AHB(DW914B)系列万能式空气断路器安装使用说明书

一．概述

AHB系列万能式空气断路器是引进日本寺崎电气产业株式会社专有技术制造的改进型产品，型号为DW914B。该断路器适用于额定电流630~6300A、交流50(60)Hz、额定电压660V及以下、直流440V及以下的船舶配电系统中，作为交流过载、欠压及短路保护，直流欠压及短路保护使用，以及在正常的工作条件下供该线路不频繁转换使用。

二．保管与搬运

1．保管：

收到断路器后，建议尽快地投入运行。如暂不用，应注意：

(1) 断路器需置于温暖干燥的环境保管，使之不产生凝露。

(2) 断路器应置于无腐蚀性气体及无尘埃的场所保管。

(3) 断路器应水平放置，且不得直接放在水泥地面上。

2．搬运：

(1) 起吊断路器时，挂钩或钢丝绳应挂在断路器的提升板上，起吊时应避免挂钩或钢丝绳与灭弧室相碰。

(2) 搬运中应避免磕碰和剧烈的振动。

三．主要技术参数

断路器主要技术参数见表1~表2

表2.过电流脱扣器保护特性参数

断路器型号				DW914B−630	DW914B−1000	DW914B−1600	DW914B−2000	DW914B−2500	DW914B−3200、4000	DW914B−5000、6300
标准型	配电用(含故障显示功能)	长延时	整定电流I_{r1}(A) 延时时间T_1(s)*	$I_o\times(0.8\sim0.9\sim1.0\sim1.10)$连续可调。						
				≤$I_{r1}\times105\%$ 不动作；≥$I_{r1}\times120\%$ 动作。						
				在$I_{r1}\times600\%$ 时，5～30s连续可调，($I_{r1}\times150\%$ 时，120～180s；$I_{r1}\times200\%$ 时，60～120s)。						
				推荐选用：5；10；15；20；25；30s，误差±15%。						
		短延时	整定电流I_{r2}(A) 延时时间T_2(ms)	$I_o\times(4\sim5\sim6\sim7\sim8\sim9\sim10)$连续可调，误差±15%。						
				$I_{r2}\times1.2$以上时，120～420ms，连续可调。						
				推荐选用：120；170；220；270；320；370；420ms。						
		瞬时	整定电流I_{r3}(A)	$I_o\times(4\sim5\sim6\sim7\sim8\sim9\sim10\sim12\sim14\sim16)$连续可调，误差±20%。						
	保护发电机用	长延时	整定电流I_{r1}(A) 延时时间T_1(s)*	$I_o\times1.0$；1.05；1.10；1.15；1.25，五档，误差±5%。						
				在$I_{r1}\times120\%$(或115%)时，15～60s，连续可调。						
				推荐选用：15；20；25；30；35；40；45；50；55；60s，误差±15%。						
		短延时	整定电流I_{r2}(A) 延时时间T_2(ms)	$I_o\times(2.0\sim2.5\sim3.0\sim3.5\sim4.0)$连续可调，误差±10%。						
				$I_{r2}\times1.2$以上时，120～420ms，连续可调。						
				推荐选用：120；170；220；270；320；370；420ms。						
		预报警	整定电流I_P(A) 延时时间T_P(s)*	$I_{r1}\times(0.82\sim0.96)$连续可调，误差±5%。						
				在$I_{r1}\times120\%$(或115%)时，5～10s。						
				推荐选用：10s，误差±15%。						
电磁型	瞬时整定电流(kA) 误差±20%			3,5 7.5 10,15	5,7.5 10 15,20	7.5,10 15,20	7.5,10 15 20,25	7.5,10 15,20 25,30	10,15 20,25 30,40	15,20 25 30,40

注： 可返回系数＞0.8

AHB(DW914B)Series All—purpose ACB Installation Instruction

I.Summarization

AHB series all—purpose ACB is improved production, based on the TERASAKI technology from Japan, and apply to shipping distribution and Rated Current is from 630A to 6300A, AC 50(60)Hz, rated voltage is up to and including 660V and DC440V. And used to protect AC over—current and under—voltage, short circuit for AC and DC. And not apply to frequent transform in normal condition.

II.Storage and delivery

1. Keeping: Please launch into running as soon as possible after receiving ACB, if can not use temporarily, please take note of following items:

(1).The breaker should be kept in the warm and dry ambient without dew.

(2).The location should keep away from caustic gas and dust.

(3).The breaker should be placed horizontally and can not place on cement ground directly.

2. Delivery

When lift breaker, the pothook or steel wire, avoiding impacting the arc chutes, should hang the lifting panel.

III. Main technical parameter(refer to table 1—table 2)

Table 2: Protection parameter of over current release

Type				DW914B—630	DW914B—1000	DW914B—1600	DW914B—2000	DW914B—2500	DW914B—3200,4000	DW914B—5000,6300
Standard type	For distribution(with Fault display)	Long time-delay	Long time—delay I_{r1}(A) Setting current Delay time T_1(s)*	$I_0\times(0.8\sim0.9\sim1.0\sim1.10)$ Adjust continuously.						
				⩽ $I_{r1}\times105\%$ No act; ⩾ $I_{r1}\times120\%$ act.						
				When $I_{r1}\times600\%$, 5～30s Adjust continuously, (When $I_{r1}\times150\%$, 120～180s; When $I_{r1}\times200\%$, 60～120s).						
				Propose to select: 5; 10; 15; 20; 25; 30s, error±15%.						
		Short time-delay	Long time—delay I_{r2}(A) Setting current Delay time T_2(ms)	$I_0\times(4\sim5\sim6\sim7\sim8\sim9\sim10)$ Adjust continuously, error±15%.						
				When higher than $I_{r2}\times1.2$, 120～420 ms, Adjust continuously.						
				Propose to select: 120; 170; 220; 270; 320; 370; 420 ms.						
		instantaneous	Long time—delay I_{r3}(A)	$I_0\times(4\sim5\sim6\sim7\sim8\sim9\sim10\sim12\sim14\sim16)$ Adjust continuously, error±20%.						
	For generator protection	Long time-delay	Long time—delay I_{r1}(A) Setting current Delay time T_1(s)*	$I_0\times1.0$; 1.05; 1.10; 1.15; 1.25, five position, error±5%.						
				When $I_{r1}\times120\%$(or 115%), 15～60s, Adjust continuously.						
				Propose to select: 15; 20; 25; 30; 35; 40; 45; 50; 55; 60s, error±15%.						
		Short time-delay	Long time—delay I_{r2}(A) Setting current Delay time T_2(ms)	$I_0\times(2.0\sim2.5\sim3.0\sim3.5\sim4.0)$ Adjust continuously, error±10%.						
				When higher than $I_{r2}\times1.2$, 120～420 ms, Adjust continuously.						
				Propose to select: 120; 170; 220; 270; 320; 370; 420 ms.						
		Ariam	Long time—delay I_P(A) Setting current Delay time T_P(s)*	$I_{r1}\times(0.82\sim0.96)$ Adjust continuously, error±5%.						
				When $I_{r1}\times120\%$(or 115%), 5～10s.						
				Propose to select: 10s, error±15%.						
Electromagnetic type	Instantaneous setting current (kA) error±20%			3,5 7.5 10,15	5,7.5 10 15,20	7.5,10 15,20	7.5,10 15 20,25	7.5,10 15,20 25,30	10,15 20,25 30,40	15,20 25 30,40

Note: Returnable factor ＞0.8

IV. Structure

The breaker is composed by contacting system, operating mechanism and switch release device.

1.Contacting system.

The main moving contacts and main fixed contacts need to replaced by manufacture if the contacts are severe burned.The arc—moving contacts and arc—fixed contacts need to replaced if contacting—thickness is less than 1/3(see drawing 1),and make sure that the three phase should contact simultaneously.

2.Operating system

表1.万能式空气断路器技术参数

型号			DW914B-630	DW914B-1000	DW914B-1600	DW914B-2000	DW914B-2500	DW914B-3200	DW914B-4000	DW914B-5000	DW914B-6300
额定电流(A)			630	1000	1600	2000	2500	3200	4000	5000	6300
极数			2；3；4								
过电流脱扣器额定电流I_o(A)			100,160 250,400 630	250,400 630,800 1000	250,400,630 800,1000 1250,1600	500,800 1250 2000	800,1250 2000 2500	2000 2500 3200	3200 4000	5000	6300
额定绝缘电压(V)			660（690）								
额定运行短路分断能力Ics(kA)	瞬时	AC660V	22/46.2	30/63	30/63	30/63	30/63	50/105	50/105	85/187	85/187
		AC500V	35/73.5	40/84	50/105	65/143	65/143	85/187	85/187	100/220	100/220
		AC380V	50/105	50/105	65/143	70/154	75/165	85/187	120/264	120/264	120/264
		DC440V	22	22	22	22	22	22	22	22	22
		DC250V	40	40	40	40	80	85	85	85	85
机械寿命(次)			10000	10000	10000	10000	10000	2500	2500	2000	2000
电寿命(次)			1000	1000	1000	2500	2500	800	800	800	800
额定短时耐受电流(kA、1s)			40	40	50	70	70	85	100	100	100
*飞弧距离(mm)(380V)			(65)0			(140) 0		(170) 0		170	
重量kg	电磁操作型	固定式/抽屉式 3P	46/72	48/75	50/80	95/150	100/158	140/220	165/250	—	—
		4P	52/86	54/90	57/98	119/178	125/185	186/276	/310	—	—
适用工作条件			环境温度 −5 ~ +45(°C)								
			海上潮湿空气、盐雾、霉菌、油雾								
			有倾斜≤22° 30′								
			有摇摆、有振动								

*注：一般型( )内，飞弧距离自电子脱扣器顶部算起。

Table 1: Technical parameter for all-purpose ACB

Type				DW914B-630	DW914B-1000	DW914B-1600	DW914B-2000	DW914B-2500	DW914B-3200	DW914B-4000	DW914B-5000	DW914B-6300
Rated(A)				630	1000	1600	2000	2500	3200	4000	5000	6300
Pole number				2; 3; 4								
Rated current for over current release Io(A)				100,160 250,400 630	250,400 630,800 1000	250,400,630 800,1000 1250,1600	500,800 1250 2000	800,1250 2000 2500	2000 2500 3200	3200 4000	5000	6300
Rated insulation voltage(V)				660 (690)								
Rated running short breaking capacity Ics(kA)	Instantaneous		AC660V	22/46.2	30/63	30/63	30/63	30/63	50/105	50/105	85/187	85/187
			AC500V	35/73.5	40/84	50/105	65/143	65/143	85/187	85/187	100/220	100/220
			AC380V	50/105	50/105	65/143	70/154	75/165	85/187	120/264	120/264	120/264
			DC440V	22	22	22	22	22	22	22	22	22
			DC250V	40	40	40	40	80	85	85	85	85
Mechanical life (times)				10000	10000	10000	10000	10000	2500	2500	2000	2000
Electric life(times))				1000	1000	1000	2500	2500	800	800	800	800
Rated short time withstanding current(KA,1s)				40	40	50	70	70	85	100	100	100
*Arcing space(mm)(380V)				(65)0			(140) 0		(170) 0		170	
Weight kg	Electromagnetic operation type	Fixed type /Draw out type	3P	46/72	48/75	50/80	95/150	100/158	140/220	165/250	–	–
			4P	52/86	54/90	57/98	119/178	125/185	186/276	/310	–	–
Service condition				Ambient temperature -5 ~ +45(°C)								
				Humidity on the sea, salt fog, mildew, oil fog								
				Gradient ≤20° 30′								
				Swing and tremble								

*Note: Arcing space is from the top of electric release.

