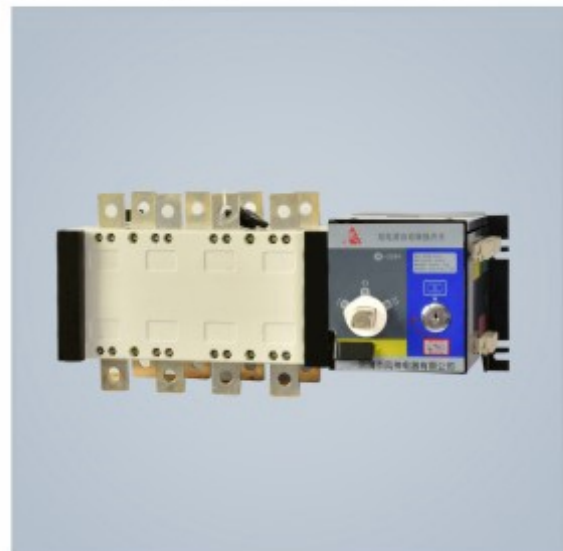


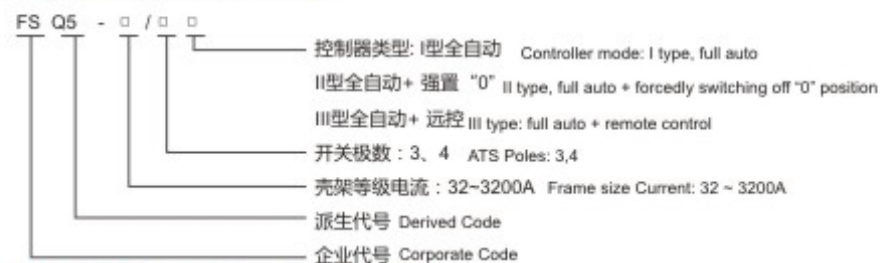
# FSQ5

## 系列双电源自动转换开关

### Series twin power source auto transfer switch (ATS)

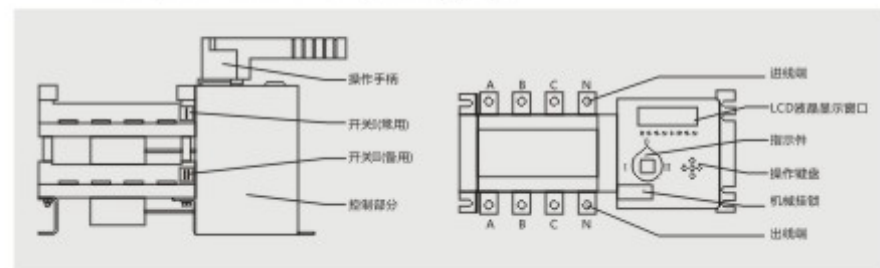


#### 型号及含义 Type and meaning



#### 开关结构说明 Instruction of switch structure

1. 电气钥匙: 控制开关内部控制线路电源, 电气锁开启时, 开关可实现全自动、远控、强置 "0" 操作; 电气锁关闭时, 开关只能手动操作。
  2. 操作手柄: 使用操作手柄手动操作时, 必须先关闭电气锁。
  3. 机构挂锁: 检修专用, 即先用操作手柄使开关处于 "0" 档位置, 再拉起挂锁机构并上挂锁, 方可进行检修(拉起挂锁则切断开关内部控制电源, 开关无法自动, 并且无法实现手动)。
  4. 指示件: 指示开关的工作状态位置(I、O、II)。
1. Electric key: to control the power source for inner control circuit in the switch, when electric lock is opened, full auto operation, remote control, forcedly switching off operations can be executed; while electric lock is closed, the ATSE can be operated by hand.
2. Operating handle: before to use operating handle to operate, please close electric lock.
3. Padlock: special for inspection and repair, namely make the switch in 0 position by use of operating handle, then hung the padlock for safety against power source wrong closed, finally inspection and repair can be executed (when padlock is locked, it cut off power source for inner circuit, ATSE can't be closed automatically or by hand).
4. Indication parts: to indicate the working positions: (I、O、II)



#### 适用范围 Application

自动转换开关(ATSE), 是集开关与逻辑控制于一体, 真正实现机电一体化自动转换开关, 它适用于交流50Hz、额定电压AC400V、约定发热电流至1600A的工业企业配电网中, 具有电压检测、强制置 "0"、紧急手动操作, 广泛应用于供电系统的主电源与备用电源的自动转换或两台负载设备的自动转换及安全隔离等。开关由控制线路板发出各种逻辑命令来管理电机, 由电机带动开关主体部分的操作机构, 快速接通分断电路或进行电路转换, 通过明显可见状态实现安全隔离。

Auto transfer switching equipment (ATSE, ATS), is a device integrated with the switching function and logic control, truly perform electromechanical integration function, suitable for operating in the distribution system of AC50Hz, rated voltage AC400V, conventional thermal current up to 1600A in mineral and other enterprises. It provides the operation function of voltage detection, forcedly switching off "0" position, manual emergency operation and etc, widely used to shift between normal power and standby power or two loading equipment, or perform safe isolation and etc. the control circuit board will govern the motor through logic commands, then motor will drive the operating mechanism of main switches, quickly closing or opening or shift the lines, the safe isolation of main switch is obvious and legible by eye.

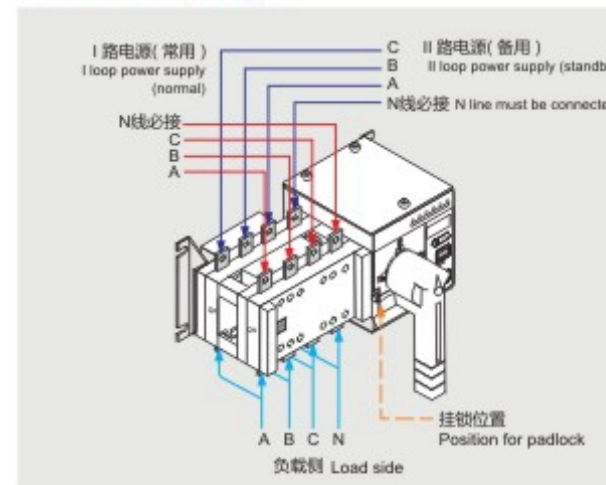
#### 主要技术参数 Main Technical data

- 开关符合: IEC6094-6-1, GB14048.11-2008
- 额定工作电压(Ue): AC400V;
- 额定绝缘电压(Ui): AC690V;
- 额定工作电流(Ie): 10~3200A;
- 控制电源电压: DC24V, DC48V, AC230V
- Complied standard: IEC6094-6-1, GB14048.11-2008
- Rated operating voltage (Ue): AC400V;
- Rated insulation voltage (Ui): AC690V;
- Rated operating current (Ie): 10 ~ 3200A;
- Control supply voltage: DC24V, DC48V, AC230V

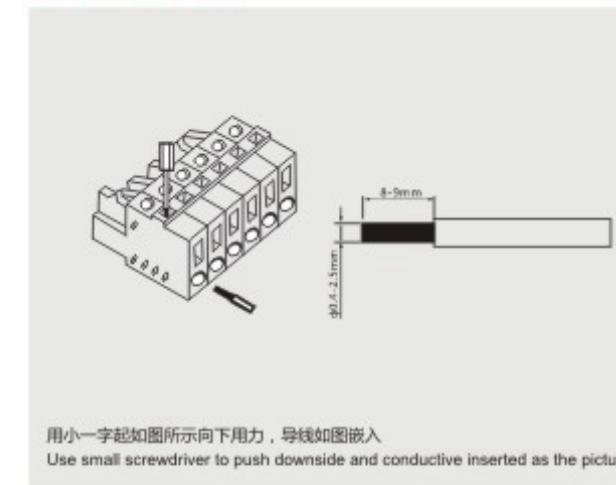
#### 主要技术参数 Main Technical data

约定发热电流(A) Conventional thermal current	100	160	250	400	630	1000	1250	1600	2000	2500	3200	
额定绝缘电压 Rated insulation voltage	750V						1000V					
额定冲击耐受电流 Rated impulse withstand current	8kV						12kV					
额定工作电流(A) Rated operating current	AC-31A	100	160	250	400	630	1000	1250	1600	2000	2500	3200
	AC-35A	100	160	250	400	630	1000	1250	1600	2000	2500	3200
	AC-33A	100	160	250	400	630	1000	1250	1600	2000	2500	3200
额定短时耐受电流 Rated short time withstand current	7kV		9kV		13kV		50kV		55kV			
额定限制短路电流 Rated short-circuit current limit	100kA			70kA			100kA		120kA		80kA	
控制电源电压 Control supply voltage	DC24V, 48V, 110V, AC220V											
转换时间(s) Conversion time	0.5		1		1.1		1.2		1.25		2.45	

#### 接线示意图 Wiring diagram



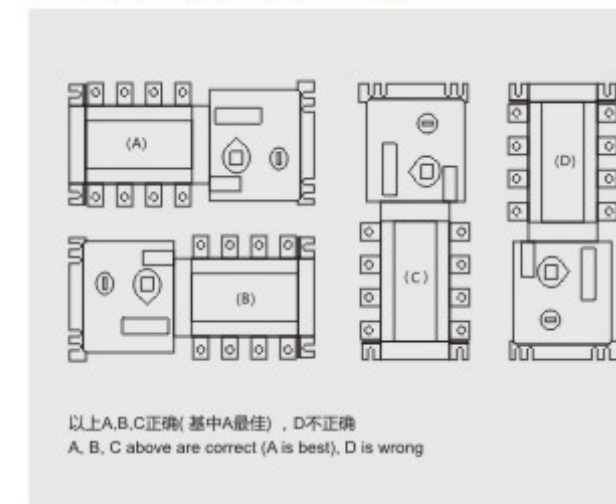
#### 端子接线操作说明 Operation instruction for terminal wiring



#### 使用方法 Usage method

- 开关功能
  1. 全自动功能: 当常用电源断电时, 开关自动转换至备用电源; 当常用电源恢复正常时, 开关又自动返回转换至常用电源。
  2. 强置 "0" 功能: 启动强置 "0" 按钮, 开关将切断两路电源。
  3. 远程控制功能: 即远距离控制, 按下 "I" 档按钮; 则常用电源工作; 按下 "II" 档按钮, 则备用电源工作; 按下 "0" 档按钮, 则切断两路电源。
  4. 请根据需要选择开关功能, 并按相应功能接线。
  5. 订货时请指明开关型号、电流规格及所需功能。
- 1. Full auto function: when normal power is off, the ATSE auto transferred to standby power; when normal power recover, ATSE will auto transferred to normal power again.
- 2. The function of forcedly switching off "0" position: push "0" button forcedly, ATSE will cut off two loops of power supply.
- 3. Remote control function: push "I" button, normal power will be in service; push "II" button, then standby power will put into use, push "0" button, to cut off two loops of power supply
- 4. Please select the switching function according to requirement and connect the wire correctly.
- 5. When to book product, please indicate the ATSE model, current rating and the function you need.

#### 开关正确安装方法 Correct mounting method



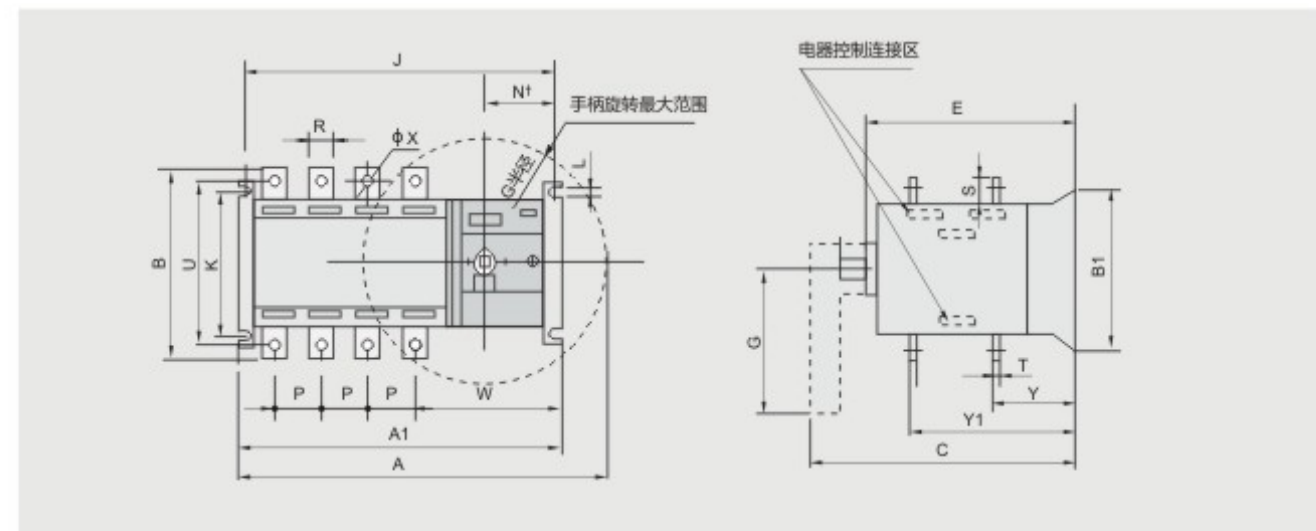
以上A,B,C正确(其中A最佳), D不正确  
 A, B, C above are correct (A is best), D is wrong

# FSQ5

## 系列双电源自动转换开关

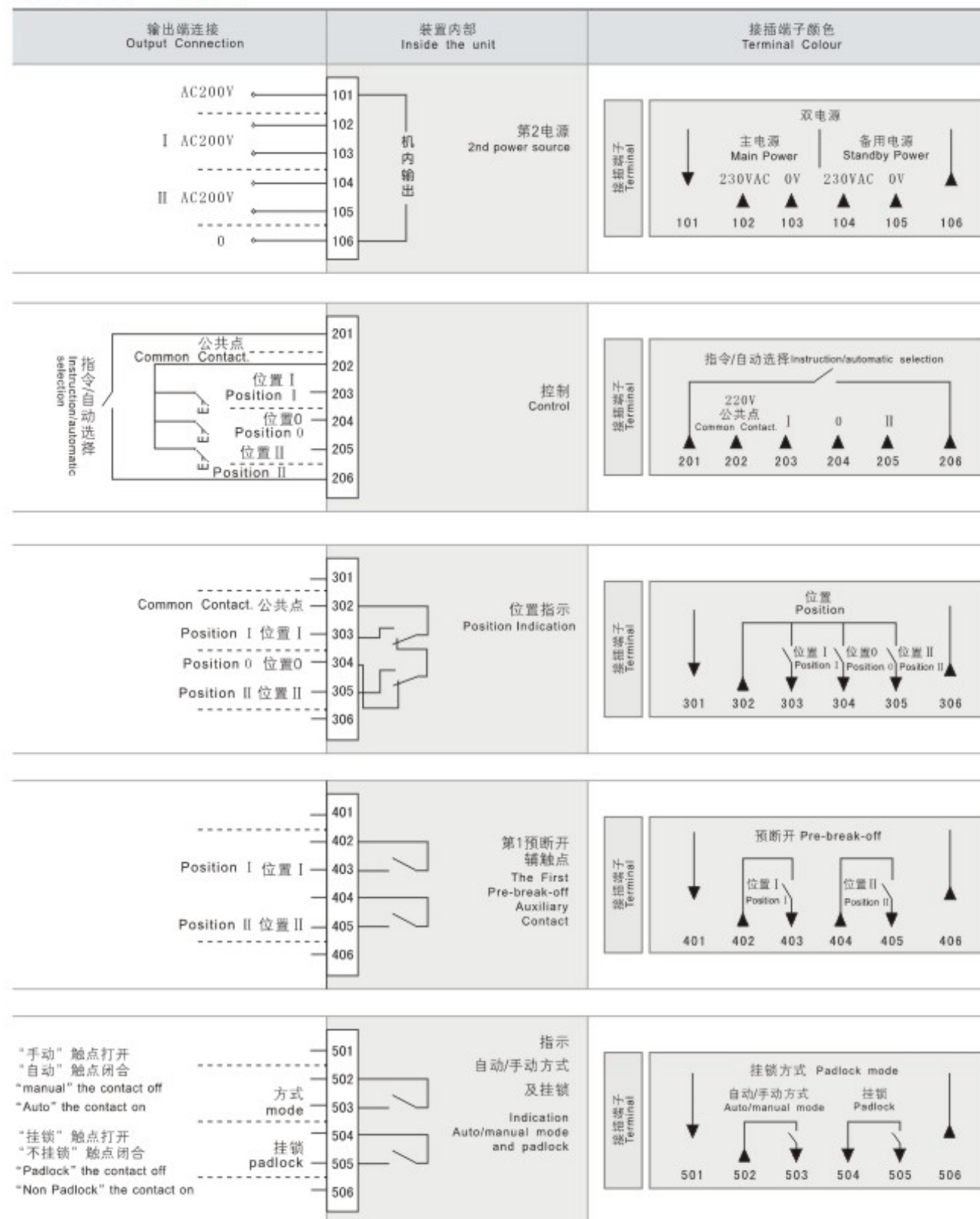
### Series twin power source auto transfer switch (ATS)

#### 外形及安装尺寸 Dimensions



规格In Type	外形尺寸与安装尺寸 Dimensions																			
	A	A1	B	B1	C	E	G	J	K	L	N	P	R	S	T	U	W	ΦX	Y	Y1
100A/3	235	232	106	105	134	133	115	221.5	84	7	74.5	30	14	18	2.5	105	126	6	36	86
100A/4	247	244	106	105	134	133	115	233.5	84	7	74.5	30	14	18	2.5	105	126	6	36	86
125A/3	292	270	135	128	230	189	145	254	102	7	91	36	20	25	3.5	127	158	9	55	125
125A/4	322	300	135	128	230	189	145	284	102	7	91	36	20	25	3.5	127	158	9	55	125
160A/3	292	270	135	128	230	189	145	254	102	7	91	36	20	25	3.5	127	158	9	55	125
160A/4	322	300	135	128	230	189	145	284	102	7	91	36	20	25	3.5	127	158	9	55	125
250A/3	356	312	170	142	261	208	145	293	102	7	91	50	25	30	3.5	142	158	11	60	145
250A/4	406	362	170	142	261	208	145	343	102	7	91	50	25	30	3.5	142	168	11	60	145
400A/3	487	368	260	222	284	273	189	351	180	9	93	65	32	40	5	222	168	11	83	193
400A/4	552	433	260	222	284	273	189	416	180	9	93	65	32	40	5	222	203	11	83	193
630A/3	487	368	260	222	284	273	189	351	180	9	93	65	40	50	6	222	203	12	83	193
630A/4	552	433	260	222	284	273	189	416	180	9	93	65	40	50	6	222	203	12	83	193
800A/3	646	519	357	250	363	350	443	499	220	11	87	120	60	69	8	250	203	12.5	109	254
800A/4	760	633	357	250	363	350	443	613	220	11	87	120	60	69	8	250	207	12.5	109	254
1000A/3	646	519	357	250	363	350	443	499	220	11	87	120	60	69	8	250	207	12.5	109	254
1000A/4	760	633	357	250	363	350	443	613	220	11	87	120	60	69	8	250	207	12.5	109	254
1250A/3	646	519	357	250	363	350	443	499	220	11	87	120	80	69	8	250	207	13	110	255
1250A/4	760	633	357	250	363	350	443	613	220	11	87	120	80	69	8	250	207	13	110	255
1600A/3	676	519	357	250	363	350	443	499	220	11	87	120	80	69	10	250	207	13	110	255
1600A/4	760	633	357	250	363	350	443	613	220	11	87	120	80	69	10	250	207	13	110	255
2000A	800	633	460		542		447	610			84.5	80	120	10						169
2500A	800	633	460		542		447	610			84.5	80	125	15						174
3200A	800	633	460		542		447	610			84.5	80	130	20						179

#### 接插端子图 Terminal diagram



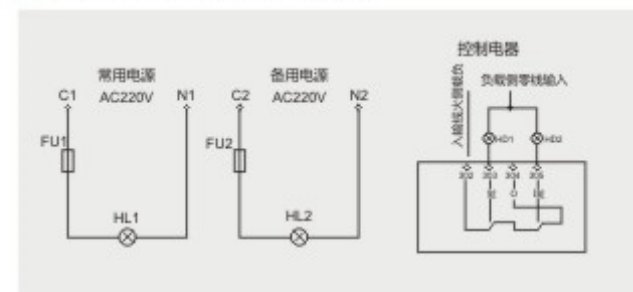
# FSQ5

## 系列双电源自动转换开关

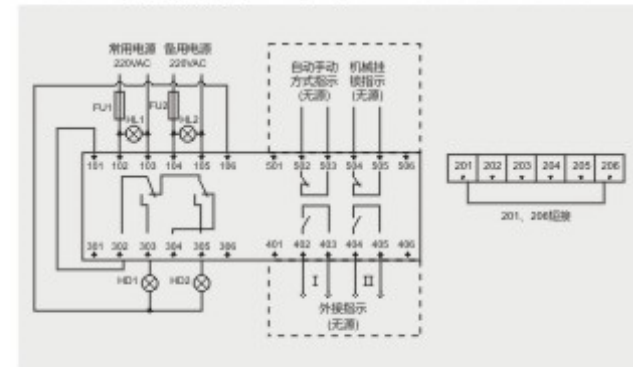
### Series twin power source auto transfer switch (ATS)

#### 外接端子接线方式图 Wiring diagram of outer terminals

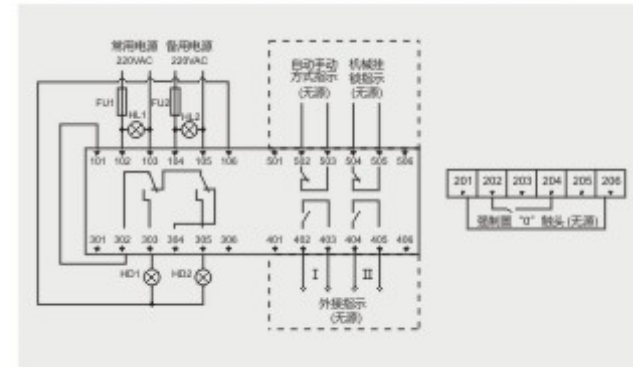
100典型接线方式 100 typical wiring mode



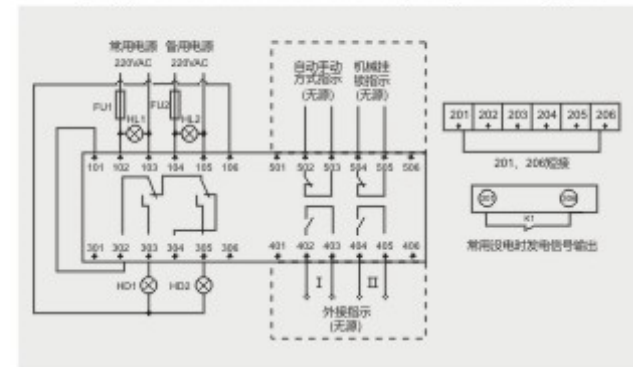
160~3200全自动接线方式 Wiring diagram of 160~3200 full auto mode



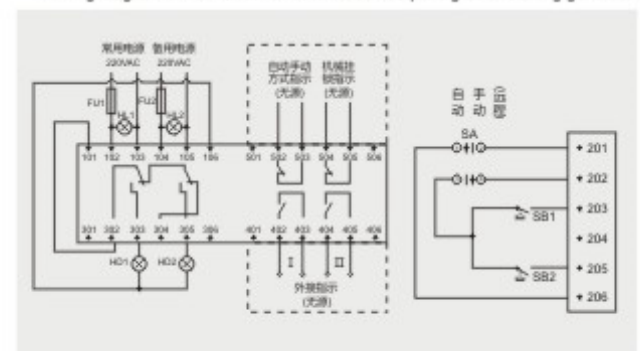
100~3200全自动+强制置“0”（双路电源均断开）接线方式  
 Wiring diagram of 100~3200 full auto mode + forcedly switching off "0"



100~3200全自动+发电机信号输出接线方式  
 Wiring diagram of 100~3200 full auto mode + output signal of starting generator



100~3200全自动+发电机信号输出接线方式  
 Wiring diagram of 100~3200 full auto mode + output signal of starting generator

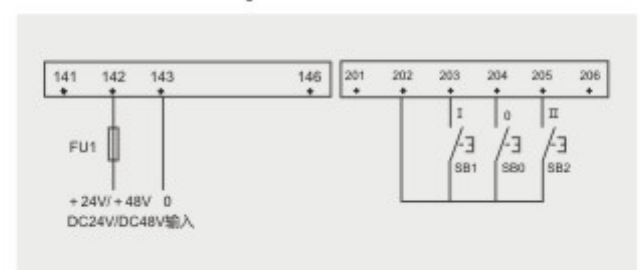


字母与符号说明

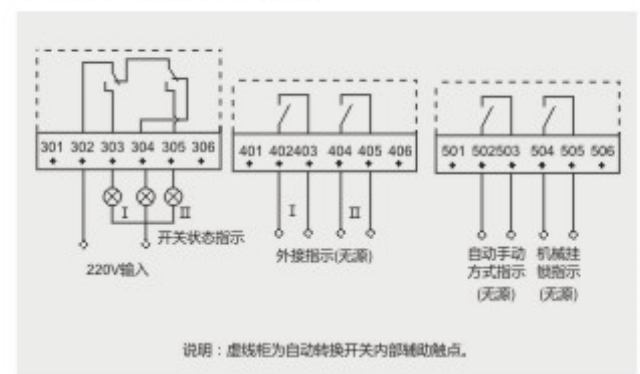
- C1、N1分别为常用电源火线和零线，C2、N2分别为备用电源火线和零线。HL1、HL2分别为常用电源、备用电源有指示，HD1、HD2分别为常用电源、备用电源投入指示，FU1、FU2为2A保险丝。
- 101-106、201-206为自动转换开关二次接线端子
- 301-306为自动转换开关外接指示灯端子
- 401-406、501-506自动转换开关端子可选用
- 全自动接线方式201、206必须短接
- 强制置“0”触头（无源）也可输入DC24V电源
- K1为发电信号输出（当常用没电时）
- SA为自动/手动功能选择开关，SB1、SB2分别为常用电源、备用电源手动投入按钮（无源触头）

#### DC24V 接线方式 Wiring mode of DC24V

1、基本接线方式 Basic wiring mode



2、其它端子接线 Other terminal wiring.



说明：虚线框为自动转换开关内部辅助触点。

# DW15

## 系列万能式断路器

### Series conventional circuit breaker



#### 适用范围 Application

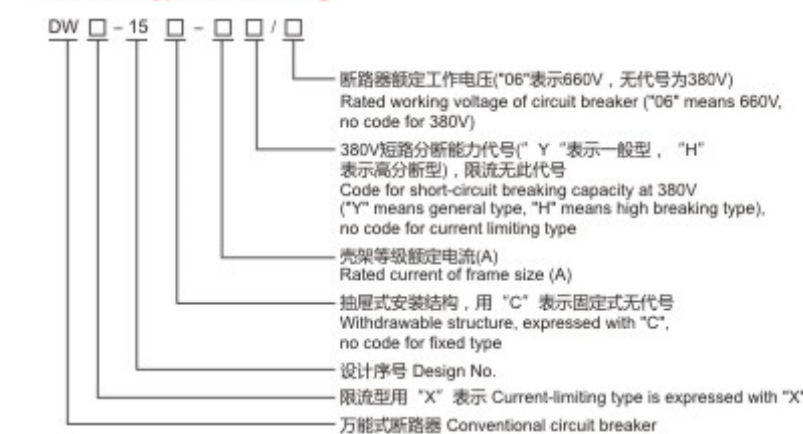
DW15系列万能式断路器(以下简称断路器)及DWX15系列万能式限流断路器(以下简称限流断路器)的额定电流100A至4000A(限流断路器至630A),额定电压交流50Hz、380V至660V(Inm≥1600A仅380V等级)。该断路器主要在配电网中用来分配电能,保护线路及电源设备的过载、欠电压和短路。DW15-630也能在交流50Hz、380V电网中用来保护电动机的过载、欠电压和短路,上述断路器除固定式结构外,还具有抽屉式结构。DW15-630及限流断路器在正常条件下可作为电动机的不频繁启动之用。限流断路器由于具有限流特性,特别适用于可能出现大短路电流的网络。

产品符合IEC60947-2、GB14048.2及JB8590.1标准。

DW15 series conventional circuit breaker (hereinafter referred to as circuit breaker) and DWX15 series conventional current-limiting circuit breaker (hereinafter referred to as circuit breaker), rated current 100A~4000A (current-limiting circuit breaker up to 630A), AC50Hz and rated voltage 380V~660V (Inm≥1600A only class of 380V). They are mainly used to distribute electric energy, protect the circuit and power equipment against overload, under-voltage or short-circuit in the distribution network. DW15-630 also can be used to protect the motor against overload, under-voltage or short-circuit in power grid of AC 50Hz with voltage 380V, in addition to the fixed type structure, the circuit breaker also has with draw able type. Under normal conditions, this circuit breaker can be used to change over the circuits infrequently. DW15-630 and current-limiting circuit breaker also can be used for infrequent starting of motor. The current-limiting circuit breaker is especially suitable for networks that may come across heavy short-circuit current.

The products are in accordance with the standards IEC60947-2, GB14048.2 and JB8590.1.

#### 型号及含义 Type and meaning



#### 正常工作条件和安装条件 Normal working condition and mounting conditions

- 周围空气温度为: -5°C~+40°C, 24小时内其平均值不超过+35°C;
- 海拔高度: 不超过2000m;
- 大气条件: 在+40°C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°C,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振动、冲击和振动的地方。
- Ambient temperature: -5°C ~ 40°C, daily average over 35°C
- 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°C, 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.

# DW15

## 系列万能式断路器

### Series conventional circuit breaker

#### 特点 Characteristics

DW15-200、400、630断路器为立体布置形式，触头系统、瞬时过电流脱扣器左右侧板均安装在一块绝缘板上。上部装有灭弧系统，操作机构可装在正前方或右侧面，有“分”、“合”指示及手动断开按钮。其左上方装有分励脱扣器，背部装有与脱扣半轴相连的欠电压脱扣器。速饱和电流互感器或电流电压变换器套在下母线上。欠电压延时装置、热继电器或半导体脱扣器可分别装在下方。

DW15-1000、1600、2500、4000断路器为立体面置形式，由底架、侧板、横梁组成框架，每相触头系统安装在底架上，上面装灭弧室。操作机构在断路器右前方，通过主轴与触头系统相连。电动操作机构通过方轴与机构连成一体装于断路器下部，作为断路器的储能或直接闭合之用，储能后的闭合由释能电磁铁承担。在左侧上方装有防回跳机构，以防止断路器在断开时弹跳。各种过电流脱扣器按不同要求装在断路器下方，欠电压、分励脱扣器及电动操作控制部分装在左侧，其中欠电压、分励脱扣器通过脱扣器与放大机构相连，以减少断路器的脱扣力。辅助触头供用户联接二次回路用，面板上有显示断路器工作位置的指示牌“|”“○”和“储能”指示，还有供合闸及分闸用的按钮“|”“○”（均按下）。DW15-1000、1600断路器附有正面手动操作手柄；DW15-2500、4000附有检修用的手动操作手柄（均可卸下）。

DW15-200, 400 and 630 circuit breakers are arranged in tridimensional, the contact system and both left and right side plates of instantaneous over-current release are installed on the same insulation board. There is arc-extinguishing system in the upper part, the operating mechanism can be installed right ahead or right side, there are "ON" and "OFF" indications and manual breaking button. There is shunt release on the upper left side, and there is an under-voltage release that is connected with tripping half-shaft on the back. The rapidly saturable current transformer or current-to-voltage converter is put on the lower bus. Under-voltage delay device, thermal relay or semiconductor release can be installed in lower part respectively.

DW15-1000, 1600, 2500 and 4000 circuit breakers are arranged in tridimensional, they are composed of base frame, side plate and beam, these form into the framework, contact system of each phase is set on the base frame, with arc-extinguishing chamber installed at the top. The operating mechanism is set in right front, being connected with the contact system through the main shaft. The electric operating mechanism is integrated with mechanism through square shaft and is mounted in the lower part of circuit breaker, used for energy storing or direct closing of circuit breaker, the closing after energy storing will be at the responsibility of energy-releasing electromagnet. There is de-bounce device in the upper of left side plate, used for preventing circuit breaker from bouncing during opening. Various over-current releases are mounted in the lower part of circuit breaker according to different requirements, under-voltage and shunt releases as well as control part of electric operating mechanism are arranged on the left side, there into, the under-voltage and shunt releases are connected with the mechanism of amplification through the release, for reducing tripping force of circuit breaker. The auxiliary contacts are used for connecting with the secondary circuit, the panel has indicators of "|", "○" and "ENERGY STORAGE" for showing the working position of circuit breaker, also has buttons "|" and "○" for closing and opening. DW15-1000 and 1600 circuit breakers have front manual operated handles; DW15-2500 and 4000 are attached with manual operated handles for overhaul purpose (both of them can be dismantled).

#### 主要技术参数 Main Technical data

断路器壳架等级额定电流(Inm(A) Rated frame current	630			1600	2500	6300
极数 Pole	3	3	3	3	3	3
额定电流 Rated current In(A)	100,160,200,315,400,630			630,800,1000,1600	1600,2000,4000,2500	2500,3000,4000,6300
额定极限短路分断能力 Icu(kA) Rated Ultimate short-circuit breaking capability Icu(kA)	20(50)	20(50)	20(50)	40	60	80
额定运行短路分断能力 Ics(kA) Rated Service short-circuit breaking capability	12	12	12	16	25	25
额定运行短路分断能力 Ics(kA) Rated Service short-circuit breaking capability	20(20)	20(20)	20(20)	30	40	50
进线方式 Incoming methods	上进线	上进线	上进线	上进线或下进线	上进线或下进线	上进线或下进线
机械寿命(次) Mechanical life	9000	9000	9000	4500	4500	3500
电寿命(次) Electrical life	1000	1000	1000	500	500	500
操作频率 Operating frequency(次/h)	15	15	15	40	40	40
操作频率 Operating frequency(次/h)	16	16	16	20	20	10
飞弧距离 Flashover distance(mm)	280(350)	280(350)	280(350)	350(450)	350(450)	400(500)
操作力臂 Operating arm of force(mm)	90	90	90	250	250	250
操作力 Operation of power(N)	200	200	200	300	300	300

- 注：a. DW15C-200、400、630技术参数同DW15-200、400、630。  
 b. DW15C抽屉座插接寿命为200次，DW15-6300(In≥5000A)机械寿命免维护1500次。  
 c. 飞弧距离括号内为1140V产品。  
 d. 分断能力括号内的指标仅适用于限流型。  
 e. In=5000、6300A只有电磁式，其余均有热-电磁式和电磁式两种。

Note: a. Technical parameters of DW15C-200, 400 and 630 are the same as that of DW15-200, 400 and 630.  
 b. Service life of drawer seat of DW15C is 200 times, mechanical life of DW15-6300(In≥5000A) free of maintenance is 1500 times.  
 c. Indexes of flashover distance in brackets are for products of 1140V.  
 d. Indexes of breaking capacity in brackets are for current-limiting types.  
 e. In=5000 and 6300A only have electromagnetic type, the rests have thermal-electromagnetic and electromagnetic two types.

