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中国认可
国际互认
检测
TESTING
CNAS L0207

报 告 编 号
Reference№ CT24-01488W1

# 检 测 报 告
# Test Report

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|---|---|
| 样 品 名 称<br>Name of sample | 铜芯交联聚乙烯绝缘焊接皱纹铝套聚乙烯护套纵向阻水阻燃A类电力电缆系统<br>Copper conductor cross-linked polyethylene insulation welded corrugated aluminum sheath polyethylene sheath longitudinal water-blocking flame retardant of category A power cable system |
| 样 品 型 号<br>Type of sample | 电缆Cable: ZA-YJLW03-Z<br>附件Accessories：见附录C和E See annex C, E |
| 委 托 方<br>Consigner | 江苏宇辉电力科技有限公司<br>Jiangsu Yuhui Electric Power Technology Co., Ltd. |
| 试 验 类 型<br>Kind of test | 型式试验<br>Type Test |


上海国缆检测股份有限公司
SHANGHAI NATIONAL CENTER OF TESTING AND INSPECTION FOR ELECTRIC CABLE AND WIRE CO., LTD

国家电线电缆质量检验检测中心
CHINA NATIONAL CENTRE OF TESTING AND INSPECTION FOR ELECTRIC CABLE AND WIRE

TICW 国缆检测

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# 上海国缆检测股份有限公司
# 国家电线电缆质量检验检测中心
# 检测报告

Shanghai National Center of Testing and Inspection for Electric Cable and Wire Co., Ltd.
China National Centre of Testing and Inspection for Electric Cable and Wire
Test Report



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| 型号规格 Type and Size | | | 电缆Cable: ZA-YJLW03-Z 127/220 1×2500; 附件Accessories：见附录C和E See annex C, E | | 检测日期 Date of test | 2024-04-07 ～ 2024-07-17 |
| 委托方和附件生产单位 | Consigner and manufacturer of accessories | 名 称 Name | 江苏宇辉电力科技有限公司 Jiangsu Yuhui Electric Power Technology Co., Ltd. | | | |
| | | 地 址 Address | 宜兴市新建镇新闸西路168号 #168 Xinzha West Road, Xinjian Town, Yixing City, Jiangsu Province | | | |
| | | 电话号码 Tel. | 0510-87285668 | 邮政编码 P.C. | 214200 | 单位编号 Unit No. 214601 |
| 电缆生产单位 | Manufacturer of cable | 名 称 Name | 京缆电缆有限公司 Jinglan Cable Co., Ltd.Co., Ltd. | | | |
| | | 地 址 Address | 河北省邢台市宁晋县贾家口镇小河庄村 Xiaohezhuang Village, Ningjin County, Xingtai City, Hebei Province | | | |
| | | 电话号码 Tel. | 0319-5481171 | 邮政编码 P.C. | 055550 | 单位编号 Unit No. / |
| 来样方式 Delivering mode | | | 送样 Supplied by consigner | 接收状态 Sample state at receiving | 正常 Normal | 收样日期 Receiving date 2024-04-02 |
| 检测依据 Test standard | | | 见第2页 See page 2 | | | |
| 判定依据 Verdict standard | | | 见第2页 See page 2 | | | |
| 检测结论 Conclusion | | | 1. 样品进行了IEC 62067: 2022、GB/T 18890.2—2015和GB/T 18890.3—2015标准要求的全部项目检测，经检测该样品符合IEC 62067: 2022、GB/T 18890.2—2015和GB/T 18890.3—2015标准要求。All items for the sample have been carried out according to IEC 62067: 2022, GB/T 18890.2—2015 and GB/T 18890.3—2015, and the sample is qualified for the requirements of IEC 62067: 2022, GB/T 18890.2—2015 and GB/T 18890.3—2015.<br>2. 该样品户外终端无线电干扰试验项目符合委托方的技术要求。The item RIV test for outdoor termination tested for the sample comply with the technical requirements of consigner.<br>3. 该样品电缆成束燃烧试验（A类）试验项目符合GB/T 18380.33—2022标准要求。The item vertical flame spread of vertically-mounted bunched cables (Category A) tested for the sample comply with the requirements of GB/T 18380.33—2022. | | | |
| 备 注 Note | | | 见第2页 See page 2 | | | |

| 主 检 Tested by | 肖敬成 Xiao Jingcheng | 审 核 Checked by | 王子强 Wang Ziqiang | 批 准 Approved by | 范玉军 Fan Yujun |
|---|---|---|---|---|---|
| 日期 Date | 2024.07.22 | 日期 Date | 2024.07.23 | 日期 Date | 2024.07.25 |

| 型号和规格 Type and size | 电缆 Cable：ZA-YJLW03-Z 127/220 1×2500<br>附件 Accessories：见附录 C 和 E See annex C, E | 报告编号 Reference No. | CT24-01488W1 |
|---|---|---|---|

检测依据：
Test standard:

1. IEC 62067: 2022 额定电压150kV（$U_m$=170kV）以上至500kV（$U_m$ =550kV）挤包绝缘电力电缆及其附件—试验方法和要求 Power cables with extruded insulation and their accessories for rated voltages above 150 kV ($U_m$ = 170 kV) up to 500 kV ($U_m$ = 550 kV) —Test methods and requirements
2. GB/T 18890.1—2015 额定电压220kV（$U_m$ =252kV）交联聚乙烯绝缘电力电缆及其附件 第1部分：试验方法和要求 Power cables with cross-linked polyethylene insulation and their accessories for rated voltage of 220kV($U_m$ =252kV) - Part1: Test methods and requirements
3. GB/T 18890.3—2015 额定电压220kV（$U_m$ =252kV）交联聚乙烯绝缘电力电缆及其附件 第3部分：电缆附件 Power cables with cross-linked polyethylene insulation and their accessories for rated voltage of 220kV($U_m$ =252kV) - Part3: Accessories
4. GB/T 18380.33—2022 电缆和光缆在火焰条件下的燃烧试验 第33部分：垂直安装的成束电线电缆火焰垂直蔓延试验 A类
   Tests on electric and optical fibre cables under fire condition – Part 33：Test for vertical flame spread of vertically-mounted bunched wires or cables – Category A
5. GB/T 11604-2015高压电气设备无线电干扰测试方法
   Testing procedure of radio interference generated by high voltage equipment

判定依据：
Verdict standard:

1. IEC 62067: 2022 额定电压150kV（$U_m$=170kV）以上至500kV（$U_m$ =550kV）挤包绝缘电力电缆及其附件—试验方法和要求 Power cables with extruded insulation and their accessories for rated voltages above 150 kV ($U_m$ = 170 kV) up to 500 kV ($U_m$ = 550 kV) Test methods and requirements
2. GB/T 18890.2—2015 额定电压220kV（$U_m$ =252kV）交联聚乙烯绝缘电力电缆及其附件 第2部分：电缆 Power cables with cross-linked polyethylene insulation and their accessories for rated voltage of 220kV ($U_m$ =252kV) - Part2: Power cables
3. GB/T 18890.3—2015 额定电压220kV（$U_m$ =252kV）交联聚乙烯绝缘电力电缆及其附件 第3部分：电缆附件 Power cables with cross-linked polyethylene insulation and their accessories for rated voltage of 220kV ($U_m$ =252kV) - Part3: Accessories
4. GB/T 18380.33—2022 电缆和光缆在火焰条件下的燃烧试验 第33部分：垂直安装的成束电线电缆火焰垂直蔓延试验 A类
   Tests on electric and optical fibre cables under fire condition – Part 33：Test for vertical flame spread of vertically-mounted bunched wires or cables – Category A
5. 委托方提供的技术要求。Technical requirements are provided by the consigner.