四.结构

断路器由接触系统、操作机构和脱扣器三部分组成。

1．接触系统

触头有动、静主触头和动、静弧触头之分，前者如烧损过度，需由厂家调换，后者在接点厚度小于原厚度1/3时应更换(见图1)，更换时应保证三相同时接触。

2．操作机构

断路器为电磁铁闭合方式(见图2)。

电磁铁闭合方式可采用交流或直流电源，其额定值见表3。在85%～110%额定电压范围内断路器应可靠闭合(连续操作30次以后应冷却15分钟以上)。使用交流电源应配备合闸整流装置(ARH)，此整流装置单独安装，其外形尺寸见图3。

表3.电磁铁闭合型断路器额定值

电压种类	额定电压(V)(控制电源)	合闸线圈电流(A)DC峰值		合闸接触器线圈电流(A)
		DW914B-630～1600	DW914B-2000～6300	
AC	440	8.5	5.5	0.23
	380	11	6	0.33
	220	19	9.5	0.53
	110	50[36]	17.5	0.85
DC	220	20	9	0.44
	110	36	17	0.61

注：[36]为DW914B-630 三极型的合闸线圈电流。

电磁铁闭合操作电路见图4：

动作原理：当1、2接通电源后，按下SB1按钮，1、3接通，经过辅助开关S1和行程开关SA，线圈K通电，触头Q闭合，线圈YA2通电，动铁芯快速吸合，断路器完成闭合。当线圈K通电后，SA常闭接点断开，故合闸按钮接通一次，只能闭合一次，以防止重合闸。手动闭合操作仅作为检修、维护、调整用。

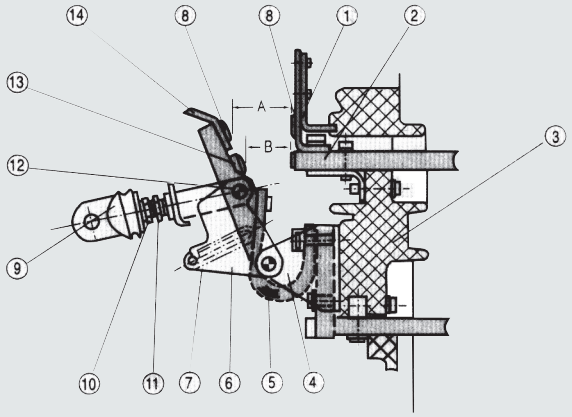
3．脱扣器

(1) 分励脱扣器(AVH)

分励脱扣器在额定电压70%～110%范围内，使断路器可靠断开，其额定参数见表4。

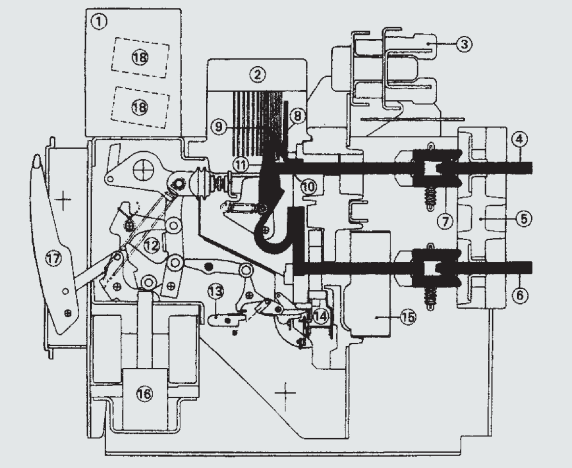
表4.分励脱扣器额定值

电压种类	额定电压(V)(控制电源)	线圈峰值电流(A)
AC	440	1.5
	380	1.9
	220	2.7
	110	4
DC	220	2.4
	110	2.7
	48	5.1
	24	8.1



1.静弧触头　2.静主触头　3.底板　4.触头支架　5.软连接
6.支架　7.触头弹簧　8.接点　9.绝缘拉杆　10.螺母
11.调整螺杆　12.动触头轴　13.动主触头　14.动弧触头
A.弧触头开距　B.主触头开距

图1.触头结构示意图



1.电子型过电流脱扣装置　2.灭弧罩　3.控制回路二次插头
4.主回路端子　5.抽屉座模压底板　6.主回路端子
7.主回路插入触头　8.静弧触头　9.动弧触头
10.静主触头　11.动主触头　12.操作机构　13.脱扣子
14.电磁型瞬时脱扣装置　15.CT(用于电子型过电流脱扣装置)
16.动铁芯　17.手柄　18.辅助开关

2.电磁铁闭合型断路器示意图

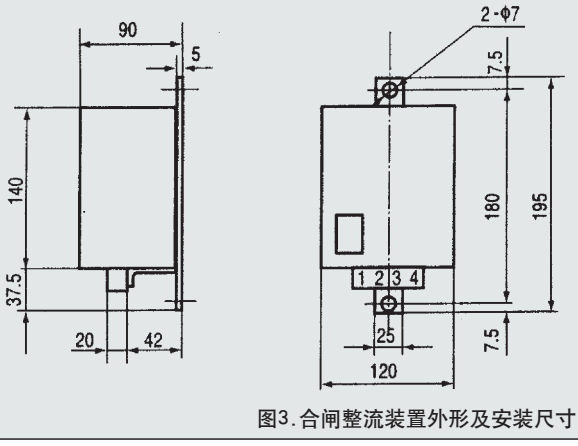


图3.合闸整流装置外形及安装尺寸

The closing for breaker can be completed by the elec-magnet type. see drawing 2.

Elec-magnet closing type can adopt AC or DC power supply, and the rated parameter is showed in table 3. Ahe breaker can be closed reliably under the 85%--110% rated voltage. (The breaker should cooled for 15 minutes after operating 30 times continuously.) AC power supply should be equipped closing rectifier device (ARH). And the rectifier should be installed solely and the outline dimensions are show in drawing 3.

Table 3. Ratings of magnetic closing circuit breaker

Voltage	Rated voltage (V) (control power)	Closing coil current (A) DC peak		Closing contact coil current (A)
		DW914B-630~1600	DW914B-2000~6300	
AC	440	8.5	5.5	0.23
	380	11	6	0.33
	220	19	9.5	0.53
	110	50[36]	17.5	0.85
DC	220	20	9	0.44
	110	36	17	0.61

Note: (36) is the closing loop current of three poles DW914B-630.

The circuit for elec-magnet closing type refer to drawing 4.

The act principle: when 1, 2 supply power, push button SB1,1 put though 3, the loop K is supplied power by auxiliary switch S1 and journey switch SA. The contact Q closed, the loop YA2 get active, the iron core was closed quickly, the breaker closing completed, when the loop K get though power, SA NC auxiliary switch open, so the closing button get though for one time, and only closed for one time to avoid re-close, manual closing operating is just designed for the examination, maintenance and adjustment.

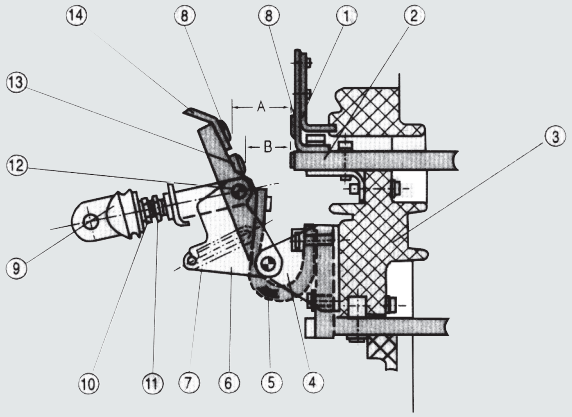
3. Switch release device

(1) Shunt trips AVH

Shunt trips can make breaker opened reliably under 70%--110% rated voltage. Parameters see table 4.

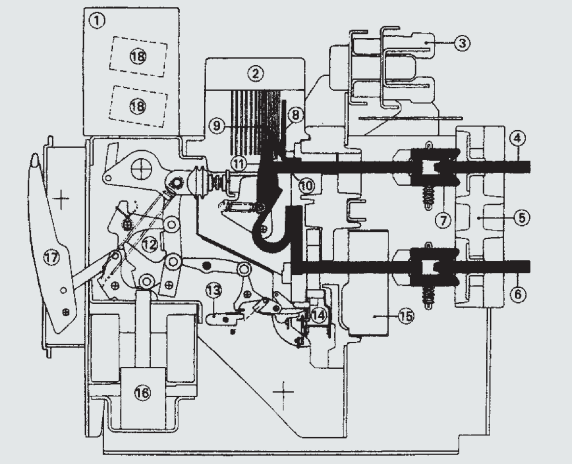
Table 4. Ratings of shunt release

Voltage type	Rated voltage(V) (for control power supply)	Loop peak current(A)
AC	440	1.5
	380	1.9
	220	2.7
	110	4
DC	220	2.4
	110	2.7
	48	5.1
	24	8.1



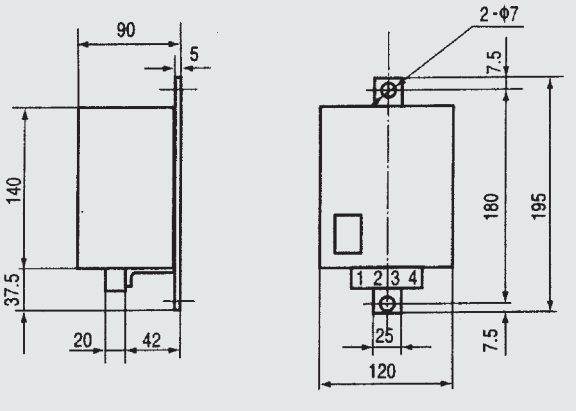
1.Fixed arc contact 2.Fixed main contact 3.Bottom base 4.Contact support 5.Soft connection pieces 6.Support 7.Contact spring 8.Connect terminal 9.Insulation level 10.Bolt 11.Adjusting screw 12.Movable contact axis 13.Movable main contact 14.Movable arc contact
A.Arc contact open distance B.Main contact open distance

Drawing 1: Contact structure sketch map



1.Electronic over current release 2.Arc extinguish cover
3.Secondary pin for control circuit 4.Main circuit terminal
5.Base for draw-out 6.Main circuit terminal
7.Inserting contact for main circuit 8.fixed arc contact
9.Movable arc contact 10.Fixed main contact
11.Movable main contact 12.Operating structure 13.Release
14.Electromagnetic instantaneous release device
15.CT(for electric over current release) 16.Movable iron core
17.Handle 18.Auxiliary switch

Drawing 2: Electromagnetic closing breaker sketch map



Drawing 3: Closing rectifier outline and installation dimension

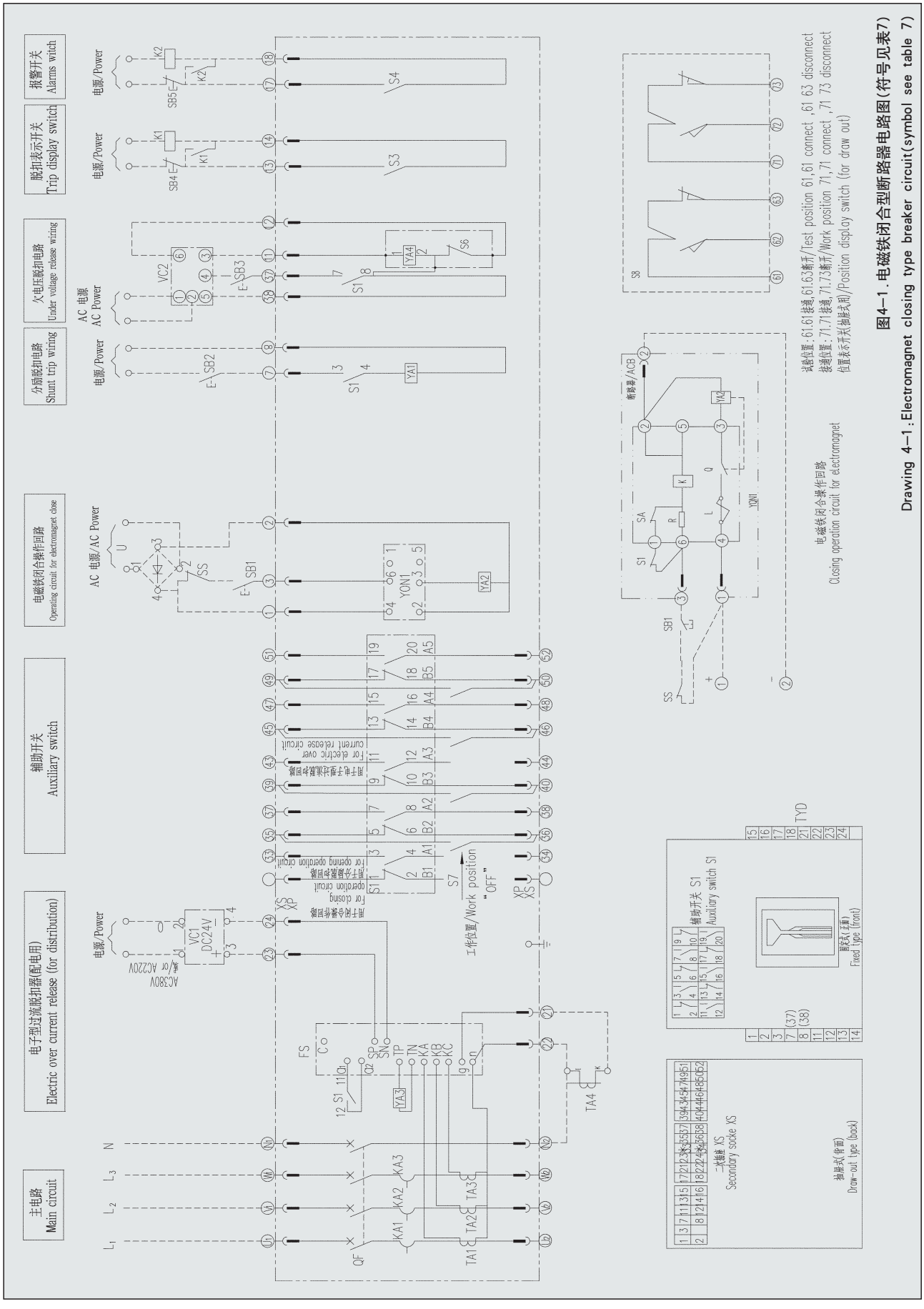


图4—1. 电磁铁闭合型断路器电路图(符号见表7)