#### 外形及安装尺寸

单位：mm

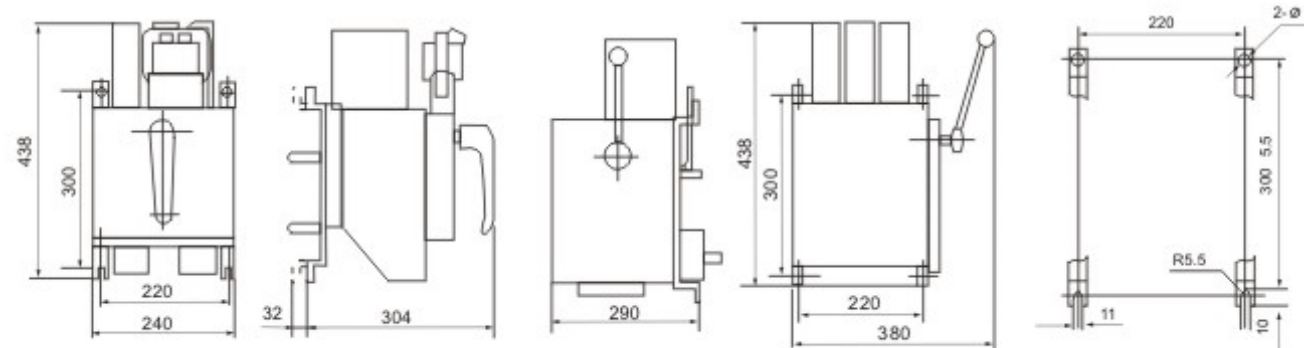


图1. DW15-630外形尺寸图 (正面操作)

图2. DW15-630外形尺寸图 (侧面操作)

图3. DW15-630安装尺寸图

单位：mm

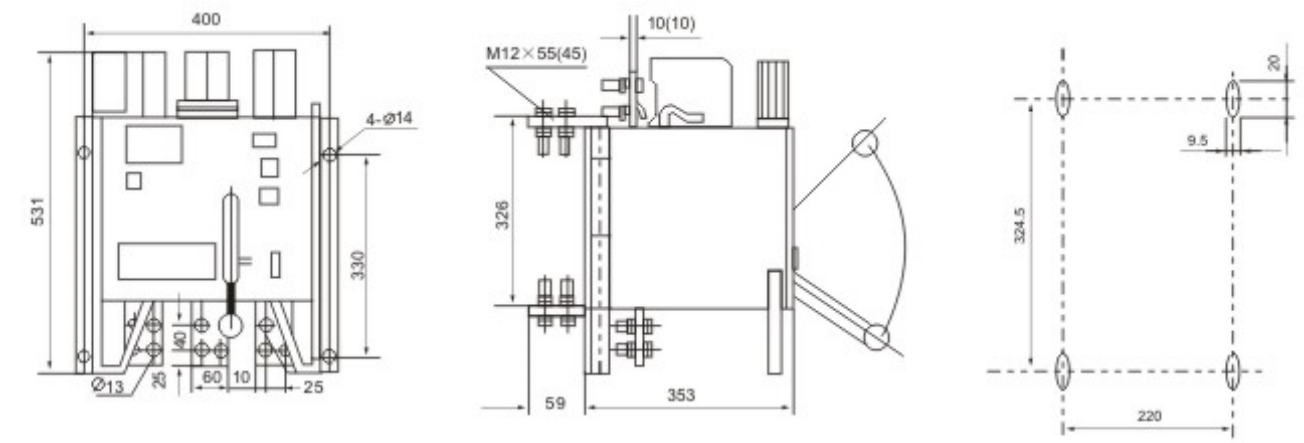


图4. DW15-1600外形尺寸及安装尺寸图

图5. DW15C-630安装尺寸图

单位：mm

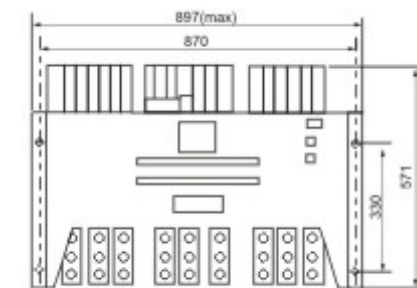


图6. DW15-4000外形尺寸及安装尺寸图



# DW17

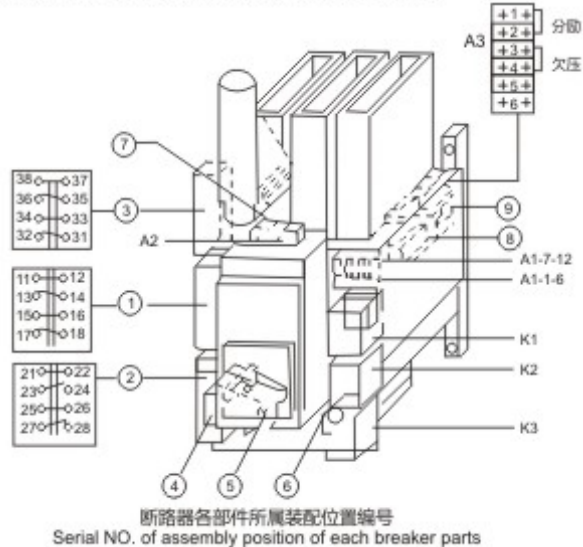
## 系列万能式断路器

### Series conventional circuit breaker

#### 接线图和外形尺寸图 Wiring diagram and outline drawing

● 断路器控制线路接线端子位置见图

Terminal location of control circuit for breaker as Picture



- ①-第一只HS5辅助触头DF1 First HS5 auxiliary contact DF1
- ②-第二只HS5辅助触头DF2 second HS5 auxiliary contact DF2 (预储能23-24接点为动断) (terminals 23-24 for pre-charging are tripping off)
- ③-第三只HS5辅助触头DF3 Third HS5 auxiliary contact DF3
- ④-限位开关zh Limit switch
- ⑤-S-脱扣器锁扣装置S-Lock device for release
- ⑥-b-脱扣器锁扣装置b-Lock device for release
- ⑦-电动机传动带释能装置 motor driving strip with energy released device
- ⑧-欠电压脱扣器或第二个分励脱扣器 under-voltage release or second shunt release
- ⑨-第一个分励脱扣器或闭锁电磁铁 first shunt release or closing electromagnet

断路器各部件所属装配位置编号  
Serial NO. of assembly position of each breaker parts

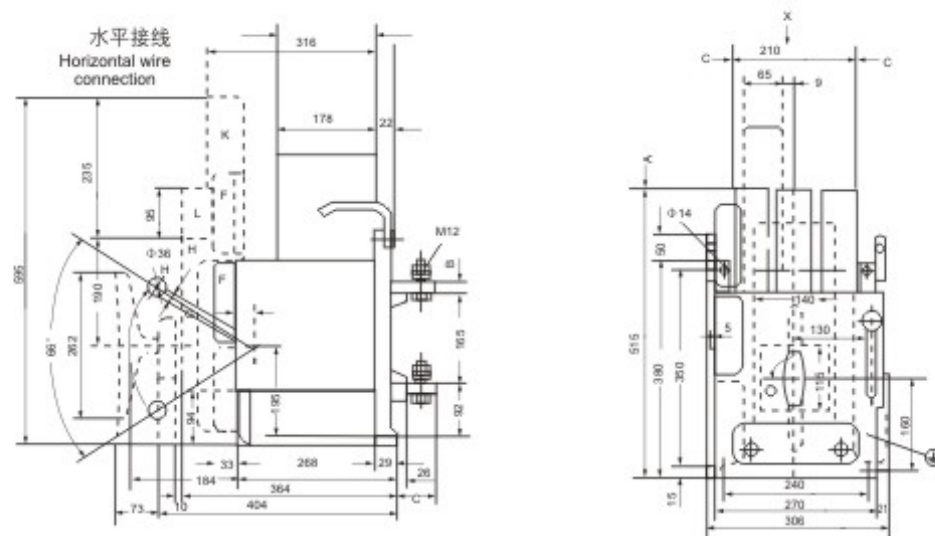
断路器安全距(包括飞弧距离)外形及安装尺寸 Safe distance of breaker (including arcing distance), outline and mounting dimensions :

a. 断路器安全间距(包括飞弧距离)参见表 Horizontal fixed connection and safe distance of draw-out breaker mm

断路器型号 Breaker model	固定水平联结及抽屉式安全间距mm Horizontal fixed connection and safe distance of draw-out breaker mm				固定式垂直联结安全间距mm Vertical connection and safe distance mm			
	A	B	C	D	A	B	C	D
DW17-630/800/1250/1600	250	100	100	120	250	100	100	120
DW17-1605	250	100	100	120				
DW17-2000/2500/3200	350	100	100	120	500	100	100	120
DW17-2505/3205/4000/4005	350	100	100	120				

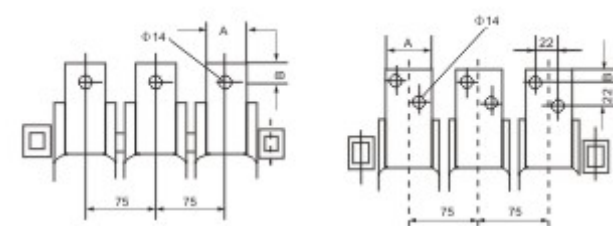
注：1、所有带电零件与接地零件之间必须可靠绝缘；2、本有为交流至380V数据。  
Note: 1. All active parts shall be reliably insulated from earthing parts; 2. These are valid data under AC380V

b. DW17-630/800/1000/1250/1600/1605固定式断路器外形尺寸见图。  
Outline of DW17-630/800/1000/1250/1600/1605 fixed type circuit breaker as drawing



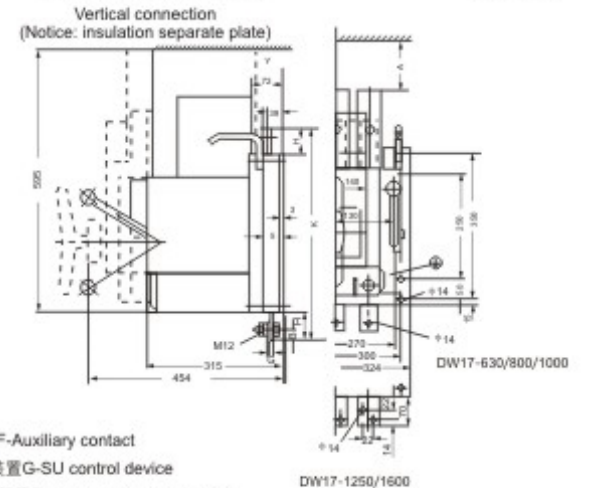
#### 接线端尺寸(X向视图) Size of terminal (X-direction view)

DW17-630/800/1000



断路器型号	a	b	c	d	g	h	k
DW17-630	30	5	61	15	5	50	480
DW17-800/1000	40	8	71	20	8	60	500
DW17-1250	50	10	81	14	10	70	520
DW17-1600	50	20	81	14	15	70	520
DW-1605	60	20	81	14	20	70	520

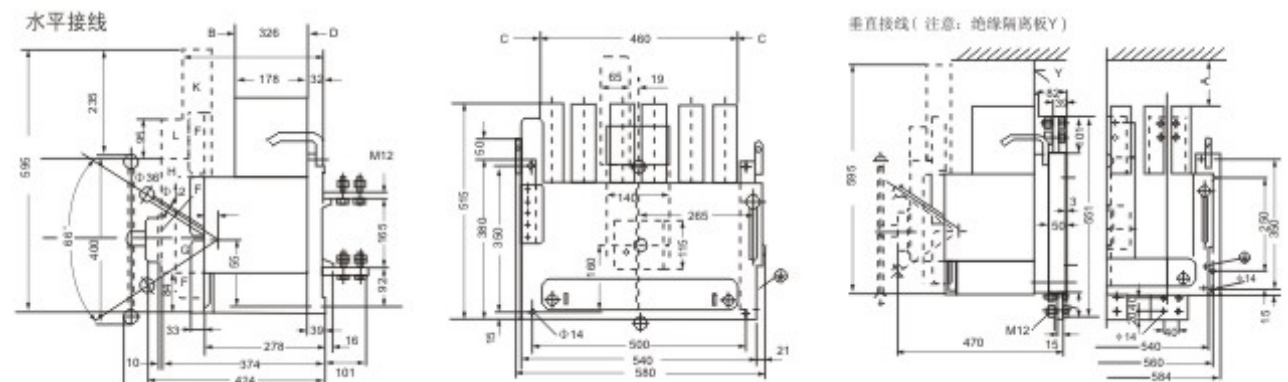
垂直接线(注意:绝缘隔板Y) 单位: mm



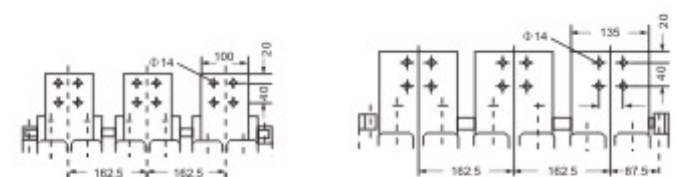
- F-辅助触头F-Auxiliary contact
- G-SU控制装置G-SU control device
- H-正面操作机构Front operating mechanism
- K-电动机操作机构Motor operating mechanism
- L-释放装置release device
- Y-用于垂直接线的绝缘隔板(用户自备)
- Y-Insulation separated plate for vertical connection shall be provided by user

c. DW17-2000/2500/2505固定式断路器外形尺寸见图。

单位: mm



- F-辅助触头F-Auxiliary contact
- G-SU控制装置G-SU control device
- H-正面操作机构Front operating mechanism
- K-电动机操作机构Motor operating mechanism
- L-释放装置release device
- Y-用于垂直接线的绝缘隔板(用户自备)
- Y-Insulation separated plate for vertical connection shall be provided by user



接线端尺寸 DW17-2000/2500

接线端尺寸 DW17-2505

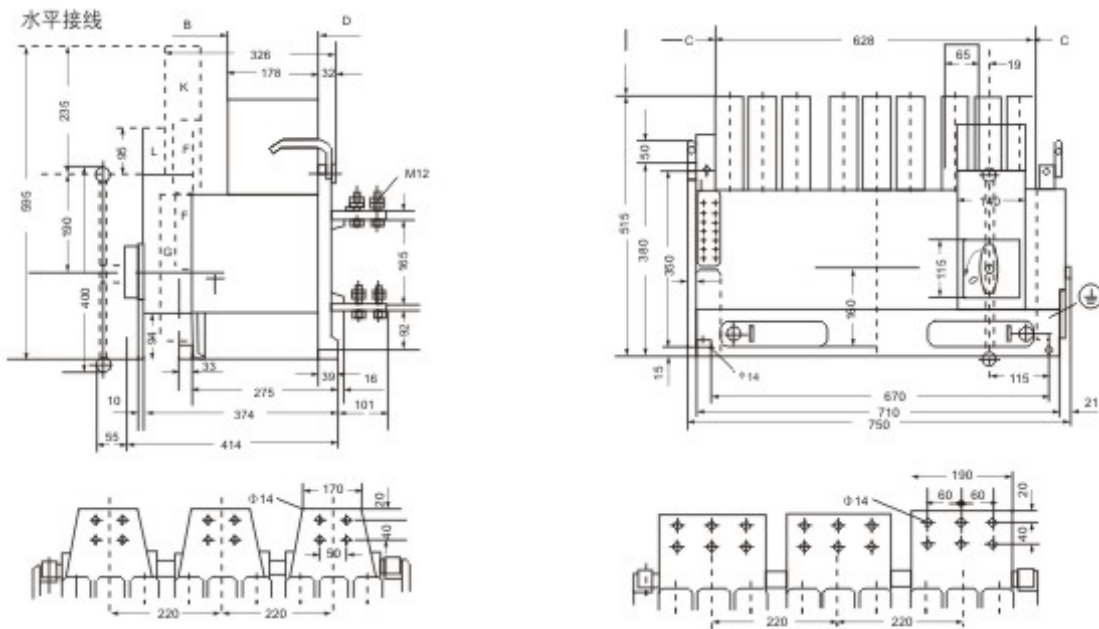
# DW17

## 系列万能式断路器

Series conventional circuit breaker

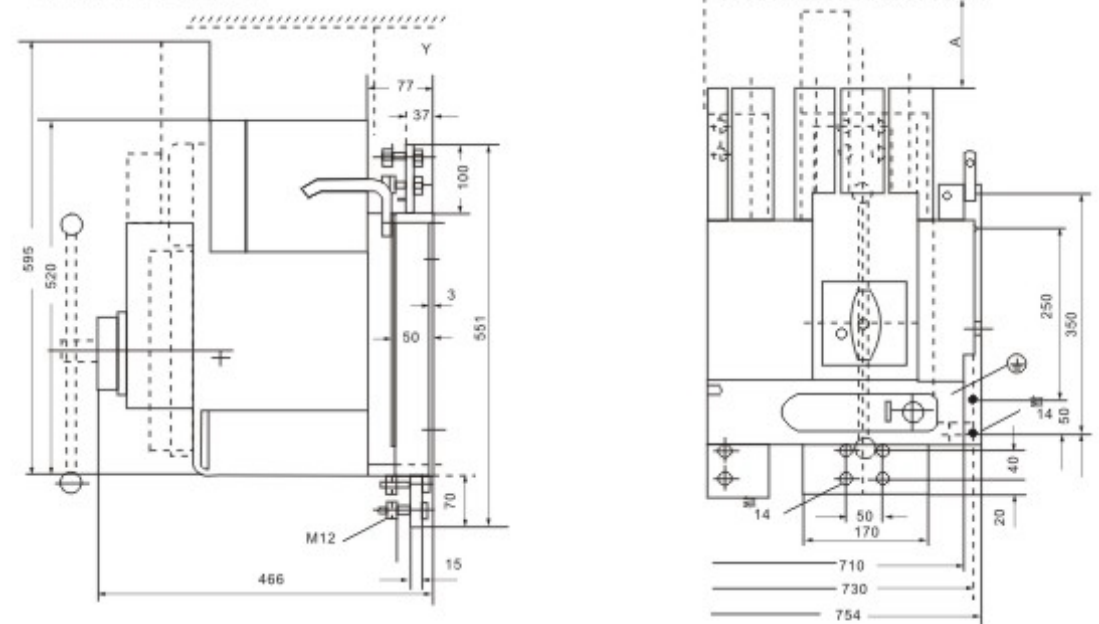
d. DW17-3200/3205 固定式断路器外形尺寸见图。

单位: mm



接线端子尺寸 DW17-3200

垂直接线(注意:绝缘隔板Y)



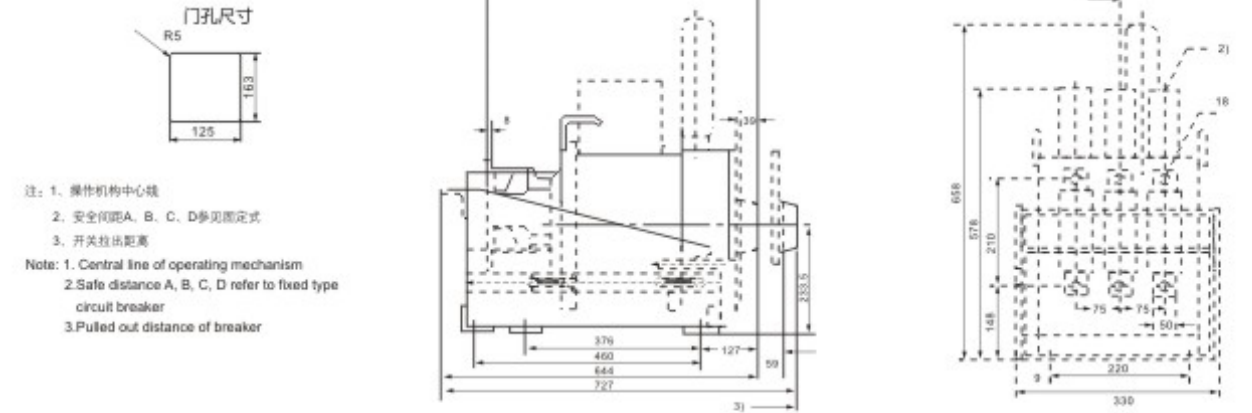
F-辅助触头  
F-Auxiliary contact  
G-SU控制装置  
G-SU control device

H-正面操作机构  
H-Front operating mechanism  
K-电动机操作机构  
K-Motor operating mechanism

L-释放装置  
L-release device  
Y-用于垂直接线的绝缘隔板(用户自备)  
Y-Insulation separated plate for vertical connection shall be provided by user

e. DW17-630/800/1000/1250/1600 抽屉式断路器外形尺寸见图。

单位: mm



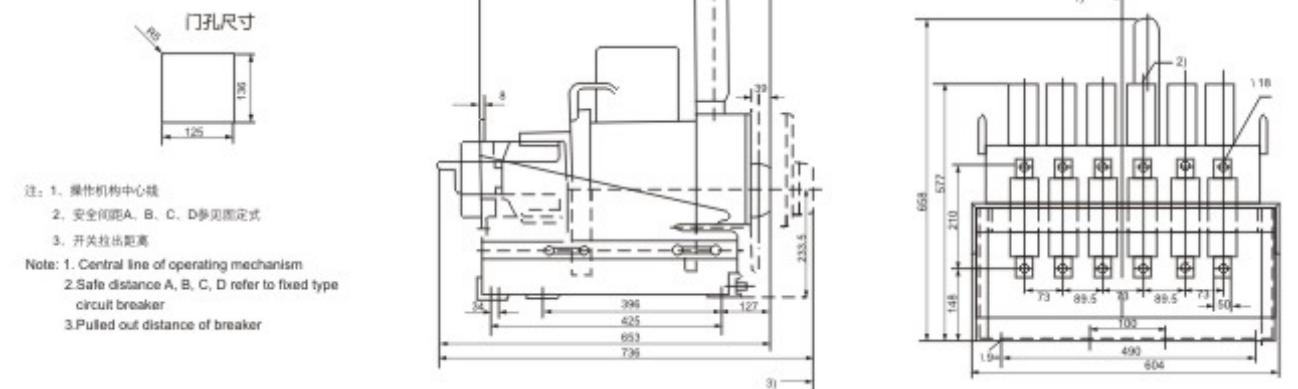
f. DW17-1605 抽屉式断路器外形尺寸见图。

单位: mm



g. DW17-2000/2500 抽屉式断路器外形尺寸见图。

单位: mm



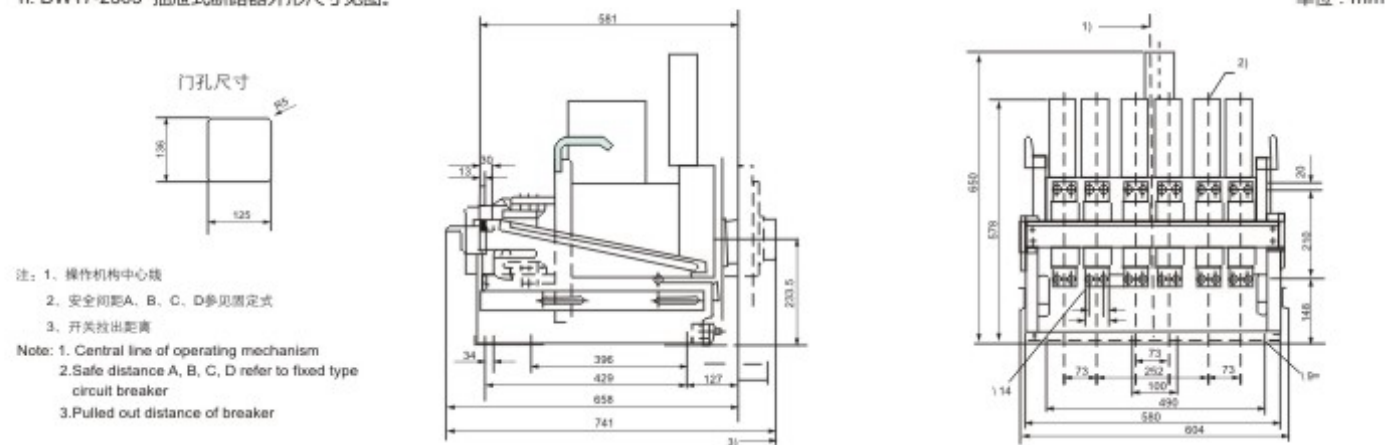
# DW17

## 系列万能式断路器

### Series conventional circuit breaker

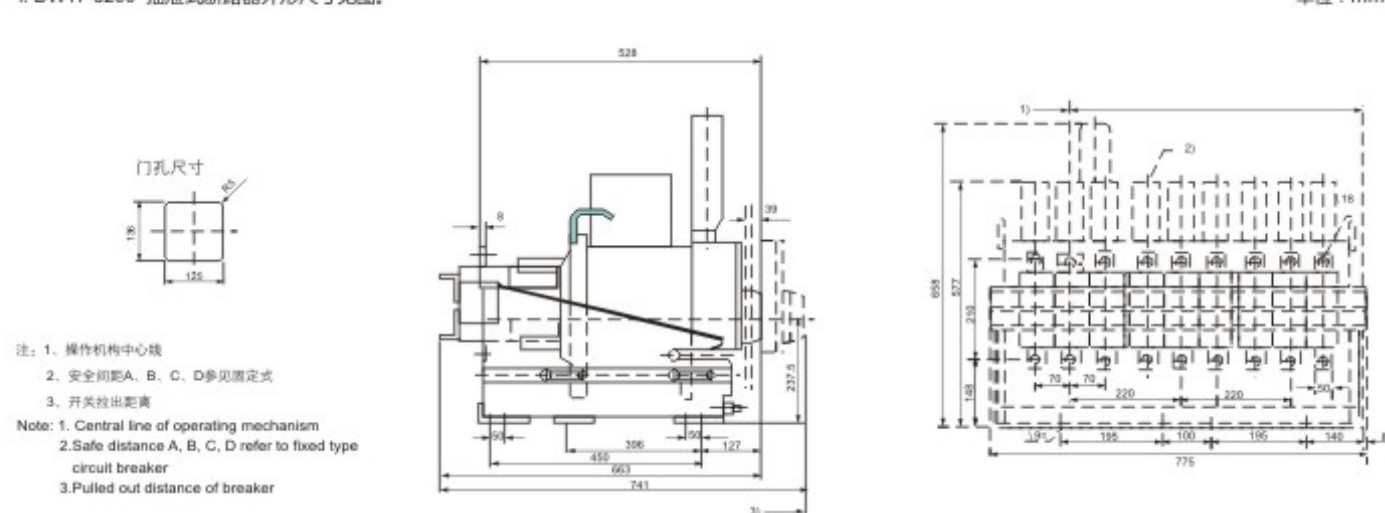
h. DW17-2505 抽屉式断路器外形尺寸见图。

单位：mm



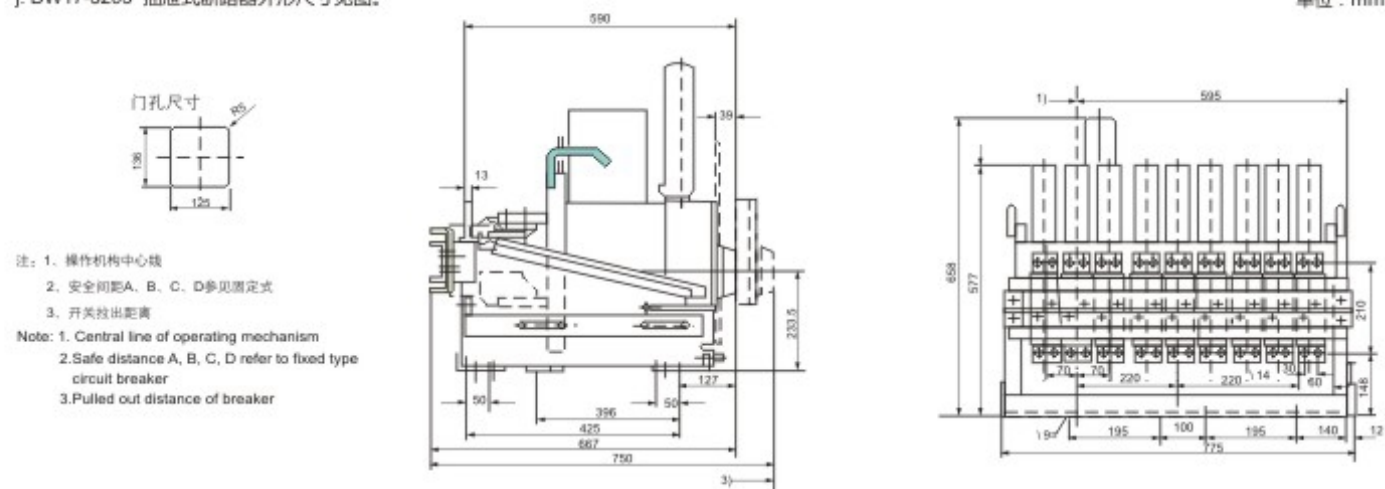
i. DW17-3200 抽屉式断路器外形尺寸见图。

单位：mm



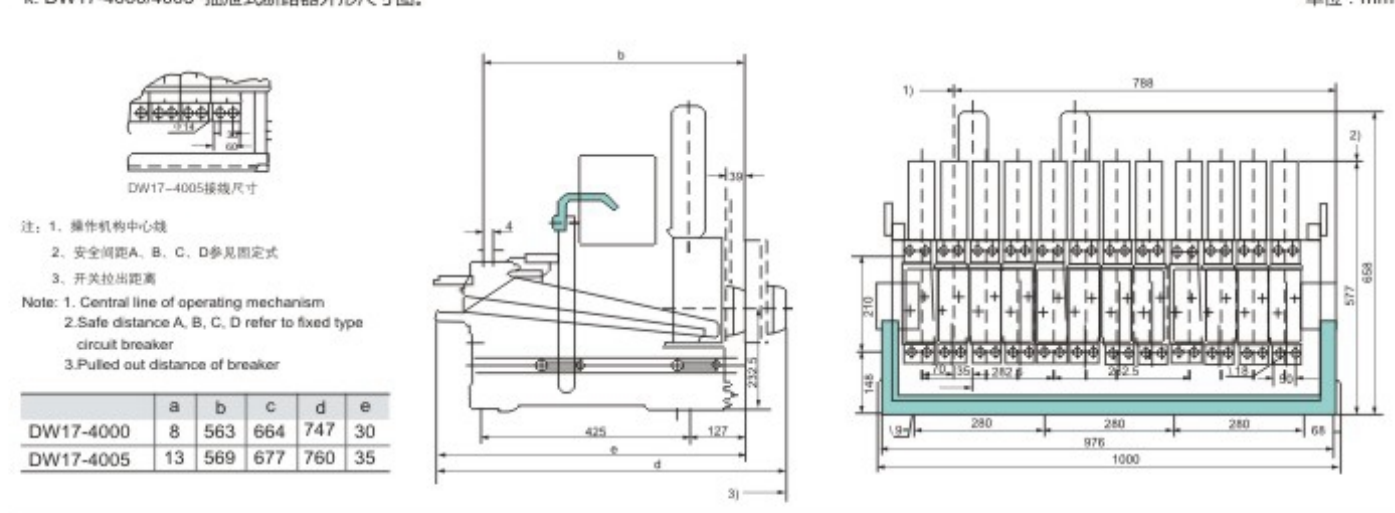
j. DW17-3205 抽屉式断路器外形尺寸见图。

单位：mm



k. DW17-4000/4005 抽屉式断路器外形尺寸图。

单位：mm



### 订货须知

订购断路器时，需注明下述各点：

- 断路器的型号、名称及数量；
- 额定电压及电流；
- 过电流脱扣器型式及额定电流；
- 电动操作机构型式及额定电压；
- 分励脱扣器型式及额定电压；
- 手动操作机构型式、辅助触头数量、安装型式、接线型式；
- 如需要W1、W2、W3、W4锁听到装置也需注明；
- 用户若有特殊要求，可经协商后签订协议或合同，按双方签订的协议或合同供货。

### Order Notice

Please indicate the following details when to purchase the products

- Model, name, and qty of the breaker
- rated voltage and current
- Over-current tripping mode and its rated current
- Motor operating mechanism and its rated voltage
- Shunt release details and its rated voltage
- Hand operating mechanism, number of auxiliary contacts, assembly mode, and connection modes
- If W1, W2, W3, W4 locking device required, please indicate it as well
- If user has other special requirement, please discuss at firstly, then sign the contract, we will supply the goods according to the contract



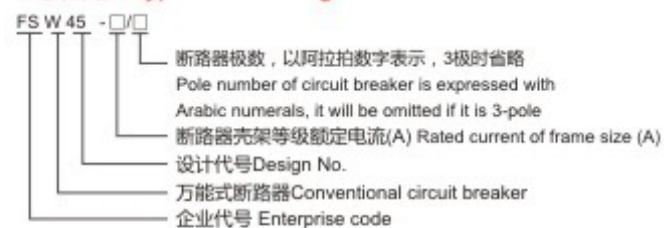
# FSW45

## 智能型万能式断路器

Overload and short circuit instantaneous



### 型号及含义 Type and meaning



### 主要技术参数 Main Technical data

断路器的额定电流见表1

Circuit breakers rated current in Table 1

表1 Table 1

壳架等级额定电流Inm A	额定电流In A
2000	(400)630、800、1000、1250、1600、2000
3200	2000、2500、2900、3200、
4000	3200、3600、4000
6300	4000、5000、6300

断路器的额定短路分断能力及短时耐受电流见表2, 断路器飞弧距离为“零”(即断路器外无飞弧)

Circuit breakers rated breaking capacity cut short and short-term tolerance of the current see table 2, circuit breakers arcing distance of a "zero" (that is, outside the non-arcing circuit breaker)

表2 Table 2

壳架等级额定电流Inm A	2000	3200	4000	6300
额定极限短路分断能力 Rated limit short-circuit breaking capacity Icu(kA)O-CO	400V 80 690V 50	100 65	100 75	120 85
额定短路接通能力 Rated short-circuit making capacity Ics(kA)/COSφ	400V 176/0.2 690V 105/0.25	220/0.2 143/0.2	220/0.2 165/0.2	264/0.2 187/0.2
额定运行短路分断能力 Rated service short-circuit breaking capacity Ics(kA)O-CO-CO	400V 50 690V 40	65 65	80 65	100 75
额定短时耐受电流 Rated short-time withstand current Icw(kA)1S, 延时 time delay 0.4s, O-CO	400V 50 690V 40	65 50	65/80(MCR) 50/65(MCR)	85/100(MCR) 65/75(MCR)

注: 表中分断能力上下进线相同。Note: breaking capacity indexes of upper and lower incoming lines are the same.

### 适用范围 Application

FSW45系列智能万能式低压断路器适用于交流50Hz, 额定电压至690V及以下, 额定电流400A~6300A的配电网络中, 用来分配电能和保护线路及电源设备免受过载、欠电压、短路、单相接地等故障的危害。断路器具有智能化保护功能, 选择性保护精确, 能提高供电可靠性, 避免不必要的停电。同时带有开放式通讯接口, 可进行四遥, 以满足集控中心和自动化系统的要求。该断路器在海拔2000米时脉冲耐压8000V(不同海拔按标准修正, 最多不超过12000V)。该断路器、不带智能脱扣器及传感器可作隔离器用, 标示为 —/—。

断路器符合GB14048.2《低压开关设备和控制设备低压断路器》和IEC947-2《低压开关设备和控制设备断路器》等标准。

FSW45 series intelligent conventional circuit breaker is applicable for distribution network of AC50Hz with rated voltage up to and including 690V and rated current 400A~6300A, used to distribute electric energy and protect the power equipment against overload, under-voltage, short-circuit or single-phase grounding fault. This circuit breaker has intelligent protection function and accurate selective protection, it improves reliability of power supply and avoids unnecessary power failure. Meanwhile, it has open type communication interface, it is able to carry out four remote controls, satisfying requirements of control center and automatic system. Pulse withstand voltage of this circuit breaker at altitude 2000m is 8000V (it can be corrected for different altitudes according to the standard, but not over 12000V at most). This circuit breaker also can be used as disconnector when it is prepared without intelligent release or sensor, marked as —/—.

This circuit breaker is in accordance with GB14048.2 Low-voltage switchgear and controlgear-Low-voltage circuit breakers and IEC947-2 Low-voltage switchgear and controlgear-Circuit breakers.

断路器的最大耗损功率为360W, 断路器在不同环境温度下额定持续电流变动见表3

Max dissipation power of circuit breaker is 360W. Rated continuous current change of circuit breaker under different ambient temperatures as shown in table 3.

表3 Table 3

环境温度°C	DW45	400A	630A	800A	1000A	1250A	1600A	200A
40		400A	630A	800A	1000A	1250A	1600A	2000A
50		400A	630A	800A	1000A	1250A	1600A	1900A
60		400A	630A	800A	1000A	1250A	1600A	1800A

注: 2500A及以上降容系数为0.9, 其中6300A中的4000A不降容。Note: derating factor for 2500A above is 0.9, and the capacity does not fall at 4000A within 6300A.

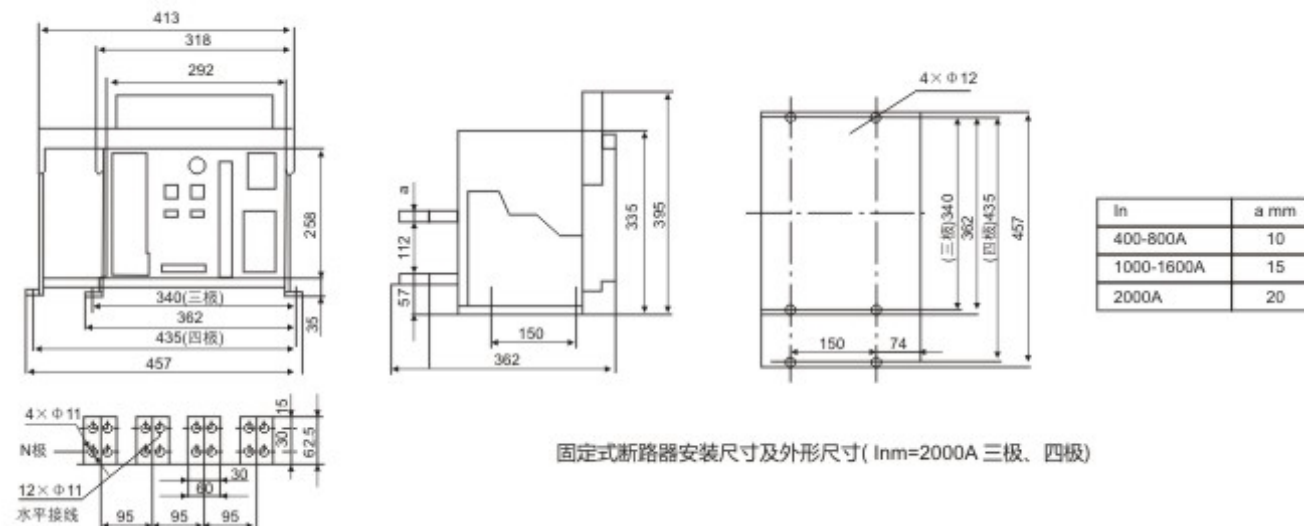
### 正常工作条件和安装条件 Normal working condition and mounting conditions

- 周围空气温度为: -5°C~+40°C, 24小时内其平均值不超过+35°C;
- 海拔高度: 不超过2000m;
- 大气条件: 在+40°C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°C, 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振动、冲击和振动的地方。
- Ambient temperature: -5°C ~ 40°C, daily average over 35°C
- 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°C, 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.

