire
  4: Three-phase four-wire system
- 补偿电流 Compensation current
- 额定工作电压 Rated working voltage
- 有源电力滤波装置 Active Power Filter
- 公司产品代号 Company product code





清洁的馈电电流 Clean feed current　　负载电流 Load current　　补偿电流 Compensation current

有源电力滤波器工作原理框图 Active Power Filte Diagram

应用场合 Application

有源电力滤波器(ZM-APF), 是采用现代电力电子技术和基于高速DSP器件的数字信号处理技术制成的新型电力谐波治理专用设备。它由指令电流运算电路和补偿电流发生电路两个主要部分组成。指令电流运算电路实时监视线路中的电流，并将模拟电流信号转换为数字信号，送入高速数字信号处理器(DSP),对信号进行处理，将谐波与基波分离，并以脉宽调制(PWM)信号形式向补偿电流发生电路送出驱动脉冲，驱动IGBT或IPM功率模块，生成与电网谐波电流幅值相等、极性相反的补偿电流注入电网，对谐波电流进行补偿或抵消，主动消除电力谐波。

ZM-APF系列有源电力滤波器是电力污染严重或对供电电能质量要求高的企业，需要进行电能质量改善的理想产品。可广泛用于冶金钢铁行业、通信行业、轨道交通行业、烟草行业、医疗行业、水处理行业、水泥行业、汽车行业、过程控制行业、造纸行业、太阳能行业、印染行业、建筑行业等领域。产品质量稳定、可靠，治理效果好，同时达到节能、节材的效果，是电流谐波治理技术的最新发展方向。

Active power filter (ZM-APF) adopted modern power electronic technology, is a new power harmonic treatment equipment on basis of hi-speed DSP, digital signal processing technology. It consists of instructive current calculation circuit and compensated current production circuit. The instructive current calculation circuit monitor the current of the line at real time, and convert analog current signal to digital signal, transmitted into DSP, and processed, separate the harmonic waves from basic content, send driving pulse to compensated current production circuit via PWM signal, drive IGBT or IPM power module, produce a compensated current with same amplitude of the harmonic wave, but reverse polarity, to eliminate the harmonic waves in the system.

ZM-APF active power filter is an ideal product for the enterprise that need high electric quality or its power system is heavily distorted and need improved, it can be used widely in steel metallurgy, communication field, rail transportation, tobacco, medical field, water treatment system, cement filed, automobile field, program control field, papermaking field, solar energy field, printing field, building field and etc. The product has steady quality, good performance, meanwhile it can save energy, save material, which is a new way to solve the harmonic waves of the current.

XIKAI®

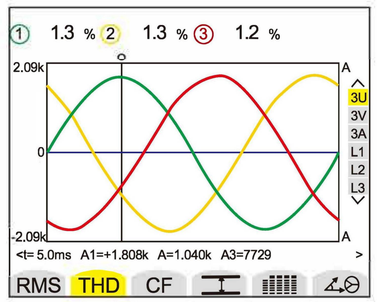
ZM-APF
系列有源电力滤波器
Series Active Power filter

技术特点 Technical Features

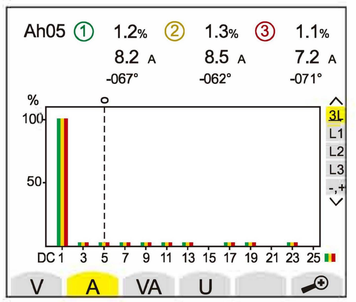
额定容量 Rated Capacity	50A	75A	100A	150A	200A	250A	300A	500A
额定电压 Rated voltage	AC380V±15% / 690V±15%							
电气接线 Electrical Wiring	三相三线、三相四线 Three-Phase three-wire, three-phase four-wire							
额定工作频率 Rated frequency	50Hz±5%							
滤波范围 Filter range	2-50次谐波(可以选择性滤波，各次谐波补偿可分别设定) 2-50 th power harmonic waves (selective filtration, each power of harmonic content can be set separately)							
滤波程度 Filtering degree	选定每次谐波可进行幅值补偿设定 Select each power of harmonic wave, its amplitude for compensation can be set.							
自动限流输出功能 Auto current limiting output	当负载侧的谐波电流大于装置电流时，装置将输出电流限制在额定值 When harmonic current on loading side is larger than the compensation current of APF, it output will be limited to rated compensation current.							
过热保护 Overheating protection	散热器温度超过65℃会自动启动风扇 When the temperature exceed 65℃, it will auto-start the cooling fan							
失压保护 Voltage protection	系统电压低于Un85%，主断路器会失压保护，装置停止工作 When system voltage is less than Un85% ,main circuit breaker will take action to trip due to under voltage, APF will stop working.							
负荷过流保护 Load current protection	流经负荷的电流超过阈值，装置停止工作 When the loading current exceeds the threshold, APF will stop working.							
补偿过流保护 Compensation overcurrent protection	设备具备软件和硬件两种保护，软件保护点(电流峰值)可自行设定，一般可设定为额定电流(RMS)的2倍，硬件保护点为额定电流(RMS)的2.3倍，当补偿电流超过保护阈值时，设备停止，报相应故障 The device has two protections from software and hardware: the software protection value (current peak) can be set by user, generally 2 times of rated current (RMS), hardware protection point is 2.3 times of rated current (RMS), when compensated current exceeds the protective threshold, the device stop working and produce the warning of related fault							
系统电压保护 System voltage protection	系统侧电压欠压阈值或过压阈值，装置停止工作 The voltage on the side of system is under or over the threshold, the device stop working							
直流电压保护 DC voltage protection	设备具备软件和硬件两种保护，软件保护点可自行设定一般可设定为正常电压的1.1倍，硬件保护点为正常工作电压的1.3倍当直流电压超过保护阈值时，设备停止，报相应故障 The device has two protections from software and hardware: the software protection value can be set by user, generally 1.1 times of rated voltage, hardware protection point is 1.3 times of rated voltage, when DC voltage exceeds the protective threshold, the device stop working and produce the warning of related fault							
IGBT保护 IGBT protection	IGBT内部温度超过108℃，装置停止工作，报IGBT故障 The inner temperature of IGBT exceed 108℃, the device will stop working and produce the warning of fault of IGBT							
冲击电流 The impact of current	功率模块内IGBT额定电流的2倍 2 times of rated current of power module IGBT							
滤波能力 Filtering capabilities	95%							
滤波效果Filtering effect	符合GB/T14549-93标准要求 Standard: GB/T14549-93							
补偿模式 Compensation mode	1、补谐波，谐波次数可选 Harmonic compensation, the power of harmonic wave, are optional 2、补谐波和无功，部分型号可选 Harmonic compensation and reactive compensation are optional for some models.							
过载能力 Overload	120%							
多台运行方式 Multiple operation modes	并联运行 Parallel operation							

完美效果 Perfecct results

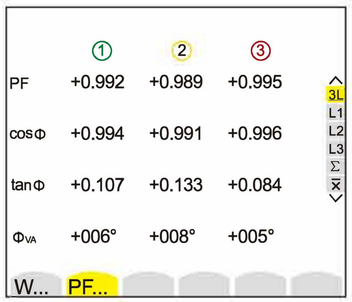
THDi≤5%　PF≥0.98　三相平衡 Three phase



三相三线制 THDi < 5%波形图
Three-phase three-wire THD <5% waveform



三相三线制 THDi < 5% 频谱图
Three-phase three-wire THD <5% spectrogram



PF≥0.98的功率因数
PF≥0.99 power factor

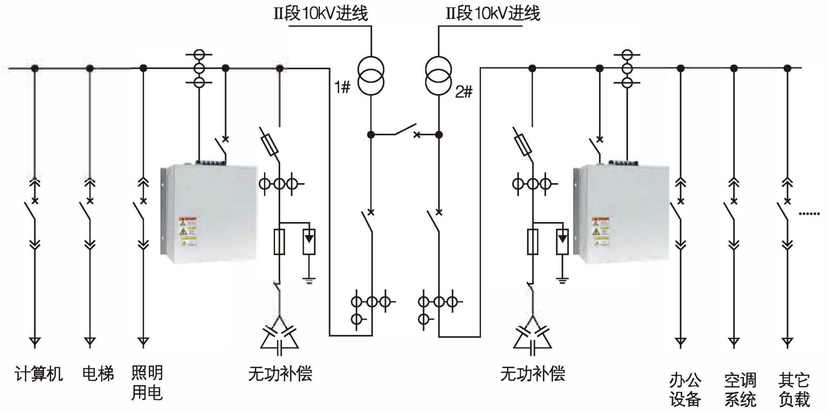
ZM-APF
系列有源电力滤波器
Series Active Power filter