Drawing 4—1. Electromagnet closing type breaker circuit(symbol see table 7)

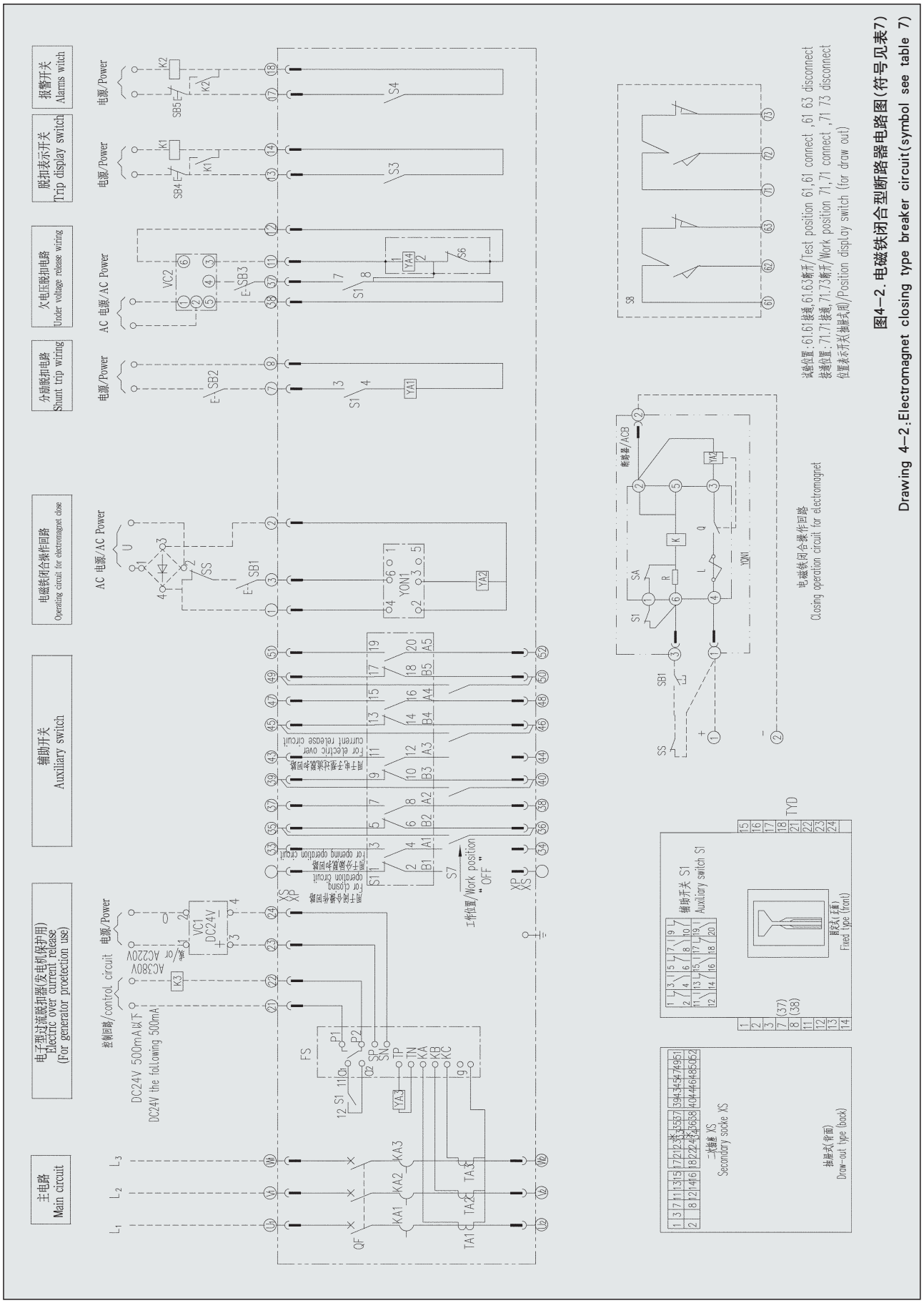


图4—2. 电磁铁闭合型断路器电路图(符号见表7)

Drawing 4—2:Electromagnet closing type breaker circuit(symbol see table 7)

表5.图4符号明细表

序号	代号	名称	符号
1	FS	电子型过电流脱扣器	AOJ
2	GJ	过电流继电器接点	
3	K	闭合操作用控制装置线圈	
4	K1～K3	继电器	用户自备
5	KA1～KA3	电磁型瞬时脱扣器	AOI
6	L	磁吹线圈	
7	Q	触头	
8	QF	断路器	DW914B-630-6300
9	S1	辅助开关	AXH(五开五闭)
10	S3、S4、S6	微动开关	
11	S7	短路接点	
12	S8	位置表示开关	ALB
13	SA	行程开关	
14	SB1～SB5	按钮	用户自备
15	SS	连锁开关	用户自备
16	TA1 TA2 TA3	电流互感器	ATB
17	TA4	电流互感器(N级)	
18	SB	放电按钮	
29	TYD	固定式断路器接线端子	接线序号与抽屉式相同
20	U	闭合操作用整流装置	ARH
21	VC1	电子脱扣器电源装置	ARO(DC24V)
22	VC2	欠电压脱扣器整流装置	ARU-1DC、1SC
23	XP	二次插头	AIH
24	XS	二次插座	AIH
25	YA1	分励脱扣器	AVH
26	YA2	合闸电磁铁	AEH
27	YA3	电子脱扣器脱扣装置	AVI
28	YA4	欠电压脱扣器	AUH-1C
29	YON1	闭合操作控制装置	ACH

(2) 电容器脱扣装置(OQB)(选用)

当分励脱扣器的电源因某种故障停止供电或因短路故障而电压显著降低时,若配置有电容器脱扣装置，则可在电源发生故障或断电30分钟内，用分励脱扣器断开断路器。

电容器脱扣装置额定电压为AC380V、AC220V，配合相同电压等级的分励脱扣器使用。

电容器脱扣装置应单独安装。其外形尺寸见图5，电路图见图6。

(3) 欠电压脱扣器(AUH-1C)

欠电压脱扣器采用直流电磁系统，其动作值与频率变化无关，欠电压脱扣器在正常工作时处于通电吸合状态。欠压脱扣器在额定电压的70%～35%范围内，应使断路器可

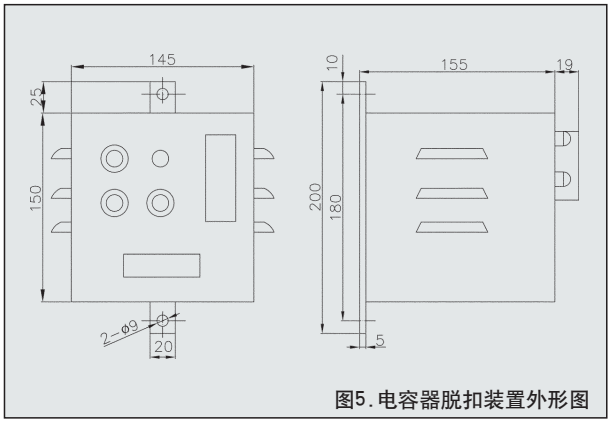


图5.电容器脱扣装置外形图

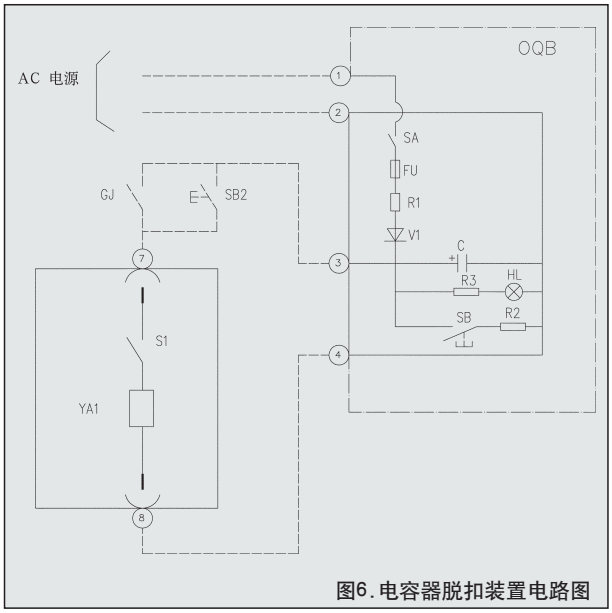


图6.电容器脱扣装置电路图

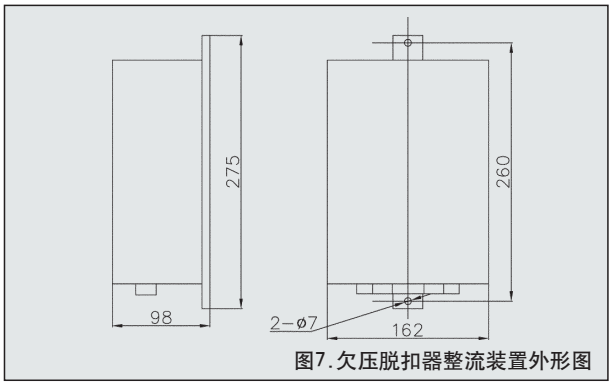


图7.欠压脱扣器整流装置外形图

靠断开，在额定电压低于35%时，断路器不得闭合，额定电压85%及以上时，断路器应可靠闭合。

欠压脱扣器额定电流为0.1A，额定电压为AC220V、AC380V、AC440V。

欠压脱扣器具有瞬时型和延时型两种。延时型脱扣器延时时间≥0.5秒，可返回系数≥0.8。交流欠压脱扣器使用时应配备整流装置(ARU-1DC延时型，或ARU-1SC瞬时型)。欠压整流装置应单独安装，其外形尺寸见图7，电

Table 5:The symbol list

No.	Symbol	Name	Sign
1	FS	Electric over current release	AOJ
2	GJ	Over current relay connection terminal	
3	K	Control device loop for closing operation	
4	K1~K3	Relay	Provided by user
5	KA1~KA3	Electromagnetic instantaneous release	AOI
6	L	Magnetic below loop	
7	Q	Contact	
8	QF	Circuit breaker	DW914B-630-6300
9	S1	Auxiliary switch	AXH(5on/5oc)
10	S3、S4、S6	Jog key	
11	S7	Short connection termina	
12	S8	Position display switch	ALB
13	SA	Journey switch	
14	SB1~SB5	Button	Provided by user
15	SS	Interlock switch	Provided by user
16	TA1 TA2 TA3	CT	ATB
17	TA4	CT (N pole)	
18	SB	Button	
19	TYD	Fixed breaker wiring terminal	Wiring number is same as draw-out type
20	U	Rectify for closing operation	ARH
21	VC1	Power supply for electric release	ARO(DC24V)
22	VC2	Rectify for under voltage release	ARU-1DC、1SC
23	XP	Secondary pin	AIH
24	XS	Secondary socket	AIH
25	YA1	Shunt trips	AVH
26	YA2	Closing electromagnet	AEH
27	YA3	Release device for electric release	AVI
28	YA4	Under voltage release	AUH-1C
29	YON1	Control device for closing operation	ACH

(2) Capacitor release device (OQB) (If Applicable)

When the power of the Shunt trips can not work because of circuit fault or short-circuit, which make the voltage fall down obviously, in such case, the Shunt trips can open the breaker within 30 minutes when the power supply fault or lose.