### 外形及安装尺寸 Outline & installation size

FSW45-2000A 固定式断路器安装尺寸、外形尺寸

单位: mm



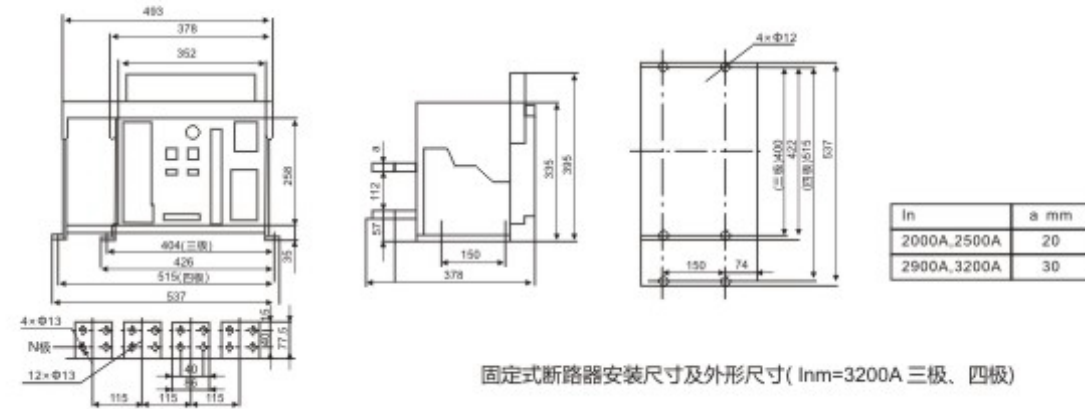
# FSW45

## 智能型万能式断路器

Overload and short circuit instantaneous

FSW45-3200A 固定式断路器安装尺寸、外形尺寸

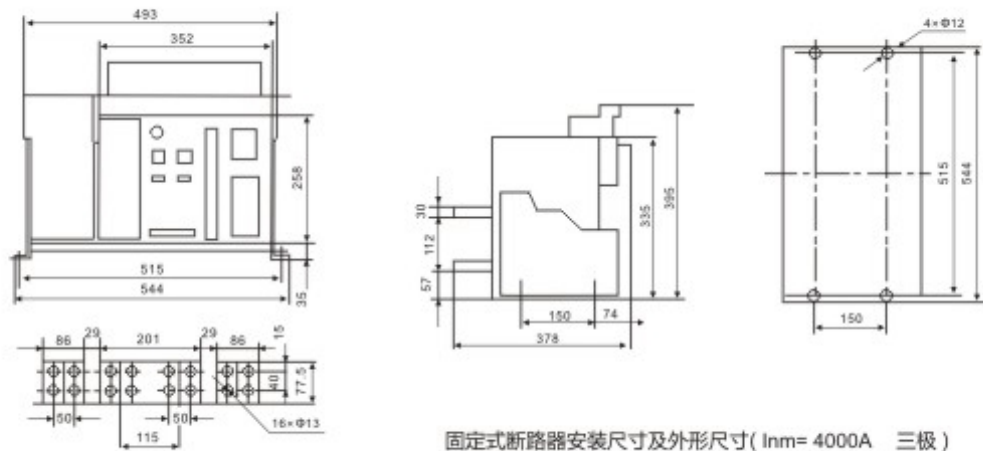
单位: mm



固定式断路器安装尺寸及外形尺寸 (In=3200A 三极、四极)

FSW45-4000A 固定式断路器安装尺寸、外形尺寸

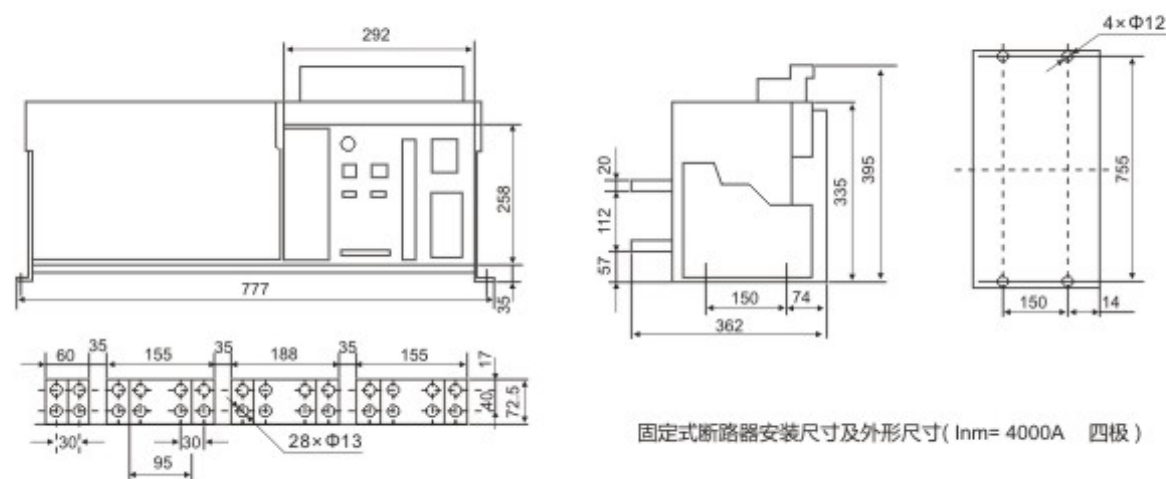
单位: mm



固定式断路器安装尺寸及外形尺寸 (In= 4000A 三极)

FSW45-4000A (四极) 固定式断路器安装尺寸、外形尺寸

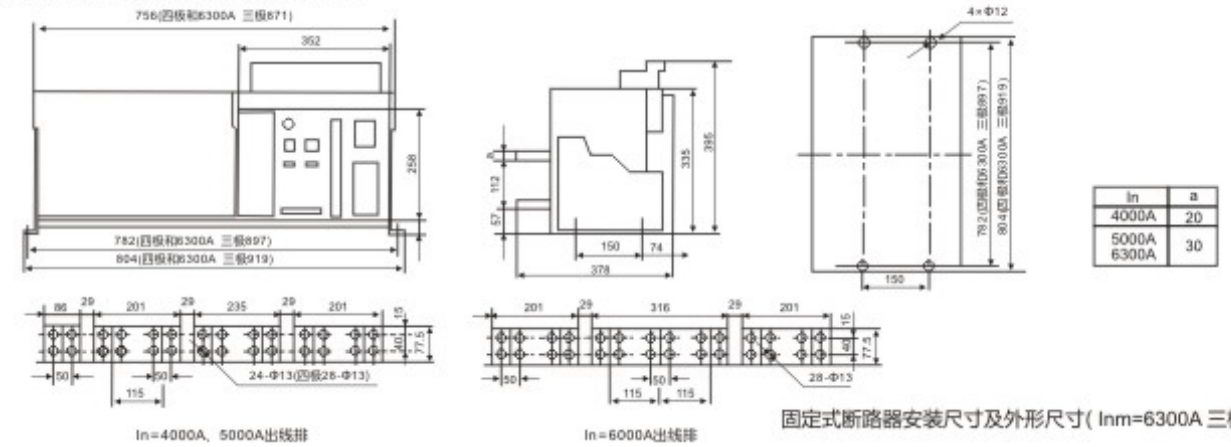
单位: mm



固定式断路器安装尺寸及外形尺寸 (In= 4000A 四极)

FSW45-6300A 固定式断路器安装尺寸、外形尺寸

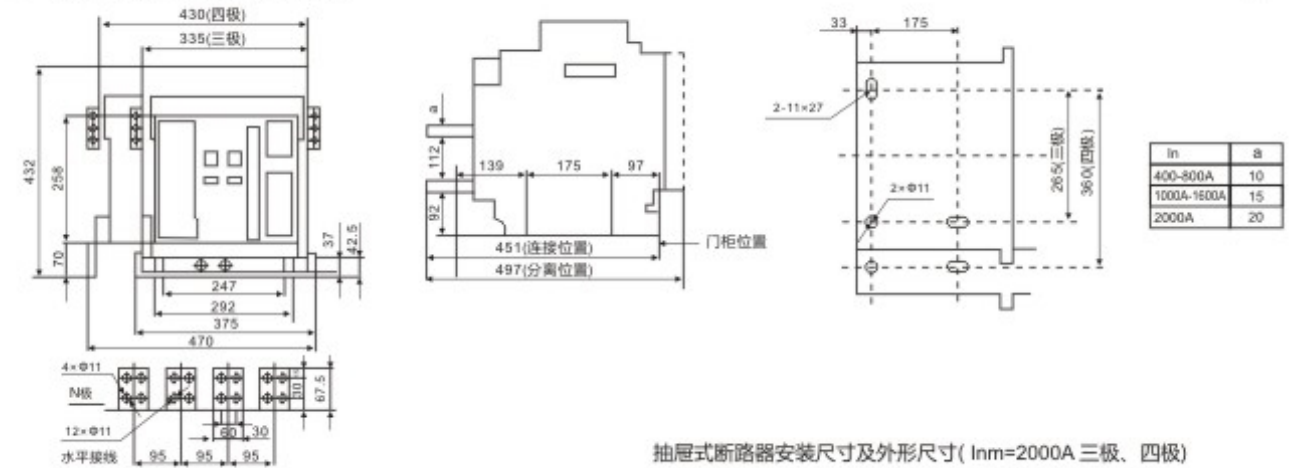
单位: mm



固定式断路器安装尺寸及外形尺寸 (In=6300A 三极、四极)

FSW45-2000A 抽屉式断路器安装尺寸、外形尺寸

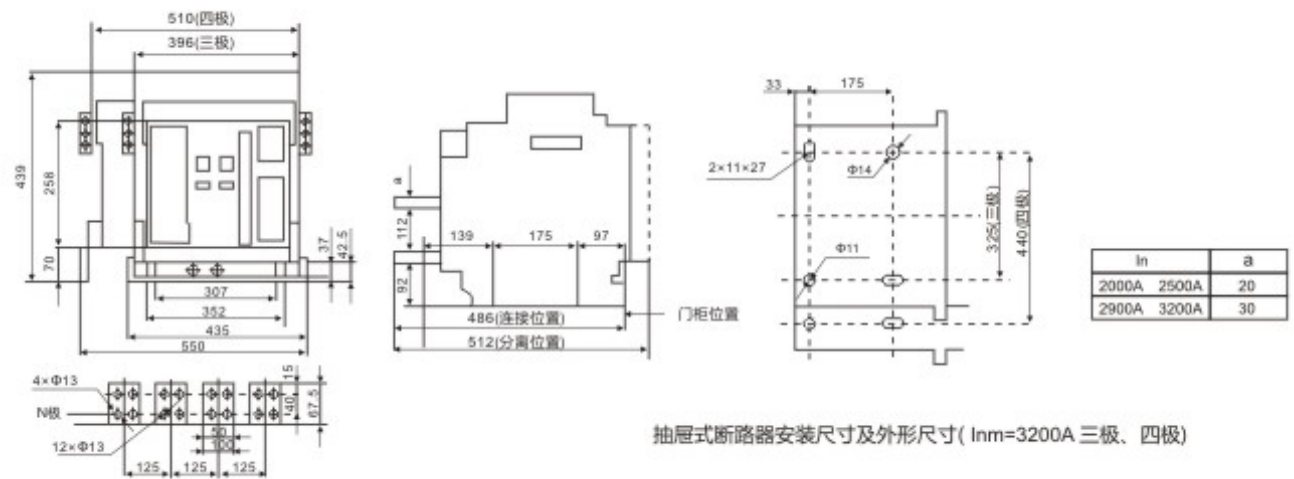
单位: mm



抽屉式断路器安装尺寸及外形尺寸 (In=2000A 三极、四极)

FSW45-3200A 抽屉式断路器安装尺寸、外形尺寸

单位: mm



抽屉式断路器安装尺寸及外形尺寸 (In=3200A 三极、四极)

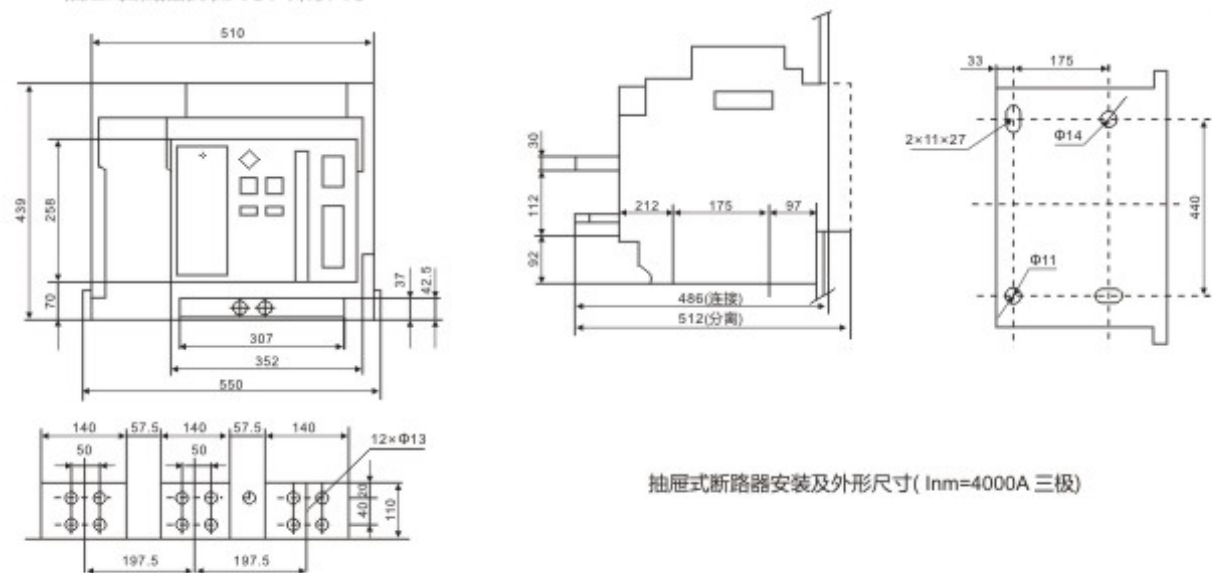
# FSW45

## 智能型万能式断路器

Overload and short circuit instantaneous

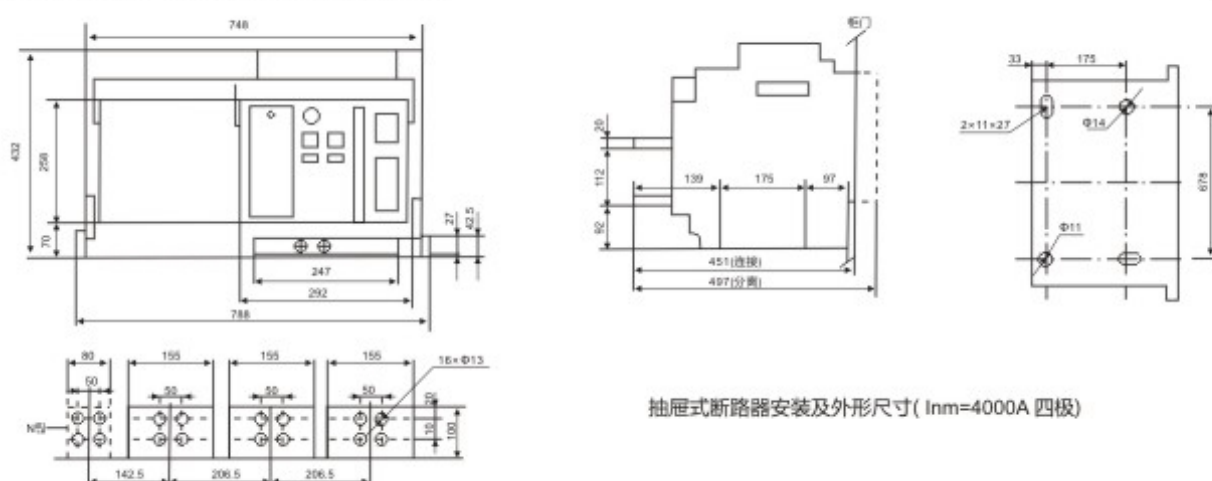
FSW45-4000A 抽屉式断路器安装尺寸、外形尺寸

单位: mm



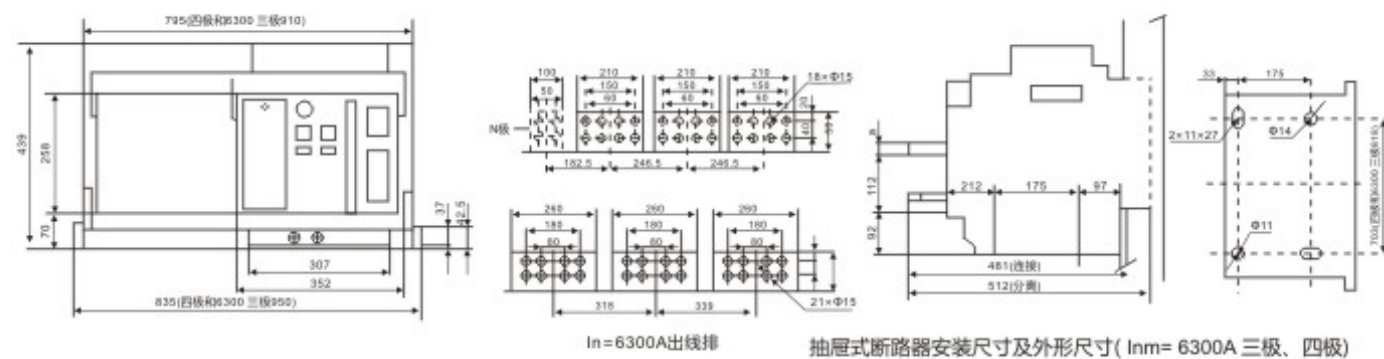
FSW45-4000A (四極) 抽屜式断路器安裝尺寸、外形尺寸

单位: mm



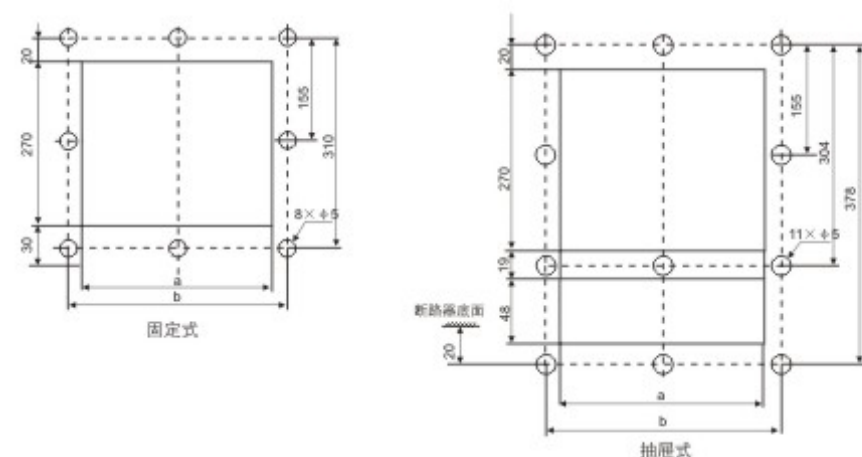
FSW45-6300A 抽屜式断路器安裝尺寸、外形尺寸

单位: mm



面板钻孔安装尺寸见图

单位: mm

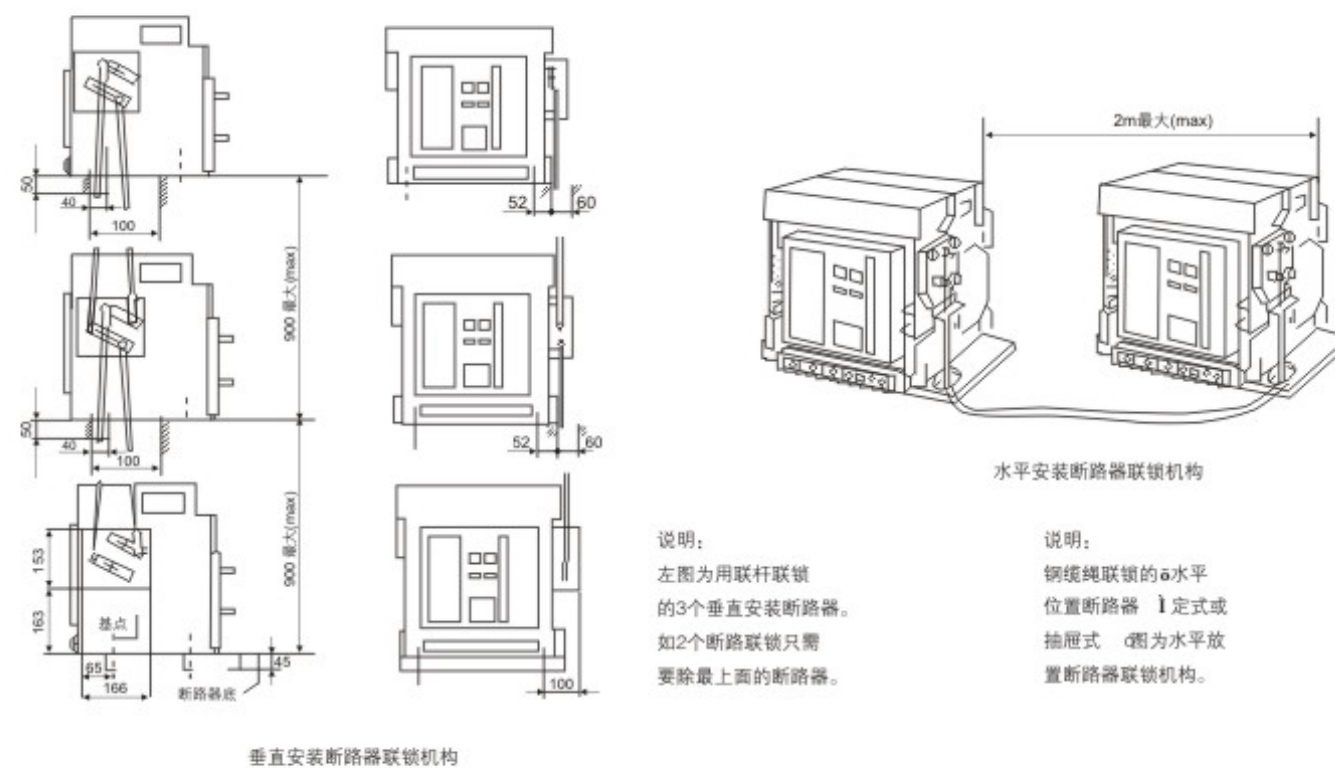


面板钻孔安装尺寸

型号	a	b
MYW1-2000	306	346
MYW1-3200-6300	366	406

断路器的联锁机构见图

单位: mm



说明:  
 左图用连杆联锁的3个垂直安装断路器的2个断路器联锁只需去除最上面的断路器。

说明:  
 钢丝绳联锁的a水平位置断路器 1 定式或抽屜式 a 为水平放置断路器联锁机构。



# FSW50-1000

## 智能型万能式断路器

### Overload and short circuit instantaneous

#### 正常工作条件 Normal working condition

● 周围空气温度：上限不超过+40℃；下限不低于-5℃；24h的平均值不超过+35℃；

注：1、下限值为-10℃或-25℃的工作条件，在订货时用户须向制造厂申明；2、上限值超过+40℃或下限值低于-25℃的工作条件，用户应与制造厂协商。

● 海拔：安装地点海拔不超过2000m。

● 大气条件：大气相对湿度在周围空气温度为+40℃时不超过50%，在较低温度下可以有较高的相对湿度，最湿月的平均最大相对湿度为90%，同时该月的月平均最低温度为+25℃，并考虑到因温度变化发生在产品表面上的凝露。

● 污染等级：3级

● 安装类别：断路器主电路的安装类别为IV类，辅助电路的安装类别除了欠电压脱扣器线圈、电源变压器初级线圈与断路器的主电路相同外，其余均为Ⅲ类。

● 使用类别：B类

● 安装条件：断路器应按安装使用说明书的安装要求进行安装。断路器的垂直倾斜度不超过5°。

● When the ambient air temperature is -5℃~+40℃, the mean value is no greater than +35℃ with in 24 hours.

Note: If the upper limit is higher than +40℃ or lower limit lower than -5℃ in work, discussions shall be made between the user and the manufacturer.

● Altitude: not higher than 2000m for the installation site.

● When the ambient air temperature is +40℃, the relative humidity of the air shall not be higher than 50%; a higher relative humidity is allowed at a lower temperature; special measures shall be taken for the condensation occasionally produced due to temperature change.

● Degree of Pollution: III

● The installation category of the breaker main circuit is IV; The installation category of the control circuit and auxiliary circuit is III, apart from the similarity between the under voltage release coil and the intellectual controller's power transformer primary coil and the breaker;

● Use Category: B type

● Installation conditions: the mounting inclined angel shall not more the +5°

#### 主要技术参数 Main Technical data

● 断路器的额定电流见表1 Circuit breakers rated current (see Table 1)

表1 Table 1

壳架等级额定电流Inm A Frame size rated current	额定电流In A Rated Current	控制器额定电流In(A) Rated controller current
1000	200, 400, 630, 800, 1000	200, 400, 630, 800, 1000

● 断路器的额定绝缘电压690V；额定工作电压400V、690V。Circuit breakers rated insulation voltage 690V; rated working voltage of 400V, 690V.

● 断路器的额定短路接通能力应不小于2.1Icu。Rated short circuit making capacity of breaker shall not be less than 2.1Icu.

● 断路器的额定短路分断能力及短时耐受电流见表2。Rated short circuit breaking capacity and short time withstand current of the breaker as table 2

表2 Table 2

壳架等级 额定电流 Inm(A) Frame size rated current	额定极限短路分断能力 Icu(kA)cosφ Rated ultimate short-circuit breaking capacity	额定运行短路分断能力 Ics(kA)cosφ Rated short-circuit breaking capacity	额定短时耐受电流 Icw(kA)cosφ Rated short time withstand current		飞弧距离 Arcing distance	进线方式 Connection
	380(400)V	380(400)V	380(400)V	380(400)V		
1000	42	30	短时1s 延时0.25s Short time 1s Delay 0.25s	短时0.5s 延时0.25s Short time 0.5s Delay 0.25s	零飞弧 "zero" (namely no arc)	上进线或下进线 Upper wires or Lower wires
			20	30		

注：Ue=690V，Icu=20kA。

● 智能控制器保护特性 Protection characteristic of the Intelligent controller

1) 智能控制器的整定值及误差见表3 Controller Current setting & Accuracy (see table 3)

表3 Table 3

长延时 Long delay		短延时 Short delay		瞬时 Instantaneous		接地故障 Ground fault	
Ir1	Ir2	误差 Accuracy	Ir3	误差 Accuracy	Ir3	误差 Accuracy	
(0.4~1)In	(3~10)In	±10%	(10~20)In	±15%	(0.2~0.8)In	±10%	
			⌘(3~10)In				

注：瞬时(3~10)In为2L2型脱扣器的整定值。

Note: Instantaneous tripping current (3~10)In is the setting value of 2L2 type release.

2) 智能控制器长延时过电流保护反时限动作特性为 $I^2TL=(1.5Ir1)^2tL$  (式中 $tL$ :长延时1.5Ir1时整定时间,  $Ir1$ :长延时整定电流,  $tL$ 长延时动作时间), 动作时间见表4。其时限误差为±10%。

3) 智能控制器短延时过电流保护特性为定时限特性, 其延时时间为0.2s(L型控制器)、0.4s, 可返回时间为0.21s, 其时限误差为±10%。

4) 接地故障保护动作特性为定时限, 其延时特性符合表5。其时限误差为±15%。

5) 断路器过电流保护特性、接地故障保护特性曲线见图1所示。

2) Inverse time delay tripping characteristics for long time delay over-current protection is  $I^2TL=(1.5Ir1)^2tL$  ( $tL$ : setting time of long time delay tripping 1.5Ir1,  $Ir1$ : setting value of long time delay tripping,  $tL$ : tripping time of long time delay protection) Tripping time as table 4, time limit error: ±10%

3) Short time delay over-current protective characteristics of the controller is definite time tripping, time delay is 0.2s (L type controller), 0.4s, returnable time 0.21s, time limit error: ±10%

4) Earthing fault protection characteristics is definite time tripping, and complies with table 5, time limit error: ±15%

5) Over-current protective characteristics, earthing fault protection characteristics of breaker as Figure 1.

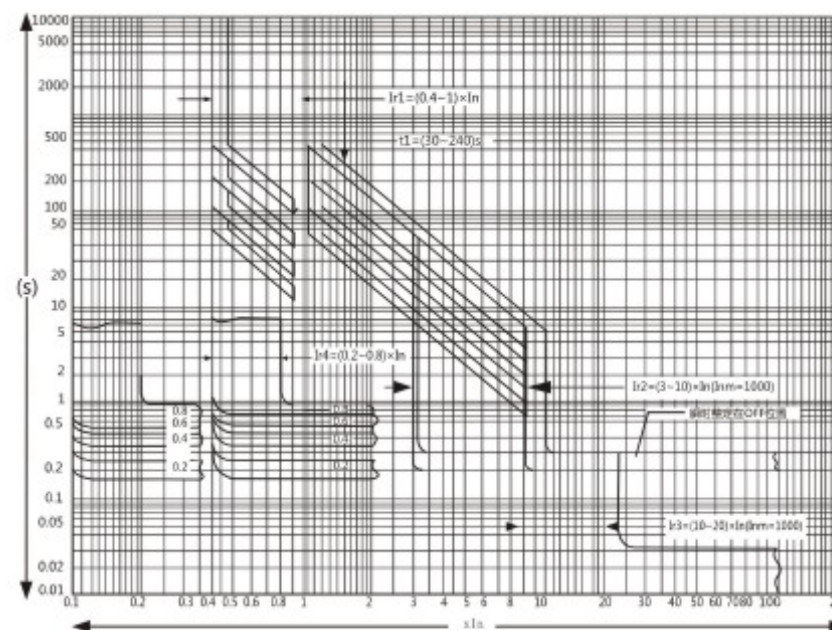


图1 Figure 1

表4 Table 4

I	动作时间 Action time			
1.05Ir1	> 2h不动作 No action			
1.3Ir1	< 1h不动作 No action			
1.5Ir1	30s	60s	120s	240s
2.0Ir1	16.9s	33.7s	67.5s	135s

注：1.5Ir1的时间由用户整定，2.0Ir1的时间按 $I^2TL=(1.5Ir1)^2tL$ 计算。

Note: the time of 1.5Ir1 set by user, time of 2.0Ir1 determined by calculation according to  $I^2TL=(1.5Ir1)^2tL$

表5 Table 5

延时时间 Delay time	0.2s	0.4s	0.6s	0.8s
可返回时间 Time return	0.16s	0.36s	0.54s	0.72s

# FSW50-1000

## 智能型万能式断路器

### Overload and short circuit instantaneous

6) 断路器的操作循环次数见表6 Operation performances of breaker are shown by operation cycles(see table 6)

表6 Table 6

壳架等级额定电流 Inm(A) Rated frame size current	每小时操作循环次数 Operating cycles per hour	操作循环次数 Operating cycles		
		通电 Energize	不通电 Not energized	总数 Total
1000	20	500	4500	5000

7) 断路器控制电路电源电压见表7。 Supply voltage circuit breaker control(see table 7)

表7 Table 7

名称 Description	额定电压 Rated voltage	
	交流AC (V)	直流DC (V)
欠电压脱扣器 (Ue) Undervoltage release	220 (380) 380 (400)	-
分励脱扣器 (Us) Shunt release		-
闭合电磁铁 (Us) Closing electromagnet		110 220
操作电动机 (Us) Operation counter		-
控制器电源电压 (Ue) Power voltage of controller†	-	110 220 24

注：控制器工作电压为DC24V其变压器或电源模块一次侧可提供电压为AC380V、220V或50Hz或DC220V、110V。

Note: Operating voltage of controller is DC24V, input side of the transformer or power source module can be AC380V、220V (50Hz) or DC220V、110V

注：分励脱扣器在70%~100%Us范围内保证断开断路器；操作电动机在85%~110%Us范围内可靠完成储能，闭合电磁铁应在85%~100%Us范围内保证断路器可靠闭合。智能控制器应在85%~115%Ue范围内保证断路器可靠工作。

Note: the shunt release under 70%~110%Us shall open the breaker reliably, operating motor under 85%~110%Us can perform charging energy reliably, for closing electromagnet, the operating voltage within 85%~100%Us shall guarantee breaker being closed reliably. The controller shall be able to work within 85%~115%Ue safely and reliably

8) 断路器欠电压脱扣特性见表8。 Operating characteristic of Undervoltage release(see table 8)

表8 Table 8

类别 Type	欠电压延时脱扣器 Undervoltage time delay release	欠电压瞬时脱扣器 Undervoltage instantaneous release
脱扣器动作时间 Action time release	延时 time delay 1、3、5s	瞬时 Instantaneous
脱扣器动作电压值 Release operation voltage value	35%~70%Us	能使断路器断开 Reliable disconnect breaker
	≤35%	断路器不能闭合 Breaker can not be closed
在1/2延时时间内，当电源电压恢复到85%Ue Within 1/2 time delay, if power source recover up to 85% Ue	≥85%~110%Ue	断路器可靠闭合 Breaker can be reliably closed
	断路器不断开 Constantly open breaker	—

注：延时时间误差±10% Note: Time delay Accuracy±10%

9) 辅助触头

9) Auxiliary contacts

9.1 辅助触头的约定发热电流Ith=6A。

9.1 Conventional thermal current of auxiliary contact Ith = 6A

9.2 辅助触头形式：标准配置为四常开三常闭，一组转换触头（如用户有特殊要求订货时应说明）。

9.2 The types of auxiliary contacts: standard arrangement: 4 NO + 3NC,

1 pair of changeover contacts(Other than this, please indicate it when to book the product.)

9.3 辅助触头的非正常接通与分断能力见表9。

9.3 The abnormal making and breaking capacity of auxiliary contacts as table 9

表9 Table 9

使用类别 Use Category	额定控制容量 (Pe) Rated control capacity	额定工作电压 (Ue) Rated operating voltage	接通与分断 Making and breaking				通断操作循环次数和操作频率 Operating cycles and operating frequency		
			U/Ue	I/Ie	cosφ	T0.95(ms)	操作循环次数 Operating cycles	每分钟操作循环次数 Operating cycles per minute	通电时间 (Power-on time)
AC-15	300VA	380V	1.1	10	0.3	—	10	6(与主回路操作频率相同) Operating frequency with the main circuit	0.5
DC-13	60W	220V	1.1	1.1	—	300			

9.4 辅助触头正常条件下的接通与分断能力见表10。 The normal making and breaking capacity of auxiliary contacts as table 10

表10 Table 10

使用类别 Use Category	额定控制容量 (Pe) Rated control capacity	额定工作电压 (Ue) Rated operating voltage	接通 Making				分断 Breaking			
			U/Ue	I/Ie	cosφ	T0.95(ms)	U/Ue	I/Ie	cosφ	T0.95(ms)
AC-15	300VA	380V	1	10	0.3	—	1	10	0.3	—
DC-13	60W	220V	1	1	—	300	1	1	—	300

9.5 辅助触头的不通电操作循环次数与断路器主回路相同。 Operation cycles of auxiliary contact without being electrified are same as main circuit of the breaker

9.6 断路器的最大操动力100N，抽屉式推进机构操作手柄的操动力不大于125N。

The maxi operating force for breaker is 100N, for push-in mechanism of the breaker (draw-out type) not exceed 125N

● 用户安装用铜排推荐见表11。 Copper busbar for installation recommended as table 11

表11 Table 11

母排 Busbar	额定电流In(A) Rated Current	200	400	630	800	1000
	厚度(mm) Thickness	5	5	5	6	8
宽度(mm) Width	30	30	40	50	50	
根数 Quantity	1	2	2	2	2	

● 断路器的最大耗功率见表12。 Max. power loss of breaker as table 12

表12 Table 12

功率消耗(W) Power Consumption	额定电流In(A) Rated Current	200	400	630	800	1000
	抽屉式 Draw-out type	40	101	123	110	171
固定式 Fixed type	33	85	107	94	146	

● 断路器在不同环境温度下额定持续电流变动见表13，即断路器降容系数（环境温度+40℃）。

The rated continuous current of breaker at different ambient temperature as table 13, namely derating coefficient (under ambient temperature +40℃)

表13 Table 13

环境温度 Ambient air temperature	+40℃	+45℃	+50℃	+55℃	+60℃	
允许持续工作电流 Permissible continuous operating current	1000A	1.0In	0.95In	0.92In	0.88In	0.85In

注：周围空气温度与允许持续工作电流关系(在各种环境温度条件下，实测断路器进出线端温度达到+110℃为基准。)

Note: the relation between ambient temperature and permissible continuous operating current (based on when the temperature reach up to +110℃ actually measured on incoming and outgoing terminals, at different ambient temperature)

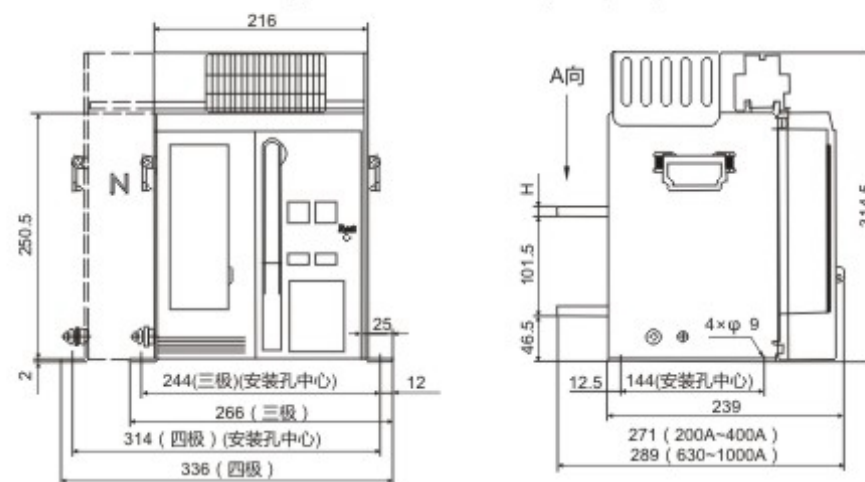
● 断路器的附件功率消耗见表14。 Power consumption of accessories for breaker as table 14

表14 Table 14

类别 Type	额定电压 Rated voltage	AC220V	AC380V	DC220V	DC110V	备注 Remark
欠电压脱扣器 Undervoltage release		400VA		—		最大瞬时功耗 Maximum instantaneous power consumption
分励脱扣器 Shunt release		200VA		200W		
闭合电磁铁 Closing electromagnet		400VA		400W		
操作电动机 Operation counter		80VA		80W		

### 外形及安装尺寸 Outline & installation size

● 固定式断路器的安装尺寸和外形尺寸见图2； Fixed type circuit breakers dimensions (see Figure 2)



# FSW50-1000

## 智能型万能式断路器

Overload and short circuit instantaneous

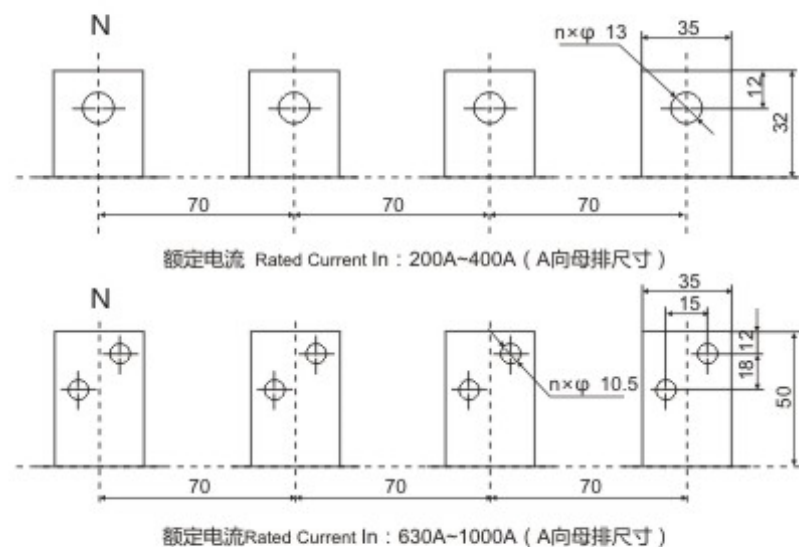


图2 FSW50-200A~1000A固定式断路器 Figure 2: Fixed type circuit breakers dimensions

额定电流 (A) Rated Current	200, 400	630	800, 1000	备注
母线厚度H (mm) Busbar thickness	6	8	10	—
n	6	12	12	三板
	8	16	16	四板

● 抽屉式断路器的安装尺寸和外形尺寸见图3。 Draw-out type circuit breakers dimensions (see Figure 3)

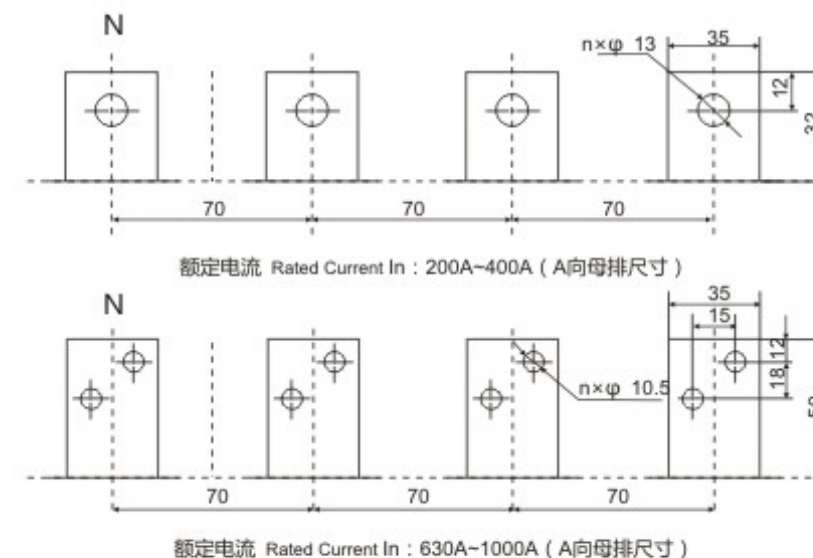
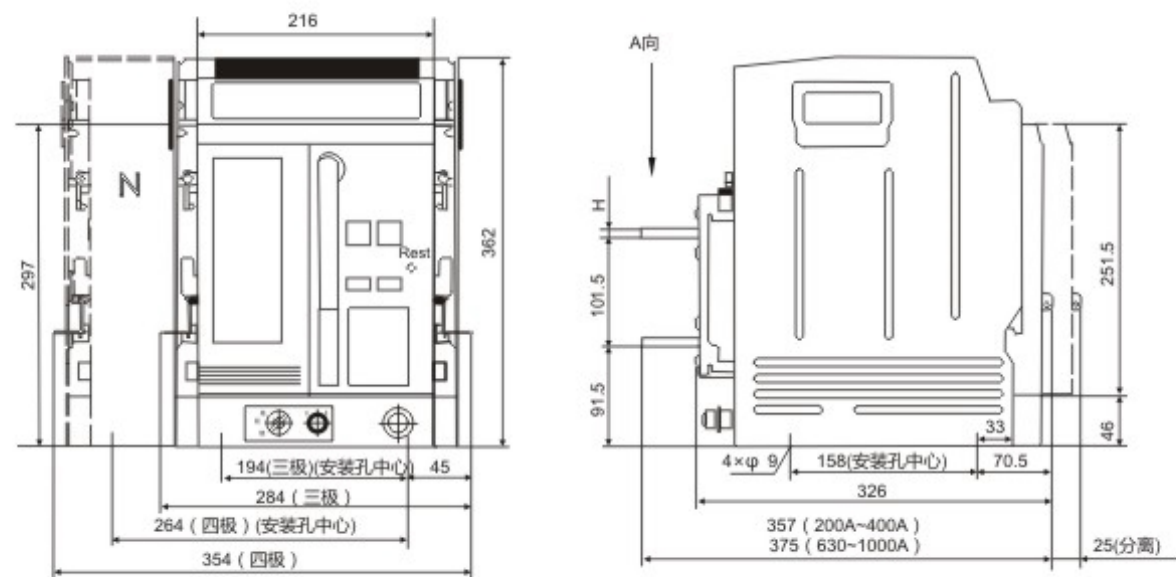
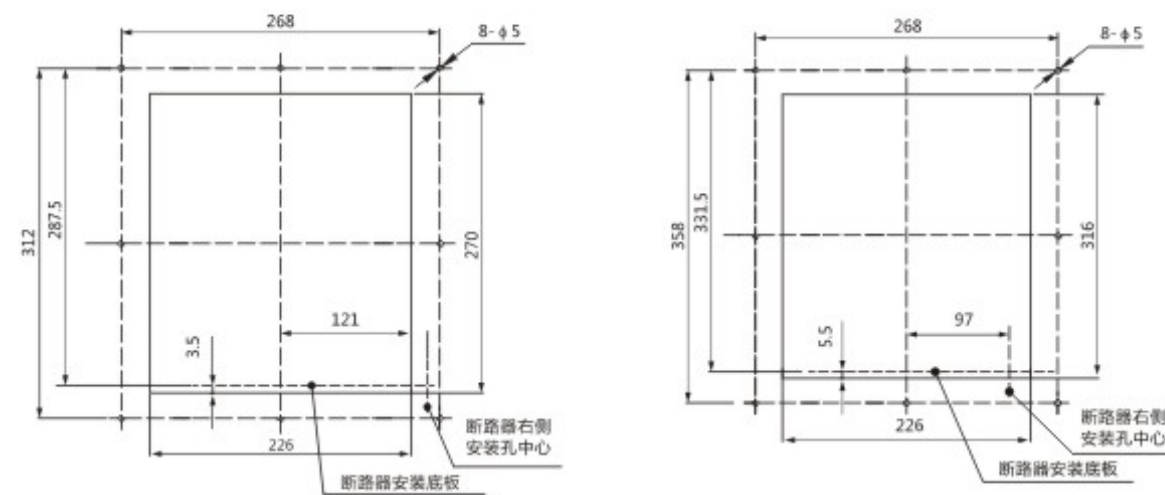