补偿方案及计算 Compensation Scheme and Computing

集中补偿 Concentrated Compensation

在电网的低压进线端安装指明有源滤波器，适用于负载类型较多的配电系统，非线性负载数量庞大、分散，并且单台非线性负载谐波含量小的场合。

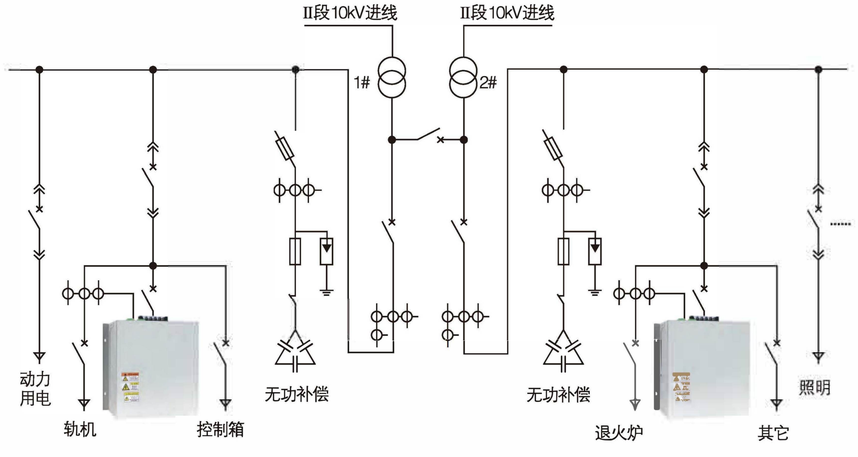
APF able to be installed on the LV incoming side of system, is suitable for the distribution system that has many kinds of loads, non-linear loads, separately, but each non-linear load with small harmonic waves.



就地补偿 Local Compensation

可在负载的输入端安装ZM-APF有源滤波器，适用于单台谐波含量较大且分布较为分散的配电系统。

APF able to be installed on the input side of load, is suitable for the distribution system that one non-linear loads have large harmonic waves, and located separately.



ZM-APF
系列有源电力滤波器
Series Active Power filter

选型计算

根据负载额定电流和行业类型选型

$I_H = I_I \times THD_i$ ..... (1)

IH为补偿电流

Ii为负载额定电流

THDi为总谐波畸变率

根据变压器容量和行业类型选型

$$I_{THD} = \frac{S_T \times K_1 \times THD_i}{\sqrt{3} \times U_S \times \sqrt{1+(THDi)^2}} \quad \text{..... (2)}$$

K1为负荷率：即负荷占变压器额定容量的比例，通常取0.6~0.8；

THDi为总谐波畸变率，根据系统场合不同而不同；

ST为变压器额定容量，单位kVA；

US为低压系统电压，一般取0.38~0.4。

Selection Calculation

According to the load rated current and Industry Type Selection

$I_H = I_I \times THD_i$ ..... (1)

IH: Compensation current

Ii: Load Current Rating

THDi: Total Harmonic Distortion

According to the type of transformer capacity and industry selection

$$I_{THD} = \frac{S_T \times K_1 \times THD_i}{\sqrt{3} \times U_S \times \sqrt{1+(THDi)^2}} \quad \text{..... (2)}$$

K1: Load factor: the percentage of transformer rated load capacity, usually 0.6 to 0.8;

THDi: Total harmonic distortion, depending on the system and different occasions;

ST: Transformer rated capacity, the unit kVA;

US: LV system voltage, and generally 0.38 to 0.4.

不同行业谐波THDI参考值

办公楼宇	烟草	通信	轨道交通	污水处理	钢铁
30%	20%	40%	40%	30%	20%
采矿	影剧院	医药	化工	玻璃	油田
40%	50%	40%	40%	50%	40%

注意：以上数据只是参考，由于相同行业负载情况不同，电流谐波总畸变率(THDI)也有所不同。

Harmonic THD reference value in different sectors

Office buildings	Tobacco	Communicate	Rail	Sewage Treatment	Steel
30%	20%	40%	40%	30%	20%
Mining	Theater	Medicine	Chemical industry	Glass	Oilfield
40%	50%	40%	40%	50%	40%

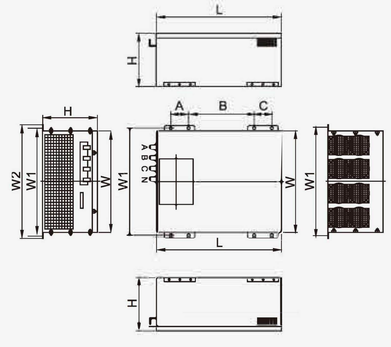
Note: The above data is only for reference, since the same industry in different load conditions, the total current harmonic distortion (THDI) Different.

订货须知 Ordering Information

- 需提供设计的系统图
- 系统工作电压
- 系统补偿电流
- 产品的柜型及尺寸
- 产品进线方式

- Design of the system diagram
- System voltage
- System compensation current
- Product container type and size
- Product Line Information

模块外形尺寸图 Outline size



APF模块型号 Model specifications	外形尺寸Outline size							
	L	W	W1	W2	H	A	B	C
ZM-APF-400V-50A-4M	550	470	503	526	200	80	300	80
ZM-APF-400V-75A-4M	570	470	503	526	250	80	300	80
ZM-APF-400V-100A-4M	640	500	533	556	250	80	390	80
ZM-APF-400V-150A-4M	650	530	563	583	321.5	80	380	80

注:由于产品更新变化较快，实际尺寸以厂家提供为准。

XIKAI®

ZM-SVG
系列静止式无功发生器
Series static reactive producer

型号及其含义 Model and implication

ZM-SVG-xxx/xx/x x

- M:壁挂式，略去为柜式 M: Wall mounted type , Non: Cabinet type
- 工作方式: 3-三相三线; 4-三相四线制 Way of working: 3-three-phase three-wire; 4-Three-phase four-wire system
- 补偿无功容量 Compensation current
- 额定工作电压 Rated working voltage
- 静止无功发生器 Static reactive producer
- 公司产品代号 Company product code

技术特点 Technical Features

额定容量 Rated Capacity	35KVAR	50KVAR	75KVAR	100KVAR
额定电压 Rated voltage	AC380V±15%/AC690V±15%			
电气接线 Electrical Wiring	三相三线、三相四线 Three-Phase three-wire, three-phase four-wire			
控制电容器组方式 Capacitor bank control mode	节点控制:12路输入+12路输出通讯; 控制:RS485连接,MODBUS通讯协议 Node Control: +12 12 inputs outputs; communication and control: RS485 connection, MODBUS communication protocol			
补偿设定 Compensation settings	无功补偿、三相不平衡、谐波滤除设定 Reactive power compensation, phase unbalance, harmonic filter set			
保护功能 Protection	失压保护、负载过流保护、补偿过流保护、系统电压保护、直流电压保护 Voltage protection, load over-current protection, over-current compensation system voltage protection and DC voltage protection			
响应时间 Response time	≤10ms			
装置功率损耗 Device power loss	额定满载运行时，损耗不超过2%额点功率 Rated full-load operation, the loss does not exceed 2% of the point power			

订货须知 Oedering Information

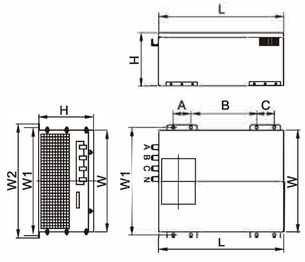
- 系统工作电压 System voltage
- 系统无功补偿容量 Reactive power compensation capacity
- 产品的柜型及尺寸 Product container type and size
- 产品进线方式 Product Line Information