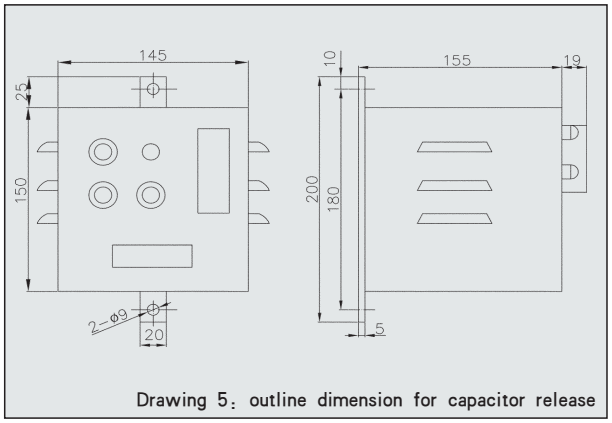
The rated voltage for capacitor release device: AC380V, AC220V, which match the equal voltage for the Shunt trips.
The capacitor release should be installed individually, drawing 5 for outline dimension and drawing 6 for the circuit wiring.

(3) Under voltage release device (AUH-1C)

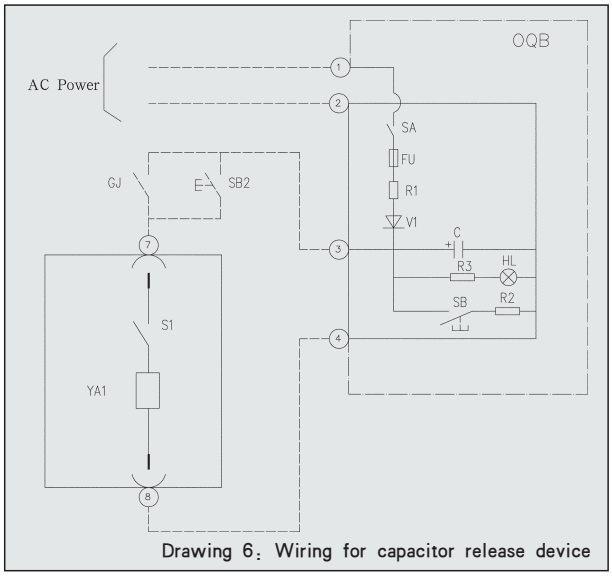
Under voltage release device adopt DC electromagnetic system, and value for acting have no relation with the frequency, Under voltage release device keep closing when work normally, Under voltage release device can open the breaker reliably within 70%--35% rated voltage, the breaker can not close when the voltage is lower than 35% rated voltage, whereas, the breaker can close reliably when the voltage is higher than and including 85% rated voltage.

Rated current: 0.1A; rated voltage: AC380V,AC440.

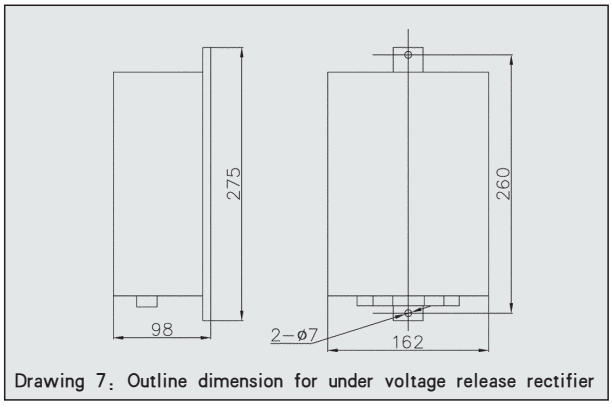
The under voltage release device have instantaneous type and delay time type, delay time ≥0.5 sec. returnable quotiety ≥0.8. AC Under voltage release device should equipped with rectifier (ARU-1DC delay time type; ARU-1SC instantaneous type. The under voltage release device should be installed individually. Drawing 7 or outline dimension and drawing 8 for the circuit wiring.



Drawing 5: outline dimension for capacitor release



Drawing 6: Wiring for capacitor release device



Drawing 7: Outline dimension for under voltage release rectifier

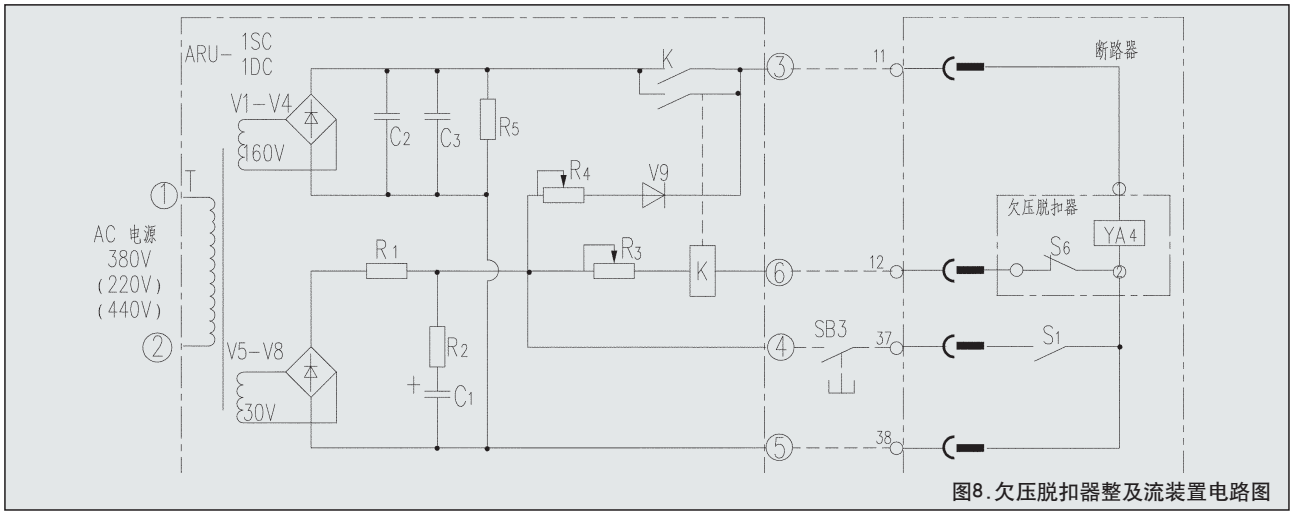


图8.欠压脱扣器整及流装置电路图

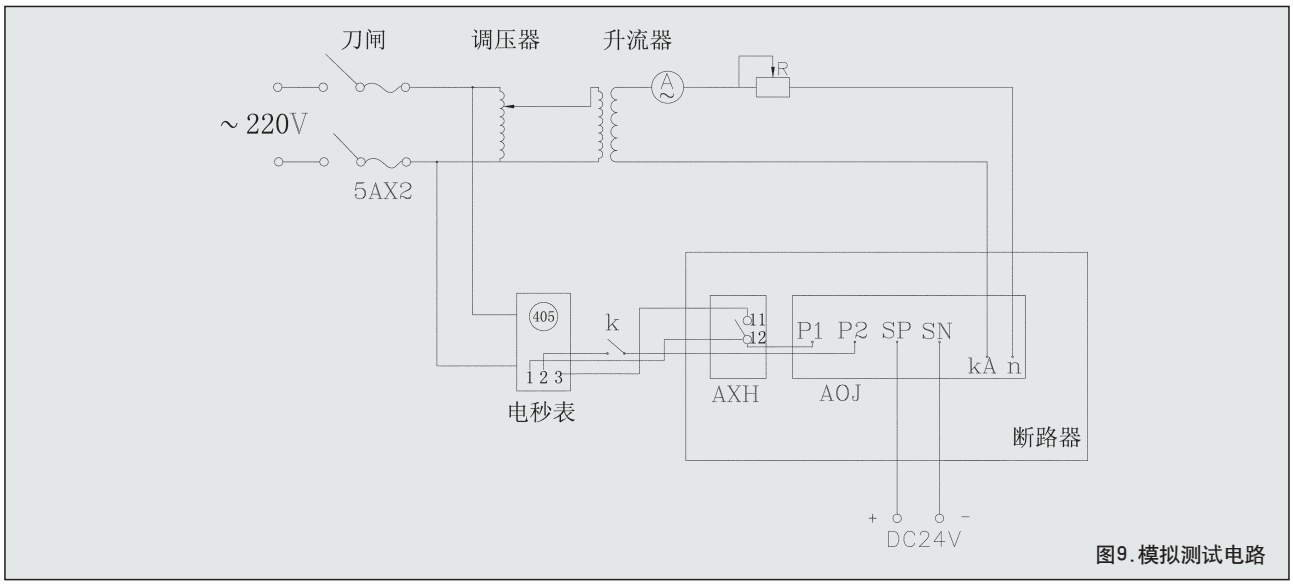


图9.模拟测试电路

路原理见图8。

注：在同一台断路器中，分励脱扣器与欠压脱扣器不能同时安装。

(4) 电子式过电流脱扣器(AOJ)

过电流脱扣器采用运算放大器和分立元件混装。它具有过载、短路保护特性。电流互感器套在断路器的出线端。(1600A以下的N极互感器厂方提供由用户安装)。过电流信号由互感器检出，经整流环节，作为过电流脱扣的信号输入。按其保护特性，可分为配电用和保护发电机用(参见表2)。

配电用电子脱扣器在进行测试时，请将试验钮子开关(在脱扣器顶部，将小盖板摘下可见)拨到试验位置(向下拨)。

过电流脱扣器的电流整定和时间整定，可用模拟方法进行，其模拟线路见图9，(检查测试时必须将电子脱扣器的KA、KB、KC、n连接线取下并短接)。如要进行精确参数整定，请向厂方订购便携式OCR测试仪，见图10。长延时、短

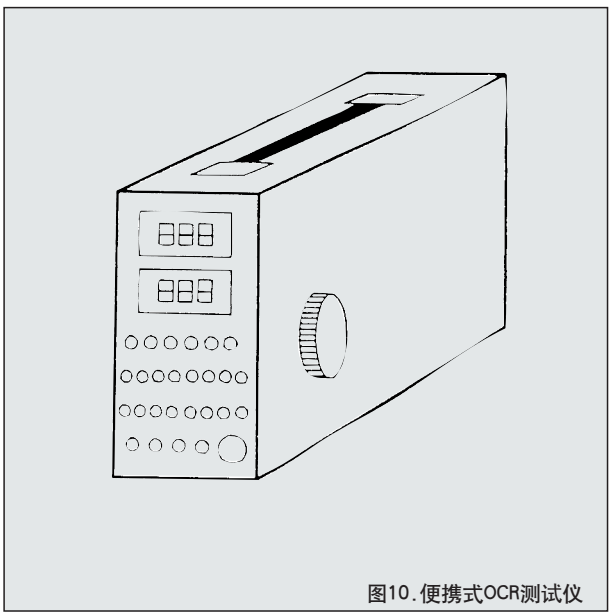
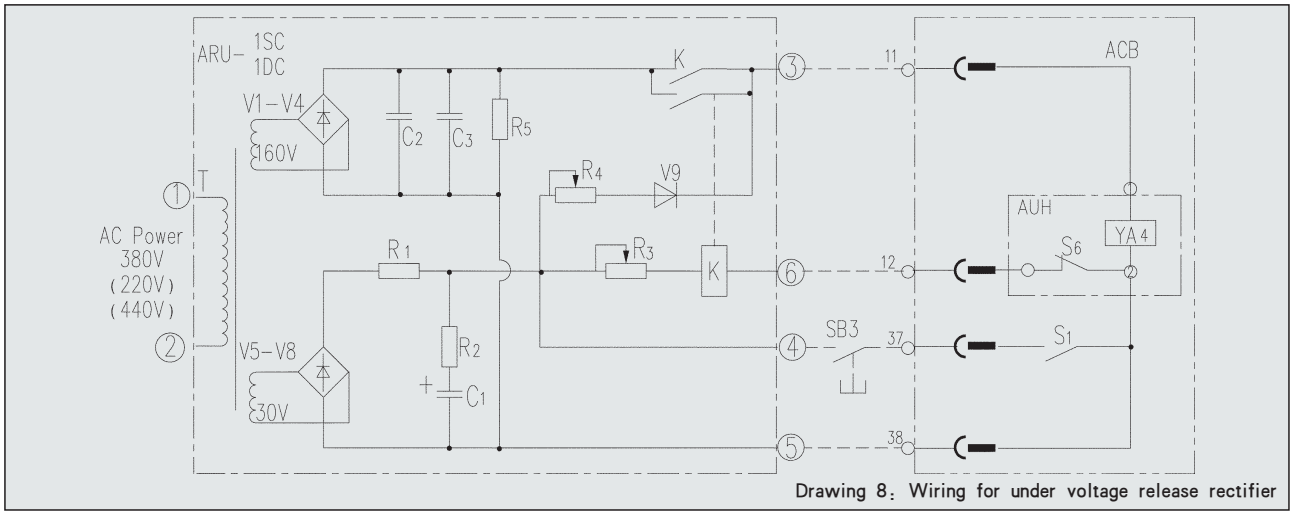