备注Note

1. 样品名称、型号规格和电缆生产单位信息由委托方提供；
   The name, type and size of the sample and the manufacturer of cable are provided by the consigner;
2. 带“*”标记处为GB/T 18890.2—2015和GB/T 18890.3—2015与 IEC 62067: 2022标准要求不同的项目或要求，带“**”标记的项目为委托方要求特殊的试验项目；
   The items and requirements with the mark of '*' are required specially by the GB/T 18890.2—2015 and GB/T 18890.3—2015 which is different from IEC 62067: 2022, the items with the mark of '**' are required specially by the consigner;
3. 成束燃烧试验（A类）项目在本中心试验基地 -上海市金山区张堰镇振康路233号开展。
   The item tested of vertical flame spread of vertically-mounted bunched（Category A） has been carried out at our test base - No. 233, Zhenkang Road, Zhangyan Town, Jinshan District, Shanghai.

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|---|---|---|---|

| 序号 No. | 检测项目 Test Items | 单位 Unit | 技术要求 Requirements | 检测结果 Test Results | 评定 Verdict |
|---|---|---|---|---|---|
| 1 | 结构尺寸<br>Check of cable construction | | | | |
| 1.1 | 导体 Conductor | | | | |
| | —材料 Material | | / | 铜 Copper | N |
| | —导体结构 Construction | | 分割型Milliken type | 分割导体(5分割)<br>Milliken conductor<br>(5 segments) | P |
| * | —单线根数 Number of wires | | ≥265 | 459<br>（5×88+19） | P |
| | —导体外径 Diameter | mm | / | 61.1 | N |
| * | —分割导体的圆度<br>Roundness of milliken type conductor | | 卡尺测得的5个最大直径的平均值不应超过周长带测得的5个直径的平均值2%；在任一位置卡尺测得的最大直径不应超过周长带测得的直径3%。<br>The average of the five largest diameters measured by calliper should not exceed 2% of the average of the five diameters measured by a measuring tape, and the maximum diameter measured by the calliper at any position should not exceed 3% of the diameter measured by a measuring tape. | 卡尺测得的5个最大直径的平均值未超过周长带测得的5个直径的平均值的0.8%；在任一位置卡尺测得的最大直径未超过周长带测得直径的1.0%。The average value of the five largest diameters measured by calliper is no more than 0.8% of the average value of the five diameters measured by a measuring tape, and the maximum diameter measured by calliper at any position is less than 1.0% of the diameter measured by a measuring tape. | P |
| * | —导体外观 Appearance | | 表面应光洁、无油污、无损伤屏蔽及绝缘的毛刺、锐边以及凸起或断裂的单线<br>The surface of conductor should be smooth and free from greasy dirt, burr and sharp edge that damage the semi-conducting screen and insulation, and the individual wire protruded or broken | 符合<br>Passed | P |

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Note: "P" means this item does meet the requirement, "F" means this item does not meet the requirement, "N" means this item does not require to the verdict

| 型号和规格 Type and Size | 电缆 Cable：ZA-YJLW03-Z 127/220 1×2500<br>附件 Accessories：见附录 C 和 E See annex C, E | 报告编号 Reference No. | CT24-01488W1 |
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|---|---|---|---|---|---|
| 1.2 | 导体屏蔽 Conductor screen | | | | |
| * | —结构 Construction | | 应由绕包半导电带和其上挤包的半导电层组成<br>Should be consisted of semi-conducting tape and extruded semi-conducting layer | 先绕包2层半导电带再在其上挤包半导电层组成<br>The conductor screen consists of 2 layers of semi-conducting tape and extruded semi-conducting layer | P |
| | —平均厚度 Average thickness | mm | / | 1.8 | N |
| * | —最薄处厚度 Minimum thickness | mm | ≥0.8 | 1.5 | P |
| 1.3 | 绝缘 Insulation<br>（标称厚度 The nominal thickness: 24.0mm） | | | | |
| | —平均厚度 Average thickness | mm | / | 24.1 | N |
| | —最薄处厚度 Minimum thickness | mm | ≥21.60 | 23.55 | P |
| | —偏心度 Eccentricity | | *≤0.08 (≤0.10) | 0.05 | P |
| 1.4 | 绝缘屏蔽 Insulation screen | | | | |
| * | —绝缘屏蔽结构 Construction | | 应为挤包半导电层<br>Should be consisted of extruded semi-conducting layer | 挤包半导电层<br>Extruded semi-conducting layer | P |
| | —平均厚度 Average thickness | mm | / | 1.2 | N |
| * | —最薄处厚度 Minimum thickness | mm | ≥0.5 | 1.0 | P |
| *1.5 | 缓冲层和纵向阻水层<br>Buffer layer and longitudinal water blocking layer | | 半导电弹性材料或半导电弹性阻水材料<br>Semi-conducting elastic material or semi-conducting water blocking elastic material | 2层半导电阻水膨胀带<br>2 layers semi-conductive water blocking swellable tape | P |
| 1.6 | 皱纹铝套<br>Corrugated aluminium sheath<br>（标称厚度 The nominal thickness: 2.8mm） | | | | |
| | —工艺 Process | | / | 焊接<br>Welded | N |
| | —平均厚度 Average thickness | mm | / | 3.0 | N |
| | —最薄处厚度 Minimum thickness | mm | ≥2.28 | 2.96 | P |

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| | —防腐层 Anticorrosion layer | | 表面应有沥青或热熔胶<br>Cable asphalt or thermosol should be coated on the aluminium sheath surface | 铝套表面有沥青<br>Cable asphalt was coated on the aluminium sheath surface | P |
| 1.7 | PE 外护套 PE oversheath<br>（标称厚度 The nominal thickness: 5.0mm） | | | | |
| | —颜色 Color | | / | 黑色Black | N |
| | —平均厚度 Average thickness | mm | / | 6.3 | N |
| | —最薄处厚度 Minimum thickness | mm | ≥4.2 | 5.3 | P |
| * | —导电层 Conducting layer | | 外护套表面应有均匀牢固的导电层<br>Conducting layer should be coated evenly and firmly over the oversheath surface | 挤出半导电层覆盖在外护套表面<br>Extruded semi-conducting layer was coated over the oversheath surface | P |
| 1.8 | 电缆外径 Overall diameter of cable | mm | / | 154.2 | N |
| *2 | 成品电缆标志检查<br>Check of marking on completed cable | | | | |
| | —标志内容 Marking | | 应有制造厂名称、产品型号、额定电压、导体截面的连续标志和长度标志<br>The cable should be continuous marked with the manufacturer's name, cable type, rated voltage, size and length | 京缆电缆有限公司<br>京一牌<br>ZA-YJLW03-Z<br>127/220kV 1×2500mm$^2$<br>GB/T 18890.2-2015/Q/GDW 13242-2018 米数 | P |
| | —标志间距离<br>Distance between the end of marking and beginning of the next marking | mm | ≤500 | 138 | P |
| | —清晰度 Legibility | | 所有标志应字迹清楚、容易辨认<br>The markings shall be legible, easy to identify | 所有标志字迹清楚、容易辨认<br>The markings are legible, easy to identify | P |
| | —耐擦性 Durability | | 所有标志应耐擦<br>The markings shall be durable | 所有标志耐擦<br>The markings are durable | P |