应用场合 Application

静止无功发生器(ZM-SVG), 是采用现代电力电子技术和基于高速DSP器件的数字信号处理技术制成的新型无功补偿专用设备。它由指令电流运算电路和补偿电流发生电路两个主要部分组成。指令电流运算电路实时监视线路中的电流，并将模拟电流信号转换为数字信号，送入高速数字信号处理器(DSP)对信号进行处理，来分析负载电流的无功含量，并以脉宽调制(PWM)信号形式向补偿电流发生电路送出驱动脉冲，驱动IGBT或IPM功率模块，产生满足要求的无功补偿电流，并将无功补偿电流注入电网，从而实现动态无功补偿目的。

Static Var Generator (ZM-SVG) is a new reactive power compensation device adopting modern power electronic technology and DSP digital signal processing system. It consists of instructive current calculation circuit and compensated current production circuit. The instructive current calculation circuit monitor the current of the line at real time, and convert analog current signal to digital signal, transmitted into DSP, and processed, separate the harmonic waves from basic content, send driving pulse to compensated current production circuit via PWM signal, drive IGBT or IPM power module, produce a compensated current that can meet with the requirement of system, input reactive compensation current into the system

模块外形尺寸图 Outline sizes



SVG模块型号 Model specifications	外形尺寸Outline size							
	L	W	W1	W2	H	A	B	C
ZM-SVG-400V-35kvar-4M	550	470	503	526	200	80	300	80
ZM-SVG-400V-50kvar-4M	570	470	503	526	250	80	300	80
ZM-SVG-400V-75kvar-4M	640	500	533	556	250	80	390	80
ZM-SVG-400V-100kvar-4M	650	530	563	583	321.5	80	380	80

注:由于产品更新变化较快，实际尺寸以厂家提供为准。

XIKAI®

TBBX
高压无功就地补偿装置
High voltage Reactive local Compensating Device

适用范围 Application

TBBX型高压无功地补偿装置(以下简称补偿装置)为户内式，额定电压6-10kV，频率50Hz，用于额定电压6-10kV三相交流电动机进行就地无功补偿，以减少电能损耗，提高电网电压质量及改善电动机的启动性能。补偿装置内的电容器随电动机的起动而投入，停止而切除。它是一种补偿效果大大优于集中补偿的、新颖的节能产品。

TBBX type high voltage reactive local compensating device (hereinafter call compensating device) is of indoor use, for rated voltage 6-10KV, 50Hz, system to locally compensate reactive power for 6-10KV 3-P AC motor and to lessen the electric loss, improve electric quality and motor starting performance, the compensating device will be switched on/off along with the motor on/off. The effect is better than the central compensation.

型号及其含义 Model and implication

TBB X □-□-3N

- 户内三相 3 phases indoor use
- 额定容量(kvar) rated capacity (kvar)
- 额定电压(kV) rated voltage (kV)
- 就地补偿 local compensation
- 并联电容器装置 shunt capacitor device

主要技术参数 Main Technical data

就地补偿装置基本参数

序号 No.	型号规格 Type	额定电压(kV) Rated voltage (kV)	电容器组额定容量(kvar) Rated capacity of capacitor group (Kvar)	电容器组额定电流(A) Rated current of capacitor group (A)	保护方式 Protection mode	并联电容器型号 Shunt capacitor model
1	TBBX6-90-3N	6.6	90	7.9	Each capacitor unit has fuse protection 单台电容器熔断器保护	BFM6.6/√3-30-1
2	TBBX6-120-3N		120	10.5		BFM6.6/√3-40-1
3	TBBX6-150-3N		150	13.1		BFM6.6/√3-50-1
4	TBBX6-180-3N		180	15.75		BFM6.6/√3-60-1
5	TBBX6-200-3N		200	17.5		BFM6.6/6-200-3
6	TBBX6-240-3N		240	21		BFM6.6/6-80-3
7	TBBX6-300-3N		300	26.2		BFM6.6/√3-100-1
8	TBBX6-360-3N		360	31.5		BFM6.6/√3-120-1
9	TBBX6-450-3N		450	39.4		BFM6.6/√3-150-1
10	TBBX6-600-3N		600	52.5		BFM6.6/√3-200-1
11	TBBX10-90-3N	10	90	4.7		BFM11/√3-30-1
12	TBBX10-120-3N		120	6.3		BFM11/√3-40-1
13	TBBX10-150-3N		150	7.9		BFM11/√3-50-1
14	TBBX10-180-3N		180	9.45		BFM11/√3-60-1
15	TBBX10-200-3N		200	10.5		BFM11-200-2
16	TBBX10-240-3N		240	2.6		BFM11-80-3
17	TBBX10-300-3N		300	15.75		BFM11/√3-100-1
18	TBBX10-360-3N		360	18.9		BFM11/√3-120-1
19	TBBX10-450-3N		450	23.6		BFM11/√3-150-1
20	TBBX10-600-3N		600	31.5		BFM11/√3-200-1

XIKAI®

ZBBX
高压无功就地补偿装置
High voltage Reactive local Compensating Device

使用环境条件 Working conditions

- 户内使用
- 海拔高度不超过1000m
- 周围空气温度为-10℃~+40℃
- 安装地点无严重霉菌，无腐蚀性气体，无严重粉尘，无导电性尘埃存在，无严重振动。
- 相对湿度：日平均不大于95%，月平均不大于90%。
- 该装置只适应于电动机为连续工作制，且无大的冲击性负载。并不得承受反转或反接制动。不得使用在调速控制的电动机负载上。

- Indoor use
- Altitude not more than 1000m
- Ambient temperature: -10~ 40°C
- Mounting sites shall have no bacterium, corrosive gas, explosive particles, conductive dusts, and no severe vibration
- Relative humidity: daily average: < 95%, month average: < 90%
- This device is only suitable for continuous working motor that it has no severe fluctuated loading, inverse rotationor inverse braking is forbidden, and it is not allowed to connect with speed adjustable motor.

- 额定电压：6-10kV
- 额定容量：详见上表
- 额定电流：详见上表
- 补偿装置的接线方式为Y接线方式，中性点不接地。

- Rated voltage: 6-10KV
- Rated capacity as above sheet
- Rated current as above sheet
- Wiring mode: Y (star) connected, neutral line earthed

结构 Structure

补偿装置的壳体可以由柜体型材组合或用钢板折弯焊接而成。柜体的上部为安装仪表的仪表门，下部为钢板门，门内设有安全闭锁。补偿装置柜后面设有带上下通风孔的门，该门用螺旋式锁具锁紧，在一般情况下不得打开。只有在停机以后才能打开。

补偿装置的进线方式：采用电缆下进线方式：采用电缆下进线方式和母排架空上进线方式两种。

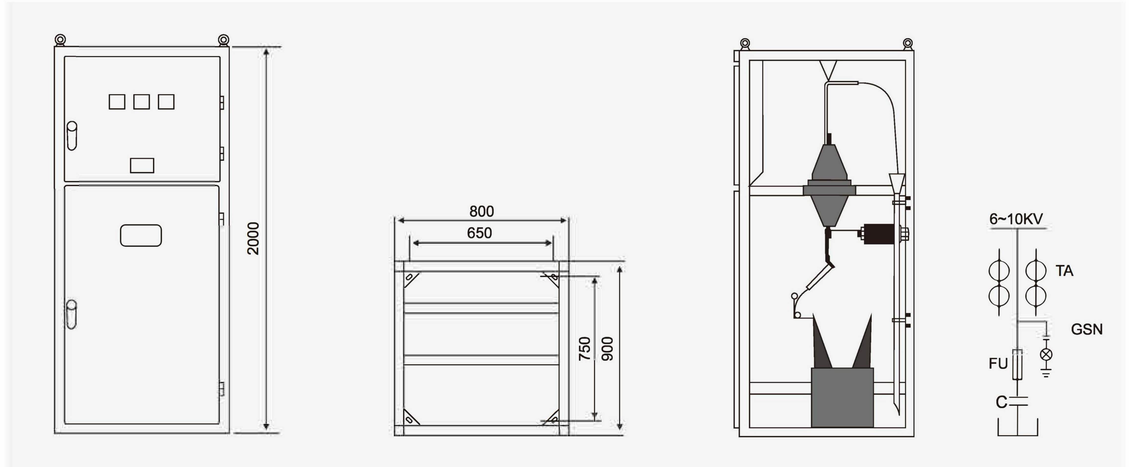
The enclosure of the device can be made of panel material or steel bent formation, the panel upper part is meter door, downward part is steel door, inside door is provided with safe lock, rear panel is left ventilating door which it is locked by spiral lock, at normal working, this do or is not allowed to open except that the power is out of supply

选型方式 Selection

- 补偿装置的额定电压与系统电压相一致；
- 补偿装置柜的额定电流不大于电动机的空载电流。
- 补偿容量的计算；补偿容量的计算与GGJ型低压无功功率自动补偿装置相同。

- Rated voltage of the device shall is equal the system voltage
- Rated voltage of the device shall is not bigger than motor no-loading current.
- Calculation of compensated capacity: as the methods of GGJ low voltage reactive auto compensation device.