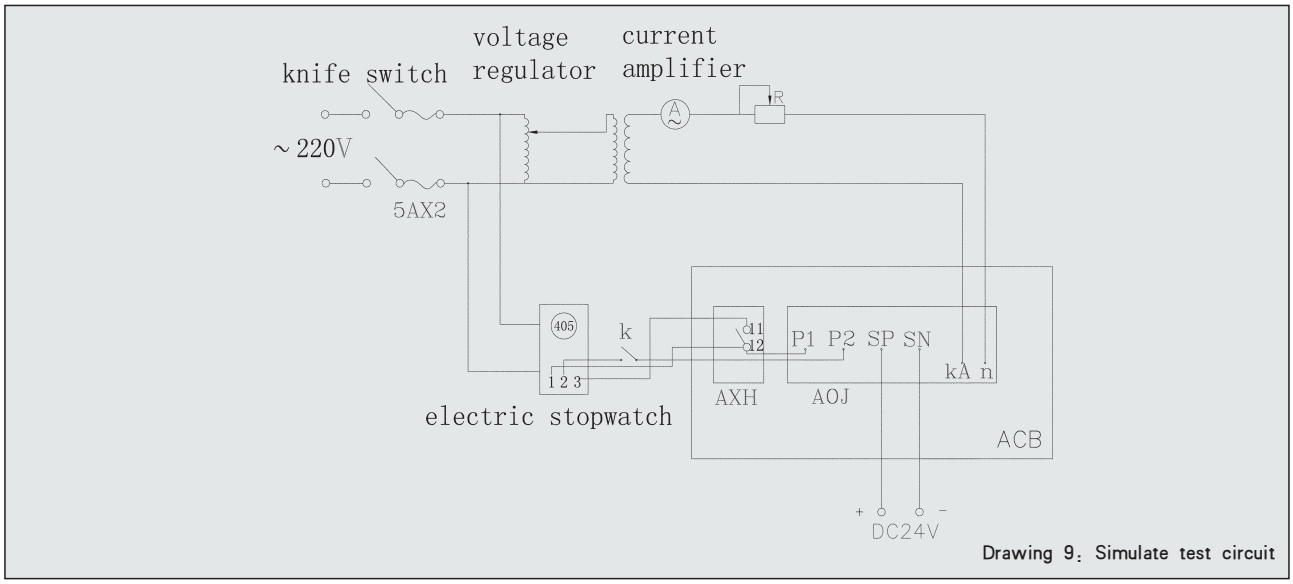
图10.便携式OCR测试仪

延时、瞬时整定调整采用单相通电或二相串联方式(见图9)。

配电用电子脱扣器，可提供故障显示型，在脱扣器面



Drawing 8: Wiring for under voltage release rectifier



Drawing 9: Simulate test circuit

Note: The Under voltage release device and Shunt trips can not be installed in one breaker at the same time.

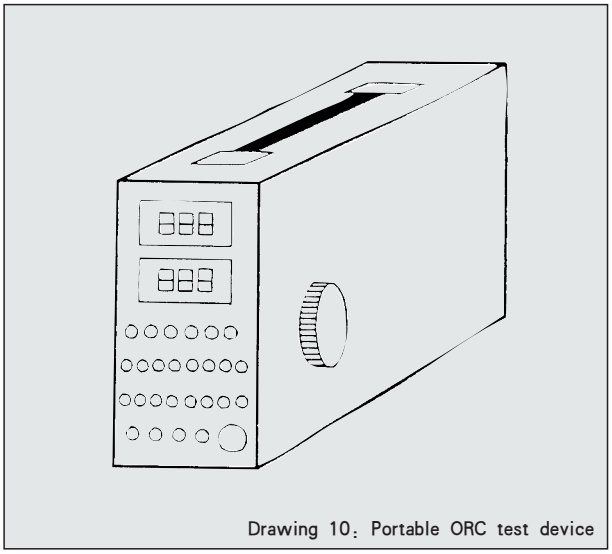
(4) Electronic over current release device (AOJ)

Electronic over current release device adopt blending assembling of operational amplifier and special components, and have protection feature of over-loading and short-circuit. Current transformer is installed on the bushing of the breaker's outlet terminal, (for the under and including 1600A, manufacture will supply the N pole of the transformer and should be installed by user.) The signal of over current, checking by the transformer and processing by the rectifier, would be input signal as over current release.

Electronic over current release device can be used to distribution and generator protection. (refer to table 2).

When Electronic over current release device for distribution test, please push the test switch to the "test position (put down)" (you can find the test switch after open the top cover).

Current setting and time setting of over current release can be set by simulation, the simulation wiring refer to drawing 9. (the connection wiring KA KB KC n should be dismantled and connected when testing), purchasing portable ORC testing device can have accurate parameter setting.(see drawing 10), long- time-delayed, short-time-delayed, instantaneous adopt single phase or two phases setting in series, (refer to drawing 9).



Drawing 10: Portable ORC test device

板上有两个发光二极管，可提供过载或短路故障显示，便于用户分析及处理故障。因过电流脱扣器而分闸的，在断路器再次投入使用前应按一次复位按钮(在脱扣器面板上)。具有显示功能的电子脱扣器使用方便，但需在SP、SN端子处加直流24V电源。接线参见图4。

(5) 电磁型瞬时过电流脱扣器(AOI)(选用)

AOI是电磁脱扣机构。电磁瞬时脱扣器的静铁芯套在断路器出线端上，当电流足够大(大于3kA)时，由于磁场力的作用，动铁芯与静铁芯吸合，与动铁芯联动的机构使脱扣轴转动，导致断路器分闸。调整动铁芯上弹簧压力，可改变瞬时整定电流。电磁脱扣须在低压大电流条件下整定，采用串联方法，即A、B相串联调整A相，再调整B相，然后B、C串联调整C相，因一般使用单位无大电流设备，此工作由生产厂出厂前根据合同要求调整好，用户勿再调整。其电流整定值参见表2。

4.其它附件

(1) 辅助开关(AXH)

辅助开关安装在断路器的左上方,其常规订货为五常开、五常闭。闭合操作电路用一对常闭接点，脱扣电路用一对常开接点，电子脱扣器用一对常开接点。详细接线见图4。其额定值见表6。有特殊要求，请与厂家协商。

表6.辅助开关额定值

电压种类	额定电压(V)	电流容量(A)
AC	440、380、220	5
DC	220、110	2.5

(2) 电子型过电流脱扣器辅助电源装置(ARO-A)

电子型过电流脱扣器辅助电源装置用于过电流脱扣器正常工作及性能校验，其外形见图11。

(3) 报警开关(选用)

当电网中出现过载或短路电流，断路器断开瞬间，报警用微动开关接点瞬间接通。用户可根据需要连接自保持电路。其额定值见表7。

表7.脱扣表示开关和报警开关额定值

附件名称	电压(V)	电流(A)
脱扣表示开关	AC220	1.0
报警开关		2.0

(4) 脱扣表示开关(选用)

当断路器因过载、短路、欠压、分励及手动脱扣等方式断开瞬间，均能使脱扣表示开关接点瞬间接通。因此用户应根据需要连接自保持回路。其额定值见表7。

(5) 位置表示开关(选用)

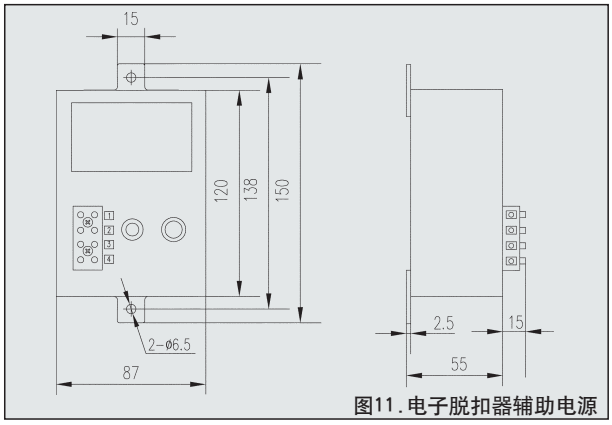


图11.电子脱扣器辅助电源

位置表示开关限抽屉式断路器使用，它装在抽屉座右下方，用于显示断路器处于连接或试验位置。

5.抽出装置(ADH)

抽出装置在断路器的抽出范围内有三个位置： 连接位置、试验位置和断开位置，断路器的每个位置都能被锁住。断路器和抽出框架的电气连接为：主电路由插入触头连接，控制电路由二次插头连接。其连接状态见表8。

表8.连接状态

断路器的位置	连接状态		备注
	主电路	控制电路	
连接位置	接通	接通	正常使用状态
试验位置	断开	接通	可进行分合操作，控制回路的动作试验。
断开位置	断开	断开	断路器完全与抽屉座脱离

(1).断路器的抽出

DW914B-630～1600见图12所示：

i.松开断路器左右侧的固定用蝶形螺钉11，取出抽出手把13，松开固定螺钉9，将抽出手把挂在抽出杠杆销17上。

ii.推手分按钮14，可搬下止动杠杆5，再将抽出手把向下按，断路器外移，当止动杠杆5复位时，断路器处于试验位置。

iii.断路器如继续往外抽，须重复步骤ii，止动杠杆复位后是断开位置。

iv.断路器在断开位置，将止动杠杆5按下来，握住拉手10，向外拉，逐渐使断路器与抽出框架的滑道脱离，因断路器比较重，抽出时要格外注意，防止碰人或把断路器撞坏。

DW914B-2000～6300见图13所示：

i.松开断路器右侧的蝶型螺母6， 取出抽出手柄7，松开安装螺钉4。

ii.搬下止动杠杆3，推手分按钮12，使其将抽出手柄7插入窗口中的蜗杆连接轴5上。按顺时针方向旋转手柄，断路器缓慢抽出，至“试验位置”时止动杠杆3复位。若进行合分

Electronic over current release device for distribution can supply fault display by two flashing LED on the panel in order to analyze and treat with fault, for the open arose by over current release device, reset should be done before closing breaker again(reset button is on the panel) Electronic over current release device with display will be easy use, but DC 24V power should be supplied on the SP, SN terminal. See drawing 4.

(5) Electromagnetic instantaneous over-current release (AOI)

AOI is electromagnetic release structure, the fixed iron core for Electromagnetic instantaneous over-current release are installed on the bushing of the outlet terminal of the breaker. When the current value is above and including 3KA, the magnetic field make the fixed movable iron core touched. Then trips, connected with fixed iron core structure, turn to make breaker open. Adjusting spring force of movable iron core can change the instantaneous setting current. And the electromagnetic release should set under high current with low voltage in series: adjust B phase after adjust A phase when A and B in series. Then adjust C phase after adjust B phase first when B and C in series. Such adjusting work should finish by manufacture before delivery according to the contract and user can not adjust again. (Current setting see table 2).

4.Other accessories

(1) Auxiliary switch(AXH)

Auxiliary switch is above breaker, and 5 ON/OC supplied in normal ordering, one OC for closing operating circuit, one ON for release circuit, one ON for electronic release. Wiring see drawing 4 and the rated value see table 6. Please confer with manufacture when special requirement.

Table 6: rated value for auxiliary switch

Voltage type	Rated voltage(V)	Current capacity(A)
AC	440、380、220	5
DC	220、110	2.5

(2) Auxiliary power supply for Electronic over-current release (ARO-A) (See drawing 11)

Auxiliary power supply for Electronic over-current release is used to checkout the work and features of over-current release.

(3) Alarm switch (If Applicable)

When overload or short current happened, jog key for alarm switch will connect when the breaker open instantaneously, the self-maintained circuit can be connect according to user's requirement. Rated value see Table 7.