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| 3 | 电性能Electrical tests | | | | |
| 3.1 | 型式试验前绝缘厚度检查和试验电压值确定<br>Check of insulation thickness and determination of test voltage value prior to the type test | | | | |
| | —绝缘厚度平均值<br>Average insulation thickness | mm | ≤27.6<br>(24.0×(1+15%)) | 24.1 | P |
| | —$(t_{avg.} - t_n) / t_n \times 100\%$<br>$t_{avg.}$: 绝缘平均厚度，单位毫米<br>Average insulation thickness (mm)<br>$t_n$: 绝缘标称厚度，单位毫米<br>Nominal insulation thickness (mm) | % | / | 0.4<br>（绝缘平均厚度未超过标称厚度的5%，试验电压值按标准中规定，无需调整。）<br>(The average insulation thickness does not exceed 5% of the nominal thickness, and the test voltages are the values specified in the standard without adjustment.) | N |
| 3.2 | 弯曲试验及随后的局部放电试验<br>Bending test followed by a partial discharge test | | | | |
| | —弯曲试验(≤25(d+D) ×1.05)<br>Bending test(≤25(d+D) ×1.05) | | 应在直径不大于(5468+273)mm的圆柱体上完成3次弯曲<br>The cable sample should be bent three times around a test cylinder, the diameter of which should not be greater than (5468+273)mm | 在直径为5400mm的圆柱体上完成3次弯曲<br>Completed three times bending around a test cylinder, the diameter of which is 5400mm | P |
| | —安装附件后的局部放电试验(室温，190kV)<br>Partial discharge test after installed accessories (at ambient temperature, 190kV) | | 在5pC或更优的灵敏度下无可检测的放电<br>No detectable discharge at the declared sensitivity (5pC or better) | 未检测出超过申明灵敏度的放电(灵敏度为3.6pC)<br>No detectable discharge exceeding the declared sensitivity (the sensitivity is 3.6pC) | P |

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| 3.3 | Tanδ试验(95°C～100°C，127kV)<br>Tanδ measurement<br>(95°C～100°C, 127kV) | | ≤$10\times10^{-4}$ | $2.8\times10^{-4}$ | P |
| 3.4 | 热循环电压试验<br>(254kV，95°C～100°C，加热8h，冷却16h，20次循环)Heating cycle voltage test (254kV, 95°C～100°C, heating 8h,cooling 16h，20cycles) | | 不击穿或闪络<br>No breakdown nor flashover | 未击穿、未闪络<br>No breakdown and flashover | P |
| 3.5 | 局部放电试验(室温，190kV)<br>Partial discharge test<br>(at ambient temperature, 190kV) | | 在5pC或更优的灵敏度下无可检测的放电<br>No detectable discharge at the declared sensitivity (5pC or better) | 未检测出超过申明灵敏度的放电<br>(灵敏度为3.6pC)<br>No detectable discharge exceeding the declared sensitivity (the sensitivity is 3.6pC) | P |
| 3.6 | 局部放电试验((95°C～100°C, 190kV)<br>Partial discharge test<br>(95°C～100°C, 190kV) | | 在5pC或更优的灵敏度下无可检测的放电<br>No detectable discharge at the declared sensitivity (5pC or better) | 未检测出超过申明灵敏度的放电<br>(灵敏度为3.6pC)<br>No detectable discharge exceeding the declared sensitivity (the sensitivity is 3.6pC) | P |
| 3.7 | 雷电冲击电压试验及随后的工频电压试验Lightning impulse voltage test followed by a power frequency voltage test | | | | |
| | —雷电冲击电压试验(95°C～100°C, ±1050kV各10次)<br>Lightning impulse voltage test (95°C～100°C, ±1050kV,10times, respectively) | | 不击穿或闪络<br>No breakdown nor flashover | 未击穿、未闪络<br>No breakdown and flashover | P |
| | —工频电压试验<br>(室温，254kV，15min)<br>Power frequency voltage test (at ambient temperature , 254kV,15min) | | 不击穿或闪络<br>No breakdown nor flashover | 未击穿、未闪络<br>No breakdown and flashover | P |

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| 3.8 | 绝缘接头外保护层试验<br>Test of outer protection for insulation joint（YJJJI2） | | | | |
| 3.8.1 | 浸水循环<br>Water immersion and heat cycling<br>(加热至70°C～75°C, 保持5h冷却至30°C以下或环境温度以上10°C以内; Heating,70°C～75°C, keeping 5h; cooling, ≤30°C or 10°C above ambient temperature.) | | 20 次<br>20 times | 完成<br>Completed | P |
| 3.8.2 | 直流电压试验 DC voltages tests | | | | |
| | —接头两端的金属套之间<br>(DC -25kV/1min)<br>Between the metal sheath<br>(DC -25kV/1min) | | 不击穿No breakdown | 未击穿<br>No breakdown | P |
| | —接头两端的金属套对地之间<br>(DC -25kV/1min)<br>Between the metal sheaths and the earthed exterior of the joint outer protection (DC -25kV/1min) | | 不击穿No breakdown | 未击穿<br>No breakdown | P |
| 3.8.3 | 冲击电压试验 Impulse voltage tests | | | | |
| | —接头两端的金属套之间<br>(±95kV 各 10 次)<br>Between the metal sheaths<br>(±95kV,10times,respectively) | | 不击穿No breakdown | 未击穿<br>No breakdown | P |
| | —接头两端的金属套对地之间<br>(±47.5kV 各 10 次)<br>Between the metal sheaths and the earthed exterior of the joint outer protection<br>(±47.5kV,10times, respectively) | | 不击穿No breakdown | 未击穿<br>No breakdown | P |
| | —检验 Examination | | 应无可见的内部气孔或因水分进入使浇注剂移动或浇注剂从各密封或保护盒壁泄漏的迹象<br>There shall be no visible evidence of either internal voids or internal displacement of compound bywater ingress, or of compound loss via the various seals or box walls | 无可见的内部气孔或因水分进入使浇注剂移动或浇注剂从各密封或保护盒壁泄漏的迹象<br>There is no visible evidence of either internal voids or internal displacement of compound by water ingress, or of compound loss via the various seals or box walls | P |

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| 3.9 | 直通接头外保护层试验<br>Test of outer protection for straight joint（YJJTI2） | | | | |
| 3.9.1 | 浸水循环<br>Water immersion and heat cycling<br>(加热至70°C～75°C, 保持5h冷却至30°C以下或环境温度以上10°C以内; Heating,70°C～75°C, keeping 5h; cooling, ≤30°C or 10°C above ambient temperature.) | | 20 次<br>20 times | 完成<br>Completed | P |
| 3.9.2 | 直流电压试验 DC voltages tests | | | | |
| | —接头两端的金属套对地之间 (DC -25kV/1min)<br>Between the metal sheaths and the earthed exterior of the joint outer protection (DC -25kV/1min) | | 不击穿No breakdown | 未击穿<br>No breakdown | P |
| 3.9.3 | 冲击电压试验 Impulse voltage tests | | | | |
| | —接头两端的金属套对地之间 (±47.5kV 各 10 次)<br>Between the metal sheaths and the earthed exterior of the joint outer protection<br>(±47.5kV,10times, respectively) | | 不击穿No breakdown | 未击穿<br>No breakdown | P |
| | —检验 Examination | | 应无可见的内部气孔或因水分进入使浇注剂移动或浇注剂从各密封或保护盒壁泄漏的迹象<br>There shall be no visible evidence of either internal voids or internal displacement of compound bywater ingress, or of compound loss via the various seals or box walls | 无可见的内部气孔或因水分进入使浇注剂移动或浇注剂从各密封或保护盒壁泄漏的迹象<br>There is no visible evidence of either internal voids or internal displacement of compound by water ingress, or of compound loss via the various seals or box walls | P |
| *3.10 | 户外终端淋雨工频电压试验（460kV，1min）<br>AC voltage and test under raining for outdoor termination（460kV， 1min）<br>(YJZWY4、YJZWFY4) | | 不闪络或击穿<br>No breakdown or flashover | 未击穿、未闪络<br>No breakdown and flashover | P |