外形及安装尺寸 Outline and dimensions



订货须知 Order notice

- 用户订货时须提供一二次回路电气原理图、平面布置图。
- 提供进线方式(上、下、左、右后进线，是电缆还是母排进线)。
- 用户须写明型号、规格、数量，以及其他有关技术方面的要求。

- Please provide primary and secondary wiring diagram, and its layout
- Incoming methods (Up, down, left, right incoming, cable or busbar used)
- Please indicate the model, specification, quantity, and other technical requirements

XIKAI®

TBBZ
高压无功柱上自动补偿装置
High voltage reactive power automatic compensating equipment

使用条件 Service conditions

- 海拔高度：不高于1000m；
- 风速：不大于35m/s；
- 地震：地震烈度不超过8度；
- 日照：最大幅度为0.1w/cm2；
- 周围空气温度：上限+45℃，下限-40℃；
- 化学条件：安装场所无有害气体和蒸汽，无导电性或爆炸性尘埃；
- 抗污秽能力：外部绝缘泄漏比距≥2.5cm/kV；
- 安装：安装倾斜度不超过5度；
- 安装地点谐波含量符合国家有关规定。

注：高原及特殊环境产品另行商定。

- Altitude: not higher than 1,000m;
- Wind velocity: not more than 35m/s;
- Earthquake: intensity of earthquake can't exceed 8 degree.
- Sunshine: max amplitude is 0.1w/cm2;
- Ambient air temperature: -40℃~+45℃;
- Chemical conditions: no harmful gas and steam, no electric conductive or explosive dust.
- Pollution-proof capability: leakage distance of outer insulation is ≥2.5cm/kV;
- Installation: the gradient is not more than 5 degree.
- The harmonic content of installation site shall conform to the national relevant regulations.
- Note: If the products are used in the plateau area or special environments, user shall negotiate with us separately.

特点 Characteristics

本装置采用一体化结构，配置齐全、结构紧凑、安装简单、维护方便、质量稳定、使用寿命长。本装置可根据实际需要，参数由用户自行设置，微电脑自行判断，分析，实现高压并联电容器组的自动投切。同时本装置还设有完善的保护功能，具有母线短路速断保护，电容器过流短延时保护及过电压保护、欠电压保护、缺相保护(定货时可选)。

It has following highlight features: integration structure, complete assembly, compact structure, convenient maintenance, stable quality, long service life and so on. According to practical requirement, user can set the parameters. Its microcomputer can judge and analyze automatically, automatic switching of high voltage shunt capacitor bank can be realized. Furthermore, the equipment has perfect protection functions such as quick-breaking protection against busbar short-circuit, capacitor over-current short-time delay protection, over voltage protection, under voltage protection, phase failure protection (The protection functions can be chosen).

适用范围 Application

TBBZ高压无功自动补偿装置(以下简称装置)适用于10KV和6KV配电线路中，安装在架空线路上，作为提高功率因数，减少线路损耗，节约电能，改善电压质量之用，也可用于小型化终端变电所10KV母线无功补偿，高压电动机就地补偿。

本装置符合JB/T7111-1993《高压并联电容器装置》、DL/T604-1996《高压并联电容器装置订货技术条件》等标准。

本装置由跌落式熔断器、大容量电压互感器、电容器投切专用高压真空接触器、电流互感器、氧化锌避雷器、全膜高压并联电容器、高压电容器自动补偿控制装置及箱体等组成。

TBBZ high voltage reactive power automatic compensating equipment (hereinafter referred to as equipment) is suitable for 10KV and 6KV distribution circuit, installed on the overhead circuit, to improve power factor, reduce circuit consumption, save electric energy and improve the voltage quality, besides, it is also used for reactive compensating of 10KV busbar of miniature terminal transformer substation and compensating high voltage motor on the spot.

This equipment conforms to the standard JB/T7111-1993 High Voltage Shunt Capacitor Installation and standard DL/T604-1996 Specification of High voltage Shunt Capacitor Installation for Order.

It is made up of drop-out fuse, voltage transformer of large capacity, high voltage vacuum contactor special for switching capacitor, current transformer, ZnO arrester, whole-film high voltage shunt capacitor, automatic compensating controller of high voltage capacitor, box body and so on.

系统运行条件

- 额定电压6kV，10kV；
- 最高运行电压6.6kV，11kV；
- 额定频率50Hz；

System running conditions

- Rated voltage 6kV，10kV；
- Max running voltage 6.6kV，11kV；
- Rated frequency 50Hz；

TBBZ
高压无功柱上自动补偿装置
High voltage reactive power automatic compensating equipment

型号含义和产品功能说明 Model and iproduction functions description

TBBZ □—□—□—□

- 缺省：电压、时间控制
  Default: Control of voltage and time
- P：电压、时间控制；射频无线抄表控制
  P：Control of voltage and time: control of radio frequency meter reading
- G：电压、时间控制；GPRS或CDMA远程抄表控制
  G：Control of voltage and time: control of GPRS or CDMA remote meter reading
- Q：功率因素等五套策略控制
  Q：Control of five strategies such as power factor and so on.
- 装置的额定容量kvar Rated capacity of equipment (kvar)
- 额定电压KV Rated voltage(KV)
- J：真空接触器 J:Vacuum contactor
- 高压无功自动补偿装置 High voltage reactive automatic compensating equipment

主要技术参数 Main Technical data

序号 NO	型号 Type	额定电压(kV) Rated voltage	电容器组额定电压(kV) Rated voltage of capacitor group	额定容量(kvar) Rated Capacity	额定电流(A) Rated current	额定电容(μf) Rated capacitance	允许稳态过电压	允许稳态过电流	额定频率(Hz) Rated frequency
1	TBBZ-100	10	10.5	100	5.5	2.87	1.1Un	1.3In	50
2	TBBZ-200	10		200	11	5.77			50
3	TBBZ-300	10	10.5/√3	300	16.5	8.66			50
4	TBBZ-360	10		360	19.8	10.4			50
5	TBBZ-450	10		450	24.7	12.99			50
6	TBBZ-600	10		600	33	17.32			50
7	TBBZ-900	10		900	49.4	25.98			50
8	TBBZ-1200	10		1200	65.9	34.65			50
9	TBBZ-100	6	6.3	100	9.2	8.02			50
10	TBBZ-200	6		200	18.3	16.04			50
11	TBBZ-300	6	6.3/√3	300	27.5	24.06			50
12	TBBZ-360	6		360	33	28.87			50
13	TBBZ-450	6		450	41.2	36.09			50
14	TBBZ-600	6		600	54.9	48.12			50
15	TBBZ-900	6		900	72.4	72.18			50
16	TBBZ-1200	6		1200	110	96.24			50

性能 Performance

电容偏差

装置实际电容与额定电容之差在额定电容的0~5%范围内。

放电性能

断电后10min，每一组电容器上的电压低于50V。

Capacitance difference

The difference of actual capacitance and rated capacitance of equipment is within the range 0~5% of rated capacitance

Discharge performance

After power is off for 10min, voltage of each group of capacitors is lower than 50V.

