

XGN □ -40.5

箱型固定式交流金属封闭开关设备

XGN □ -40.5 Box-type fixed AC metal-enclosed switchgear



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概述 Summary

XGN □ -40.5 箱型固定式交流金属封闭开关设备是根据 GB3906-200 《3.6kV~40.5kV 交流金属封闭开关设备和控制设备》进行设计。其外壳符合 GB 4208-2008 规定的 IP2X 防护等级。本开关设备系三相交流 50Hz 单母线及带母线旁路系统的户内成套装置，作为接受和分配 35kV 的网络电能之用。

XGN □ -40.5 box type fixed AC metal enclosed switchgear is designed according to GB3906-200 3.6kV~40.5kV AC Metal Enclosed Switchgear and Control Equipment. Its shell complies with IP2X protection grade specified in GB 4208-2008. The switchgear is a three-phase AC 50Hz single bus and indoor complete set device with bus bypass system for receiving and distributing 35kV network power.

型号含义 Type meaning



使用环境条件 Environmental conditions

- ◇ 海拔高度：不超过 1000m；
- ◇ 环境温度：上限 +40°C，下限 -5°C；
- ◇ 相对湿度：日平均值不大于 85%，(+25°C时)；
- ◇ 地震烈度：没有剧烈震动和颠簸及垂直倾斜不超过 5°的场所；
- ◇ 环境条件：没有爆炸危险的场所。

注：超出上述正常使用条件时，用户可与我公司协商确定。

- ◇ Altitude: no more than 1000m;
- ◇ Ambient temperature: upper limit+40 °C , lower limit - 5 °C ;
- ◇ Relative humidity: the daily average value is not more than 85% (at+25 °C);
- ◇ Seismic intensity: there is no violent vibration and turbulence, and the vertical inclination is not more than 5 ° ;
- ◇ Environmental conditions: no explosion hazard.

Note: Users can negotiate with our company when the above normal use conditions are exceeded.

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开关柜主要技术参数 Main technical parameters of switch cabinet

◆ 高压柜技术参数 Technical parameters of high-voltage cabinet

名称 Name	单位 Unit	参数 Parameter	
额定电压 Rated voltage	kV	40.5	
最大额定电流 Maximum rated current	A	2000	
额定开断电流 Rated breaking current	kA	25	31.5
额定关合电流 (峰值) Rated making current (peak value)	kA	63	80
极限通过电流峰值 Peak value of limit passing current	kA	63	80
额定短时耐受电流 (4s) Rated short-time withstand current (4s)	kA	25	31.5
外形尺寸 (宽 × 深 × 高) Overall dimension (Width × Deep × High)	mm	1918 × 3250 × 3125	
防护等级 Degree of protection		IP2X	
重量 Weight	kg	约 1500 About 1500	

◆ GN27-35 隔离开关技术参数 Technical parameters of GN27-35 disconnector

型号	额定电压 (kV)	额定电流 (A)	短时耐受电流 (4s)(kA)	峰值耐受电流 (kA)
GN27-35/630-20	40.5	630	20	50
GN27-35/1250-31.5	40.5	1250	31.5	80
GN27-35/2000-40	40.5	2000	40	100

◆ P-C 式过电压吸收器主要技术参数 Main technical parameters of P-C overvoltage absorber

型号 Model	额定电压 (kV) Rated voltage	额定电容 (MF) Rated capacitance	电阻 (Ω) Resistanc	工频介电试验电压 1min (kV) Power frequency dielectric test voltage 1min	重量 (kg) Weight	说明 Description
LG36-0.05/100-1	36	0.5	100	100	22	
LG36-0.1/100-1	36	0.1	100	100	22	
LGQ36-0.05/100-1	36	0.05	100	100	27	Q 型 Type
LGQ36-0.1/100-1	36	0.05	100	100	27	Q 型 Type
LG36-0.5/300-1	36	0.05	300	300	27	
LG36-0.05/30-1	36	0.05	300	300	27	Q 型 Type

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◆ 真空断路器主要技术参数 Main technical parameters of vacuum circuit breaker