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| **3.11 | 户外终端无线电干扰试验（140kV,1MHz）<br>RIV test for outdoor termination（140kV,1MHz）<br>(YJZWY4、YJZWFY4) | | | | |
| | —无线电干扰电压值<br>Value of RIV | μV | ≤500 | <151 | P |
| 3.12 | 电气试验后的检查<br>Examination after the electrical test | | | | |
| | (应使用正常或经矫正的视力对电缆和附件进行检查)<br>(Examination of the cable and the accessories, with normal or corrected vision without magnification) | | 应无可能会影响电缆系统正常运行的劣化迹象 (例如:电气品质降低、泄露、腐蚀或有害的收缩)<br>Shall reveal no signs of deterioration (e.g. electrical degradation, leakage, corrosion or harmful shrinkage) which could affect the cable and accessories in service operation. | 通过<br>Passed | P |
| 3.13 | 半导电屏蔽电阻率(90°C)<br>Resistivity of semi-conducting screen (90°C) | | | | |
| | 老化前 Without ageing | | | | |
| | —导体屏蔽 Conductor screen | Ω·m | ≤1000 | 4.511 | P |
| | —绝缘屏蔽 Insulation screen | Ω·m | ≤500 | 1.22 | P |
| | 成品电缆段老化后(100°C,168h)<br>After additional ageing test on pieces of completed cable(100°C, 168h) | | | | |
| | —导体屏蔽 Conductor screen | Ω·m | ≤1000 | 4.020 | P |
| | —绝缘屏蔽 Insulation screen | Ω·m | ≤500 | 1.53 | P |
| *3.14 | 导体直流电阻(20°C)<br>DC conductor resistance | Ω/km | ≤0.0072 | 0.0071 | P |
| *3.15 | 电容测量<br>Measurement of capacitance | pF/m | ≤249<br>(231×1.08=249) | 228 | P |
| 4 | 绝缘物理机械性能<br>Mechanical properties of insulation | | | | |
| 4.1 | 老化前 Without ageing | | | | |
| | —抗张强度 Tensile strength | $N/mm^2$ | ≥12.5 | 19.5 | P |

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| | —断裂伸长率 Elongation at break | % | ≥200 | 500 | P |
| 4.2 | 空气箱老化后(135°C，168h)<br>After ageing in air oven(135°C,168h) | | | | |
| | —抗张强度 Tensile strength | N/mm² | / | 21.3 | N |
| | —断裂伸长率 Elongation at break | % | / | 530 | N |
| | —抗张强度变化率<br>Variation of tensile strength | % | ≤±25 | 9 | P |
| | —断裂伸长率变化率<br>Variation of elongation at break | % | ≤±25 | 6 | P |
| 4.3 | 成品电缆段老化后(100°C,168h)<br>After ageing on pieces of the complete cable(100°C,168h) | | | | |
| | —抗张强度 Tensile strength | N/mm² | / | 20.9 | N |
| | —断裂伸长率 Elongation at break | % | / | 500 | N |
| | —抗张强度变化率<br>Variation of tensile strength | % | ≤±25 | 7 | P |
| | —断裂伸长率变化率<br>Variation of elongation at break | % | ≤±25 | 0 | P |
| 4.4 | 热延伸试验(200°C,20N/cm²)<br>Hot set test(200°C,20N/cm²) | | | | |
| | —负载下伸长率<br>Elongation under load | % | ≤175 | 78 | P |
| | —冷却后永久伸长率<br>Permanent elongation after cooling | % | ≤15 | 0 | P |
| 5 | PE 外护套物理机械性能<br>Mechanical properties of PE oversheath | | | | |
| 5.1 | 老化前 Without ageing | | | | |
| | —抗张强度 Tensile strength | N/mm² | ≥12.5 | 13.0 | P |
| | —断裂伸长率 Elongation at break | % | ≥300 | 460 | P |
| 5.2 | 空气箱老化后(110°C，240h)<br>After ageing in air oven (110°C,240h) | | | | |
| | —抗张强度 Tensile strength | N/mm² | / | 12.7 | N |
| | —断裂伸长率 Elongation at break | % | ≥300 | 420 | P |
| | —抗张强度变化率<br>Variation of tensile strength | % | / | -2 | N |
| | —断裂伸长率变化率<br>Variation of elongation at break | % | / | -9 | N |

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| 5.3 | 成品电缆段老化后(100°C,168h)<br>After ageing on pieces of the complete cable(100°C,168h) | | | | |
| | —抗张强度 Tensile strength | $N/mm^2$ | / | 13.2 | N |
| | —断裂伸长率 Elongation at break | % | / | 400 | N |
| | —抗张强度变化率<br>Variation of tensile strength | % | / | 2 | N |
| | —断裂伸长率变化率<br>Variation of elongation at break | % | / | -13 | N |
| 5.4 | 高温压力试验(110°C,6h)<br>Pressure test at high temperature (110°C, 6h) | | | | |
| | —压痕深度/平均厚度<br>Depth of indentation/Average thickness | % | ≤50 | 7 | P |
| 5.5 | 碳黑含量 Carbon black content | % | 2.5±0.5 | 2.9 | P |
| *6 | 微孔、杂质和突起试验<br>Voids, contaminants and protrusion | | | | |
| 6.1 | 绝缘层微孔和杂质试验<br>Voids and contaminants in insulation | | | | |
| | —大于0.05mm的微孔<br>Voids larger than 0.05mm | | 无<br>None | 无<br>None | P |
| | —大于0.025mm，小于等于0.05mm的微孔数<br>Num. of voids larger than 0.025mm and not larger than 0.05mm | No.个 /$10cm^3$ | ≤18 | 0 | P |
| | —大于0.125mm的不透明杂质<br>Contaminants larger than 0.125mm | | 无<br>None | 无<br>None | P |
| | —大于0.05mm，小于等于0.125mm的不透明杂质数<br>Num. of contaminants larger than 0.05mm and not larger than 0.125mm | No.个 /$10cm^3$ | ≤6 | 0 | P |
| | —大于0.16mm的半透明棕色杂质<br>Translucent brown contaminants larger than 0.16mm | | 无<br>None | 无<br>None | P |

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| 6.2 | 半导电屏蔽层与绝缘层界面微孔、突起试验<br>Voids and protrusion in contact surface between semi-conducting screen and insulation | | | | |
| | —大于 0.05mm 的微孔<br>Voids larger than 0.05mm | | 无<br>None | 无<br>None | P |
| | —导体半导电屏蔽层与绝缘层界面大于 0.08mm 的突起<br>Protrusion larger than 0.08mm in contact surface between conductor screen and insulation | | 无<br>None | 无<br>None | P |
| | —绝缘半导电屏蔽层与绝缘层界面大于 0.08mm 的突起<br>Protrusion larger than 0.08mm in contact surface between insulation screen and insulation | | 无<br>None | 无<br>None | P |
| *7 | 外护套刮磨试验<br>Abrasion test on oversheath | | | | |
| | —刮磨试验(550N，25次)<br>Abrasion test (550N,25 times) | | 无裂缝或开裂<br>No crack | 无裂缝和开裂<br>No crack | P |
| | —直流电压试验(-20kV，1min)<br>DC voltage test (-20kV, 1min) | | 不击穿<br>No breakdown | 未击穿<br>No breakdown | P |
| | —冲击电压试验(47.5kV, ±10次)<br>Impulse voltage test (47.5kV, ±10 times) | | 不击穿<br>No breakdown | 未击穿<br>No breakdown | P |
| *8 | 铝套腐蚀扩展试验<br>Corrosion spread test on aluminium sheath（浸入1%硫酸钠水溶液中，100V 10mA，100h. Immersed in 1% $Na_2SO_4$ aqueous solution, 100V 10mA, 100h.） | mm | 距钻孔边缘 10mm 外处，应无肉眼可见的腐蚀痕迹<br>There are no signs of corrosion extending more than 10 mm beyond the rim of any hole at any point by examination with normal vision. | 距钻孔边缘 4mm 外处，无肉眼可见的腐蚀痕迹<br>There are no signs of corrosion extending more than 4 mm beyond the rim of any hole at any point by examination with normal vision. | P |