TBBZ
高压无功柱上自动补偿装置
High voltage reactive power automatic compensating equipment

保护

- 装置的保护有短路、过电流、过电压、欠电压、失压、缺相(可选)保护和防止电容器带电荷合闸。具体设置如下：
- 主电路相间短路：跌落式熔断器动作切除故障相，接触器略带时限(延时0.2~0.5S)动作于跳闸，退出运行并自行闭锁。
- 电容器组相对中性点短路：接触器略带时限(延时0.2~0.5S)动作于跳闸，并自行闭锁。整定值：3In。
- 电容器组过电流：带时限(延时5S)动作于跳闸，并自行闭锁。整定值:1.4~1.5In。
- 过电压：带时限(延时20~30S)动作于跳闸，整定值：1.1~1.3UN。
- 雷击过电压：由金属氧化锌避雷器实现保护。
- 操作过电压：由电容型氧化锌避雷器实现保护。
- 欠电压：略带时限(延时0.2~0.5S)动作于跳闸。整定值：0.6UN。
- 失压：略带时限(延时0.2~0.5S)动作于跳闸。
- 缺相：任意一相断电动作于跳闸，并自行闭锁(选用)。
- 防止电容器带电荷合闸：投入电容器组前延时10min (不可更改)。

注：以上整定值及延时时间可以按需要自行设置和更改。

Protection

- This equipment provides short-circuit protection, over-current protection, over-voltage protection, under voltage protection, voltage loss protection, phase failure protection(selectable). Prevent capacitor closing with charge. The setting is shown as follows:
- Phase-to-phase short circuit of main circuit: drop-out fuse operates to cut off the fault phase, the contactor performs time-delay operation (delay for 0.2~0.5S) a little to trip, and exits running to close automatically.
- Phase-to-neutral point short circuit of capacitor bank: the contactor performs time-delay operation (delay for 0.2~0.5S) a little to trip, and exits running to close automatically. The setting value is 3In.
- Over current of capacitor bank: perform time-delay operation (delay for 5S) to trip, and close automatically. The setting value is 1.4~1.5In.
- Over voltage: perform time-delay operation (delay for 20~30S) to trip, the setting value is1.1~1.3UN.
- Lightning over voltage: protected by ZnO arrester.
- Operation over voltage: protected by capacitor type ZnO arrester.
- Under voltage: perform time-delay (delay for 0.2~0.5S) a little to trip. The setting value is 0.6UN.
- Voltage loss: perform time-delay (delay for 0.2~0.5S) a little to trip.
- Phase failure: perform any phase breaking operation to trip and close automatically (selectable)
- Prevent capacitor closing with charge: delay for 10min (not changed) before cutting in capacitor.

Note: above setting values and delay time can be set or changed according to requirement.

6kV~10kV配电线路最佳补偿容量和补偿位置的选择
Selection for the best compensating capacity and compensating position of 6kv~10kv distribution circuit

6kV~10kV配电线路如何合理选择安装TBBZ高压无功自动补偿装置，使配电线路损耗最小，投资最少，获得的补偿效益最好，是一个非常值得分析的重要问题。按照等网损微增率准则，通过数学分析，得到以下结论，见下表。

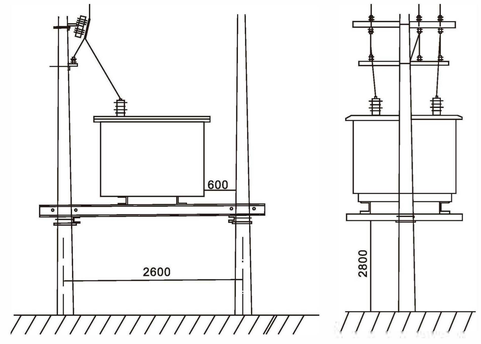
It is an important problem that is worth being analyzed that how to choose and install TBBZ high voltage reactive automatic compensating equipment properly to get the least consumption and investment and best compensating benefit for 6kV~10kV distribution circuit. According to rule of equal network loss micro-increment rate and mathematic analysis, the following conclusion is got. (see following table):

无功负荷分布方式 Reactive load Distribution way	线路电容器安装组数 Group no. of circuit capacitor installed	最佳补偿容量 The best compensating capacitor		最佳安装位置(位于主干线的长度的) The best installing position (Lie on about of main wire)	线损下降率(%) Reducing ratio of wire loss
		变电站 Transformer substation	线路 Circuit		
均匀分布 Uniform distribution	一组 One group	1/3	2/3	2/3	88.9%
	二组 Two groups	1/5	4/5	2/5，4/5	96%
沿线递增分布 Increasing distribution along the line	一组 One group	0.2	0.8	0.775	93%
沿线递减分布 Decreasing distribution along the line	一组 One group	0.374	0.626	0.442	86.4%
沿线等腰分布 Isosceles distribution along the line	二组 Two groups	0.204	0.796	0.554	91.7%

注：最佳补偿容量是指线路所需总无功容量的最佳分配方法，即变电站占总补偿容量的比例，线路上占总补偿容量的比例。

在实际应用中，由于现场情况不一定完全满足表中要求，因此要灵活运用表中数据。在安装地点选择时，还要踪合考虑安装点的交通、环境、运输和今后的管理等方面的问题。

Note: the best compensating capacitor that is the best distribution method for total reactive capacitor required by circuit, that is, transform substation share of total compensating capacity, and the circuit share of total compensating capacity. In the practical application, the spot situation may not meet the requirement in the table, so the data in the table shall be used flexibly. With respect to selection of installation site, please comprehensively consider any aspects such as traffic, environment and following management and so on.



TBB
高压并联电容器补偿装置
High voltage shunt capacitor compensating switchgear

适用范围 Application

高压并联电容器补偿装置 (以下简称装置)主要用于工频6~10kV的三相电力系统，用以调整、平衡变电站网络电压，提高功率因数，降低损耗，提高供电质量。

该产品符合JB/T7111-1993《高压并联电容器装置》、DL/T604-1996《高压并联电容器装置订货技术条件》、GB50277-1995《并联电容器装置设计技术规程》等标准。

The high voltage shunt capacitor compensating device is mainly used in 6-10KV three phases system, to adjust and balance the network voltage, improve power factor, lessen loss and improve the electric quality.
This device meet with standard of JB7112-2000 "Aggregate High voltage shunt capacitor" and DL/T628-1997 "technical rules on ordering for Aggregate High voltage shunt capacitor", GB50277-1995 "Technical design regulations for shunt capacitor switchgear".

型号及其含义 Model and implication

TBB (□)□-□/□-□□□

- 第三尾注号 注3 NB 3
- 第二尾注号 注2 NB 2
- 第一尾注号 注1 NB 1
- 单台电容器额定容量(kvar) Each unit capacity
- 装置额定容量(kvar) Rated total capacity
- 装置额定电压(kV) Rated voltage(kv)
- 带F为分组投切型，不带为普通型单台电容器带H为集合式电容器
  "F" is step-by-step switching, no "F" is normal type "H" mean each unit is aggregate capacitor (oil immersed type)
- 并联电容器装置 Shunt capacitor switchgear

注1：A表示Y接线，B表示Y-Y接线

注2：K表示开口三角电压保护，C表示电压差动保护，L表示中线不平衡电流保护。

注3：W表示户外装置，如不标则为户内。

例如：TBB10-4800/100-AK 表示装置额定电压为10kV，装置额定容量为4800kvar，单台电容容量为100kvar,Y接线，开口三角电压保护的户内式并联电容器装置

NB 1: A stand for Y/star connection, B stand for Y-Y connection
NB 2: K stand for opening delta voltage protection, C stand for voltage differential protection, L stand for Neutral unbalanced current protection.
NB 3: W stand for outdoor use, no mark mean indoor use
For example: TBB10-4800/100-AK
Mean: rated voltage 10KV, rated total capacity 4800Kvar, each has 100Kvar, Y connection, opening delta voltage protection, indoor use.

使用环境条件 Working conditions

- 安装运行地区的海拔高度不超过1000m。
- 安装运行地区无剧烈机械振动。无腐蚀性气体和蒸汽。无导电性爆炸性尘埃。
- 安装运行地区的环境温度：
  户内装置不超过-5℃~+40℃；对户外装置不超过-40℃~+40℃。

- Altitude of mounting site: not more than 1000m.
- Mounting size shall have no severe vibration, no corrosive gas and steam, no conductive and explosive dust Ambient temperature.
- Indoor use: 5℃ ~ 40℃; outdoor use 40℃~ 40℃.