图3 FSW50-200A~1000A抽屉式断路器 Figure 3: Draw-out type circuit breakers dimensions

额定电流 (A) Rated Current	200, 400	630	800, 1000	备注
母线厚度H (mm) Busbar thickness	6	8	10	—
n	6	12	12	三板
	8	16	16	四板

● 抽屉式、固定式断路器的门柜开孔尺寸见图4 Door frame size & Mounting hole



固定式3P/4P门柜开孔尺寸  
Fixed type 3P/4P

图4 门柜开孔尺寸  
Panel cutting size

抽屉式3P/4P门柜开孔尺寸  
Draw-out type 3P/4P

# FSW50-1000

## 智能型万能式断路器

Overload and short circuit instantaneous

订货规范 Ordering sheet

(请在□内打√或填上数字, 一个规格一张单)

用户单位 User	订货数量 Order amount	订货日期 Order date			
型号 Type	FSW50-1000	极数 Number of poles	<input type="checkbox"/> 3P <input type="checkbox"/> 4P	安装方式 Installation mode	
额定工作电压 Rated operating voltage	<input type="checkbox"/> AC400V <input type="checkbox"/> AC690V	额定电流 Rated Current	In = <input type="text"/> A		
智能型万能式断路器 Intelligent Controller	类型 Type	<input type="checkbox"/> H型 H-Type	<input type="checkbox"/> M型 M-Type	<input type="checkbox"/> L型 L-Type ( <input type="checkbox"/> L2, <input type="checkbox"/> L3, <input type="checkbox"/> L4)	
	基本功能 Basic function	<input type="checkbox"/> 过载长延时保护 Long delay overload protection	<input type="checkbox"/> 短路短延时保护 Short-circuit protection short delay	<input type="checkbox"/> 短路瞬时保护 Instantaneous short-circuit protection	
	增选功能 Optional function	<input type="checkbox"/> 电流表功能 Measurement of current	<input type="checkbox"/> 热模拟功能 Electric energy measurement	<input type="checkbox"/> 通讯功能 Communication functions	
	接地方式 Grounding	<input type="checkbox"/> 3PT <input type="checkbox"/> 4PT	<input type="checkbox"/> (3P+N)T(需外接互感器)★		
智能型万能式断路器 Intelligent Controller	控制器电源 Controller Power	<input type="checkbox"/> AC400V <input type="checkbox"/> AC230V	<input type="checkbox"/> DC220V(需增选电源模块)★		
		<input type="checkbox"/> DC110V(需增选电源模块)	<input type="checkbox"/> DC240V(不需增选电源模块)★		
智能型万能式断路器 Optional configuration	分励脱扣器 Shunt release	<input type="checkbox"/> AC400V <input type="checkbox"/> AC230V	<input type="checkbox"/> DC220V	<input type="checkbox"/> DC110V	
	合闸电磁铁 Closing electromagnet	<input type="checkbox"/> AC400V <input type="checkbox"/> AC230V	<input type="checkbox"/> DC220V	<input type="checkbox"/> DC110V	
	电动操作机构 Operation counter	<input type="checkbox"/> AC400V <input type="checkbox"/> AC230V	<input type="checkbox"/> DC220V	<input type="checkbox"/> DC110V	
	辅助开关 Auxiliary switch	<input type="checkbox"/> 标准型(3a3b) Standard type(3a3b)	<input type="checkbox"/> 特殊型(5a5b) Special type(5a5b)	<input type="checkbox"/> 特殊型(6a6b) Special type(6a6b)	
智能型万能式断路器 Standard configuration	欠电压脱扣器 Undervoltage release	<input type="checkbox"/> AC400V	<input type="checkbox"/> 欠电压瞬时脱扣器 Instantaneous undervoltage release		
		<input type="checkbox"/> AC230V	<input type="checkbox"/> 欠电压瞬时脱扣器 Instantaneous undervoltage release		
智能型万能式断路器 Standard configuration	断开位置锁定 OFF locking device	<input type="checkbox"/> 一锁一钥匙 1 lock 1 key	<input type="checkbox"/> 二锁一钥匙 2 lock 1 key	<input type="checkbox"/> 三锁二钥匙 3 lock 2 key	
	机械联锁 Mechanical inter lock	<input type="checkbox"/> 钢丝绳联锁(二台) Steel cable interlock (2 breakers)	<input type="checkbox"/> 杠杆联锁二台开关 Interlock lever (2 breakers)	<input type="checkbox"/> 杠杆联锁三台开关 Interlock lever (3 breakers)	
	其他附件 Other accessories	<input type="checkbox"/> 门联锁 Door interlock	<input type="checkbox"/> 抽屉座三位置锁 3-position locking device for the draw-out socket	<input type="checkbox"/> 抽屉座三位置信号输出 3-position signal output for the draw-out socket	
		<input type="checkbox"/> 扩展排 Extended busbar	<input type="checkbox"/> 相间隔板 Separator between phases	<input type="checkbox"/> 其他 Other	
连接 Connection mode	<input type="checkbox"/> 水平接线 Horizontal connection	<input type="checkbox"/> 垂直接线 Vertical connection	<input type="checkbox"/> 特殊接线 Special connection		

注: 1、L型控制器为经济型, M型为普通型, H型在M型基础上增加通讯及位置锁功能(参照控制器类型);

2、控制器的MCR功能为标准配置, 针对M、H型产品增选漏电功能时, 则无接地保护功能;

3、用户选用增选功能或带“★”时, 需另行增加费用。

Note: 1. L type controller is economic type, M type is common type, H type has extra communication and OFF position locking on basis of M type (please refer to controller types)

2. MCR function is the standard arrangement for controller, for M, H type if leakage function added, then earthing protection is not available.

3. If user select those optional functions or the one marked with “★”, you shall pay additionally

备注: 如用户订货还有其他特殊要求, 请与厂家协商。 Note: If user has other special requirements, please discuss with factory.

# FSW2-1600

## 智能型万能式断路器

Overload and short circuit instantaneous



### 型号及含义 Type and meaning



### 分类 Classification

按使用类别分:

- 主电路: A类(非选择性)、B类(选择性)及AC-3(直接操作电动机)
- 辅助电路: AC-15、DC-13
- 安装方式: 固定式 抽屉式
- 传动方式: 电动机传动 手动
- 极数: 三极 四极
- 按是否适合隔离分: 适合隔离、不适合隔离
- 按是否需要维修分: 需要维修、不需要维修
- 脱扣器种类: 智能型控制器 分励脱扣器、欠电压瞬时(或延时)脱扣器

智能型控制器分类


- 2L型: 经济型(基本功能);
- 3M型: 基本型(基本功能+智能功能)
- 3H型: 高级型(基本功能+智能功能+通讯接口);

Classification according to usage category:

- Main circuit: Kind A (non selective type), Kind B (selective type) and AC-3 type (directly control motor)
- Auxiliary circuit: AC-15、DC-13
- According to mounting mode: Fixed type Draw-out type
- According to operating mode: Motor operation Hand Operation
- According to pole number: 3 poles 4 poles
- Classified depending on if isolation is available or not: feasible, unfeasible
- According to maintenance is required or not: required, not required
- Release types: intelligent controller, shunt release, under-voltage (instantaneous or delay) release
- Classification of intelligent controller
- 2L type: economic type (basic functions)
- 3M type: common type (basic functions + intelligent functions)
- 3H type: super type (basic function + intelligent functions + communication port)


### 适用范围 Application

FSW2-1600智能型低压万能式断路器(以下简称断路器)适用于交流50Hz, 额定工作电压至690V, 额定电流200A~1600A的配电网中, 用来分配电能和保护线路及电源设备免受过载、欠电压、短路、单相接地(漏电)等故障的危害。断路器具有智能化保护功能, 选择性保护精确, 能提高供电可靠性, 避免不必要的停电。同时带有开放式通讯接口, 便于与现场总线连接, 可实现“四遥”功能, 以满足控制中心和自动化系统的要求。配置相应的漏电互感器及智能控制器即可实现漏电保护。

断路器具有隔离功能, 采用符号“”表示。额定工作电流630A及以下的断路器, 亦可用于交流50(60)Hz、400V配电网中作为电动机的过载、短路、缺相、欠电压和接地等故障保护。在正常条件下, 断路器亦可作为线路的不频繁转换及电动机的不频繁启动之用。

断路器符合GB14048.1-2006《低压开关设备和控制设备: 总则》; 及GB14048.2-2008《低压开关设备和控制设备 第2部分: 断路器》; GB14048.4-2003《低压开关设备及控制设备 机电式接触器和电动机起动器》等标准。

FSW2-1600 conventional circuit breaker (hereinafter call “breaker”) is suitably used in the distribution circuit of AC 50Hz, rated voltage 690V, rated current 200~1600A, to distribute electric power and protect circuit and equipment from overloading, short circuit, under-voltage, single phase earthing, residual current faults. The breaker provides the intelligent protection function and high precise selective protection, improve the reliability of power supply, and prevent unnecessarily cutting off power supply. Meanwhile the breaker has opening communication port, convenient to connect with local bus, and realize four remote operations, to meet with the requirement of control center and automation. If leakage CT and intelligent controller assembled, the breaker can perform leakage protection.

The breaker has isolation function, use the symbol “” to indicate. The circuit breaker with rated current 630A and below can also be used to protect the motor from overload, short circuit, phase absence, under-voltage, and earthing fault. At normal conditions, the breaker can be used to transfer the lines or start the motor non-frequently.

The breaker complies with the standards of GB14048.1-2006 “Low-voltage switchgear and controlgear: General requirements”, GB14048.2-2008 “Low-voltage switchgear and controlgear Part 2: Low-voltage circuit breakers” and GB14048.4-2003 “Low-voltage switchgear and controlgear: Electromechanical contactors and motor starter”



# FSW2-1600

## 智能型万能式断路器

### Overload and short circuit instantaneous

#### 正常工作条件 Normal working condition

● 周围空气温度上限值不超过+40℃；下限值不低于-5℃；且24h平均值不超过+35℃；

注：对于使用在周围空气高于+40℃或低于-5℃的工作条件，用户应与制造厂协商。

- 安装地点海拔不超过2000m。
- 最高温度为+40℃时，空气的相对湿度不超过50%，在较低温度下可以有较高的相对湿度，例如20℃时达90%，对于温度变化偶尔产生的凝露应采取特殊的措施。
- 污染等级3级
- 断路器安装在柜体内，且加装门框，防护等级达IP40。
- 断路器的主电路及欠电压脱扣器线圈，电源变压器初级线圈安装类别IV，其余辅助电路、控制电路安装类别为Ⅲ。
- 使用类别B类。
- 断路器的运输和储存条件：-25℃至+55℃，短时间内（24h内）可达+70℃。
- 断路器应安装在无爆炸危险和导电尘埃、无足以腐蚀金属和破坏绝缘的地方，且断路器的垂直倾斜度不超过5°。

● When the ambient air temperature is -5℃~+40℃, the mean value is no greater than +35℃ with in 24 hours.

Note: if the upper limit is higher than +40℃ or lower limit lower than -5℃ in work, discussions shall be made between the user and the manufacturer.

- Altitude: not higher than 2000m for the installation site.
- When the ambient air temperature is +40℃, the relative humidity of the air shall not be higher than 50%; a higher relative humidity is allowed at a lower temperature; special measures shall be taken for the condensation occasionally produced due to temperature change.
- Degree of Pollution: III
- Degree of protection: IP40
- The installation category of the breaker main circuit is IV; The installation category of the control circuit and auxiliary circuit is III, apart from the similarity between the under voltage release coil and the intellectual controller's power transformer primary coil and the breaker;
- Use Category: B type
- Transportation and storage conditions of the circuit breaker: -25℃ to +55℃ short time (24h inside) up to +70℃
- The ambient air is not significantly polluted by dust, smoke, corrosive and/or flammable gases, vapours or salt. The mounting inclined angle shall not more the +5°

#### 主要技术参数 Main Technical data

● 断路器的额定电流见表1 Circuit breakers rated current in Table 1

表1 Table 1

壳架等级额定电流Inm A Frame size rated current	额定电流In A Rated Current
1600	200, 400, 630, 800, 1000, 1250, 1600

● 断路器的额定绝缘电压690V；额定工作电压400V、690V。Circuit breakers rated insulation voltage 690V; rated working voltage of 400V, 690V.

● 断路器的额定短路接通能力应不小于2.1Icu。Rated short circuit making capacity of breaker shall not be less than 2.1Icu.

● 断路器的额定短路分断能力及短时耐受电流见表2。Rated short circuit breaking capacity and short time withstand current of the breaker as table 2

表2 Table 2

壳架等级额定电流Inm(A) Frame size rated current	1600	飞弧距离	进线方式
额定极限短路分断能力Icu(kA)0-C0 Rated ultimate short-circuit breaking capacity	AC400V 55 AC690V 25	零飞弧	上进线或下进线
额定运行短路分断能力Ics(kA)0-C0-C0 Rated short-circuit breaking capacity	AC400V 42 AC690V 20		
额定短时耐受电流Icw(kA) 1s 0-C0 Rated short time withstand current	AC400V 42 AC690V 20		

● 智能控制器保护特性 Protection characteristic of the intelligent controller

1) 过电流脱扣器保护特性曲线见图1，接地故障保护特性曲线见图2。

Over current protection characteristics (Fig.1), Neutral line (grounding) fault protection characteristics (Fig.2)

2) 智能控制器的整定值及误差见表3。Controller Current setting & Accuracy (see table 3)

表3 Table 3

过电流脱扣器特性 Over current protection characteristics	整定值范围 Setting range		出厂整定值 Default setting
	2L	3M/3H	
长延时 IR Long delay	(0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1)In+OFF	(0.4~1)In+OFF	1In, 120s
短延时 I <sub>sd</sub> Short delay	L3:(3, 4, 6, 8, 10, 12, 15)In+OFF L4:(3, 4, 5, 6, 7, 8, 10)In+OFF	(1.5~15)In+OFF	6In, 0.2s
瞬时 Ii Instantaneous	L2:(3, 4, 6, 8, 10, 12, 15)In+OFF L3:(10, 11, 12, 14, 16, 18, 20)In+OFF	1In~50kA+OFF	10In
接地故障 Ig Grounding Fault	(0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8)In+OFF	(0.2~1)In+OFF	0.4In, 0.2s

注：1、OFF为过电流脱扣器保护特性处于关闭状态。

2、除非客户另有规定，产品出厂时按出厂整定值设定，客户需整定时请参照智能控制器使用说明书。

Note: 1. OFF means the protective characteristics of over-current release is closed.

2. Except for what the customer specify, the product will be set as defaults, if the user need adjustment, please refer to the operation manual of this breaker.

3) 智能控制器长延时过电流保护反时限动作特性

智能控制器长延时过电流保护反时限动作特性为  $I_{TR} = (1.5I_R) t_R$  (式中  $I_R$ : 长延时1.5I<sub>R</sub>时整定时间,  $I_R$ : 长延时整定电流,  $T_R$ 长延时动作时间), 动作时间见表4。可返回系数不小于0.9, 返回电流为0.9I<sub>R</sub>。

3) Long delay over-current inverse time limit tripping characteristics of intelligent controller

Inverse time tripping characteristics of overloading long delay tripping time:  $I_{TR} = (1.5I_R) t_R$  ( $I_R$ : setting time of long time delay tripping at 1.5I<sub>R</sub>,  $I_R$ : setting current of load time delay tripping,  $T_R$  is long delay tripping time). Tripping time as table 4, returnable coefficient not less than 0.9, returned current is 0.9I<sub>R</sub>.

表4 Table 4

电流整定值 Current setting	动作时间 Action time										准确度 Accuracy
	2L					3M/3H					
1.05I <sub>R</sub>	> 2h不动作 No action					> 2h不动作 No action					±15%
1.3I <sub>R</sub>	≤ 1h动作 Action					≤ 1h动作 Action					
1.5I <sub>R</sub>	30s	60s	120s	240s	15s	30s	60s	120s	240s	480s	
2.0I <sub>R</sub>	16.9s	33.7s	67.5s	135s	8.4s	16.9s	33.7s	67.5s	135s	270s	
7.2I <sub>R</sub>	1.3s	2.6s	5.2s	10.4s	0.65s	1.3s	2.6s	5.2s	10.4s	21s	
脱扣级别 Tripping level	—					10A 10 20 30					

注：以上为配电和电动机保护整定时间，发电机保护用整定时间由用户与公司协商。

Note: the above-mentioned setting times are for distribution type breaker, if breaker used to protect motor, the setting time is negotiated between user and our company.

4) 智能控制器短路短延时动作特性

短路短延时过电流保护一般为定时限。如要求低倍数为反时限，其特性按  $I T_s = (8I_R) t_{sd}$  (或中  $T_s$  为短延时整定时间,  $t_{sd}$  为短延时动作时间, 当过载电流 > 8I<sub>R</sub> 时, 自动转换为定时限特性, 其动作特性见表5。

5) 智能控制器短路瞬时动作特性

短路瞬时的动作时间 (含断路器固有分断时间) 应小于 30ms。其动作特性为: ≤ 0.85I<sub>i</sub> 时不动作, > 1.15I<sub>i</sub> 时动作。

4) Short delay tripping characteristics of intelligent controller

↑ Generally it will be the definite time limit tripping. If inverse time limit trip at low times of rated current is required, its characteristics shall follow  $I T_s = (8I_R) t_{sd}$  ( $T_s$  is setting time for short time delay tripping,  $t_{sd}$  is the short delay tripping time, when overloading current > 8I<sub>R</sub>, the controller will auto transfer to definite time limit tripping characteristics, as table 5.

5) Instantaneous tripping of short circuit for intelligent controller

Tripping time of short circuit instantaneous protection (including the opening time of the breaker) shall be less than 30ms. Its tripping characteristics: not trip at ≤ 0.85I<sub>i</sub>; trip at > 1.15I<sub>i</sub>

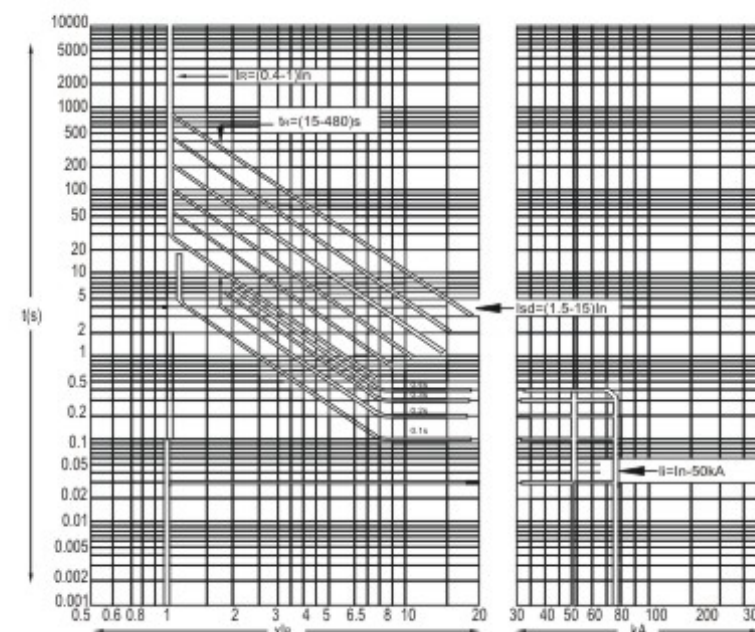


图1 过电流脱扣器保护特性曲线  
Figure 1 Over current protection characteristics

# FSW2-1600

## 智能型万能式断路器

Overload and short circuit instantaneous

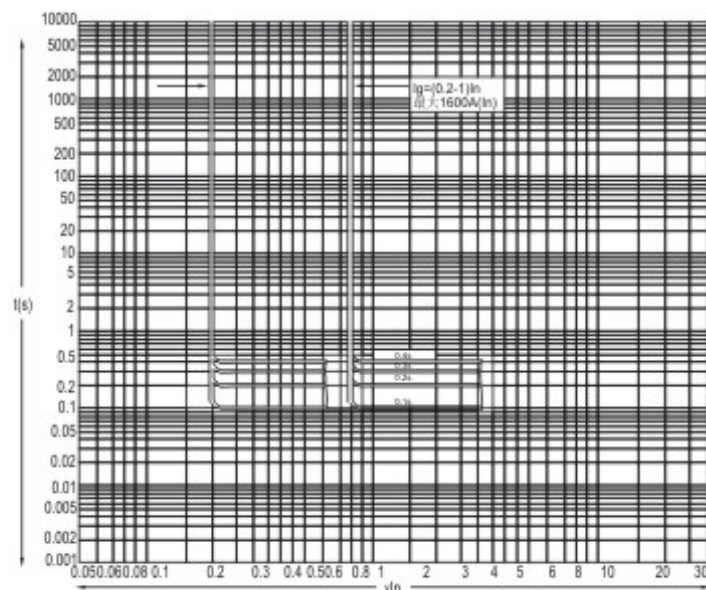


图2 接地故障保护特性曲线 Figure 2 Neutral line (grounding) fault protection characteristics

表5 Table 5

保护方式 Protection		动作时间 Action time				准确度 Accuracy
		2L		3M/3H		
定时限 Time limit	脱扣时间整定值 tsd Tripping time setting	200ms	400ms	0.1s~1s(0.1s极差)		±10%
	最大分断时间 Maximum breaking time	230ms	460ms			
	不脱扣持续时间 Not trip duration	140ms	330ms			
反时限特性 Inverse time characteristics		无		曲线同过载长延时,但曲线速度快10倍		
动作特性 Operating Characteristics		≤0.9Isd 不动作 No action				
		>1.1Isd 延时动作 Delay action				

6) 接地故障保护动作特性为定时限,其延时特性符合表6。 Earth fault protection is the definite time tripping, the time delay as table 6.

表6 Table 6

保护方式 Protection		动作时间				准确度
		2L		3M/3H		
定时限 Time limit	脱扣时间整定值 tg Tripping time setting	200ms	400ms	600ms	800ms	±10%
	最大分断时间 Maximum breaking time	230ms	460ms	650ms	850ms	
	可返回时间 Not trip duration	140ms	330ms	560ms	760ms	
动作特性 Operating Characteristics		≥0.8Ig 不动作 No action				
		<1.0Ig 延时动作 Delay action				

7) 剩余漏电流保护是通过外接外部漏电流互感器来实现剩余漏电流讯号检测,动作特性为延时型。其延时特性符合表7(表中不包括控制器固有动作时间20ms)

额定剩余动作电流  $I_{\Delta n}$ : 3A、10A、20A、30A。

额定剩余不动作电流 ( $I_{\Delta no}$ ) 的最小值为  $0.5I_{\Delta n}$ 。

The residual current protection is performed via an exterior electric leakage current transformer to monitor electric leakage, the tripping characteristics is time delay type, as table 7 (the inherent time delay 20ms of controller is not included).

Rated residual tripping current  $I_{\Delta n}$ : 3A, 10A, 20A, 30A

The minimum of rated residual tripping current  $I_{\Delta no}$ :  $0.5I_{\Delta n}$

表7 Table 7

极限不驱动时间(2I <sup>Δ</sup> n时) Do not drive time limit	0.06s	0.1s	0.2s	0.3s	0.4s	0.5s	1s
剩余电流 Residual current	最大断开时间 (s) Maximum break time						
$I_{\Delta n}$	0.36	0.50	1.00	1.50	2.00	2.50	5.00
$2I_{\Delta n}$	0.18	0.25	0.50	0.75	1.00	1.25	2.50
$5I_{\Delta n}$ , $5I_{\Delta n}$	0.07	0.10	0.20	0.30	0.40	0.50	1.00

### 8) 接地或剩余电流保护方式

接地或剩余电流保护是由于设备对大地有泄漏电流,作为保护设备的一种保护功能。根据泄漏电流的大小分为接地保护和剩余电流保护。

接地保护是控制器根据三相电流和中性电流矢量和进行保护。根据断路器极数分为 3PT、4PT、(3P+N) T 三种保护方式(见图3)。

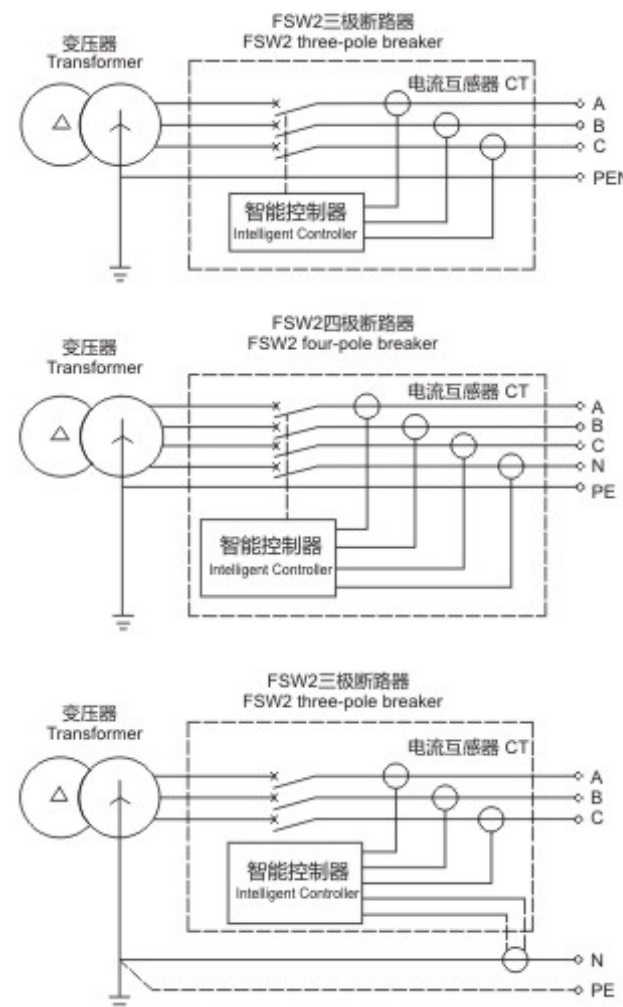
剩余电流保护是控制器直接取外加电流互感器的输出电流信号进行保护,保护灵敏度高,特别适用于几安培到几十安培的较小接地电流的保护。接地信号取样有两种方式,一种为矩形互感器(ZCT1)取样,另一种为直径100mm的环形互感器(ZT100)取样。

### 8) Earthing or residual current protection modes

Earthing or residual current protection is used to break leakage current from equipment to ground, as one of protection function, according to the value of leakage current, it divided into earthing protection and residual current protection.

Earthing protection will be performed according to the vector sum of three-phase and neutral current determined by the controller. According to pole number of circuit breaker, it can divided into: 3PT、4PT、(3P+N) T three kinds of protection modes (Picture 3)

Residual current protection will be executed according to output current signal of exterior CT directly read by controller, high sensitivity, especially suitable for protection of several to tens amperes, earthing current sampling has two modes: one is through rectangular CT (ZCT1), another is through ring CT (ZT100) (dia. 100mm)



### 3PT型

差值型接地故障保护,信号只取三相电流的矢量和(三相不平衡)

### 3PT type

Difference type earthing fault protection, the signal just sampled from the vector sum of three-phase current (three-phase imbalanced current)

### 4PT型

差值型接地故障保护,信号取三相电流及N相电流的矢量和

### 4PT type

Difference type earthing fault protection, the signal sampled from the vector sum of three-phase current and Neutral line current

### (3P+N)T型外接中性极互感器

差值型接地故障保护,信号取三相电流及N相电流的矢量和

### (3P+N)T type 外接中性极互感器

Difference type earthing fault protection, the signal sampled from the vector sum of three-phase current and Neutral line current

图3 接地保护方式 Figure 3 Ground Protection

# FSW2-1600

## 智能型万能式断路器

Overload and short circuit instantaneous

● 断路器的操作性能见表8。 Operation performances of breaker are shown by operation cycles(see table 8)

表8 Table 8

壳架等级额定电流 Inm(A) Rated frame size current	每小时操作循环次数 Operating cycles per hour	操作循环次数 Operating cycles		
		通电 Energize	不通电 Not energized	总数 Total
1600	20	500	3000	2500

注：1. 每小时实际操作循环次数应记录在试验报告中；  
 2. 每个通电操作循环期间，保持接通的最长时间为2s。  
 3. 电操机构操作循环次数及手动操作循环次数为总数的1/2。

Note: 1. Actual operating cycles per an hour shall be record in test report;  
 2. Maxi duration of remaining being electrified is 2s during each operating cycle.  
 3. Operation cycles by motor and hand are 1/2 of total operation cycles.

● 断路器的分励脱扣器、欠电压脱扣器、电动操作机构、释能（合闸）电磁铁、智能控制的工作电压及所需功耗见表9。  
 Operating voltage and power consumption of shunt release, under-voltage release, motor operating mechanism, releasing (closing) electromagnet, and intelligent controller see as table 9.

表9 Table 9

项目 Description	AC50Hz		DC	
	220V	380V	110V	220V
分励脱扣器 Shunt release	24VA	36VA	24W	24W
欠电压脱扣器 Undervoltage release	24VA	36VA	-	-
合闸电磁铁 Closing electromagnet	24VA	36VA	24W	24W
电动操作机构 Operation counter	85VA	85VA	85W	85W
智能控制器电源电压 Power voltage of controller†	AC220V, AC380V, DC220V, DC110V, DC24V			

注：1. 控制器工作电压为DC24V，其变压器或电源模块一次侧可提供电压为AC380V、220V（50Hz）或DC220V、110V。  
 2. 分励脱扣器的可靠动作电压范围为70%~110%，合闸电磁铁和操作机构为85%~110%。

Note: 1. Operating voltage of controller is DC24V, input side of the transformer or power source module can be AC380V, 220V (50Hz) or DC220V, 110V  
 2. Reliable operating voltage range for shunt release is 70%~110%, for closing electromagnet and operating mechanism is 85%~110%.

● 8) 断路器的欠电压脱扣器性能见表10 The characteristics of under-voltage release as table 10

表10 Table 10

类别 Type	欠电压延时脱扣器 Undervoltage time delay release		欠电压瞬时脱扣器 Undervoltage instantaneous release
	脱扣器动作时间 Action time release	延时 time delay 1、3、5s	瞬时 Instantaneous
脱扣器动作电压值 Release operation voltage value	35%~70%Ue	断路器可靠断开 Reliable disconnect breaker	断路器不能闭合 Breaker can not be closed
	≤35%Ue	断路器能可靠闭合 Breaker can be reliably closed	
	(85~110%) Ue		
在1/2延时时间内，如果电源电压恢复到85%Ue时 Within 1/2 time delay, if power source recover up to 85% Ue		断路器不断开 Breaker can not OFF	

注：延时时间精度为±10% Note: Time delay Accuracy±10%

● 辅助触头的性能 Auxiliary contacts

1) 辅助触头的约定发热电流为6A，额定工作电压对交流为127V、220V、380V，对直流为110V、220V，控制容量为300VA/Ue(交流)及60W/Ue(直流)；  
 2) 辅助触头形式：四常开四常闭，特殊形式订货时应说明。  
 3) 辅助触头的非正常接通与分断能力

1) Conventional thermal current of auxiliary contact Ith = 6A, AC rated voltage 127V, 220V, 400V 230V, or DC220V, 110V, the rated control capacity: 300VA/Ue (AC), or 30W/Ue(DC)  
 2) The types of auxiliary contacts: 4 NO + 4NC, other than this, please indicate it when to book the product.  
 3) The abnormal making and breaking capacity of auxiliary contacts

辅助触头非正常使用条件下的接通分断能力见表11。 The abnormal making and breaking capacity of auxiliary contacts as table 11

表11 Table 11

使用类别 Use Category	接通 Making			分断 Breaking			通断操作循环次数和操作频率 Operating cycles and operating frequency		
	I/le	U/le	COSφ或T0.95	I/le	U/le	COSφ或T0.95	操作循环次数 Operating cycles	每分钟操作循环次数 Operating cycles per minute	通电时间 Power-on time
AC-15	10	1.1	0.3	10	1.1	0.3	10	6(与主回路操作频率相同) Operating frequency with the main circuit	0.5
DC-13	1.1	1.14	300ms	1.1	1.14	300ms			

4) 辅助触头正常条件下的接通与分断能力见表12 The normal making and breaking capacity of auxiliary contacts as table 12

表12 Table 12

使用类别 Use Category	接通 Making			分断 Breaking		
	I/le	U/le	COSφ或T0.95	I/le	U/le	COSφ或T0.95
AC-15	10	1	0.3	1	1	0.3
DC-13	1	1	300ms	1	1	300ms

● 温升试验用铜排（或PVC绝缘铜线）截面（见表13）

The sectional cross area of copper busbar (or PVC insulated cable) used for temperature rise test (As table 13)

表13 Table 13

试验电流 (A) Test current	铜导线 Copper wire		铜导线 Copper wire	
	根数 Quantity	截面mm <sup>2</sup> Cross-sectional area	根数 Quantity	尺寸mm Dimension
200A	1	95		
400A	1	240		
630A	2	185	2	40×5
800A	2	240	2	50×5
1000A			2	60×5
1250A			2	80×5
1600A			2	100×5

表中规格为断路器处于周围环境温度最高+40℃，散开安装且满足GB14048.2中约定发热条件下所采用的铜排规格。

The data is busbar specification which can meet with the requirement of conventional thermal in GB14048.2 standard under highest ambient temperature +40℃

● 断路器的最大耗损功率（环境温度+40℃），

● Maxi power loss of breaker (ambient temperature +40℃)

FSW2-1600 三级 340W

FSW2-1600 3P: 340W

FSW2-1600 四级 400W

FSW2-1600 4P 400W

● 断路器的降容系数（见表14）

● Derating coefficient of breaker (as table 14)

表14表示断路器在所处周围工作环境温度且满足GB14048.2中约定发热条件下持续承载电流的能力。

Table 14 show the current carrying capacity in compliance with the requirement of GB14048.2 standard under the ambient temperature.

表14 Table 14

环境温度 Ambient air temperature	+40℃	+45℃	+50℃	+55℃	+60℃	
允许持续工作电流 Permissible continuous operating current	1600A	1.0In	0.95In	0.92In	0.88In	0.85In

● 断开位置钥匙锁（可选件）

● Key for OFF position (optional)

断路器具有“断开位置钥匙锁”附件（按订货要求供货），能将断路器锁定在断开位置。此时无论用合闸按钮或释能（合闸）电磁铁均不能使断路器闭合。适用于远距离断路器之间联锁。

The breaker can provide the accessory for locking in OFF position by padlock (please indicate when to book the product), it can lock the breaker in OFF position. At this case both ON pushbutton or releasing (CLOSE) electromagnet can't make breaker to be closed. This is suitable for the interlock between breakers located faraway.

● 钢缆机械联锁或连杆式机械联锁（可选件）

● Mechanical interlock by steel rope or connecting rod (optional)

可实现二台或三台断路器水平排列安装或垂直排列安装不同状态的联锁。

This function can realize the interlock between two or three pieces of breaker mounted in horizon or vertically.

● 门连锁（可选件）

● Door interlock (optional)

断路器在“连接”或“试验”位置，禁止柜门打开。

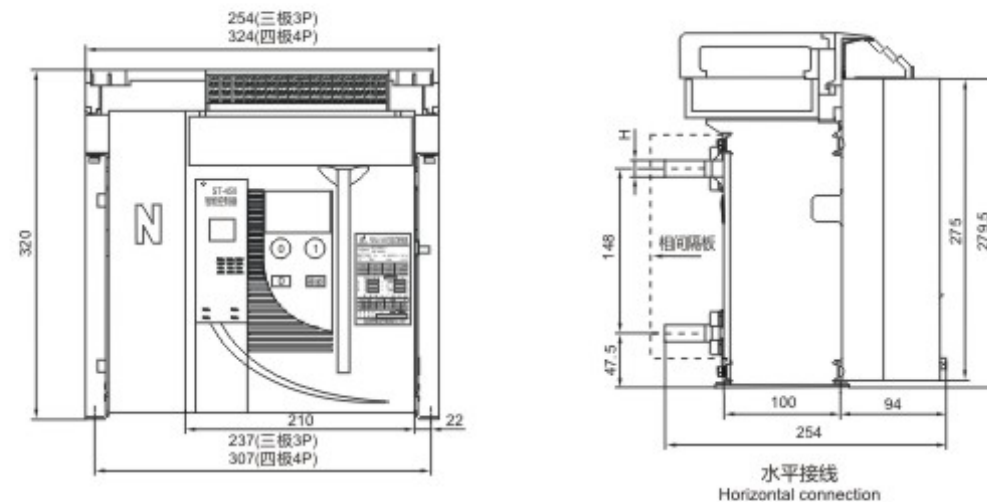
When breaker is in DISCONNECTED or TEST position, panel door not allowed to be opened.

柜门已打开，而断路器在“试验”位置，不用断开断路器就能够关闭柜门。

When panel door is opened and breaker in TEST position, it can close the panel door without need of opening the breaker.