名称 Name	单位 Unit	参数 Parameter		
额定电压 Rated voltage	kV	40.5		
额定电流 Rated current	A	1250	1600	2000
额定短路开断电流 Rated short-circuit breaking current	kA	25		31.5
额定峰值耐受电流 (峰值) Rated peak withstand current (peak value)	kA	63		80
额定短路耐受电流 (4S) Rated short-circuit withstand current (4S)	kA	25		31.5
额定短路关合电流 (峰值) Rated short-circuit making current (peak value)	kA	63		80
额定短路电流开断次数 Breaking times of rated short-circuit current	次	20		
额定操作顺序 Rated operating sequence		分 -0.3s- 合分 180s- 合分 O-0.3s-CO 180s-CO		
额定频率 Rated frequency	Hz	50		
额定雷电冲击耐受电压 (全波) Rated lightning impulse withstand voltage (full wave)	kV	185		
额定短时工频耐受电压 (min) Rated short-time power frequency withstand voltage (min)	kV	90		
合闸时间 Closing time	ms	≤ 90	≤ 200(配 CD10), ≤ 100(配 CT) ≤ 200 (with CD10); ≤ 100 (with CT)	
分闸时间 Opening time	ms	≤ 75	4 ≤ 60	
机械寿命 Mechanical life	次 Times	10000 6000*	6000(配 CD10); 10000(配 CT) 6000 (with CD10); 10000 (with CT)	
额定电容器组合开断电流 Rated combined breaking current of capacitor	A	630	400	
额定电流开断次数 Rated current breaking times	次 Times		6000(配 CD10); 10000(配 CT) 6000 (with CD10); 10000 (with CT)	
储能电动机额定功率 Rated power of energy storage motor	W	275	150-6000	
储能电动机额定电压 Rated voltage of energy storage motor	V	AD/DC 110	AD/DC 220	
储能时间 Energy storage time	s			
合分闸电磁铁额定电压 Rated voltage of closing and opening electromagnet	V	DC220 DC110	-(110)220,380,-110,220	
过流脱扣器额定电流 Rated current of overcurrent release	A	5		
辅助开关额定电流 Rated current of auxiliary switch	A	AC10	DC5	
触头允许磨损累计厚度 Allowable accumulated thickness of contact wear	mm	3		
总重量 Total weight	kg	450		
回路电阻 Loop resistance	μΩ	≤ 50		

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◆ 六氟化硫断路器的技术参数 Technical parameters of sulfur hexafluoride circuit breaker

名称 Name		单位 Unit	参数 Parameter		
额定电压 Rated voltage		kV	40.5		
额定绝缘水平 Rated insulation level	雷电冲击耐压 (全波) Lightning impulse withstand voltage (full wave)	kV	185		
	工频耐压 (1min) Power frequency withstand voltage (1min)		95		
额定频率 Rated frequency		Hz	50		
额定电流 Rated current		A	1250	1250	1600
额定短路开断电流 Rated short-circuit breaking current		kA	16	25	25
额定操作顺序 Rated operating sequence			分 -0.3s- 合分 180s- 合分 O-0.3s-CO 180s-CO		
额定短路关合电 Rated short-circuit making current		kA	63		
额定峰值耐受电流 (动稳定电流) Rated peak withstand current (dynamic stability current)			40	63	63
额定短时耐受电流 (热稳定电流) Rated short-time withstand current (thermal stability current)		kA	40	25	63
额定短时持续时间 (热稳定电流) Rated short-time duration (thermal stability current)		s	16	4	25
			LN2-40.5/1250-16	LN2-40.5 II /1250-16	LN2-40.5 III /1250-16
额定电流 Rated current		A	630		
开合单个电容器组开合电流 Switching current of single capacitor bank		A	630		
额定电流下的累计开断次数 Cumulative breaking times under rated current		次 Times	600		
额定短路开断电流下的累计开断次数 Cumulative breaking times under rated short-circuit breaking current		次 Times	30		
机械寿命 Mechanical life	电磁机构 Electromagnetic mechanism	S			
合闸时间 Closing time	弹簧机构 Spring mechanism		≤ 0.2		
储能时间固有分闸时间 Energy storage time inherent opening time	当操作电压分为 When the operating voltage is divided into	最低 Minimum	≤ 0.1		
		额定 Rated	≤ 0.01		
		最高 Highest	≤ 0.06		
六氟化硫气体额定压力 (20°C时压力表) Rated pressure of sulfur hexafluoride gas (pressure gauge at 20 °C)		Mpa	≤ 0.65		
闭锁压力 (20°C时压力表) Locking pressure (pressure gauge at 20 °C)			130	0.95	135
年漏气率 Annual air leakage rate			≤ 1%		
六氟化硫气体水份含量 Moisture content of sulfur hexafluoride gas		ppm(V)	≤ 150		
配用弹簧操动机构的 额定操作电压 Rated operating voltage of spring operating mechanism	合闸线圈 Closing coil	V	交流 AC 110、220、380		
	分闸线圈 Opening coil		直流 DC 110、220		
配用电磁操作机构的 额定操作电压 Rated operating voltage of electromagnetic operating mechanism	电动机 Motor		交流 AC 110、220、380		
			直流 DC 110、220		
	合闸线圈 Closing coil		直流 DC 110、220		
	分闸线圈 Opening coil		直流 DC 110、220		
重量 Weight	断线本体 Broken body	kg	130		
	六氟化硫气体 Sulfur hexafluoride gas		130	1.5	135