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| 9 | 透水试验<br>Water penetration test<br>（从经过弯曲试验后的样品上取 8 米电缆，在其中间剥开一个约 50mm 宽的圆环，剥去环内绝缘屏蔽以外的所有包覆层，在 5 min 内把(20±10)℃的水注入透水装置，使管子中水位高于电缆中心 1m，试样放置 24 h。采用导体通电加热方法对试样进行 10 次加热循环，使导体温度达到 95 ℃~100 ℃, 但不应达到水的沸点。每个循环加热 8 h，加热期间导体温度在 95℃~100℃至少维持 2 h，随后自然冷却 16 h。试验期间水头保持 1 m。<br>An 8 m length of cable shall be cut from the length which has been subjected to the bending test and placed horizontally. A ring approximately 50 mm wide shall be removed from the centre of the length. This ring shall comprise all the layers external to the insulation screen. The tube is filled within 5 min with water at a temperature of (20±10) °C so that the height of the water in the tube is 1 m above the cable centre. The sample shall be allowed to stand for 24 h. The sample shall be subjected to 10 heating cycles. The conductor shall be heated by current until it has reached at 95 °C ～ 100 °C. It shall not reach the boiling point of water. The heating shall be applied for 8 h. The conductor temperature shall be maintained at 95 °C～100 °C for 2 h of each heating period and followed by 16 h of natural cooling. The water head shall be maintain at 1 m during the period of testing.） | | 在整个试验期间试样两端应无水渗漏。<br>During the period of testing no water shall emerge from the ends of the test piece. | 通过<br>Passed | P |
| *10 | 户外终端组装后的密封试验<br>Sealing test on terminations assembled (YJZWY4、YJZWFY4、YJZGG/S、YJZGG/L) | | | | |

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| 10.1 | 压力泄漏试验(表压:250±10kPa,1h)<br>Press leakage test<br>(gage pressure:250±10kPa,1h) | | 无气体逸出<br>No leakage of gas | 通过<br>Passed | P |
| 10.2 | 真空漏增试验 (10kPa, 1h)<br>Vacuum leakage increase test<br>(10kPa, 1h) | | | | |
| | —压力漏增值（B-A）<br>Pressure increment（B-A） | kPa | ≤10 | ＜2 | P |
| 11 | 支柱绝缘子（分段绝缘户外终端）的电压试验<br>Voltage test on stand-off insulators<br>(Outdoor termination with sectionalizing insulation)<br>Ankura-YJZWY4、YJZWFY4) | | | | |
| | —直流电压试验 (-25kV,1min)<br>DC voltage test (-25kV,1min) | | 不闪络或击穿<br>No flashover or breakdown | 未击穿和闪络<br>No breakdown and flashover | P |
| | —冲击电压试验(±47.5kV各10次)<br>Impulse voltage test<br>(±47.5kV,10times, respectively) | | 不闪络或击穿<br>No flashover or breakdown | 未击穿和闪络<br>No breakdown and flashover | P |
| 12 | 分段绝缘 GIS 终端的电压试验<br>Voltage test on GIS termination with sectionalizing insulation<br>(YJZGG/S、YJZGG/L) | | | | |
| | —直流电压试验 (-25kV,1min)<br>DC voltage test (-25kV,1min) | | 不闪络或击穿<br>No flashover or breakdown | 未击穿和闪络<br>No breakdown and flashover | P |
| | —冲击电压试验(±47.5kV各10次)<br>Impulse voltage test<br>(±47.5kV,10times, respectively) | | 不闪络或击穿<br>No flashover or breakdown | 未击穿和闪络<br>No breakdown and flashover | P |
| 13 | 瓷套绝缘子悬臂负荷耐受试验（负载 2000N，保持 60s）<br>Cantilever load withstand test for ceramic insulators<br>(Load 2000N，maintained for 60s)<br>(YJZWY4) | | 未破坏<br>No damage | 未破坏<br>No damage | P |

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| 序号 No. | 检测项目 Test Items | 单位 Unit | 技术要求 Requirements | 检测结果 Test Results | 评定 Verdict |
|---|---|---|---|---|---|
| 14 | 瓷套绝缘子内压力试验<br>（设计压力 2.8MPa，保持 5min）<br>Internal pressure test for ceramic insulators<br>(The design pressure 2.8MPa, maintained for 5 min)<br>(YJZWY4) | | 未破坏<br>No damage | 未破坏<br>No damage | P |
| 15 | 复合套绝缘子内压力试验<br>Internal pressure test for composite insulators（MSP=1.0MPa）<br>(YJZWFY4) | | | | |
| 15.1 | 第一阶段 Stage 1<br>(2.0×MSP，保持5 min)<br>(2.0×MSP，maintained for 5 min) | | | | |
| | —残余应变百分比<br>Percentage of residual strain<br>(应力片位置平行于套管的轴向The position of the strain gauges parallel to the axis of the tube) | % | ≤±5 | 1 | P |
| | —残余应变百分比<br>Percentage of residual strain<br>(应力片位置垂直于套管的轴向<br>The position of the strain gauges perpendicular to the axis of the tube) | % | ≤±5 | 0 | P |
| | —检查 Examination | | 无损伤 No damage | 无损伤 No damage | P |
| 15.2 | 第二阶段 Stage 2<br>(4.0×MSP， 保持5 min)<br>(4.0×MSP，maintained for 5 min) | | | | |
| | —检查 Examination | | 无损伤 No damage | 无损伤 No damage | P |
| 16 | 复合套绝缘子抗弯试验<br>Cantilever load test for composite insulators（MML=5.6kN）<br>(YJZWFY4) | | | | |
| 16.1 | 第一阶段 Stage 1<br>(机械负荷：1.0×MML， 保持30s)<br>(Mechanical load: 1.0×MML, maintained for 30s) | | | | |