TBB
高压并联电容器补偿装置
High voltage shunt capacitor compensating switchgear

主要技术性能 Main technical specifications

- 装置能在1.1倍额定电压的稳态过电压下长期运行。
- 装置能在方均根值不超过1.3倍电容器组额定电流的过电流下连续运行，这一过电流是由谐波和高至1.1倍额定电压的过电压共同作用的结果。
- 在4.1条及4.2条规定限度内的过电压和过电流下运行时，装置的总容量应不超过1.35倍额定容量。
- 电容器组的实测电容与其额定电容之差在0~+10%范围之内，当电容偏差+10%时，上述4.2条过电流可能达到1.43倍。
- 装置运行中工频加谐波的过电压产生的过电流不能超过4.2条的规定值。装置在不高于1.1倍额定电压下长期运行时，包括所有谐波分量在内的电压峰值不能超过1.2 2倍额定电压。
- 装置采用无重击穿的高压断路器，并装有氧化锌避雷器，以限制投切电容器组时产生的操作过电压。6kV、10kV装置选用真空负荷开关、真空断路器或SF6型断路器来作电容器组的切换开关。对于小电容量的电容器组，且需分组投切的采有和真空负荷开关，对于大电容量的电容器组应采用真空断路器或SF6型开关。
- 装置选用CKGK型干式空心电抗器接装置电源侧或CKSW型油浸铁心电抗器接装置中性点侧，用以限制合闸涌流，抑制高次谐波，改善网络电压波形。额定电抗率为0.5~1%的电抗器用于限制合闸涌流。额定电抗率为5~6%电抗器用于犯制7次及以上谐波和限制合闸涌流。额定电抗率为12~13%者用于抑制3次及以上谐和波和限制合闸涌流。
- 装置选用FD型放电线圈，可在5s内将电容器组的剩余电压自额定电压峰值降至0.1倍额定电压以下。
- 根据系统及用户的需要，装置可采用就地控制或主控制室、集中控制，或自动控制等方式。
- 装置采用单台电容器熔断器保护为主保护，(集合式电容器补偿装置以内熔丝为主保护)，开口三角电压、电压差动、中线不平衡电流保护作为后备保护，此外装置还设有过流、速断、过压、失压保护。这些保护的实现选用较好性能的微机电容器保护装置，以实现对电容器继电保护。
- 分组投切的电容器并联补偿装置是按不同容量规格，将电容器设计成多个小组(1~3个)，配已多功能自动控制器，按电压、无功指令真空负荷开关或断路器对电容器组进行分合控制，以达到合理调节电压、补偿无功的目的。

- The switchgear can work long-term under 1.1 Un.
- The switchgear can work long-term under 1.3 In rms rated current of capacitor group, which over current is generally come from harmonic wave and 1.1Un action.
- Under above clause 4.1 and 4.2 action, the total capacity shall not more than 1.35 rated total capacity.
- The deviation between the measured capacitance and the rated capacitance shall be within 0-+10%, when the deviation reach up to 10%, the over current mentioned in clause 4.2 can reach up to 1.43.
- The over-current resulted from power frequency and harmonic wave voltage shall not more than the value specified in clause 4.2. when the switchgear work under 1.1 Un and below for long term, the peak voltage value including all harmonic values shall not more than 1.22Un.
- The switchgear connected with no-severe break-down circuit breaker and ZnO arrester to limit the operational over voltage. 6KV, 10KV capacitor switchgear use vacuum load switch, VCB or SF6 breaker as the switch. Regarding the small capacity switchgear, and where it need step-by-step switch the capacitor group, we recommend to use vacuum load switch, regarding the large capacity switchgear, it shall use VCB or SF6 breaker.
- CKGK dry type hollow resistor connected to power source side or CKSW oil immersed steel core resistor connected to neutral line is used to limit surge during close operation, finally to restrain the hi-freq harmonic wave, improve voltage wave. Rated resistive rate 0.5~1% resistor is used to restrain surge coming from closing operation, rate 5-6% resistor is used to restrain 2times frequency wave and surge coming from closing operation, rate 12-13% resistor is used to restrain 3 times frequency wave and surge coming from closing operation.
- FD discharge coil is used, it can discharge the electricity and let the residual voltage come down to 0.1 time rated voltage within 5s.
- As required, local control, main control room, central control or automatic control can be provided.
- Main protection is that each capacitor unit has fuse, (aggregate oil immersed capacitor bank is mainly protected by inner fuse), opening delta over voltage protection, voltage differential protection, neutral unbalanced current protection are as backup protection modes, moreover, over-current protection, quick-break, over-voltage protection, voltage failure protection are provided,
- Step-by-step switching capacitor switchgear is according to different capacity, divide several groups (1~3), and provided with multi-functional auto-controller, in the command of voltage status and reactive capacity to control the vacuum load switch or breaker switching on/off reasonably.

结构 Structure

6~10kV装置由高压开关柜(包括断路器、高压隔离开关、电流互感器、继电保护、测量仪表)、串联电抗器、放电线圈、氧化锌避雷器、接地开关、单台电容器保护用熔断器、并联电容器及连接母线和钢构架组成。双星形者还包括中线不平衡电流保护用电流互感器。

- 根据并联电容器且结构的不同可分为构架式、拼装式、户内柜式、集合式组成。

- 6-10KV capacitor switchgear consist of HV switchgear (breaker, isolator, CT, relay protection, metering system), series connected resistor, discharging coil, ZnO arrester, earth switch, fuses for each capacitor unit, shunt capacitor units, busbar and steel mounting supports. Y-Y type also includes CT for neutral unbalanced current protection.
- According to shunt capacitor and structure, divided: Frame type, Split type, indoor panel type, aggregate type.

TBB
高压并联电容器补偿装置
High voltage shunt capacitor compensating switchgear

构架式

电容器组包括进线架和电容构架。整个装置构架分成若干个板块，然后在现场进行组装。进线架内装设放电线圈、接地开关、氧化锌避雷器。双星形接线者还有中线不平衡电流保护用，电流互感器。电容器构架由并联电容器、单台电容器保护用熔断器、铜等所组成。

拼装式

拼装式并联电容器装置与构架式不同之处就是装置按放电线圈柜，电容器柜拼装成柜型，在工作现场只需拼柜即成。整个装置设有机械、电气闭锁。

户内柜式

电容器组按不同容量规格，由一台进线柜和一至数台电容器柜组合而成。进线柜装设放电线圈、接地开关氧化锌避雷器。电容器柜内包括并联电容器、单台电容器保护用熔断器。

集合式是由集合式并联电容器配以放电线圈、氧化锌避雷器、电抗器、接地开关所组成。放电线圈安装在集合式电容器与电抗器架之上。装置的额定容量由集合式电容器额定容量所决定。

串联电抗器的接线

串联电抗器有三种型式即干式空芯串联电抗器、干式三相串联电抗器和油浸三相串联电抗器。按照接线方案的要求可安装电容器组之前，或电容器组之后，即装置的电源侧，或装置的中性点侧。

列表中的外形尺寸以出具的安装图，基础图的尺寸为准。该样本尺寸仅供参考。

Frame type

Capacitor group includes incoming support and capacitor supports, the whole switchgear divided into several parts, and transported to the site for mounting, incoming support fixed with discharging coil, earth switch, ZnO arrester, if Y-Y type, there CT for neutral unbalanced current protection is fixed as well, and capacitor support includes fuses, busbars.

Split type

The difference from the frame type is that this is constructed as discharging coil panel, capacitor panel, it is enough that combine them together on site. The whole switchgear provides mechanical and electrical interlocks.

Indoor panel type.

Capacitor group according to different capacity form 1 incoming panel and 1 or several capacitor panels, incoming panel consists of discharging coil, earth switch, ZnO arrester, capacitor panel includes capacitor, fuse for each capacitor units.

Aggregate type: this type consists of aggregate (oil immersed) capacitor, and discharging coil, ZnO arrester, resistor, earth switch, the discharging coil is mounted upon the capacitor or resistor supports. The switchgear capacity depends on the aggregate capacitors.

Wiring of series connected resistor.