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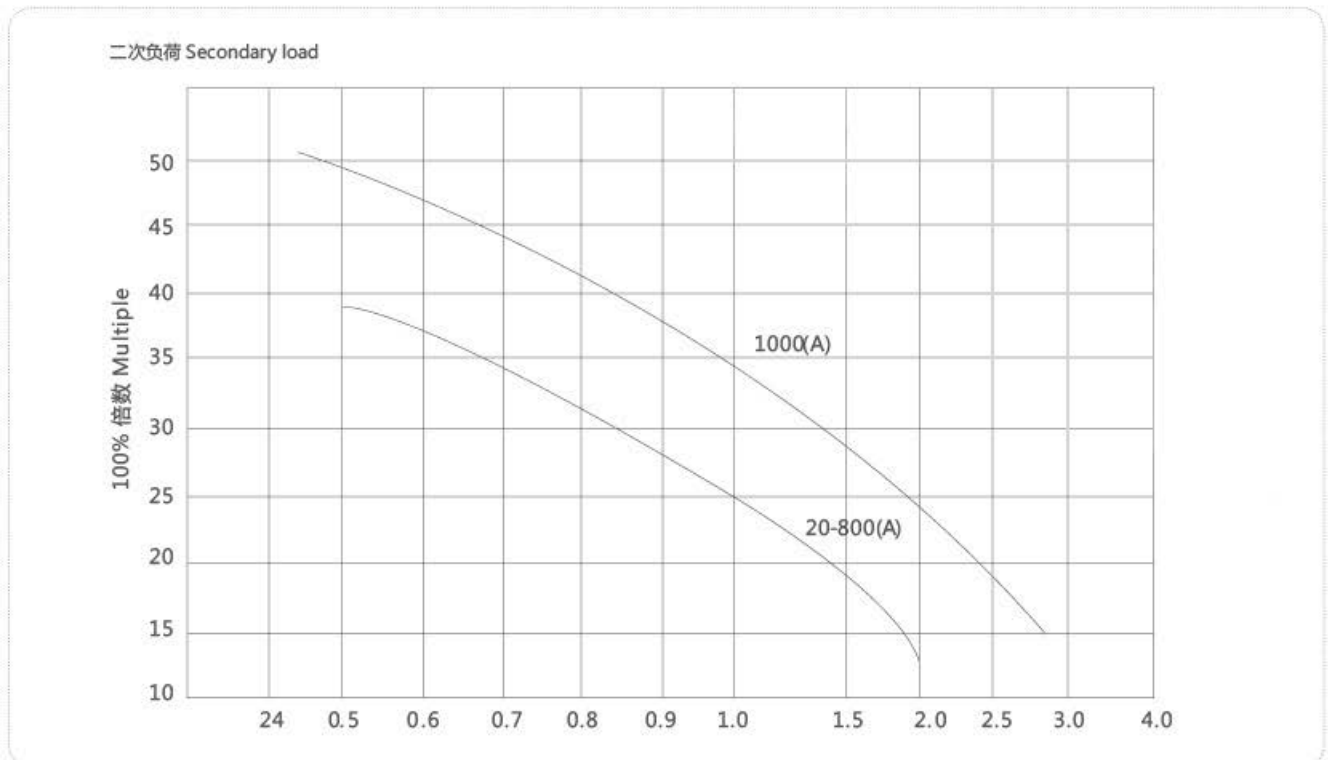
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◆ LCZ-35 电流互感器技术参数 Technical parameters of LCZ-35 current transformer