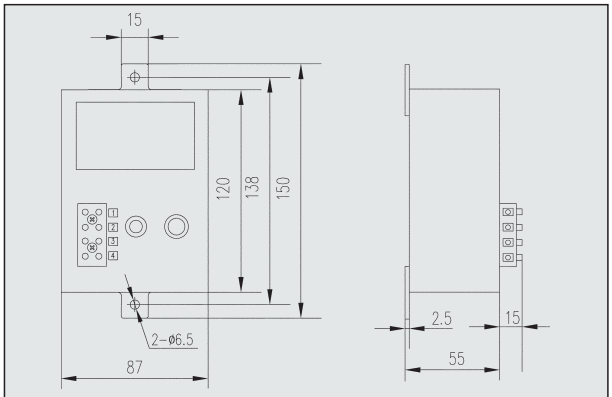
Table 7: rated value for release display and alarm switch

Accessory name	Rated voltage(V)	Current (A)
Release display switch	AC220	1.0
Alarm switch		2.0

(4) Release display switch

The release display switch would connect at the moment that breaker open caused by over-load, short-current, under voltage, shunt, manual release and so on. the self-maintained circuit can be connect according to user's requirement. Rated value see table 7.

(5) Position display switch (If Applicable)



Drawing 11. Auxiliary power supply for electric over current release

Position display switch is for withdrawable circuit-breaker and install under breaker. It used to show the TEST and WORK position of breaker.

5. Draw out device (ADH)

Draw out device have three positions during moving range of breaker: WORK TEST OPEN. And every position can be locked. The electric connection for beaker and draw out frame: plug-in contact connects the main circuit, and the secondary plug connects the control circuit. The connection see table 8.

Table 8: connection state

Position for breaker	State		note
	Main circuit	Control circuit	
work	Connect	Connect	Service status
Test	disconnect	Connect	Close and open permitted; action test of controlling circuit.
open	disconnect	disconnect	Circuit breaker isolated from drawer pedestal

(1) Draw out circuit breaker

DW914B-630—1600 see drawing 12.

i Loosen the wing bolt 11,take out the handle 13, loosen fast bolt 9, draw out handle and hang it on to lever pin 17.

ii push the hand-open button 14, can put down stop-level 5. Then push down the draw out handle, the circuit breaker move out,when stop-level 5 reset, the circuit breaker is in TEST position.

iii When breaker take out continuously, should repeat step ii, the circuit breaker is in OPEN position after stop-level 5 reset.

iv when beaker in OPEN position, push down the stop-level,take hold of handle 10 and draw out, and make the breaker separate from the slideway of draw-out frame. Caused the heavy breaker, please be careful when drawing out avoiding damage the breaker or injure person.

DW914B-2000—6300 see drawing 13.

i Loosen the wing bolt 6 on the right of breaker, take out the handle 7, loosen bolt 4.

ii Put down stop-level 3, push the hand-open button 12. Then plug the draw-out handle into worm connect axis 5 in the window, turn handle clockwise, draw out breaker slowly, the stop-level 3 reset at TEST position. Draw-out handle should take out before operate the breaker.

操作，须将抽出手柄取下，方可进行。

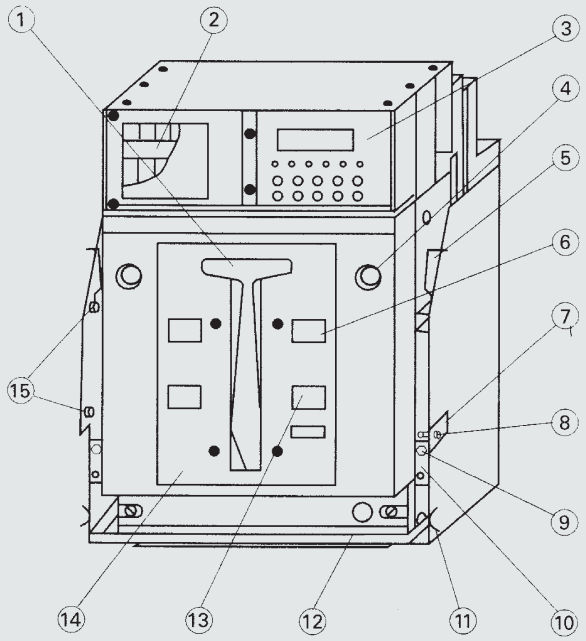
iii.断路器继续抽出，重复步骤ii，到达断开位置，止动杠杆3复位。

iv.如需将断路器完全抽出，应将延长导轨8插在抽出导轨12的端部，搬下止动杠杆3握住安装螺钉座23，将断路器抽出至延长导轨端部，再将吊钩挂在提升板2上吊起。

(2) 断路器的插入：(图12、13)

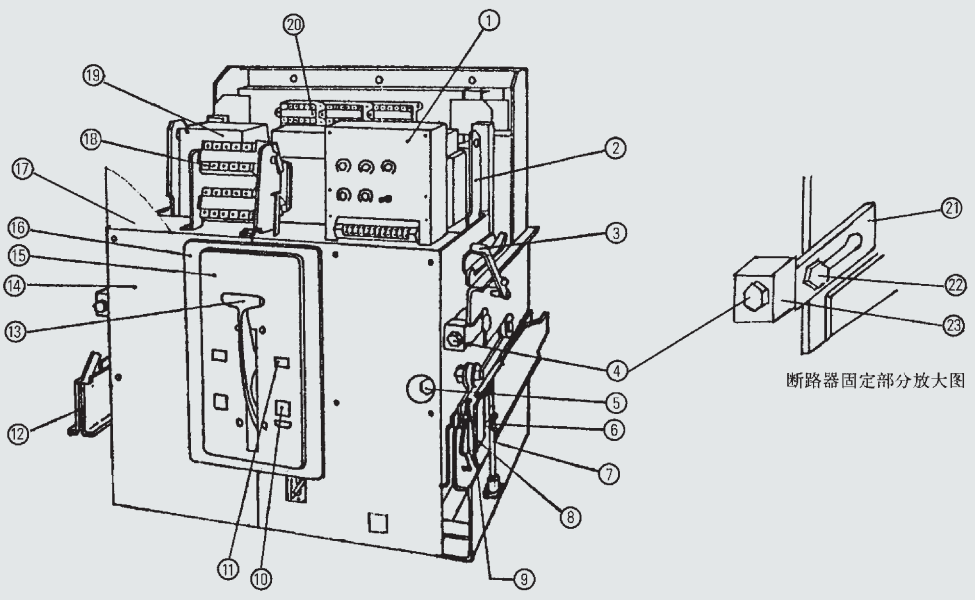
DW914B-630～1600将断路器的两侧导轨插入框架滑道，推手分按钮13，搬下止动杠杆5，将断路器依次推至断开位置、试验位置、连接位置，并使止动杠杆5复位，最后紧固螺钉9、将断路器固定在抽出框架上。

DW914B-2000～6300装上延长导轨，将断路器吊放在延长导轨上，将断路器推至抽出导轨上。拆下延长导轨8，搬下联锁杠杆3。将抽出手柄插入蜗杆联接轴5上，并沿逆时针方向旋转。依次将断路器推至“试验位置”、“连接位置”(每至一位置联锁杠杆复位，搬下联锁杠杆再旋转抽出手柄)。将抽出手柄取下，拆下延长导轨，抬起联锁杠杆，并将左右安装螺钉4紧固，插入工作完成。



1.手动合闸手柄
2.辅助开关
3.脱扣器
4.面板
5.止动杠杆
6.分合表示窗
7.试验位置固定板
8.试验位置固定螺钉
9.断路器固定螺钉
10.拉手
11.碟形螺钉
12.抽出手柄
13.手分按钮
14.面板
15.抽出杠杆销

图12.DW914B-630~1600断路器外观图



断路器固定部分放大图

1.过电流脱扣器
2.提升板
3.止动杠杆
4.安装螺钉
5.螺杆联接轴
6.蝶型螺母
7.抽出手柄
8.延长导轨
9.止动板
10.手分按扭
11.表示窗(合、分)
12.抽出导轨
13.手柄
14.面板(左、右)
15.面板
16.防尘板
17.罩
18.辅助开关
19.灭弧室
20.二次端子
21.断路器固定板
22.固定螺钉
23.安装螺钉座

图13.DW914B-2000~6300断路器外观图

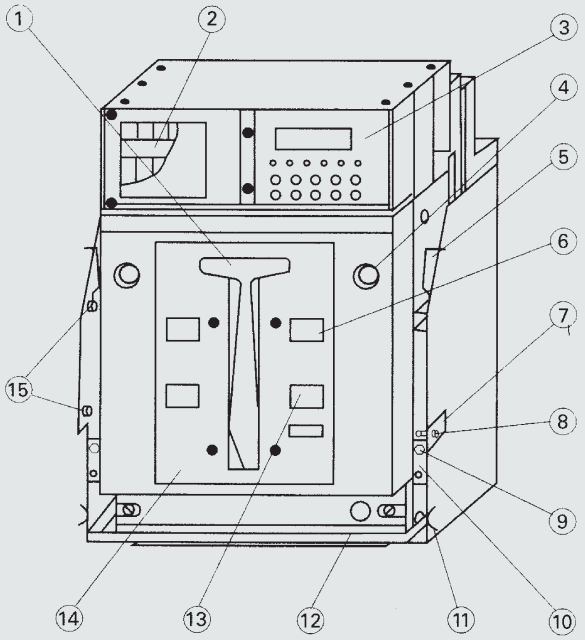
iii When breaker take out continuously, should repeat step ii, when the circuit breaker reach OPEN position, stop-level 5 reset. iv if the breaker should take out breaker completely, the extension track 8 should plug into the terminal of draw-out track 12, push down stop-level 3, and take hold of bolt base 23, and draw the breaker to the terminal of extension track, then put the pothook on the lifting panel 2 and lift the breaker.

(2) Insert circuit breaker

DW914B-630—1600 see drawing 12~13.

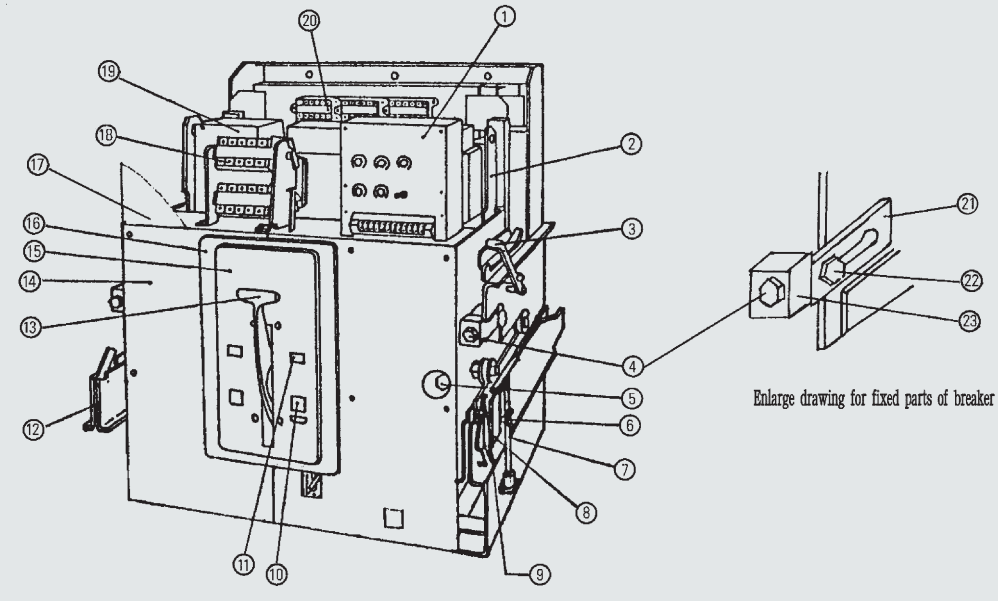
Push the railway of breaker into the frame slideway, push the hand-open button 13, can put down stop-level 5. Push the circuit breaker to TEST, work OPEN positions as you need. And make the stop-level 5 reset, then tight the fast bolt 9 and fasten the breaker inside the draw-out fame finally.

DW914B-2000—6300 install the extension railway, on which put the breaker, push the breaker to the draw out railway, and dismantle the extension railway 8 and push down the interlock level 3, plug the draw-out handle into the worm connecting axis 5, and turn anticlockwise, Push the circuit breaker to TEST, work OPEN positions as you need, (the interlock level reset in every position, push down the interlock level and then turn the draw out handle).Take off the draw out handle and dismantle extension railway, uplift the interlock level and fast the bolt 4 in two side and then finished.