注："单项评定"符号含义：P：检测结果符合要求；F：检测结果不符合要求；N：检测结果不要求判定。
Note: "P" means this item does meet the requirement, "F" means this item does not meet the requirement, "N" means this item does not require to the verdict

| 型号和规格 Type and Size | 电缆 Cable：ZA-YJLW03-Z 127/220 1×2500<br>附件 Accessories：见附录 C 和 E See annex C, E | 报告编号 Reference No. | CT24-01488W1 |
|---|---|---|---|

| 序号 No. | 检测项目 Test Items | 单位 Unit | 技术要求 Requirements | 检测结果 Test Results | 评定 Verdict |
|---|---|---|---|---|---|
| | —最大偏移量<br>The maximum deflection | mm | ≤20 | 18 | P |
| | —残余偏移量<br>The residual deflection | mm | ≤2 | 0.1 | P |
| | —检查 Examination | | 没有出现管的破坏或抽出，没有出现端部附件的破坏。<br>No fracture or pull out of the tube occurred;<br>no visible damage of the end fittings was observed | 通过<br>Passed | P |
| 16.2 | 第二阶段 Stage 2<br>(机械负荷：1.5×MML， 保持60s)<br>(Mechanical load: 1.5×MML，maintained for 60s) | | | | |
| | —最大偏移量<br>The maximum deflection | mm | ≤40 | 35 | P |
| | —残余偏移量<br>The residual deflection | mm | ≤3 | 0.1 | P |
| | —残余应变百分比（第1个应力片）<br>Percentage of residual strain<br>（The 1st the strain gauges）<br>(应力片位置平行于套管的轴向<br>The position of the strain gauges parallel to the axis of the tube) | % | ≤±5 | -0.2 | P |
| | —残余应变百分比（第2个应力片）<br>Percentage of residual strain<br>（The 2nd the strain gauges）<br>(应力片位置平行于套管的轴向<br>The position of the strain gauges parallel to the axis of the tube) | % | ≤±5 | 0 | P |
| | —检查 Examination | | 没有出现管的破坏或抽出，没有出现端部附件的破坏，套管没有可视的损伤。<br>No fracture or pull out of the tube occurred，no visible damage of the end fittings was observed，no visible damage to the tube. | 通过<br>Passed | P |

注："单项评定"符号含义：P：检测结果符合要求；F：检测结果不符合要求；N：检测结果不要求判定。
Note: "P" means this item does meet the requirement, "F" means this item does not meet the requirement, "N" means this item does not require to the verdict

| 型号和规格 Type and Size | 电缆 Cable：ZA-YJLW03-Z 127/220 1×2500<br>附件 Accessories：见附录 C 和 E See annex C, E | 报告编号 Reference No. | CT24-01488W1 |
|---|---|---|---|

| 序号 No. | 检测项目 Test Items | 单位 Unit | 技术要求 Requirements | 检测结果 Test Results | 评定 Verdict |
|---|---|---|---|---|---|
| 16.3 | 第三阶段 Stage 3<br>(机械负荷：2.5×MML， 保持60s)<br>(Mechanical load: 2.5×MML，maintained for 60s) | | | | |
| | —检查 Examination | | 没有出现管的破坏或抽出，套管没有可视的损伤。<br>No fracture or pull out of the tube occurred，no visible damage to the tube. | 通过<br>Passed | P |
| 17 | 电缆单根垂直燃烧试验<br>Test for vertical flame propagation for a single cable | | | | |
| | —上支架下缘与炭化部分起点间距离<br>The distance between the lower edge of the top support and the upper onset of charring | mm | >50 | 373 | P |
| | —燃烧向下延伸至上支架下缘距离<br>The distance between the lower edge of the top support and the lower onset of charring | mm | ≤540 | 510 | P |
| **18 | 成束燃烧试验（A 类）Test for vertical flame spread of vertically-mounted bunched cables(Category A) | | | | |
| | —喷灯底边以上炭化高度<br>The maximum extent of damage from the bottom edge of the burner to the onset of char | m | ≤2.5 | 1.2 | P |
| | —所有燃烧和发光熄灭时间<br>The time to extinction of all burning or glowing | h | / | 0.03 | N |
| | 以下为部分试验波形和样品信息<br>Following some test wave and sample's information | | | | |

注："单项评定"符号含义：P：检测结果符合要求；F：检测结果不符合要求；N：检测结果不要求判定。
Note: "P" means this item does meet the requirement, "F" means this item does not meet the requirement, "N" means this item does not require to the verdict

| 型号和规格<br>Type and Size | 电缆 Cable：ZA-YJLW03-Z 127/220 1×2500<br>附件 Accessories：见附录 C 和 E See annex C, E | 报 告 编 号<br>Reference No. | CT24-01488W1 |
|---|---|---|---|

附录 A　局部放电试验图形 Annex A　Oscillograms of partial discharges


图 **A1** 局部放电试验背景噪声（弯曲试验后）
**Fig A1** Background noise during PD test
(after bending test)

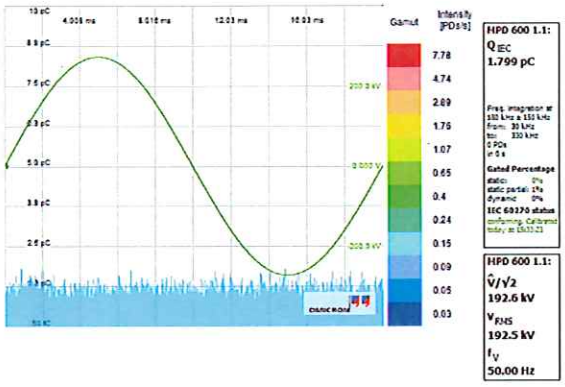



图 **A2** 190kV 下局部放电波形（弯曲试验后）
**Fig A2** The oscillograms of PD at 190kV
(after bending test)


图 **A3** 局部放电试验背景噪声（热循环试验后室温下）
**Fig A3** Background noise during PD test
(after heating cycle voltage test at ambient temperature)

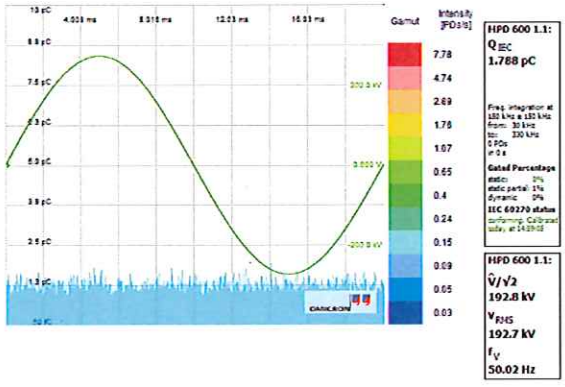



图 **A4** 190kV 下局部放电波形（热循环试验后室温下）
**Fig A4** The oscillograms of PD at 190kV
(after heating cycle voltage test at ambient temperature )

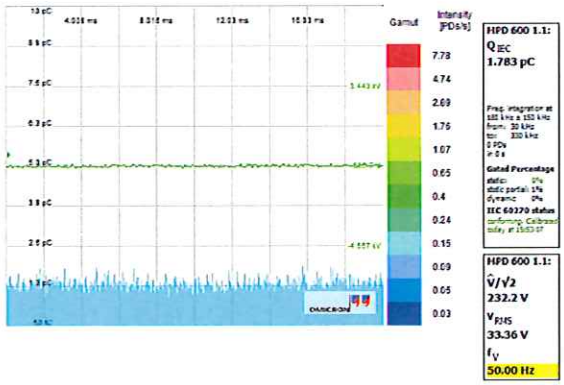



图 **A5** 局部放电试验背景噪声（热循环试验后高温下）
**Fig A5** Background noise during PD test
(after heating cycle voltage test at high temperature)

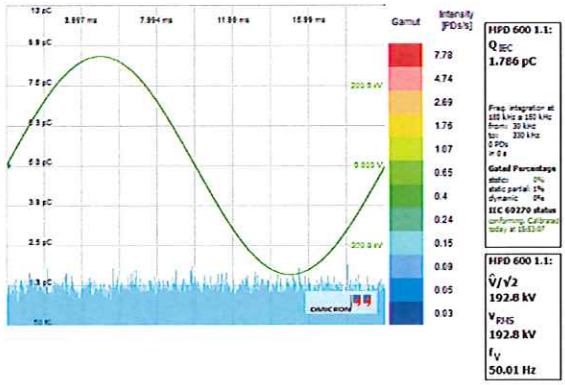



图 **A6** 190kV 下局部放电波形（热循环试验后高温下）
**Fig A6** The oscillograms of PD at 190kV
(after heating cycle voltage test at high temperature )

| 型号和规格 Type and Size | 电缆 Cable：ZA-YJLW03-Z 127/220 1×2500<br>附件 Accessories：见附录 C 和 E See annex C, E | 报告编号 Reference No. | CT24-01488W1 |
|---|---|---|---|