The resistor has three kinds: dry hollow type series resistor, dry three phases series resistor and oil immersed resistor. According to wiring layout, the resistor can be connected in front of or back of capacitor group, namely besides power source side or neutral line.

The mounting dimensions in sheet are only for reference.

主要技术数据 Main Technical data

6kV构架式并联电容器装置(见表1) 6KV frame type shunt capacitor switchgear (sheet 1)

序号 No	型号规格 Type	额定电压 (kV) Rated voltage (KV)	电容器组 额定电压量(kV) Rated voltage of capacitor group (KV)	电容器组 额定容量(kvar) Rated total capacity (Kvar)	电容器组 额定电流(A) Rated current of capacitor group (A)	接线方式 Wiring mode	保护方式 Protection mode	并联电容器型号 Capacitor unit model	电容器组外形尺寸(L×W×H)mm Capacitor group size (L×W×H)	外形图号 Drawing Number
1	TBB6-1200/50-AK	6	6.6	1200	105	Y	开口三角电压保护 Opening delta voltage protection	BFM6.3/$\sqrt{3}$-50-1W	2000×1600×3215	1.2
2	TBB6-1500/50-AK	6	6.6	1500	131	Y	开口三角电压保护 Opening delta voltage protection	BFM6.3/$\sqrt{3}$-50-1W	2232×1600×3215	1.2
3	TBB6-1800/50-AK	6	6.6	1800	157	Y	开口三角电压保护 Opening delta voltage protection	BFM6.3/$\sqrt{3}$-50-1W	2460×1600×3215	1.2
4	TBB6-2400/50-AK	6	6.6	2400	210	Y	开口三角电压保护 Opening delta voltage protection	BFM6.3/$\sqrt{3}$-50-1W	3000×1600×3215	1.2
5	TBB6-2400/50-BL	6	6.6	2400	210	Y-Y	中线不平衡电流保护 Neutral unbalanced current protection	BFM6.3/$\sqrt{3}$-50-1W	3000×1600×3215	1
6	TBB6-2400/100-AK	6	6.6	2400	210	Y	开口三角电压保护 Opening delta voltage protection	BFM6.3/$\sqrt{3}$-100-1W	2600×1700×2350	1.2

ZMTBBL
型高压滤波无功补偿成套装置
High voltage Filter Reactive Power Compensation Complete Set

产品概述 Product overview

ZMTBBL 型高压滤波无功补偿成套装置用于6~35kV 电力系统，主要安装在电力、钢铁、冶金、化工、煤矿、轻工、建材以及有谐波电流产生的场所，起到就近吸收谐波源所产生的谐波电流，抑制谐波，消除电力谐波“污染”的作用。ZMTBBL 装置在运行中和谐波源并联，除起滤波作用外还兼作向系统提供无功功率，提高功率因数进行无功补偿的目的。

ZMTBBL High Voltage Filter Reactive Power Compensation Complete SetFor 6-35kV power system,Mainly installed in electric power, steel, metallurgy, chemical industry, coal mine, light industry, building materials and places where harmonic currents are generated.It can absorb the harmonic current generated by the harmonic source nearby, restrain the harmonic and eliminate the "pollution" of the power harmonic.The ZMTBBL device is in parallel with the harmonic source in operation.Besides filtering, it also provides reactive power to the system.The purpose of reactive power compensation is to improve power factor.

型号及其含义 Model and implication

ZM TBB L □-□/□-□ □ □

- W：户外(缺省表示户内) — W: Outdoor (default means indoor)
- 继电保护方式： — Relay protection mode:
  - K：开口三角保护 — K: Open Triangle Protection
  - C：电压差动保护 — C: Voltage differential protection
  - L：不平衡电流保护 — L: Unbalanced Current Protection
  - Q：桥式差电流保护 — Q: Bridge Differential Current Protection
  - Y：不平衡电压保护 — Y: Unbalanced Voltage Protection
- 主接线方式： — Main wiring mode:
  - A：单星 B：双星 — A: Single star B: Double star
- 单台容量 (kvar) — Single capacity (kvar)
- 额定容量 (kvar) — Rated capacity (kvar)
- 系统电压 (kV) — System Voltage (KV)
- 滤波 — Wave filtering
- 并联电容器成套 — Shunt capacitor set
- 企业代号 — Enterprise code

执行标准 Executive standard

- GB 50227-2008《并联电容器装置设计规范》
- JB/T7111-1993《高压并联电容器装置》
- DL/T 604-1996《高压并联电容器装置订货技术条件》

- GB 50227-2008 "Design Specification for Parallel Capacitor Devices"
- JB/T7111-1993 "High Voltage Shunt Capacitor Device"
- DL/T 604-1996 Technical Conditions for Order of High Voltage Shunt Capacitor Devices

使用环境条件 Working conditions

- 安装环境：户外或户内。
- 海拔：不超过1000 米。
- 环境温度：-40℃ ~ +45℃。
- 相对湿度：月平均不大于85%。
- 抗污秽能力：外绝缘爬电比距不小于25mm/kV(相对于系统最高运行电压)。对重污秽区应适当加大爬电比距。
- 安装地点无腐蚀性气体及蒸汽，无导电性、爆炸性尘埃。
- 安装场所无剧烈机械振动。
- 最大风速不超过35 米/ 秒。

备注：高原型及特殊环境条件的产品可另行协商解决

- Installation environment: outdoor or indoor.
- Elevation: No more than 1000 meters.
- Ambient temperature: -40~45°C.
- Relative humidity: monthly average is not more than 85%.
- Pollution resistance: creepage ratio distance of external insulation is not less than 25mm/kV (relative to the maximum operating voltage of the system).
- The creepage ratio should be increased appropriately in the heavily polluted area.
- There is no corrosive gas and steam in the installation site and no conductivity. Explosive dust.
- There is no severe mechanical vibration in the installation site.
- The maximum wind speed does not exceed 35 meters per second.

Note: Products of plateau type and special environmental conditions can be settled through negotiation separately.

ZMTBBL
型高压滤波无功补偿成套装置
High voltage Filter Reactive Power Compensation Complete Set

主要技术性能指标 Main technical data

- 电容偏差
- 装置实际电容与额定电容之差在额定电容的0~ +5% 范围内。
- 装置任何两线路端子之间，其电容的最大值与最小值之比不超过1.02。
- 电感偏差
- 在额定电流下，其电抗值的容许偏差为0~+5%。
- 每相电抗值不超过三相平均值的 ± 2%。
- 绝缘水平

- Capacitance Deviation
- The difference between the actual capacitance and the rated capacitance of the device is within the rated capacitance,In range of 0~+5%.
- The ratio of maximum capacitance to minimum capacitance between any two line terminals of the device does not exceed 1.02.
- Inductance deviation
- At rated current, the allowable deviation of reactance value is 0 ~+5%.
- The reactance of each phase does not exceed 2% of the average value of three phases.
- Insulation level

单位：kV 表1

装置额定电压 Device rated voltage	一次电路1min 工频耐受电压(方均根值) 1 min power frequency of primary circuit Tolerance Voltage	一次电路冲击耐受电压[(1.2~5)/50μs 峰值] Impulse Tolerance Voltage of Primary Circuit[(1.2-5)/50μs peak]	二次电路1min 工频 耐受电压(方均根值) 1 min power frequency tolerance of secondary circuit Voltage
6	32	60	2
10	42	75	2
35	95	200	2

- 过负载能力
- 稳态过电压

- Overload capacity
- Steady state overvoltage

单位：kV 表2

工频过电压UN Power Frequency Overvoltage UN	最大持续时间 Maximum duration	说明 Explain
1.10	长期 Long-term	指长期过电压的最高值不超过1.10U N The maximum value of a long-term overvoltage not exceeding 1.10U N
1.15	每24h 中30min 30 minutes per 24 hours	系统电压的调整与波动 System Voltage Adjustment and Fluctuation
1.20	5min	轻负载时电压升高 Voltage rise under light load
1.30	1min	轻负载时电压升高 Voltage rise under light load

- 稳态过电流：能在方均根值不超过1.1×1.3IN 下长期运行。
- 最大允许容量:在5.4.1,5.4.2 的限度内，总容量不超过1.35QN。
- 放电性能：断电后5s,每一组电容器上的电压低于50V。
- 滤波效率：可达85% 以上。
- 补偿后功率因数提高到0.92以上。
- 额定容量和外形尺寸: 均根据用户要求。

- Steady-state overcurrent: It can be operated for a long time under RMS less than 1.1*1.3IN.
- Maximum allowable capacity: within the limits of 5.4.1 and 5.4.2, the total capacity does not exceed 1.35QN.
- Discharge performance: Five seconds after power off, the voltage on each capacitor group is less than 50V.
- Filtering efficiency: up to 85%.
- After 5.7 compensation, the power factor is increased to over 0.92.
- Rated capacity and size: according to user requirements.