### 外形及安装尺寸 Outline & installation size

● FSW2-200A~1600A固定式断路器外形及安装尺寸 FSW2-200A~1600A Fixed type circuit breakers dimensions



# FSW2-1600

## 智能型万能式断路器

Overload and short circuit instantaneous

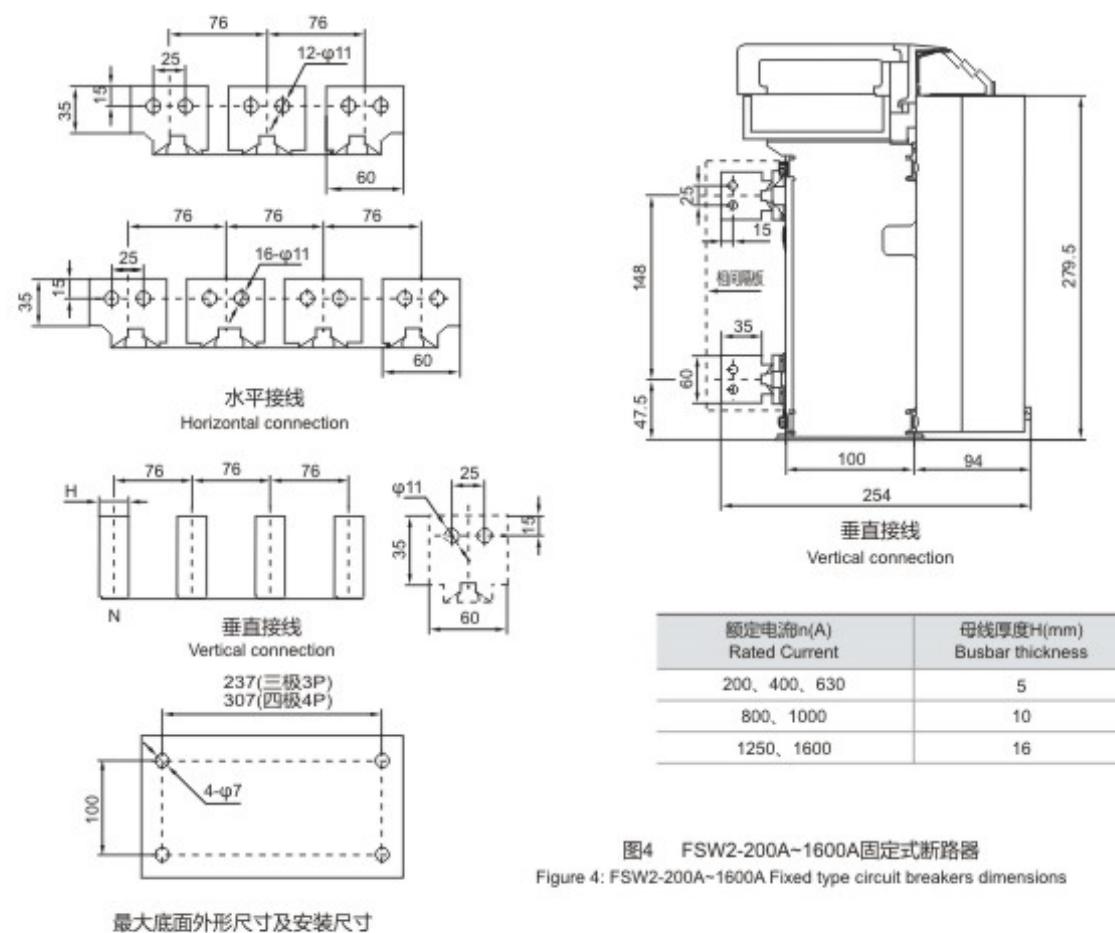


图4 FSW2-200A~1600A固定式断路器  
Figure 4: FSW2-200A~1600A Fixed type circuit breakers dimensions

FSW2-200A~1600A抽屜式断路器外形及安装尺寸 FSW2-200A~1600A Draw-out type circuit breakers dimensions

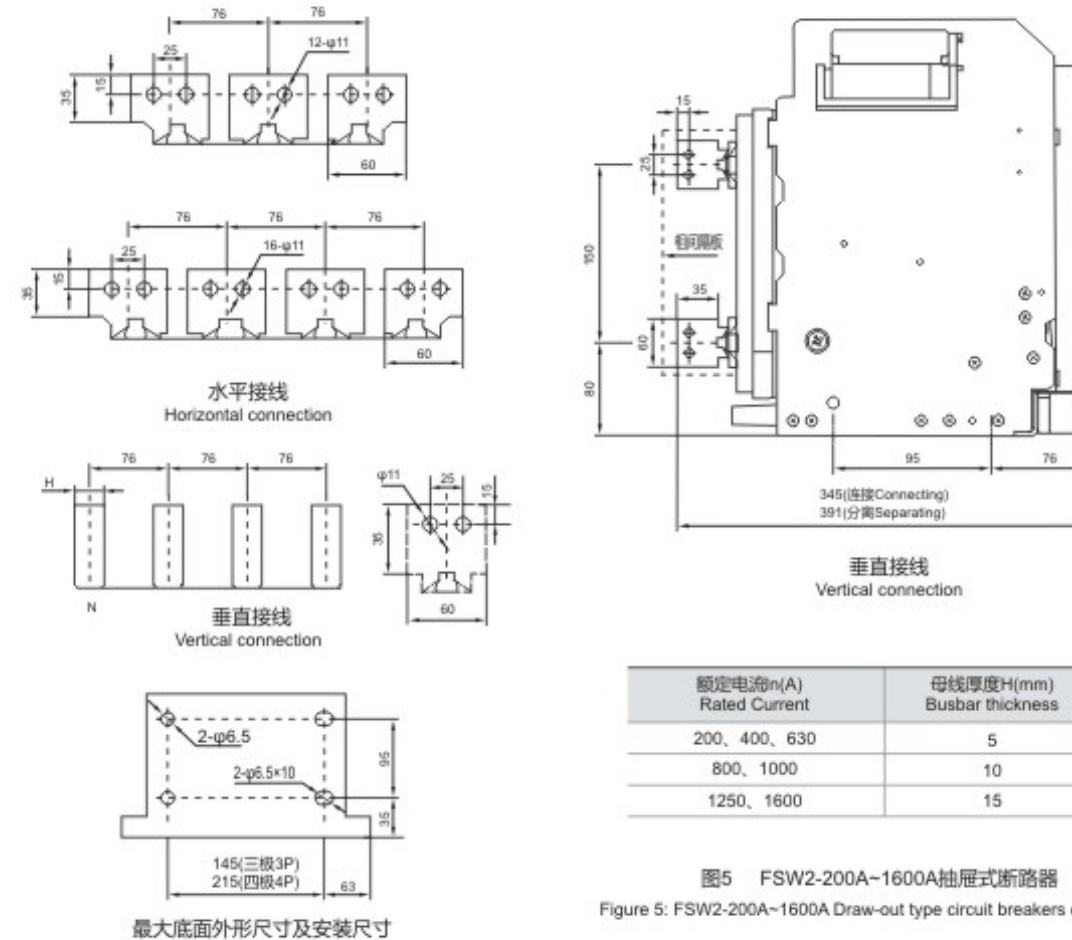
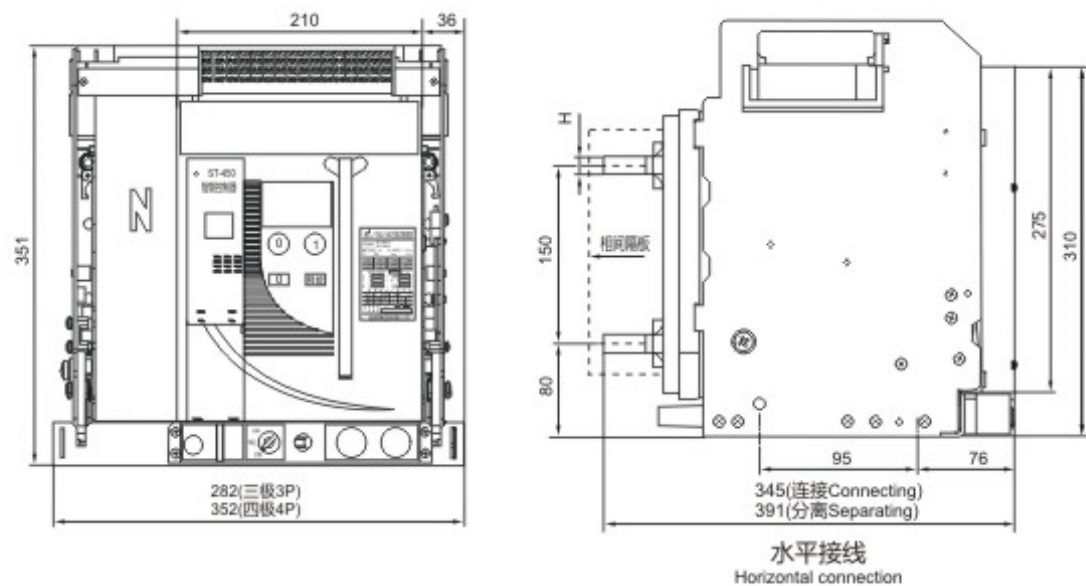


图5 FSW2-200A~1600A抽屜式断路器  
Figure 5: FSW2-200A~1600A Draw-out type circuit breakers dimensions

断路器门框开孔与安装尺寸 (见图6) Door frame size & Mounting hole (see Figure 6)

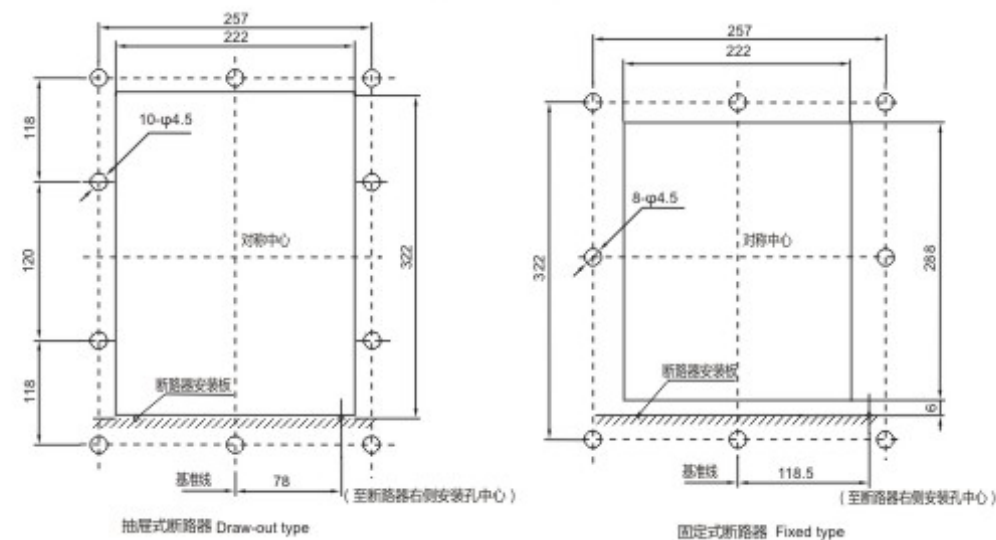


图6 FSW2-1600/3P, 4P断路器门框开孔与安装尺寸  
Figure 6 FSW2-1600/3P, 4P Door frame size & Mounting hole

# FSW2-1600

## 智能型万能式断路器

Overload and short circuit instantaneous

### 订货规范 Ordering sheet

(请在□内打√或填上数字, 一个规格一张单)

用户单位 User	订货数量 Order amount		订货日期 Order date	
型号 Type	FSW2-1600		极数 Number of poles	<input type="checkbox"/> 3P <input type="checkbox"/> 4P
额定工作电压 Rated operating voltage	<input type="checkbox"/> AC400V <input type="checkbox"/> AC690V	额定电流 Rated Current $I_n =$ <input type="text"/> A		
类型 Type	<input type="checkbox"/> H型 H-Type		<input type="checkbox"/> M型 M-Type	
	<input type="checkbox"/> L型 L-Type ( <input type="checkbox"/> L2, <input type="checkbox"/> L3, <input type="checkbox"/> L4)			
基本功能 Basic function	<input type="checkbox"/> 过载长延时保护 Long delay overload protection		<input type="checkbox"/> 短路短延时保护 Short-circuit protection short delay	
	<input type="checkbox"/> 接地或漏电保护 Neutral line grounding fault protection		<input type="checkbox"/> 短路瞬时保护 Instantaneous short-circuit protection	
增选功能 Optional function	<input type="checkbox"/> 电流表功能 Measurement of current		<input type="checkbox"/> 热模拟功能 Electric energy measurement	
	<input type="checkbox"/> 负载监控功能 Load monitoring function		<input type="checkbox"/> MCR功能 MCR make/break function	
接地方式 Grounding	<input type="checkbox"/> 3PT		<input type="checkbox"/> 4PT	
	<input type="checkbox"/> (3P+N)T(需外接互感器)*			
控制器电源 Controller Power	<input type="checkbox"/> AC400V <input type="checkbox"/> AC230V		<input type="checkbox"/> DC220V(需增选电源模块I)	
	<input type="checkbox"/> DC110V(需增选电源模块II)		<input type="checkbox"/> DC240V(不需增选电源模块)	
分闸脱扣器 Shunt release	<input type="checkbox"/> AC400V <input type="checkbox"/> AC230V		<input type="checkbox"/> DC220V <input type="checkbox"/> DC110V	
	<input type="checkbox"/> AC400V <input type="checkbox"/> AC230V		<input type="checkbox"/> DC220V <input type="checkbox"/> DC110V	
合闸电磁铁 Closing electromagnet	<input type="checkbox"/> AC400V <input type="checkbox"/> AC230V		<input type="checkbox"/> DC220V <input type="checkbox"/> DC110V	
	<input type="checkbox"/> AC400V <input type="checkbox"/> AC230V		<input type="checkbox"/> DC220V <input type="checkbox"/> DC110V	
电动操作机构 Operation counter	<input type="checkbox"/> AC400V <input type="checkbox"/> AC230V		<input type="checkbox"/> DC220V <input type="checkbox"/> DC110V	
	<input type="checkbox"/> AC400V <input type="checkbox"/> AC230V		<input type="checkbox"/> DC220V <input type="checkbox"/> DC110V	
辅助开关 Auxiliary switch	<input type="checkbox"/> 标准型(3a3b) Standard type(3a3b)		<input type="checkbox"/> 特殊型(5a5b)★ Special type(5a5b)★	
	<input type="checkbox"/> 特殊型(6a6b)★ Special type(6a6b)★			
欠电压脱扣器 Undervoltage release	<input type="checkbox"/> AC400V		<input type="checkbox"/> 欠电压瞬时脱扣器 Instantaneous undervoltage release	
	<input type="checkbox"/> AC230V		<input type="checkbox"/> 欠电压瞬时脱扣器 Instantaneous undervoltage release	
断开位置锁定 OFF locking device	<input type="checkbox"/> 一锁一钥匙 1 lock 1 key		<input type="checkbox"/> 二锁一钥匙 2 lock 1 key	
	<input type="checkbox"/> 三锁二钥匙 3 lock 2 key			
机械联锁 Mechanical inter lock	<input type="checkbox"/> 钢缆绳联锁(二台) Steel cable interlock (2 breakers)		<input type="checkbox"/> 杠杆联锁二台开关 Interlock lever (2 breakers)	
	<input type="checkbox"/> 杠杆联锁三台开关 Interlock lever (3 breakers)			
其他附件 Other accessories	<input type="checkbox"/> 门联锁 Door interlock		<input type="checkbox"/> 抽屉座三位置锁 3-position locking device for the draw-out socket	
	<input type="checkbox"/> 扩展排 Extended busbar		<input type="checkbox"/> 相间隔板 Separator between phases	
连接 Connection mode	<input type="checkbox"/> 水平接线 Horizontal connection		<input type="checkbox"/> 垂直接线 Vertical connection	
	<input type="checkbox"/> 特殊接线 Special connection			

注: 1. L型控制器为经济型, M型为普通型, H型在M型基础上增加通讯及位置锁功能(参照控制器类型);

2. 控制器的MCR功能为标准配置, 针对M、H型产品增选漏电功能时, 则无接地保护功能;

3. 用户选用增选功能或带“★”时, 需另行增加费用。

Note: 1. L type controller is economic type, M type is common type, H type has extra communication and OFF position locking on basis of M type (please refer to controller types)

2. MCR function is the standard arrangement for controller, for M, H type if leakage function added, then earthing protection is not available.

3. If user select those optional functions or the one marked with “★”, you shall pay additionally

备注: 如用户订货还有其他特殊要求, 请与厂家协商。 Note: If user has other special requirements, please discuss with factory.

# JR36

## 系列热继电器

### Series Thermal Relay



### 主要技术参数 Main technical data

1. 动作特性: 三相负载平衡时的动作时间  
Motion characteristic: three-phase balance motion time

序号 No.	整定电流倍数 Set current cinles	动作时间 Motion time	起始条件 Start condition	环境温度 Temperature
1	1.05	> 2h	冷态 Cold state	20±5°C
2	1.2	< 2h	热态 heat state	
3	1.5	< 4min	(按序号1试验后Following the No.1test)	
4	7.2	10A 2s>Tp>10s >36A 10A 4s>Tp>10s >63A	冷态 Cold state	

2. 动作特性: 三相负载平衡时的动作时间  
Motion characteristic: three-phase balance motion time

序号 No.	整定电流倍数 Set current cinles		动作时间 Motion time	起始条件 Start condition	环境温度 Temperature
	任意二相 Arbitrary two phase	第三相 Three phase			
1	1.0	0.9	> 2h	冷态 Cold state	20±5°C
2	1.15	0	< 2h	热态 heat state (按序号1试验后Following the No.1test)	

3. 规格 Specifications

型号 Type	JR36-20	JR36-32	JR36-63	JR36-160
额定电流范围(A) Setting range(A)	0.25~0.35	10~16	14~22	40~63
	0.32~0.5	14~22	20~32	53~85
	0.45~0.72	20~32	28~45	75~120
	0.68~1.1		40~63	100~160
	1~1.6			
	1.5~2.4			
	2.2~3.5			
	3.2~5			
	4.5~7.2			
	6.8~11			
10~16				
14~22				
安装尺寸 Installation dimension	38mm	66mm	66mm	90mm

### 适用范围 Application

JR36系列热继电器适用于交流50Hz或60Hz, 主电路额定电压660V, 电流至160A的电力系统中作为三相交流电动机的过载和断相保护, 具有温度补偿, 自动与手动复位功能。

JR36series thermal relay is suitable for AC 50Hz or 60Hz, main circuit rated voltage up to 660V, current up to 160A, used as protecting AC three-phase motor against overload and has the functions of breaking phase protection, temperature compe. It can automatically and manually reset, too.

### 型号及含义 Type and meaning



# JRS1, JR28

## 系列热继电器

### Series Thermal Relay



#### 主要技术参数 Main technical data

1、动作特性：三相负载平衡时的动作时间  
 Motion characteristic: three-phase balance motion time

序号 No.	整定电流倍数 Set current cinles	动作时间 Motion time	起始条件 Start condition	环境温度 Temperature
1	1.05	> 2h	冷态 Cold state	20±5°C
2	1.2	< 2h	热态 Heat state	
3	1.5	< 4min	(按序号1试验后 Following the No.1test)	
4	7.2	10A 2s < Tp ≤ 10s ≤ 63A 10A 4s < Tp ≤ 10s > 63A	冷态 Cold state	

2、动作特性：三相负载平衡时的动作时间  
 Motion characteristic: three-phase balance motion time

序号 No.	整定电流倍数 Set current cinles		动作时间 Motion time	起始条件 Start condition	环境温度 Temperature
	任意二相 Arbitrary two phase	第三相 Three phase			
1	1.0	0.9	> 2h	冷态 Cold state	20±5°C
2	1.15	0	< 2h	热态 Heat state (按序号1试验后 Following the No.1test)	

3、规格 Specifications

型号 Type	编号 Number	整定电流范围(A) Setting Range(A)	可插接安装的接触器 Contactors insert	型号 Type	编号 Number	整定电流范围(A) Setting Range(A)	可插接安装的接触器 Contactors insert
JRS1 (LR1-D)	09301	0.1-0.16	D09-D25	JR28 (LR2-D)	1301	0.1-0.16	D09-D32
	09302	0.16-0.25	D09-D25		1302	0.16-0.25	D09-D32
	39303	0.25-0.4	D09-D25		1303	0.25-0.4	D09-D32
	09304	0.4-0.63	D09-D25		1304	0.4-0.63	D09-D32
	09305	0.63-1	D09-D25		1305	0.63-1	D09-D32
	09306	1-1.6	D09-D25		1306	1-1.6	D09-D32
	09307	1.6-2.5	D09-D25		1307	1.6-2.5	D09-D32
	09308	2.5-4	D09-D25		1308	2.5-4	D09-D32
	09310	4-6	D09-D25		1310	4-6	D09-D32
	09312	5.5-8	D09-D25		1312	5.5-8	D12-D32
	09314	7-10	D09-D25		1314	7-10	D18-D32
	12316	10-13	D09-D25		1316	9-13	D25-D32
	16321	13-18	D09-D25		1321	12-18	D25-D32
	25322	18-25	D09-D25		1322	17-25	D32
	40353	23-32	D09-D25		2353	23-32	D25-D32
	40355	30-40	D40,D50,D63		2355	30-40	D25-D32
63357	38-50	D40,D50,D63	3322	17-25	D40-D95		
63359	48-57	D40,D50,D63	3353	23-32	D40-D95		
63361	57-66	D40,D50,D63	3355	30-40	D40-D95		
80363	63-80	D40,D50,D63	3357	37-50	D50-D95		
			3359	18-65	D50-D95		
			3361	55-70	D65-D95		
			3363	63-80	D80-D95		
			3365	80-93	D95		

#### 适用范围 Application

JRS1(LR1-D)系列热过载继电器适用于交流50或60Hz,电压至660V,电流至80A以下的电路中,供交流电动机热保护用。并且有差动机构和温度补偿环节,可与CJX2(LC1-D)交流接触器配装,也可独立安装。

JR28系列热过载继电器适用于交流50或60Hz,电压至660V,电流至80A以下的电路中,供交流电动机热保护用。并且有差动机构和温度补偿环节,可与CJX2(LC1-D)交流接触器配装,也可独立安装。

JRS1(LR1-D) series thermal relay is suitable for using in the circuits rated voltage up to 660V, rated current 93A AC 50Hz or 60Hz, for over-voltage protection of A.C. motor. The relay has the differential mechanism and temperature compensation and can plug in CJX2(LC1-D) series A.C. contactor.

JR28 series thermal relay is suitable for using in the circuits rated voltage up to 660V, rated current 93A AC 50Hz or 60Hz, for over-voltage protection of A.C. motor. The relay has the different mechanism and temperature compensation and can plug in CJX2(LC1-D) series A.C. contactor.

# CJT1

## 系列交流接触器

### Series AC Contactor



#### 主要技术参数 Main technical data

- 接触器主电路的基本参数见下表。  
Basic parameters of contactor main circuit are shown as the following list.
- 接触器的吸引圈在其额定控制电源电压Us的85%~110%范围内能正常工作。  
The pull-in windings of contactor can work normally at 85%~110% of rated control supply voltage Us.

型号 Type	Ui V	Ue V	Ith A	断续周期工作制下的Ie(A) Ie under intermittent periodic duty				AC-3的Pe (kW)
				AC-1	AC-2	AC-3	AC-4	
CJT1-10	690	220	10	10	10	10	10	2.2
		380			5	5	5	4
		660			5	5	5	4
CJT1-20	690	220	20	20	20	20	20	5.5
		380			12	12	12	10
		660			12	12	12	10
CJT1-40	690	220	40	40	40	40	40	11
		380			25	25	25	20
		660			25	25	25	20
CJT1-60	690	220	60	60	60	60	60	17
		380			40	40	40	30
		660			40	40	40	35
CJT1-100	690	220	100	100	100	100	100	28
		380			60	60	60	50
		660			60	60	60	50
CJT1-150	690	220	150	150	150	150	150	43
		380			100	100	100	75
		660			100	100	100	75

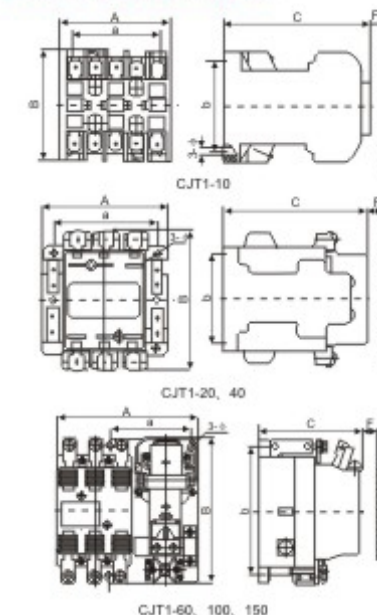
#### 适用范围 Application

CJT1系列交流接触器(以下简称接触器)主要用于交流50Hz、额定工作电压最高至660V, AC-3使用类别下,380V时的额定工作电流至150A、660V时的额定工作电流至100A的电力系统中,供远距离接通和分断电路或频繁地启动和控制交流电动机的运转。可与适当的热过载继电器或电子式保护装置组成电磁起动器,以保护可能发生过载的电路。

产品符合GB 14048.4和IEC 60947-4-1等标准。

CJT1 series AC contactor (hereinafter referred to as contactor) is suitable for the power system of AC 50Hz and rated working voltage up to 660V or the power system of rated working current up to 150A at 380V and rated working current up to 100A at 660V under AC - 3 utilization, to make and break circuit in a far distance, or to frequently start and control AC motor. The contactor can be combined with thermal overload relay or electronic protection equipment to form into an electromagnetic starter, to protect the circuit against possible overload. The products are in conformity with such standards as GB 14048.4 and IEC 60947-4-1.

#### 外形及安装尺寸 Outline & installation size



型号 Type	A	a	B	b	C	φ	F
CJT1-10	70	56	70	58	95	4.5	>15
CJT1-20	94	76	104	68	110	5	>15
CJT1-40	116	100	131	75	126	5.5	>15
CJT1-60	171	98	182	160	137	7	>35
CJT1-100	198	110	206	180	143	9	>45
CJT1-150	222	130	234	205	154	11	>55

# CJ20

## 系列交流接触器

### Series AC Contactor



#### 主要技术参数 Main technical data

接触器主电路的基本参数见下表。  
 Basic parameters of contactor main circuit are shown as the following list.

型号 Type	Ui V	Ue V	Ith A	断续周期工作制下的Ie(A) Ie under intermittent periodic duty				AC-3的Pe (kW)	不间断工作制下的Ie(A) Ie under uninterrupted duty	重量 Weight (kg)
				AC-1	AC-2	AC-3	AC-4			
CJ20-10	690	220	10	10	-	10	10	2.2	10	0.353
		380				5.2	5.2	4		
		660				5.2	5.2	4		
CJ20-16	690	220	16	16	-	16	16	4.5	16	0.416
		380				13	13	7.5		
		660				13	13	11		
CJ20-25	690	220	32	32	-	25	25	5.5	32	0.67
		380				14.5	14.5	11		
		660				14.5	14.5	13		
CJ20-40	690	220	55	55	-	40	40	11	55	1.32
		380				25	25	22		
		660				25	25	22		
CJ20-63	690	220	80	80	63	63	63	18	80	2.9
		380				40	40	30		
		660				40	40	35		
CJ20-100	690	220	125	125	100	100	100	28	125	3
		380				63	63	50		
		660				63	63	50		
CJ20-160	690	220	200	200	160	160	160	48	200	5.5
		380				100	100	80		
		660				100	100	80		
CJ20-160/11	1140	1140			80	80	80			

#### 适用范围 Application

CJ20系列交流接触器主要用于交流50Hz(或60Hz)、额定工作电压至660V(或1140V)额定工作电流至630A的电力系统中供远距离频繁接通和分断电路,并可与适当的热继电器或电子式保护装置组合成电磁起动器,以保护可能发生过载的电路。

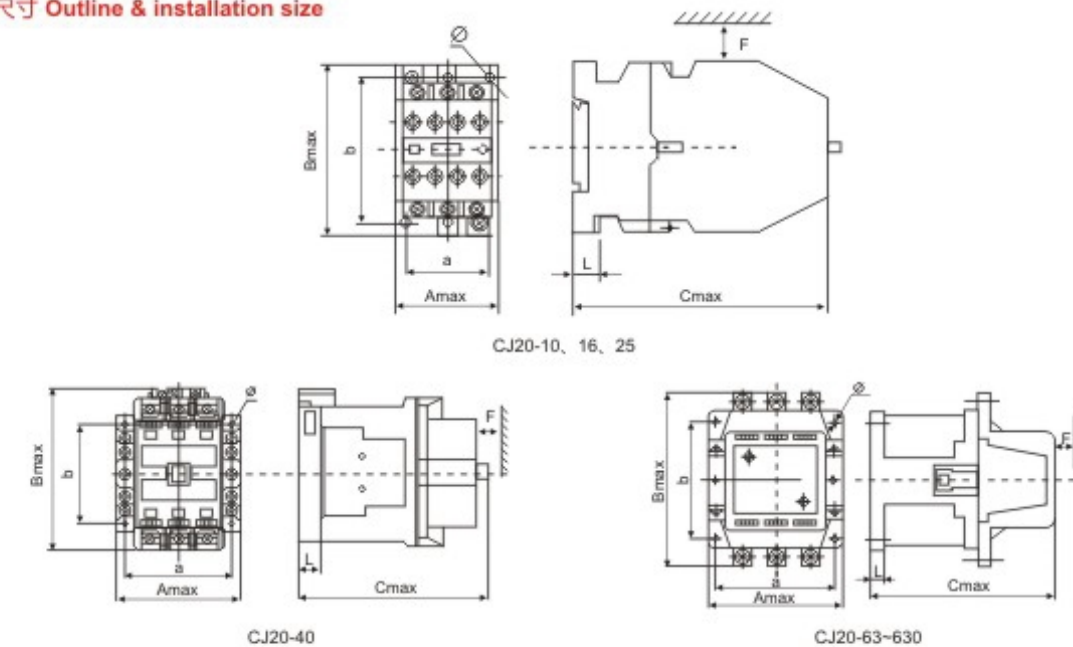
产品符合GB 14048.4和IEC60947-4-1等标准。

CJ20 series AC contactor is suitable for the power system of AC 50Hz or 60Hz, rated working voltage up to 660V or 1140V and rated working current up to 630A, used to make and break circuit frequently in a far distance, while, it can be combined with thermal relay or electronic protection equipment to form into an electromagnetic starter, to protect the circuit against possible overload. The products are in conformity with such standards as GB 14048.4 and IEC 60947-4-1.

续上表

型号 Type	Ui V	Ue V	Ith A	断续周期工作制下的Ie(A) Ie under intermittent periodic duty				AC-3的Pe (kW)	不间断工作制下的Ie(A) Ie under uninterrupted duty	重量 Weight (kg)		
				AC-1	AC-2	AC-3	AC-4					
CJ20-250	690	220	315	315	250	250	250	80	315	10.5		
		380						132				
CJ20-250/06	690	660			200	200	160	190				
CJ20-400	690	220	400	400	400	400	400	115	400	11.7		
		380						200			200	220
		660						250			250	200
CJ20-630	690	220	630	630	630	630	500	175	630	21.5		
		380						300				
CJ20-630/06	690	660			400	400	320	350				
CJ20-630-11	1140	1140			400	400	400	400				

#### 外形及安装尺寸 Outline & installation size



型号 Type	A	B	C	a	b	φ	L	F min
CJ20-10	44.5	67.5	107	35±0.31	55±0.37	5 <sup>+0.3</sup> <sub>0</sub>	8	10
CJ20-16	44.5	73	116.5	35±0.31	60±0.37	5 <sup>+0.3</sup> <sub>0</sub>	8	10
CJ20-25	53	91	122	40±0.31	80±0.37	5 <sup>+0.3</sup> <sub>0</sub>	7.5	10
CJ20-40	87	112.5	125	70±0.37	80±0.37	5 <sup>+0.3</sup> <sub>0</sub>	15.5	30
CJ20-63	116	142	146	100±0.36	90±0.36	5.8 <sup>+0.3</sup> <sub>0</sub>	13	60
CJ20-100	122	147	154	108±0.435	92±0.435	7 <sup>+0.58</sup> <sub>0</sub>	15	70
CJ20-160	146	187	178	130±0.5	130±0.5	9 <sup>+0.58</sup> <sub>0</sub>	15	80
CJ20-250	190	235	230	160±0.5	150±0.5	9 <sup>+0.58</sup> <sub>0</sub>	17	100
CJ20-400	190	235	230	160±0.5	150±0.5	9 <sup>+0.58</sup> <sub>0</sub>	17	110
CJ20-630	245	294	287	210±0.575	180±0.5	11 <sup>+0.7</sup> <sub>0</sub>	20	120

# CJ40

## 系列交流接触器

### Series AC Contactor



#### 正常工作条件 Normal operating conditions

- 周围空气温度为：-5°C~+40°C，24小时内其平均值不超过+35°C。
- 海拔高度：不超过2000m。
- 大气条件：最高温度+40°C时，空气的相对湿度不超过50%；在较低温度下可以允许有较高的相对湿度，例如20°C时达90%。对由于温度变化偶尔产生的凝露应采取特殊的措施。
- 污染等级：3级。
- 安装类别：Ⅲ类。
- 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振动、冲击和振动的地方。
- Ambient temperature: -5°C~+40°C, the average during 24 hours should not exceed +35°C;
- Altitude: ≤2000m;
- Atmosphere conditions: At mounting site, relative humidity not exceed 50% at the max temperature of +40°C, higher relative humidity is allowable under lower temperature. for example, RH could be 90% at +20°C, special measures should be taken to occurrence of dews;
- Pollution degree: 3
- Installation category: III
- Installation conditions: the inclination between installation plane and vertical plane is within ±5°
- Impact and shake: the products should locate in the places where there are no obvious impact and shake.

#### 结构特点 Structural features

- 接触器为直动式结构，触头灭弧系统位于上部，电磁系统位于下部，触头为双断点，由银合金制成。63A及以上产品有六对辅助触头，三种组合(表2)。
- CJ40-63A以上产品灭弧罩采用耐弧塑料和铁质栅片组成，一方面克服了陶土灭弧罩易碎的缺点，另一方面具有分断能力高、可靠性高的优点。
- The contactor is of directly acting structure, the contacting and arc quenching system assembled in the top, electromagnetic system located at bottom, the contacts are of dual break point, made of silver alloy. The 63A and above contactors have 6 pairs of auxiliary contacts, three combinations (as table 2).
- The arc quenching chamber of CJ40-63A contactors consist of arcing withstand plastic and steel fence, this can overcome the shortage of easy crack for argil arc quenching system, also achieve the higher interrupting capacity.

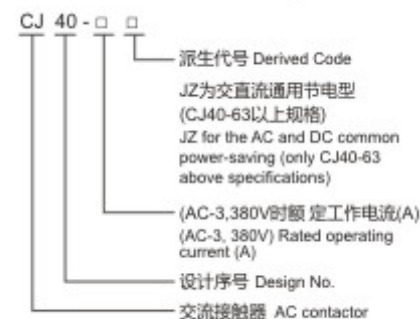
#### 适用范围 Application

CJ40系列交流接触器(以下简称接触器)主要用于交流50Hz或60Hz、额定电压至660V或1140V、电流至1000A的电力系统中接通与分断电路，并可与适当的热继电器或电子式保护装置组合成电动机启动器，以保护可能发生过载的电路。符合标准:GB14048.4, IEC 60947-4-1。

CJ40 AC contactor (hereinafter referred to as contactor) is mainly used in power system of AC 50Hz or 60Hz, and rated voltage up to 660V or 1140V, and rated operating current up to 1000A, for long-distance switching on/off the circuits, and it can be used with appropriate thermal overload relay or electronic protection device in a combined way, in order to protect circuits that may subject to operating overload.

Standard: IEC 60947-4-1.

#### 型号及其含义 Code and implication



#### 订货须知 Ordering information

订购接触器时，需指明下述各点：

- 接触器完整的名称、型号；
- 线圈的额定工电压和频率或规格代号；
- 辅助触头组合情况，如不指明，63A及以上规格均提供四常开两常闭；
- 订货数量；
- 订货示例：CJ40-63交流接触器，线圈电压380V，50Hz，10台。

When ordering the goods, the user shall indicate the following items:

- Types and names of AC contactor;
- Coil rated operating voltage and frequency or Specification Code;
- Combinations of auxiliary contacts, if not stated, 63A and above Specifications are provided four normally open two normally closed;
- Amount on order ;
- Example for ordering : 10 units of CJ40-63 AC contactor, Coil voltage 380V, 50Hz.

#### 主要参数及技术性能 Main technical data

● 主要参数及技术性能指标(见表1)。 main parameters and technical performance (see table1)

表1 Table1

接触器型号 Contactor type	额定绝缘电压 Rated insulation voltage Ui(V)	约定自由空气发热电流Ith(A) Conventional free air thermal current Ith (A)	AC-3使用类别下可控制的三相鼠笼型电动机的最大功率(kW) AC-3 three-phase squirrel cage motors can be controlled under the category of maximum power (kW)				每小时操作循环数 Operating cycles per hour	AC-3电寿命(万次) Electrical life (10,000 times)	线圈功耗 Coil Power		选用的熔断器(SCPD)型号 Fuse type
			220V	380V	660V	1140V			启动 Start (VA)	保持 Latching (VA)	
CJ40-63	1140	80	18.5	30	55	-	1200	120	480	85.5	RT16-160
CJ40-80			22	37	55	-					RT16-160
CJ40-100		125	30	45	75	-					RT16-250
CJ40-125			37	55	75	55					RT16-250
CJ40-160		250	45	75	110	-					RT16-315
CJ40-200			55	90	110	-					RT16-315
CJ40-250		500	75	132	110	110	RT16-315				
CJ40-315			90	160	300	-	RT16-500				
CJ40-400			110	220	300	-	RT16-500				
CJ40-500			150	280	300	220	RT16-500				
CJ40-630		800	200	335	475	-	RT17-4/630				
CJ40-800			250	450	475	-	RT17-4/800				
CJ40-1000		1000	360	625	475	600	300	30	3578	91.2	RT17-4/1250(1000)

● 辅助触头的组合情况及基本参数(见表2)。 Parameters of the auxiliary contacts (see Table 2).

表2 Table2

产品型号规格 Contactor type	约定自由空气发热电流(A) Conventional free air thermal current Ith (A)	额定绝缘电压(V) Rated insulation voltage	额定工作电压(V) Rated operating voltage		额定工作电流(A) Rated operating current		额定控制容量 Rated control capacity		触头种类数量 Contact number of species			
			交流AC	直流DC	交流AC	直流DC	交流AC	直流DC	常开NO	常闭NC	常开NO	
CJ40-63~250	10	690	380	220	0.82	0.27	AC-15	DC-13	常开NO	4	3	2
			220	110	1.4	0.6	300VA	60W	常闭NC	2	3	4
CJ40-315~1000	16	690	380	220	1.3	0.27	AC-15	DC-13	常开NO	4	3	2
			220	110	2.3	0.6	500VA	60W	常闭NC	2	3	4

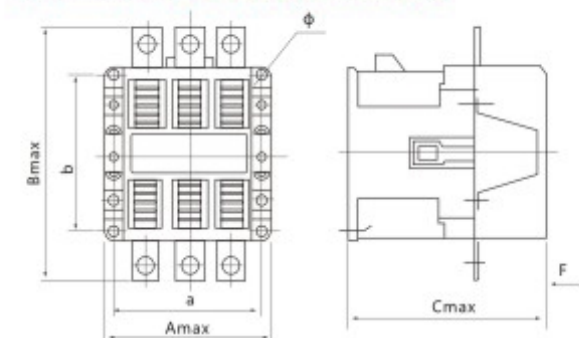
● 节能产品节电率(见表3)。 Saving products saving rate (see Table 3).

表3 Table3

产品型号 Product number	CJ40-63~250JZ	CJ40-315~1000JZ
节电率% Saving rate%	90	90

- 动作条件：吸合电压：(85%~110%)Us；释放电压：普通型的为(20%~75%)Us，其余的为(10%~75%)Us。
- 线圈控制电源电压Us为：交流50Hz，110V、127V、220V、380V；直流110V、220V。
- 机械寿命：250A以下1000万次，315~500A为600万次，630~1000A的为300万次。
- Action conditions: pull-in voltage: (85% ~ 110%) Us; release voltage: common type of (20% ~ 75%) Us, the rest of (10% ~ 75%) Us.
- Coil control supply voltage Us as: AC 50Hz, 110V, 127V, 220V, 380V; DC 110V, 220V.
- Mechanical life: 250A or less 10 million times, 315 ~ 500A is 600 million times, 630 ~ 1000A 300 million times.