次级组合 Secondary combination	额定一次电流 (A) Rated primary current	额定二次电流 (A) Rated secondary current	准确级次 Accuracy level	额定二次负荷 (VA) Rated secondary load	10% 倍数不小于 10% multiple not less than
0.5/10P10 0.5/0.5 10P 15/10P 15	200-1000	5	10P10	50	10
0.5/10P15 10P10/10P 10	20-800		10P15	20	15
0.5/10P20 10P20/10P20	1000		10P20	20	20

◆ LCZ-35 电流互感器技术参数 Technical parameters of LCZ-35 current transformer

额定一次电流 (A) Rated primary current	额定短时耐受电流 (kA) Rated short-time withstand current	额定峰值耐受电流 (kA) Rated peak withstand current	额定一次电流 (A) Rated primary current	额定短时耐受电流 (4s) (kA) Rated short-time withstand current (4s)	额定短时耐受电流 (kA) Rated short-time withstand current
20	1.3	4.2	200	200	42.5
30	2	6.4	300	300	63.6
40	2.6	8.5	400	400	84.6
50	3.3	10.6	600	600	84.9
75	4.9	16	800	800	127.3
100	6.5	1.2	1000	1000	112
150	9.8	31.5			141.4



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◆ 电压互感器技术参数 Technical parameters of voltage transformer

型号 Model	一次线圈 a.x Primary coil a.x	额定电压 (V) 基本二次线圈 a.x Rated voltage (V) Basic secondary coil a.x	辅助二闪线圈 aD.XD Auxiliary two flash coil aD.XD	0.5 级时 Level 0.5	额定短容量 (kA) Rated short capacity		最大容量 (kA) Maximum capacity
					1 级时 Level	3 级时 Level	
JDZ9-35	35000	100	-	50	250	500	1000
JDZX9-35	35000/√3	100/√3	100/3	150	250	500	1000

◆ RN2 高压熔断器技术参数 Technical parameters of RN2 high-voltage fuse

额定电压 (kV) Rated voltage	额定电流 (A) Rated current	额定容量三相 (MkA) Rated capacity three-phase	开断电流 (kV) Breaking current	当切断极限短路电流时的最大电流峰值 (kA) Maximum current peak when limiting short-circuit current is cut off	熔丝电阻 (Ω) Fuse resistance
35	0.5	1000	17	700	315

◆ 35kV 无间隙氧化避雷器技术参数 Technical parameters of 35kV gapless oxidation arrester

避雷器型号 Arrester model	HY5WZ-52.7/134	HY5WR-52.7/134
系统标称电压 (Vrms) Nominal system voltage (Vrms)	35	
避雷器额定电压 (kVrms) Rated voltage of arrester	52.7	
避雷器持续运行电压 (kVrms) Continuous operation voltage of arrester (kVrms)	40.5	
直流参考电压 (μ1mA) 不小于 (峰值 kV) DC reference voltage(μ1mA) not less than (peak kV)	74.5	
残压 (8/20μs) 5kA 下不小于峰值 (kV) Residual pressure (8/20 μ s) Not less than peak value (kV) under 5kA	134	
方案通流容量 (2ms)(A) 值 (kV) Scheme through current capacity (2ms)(A) value (kV)	200	400
冲击波通流容量 (4/10μs)(kV) Shock wave flow capacity (4/10μs)(kV)	40	
总高度 H(mm) Total height H (mm)	600	
爬电比距不小于 (cm/kV) Creepage specific distance is not less than (cm/kV)	2.5	

注：

HY5WZ-52.7/134 为额定电压 52.7kV 电站型

HY5WR-52.7/134 为额定电压 52.7kV 并联补偿

Note:

HY5WZ-52.7/134 is a power station type with rated voltage of 52.7kV

HY5WR-52.7/134 is parallel compensation with rated voltage of 52.7kV

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主要结构特点 Main structural features

XGN □ -40.5 箱型固定式交流金属封闭开关设备为固定式结构，其基本骨架均由型钢及钢板弯制作焊接而成，柜体外壳具有 IP2X 防护等级。本开关设备主要由前柜和后柜拼装而成，接不同的用途设置相应的功能单元，柜内带电体间均以空气绝缘为主，各项带电体之间及对地之间的绝缘距离不小于 300mm。

XGN □ -40.5 Box type fixed AC metal enclosed switchgear is of fixed structure, its basic skeleton is made of section steel and steel plate by bending and welding, and the cabinet shell has IP2X protection grade. The switchgear is mainly assembled from the front cabinet and the rear cabinet. Corresponding functional units are set up for different purposes. The electrified bodies in the cabinet are mainly air insulated. The insulation distance between each electrified body and the ground is not less than 300mm.