1. Manual closing handle
2. Auxiliary switch
3. Release
4. Panel
5. Stop-level
6. Show window for close and open
7. Fastening plate for test position
8. Fastening bolt for test position
9. Fastening bolt for circuit breaker
10. Handle
11. Butterfly bolt
12. Draw-out handle
13. Manual open button
14. Panel
15. Drawing out level pin

Drawing 12: Outline sketch for DW914B-630—1600 breaker



Enlarge drawing for fixed parts of breaker

1. Over current release
2. Lifting plate
3. Stop-level
4. Installation bolt
5. Screw joint axis
6. Wing nut
7. Draw-out handle
8. Extension railway
9. Stop-plate
10. Handle open button
11. Show window(open, close)
12. Draw out railway
13. Handle
14. Panel(left, right)
15. Panel
16. Anti-dust plate
17. Cover
18. Auxiliary switch
19. Arc chutes
20. Secondary terminal
21. Fast plate for breaker
22. Fast bolt
23. Installation bolt base

Drawing 13: Outline sketch for DW914B-2000—6300 breaker

五.安装及外形尺寸

DW914B-630～6300万能式空气断路器安装及外形尺寸参见图14～图18。

用户在使用前应对断路器的结构和工作原理了解清楚，在断路器不带电的情况下做几次试操作。

1.断路器应垂直安装，安装架应具有足够的刚度和强度，安装架与断路器的导电部分之间，应留有足够的绝缘距离，灭弧室上方应留出规定的绝缘距离，接地应可靠。

2.断路器周围应有足够的空间，以利于检修。

3.与断路器相连的母线应先固定，无松动，母线截面应符合规范。

4.断路器安装完毕后，通电操作前测定相-相、相-地间绝缘电阻，在主电路无电压的情况下试操作几次，检查动作是否正常，控制电路是否正确。

六.使用及维护

1.断路器应保持清洁，活动零件及易磨损的零件，应涂润滑油。

2.螺栓、螺钉应紧固无松动，如有磨损或损坏的零件应及时更换。

3.灭弧室栅片的烟尘应经常擦除，栅片间不应有熔接现象。

4.接点表面应保持光洁，如有斑点或表面不平，可用200#砂纸研磨。接点厚度过薄(原厚度1/3以下)，应同时更换动静触头。

5.断路器的检查周期，由用户根据分合操作次数、合分电流、周围环境、工作条件决定。但断路器每断开一次短路电流或连续运行六个月，应检查一次。

七.故障及处理

1.检查脱扣轴复位情况，掣子再扣情况；

2.合闸动铁芯导杆的冲程是否合适，如果需要调整请与制造厂联系；

3.机构是否灵活，可适当加注润滑油；

4.欠压脱扣器、分励脱扣器、合闸整流装置是否正常，如不正常应维修或更换。

提示：本说明书所涉及的内容，包括文字、图形、参数等，如做任何修改，恕不另行通知！

注意人身健康与安全，加强环境保护，做好包装物及废弃物的处理！

V.Installation and outline dimension

AHB series all-purpose ACB installation and outline dimension see drawing 14—18.

The user should be familiar to principle and structure, and have following trial operation without power.

1.The breaker should be installed upright and the base should be enough in strength and intensity.And the electric parts between the breaker and base should remain enough insulation space, arc chutes should remain enough insulation space and earthed reliably.

2.Enough space around the break should remain in order to maintain.

3.The bus bar connected with breaker should be fast first and the section of bus should meet the criterion.

4.After installation, insulation resistance of phase to phase, phase to earth should be check before electrify the breaker. Try the operation several times without voltage of main circuit and check the act and control circuit correct or not.

VI.Use and maintain

1.Keep the breaker clean and lubricate the active parts and easy-wear part.

2.Bolt and nut should be fast and replace the wear parts or damaged parts in time.

3.The bars of arc chutes should often be cleaned and without melting between bars.

4.The contact interface should be smooth and clean without spot which can be get off by 200# sand paper; replace the fixed and movable contacts when the thickness of interface should no less than 1/3 of initial thickness.

5.Examine period of breaker should be ranged according to the operating times, making and breaking current, surrounding temperature and working condition. But the breaker should examine for one time after switching off the short current for one time or keep running for six months.

VII. Fault and treatment

(1) Checking reset of the trip axis and release;

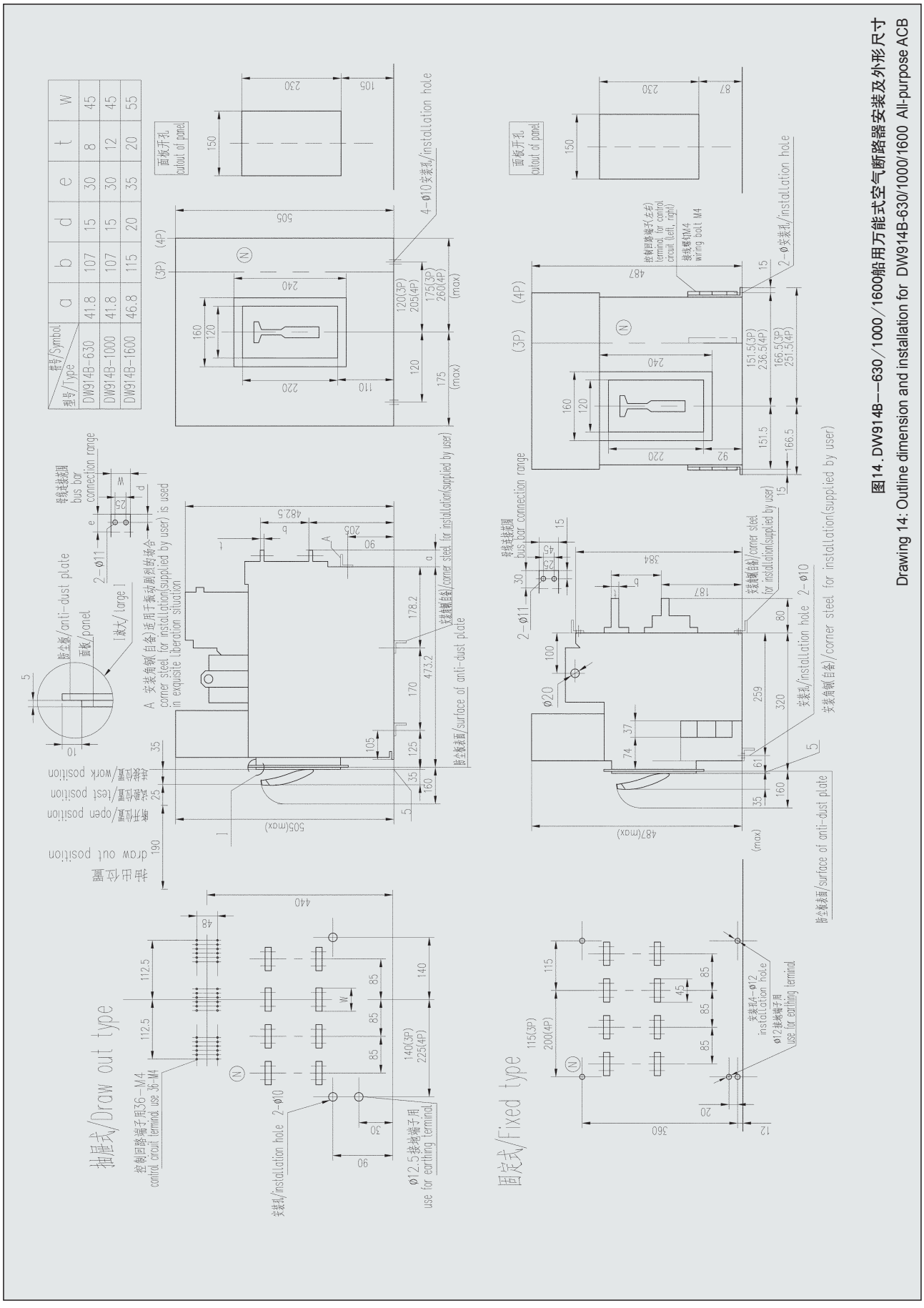
(2) Checking journey of closing movable iron core suitable or not, and contact with the manufacture if necessary;

(3) The structure is flexible or not, lubricates it if necessary;

(4) Under voltage release, s=hunt trip release, closing rectifier is in normal condition, if not, please repair or replace.

Note: All the contents covered in this specification, including words, diagram, parameters etc, can be modified without prior notice.

Sweet hint: Attach importance to human health & safety. Strengthen environment protection. Properly dispose of the wrapped and wastes.



型号/Type \ 符号/Symbol	a	b	d	e	t	W
DW914B-630	41.8	107	15	30	8	45
DW914B-1000	41.8	107	15	30	12	45
DW914B-1600	46.8	115	20	35	20	55

图14. DW914B—630/1000/1600船用万能式空气断路器安装及外形尺寸

Drawing 14: Outline dimension and installation for DW914B-630/1000/1600 All-purpose ACB

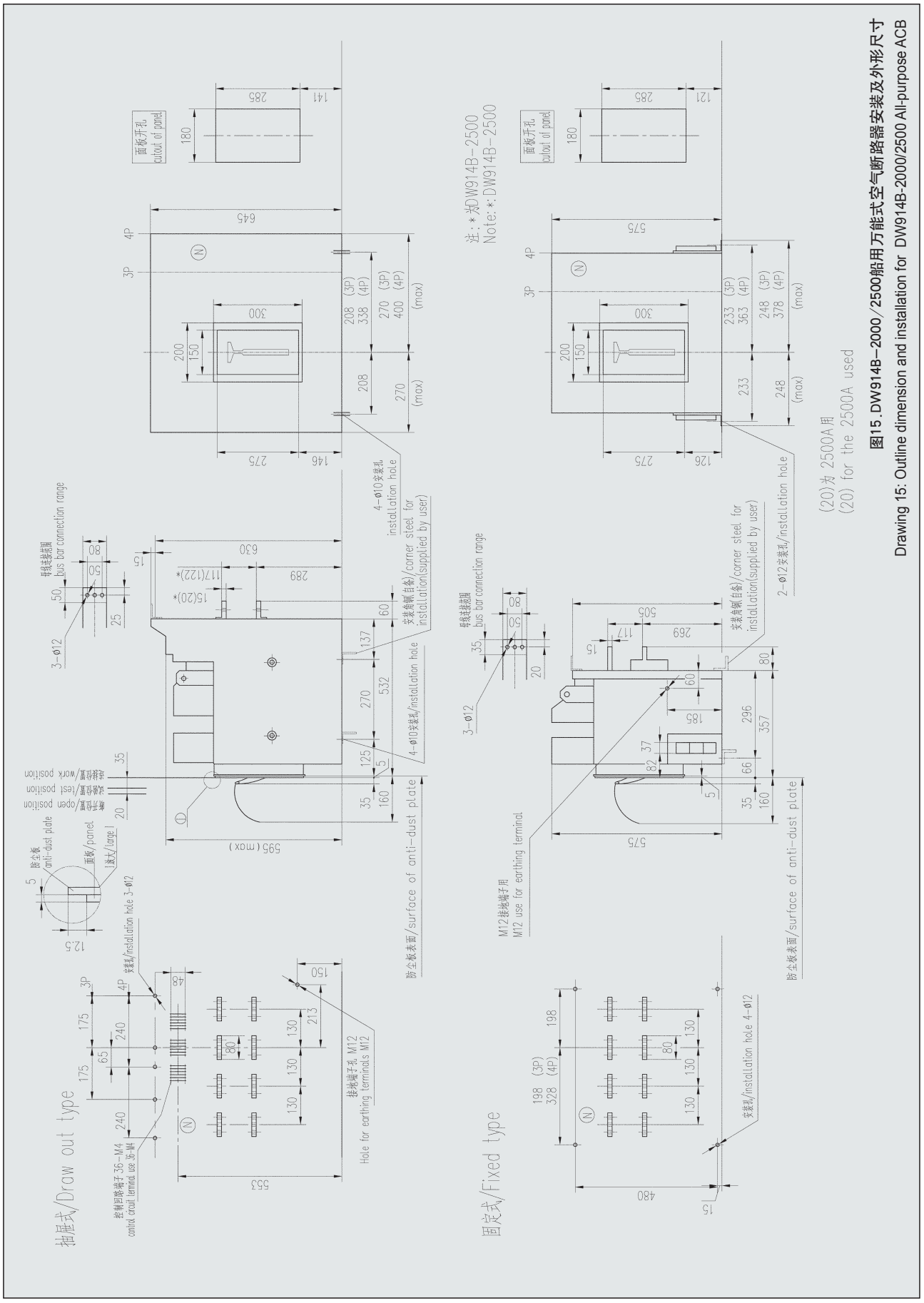


图15.DW914B—2000／2500船用万能式空气断路器安装及外形尺寸

Drawing 15: Outline dimension and installation for DW914B-2000/2500 All-purpose ACB