#### 外形及安装尺寸 Outline & installation size



接触器型号 Contactor type	外形尺寸 Dimensions			安装尺寸 Mounting dimensions			安全区域F		
	A	B	C	a	b	∅	380V	660V	1140V
CJ40-63~125	116	143	154	100±0.435	90±0.435	5.8	20	40	40
CJ40-160~200	146	186	184	130±0.5	130±0.5	9	30	40	50
CJ40-250	146	186	184	130±0.5	130±0.5	9	40	60	60
CJ40-315~400	190	235	230	160±0.5	150±0.5	9	40	60	60
CJ40-500	190	235	230	160±0.5	150±0.5	9	50	70	80
CJ40-630~1000	244.5	347	287.5	210±0.575	180±0.5	11	-	-	-



# CJX1

## 系列交流接触器

### Series AC Contactor



#### 主要技术参数 Main technical data

型号规格 Type	CJX1-9	CJX1-12	CJX1-16	CJX1-22	CJX1-32	CJX1-38	CJX1-45	CJX1-63	CJX1-75	CJX1-85	CJX1-110	CJX1-140	CJX1-170	CJX1-205	CJX1-250	CJX1-300	CJX1-400	CJX1-475
额定绝缘电压 V Rated insulation Voltage	690												1000					
频率 Frequency (Hz)	50(或60)																	
额定工作电流 A Rated Working current	AC-3 380V 9	12	16	22	32	38	45	63	75	85	110	140	170	205	250	300	400	475
在 AC-3 使用类别下可 控电动机最大功率 kW Max power of controllable motor under AC-3 utilization kW	220V 2.2	3	4	5.5	8.5	11	15	18.5	22	28	37	43	55	64	78	93	125	148
约定发热电流 A Conventional thermal current	20	20	30	30	55	55	90	80	100	100	160	160	210	220	300	300	400	550
操作频率 次/h Operating frequency	AC-3 1200	1200	1200	1200	600	600	600	600	600	600	600	300	300	300	300	300	300	300
负载因数 On-load factor AC-3	40%																	
与熔断器的组合 Combined with fuse	NT00-16	NT00-20	NT00-25	NT00-32	NT00-50	NT00-63	NT00-80	NT00-100	NT00-125	NT00-160	NT00-200	NT00-250	NT00-250	NT00-315	NT00-400	NT00-500	NT00-500	
与热过载继电器的组合 Combined with thermal overload relay	JRS2-12.5	JRS2-25	JRS2-32	JRS2-45	JRS2-60	JRS2-80	JRS2-110	JRS2-140	JRS2-170	JRS2-205	JRS2-250	JRS2-300	JRS2-400					
吸引线圈工作范围 Working range of pull-in windings	85%Us~110%Us																	
释放线圈工作范围 Working range of release windings	20%Us~75%Us																	
吸引线圈电压 V Voltage of pull-in windings	24, 36, 48, 110, 127, 220, 380																	
辅助触头约定发热电流 A Conventional thermal current of auxiliary contact	10																	
电寿命/万次 Electrical life	AC-3 100	80																60
重量 Weight (kg)	0.43	0.49	0.7	1.43	2.21	3.42	5.5	6.8	9.2									

#### 适用范围 Application

CJX1系列交流接触器主要用于交流50Hz(或60Hz)、额定工作电压至1000V,在AC-3使用类别下额定工作电压为380V时额定工作电流至475A的电路中,供远距离接通和分断电路或频繁启动和控制交流电动机,并可适当的热过载继电器组成电磁起动器,以保护可能发生过载的电路。

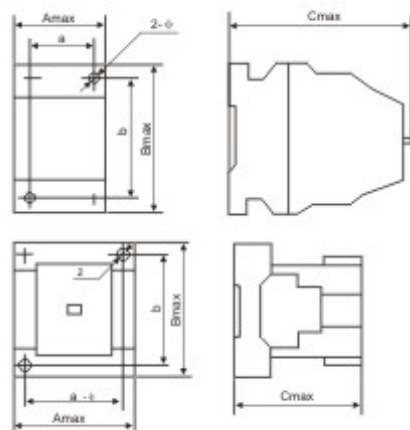
产品符合GB14048.4和IEC60947-4-1等标准。

CJX1 series AC contactor is suitable for the circuit of AC 50Hz (or 60Hz) and rated working voltage up to 1000V or the circuit of rated working voltage 380V and rated working current 475A under AC-3 utilization, it is mainly used to make and break circuits in a far distance or frequently start and control AC motors, it also can be formed into an electromagnetic starter with suitable thermal overload relay to protect the circuit against possible overload.

The products are in conformity with such standards as GB14048.4 and IEC60947-4-1.

#### 外形及安装尺寸

#### Outline & installation size



型号 Type	Amax	Bmax	Cmax	a	b	φ
CJX1-9,12	46	79	106	35±0.50	60±0.60	4.8 <sup>+0.48</sup> <sub>0</sub>
CJX1-16,22	46	89	116	35±0.50	75±0.60	
CJX1-32	74	90	109	50±0.50	75±0.60	
CJX1-38	82	102	110	45±0.50	75±0.60	5.0 <sup>+0.48</sup> <sub>0</sub>
CJX1-45,63	92	120	125	70±0.60	100±0.70	
CJX1-75,85	105	135	145	80±0.60	110±0.70	5.5 <sup>+0.48</sup> <sub>0</sub>
CJX1-110,140	125	158	155	100±0.70	130±0.80	6.5 <sup>+0.58</sup> <sub>0</sub>
CJX1-170	140	185	190	110±0.70	160±0.80	7.0 <sup>+0.58</sup> <sub>0</sub>
CJX1-205	140	185	190	110±0.70	160±0.80	7.0 <sup>+0.58</sup> <sub>0</sub>
CJX1-250	146	194	202	120±0.70	180±0.80	9.0 <sup>+0.63</sup> <sub>0</sub>
CJX1-300	146	194	202	120±0.70	180±0.80	9.0 <sup>+0.63</sup> <sub>0</sub>
CJX1-400	162	205	224	130±0.80	180±0.80	9.0 <sup>+0.63</sup> <sub>0</sub>
CJX1-475	162	205	224	130±0.80	180±0.80	9.0 <sup>+0.63</sup> <sub>0</sub>

# CJX2

## 系列交流接触器

### Series AC Contactor



#### 主要技术参数 Main technical data

型号 Type		CJX2-09	CJX2-12	CJX2-18	CJX2-25	CJX2-32	CJX2-40	CJX2-50	CJX2-65	CJX2-80	CJX2-95	
额定工作电流 A Rated Working current	380V	AC-3 9	12	18	25	32	40	50	65	80	95	
	660V	AC-3 6.6	5.9	12	18	21	34	39	42	49	55	
约定发热电流 A Conventional thermal current	220V	2.2	3	4	5.5	7.5	11	15	18.5	22	25	
	380V	4	5.5	7.5	11	15	18.5	22	30	37	45	
可控三相鼠笼电动机功率 AC-3 kW Power of controllable three-phase squirrel cage motor AC-3 kW	220V	2.2	3	4	5.5	7.5	11	15	18.5	22	25	
	380V	4	5.5	7.5	11	15	18.5	22	30	37	45	
电寿命 Electrical life	AC-3	1200					600					
	AC-4	300										
机械寿命 Mechanical life	AC-3	3600										
	AC-4	3600										
电寿命/万次 Electrical life	AC-3	100					80					60
	AC-4	20					15					10
机械寿命/万次 Mechanical life	AC-3	1000					800					600
	AC-4	3600										
熔断器型号 Fuse model		RT16-20	RT16-20	RT16-32	RT16-32	RT16-50	RT16-63	RT16-80	RT16-80	RT16-100	RT16-125	
符合标准 Conform to standard		GB/T14048.1			GB14048.4			IEC 60947-4-1				

#### 适用范围 Application

CJX2系列交流接触器主要用于交流50Hz或60Hz、额定绝缘电压690V,在AC-3使用类别下,额定工作电压380V、额定工作电流至620A的电力系统中,供远距离接通和分断电路及频繁地启动和控制交流电动机。并可适当的热过载继电器或电子式保护装置组成电磁起动器,以保护可能发生过载的电路。

CJX2 series AC contactor is suitable for the power system of AC 50Hz or 60Hz and rated insulation voltage up to 690V or the power system of rated working voltage 380V and rated working current up to 620A under AC-3 utilization, used to make and break circuit in a far distance or to frequently start and control AC motors, while, it can be combined with thermal relay or electronic protection equipment to form into an electromagnetic starter to protect the circuit against possible overload.

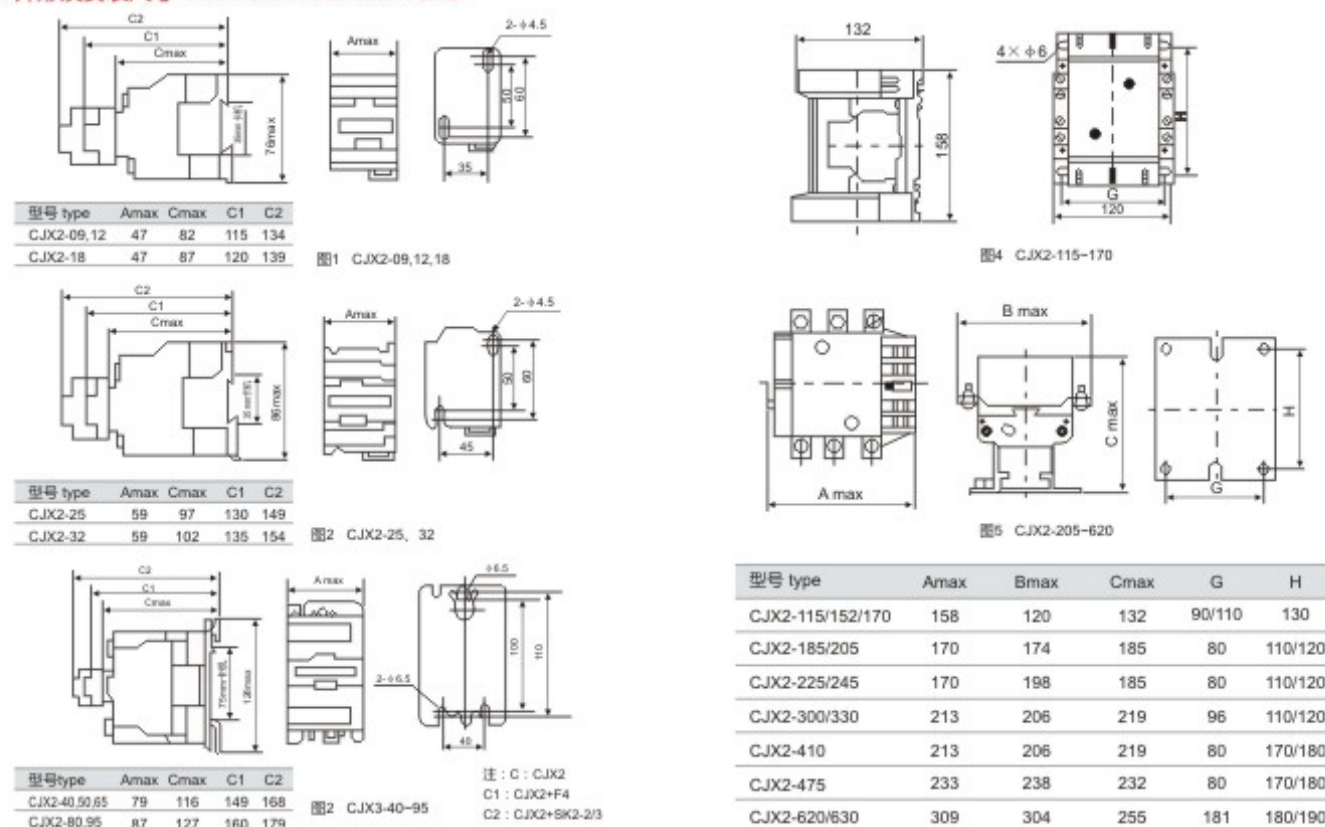
# CJX2

## 系列交流接触器

### Series AC Contactor

型号 Type		CJX2-115	CJX2-150	CJX2-170	CJX2-205	CJX2-245	CJX2-300	CJX2-410	CJX2-475	CJX2-620	
额定工作电流 A Rated Working current	380V	AC-3	115	150	170	205	245	300	410	475	620
		AC-4	52	60	75	85	105	217	135	147	180
	660V	AC-3	86	107	110	130	170	325	305	355	460
		AC-4	49	61	69	80	90	118	135	145	170
约定发热电流 A Conventional thermal current		250	250	250	275	315	400	500	700	1000	
可控三相鼠笼电动机功率 AC-3 kW Power of controllable three-phase squirrel cage motor AC-3 kW	220V	30	40	55	63	72	100	110	147	200	
	380V	55	75	90	110	132	160	200	265	335	
	660V	80	100	110	129	160	220	280	335	450	
操作频率次/h Electrical life	电寿命 Electrical life	AC-3	600						300		
	AC-4	150									
	机械寿命 Mechanical life	2400									
电寿命/万次 Electrical life	AC-3	60			50			30		20	
	AC-4	15						8		5	
机械寿命/万次 Mechanical life	600						500				
配用熔断器型号 Fuse model		RT16-160	RT16-250	RT16-250	RT16-315	RT16-315	RT16-400	RT16-500	RT16-630	RT16-630	
符合标准 Conform to standard		GB/T14048.1 GB14048.4 IEC 60947-4-1									

### 外形及安装尺寸 Outline & installation size



# CJX8(B)

## 系列交流接触器

### Series AC Contactor



### 适用范围 Application

CJX8(B)系列交流接触器主要用于交流50Hz (或60Hz)、额定工作电压至660V, 额定工作电流至370A的电力系统中接通和分断电路, 并可与适当的热过载继电器或电子式保护装置组合成电磁起动器, 以保护可能发生过载的电路。

产品符合GB 14048.4和IEC 60947-4-1等标准。

CJX(B) series AC contactor is suitable for the circuit of AC 50Hz (or 60Hz), rated working voltage up to 660V and rated working current up to 370A, used to make and break circuit in a far distance, it also can be formed into an electromagnetic starter with suitable thermal overload relay to protect the circuit against possible overload.

The products are in conformity with such standards as GB 14048.4 and IEC 60947-4-1.

### 主要技术参数 Main technical data

- 接触器主电路的基本参数下表。
- 辅助电路: 接触器配用的辅助触头有CA7、CA9、CA11型几种形式。CA7型有CA7-0(1常闭)、CA7-10(1常开), 它靠底部楔型槽固定在B9-30接触器动触头支架的楔型凸块上, 最多可装4个此类型的辅助触头、常开常闭任意。CA9、CA11型辅助触头有CA9-11(1常开1常闭)、CA9-20(2常开)、CA11-11辅助(1常开1常闭)、CA11-20(2常开)几种。CA9型配用B-37-85, CA11型配用B-105-370, 以结构连接方式固定在接触器本体四周的专门部位, 每台接触器最多可装4个上述型号的辅助触头。
- Basic parameters of contactor main circuit are shown as the following list.
- Auxiliary circuit: Auxiliary contacts for contactor have several types like CA7, CA9 and CA11, etc.. Here into, CA7 type auxiliary contacts have derived types such as CA7-0 (1NC) and CA7-10(1NO), fixed on the wedge lug of B9-30 contactors moving contact holder with the bottom wedge slot. Four auxiliary contacts of such type can be mounted at most, whether NO contact or NC contact is available. CA9 type and CA11 type auxiliary contacts have derived types like CA9-11(1NO1NC), CA9-20(2NO), CA11-11auxiliary (1NO 1 NC), CA11-20(2NO), etc.. CA9 type contacts are for B-37-85 contactors, CA11 type contacts are for B-105-370, they are fastened on the special parts around the contactor body in the structural connection way. Each contactor may be mounted with four auxiliary contacts of above-mentioned types at most.

型号 Type	框架代号 Frame code	额定绝缘电压 Ui V Rated insulation Voltage	约定发热电流 Ith A Conventional thermal current	AC-3、AC-4使用类别 AC-3 and AC-4 utilization category				操作频率 次/h Operating frequency time/h	
				额定工作电流 Ie A Rated working current		可控制电动机的最大功率 kW Max power of controllable motor		AC-3	AC-4
				380V	660V	380V	660V		
CJX8(B)-9	16	690	16	8.5	3.5	4	3	600	300
CJX8(B)-12	16	690	20	11.5	4.9	5.5	4	600	300
CJX8(B)-16	16	690	25	15.5	3.7	7.5	5.5	600	300
CJX8(B)-25	25	690	40	22	13	11	11	600	300
CJX8(B)-30	30	690	45	30	17.5	15	15	600	300
CJX8(B)-37	45	690	45	37	21	18.5	18.5	600	300
CJX8(B)-45	45	690	60	44	25	22	22	600	300
CJX8(B)-65	85	690	80	65	44	33	40	600	300
CJX8(B)-85	85	690	100	85	55	45	50	600	300
CJX8(B)-105	105	690	140	105	82	55	75	600	150
CJX8(B)-170	170	690	230	170	118	90	110	600	150
CJX8(B)-250	250	690	300	245	170	132	160	400	100
CJX8(B)-370	370	690	410	370	268	200	250	400	100

# CJX8(B)

## 系列交流接触器

### Series AC Contactor

#### 外形及安装尺寸 Outline & installation size

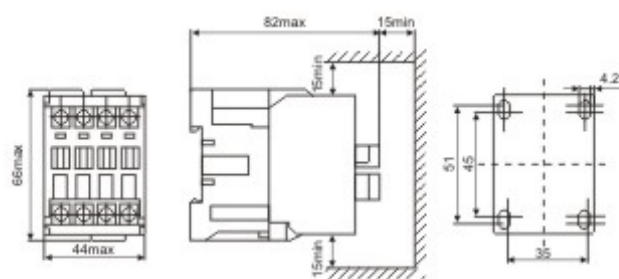


图1 CJX8(B)-9, 12, 16

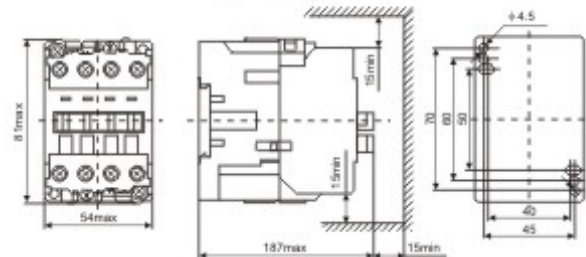


图2 CJX8(B)-25

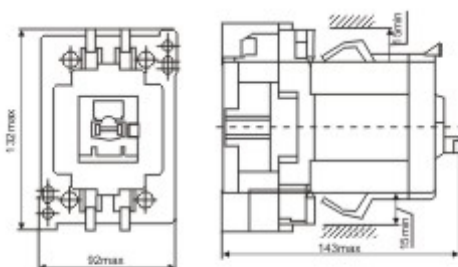


图5 CJX8(B)-65, 85

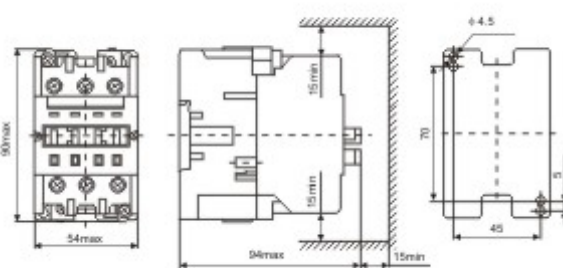


图3 CJX8(B)-30

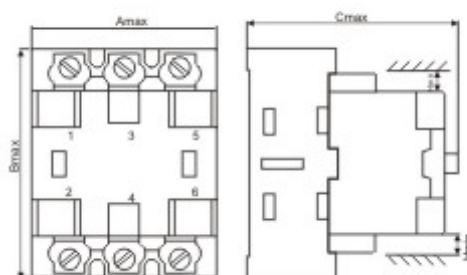


图6 CJX8(B)-105, 170, 250, 370

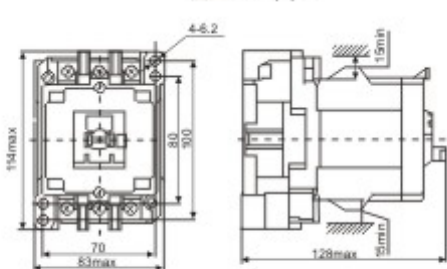


图4 CJX8(B)-37, 45

型号 Type	A	B	C	D	E	F	G	H min
	max							
CJX8(B)-105	118	154	137	140	35	6.5	6.5	15
CJX8(B)-170	134	165	152	150	40	6	7.5	15
CJX8(B)-250	167	207	193	190	50	7	8.5	15
CJX8(B)-370	202	252	221	220	60	7	8.5	15

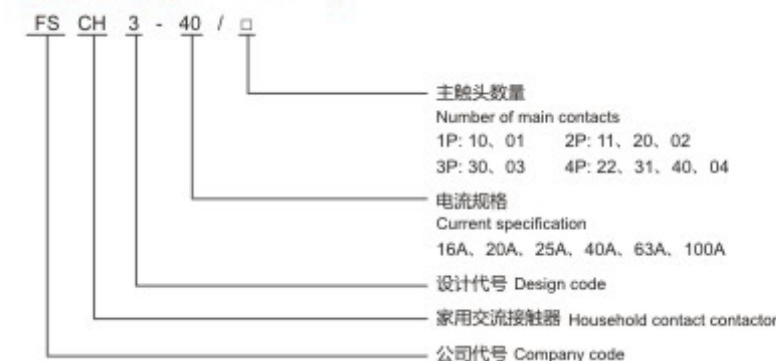
# FSCH3

## 系列家用接触器

### Household contactor



#### 型号及含义 Type and meaning



注：触头数量用两位数表示，十位数字为常开触头的对数，个位数字为常闭触头的对数。

#### 正常工作条件 Normal operating conditions

- 周围空气温度  $-5^{\circ}\text{C} \sim +40^{\circ}\text{C}$ ，日平均温度不超过  $+35^{\circ}\text{C}$ ，最低存储温度  $-25^{\circ}\text{C}$ ，如用于周围温度高于  $+40^{\circ}\text{C}$  或低于  $-5^{\circ}\text{C}$  需与制造厂协商。
- 安装地点的海拔高度不超过 2000m。
- 安装地点的相对湿度为  $+40^{\circ}\text{C}$  时，空气相对湿度不超过 50%，在较低的温度下允许有较高的相对湿度，例  $+20^{\circ}\text{C}$  时达到 90%。对由于温度变化偶尔产生的凝露应采取特殊的措施。
- 污染等级：2 级。
- 安装类别：II 类。
- 采用 TH35-7.5 型标准卡轨安装。
- 安装处应无显著冲击和振动。
- 产品垂直安装，安装面与垂直面倾斜角度不大于  $\pm 5^{\circ}$ 。
- Ambient air temperature is from  $-5^{\circ}\text{C} \sim +40^{\circ}\text{C}$ , and the daily average temperature is no more than  $+35^{\circ}\text{C}$ , minimum storage temperature  $-25^{\circ}\text{C}$ , for example, high ambient temperature. It is necessary to negotiate with the manufacturer at  $+40^{\circ}\text{C}$  or below  $-5^{\circ}\text{C}$ .
- The altitude of the installation site is not more than 2000m.
- When the relative humidity of the installation site is  $+40^{\circ}\text{C}$  degrees, the relative humidity of the air is not. Over 50%, allowing relatively high relative humidity at lower temperatures. For example,  $+20^{\circ}\text{C}$  reached 90% at temperatures, occasionally due to temperature changes. Special measures should be taken for condensation.
- Pollution grade: Grade 2.
- Installation category: Class II.
- Use TH35-7.5 standard card rail installation.
- There should be no significant impact and vibration at the installation.
- The vertical installation of the product is not more than 5 degrees.

#### 适用范围 Application

FSCH3 系列家用接触器/建筑用微型交流接触器（以下简称接触器）主要适用于交流 50Hz/60Hz，额定工作电压至 250/400V，使用类别 AC-7a 下的额定工作电流至 100A，使用类别 AC-7b 下的额定工作电流至 25A 的电路中，用于控制家用及类似用途的低感或微感负载，也可以用于控制家用电动机负载。

本产品应用于家庭、宾馆、公寓等场所，实现自动化控制功能。产品符合 GB 17885、IEC 61095 标准。

FSCH3 series household contactors / Micro AC contactor for building (hereinafter referred to as Contactors) It is mainly used for AC 50Hz/60Hz and rated working voltage 250/400V, use rated operating current of category AC-7a to 100A. Using rated current AC-7b to 25A circuit. Low or inductive loads for household and similar purposes. It can also be used to control the load of the household motor. This product is applied to families, hotels, apartments and other places. Now automatic control function. The product conforms to GB 17885, IEC 61095 standard.

#### 产品特点 Product features

- 属于模块化控制电器，结构新颖，体积小，可与小型断路器组合安装于控制照明箱内；
- 采用优质绝缘材料，大大提高了安全性；
- 外形美观，有工作状态指示窗口，右侧可加装辅助触头；
- 没有噪音，适用于宾馆、医院等场所。
- It is a modular control electric appliance with novel structure and compact size. It can be installed in the control lighting box with small circuit breakers.
- The use of high quality insulating materials greatly improves the safety.
- It has beautiful appearance, indicating window with working state, and auxiliary contacts on the right side.
- No noise, suitable for hotels, hospitals and other places.

**技术参数 Technical parameter**

项目参数 Project parameters		级别规格 Level specification		FSCH3-16	FSCH3-20	FSCH3-25	FSCH3-40	FSCH3-63	FSCH3-100			
额定电流 In(A) Rated current In (A)	AC-7a	16	20	25	40	63	100					
	AC-7b	6	7	8.5	15	25						
额定自由空气发热电流 Ith(A) Fixed free air heating current Ith (A)		25	25	25	63	63	100					
额定绝缘电压 Ui(V) Rated insulation voltage Ui (V)		500										
额定工作电压 Ue(V) Rated working voltage Ue (V)		250V(1P, 2P) 400V(3P, 4P)										
主触头数量 Number of main contacts	1P	10:1NO, 01:1NC										
	2P	11:1NO1NC 20:2NO 02:2NC						20:2NO				
	3P	30:3NO 03:3NC										
	4P	22:2NO2NC 31:3NO1NC 40:4NO 04:4NC						40:4NO				
控制功能(kW) Control function (kW)	AC-7a	230V	2.8	4	5.4	8.4	13					
		400V	8	11	15	26	40					
	AC-7b	230V	1	1.2	1.3	2.4	3.3					
		400V	-	-	4	11	15					
额定控制电源电压 Us Rated power supply voltage Us		AC 24V/50Hz AC 230V/50Hz										
允许控制回路电压 V Allow control loop voltage V	吸合 Absorption	85%~110%Us										
	释放 Release	20%~75%Us										
线圈功能 VA Coil function VA		1P/2P	3P/4P	1P/2P	3P/4P	1P/2P	3P/4P	1P/2P	3P/4P	2P	4P	
	起动 Start	9.2	34	9.2	34	9.2	34	34	53	34	53	106
	吸持 Suction	2.7	4.6	2.7	4.6	2.7	4.6	4.6	6.5	4.6	6.5	13
工作功率 W Working power W		1.2	1.6	1.2	1.6	1.2	1.6	1.6	2.1	1.6	2.1	4.2
安装 Install		接触器两侧需配装间隔件(FSCH3S1), 以利于其散热。 The spacers (FSCH3S1) on both sides of the contactor should be equipped to facilitate heat dissipation.										
指示灯 Indicator light		接触器正面有信号指示器, 红色; 线圈已接通 There is a signal indicator on the front of the contactor, red; the coil is connected.										
推荐选用的SCPD Recommended SCPD		FSB1-63 C16	FSB1-63 C20	FSB1-63 C25	FSB1-63 C40	FSB1-63 C63	FSB1-125 C100					

**额定工作制 Rated working system**
**八小时工作制**

八小时工作制是基本工作制, 接触器的约定自由空气发热电流 Ith 即由此工作制确定。

**Eight hour working system**

The eight hour working system is the basic working system. The Ith of the contactor's free air heating current is determined by this system.

**断续工作制 Intermittent working system**

接触器在本工作制下的额定操作频率为 30 次/h, 负载因数为 40%。

The rated operating frequency of contactor under this working system is 30 times/h and the load factor is 40%.

**动作 (操作) 条件 Action (operation) condition**

在周围空气温度为 -5℃ ~ +40℃ 范围内, 对接触器吸合线圈施以额定控制电源电压 Us, 使其发热至稳定状态时, 接触器在额定控制电源电压 Us 的 85% 和 110% 之间吸合, 在额定控制电源电压 Us 的 75% 和 20% 之间释放和断开。

In the ambient air temperature range from -5 to +40 C, the contactor has a rated power supply voltage Us for the contactor suction coil to heat up to a stable state, and the contactor is absorbed between 85% and 110% of the rated power voltage Us. Release and disconnect between 75% and 20% of rated power supply voltage Us.

**接通分断能力 Ability to connect and break off**

使用类别 Use category	接通和分断 (通断) 条件 Connection and breaking (off) condition			通电时间 (s) Power time (s)	间隔时间 (s) Interval time (s)	操作循环次数 (次) Operation cycle times
	Ic/Ie	Ur/Ue	COS Φ			
AC-7a	1.5	1.05	0.80	0.05	10	50
AC-7b	8	1.05	0.45	0.05	10	50

**约定操作性能 Convention operating performance**

使用类别 Use category	接通条件 Connection condition			分断条件 Breaking condition			通电时间 (s) Power time (s)	间隔时间 (s) Interval time (s)	操作循环次数 (次) Operation cycle times
	Ic/Ie	Ur/Ue	COS Φ	Ic/Ie	Ur/Ue	COS Φ			
AC-7a	1	1.05	0.80	1	1.05	0.80	0.05	10	50
AC-7b	6	1	0.45	1	0.17	0.45	0.05	10	50

**寿命 Life**

接触器的机械寿命不小于 100 万次, 接触器的电器寿命不小于 10 万次。

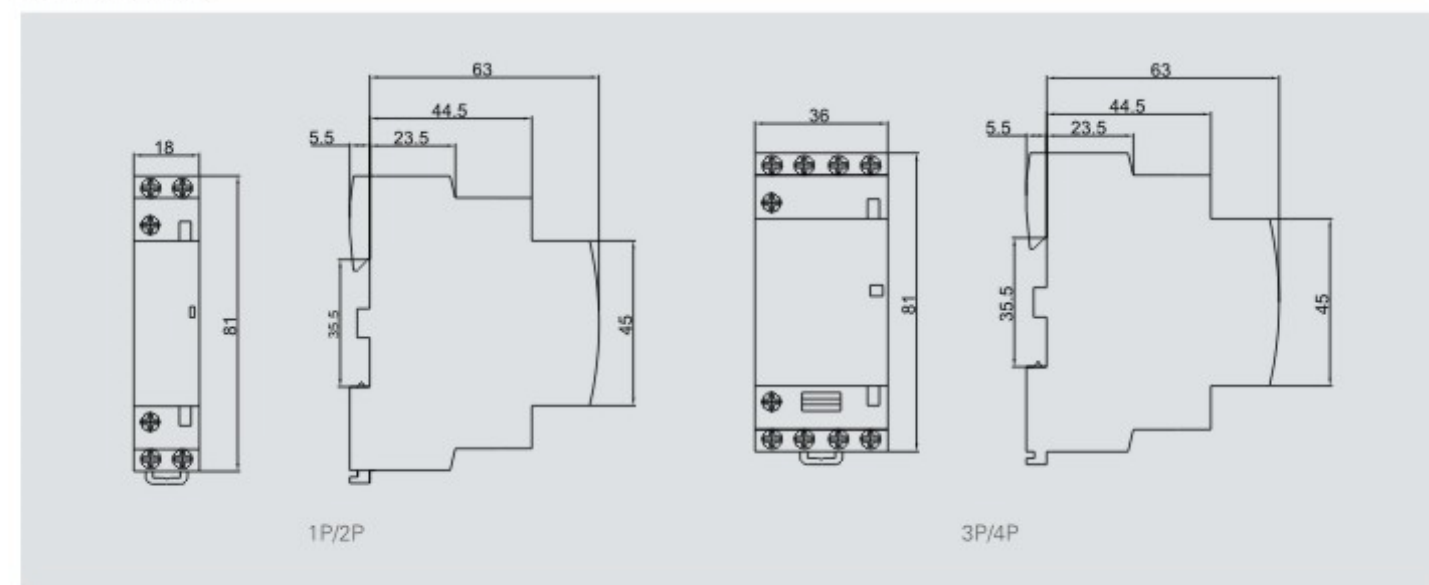
The mechanical life of contactors is not less than 1 million times, and the electrical life of contactors is not less than 100 thousand times.

**附件 Enclosure**

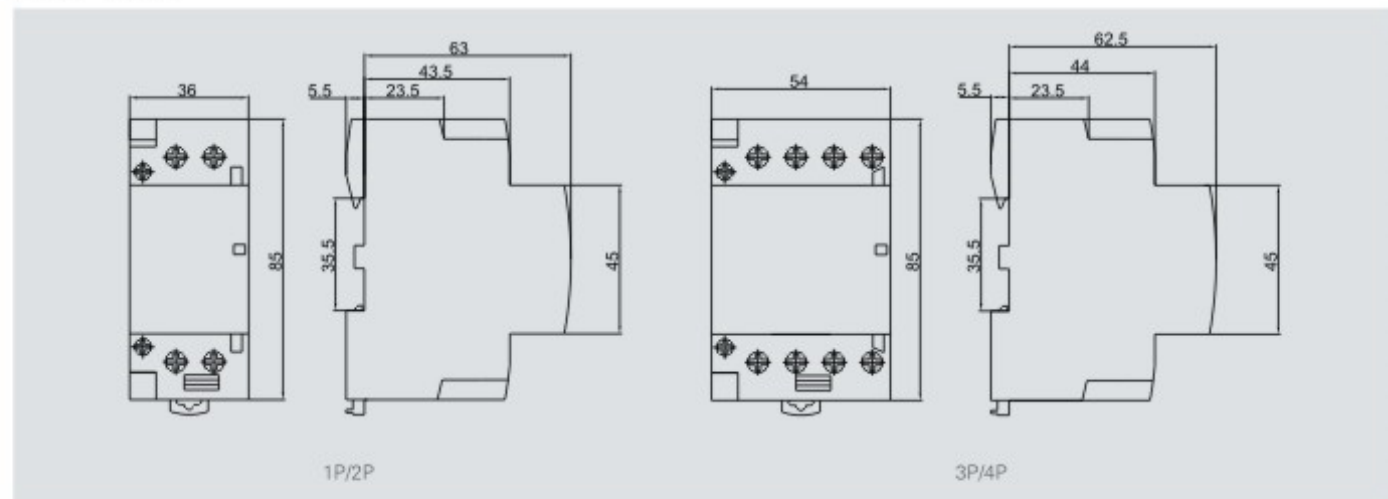
FSCH3 家用接触器可以配备 FSF3 系列辅助触头, 辅助触头规格种类如下:

FSCH3 household contactors can be equipped with FSF3 series auxiliary contacts. The specifications of auxiliary contacts are as follows:

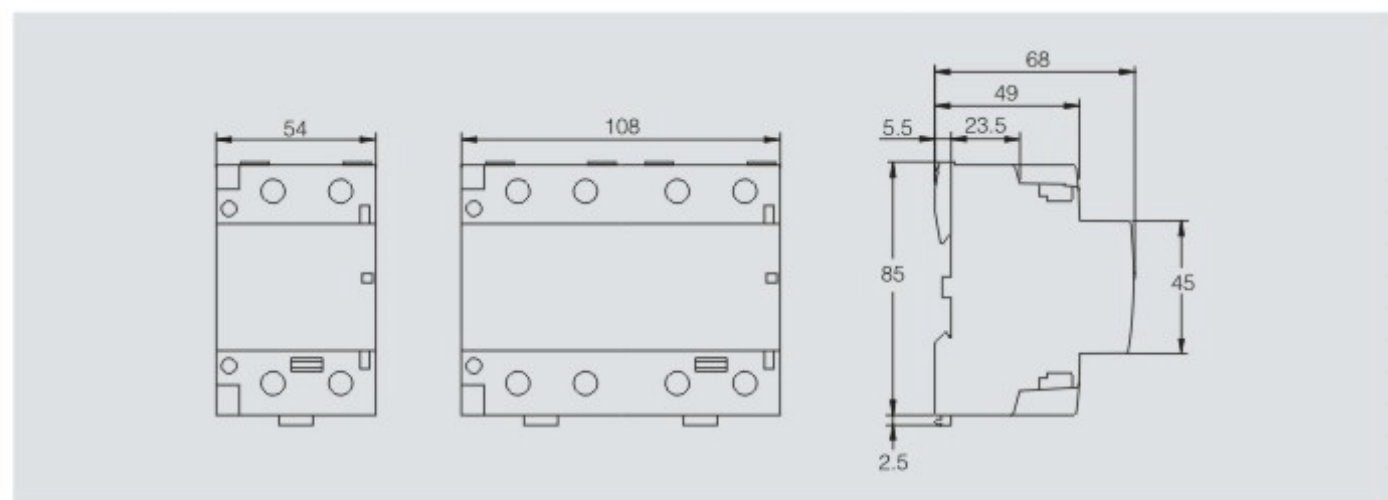
型号 Type	常开触头数量 Constant number of contact	常闭触头数量 Number of normally closed contacts
FSF3-11	1	1
FSF3-20	2	0

**外形及安装尺寸 Outline & installation size**
**FSCH3-16/20/25A**


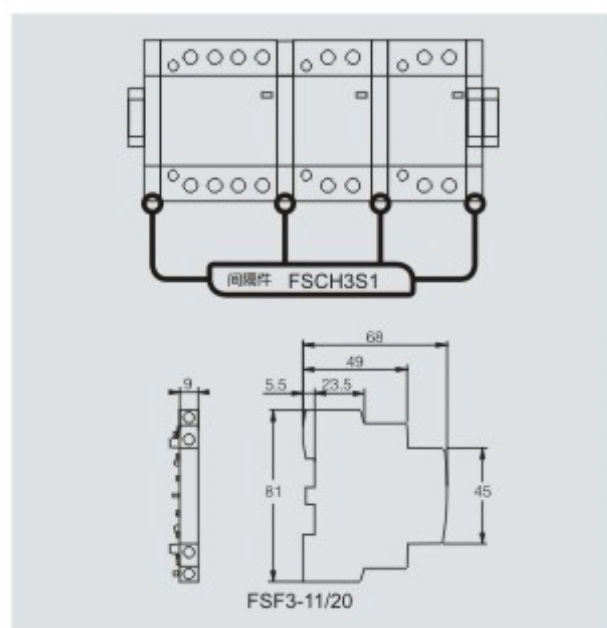
FSCH3-40/63A



FSCH3-100A



辅助附件


**使用注意事项 Use of attention**

- 安装前先检查接触器及使用范围及正常工作条件是否相符
- 接触器的接线方式应正确，接触器在接线时需将接线螺钉拧紧，但用力要适当
- 接触器不用于分断短路电流，因此使用时应选配适当的短路保护电器
- Before installation, check whether the contactor matches the working range and normal working conditions.
- The way to connect the contactor should be correct. When the contactor is connected, it is necessary to tighten the wiring screws, but the force should be appropriate.
- Contactor is not used to break short circuit current, so suitable short circuit protection devices should be selected when used.