◆ 前柜

前柜设置了主母线及母线隔离开关室、断路器室、继电器室等，主母线及母线隔离开关室在该柜上方，断路器室设置在该柜下方，该室还设置有电流互感器，两室间有绝缘板隔开，通过母线套管相连。继电器设置在该柜正前面的中部，小母线端子共 15 节，并设有二线电缆通道，端子室设在左下小门内，可安装 JH10 型端子 80 以上，该室下方还设置有 M12 的接地螺栓供辅助回路接地之用，右小门为维修通道。端子室上方为操作面板，可装设辅助开关。

◆ Front cabinet

The front cabinet is equipped with main bus and bus disconnecter room, circuit breaker room, relay room, etc. The main bus and bus disconnecter room is above the cabinet, and the circuit breaker room is below the cabinet. The room is also equipped with current transformers. The two rooms are separated by insulating plates and connected by bus bushings. The relay is set in the middle of the front of the cabinet. There are 15 small bus terminals, and a two-wire cable channel is set. The terminal room is set in the lower left small door, which can install more than 80 JH10 terminals. M12 grounding bolts are also set below the room for the grounding of the auxiliary circuit, and the right small door is the maintenance channel. Above the terminal room is the operation panel, which can be equipped with auxiliary switches.

◆ 后柜

后柜用螺栓与前柜相连，该柜根据客户要求可设置旁路母线及隔离开关，架空进出线也由该柜通过，设置旁路母线时，架空出线未达到安全高度，需增设小附柜或遮拦网。不设置旁路母线时，架空进出线可以从后柜顶部通过。该柜还可安装电压互感器避雷器，联络母线和电缆进出线安装在此柜。后门为对开门结构，若带电显示器提示没电，可打开后门，主母线室与后柜用隔板隔开。

◆ Rear cabinet

The rear cabinet is connected to the front cabinet with bolts. According to the customer's requirements, the cabinet can be equipped with bypass buses and disconnectors, and the overhead incoming and outgoing lines also pass through this phase. When the bypass bus is set, the overhead outgoing lines do not reach the safe height, so small additional cabinets or shielding nets need to be added. When the side bus is not set, the overhead incoming and outgoing lines can pass through the top of the rear cabinet. The cabinet can also be installed with voltage transformer arrester, and the interconnection bus and cable incoming and outgoing lines are installed in this cabinet. The back door is a double door structure. If the live display indicates that there is no power, the back door can be opened, and the main bus room and the rear cabinet are separated by partitions.

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产品结构及安装尺寸 Product structure and installation dimensions

◆ 开关柜结构见图 The structure of switch cabinet is shown in the figure

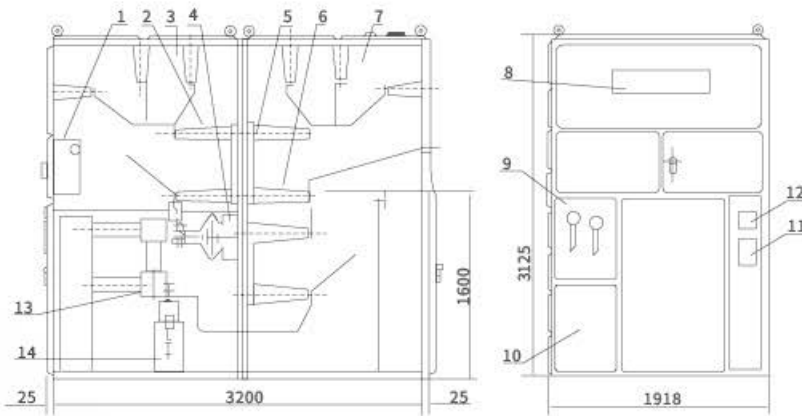


图 1 开关基本结构带旁路 (或电缆 “---” 部分) 进出线示意图 (08 方案为例)