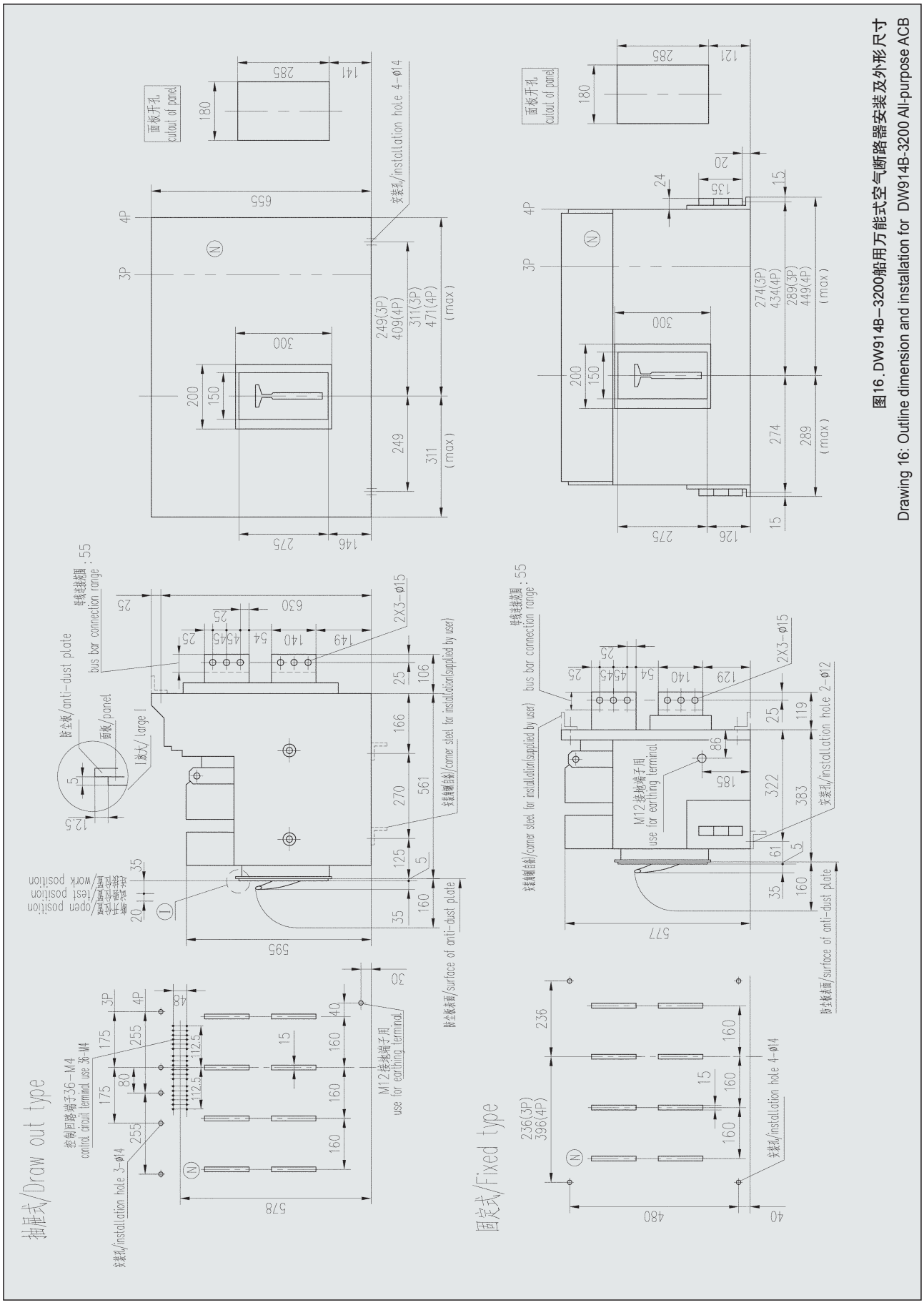


图16. DW914B—3200船用万能式空气断路器安装及外形尺寸

Drawing 16: Outline dimension and installation for DW914B-3200 All-purpose ACB

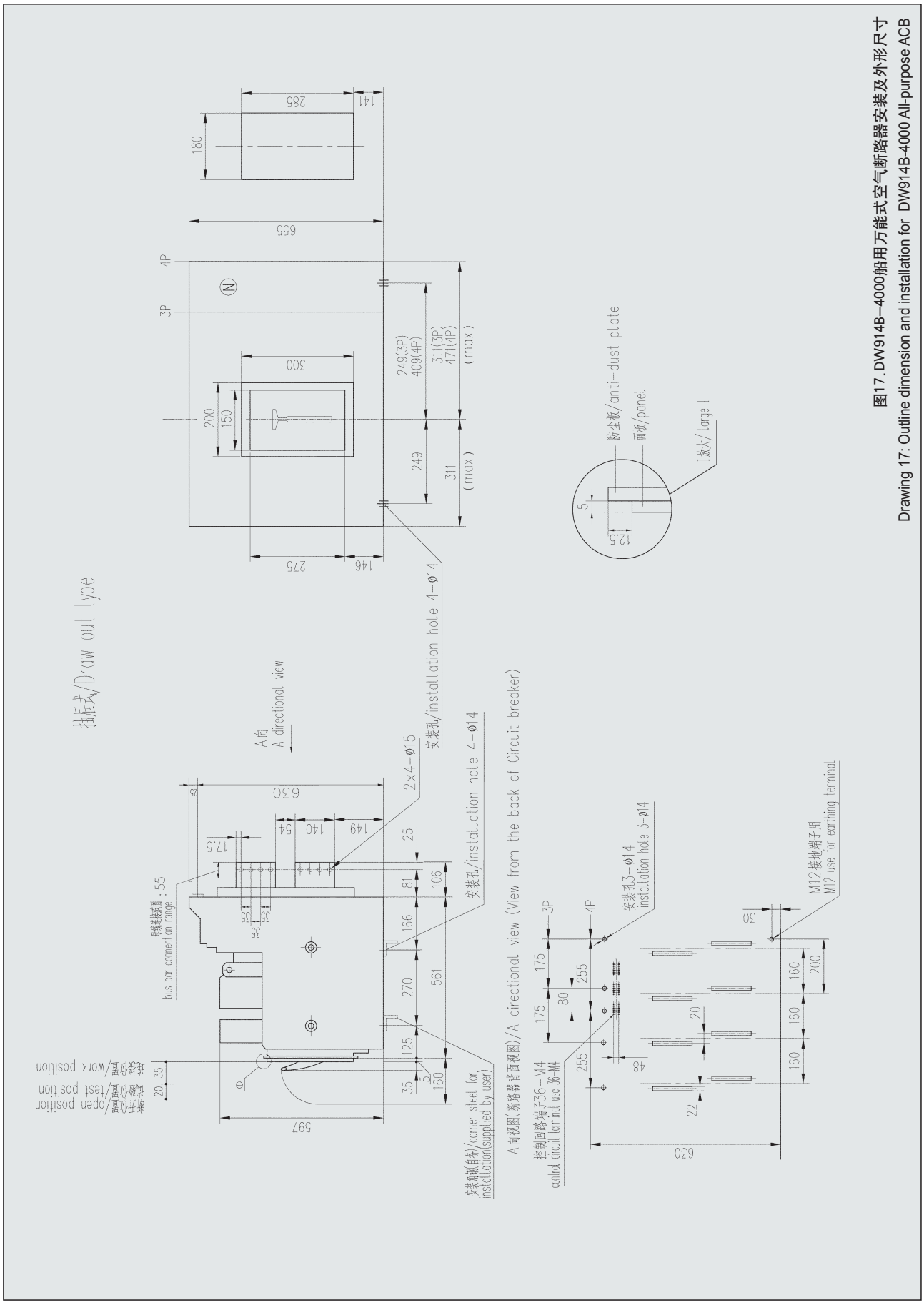


图17. DW914B—4000船用万能式空气断路器安装及外形尺寸

Drawing 17: Outline dimension and installation for DW914B-4000 All-purpose ACB

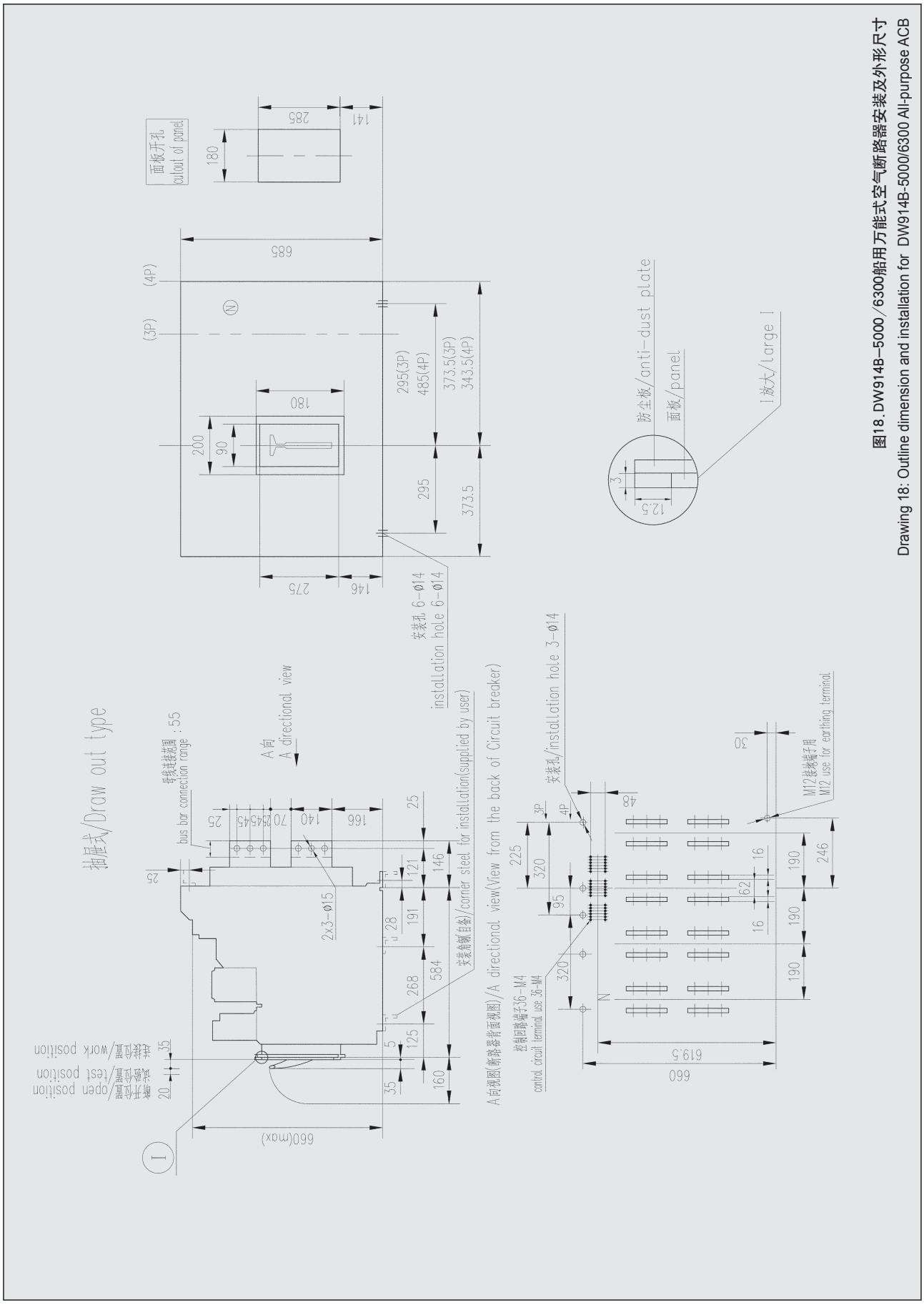


图18. DW914B–5000／6300船用万能式空气断路器安装及外形尺寸

Drawing 18: Outline dimension and installation for DW914B-5000/6300 All-purpose ACB