# HD/HS

## 系列开启式刀开关及刀形转换开关

### Open-type knife switch and blade switch


**型号及含义 Type and meaning**

**正常工作条件 Normal operating conditions**

- 周围空气温度不高于+40°C，不低于-5°C。
- 安装地点的海拔不超过2000m。
- 湿度：最高温度为+40°C时，空气的相对湿度不超过50%，在较低的温度下可以允许有较高的相对湿度，例如20°C时达90%。对由于温度变化偶尔产生的凝露应采取特殊的措施。
- 周围环境的污染等级为3级。
- 开关应安装在无显著震动、冲击振动和没有雨雪侵袭的地方，同时安装地点应无爆炸危险介质，且介质中无足以腐蚀金属和破坏绝缘的气体及尘埃。
- Ambient temperature: -5°C~+40°C
- Altitude: ≤2000m;
- When the ambient air temperature is +40°C, the relative humidity of the air shall not be higher than 50%; a higher relative humidity is allowed at a lower temperature; for example, for the wettest month, the maximum relative humidity averaged shall be 90% while the lowest temperature averaged in that month +20°C, and special measures shall be taken for the condensation occasionally produced due to temperature change.
- Pollution degree: 3
- The ambient air is not significantly polluted by dust, smoke, corrosive and/or flammable gases, vapours or salt.

**适用范围 Application**

HD系列、HS系列开启式刀开关及刀形转换开关(以下简称开关)适用于交流50Hz、额定电压至380V、直流至220V，额定电流至3000A的成套配电装置中，作为不频繁地手动接通和分断交、直流电路或作隔离开关用。其中：

- 中央手柄式的开关主要用于动力站，不切断带有电流的电路，作为隔离开关之用。
  - 侧方正面杠杆操作机构式开关主要用于正面操作、前面维修的开关柜中，操作机构可以在柜的两侧安装。
  - 中央正面杠杆操作机构开关主要用于正面操作、后面维修的开关柜中，操作机构装在正前方。
  - 侧面操作手柄式开关，主要用于动力箱中。
  - 装有灭弧室的开关可以切断适当的电流负荷，其他系列刀开关只作隔离开关使用。
- 符合标准：GB 14048.3、IEC 60947-3。

HD knife switch and knife-shaped transfer switch (hereinafter referred to as the switch) is applicable for the complete set of distribution unit with the AC frequency of 50Hz, rated current up to 380V and the rated current up to 3000A, to turn on and off the AC and DC circuit in an infrequent manner or serve as isolation switch

- Central handle switch is mainly used in the power station to serve as an isolation switch. It will not cut off the live circuit.
- Side front lever operating mechanism switches for front operation, front switchgear maintenance, operating mechanism cabinet mounted on both sides
- Central front lever operating mechanism switch is mainly used for switchgear cabinet of frontal maintenance from behind, and the operating mechanism is installed dead ahead.
- Switch with a side handle is mainly used in power box.
- Switch with an interrupter switch can cut off proper current load, while other series of knife switches can only serve as isolation switch.

# HD/HS

## 系列开启式刀开关及刀形转换开关

### Open-type knife switch and blade switch

#### 主要参数及技术性能 Main technical data

● 额定工作电压为交流380V、直流220V。Rated working voltage AC 380V, DC 220V.

● 主要技术性能及参数(见表1)。Main technical performance and parameters (see Table 1).

表1 Table 1

约定发热电流(A) Conventional thermal current	100	200	400	600	1000	1500	2000	3000
额定工作电流(A) Rated operating current	100	200	400	600	1000	1500	2000	3000
通断能力(A) Breaking capacity	AC 380V, $\cos\phi=0.72\sim 0.8$	100	200	400	600	1000	1500	
	DC T=0.01~0.011S 220V	100	200	400	600	1000	1500	
机械寿命(次) Mechanical life (times)	10000	10000	10000	5000	5000	5000	3000	3000
电寿命(次) Electrical life (times)	1000	1000	1000	500	500	500	300	300
1S短时耐受电流(kA) 1S short time withstand current	6	10	20	25	30	40	50	50
动稳定电流峰值(kA) Peak withstand current	操作机构式 Operating mechanism type	20	30	40	50	60	80	100
	手柄式 Handle	15	20	30	40	50		
操作力(N) Operating force	$\leq 300$	$\leq 300$	$\leq 400$	$\leq 400$	$\leq 400$	$\leq 400$	$\leq 400$	$\leq 400$

#### 外形及安装尺寸 Outline & installation size

● HD11板前接线 ¼1、表2)。Front connection for HD11(See Figure 1, Table 2)

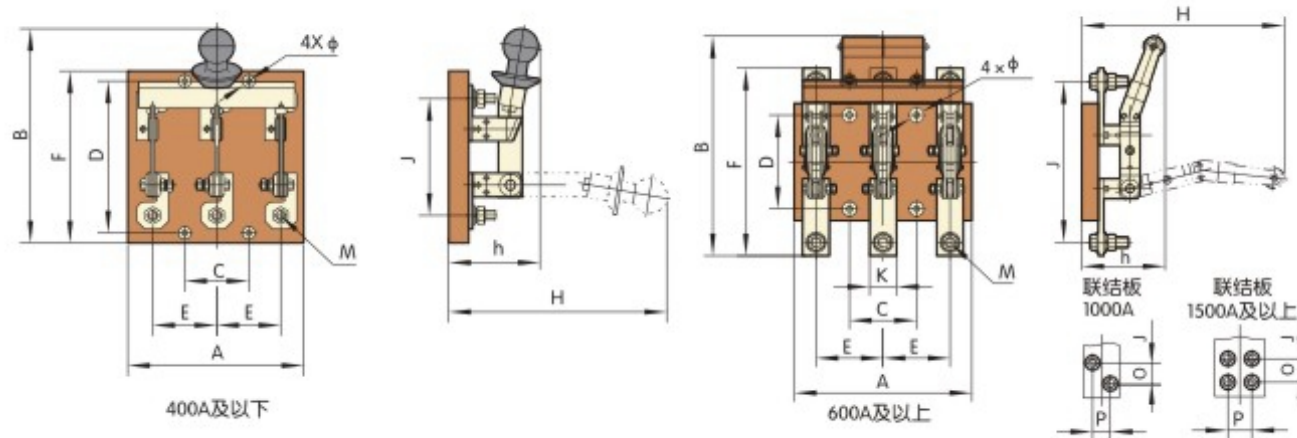


图1 Figure 1

表2 Table 2

型号 Model	规格 Type	100A		200A			400A				600A				
		2P	3P	1P	2P	3P	4P	1P	2P	3P	4P	1P	2P	3P	4P
HD11 中央手柄式 板前接线 开启式 刀开关	A	90	130	100	190	190	270	120	190	210	300	140	240	260	360
	B	210	210	210	210	210	230	270	270	270	300	350	350	330	330
	C	-	40	60	120	70	140	80	160	80	160	100	200	100	200
	D	140	140	140	140	140	140	190	190	190	190	140	140	140	140
	E	50	40	-	70	70	70	-	80	80	80	-	100	100	100
	F	165	165	165	165	165	165	215	215	215	215	274	274	274	274
HD11 Knife switch of Central lever type for front connection	H	210	220	220	220	220	240	270	270	270	300	330	310	310	
	h	110	120	120	120	120	120	135	135	135	145	140	125	125	
	J	110	110	110	110	110	110	146	146	146	146	234	234	234	234
	K	-	-	-	-	-	-	-	-	-	-	40	40	40	40
	O	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	M	8	8	8	8	8	8	12	12	12	12	16	16	16	16
	φ	7	7	7	7	7	7	7	7	7	7	9	9	9	9

续表2 Continued Table 2

型号 Model	规格 Type	1000A				1500A				2000A				3000A(2500A)				
		1P	2P	3P	4P	1P	2P	3P	4P	1P	2P	3P	4P	1P	2P	3P	4P	
HD11 中央手柄式 板前接线 开启式 刀开关	A	160	280	320	440	170	300	350	480	240	400	500	680	260	460	600	800	
	B	380	380	360	360	410	410	390	390	420	420	420	420	450	450	450	450	
	C	120	240	120	240	130	260	130	260	180	360	180	360	200	400	200	400	
	D	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140
	E	-	120	120	120	-	130	130	130	-	180	180	180	-	200	200	200	
HD11 Knife switch of Central lever type for front connection	F	284	284	284	284	330	330	330	330	320	320	320	320	365	365	365	365	
	H	380	380	360	360	390	390	370	370	380	380	380	380	390	390	390	390	
	h	175	175	160	160	175	175	160	160	170	170	170	170	180	180	180	180	
	J	208	208	208	208	230	230	230	230	204	204	204	204	230	230	230	230	
	K	50	50	50	50	70	70	70	70	100	100	100	100	120	120	120	120	
	O	25	25	25	25	35	35	35	35	40	40	40	40	45	45	45	45	
	P	25	25	25	25	35	35	35	35	55	55	55	55	68	68	68	68	
	M	12	12	12	12	12	12	12	12	12	12	12	12	16	16	16	16	
	φ	9	9	9	9	9	9	9	9	9	9	9	9	11	11	11	11	

● HD12外形及安装尺寸见图2、表3 HD12 Dimensions (See Figure 2, Table 3)

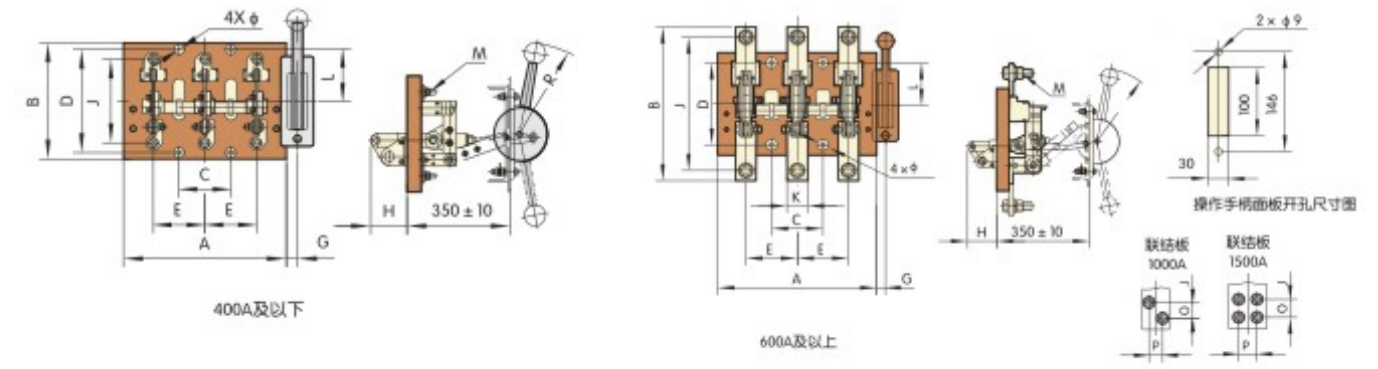


图2 Figure 2

表3 Table 3

型号 Model	规格 Type	100A, 200A			400A			600A			1000A		1500A	
		2P	3P	4P	2P	3P	4P	2P	3P	4P	2P	3P	2P	3P
HD12 侧方正面 杠杆操作 机构式 开启式 刀开关	A	200	280	360	220	310	400	250	330	430	300	400	330	440
	B	200	200	200	210	210	210	294	294	294	314	314	354	354
	C	160	80	160	180	90	180	200	100	200	240	120	260	130
	D	160	160	160	160	160	160	160	160	160	160	160	160	160
	E	80	80	80	90	90	90	100	100	100	120	120	130	130
	G	40	40	40	30	30	30	30	30	30	30	30	30	30
HD12 Knife switch of lever operating mechanism type for front side	H	80	80	80	90	90	90	95	95	95	110	110	110	110
	J	130	130	130	166	166	166	254	254	254	238	238	254	254
	K	-	-	-	-	-	-	40	40	40	50	50	70	70
	L	75	75	75	75	75	75	80	80	80	80	80	80	80
	O	-	-	-	-	-	-	-	-	-	25	25	35	35
	P	-	-	-	-	-	-	-	-	-	25	25	35	35
	R	180	180	180	180	180	180	180	180	180	230	230	230	230
	M	8	8	8	12	12	12	16	16	16	12	12	12	12
	φ	7	7	7	7	7	7	9	9	9	9	9	9	9

# HD/HS

## 系列开启式刀开关及刀形转换开关

### Open-type knife switch and blade switch

HD13外形及安装尺寸见图3，表4 HD13 Dimensions (See Figure 3, Table 4)

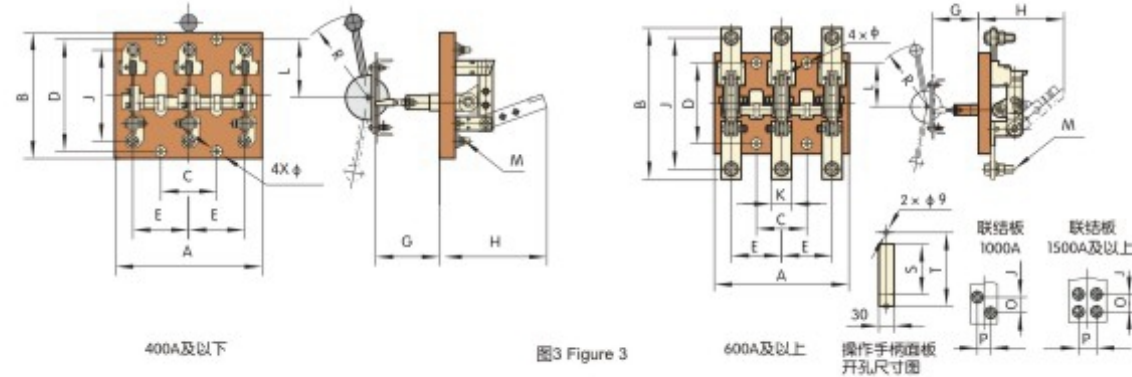


图3 Figure 3

表4 Table 4

型号 Model	规格 Type	100A、200A			400A			600A			1000A		
		2P	3P	4P	2P	3P	4P	2P	3P	4P	2P	3P	4P
HD13 中央杠杆 操作机构式 开启式 刀开关	A	190	210	300	220	245	335	240	260	360	280	320	460
	B	200	200	200	210	210	210	294	294	294	314	314	314
	C	160	80	160	180	90	180	200	100	200	240	120	240
	D	160	160	160	160	160	160	160	160	160	160	160	160
	E	80	80	80	90	90	90	100	100	100	120	120	120
	G前	350~370			350~370			350~370			350~370		
	G后	245~265			245~265			245~265			245~265		
	H	160	160	160	185	185	185	190	190	190	230	230	230
	J	130	130	130	166	166	166	254	254	254	238	238	238
	K	-	-	-	-	-	-	40	40	40	50	50	50
HD13 Knife switch of Central lever operating mechanism type	L	75	75	75	75	75	75	80	80	80	80	80	80
	O	-	-	-	-	-	-	-	-	-	25	25	25
	P	-	-	-	-	-	-	-	-	-	25	25	25
	R	180	180	180	180	180	180	180	180	180	230	230	230
	S	100	100	100	100	100	100	100	100	100	100	100	100
	T	146	146	146	146	146	146	146	146	146	146	146	146
	M	8	8	8	12	12	12	16	16	16	12	12	12
	φ	7	7	7	7	7	7	9	9	9	9	9	9

续表4 Continued Table 4

型号 Model	规格 Type	1500A			2000A			3000A(2500A)		
		2P	3P	4P	2P	3P	4P	2P	3P	4P
HD13 中央杠杆 操作机构式 开启式 刀开关	A	310	350	510	450	450	680	520	520	800
	B	354	354	354	360	360	360	400	400	400
	C	260	130	260	170	170	360	190	190	400
	D	160	160	160	160	160	160	160	160	160
	E	130	130	130	340	170	180	380	190	200
	G前	350~370			350~370			350~370		
	G后	245~265			245~265			245~265		
	H	235	235	235	230	230	230	235	235	235
	J	254	254	254	244	244	244	264	264	264
	K	70	70	70	100	100	100	120	120	120
HD13 Knife switch of Central lever operating mechanism type	L	80	80	80	80	80	80	80	80	80
	O	35	35	35	40	40	40	45	45	45
	P	35	35	35	55	55	55	68	68	68
	R	230	230	280	280	280	280	280	280	280
	S	100	100	130	130	130	130	140	140	140
	T	146	146	164	164	164	164	180	180	180
	M	12	12	12	12	12	12	16	16	16
	φ	9	9	9	11	11	11	11	11	11

注：G前：为板前操作安装距离，G后：为板后操作安装距离

HS13外形及安装尺寸见图4，表5 HD13 Dimensions (See Figure 4, Table 5)

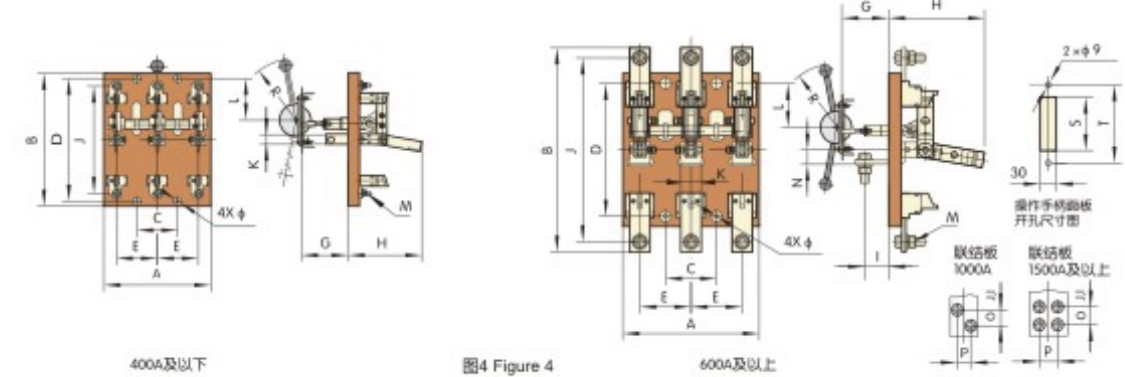


图4 Figure 4

表5 Table 5

型号 Model	规格 Type	100A、200A			400A			600A			1000A		
		2P	3P	4P	2P	3P	4P	2P	3P	4P	2P	3P	4P
HS13 中央杠杆 操作机构式 刀形 转换开关	A	190	210	300	220	245	335	240	260	360	280	330	450
	B	280	280	280	300	300	300	394	394	394	434	434	434
	C	160	80	160	180	90	180	200	100	200	240	120	240
	D	240	240	240	240	240	240	240	240	240	240	240	240
	E	80	80	80	90	90	90	100	100	100	120	120	120
	G	245~265			245~265			245~265			245~265		
	H	160	160	160	185	185	185	190	190	190	235	235	235
	I	35	35	35	26	26	26	36	36	36	36	36	36
	J	210	210	210	256	256	256	354	354	354	358	358	358
	K	-	-	-	-	-	-	40	40	40	50	50	50
HS13 Blade switch of Central lever operating mechanism type	L	75	75	75	70	70	70	70	70	70	60	60	60
	N	-	-	-	-	-	-	30	30	30	40	40	40
	O	-	-	-	-	-	-	-	-	-	25	25	25
	P	-	-	-	-	-	-	-	-	-	25	25	25
	R	180	180	180	180	180	180	180	180	180	230	230	230
	S	100	100	100	100	100	100	100	100	100	100	100	100
	T	146	146	146	146	146	146	146	146	146	146	146	146
	M	8	8	8	8	8	8	16	16	16	12	12	12
	φ	7	7	7	7	7	7	9	9	9	9	9	9

续表5 Continued Table 5

型号 Model	规格 Type	1500A			2000A			3000A(2500A)		
		2P	3P	4P	2P	3P	4P	2P	3P	4P
HS13 中央杠杆 操作机构式 刀形 转换开关	A	310	370	510	500	500	680	600	600	800
	B	504	504	504	480	480	480	540	540	540
	C	260	130	260	180	180	360	200	200	400
	D	280	280	280	240	240	240	280	280	280
	E	130	130	130	180	180	180	200	200	200
	G	245~265			245~265			245~265		
	H	255	255	255	235	235	235	260	260	260
	I	32	32	32	48	48	48	50	50	50
	J	404	404	404	370	370	370	404	404	404
	K	70	70	70	100	100	100	120	120	120
HS13 Blade switch of Central lever operating mechanism type	L	70	70	70	60	60	60	70	70	70
	N	46	46	46	50	50	50	50	50	50
	O	35	35	35	40	40	40	45	45	45
	P	35	35	35	55	55	55	68	68	68
	R	280	280	280	280	280	280	280	280	280
	S	130	130	130	130	130	130	140	140	140
	T	164	164	164	164	164	164	180	180	180
	M	12	12	12	12	12	12	16	16	16
	φ	11	11	11	11	11	11	13	13	13

# HD/HS

## 系列开启式刀开关及刀形转换开关

### Open-type knife switch and blade switch

● HD13-/BX外形及安装尺寸见图5, 表6 HD13-/BX Dimensions (See Figure 5, Table 6)

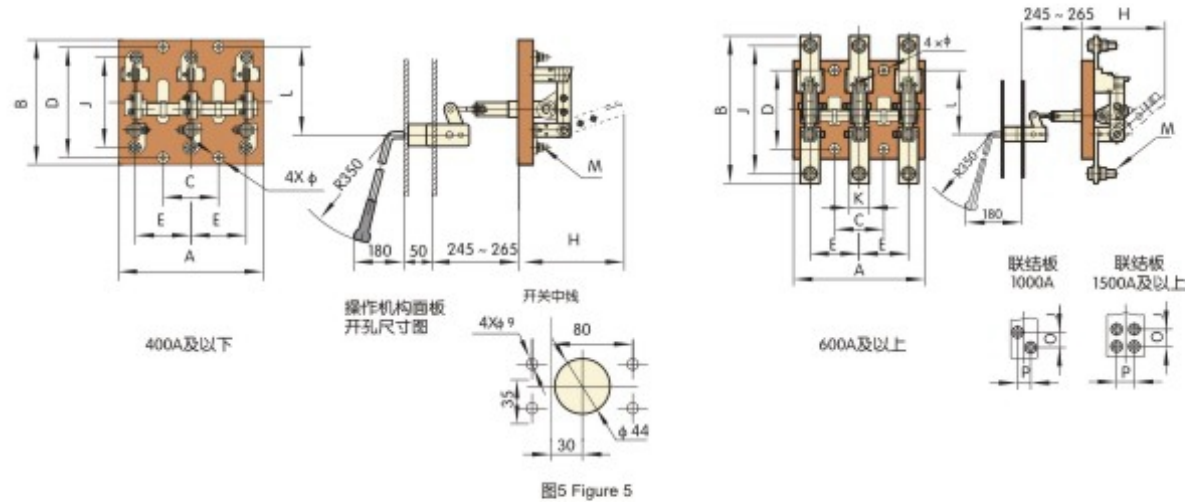


图5 Figure 5

表6 Table 6

型号 Model	规格 Type	100A, 200A			400A			600A			1000A		
		2P	3P	4P	2P	3P	4P	2P	3P	4P	2P	3P	4P
HD13-/BX 中央旋转 操作机构式 开启式 刀开关	A	190	210	300	220	245	335	240	260	360	280	320	460
	B	200	200	200	210	210	210	294	294	294	314	314	314
	C	160	80	160	180	90	180	200	100	200	240	120	240
	D	160	160	160	160	160	160	160	160	160	160	160	160
	E	80	80	80	90	90	90	100	100	100	120	120	120
	H	160	160	160	185	185	185	190	190	190	230	230	230
HD13-/BX Knife switch of Rotary operating mechanism type	J	130	130	130	166	166	166	254	254	254	238	238	238
	K	-	-	-	-	-	-	40	40	40	50	50	50
	L	125	125	125	125	125	125	135	135	135	137	137	137
	O	-	-	-	-	-	-	-	-	-	25	25	25
	P	-	-	-	-	-	-	-	-	-	25	25	25
	M	8	8	8	12	12	12	16	16	16	12	12	12
φ	7	7	7	7	7	7	9	9	9	9	9	9	

续表6 Continued Table 6

型号 Model	规格 Type	1500A			2000A			3000A(2500A)		
		2P	3P	4P	2P	3P	4P	2P	3P	4P
HD13-/BX 中央旋转 操作机构式 开启式 刀开关	A	310	350	510	450	450	680	520	520	800
	B	354	354	354	360	360	360	400	400	400
	C	260	130	260	170	170	360	190	190	400
	D	160	160	160	160	160	160	160	160	160
	E	130	130	130	340	170	180	380	190	200
	H	235	235	235	230	230	230	235	235	235
HD13-/BX Knife switch of Rotary operating mechanism type	J	254	254	254	244	244	244	264	264	264
	K	70	70	70	100	100	100	120	120	120
	L	137	137	137	137	137	137	137	137	137
	O	35	35	35	40	40	40	45	45	45
	P	35	35	35	55	55	55	68	68	68
	M	12	12	12	12	12	12	16	16	16
φ	9	9	9	11	11	11	11	11	11	

● HS13-/BX外形及安装尺寸见图5, 表6 HS13-/BX Dimensions (See Figure 6, Table 7)

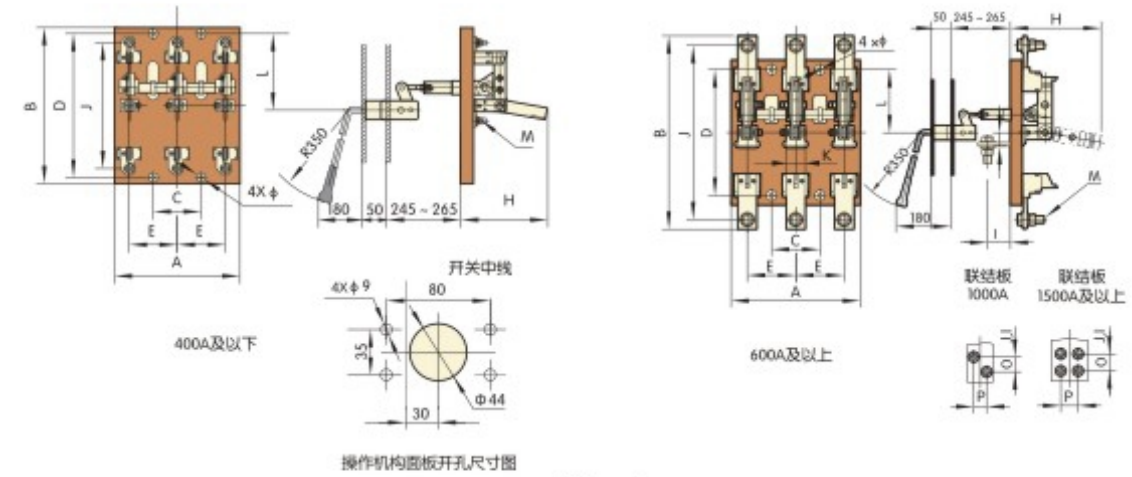


图6 Figure 6

表7 Table 7

型号 Model	规格 Type	100A, 200A			400A			600A			1000A		
		2P	3P	4P	2P	3P	4P	2P	3P	4P	2P	3P	4P
HS13-/BX 中央旋转 操作机构式 刀开 转换开关	A	190	210	300	220	245	335	240	260	360	280	330	450
	B	280	280	280	300	300	300	394	394	394	434	434	434
	C	160	80	160	180	90	180	200	100	200	240	120	240
	D	240	240	240	240	240	240	240	240	240	240	240	240
	E	80	80	80	90	90	90	100	100	100	120	120	120
	H	160	160	160	185	185	185	190	190	190	235	235	235
HS13-/BX Knife open Switch of Rotary operating mechanism type	I	35	35	35	26	26	26	36	36	36	36	36	36
	J	210	210	210	256	256	256	354	354	354	358	358	358
	K	-	-	-	-	-	-	40	40	40	50	50	50
	L	125	125	125	120	120	120	125	125	125	117	117	117
	N	-	-	-	-	-	-	30	30	30	40	40	40
	O	-	-	-	-	-	-	-	-	-	25	25	25
HS13-/BX Knife open Switch of Rotary operating mechanism type	P	-	-	-	-	-	-	-	-	-	25	25	25
	M	8	8	8	12	12	12	16	16	16	12	12	12
	φ	7	7	7	7	7	7	9	9	9	9	9	9

续表7 Continued Table 7

型号 Model	规格 Type	1500A			2000A			3000A(2500A)		
		2P	3P	4P	2P	3P	4P	2P	3P	4P
HS13-/BX 中央旋转 操作机构式 刀开 转换开关	A	310	370	510	500	500	680	600	600	800
	B	504	504	504	480	480	480	540	540	540
	C	260	130	260	180	180	360	200	200	400
	D	280	280	280	240	240	240	280	280	280
	E	130	130	130	180	180	180	200	200	200
	H	255	255	255	235	235	235	260	260	260
HS13-/BX Knife open Switch of Rotary operating mechanism type	I	32	32	32	48	48	48	50	50	50
	J	404	404	404	370	370	370	404	404	404
	K	70	70	70	100	100	100	120	120	120
	L	127	127	127	117	117	117	127	127	127
	N	46	46	46	50	50	50	50	50	50
	O	35	35	35	40	40	40	45	45	45
HS13-/BX Knife open Switch of Rotary operating mechanism type	P	35	35	35	55	55	55	68	68	68
	M	12	12	12	12	12	12	16	16	16
	φ	9	9	9	11	11	11	13	13	13



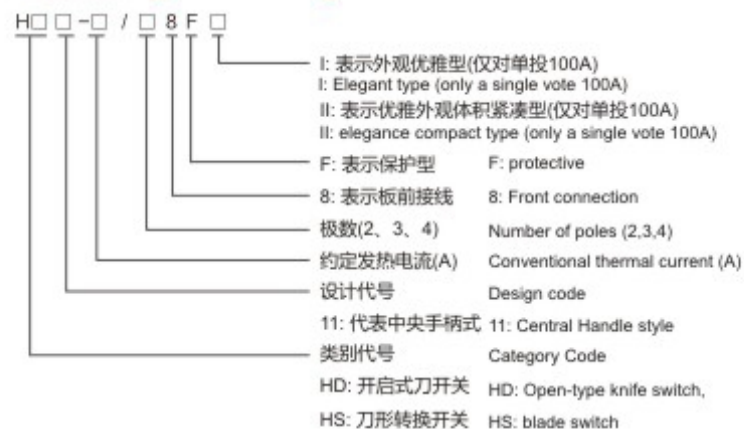
# HD11F/HS11F

## 系列保护型开启式刀开关

### Protection type open-type knife switch



#### 型号及含义 Type and meaning



#### 主要参数及技术性能 Main technical data

- 额定工作电压为交流380V、直流220V。 Rated working voltage AC 380V, DC 220V.
- 主要技术性能及参数(见表1)。 Main technical performance and parameters (see Table 1).

表1 Table 1

约定发热电流(A) Conventional thermal current	100	200	400	600	1000
额定工作电流(A) Rated operating current	100	200	400	600	1000
通断能力(A) Breaking capacity	AC 380V, cosφ=0.72~0.8	100	200	400	600
	DC T=0.01~0.011S 220V	100	200	400	600
机械寿命(次) Mechanical life (times)	10000	10000	10000	5000	3000
电寿命(次) Electrical life (times)	1000	1000	1000	500	300
1S短时耐受电流(kA) 1S short time withstand current	6	10	20	25	30
动稳定电流峰值(kA) Peak withstand current	15	20	30	40	50
操作力(N) Operating force	≤ 300	≤ 300	≤ 400	≤ 400	≤ 450

#### 适用范围 Application

HD11F和HS11F系列单投和双投保护型刀开关是我公司在HD11、HS11基础上派生新开发产品,是HD11、HD11F、HS11的理想替代产品,极大的提高对人身安全防护性能,防止误触电。该系列产品主要用于低压配电设备中,作不频繁地手动接通和切断、隔离电源之用。

符合标准: GB 14048.3、IEC 60947-3。

HD11F and HS11F series single and double break protective blade switch, is developed by our company on basis of the HD11、HS11 series switch. They are the ideal replacement device for HD11、HD11F、HS11, greatly improve the protective safety to personnel, prevent wrongly electric shock. This series of switch is mainly assembled in low voltage switchgear, used to switch on/off, disconnect the power source. It complies with the standard of GB 14048.3、IEC 60947-3

#### 正常工作条件

##### Normal operating conditions

- 周围空气温度不高于+40°C, 不低于-5°C。
- 安装地点的海拔不超过2000m。
- 湿度: 最高温度为+40°C时, 空气的相对湿度不超过50%, 在较低的温度下可以允许有较高的相对湿度, 例如20°C时达90%。对由于温度变化偶尔产生的凝露应采取特殊的措施。
- 周围环境的污染等级为3级。
- 开关应安装在无显著摇动、冲击振动和没有雨雪侵袭的地方, 同时安装地点应无爆炸危险介质, 且介质中无足以腐蚀金属和破坏绝缘的气体及尘埃。

- Ambient temperature: -5°C~+40°C
- Altitude: ≤2000m;
- When the ambient air temperature is +40°C, the relative humidity of the air shall not be higher than 50%; a higher relative humidity is allowed at a lower temperature; for example, for the wettest month, the maximum relative humidity averaged shall be 90% while the lowest temperature averaged in that month +20°C, and special measures shall be taken for the condensation occasionally produced due to temperature change.
- Pollution degree: 3
- The ambient air is not significantly polluted by dust, smoke, corrosive and/or flammable gases, vapours or salt.

#### 外形及安装尺寸 Outline & installation size

- HD11F板前接线(见图1、表2)。 Front connection for HD11F(See Figure 1, Table 2)

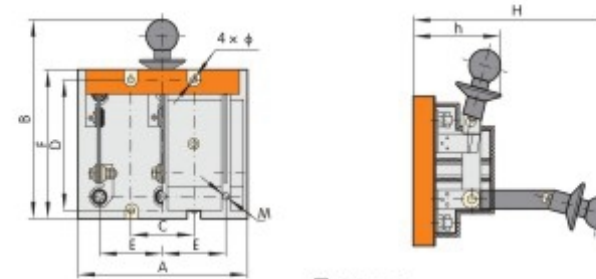


图1 Figure 1

型号 Model	规格 Type	100			200			400			600	1000	100 II型		
HD11F保护型 板前接线 开启式刀开关 HD11F Open-type knife switch of Protective type for front connection		2P	3P	4P	2P	3P	4P	2P	3P	4P	3P	3P	4P	3P	4P
	A	90	130	270	200	200	270	200	220	300	290	322	200	120	160
	B	210	210	230	210	210	230	270	270	300	330	350	210	170	170
	C	-	40	140	140	70	140	160	80	160	100	115	100	40	80
	D	140	140	140	140	140	140	190	190	190	140	140	140	100	100
	E	50	50	70	70	70	70	80	80	80	100	115	50	40	40
	F	165	165	165	165	165	165	215	215	215	260	275	158	125	125
	H	220	220	240	220	220	240	270	270	300	305	335	210	185	185
	h	110	120	120	120	120	120	135	135	145	125	160	110	90	90
	M	8	8	8	8	8	8	12	12	12	16	12	8	6	6
φ	7	7	7	7	7	7	7	7	7	9	9	7	7	7	

- HS11F板前接线(见图2、表3)。 Front connection for HS11F(See Figure 2, Table 3)

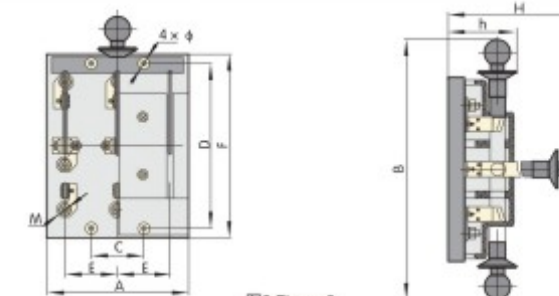


图2 Figure 2

型号 Model	规格 Type	100			200			400		
HS11F保护型 板前接线 开启式刀开关 HS11F Open-type knife switch of Protective type for front connection		2P	3P	4P	2P	3P	4P	2P	3P	4P
	A	78	140	170	200	200	270	210	210	300
	B	245	290	300	330	330	370	440	440	440
	C	-	40	80	70	70	140	160	80	160
	D	112	120	120	220	220	220	280	280	280
	E	40	50	40	140	70	70	80	80	80
	F	165	165	165	245	245	245	312	312	312
	H	180	190	200	240	240	240	280	280	300
	h	70	70	70	100	100	100	110	110	110
	M	-	-	-	8	8	8	8	8	8
φ	7	7	7	7	7	7	7	7	7	

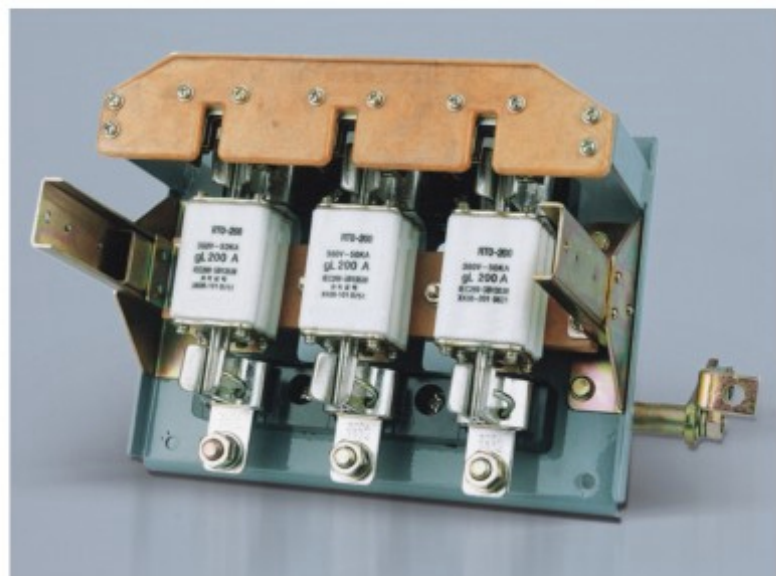
#### 订货须知 Ordering Information

订货单位须注明开关的型式特征, 电压等级, 电流等级, 极数, 操作方式及数量等, 特殊订货请咨询我公司技术部门。例如: HD11F-200/38B, 380V, 10台。  
 Shall specify the type of feature order unit switches, voltage level, current level, very few, operating mode and quantify, special orders, please consult our technical department.  
 For example: HD11F-200 / 38B, 380V, 10 units.

# HR3

## 系列熔断器式隔离开关

### Series fuse switch disconnecter



#### 型号及含义 Type and meaning

- HR 3 □ □ □ □
- 有“BX”表示旋转式操作型 With “BX”: a rotary operation type.
  - 无“BX”表示杠杆式操作型(仅对正面中央式) Without “BX”: Lever operation type (only front centralized)
  - 操作方式及检修方向 Operation and maintenance directions
  - 1: 表示正面侧方杠杆传动机构式, 前检修 1: The front side of the lever-type transmission mechanism, the front access
  - 2: 表示正面中央杠杆传动机构式, 后检修 2: front central lever actuator type, after overhaul
  - 3: 表示侧面操作手柄式, 前检修 3: side operating handle type, the front access
  - 4: 表示无面板正面侧方杠杆传动机构式, 前检修 4: No panel front side lever actuator type, the front access
  - 极数(3) Poles (3)
  - 约定发热电流(A) Conventional thermal current (A)
  - 设计代号 Design code
  - 熔断器式隔离开关 Fuse switch disconnecters

表1 Table 1

约定发热电流(A) Conventional thermal current	额定工作电流(A) Rated operating current	AC380V			
		HR3正面侧方 杠杆传动机构式 Front side of lever-type transmission mechanism	HR3正面中央 杠杆传动机构式 Central side of lever-type transmission mechanism	HR3侧面 操作手柄式 Side operating handle type	HR3无面板正面侧方 杠杆传动机构式 Without plate front side of lever-type transmission mechanism
100	100	HR3-100/31	HR3-100/32	HR3-100/33	HR3-100/34
200	200	HR3-200/31	HR3-200/32	HR3-200/33	HR3-200/34
400	400	HR3-400/31	HR3-400/32	HR3-400/33	HR3-400/34
600	600	HR3-600/31	HR3-600/32	HR3-600/33	HR3-600/34
1000	1000		HR3-1000/32	HR3-1000/33	HR3-1000/34

#### 主要参数及技术性能 Main technical data

表2 Table 2

型号 Model	额定工作电压 Rated operating voltage Ue(V)	额定绝缘电压 Rated insulation voltage Ui(V)	约定发热电流 Conventional thermal current Ith(A)	额定工作电流 Rated operating current Ie(A)	熔断器型号 Fuse type	额定限制 短路电流KA Rated short-circuit current limit
HR3-100	380	500	100	100	RT0-100	50
HR3-200			200	200	RT0-200	50
HR3-400			400	400	RT0-400	50
HR3-600			600	600	RT0-600	50
HR3-1000			1000	1000	RT0-1000	50

#### 适用范围 Application

HR3系列熔断器式隔离开关适用于交流50Hz、380V, 额定电流至1000A的配电系统中作为短路保护和电缆、导线的过载保护之用。在正常情况下, 可供不频繁地手动接通和分断正常负载电流与过载电流, 在短路情况下, 由熔断器分断电流。符合标准: GB 14048.3, IEC 60947-3。

HR3 series fuse switch-disconnector with fuse is applicable in the circuit of AC50Hz, rated voltage AC380V and below, rated current up to 1000A. HR3 series are infrequently manually operated multipolar fuse combination switches, They break or switch off on load and provide safety isolation and protection against overcurrent for any voltage electrical circuit. Standard: IEC/EN 60947-3.