结构和工作原理 Structure and working principle

结构

由高压隔离开关、高压真空接触器或真空断路器、电流互感器、干式空心滤波电抗器、氧化锌避雷器、滤波电容器、高压熔断器、放电线圈和无感电阻器适当组成单调谐滤波装置或高通滤波装置。单调谐滤波装置主要用于滤除谐波源中的主要特征谐波，如3 次，5 次，7 次，11 次等; 高通滤波装置主要达到滤除13 次及以上的高次谐波的目的。ZMTBBL 装置配备自动投切控制装置和微机保护 装置。

工作原理

ZMTBBL 滤波装置主要由滤波电容器、滤波电抗器等组成LC 滤波装置，除起滤波作用外，还兼作无 功补偿作用。LC 滤波装置主要有单调谐滤波装置、双调谐滤波装置、高通滤波装置、C 型滤波装置等。实际运用中根据谐波电流的分布及大小以及无功需求情况设计成几组滤波装置，每一组滤波装 置对该次谐波相当于一个低阻抗通道，使谐波电流大部分流入滤波回路。高通滤波装置对截止频率 以上的谐波均呈现低阻抗，C 型滤波装置具有调谐宽频带，损耗低的特点。滤波装置的分组需进行精密计算，既要滤除主要的谐波电流，也要满足无功补偿要求，同时还要防止在某一整数次频率下由于滤波装置与系统阻抗发生并联谐振而产生的谐波电流放大。我公司的滤波装置设计软件可根据 每一用户的具体特点通过精确的仿真模型快速合理地提供精确的滤波装置设计方案。

Structure

By high-voltage disconnector, high-voltage vacuum contactor or vacuum circuit breaker, current transformer, dry hollow filter reactor, zinc oxide arrester, filter Wave capacitors, high-voltage fuses, discharge coils and inductance-free resistors should be properly composed of a single-tuning filter or a high-pass filter. Monotonic filter device It is used to filter the main characteristic harmonics in the harmonic source, such as 3, 5, 7, 11, etc. The high-pass filter device mainly achieves 13 and 10 times of filtering. The purpose of higher order harmonics. ZMTBBL device is equipped with automatic switching control device and computer protection device.

Working Principle

ZMTBBL filter device is mainly composed of filter capacitor, filter reactor and other LC filter device, which not only acts as filter, but also acts as reactive power compensation. Compensation. LC filter devices mainly include single-tuned filter device, double-tuned filter device, high-pass filter device, C-type filter device and so on. Practical application According to the distribution and magnitude of harmonic current and reactive power demand, several groups of filter devices are designed, each group of filter devices is equivalent to one harmonic. The low impedance channel makes most of the harmonic current flow into the filter circuit. High-pass filter has low impedance to harmonics above cut-off frequency, and C-type filter The device has the characteristics of tuning broadband and low loss. The grouping of filter devices needs to be calculated precisely, not only to filter out the main harmonic currents, but also to meet the requirements.Reactive power compensation requirements, but also to prevent harmonic current amplifier due to parallel resonance between filter and system impedance at a certain integer frequency Big. Our company's filtering device design software can provide accurate filtering device quickly and reasonably through accurate simulation model according to the specific characteristics of each user.Set up the design scheme.

ZMTBBL
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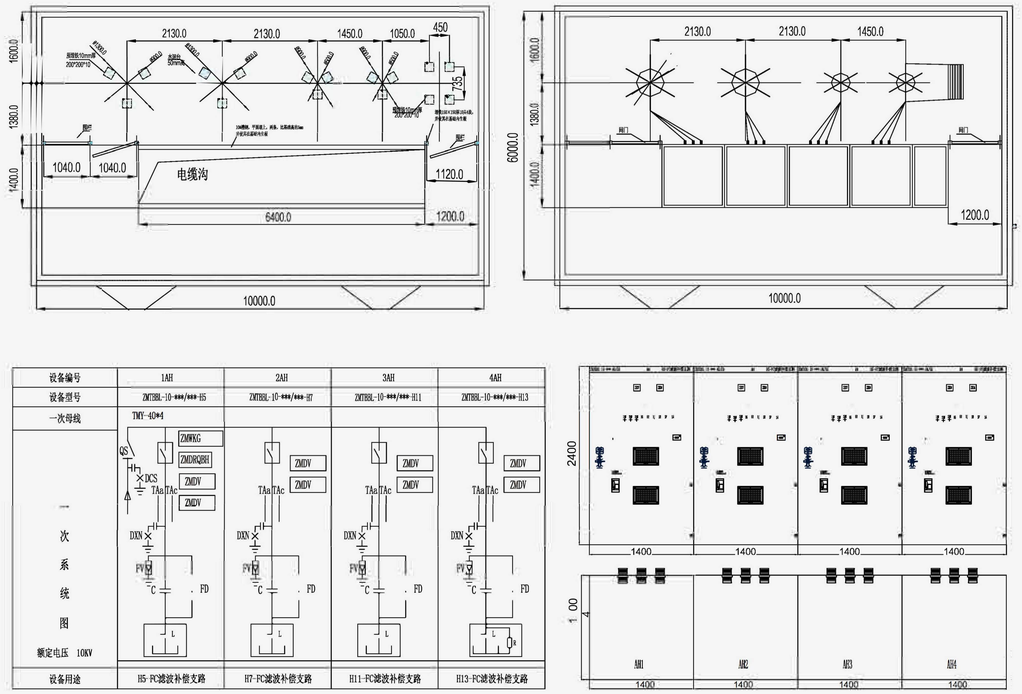
各型滤波装置电气接线图 Electrical wiring diagram of filter device



结构特点 Structural charactertistics

- 滤波电容器由多台电容器单元组成，单台滤波电容器采用单相结构以便分相调谐。滤波电容器 采用全膜复合介质, 具有体积小，损耗小，运行温度低等特点。
- 滤波电抗器采用单相干式空芯结构，坚固耐用、抗强电动力冲击、损耗小、Q 值高、温升低、噪音小，电抗器备有多个抽头，电感值 ± 5% 连续可调，
- 以适应电网的变化。电抗器可采用" —" 字形 或" 品" 字形水平安装。
- ZMTBBL 滤波装置的结构形式灵活，可采用柜式或构架式。采用构架式结构时，整套装置用围栏隔离。
- ZMTBBL 滤波装置分为人工和自动两种控制方式，使操作简便安全。
- 本ZMTBBL 滤波装置可以是一个支路（柜）和一个控制器，单独成套；也可以是二至四个滤波支路组共用一个控制器，由内部母排连接后组成一套。

- The filter capacitor is composed of several capacitor units, and the single filter capacitor adopts a single-phase structure for phase-split tuning. The filter capacitor is made of All-film composite medium, which has the characteristics of small volume, low loss and low operating temperature.
- The filter reactor adopts single coherent hollow core structure, which is durable, resistant to strong electric force impact, low loss, high Q value, low temperature rise and low noise. The reactor is equipped with multiple taps, and the inductance value is continuously adjustable (+5%).
  In order to adapt to changes in the power grid. Reactors can be installed horizontally in the form of "one" or "product".
- ZMTBBL filter device is flexible and can adopt cabinet type or frame type. When the frame structure is adopted, the whole device is isolated by fence.
- ZMTBBL filter device is divided into manual and automatic control mode, which makes the operation simple and safe.
- The ZMTBBL filter device can be a branch (cabinet) and a controller, a single set, or two or four filter branch groups can share a controller, which is composed of an internal bus after connecting.