附录 B 热循环电压试验后样品冲击电压试验实际耐受电压值及其波形图
（高温下，1050kV，允许 ±3% 偏差）

Annex B The values and oscillograms of impulse voltages on the sample after heating cycle voltage test (at high temperature, 1050kV, ±3% tolerance)

B1 样品冲击电压试验实际耐受电压值

The values of impulse voltages on the sample

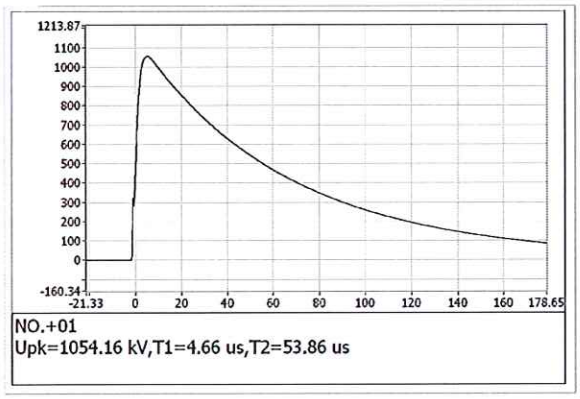
环境 温度：28°C 相对湿度：67 % 大气压：100.9 kPa

Ambient temperature: 28 °C, Relative humidity: 67 %, Atmosphere: 100.9 kPa

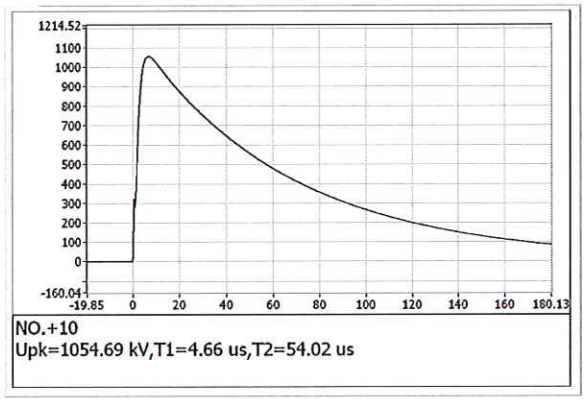
| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 正极性（kV）<br>Positive polarity | 1054.2 | 1054.3 | 1053.7 | 1054.1 | 1054.9 | 1055.1 | 1054.7 | 1050.3 | 1055.2 | 1054.7 |
| 负极性（kV）<br>Negative polarity | 1047.2 | 1047.0 | 1049.5 | 1046.8 | 1044.3 | 1043.3 | 1047.2 | 1050.4 | 1044.7 | 1049.4 |

B2 冲击电压波形图

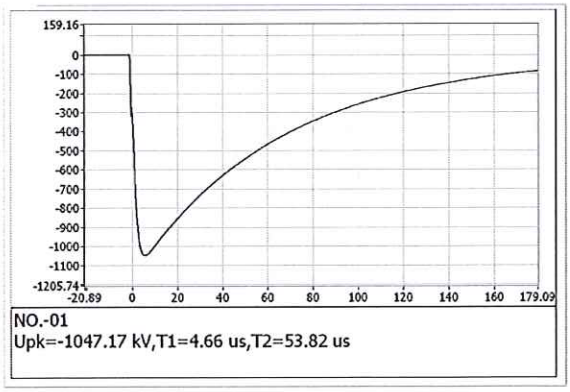
Oscillograms of impulse voltages waveform



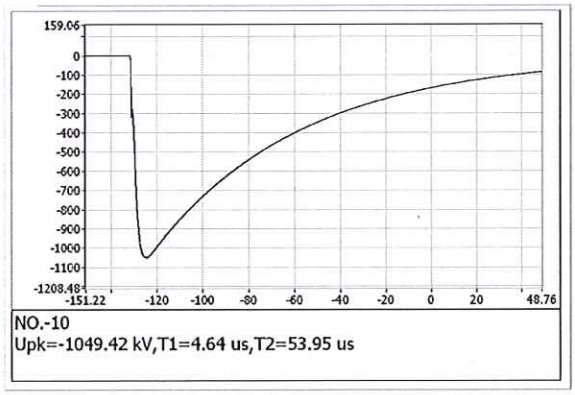

正极性第 1 次 The 1st positive impulse waveform




正极性第 10 次 The 10th positive impulse waveform




负极性第 1 次 The 1st negative impulse waveform




负极性第 10 次 The 10th negative impulse waveform

| 型号和规格<br>Type and Size | 电缆 Cable：ZA-YJLW03-Z 127/220 1×2500<br>附件 Accessories：见附录 C 和 E See annex C, E | 报 告 编 号<br>Reference No. | CT24-01488W1 |
|---|---|---|---|

附录 C 电缆系统中样品的信息 Annex C The details of the cable system tested

C1 电气试验回路信息 Information for the test loop of electrical tests

| 序号<br>No. | 样品名称<br>Name of sample | 型号规格<br>Type and size | 生产单位<br>Manufacturer | 数量<br>Quantity |
|---|---|---|---|---|
| 1 | 铜芯交联聚乙烯绝缘焊接皱纹铝套聚乙烯护套纵向阻水阻燃 A 类电力电缆<br>Copper conductor cross-linked polyethylene insulation welded corrugated aluminum sheath polyethylene sheath longitudinal water-blocking flame retardant of category A power cable | ZA-YJLW03-Z<br>127/220 1×2500 | 京缆电缆有限公司<br>Jinglan Cable Co., Ltd. | 60m |
| 2 | 127/220kV 交联聚乙烯绝缘电力电缆用液体填充绝缘瓷套管终端 127/220kV Oil-filled outdoor termination with porcelain insulator for XLPE insulation power cable | YJZWY4<br>127/220 1×2500 | 江苏宇辉电力科技有限公司<br>Jiangsu Yuhui Electric Power Technology Co., Ltd. | 1 |
| 3 | 127/220kV 交联聚乙烯绝缘电力电缆用液体填充绝缘复合套管终端 127/220kV Oil-filled outdoor termination with composite insulator for XLPE insulation power cable | YJZWFY4<br>127/220 1×2500 | | 1 |
| 4 | 127/220kV 交联聚乙烯绝缘电力电缆用整体预制橡胶绝缘件绝缘接头 127/220kV Sectionalizing joint for XLPE insulation power cable | YJJJI2<br>127/220 1×2500 | | 1 |
| 5 | 127/220kV 交联聚乙烯绝缘电力电缆用整体预制橡胶绝缘件直通接头 127/220kV Straight joint for XLPE insulation power cable | YJJTI2<br>127/220 1×2500 | | 1 |
| 6 | 127/220kV 交联聚乙烯绝缘电力电缆用干式绝缘 GIS 终端(短型) 127/220kV Dry type GIS termination for XLPE insulation power cable (short type) | YJZGG/S<br>127/220 1×2500 | | 1 |
| 7 | 127/220kV 交联聚乙烯绝缘电力电缆用干式绝缘 GIS 终端(长型) 127/220kV Dry type GIS termination for XLPE insulation power cable (long type) | YJZGG/L<br>127/220 1×2500 | | 1 |

| 型号和规格 Type and Size | 电缆 Cable：ZA-YJLW03-Z 127/220 1×2500<br>附件 Accessories：见附录 C 和 E See annex C, E | 报告编号 Reference No. | CT24-01488W1 |
|---|---|---|---|