Figure 1 Schematic Diagram of Incoming and Outgoing Lines with Bypass (or " --- " Part of Cable) in the Basic Structure of Switch (Scheme 08 as an Example)

- | | | |
|----------------|-----------------------|--|
| 1. 断路器、小母线及端子室 | 8. 用途牌 | 1. Circuit breaker, small bus and terminal room |
| 2. 主母线隔离开关 | 9. 左操作面板 | 2. Main bus disconnecter |
| 3. 电流互感器 | 10. 左下小门 | 3. Current transformer |
| 4. 电流互感器 | 11. 模拟母线牌 | 4. Current transformer |
| 5. 旁路母线隔离开关 | 12. 铭牌 | 5. Bypass bus disconnecter |
| 6. 线路隔离开关 | 13. 真空断路器 | 6. Line disconnecter |
| 7. 旁路母线室 | 14. R-C 式过电吸收器 (可变元件) | 7. Bypass busbar chamber |
| | | 8. Purpose plate |
| | | 9. Left operation panel |
| | | 10. Lower left door |
| | | 11. Analog bus plate |
| | | 12. Nameplate |
| | | 13. Vacuum circuit breaker |
| | | 14. R-C type overvoltage absorber (variable element) |

◆ 安装基础参考图 Reference drawing of installation foundation

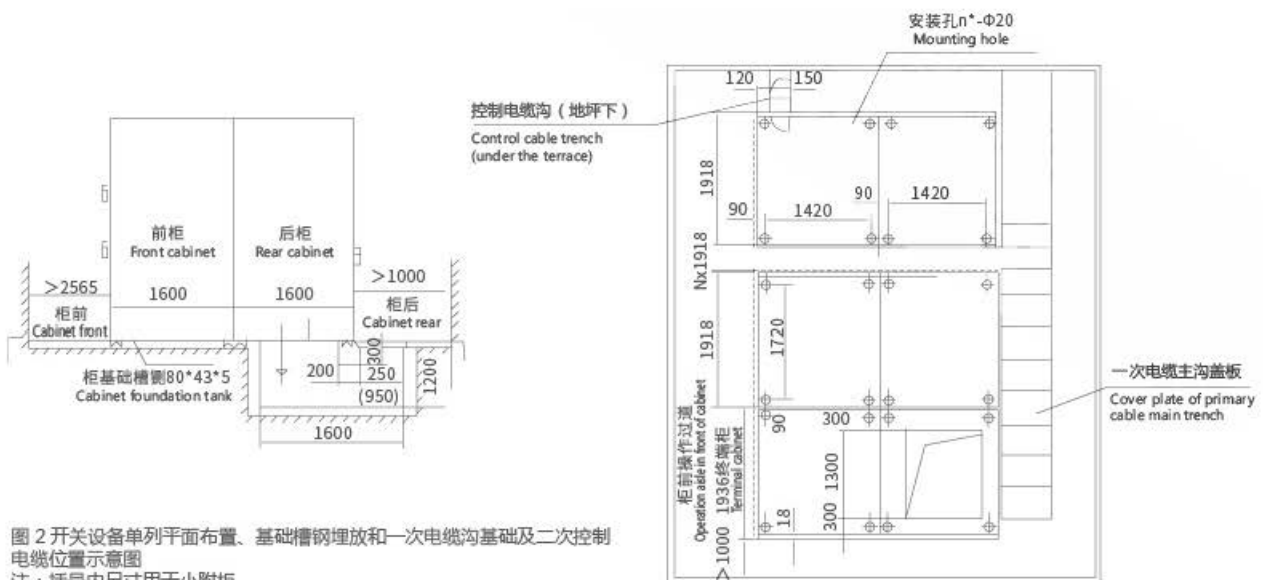


图 2 开关设备单列平面布置、基础槽钢埋放和一次电缆沟基础及二次控制电缆位置示意图

注：括号内尺寸用于小附柜

Fig.2 Schematic Diagram of Single column Layout, Foundation Channel Steel Laying, Primary Cable Trench Foundation and Secondary Control Cable Position of Switchgear

Note: dimensions in brackets are used for small accessory cabinets