#### 正常工作条件

##### Normal operating conditions

- 周围空气温度不高于+40°C, 不低于-5°C。
- 安装地点的海拔不超过2000m。
- 湿度: 最高温度为+40°C时, 空气的相对湿度不超过50%, 在较低的温度下可以允许有较高的相对湿度, 例如20°C时达90%。对由于温度变化偶尔产生的凝露应采取特殊的措施。
- 周围环境的污染等级为3级。
- 开关应安装在无显著震动、冲击震动和没有雨雪侵袭的地方, 同时安装地点应无爆炸危险介质, 且介质中无足以腐蚀金属和破坏绝缘的气体及尘埃。

- Ambient temperature: -5°C~+40°C
- Altitude: ≤2000m;
- When the ambient air temperature is +40°C, the relative humidity of the air shall not be higher than 50%; a higher relative humidity is allowed at a lower temperature; for example, for the wettest month, the maximum relative humidity averaged shall be 90% while the lowest temperature averaged in that month +20°C, and special measures shall be taken for the condensation occasionally produced due to temperature change.
- Pollution degree: 3
- The ambient air is not significantly polluted by dust, smoke, corrosive and/or flammable gases, vapours or salt.

#### 结构特征 Structure

- 熔断器式隔离开关(以下简称开关) 是熔断器和刀开关的组合电器, 具有熔断器和刀开关的基本性能, 在电路正常供电的情况下, 接通和切断电源由刀开关来担任。当线路或用电设备过载或短路时, 熔断器的熔体熔断, 及时切断故障电流。前操作前检修的开关, 中央有供检修和更换熔断器的门, 主要供BDL配电屏上安装。前操作后检修的开关主要供BSL配电屏上安装。侧操作前检修的开关可以制成封闭的动力配电箱。
- 额定电流1000A及以下的刀开关带有安全挡板, 并装有灭弧室。灭弧室是酚醛布板和钢板冲制件铆合而成的。
- 开关的熔断器固定在带弹簧、锁板的绝缘横梁上, 在正常运行时, 保证熔断器不脱扣, 而当熔断器因线路故障而熔断后, 只需要按下锁板可以很方便地更换熔断器。

- Fused disconnect switch (hereinafter abbreviated as switch) is the combination device of fuse and blade switch, with the basic features of fuse and blade switch, under normal power supply, blade switch is used to perform switching on/off, while the line or the downstream equipment has overloading or short circuit fault, the fuse will be melt and cut off the fault current punctually. The switch of front operated and front repaired will be assembled with a door for repair and replacement, mainly assembled in BDL panel. The switch of front operated and rear repair is mainly assembled in BSL panel. The switch of side operated front repaired can be assembled in power distribution box.
- Blade switches of rated current 1000A and below have safety plate and arc quenching chamber, the later made of phenol aldehyde laminated cloth board and steel plate being riveted.
- The fuse fixed on the insulated crossarm with spring and locking plate, the fuse will not trip during normal servicing, when fuse is melt down due to fault, it is very easy to replace the fuse link after locking plate is pushed down.

#### 外形及安装尺寸 Outline & installation size

- HR3/31系列开关外形及安装尺寸见图1, 表3 HR3/31 Dimensions (See Figure 1, Table 3)

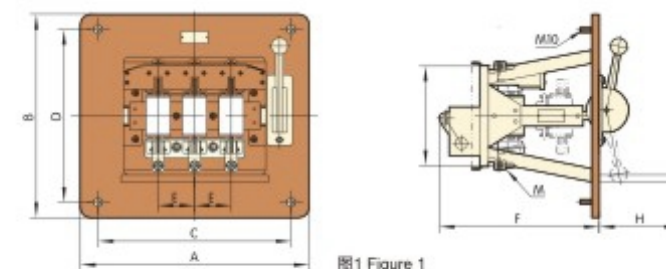


图1 Figure 1

表3 Table 3

型号 Type	外形尺寸 Dimensions									
	A	B	C	D	E	F	H	J	M	
HR3-100/31	400	400	360	360	60	275	266	162	8	
HR3-200/31	400	400	360	360	70	275	266	176	10	
HR3-400/31	400	400	360	360	80	275	266	194	12	
HR3-600/31	450	400	410	360	90	325	266	218	16	

- HR3/32系列开关外形及安装尺寸见图2, 表4 HR3/32 Dimensions (See Figure 2, Table 4)

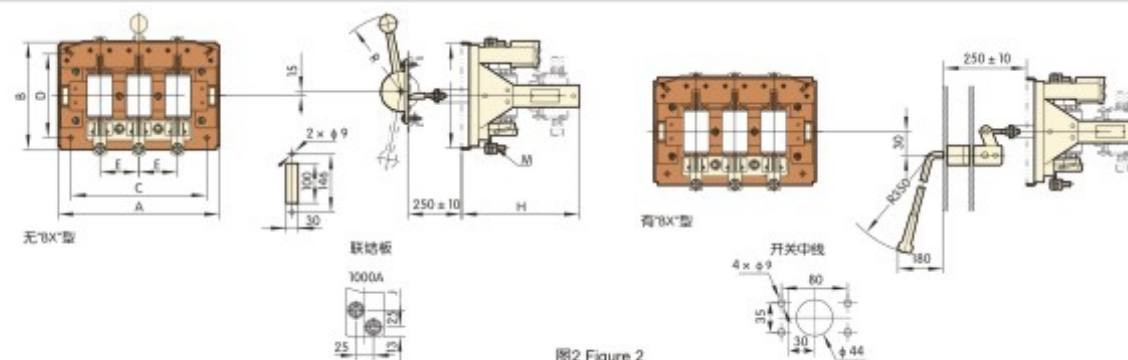


图2 Figure 2

表4 Table 4

型号 Type	外形尺寸 Dimensions										
	A	B	C	D	E	H	J	R	M	φ	
HR3-100/32	250	170	210	130	60	190	162	180	8	7	
HR3-200/32	270	170	230	130	70	193	176	180	10	7	
HR3-400/32	290	170	250	130	80	194	194	180	12	7	
HR3-600/32	320	180	280	130	90	213	218	180	16	7	
HR3-1000/32	410	310	348	248	115	280	276	230	12	8.5	

# HR3

## 系列熔断器式隔离开关

### Series fuse switch disconnecter

● HR3/33系列开关外形及安装尺寸见图3, 表5 HR3/33 Dimensions (See Figure 3, Table 5)

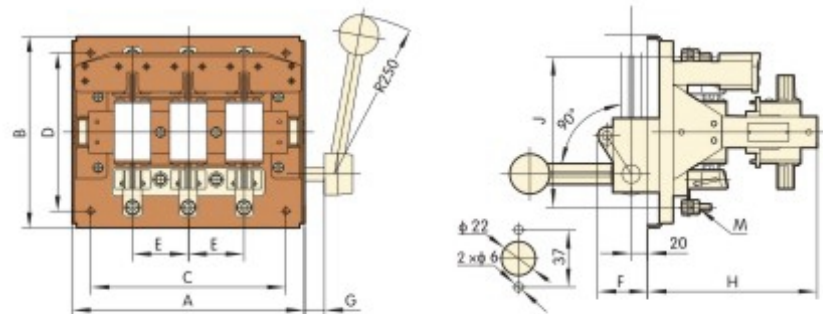


图3 Figure 3

表5 Table 5

型号 Type	外形尺寸 Dimensions										
	A	B	C	D	E	F	G	H	J	M	φ
HR3-100/33	250	200	210	170	60	77	68	190	162	8	7
HR3-200/33	270	205	230	170	70	77	60	193	176	10	7
HR3-400/33	290	290	250	170	80	77	55	194	194	12	7
HR3-600/33	320	320	280	170	90	94	50	214	218	16	7

\*注：F尺寸为手柄打开90°使连杆处于最大位置时的尺寸。

● HR3/34系列开关外形及安装尺寸见图4, 表6 HR3/34 Dimensions (See Figure 4, Table 6)

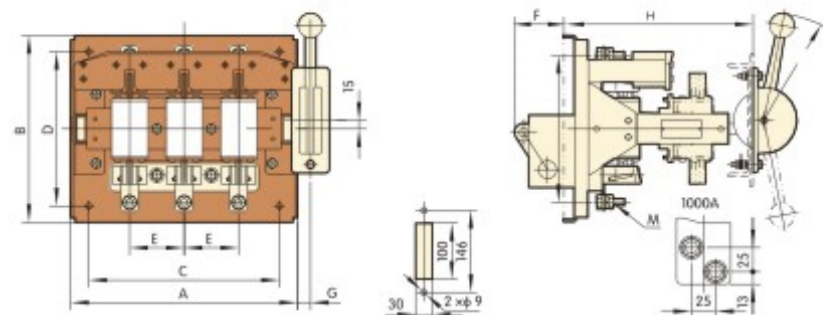


图4 Figure 4

表6 Table 6

型号 Type	外形尺寸 Dimensions											
	A	B	C	D	E	F	G	H	R	J	M	φ
HR3-100/34	250	200	210	170	60	80	43	250	180	162	8	7
HR3-200/34	270	205	230	170	70	80	53	250	180	176	10	7
HR3-400/34	290	225	250	170	80	80	43	250	180	194	12	7
HR3-600/34	320	265	280	170	90	95	43	250	180	218	16	7
HR3-1000/34	410	352	348	248	115	115	65	350	230	276	12	8.5

\*注：F尺寸为开关合闸时使连杆处于最大位置的尺寸。

### 订货须知 Ordering Information

订货单位须注明开关的型式特征, 电压等级, 电流等级, 极数, 操作方式及数量等, 特殊订货请咨询我公司技术部门。例如: HD3-200/32, 380V熔断器电流100A, 10台。  
 Shall specify the type of feature order unit switches, voltage level, current level, very few, operating mode and quantity, special orders, please consult our technical department.  
 For example: HD3-200 / 32, 380V fuse current 100A, 10 units.

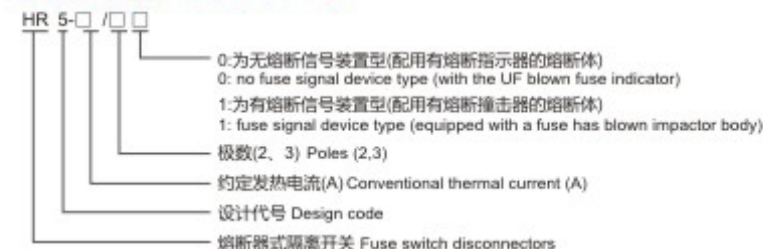
# HR5

## 系列熔断器式隔离开关

### Series fuse switch disconnecter



### 型号及含义 Type and meaning



### 主要参数及技术性能 Main technical data

- 额定绝缘电压: 690V.
- 额定工作电压: 380V、660V两种;
- 额定工作电流: 380V: 100A, 200A, 400A, 630A四种; 660V: 100A, 200A, 315A, 425A四种。
- 开关的接通和分断能力和额定熔断短路电流(见表1)。
- 开关的机械寿命分别为3000次(100A, 200A)和1000次(400A, 630A)。
- 开关的电寿命分别为600次(100A, 200A)和200次(400A, 630A)接通与分断条件(见表2)。
- 辅助开关(Lx19K)的额定工作电压交流380V, 额定发热电流5A, 额定控制容量300VA。
- Rated insulation voltage: 690V.
- Rated operating voltage: 380V, 660V;
- Rated working current: 380V: 100A, 200A, 400A, 630A; 660V: 100A, 200A, 315A, 425A.
- Making and breaking capacity and rated short-circuit current fuse (see Table 1).
- Mechanical life is 3,000 times (100A, 200A) and 1000 (400A, 630A).
- Electrical life of 600 times (100A, 200A) and 200 (400A, 630A) making and breaking conditions (Table 2).
- Auxiliary switch (Lx19K) rated working voltage AC 380V, rated thermal current 5A, rated control capacity of 300VA.

表1 Table 1

额定工作电压 Rated operating voltage Ue V	约定发热电流 Conventional thermal current Ith A	额定工作电流 Rated operating current Ie A	使用类别 Use category	额定接通和分断能力 Rated making and breaking capacity						额定限制短路电流 Rated short-circuit current limit			
				接通 Making			分断 Breaking			操作循环数 Operating cycles	电流有效值 (kA) RMS current	COSφ	通断次数 OFF times
				I/Ie	U/Ie	COSφ	Ic/Ie	Uc/Ie	COSφ				
380	100	100	AC-23B	10	1.05	0.45	8	1.05	0.45	5	100	0.25	各1次
	200	200	AC-23B	10	1.05	0.35	8	1.05	0.35	3	100	0.25	各1次
	400	400	AC-23B	10	1.05	0.35	8	1.05	0.35	3	100	0.25	各1次
	630	630	AC-23B	10	1.05	0.35	8	1.05	0.35	3	100	0.25	各1次
660	100	100	AC-22B	3	1.05	0.65	3	1.05	0.65	5	50	0.25	各1次
	200	200	AC-22B	3	1.05	0.65	3	1.05	0.65	5	50	0.25	各1次
	400	315	AC-22B	3	1.05	0.65	3	1.05	0.65	5	50	0.25	各1次
	630	425	AC-22B	3	1.05	0.65	3	1.05	0.65	5	50	0.25	各1次

### 适用范围 Application

HR5系列熔断器式隔离开关(以下简称开关)主要用于额定电压交流380V和660V(45~62Hz), 约定发热电流至630A的具有高短路电流的配电电路和电动机电路中, 作为电源开关、隔离开关、应急开关, 并作为电路保护用, 但一般不作为直接开闭单台电动机之用。

符合标准: GB14048.3、IEC60947-3。

HR5 fuse-switch disconnecter (hereinafter referred to as the switch) is mainly used in the distribution circuit with high short-circuit current and motor circuit where the rated voltage is AC 380V and 660V (45 to 62Hz), the conventional thermal current is up to 630A to serve as power switch, switch disconnecter, emergency switch and exert the function of circuit protection, but is generally not used to directly open and close a single motor.  
 Standard: IEC/EN 60947-3.

### 正常工作条件

#### Normal operating conditions

- 周围空气温度不高于+40°C, 不低于-5°C。
- 安装地点的海拔不超过2000m。
- 湿度: 最高温度为+40°C时, 空气的相对湿度不超过50%, 在较低的温度下可以允许有较高的相对湿度, 例如20°C时达90%。对由于温度变化偶尔产生的凝露应采取特殊的措施。
- 周围环境的污染等级为3级。
- 开关应安装在无显著振动、冲击振动和没有雨雪侵袭的地方, 同时安装地点应无爆炸危险介质, 且介质中无足以腐蚀金属和破坏绝缘的气体及尘埃。

- Ambient temperature: -5°C~+40°C
- Altitude: ≤2000m;
- When the ambient air temperature is +40°C, the relative humidity of the air shall not be higher than 50%; a higher relative humidity is allowed at a lower temperature; for example, for the wettest month, the maximum relative humidity averaged shall be 90% while the lowest temperature averaged in that month +20°C, and special measures shall be taken for the condensation occasionally produced due to temperature change.
- Pollution degree: 3
- The ambient air is not significantly polluted by dust, smoke, corrosive and/or flammable gases, vapours or salt.

# HR5

## 系列熔断器式隔离开关

### Series fuse switch disconnecter

表2 Table 2

额定工作电压(V) Rated operating voltage	使用类别 Use category	接通 ON I/Ie	接通 ON U/Ue	接通 ON COSφ	分断 OFF Ic/Ie	分断 OFF Ur/Ue	分断 OFF COSφ
380	AC-23B	1	1	0.65	1	1	0.65
660	AC-22B	1	1	0.8	1	1	0.80

开关与熔断器配合关系(见表3)。Switch and fuse equipped with relations(see table3)

表3 Table 3

开关约定发热电流(A) Conventional thermal current	熔断器型号 Fuse type	熔断器电流值(A) Fuse current
100	NT00, RT16-00	4, 6, 10, 16, 20, 25, 32, 35, 40, 50, 63, 80, 100, 125, 160
200	NT1, RT16-1	80, 100, 125, 160, 200, 224, 250
400	NT2, RT16-2	125, 160, 200, 224, 250, 300, 315, 355, 400
630	NT3, RT16-3	315, 355, 400, 425, 500, 630

注:当开关用于电动机电路中,允许熔断器额定电流大于开关约定发热电流。

### 外形及安装尺寸 Outline & installation size

HR5系列开关外形及安装尺寸见图1.2,表4 HR5 Dimensions (See Figure 1.2, Table 4)



图1 HR5-100/20, 30, 31

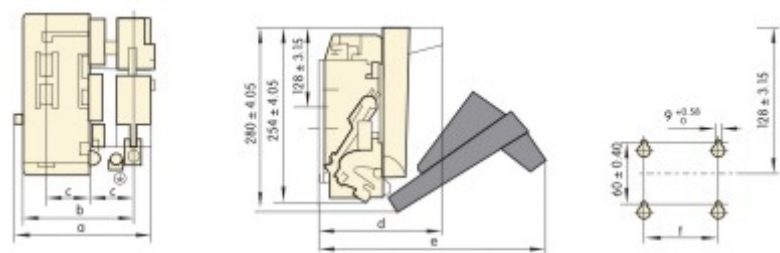


图2 HR5-200-400-630/20, 30, 31

表4 Table 4

型号 Type	额定发热电流(A) Rated thermal current	外形尺寸 Dimensions					
		a	b	c	d	e	f(安装孔距)
HR5-200/31	200	220±3.60	203±1.45	(62)	193±3.60	342±4.45	130±0.80
HR5-200/30	200	220±3.60	203±1.45	62	193±3.60	342±4.45	130±0.80
HR5-200/20	200	220±3.60	203±1.45	62	193±3.60	342±4.45	130±0.80
HR5-400/31	400	243±3.60	226±1.45	(70)	209±3.60	358±4.45	130±0.80
HR5-400/30	400	243±3.60	226±1.45	70	209±3.60	358±4.45	130±0.80
HR5-400/20	400	243±3.60	226±1.45	70	209±3.60	358±4.45	130±0.80
HR5-630/31	630	289±4.05	227±1.60	(85)	224±3.60	373±4.45	200±0.925
HR5-630/30	630	289±4.05	227±1.60	85	224±3.60	373±4.45	200±0.925
HR5-630/20	630	289±4.05	227±1.60	85	224±3.60	373±4.45	200±0.925

### 订货须知 Ordering Information

订货单位须注明开关的型式特征,电压等级,电流等级,极数,操作方式及数量等,特殊订货请咨询我公司技术部门。HR5-100/31 380V熔断器电流8A,10台。  
 Shall specify the type of feature order unit switches, voltage level, current level, very few, operating mode and quantity, special orders, please consult our technical department.  
 For example: HR5-100/31, 380V fuse current 8A, 10 units.

# HR6

## 系列熔断器式隔离开关

### Series fuse switch disconnecter



### 型号及含义 Type and meaning



### 主要参数及技术性能 Main technical data

开关与熔断器配合关系(见表1)。Switch and fuse equipped with relations(see table1)

表1 Table 1

约定发热电流(A) Conventional thermal current	熔断器型号 Fuse type	额定工作电压(V) Rated operating voltage	熔断器电流值(A) Fuse current
160	NT00, RT16-00	380	4, 6, 10, 16, 20, 25, 32, 35, 40, 50, 63, 80, 100, 125, 160
		660	4, 6, 10, 16, 20, 25, 32, 35, 40, 50, 63, 80, 100
250	NT1, RT16-1	380	80, 100, 125, 160, 200, 224, 250
		660	80, 100, 125, 160, 200
400	NT2, RT16-2	380	125, 160, 200, 224, 250, 300, 315, 355, 400
		660	125, 160, 200, 224, 250, 300, 315
630	NT3, RT16-3	380	315, 355, 400, 425, 500, 630
		660	315, 355, 400, 425

开关技术参数(见表2) Switch technical parameters (see Table 2)

表2 Table 2

型号 Type	HR6-160	HR6-250	HR6-400	HR6-630	
额定绝缘电压(V) Rated insulation voltage	660	660	660	660	
约定发热电流(A) Conventional thermal current	160	250	400	630	
额定工作电流(A) Rated current	380V 660V	160 250	200 400	315 630	
额定接通和分断能力(A) (1.05Ue时) Rated making and breaking capacity (A) (at 1.05Ue)	380V, COSφ=0.35 AC23B	接通 ON	1600	2500	4000
		分断 OFF	1280	2000	3200
660V, COSφ=0.65 AC22B	接通 ON	480	750	1200	
	分断 OFF	480	750	1200	
额定限制短路电流(kA) Rated short-circuit current limit	380V	100	100	100	
	660V	50	50	50	

### 适用范围 Application

HR6系列熔断器式隔离开关(以下简称开关)主要用于额定电压交流380V和660V(45~62Hz),约定发热电流至630A的具有高短路电流的配电电路和电动机电路中,作为电源开关、隔离开关、应急开关,并作为电路保护用,但一般不作为直接开闭单台电动机之用。

符合标准:GB14048.3、IEC60947-3。

HR6 fuse-switch disconnecter (hereinafter referred to as the switch) is mainly used in the distribution circuit with high short-circuit current and motor circuit where the rated voltage is AC 380V and 660V (45 to 62Hz), the conventional thermal current is up to 630A to serve as power switch, switch disconnecter, emergency switch and exert the function of circuit protection, but is generally not used to directly open and close a single motor.  
 Standard: IEC/EN 60947-3.

### 正常工作条件

#### Normal operating conditions

- 周围空气温度不高于+40°C,不低于-5°C。
- 安装地点的海拔不超过2000m。
- 湿度:最高温度为+40°C时,空气的相对湿度不超过50%,在较低的温度下可以允许有较高的相对湿度,例如20°C时达90%。对由于温度变化偶尔产生的凝露应采取特殊的措施。

- 周围环境的污染等级为3级。
- 开关应安装在无显著振动、冲击振动和没有雨雪侵袭的地方,同时安装地点应无爆炸危险介质,且介质中无足以腐蚀金属和破坏绝缘的气体及尘埃。
- Ambient temperature: -5°C~+40°C
- Altitude: ≤2000m;
- When the ambient air temperature is +40°C, the relative humidity of the air shall not be higher than 50%; a higher relative humidity is allowed at a lower temperature; for example, for the wettest month, the maximum relative humidity averaged shall be 90% while the lowest temperature averaged in that month +20°C, and special measures shall be taken for the condensation occasionally produced due to temperature change.
- Pollution degree: 3
- The ambient air is not significantly polluted by dust, smoke, corrosive and/or flammable gases, vapours or salt.

# HR6

## 系列熔断器式隔离开关

### Series fuse switch disconnecter

续表2 Continued Table 2

型号 Model	HR6-160	HR6-250	HR6-400	HR6-630
最大预期峰值电流(kA) Maximum expected peak current	100	100	100	100
配用NT熔断器尺码 Equipped with NT Fuse Size	00	1	2	3
污染等级 Pollution Level	3	3	3	3
安装类别 Installation category	III	III	III	III

● 辅助开关额定电压交流380V, 约定发热电流5A, 使用类别为AC-1, 额定工作功率300VA。  
 Auxiliary switch rated voltage AC 380V, thermal current 5A, use category AC-1, rated operating power 300VA.

#### 结构特征 Structure

- 开关由底座、盖和灭弧室等部分组成, 均由耐弧塑料制成, 为全塑型结构。静触头直接装在底座上, 灭弧室拆装方便, 每个灭弧室都有内室和外室二部份, 采用多片金属灭弧栅, 增强了灭弧能力, 提高了触头寿命。
- The switch is composed of base, cover, and arc quenching chamber and etc, all made of arc withstand plastic material. The static contacts are directly installed on the base, the arc quenching chamber is easy to be dismantled, each chamber has inner and outer parts, adopting multiple steel fence, arc quenching ability is increased, also improve the service life of contacts.
- NT型熔断器装在盖的内部, 盖可沿支持件呈扇形旋转, 具有较大的电隔离距离以满足隔离开关的要求, 盖可以方便地从底座上拆下, 使得安装和更换熔断器很方便。底座上具有两组安装孔, 能满足各种开关柜内及面板上安装的要求。开关的两侧面, 根据需要可装辅助触头, 发出指示开关分合状态的信号。
- NT type fuse link assembled in the cover, the cover can rotate around the support part, with large electric isolated distance, the cover can be dismantled easily from the base, so the fuse link can be easily installed and removed. On the base there have two groups of mounting holes, used to being fixed on different switchgear or panel. According to requirement, the two sides of switch can be assembled with auxiliary contacts for indicating the status of switch and etc.

#### 外形及安装尺寸 Outline & installation size

● HR6系列开关外形及安装尺寸见图1, 表3 HR6 Dimensions (See Figure 1, Table 3)

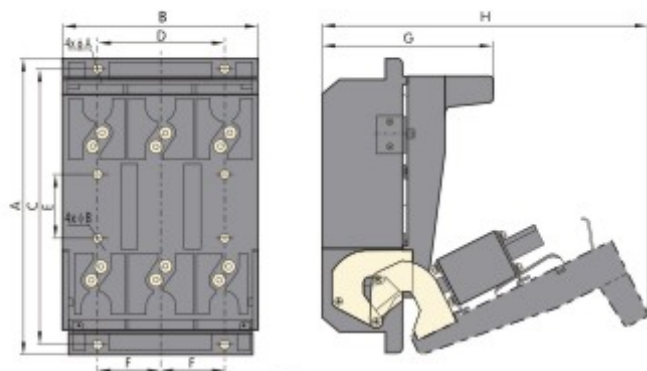


图1 Figure 1

表3 Table 3

外形尺寸 Dimensions	规格 Specification		
	160A	250A	400-630A
A	215	280	300
B	134	184	244
C	200	260	280
D	80	120	160
E	40	60	60
F	40	60	80
G	110	160	186
H	240 max	310 max	350 max
φA	φ7	φ9	φ9
φB	φ7	φ9	φ9

#### 订货须知 Ordering Information

订货单位须注明开关的型式特征, 电压等级, 电流等级, 极数, 操作方式及数量等, 特殊订货请咨询我公司技术部门。HR6-400/30 660V熔断器电流315A, 10台。  
 Shall specify the type of feature order unit switches, voltage level, current level, very few, operating mode and quantity, special orders, please consult our technical department.  
 For example: HR6-400/30, 660V fuse current 315A, 10 units.

# LW5D

## 万能转换开关

### Universal Change-over Switch

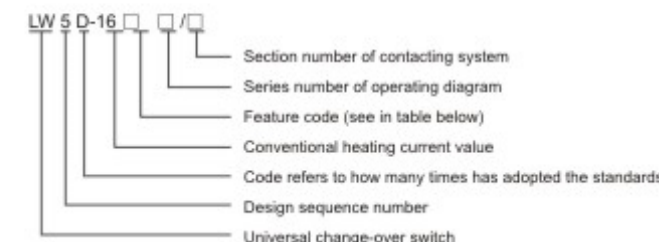
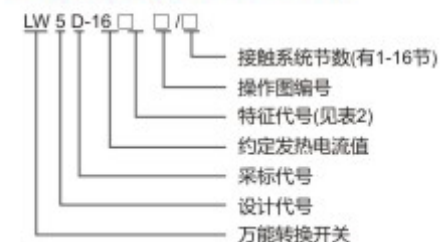


#### 适用范围 Application

LW5D系列万能转换开关主要适用于交流50-60Hz, 电压至380V, 直流电压至440V的电路中转换电气控制线路(电磁线圈、电气测量仪表和伺服电动机等), 也可直接控制5.5kW三相笼型感应电动机(启动、可逆转换、变速)。  
 符合标准: GB 14048.5, IEC60947-5-1。

Electric ratings: AC50Hz, AC 500V/DC 440V;  
 Application: applied for change-over of circuit. In addition, it also can be used to directly control 5.5kW three-phase squirrel-cage motor;  
 Standard: IEC60947-5-1.

#### 型号及含义 Type and meaning



#### 主要参数及技术性能 Main technical data

表1 Table 1

项目 Items	AC-15		DC-13		AC-15		AC-3	
	500	380	220	440	220	110	110	380
Ue(V)	500	380	220	440	220	110	110	380
Ie(A)	2.0	2.6	4.6	0.14	0.27	0.55	0.82	12
电寿命(次) Electric life	20×10 <sup>4</sup>		20×10 <sup>4</sup>				19.5×10 <sup>4</sup>	
操作频率次/h Operating frequency (operations/h)	300							
机械寿命(次) Mechanical life	80×10 <sup>4</sup>							
绝缘电压(V) Insulation voltage (V)	550V							
发热电流(A) Heating current (A)	16A							

# LW5D

## 万能转换开关

### Universal Change-over Switch

#### 其它 Others

按操作方式与操动器位置组合分类 Classifications of operating mode and operating machine position combination

表2 Table 2

使用类别 Utilization classification	操作方式代号 Code of operating mode	操作手柄位置 Position of operating handle									
自复型 Self-locking	A	0° ← 45°									
	B	45° → 0° ← 45°									
	C	0° 45°									
	D	45° 0° 45°									
	E	45° 0° 45° 90°									
定位型 Orientation type	F	90° 45° 0° 45° 90°									
	G	90° 45° 0° 45° 90° 135°									
	H	135° 90° 45° 0° 45° 90° 135°									
	I	135° 90° 45° 0° 45° 90° 135° 180°									
	J	120° 90° 60° 30° 0° 30° 60° 90° 120°									
	K	120° 90° 60° 30° 0° 30° 60° 90° 120° 150°									
	L	150° 120° 90° 60° 30° 0° 30° 60° 90° 120° 150°									
	M	150° 120° 90° 60° 30° 0° 30° 60° 90° 120° 150° 180°									
	N	45° 45°									
	P	90° 0° 90°									

#### 分类

按用途分有主令控制用和直接控制5.5kW电动机用两种；  
按操作方式分有定位型和自复型两种；  
按接触系统节数分有1~16节，共16种。

#### Classifications

It can be classified into application for master control and direct control over 5.5kW motor according to purposes.  
Operating modes can be classified into orientation type and self-restoration type.  
The Section number of contact system can be classified in to 16 kinds, which are from 1 to 16. Appearance of operation mechanism can be classified into rotary type and ball headed handle type.

电容器主柜有零位、自动、手动切换开关 Capacitor main cabinet has zero position, automatic, manual change-over switches

型号 Type	标号 Grade	自动 Automatic	停 Stop	手动 Manual	节数 No. of sessions
		45°	0°	45°	
LW5D-16 TD710/7	25-26	x			7节
	27-28	x			
LW5D-16 TD710/8	29-30	x			8节
	31-32	x			
LW5D-16 TD710/9	33-34	x			9节
	35-36	x			
LW5D-16 TD710/10	37-38	x			10节
	39-40	x			

电容器主柜有零位、自动、手动切换开关 Capacitor main cabinet has zero position, automatic, manual change-over switches

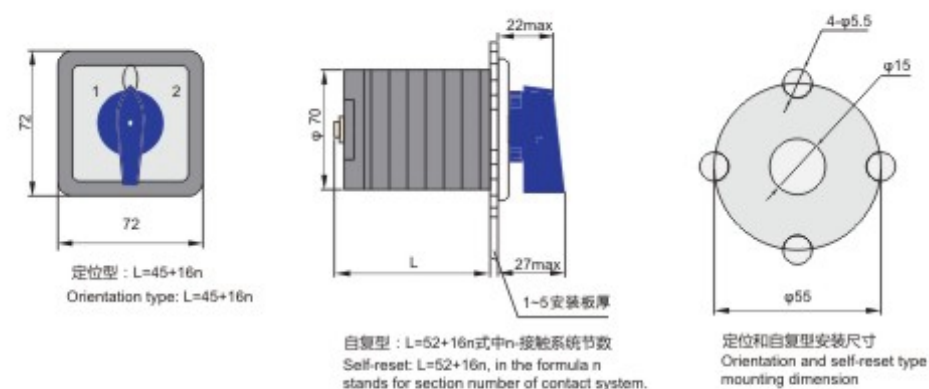
型号 Type	标号 Grade	A B C D E												节数 No. of sessions	备注 Note		
		自动	停	手动	2	3	4	5	6	7	8	9	10			11	12
特LW5D-16/3 TM703	1-2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	1节	A: 电容器 主柜2回路
	3-4	x															
	5-6	x															
	7-8		x	x	x	x	x	x	x	x	x	x	x	x	x		
LW5D-16 TM704/4	9-10				x	x	x	x	x	x	x	x	x	x	3节	B: 电容器 主柜4回路	
	11-12				x	x	x	x	x	x	x	x	x	x			
LW5D-16 TM706/5	13-14					x	x	x	x	x	x	x	x	x	4节	C: 电容器 主柜6回路	
	15-16					x	x	x	x	x	x	x	x	x			
LW5D-16 TM706/6	17-18							x	x	x	x	x	x	x	5节	D: 电容器 主柜8回路	
	19-20							x	x	x	x	x	x	x			
LW5D-16 TM707/7	21-22									x	x	x	x	x	6节	E: 电容器 主柜10回路	
	23-24									x	x	x	x	x			
LW5D-16 TM712/8	25-26											x	x	x	7节	F: 电容器 主柜12回路	
	27-28											x	x	x			
LW5D-16 TM712/8	29-30													x	8节		
	31-32													x			

#### 电容器辅助转换开关

Capacitor and auxiliary switch cabinet

型号 Type	标号 Grade	A B C D E										节数 No. of sessions	备注 Note		
		0°	30°	60°	90°	120°	150°	180°	210°	240°	270°			300°	
LW5D-16TM601/1	1-2		x	x	x	x	x	x	x	x	x	x	1节	A: 电容器 辅柜2回路	
	3-4			x	x	x	x	x	x	x	x	x			
LW5D-16TM602/2	5-6				x	x	x	x	x	x	x	x	2节	B: 电容器 辅柜4回路	
	7-8					x	x	x	x	x	x	x			
LW5D-16TM603/3	9-10						x	x	x	x	x	x	3节	C: 电容器 辅柜6回路	
	11-12							x	x	x	x	x			
LW5D-16TM604/4	13-14									x	x	x	4节	D: 电容器 辅柜8回路	
	15-16										x	x			x
LW5D-16TM605/5	17-18											x	x	5节	E: 电容器 辅柜10回路
	19-20												x		

#### 外形及安装尺寸 Outline & installation size



#### 订货须知 Ordering Information

用户订货时，采用开关的完整型号进行订货。

例如：订货万能转换开关LW5D，

接线图型式为右图；

订货代号为LW5D-16 D0723/3 100台。

When a user orders using the switch complete model were orders.

For example: Ordering universal switch LW5D,

Wiring diagram type is right;

Ordering code for LW5D-16 D0723 / 3 100 units.

接线图编号 No.	D0723		
转换角度 Angle	45°	0°	45°
1-2	x		
3-4			x
5-6	x		
7-8			x
9-10	x		
11-12			x

# LW12

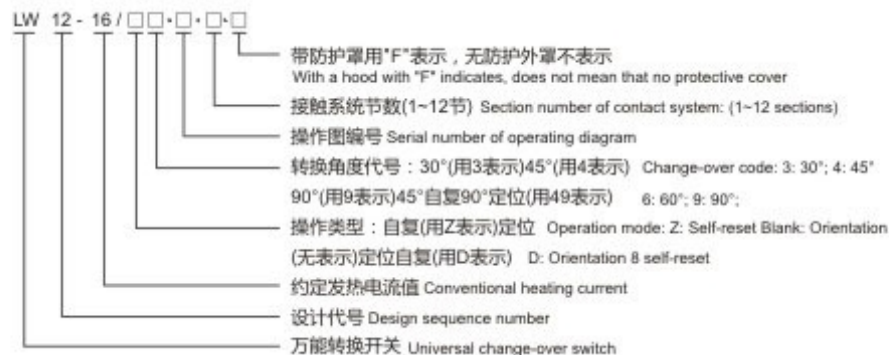
## 万能转换开关

### Universal Change-over Switch



#### 型号及含义 Type and meaning

● 主令控制用型号 Type applied for master control



#### 主要参数及技术性能 Main technical data

表1 Table 1

项目 Items	AC-15	DC-13	AC-13	AC-4
工作电压(V) Operational voltage (V)	380	220	380	380
工作电流(A) Operational current (A)	2.6	0.6	12	12
绝缘电压(V) Insulation voltage (V)	550	550		
发热电流(A) Heating current (A)	16			
电寿命(次) Electric life (operations)	20×10 <sup>4</sup>	20×10 <sup>4</sup>	19.5×10 <sup>4</sup>	0.5×10 <sup>4</sup>
机械寿命(次) Mechanical life (operations)	80×10 <sup>4</sup>			
操作频率(次/h) Operating frequency (operations/h)	300次/h(当AC-4时120次/h) 300 operations/h (Under the condition of AC-4, the value is 120 operations/h)			

#### 订货须知 Ordering Information

用户订货时，采用开关的完整型号进行订货。

例如：订货万能转换开关LW12。

接线图型式为右图；

订货代号为LW12-16/4.0408.2 10台。

When a user orders using the switch complete model were orders.

For example: Ordering universal switch LW12,

Wiring diagram type is right;

Ordering code for LW12-16/4.0408.2 10 units.

接线图编号 No.	4.0408		
转换角度 Angle	45°	0°	45°
1-2	×		×
3-4	×		×
5-6	×		×
7-8	×		×

#### 适用范围 Application

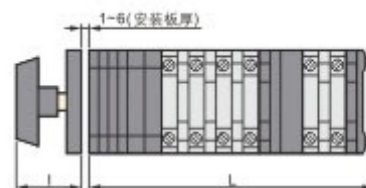
LW12万能转换开关主要适用于交流50~60Hz、电压380V及以下，直流电压220V及以下的电路中转换电气控制线路和电气测量仪表。也可直接控制5.5kW及以下的三相交流笼型感应电动机。主要用于仪表，微电机，电磁阀等控制线路中。

符合标准：GB 14048.5, IEC60947-5-1。

Electric ratings: AC50Hz, AC 380V/DC 220V;  
 Application: applied for change-over of circuits under various conditions; in addition, it also can be applied to control three-phase squirrel-cage motor with small capacity;  
 Standard: IEC60947-5-1.

#### 外形及安装尺寸

##### Outline & installation size



L=31+13.5n(定位型).  
 L=43+13.5n(自复型、定位自复型)  
 L=58+13.5n(带45°自由行程触头的定位自复型).  
 l=33~46

L=31+13.5n (Orientation type)  
 L=43+13.5n (self-reset type, orientation self reset type)  
 L=58+13.2 (Orientation self reset type with free travel contact), l=33~46