C2 电缆特性 Cable characteristics

a) -制造商：京缆电缆有限公司
Manufacturer: Jinglan Cable Co., Ltd.
-型号 Type: ZA-YJLW03-Z
-名称：铜芯交联聚乙烯绝缘焊接皱纹铝套聚乙烯护套纵向阻水阻燃 A 类电力电缆
Designation: Copper conductor cross-linked polyethylene insulation welded corrugated aluminum sheath polyethylene sheath longitudinal water-blocking flame retardant of category A power cable
-制造日期 Manufacturing date: 2024.03

b) -$U_0/U/U_m$：127/220/252 (kV)

c) -导体类型 Type of conductor: 二类导体 class 2
-导体材料 Material of conductor: 铜 Copper
-导体标称截面积 Nominal cross-sectional area: 2500mm$^2$
-导体结构 Conductor construction: 分割导体 Milliken
-导体的阻水措施(如果有)及其性质: 有，阻水带
Presence, if any, and nature of water tightness measures in the conductor: Yes, water-blocking tape
-导体标称直径（d）Nominal diameter of the conductor ($d$)：60.6mm
-正常运行时电缆导体最高温度：Maximum conductor temperature in normal operation: 90 °C

d) -绝缘材料 Material of insulation: XLPE
-绝缘标称厚度（$t_n$）Nominal thickness of insulation ($t_n$): 24.0mm
-绝缘的标称内径($d_{ii}$ ) Nominal inner diameter ($d_{ii}$)：65.6mm
-绝缘的标称外径($D_{io}$ ) Nominal outer diameter ($D_{io}$) of the insulation: 114mm

e) -绝缘系统的制造工艺类型 Type of manufacturing process for insulation system: VCV

f) -屏蔽层的阻水措施(如果有)及其性质:有，半导电缓冲阻水带
Presence, if any, and nature of water tightness measures in the screening area：Yes, semi-conductive water-blocking buffer tape

g) -金属屏蔽/套的材料 Material of metal screen / sheath：铝 Aluminum
-金属屏蔽/套的结构 Construction of metal screen / sheath：焊接皱纹铝套 Welded corrugated aluminum sheath
-金属屏蔽/套的最大直流电阻（20°C）Maximum DC resistance of the metal screen/sheath (20°C): 0.0237 Ω/km

h) -外护套的材质 Material of oversheath：PE
-外护套的标称厚度 Thickness of oversheath：5.0mm
-半导电涂覆层的性质和材料 Nature and material of semi-conductive covering：半导电 PE semi-conducting PE

i) -成品电缆标称外径（D）Nominal overall diameter of the cable ($D$)：156.4±3.0mm

j) -标称电容 Nominal capacitance：0.231 μF/km

k) -导体屏蔽上的标称电场强度($E_i$ ) Nominal electrical stress at conductor screen under $U_0$ ($E_i$): 7.0kV/mm
-绝缘屏蔽上的标称电场强度($E_o$ ) Nominal electrical stress at insulation screen under $U_0$ ($E_o$): 4.1kV/mm

| 型号和规格 Type and Size | 电缆 Cable：ZA-YJLW03-Z 127/220 1×2500<br>附件 Accessories：见附录 C 和 E See annex C, E | 报告编号 Reference No. | CT24-01488W1 |
|---|---|---|---|

C3 瓷套式终端特性(委托方提供) Porcelain type outdoor termination characteristics（Provided by the consigner）

a) -制造商：江苏宇辉电力科技有限公司
Manufacturer: Jiangsu Yuhui Electric Power Technology Co., Ltd.
-型号 Type: YJZWY4
-名称：127/220kV 交联聚乙烯绝缘电力电缆用液体填充绝缘瓷套管终端
Designation: 127/220kV Oil-filled outdoor termination with porcelain insulator for XLPE insulation power cable
-制造日期 Manufacturing date: 2024

b) -$U_0/U/U_m$：127/220/252 (kV)

c) -外绝缘类型 Type of insulator: 瓷套 Porcelain
-爬电距离 Creepage distance: 8360 mm
-闪络距离 Flashover distance: 2330 mm
-伞裙数量 Number of sheds: 59
-瓷套管最大悬臂负荷 The maximum cantilever operating load of ceramic hollow insulators: 2000 N
-瓷套管设计内压力 The design pressure of ceramic hollow insulators: 2.8 MPa

d) -应力锥类型 Type of stress relief cone: 预制式 Prefabricated
-应力锥材料 Material of stress relief cone: 硅橡胶 Silicone rubber
-应力锥外是否带有环氧件 Epoxy insulator over relief cone：

e) -绝缘填充剂 Insulating medium: 聚异丁烯 Polyisobutylene

C4 复合套式终端特性(委托方提供) Polymer type outdoor termination characteristics（Provided by the consigner）

a) -制造商：江苏宇辉电力科技有限公司
Manufacturer: Jiangsu Yuhui Electric Power Technology Co., Ltd.
-型号 Type: YJZWFY4
-名称：127/220kV 交联聚乙烯绝缘电力电缆用液体填充绝缘复合套管终端
Designation: 127/220kV Oil-filled outdoor termination with composite insulator for XLPE insulation power cable
-制造日期 Manufacturing date:2024

b) -$U_0/U/U_m$：127/220/252 (kV)

c) -外绝缘类型 Type of insulator：复合套 Composite
-爬电距离 Creepage distance: 9360 mm
-闪络距离 Flashover distance: 2380mm
-伞裙数量 Number of sheds: 63
-复合套管最大机械负荷 The maximum mechanical load of composite hollow insulators(MML): 5.6 kN
-复合套管最大的工作压力 The maximum service pressure of composite hollow insulators(MSP): 1.0 MPa

d) -应力锥类型 Type of stress relief cone: 预制式 Prefabricated
-应力锥材料 Material of stress relief cone: 硅橡胶 Silicone rubber
-应力锥外是否带有环氧件 Epoxy insulator over relief cone：

e) -绝缘填充剂 Insulating medium: 聚异丁烯 Polyisobutylene

| 型号和规格 Type and Size | 电缆 Cable：ZA-YJLW03-Z 127/220 1×2500<br>附件 Accessories：见附录 C 和 E See annex C, E | 报告编号 Reference No. | CT24-01488W1 |
|---|---|---|---|

C5 绝缘接头特性(委托方提供) Sectionalized joint characteristics（Provided by the consigner）

a) -制造商：江苏宇辉电力科技有限公司
Manufacturer: Jiangsu Yuhui Electric Power Technology Co., Ltd.
-型号 Type: YJJJI2
-名称：127/220kV 交联聚乙烯绝缘电力电缆用整体预制橡胶绝缘件绝缘接头
Designation: 127/220kV Sectionalizing joint for XLPE insulation power cable
-制造日期 Manufacturing date:2024

b) -$U_0/U/U_m$：127/220/252 (kV)

c) -接头类型 Type of joint：预制式 Prefabricated
-应力锥材料 Material of stress cone:硅橡胶 Silicone rubber

d) -导体连接 Conductor connector :压接 Compressed

e) -接头外保护盒 Joint outer protection: 有 Yes
-接头是否用在潮湿环境 May be subjected to wet conditions in service: 是 Yes

C6 直通接头特性(委托方提供) Sectionalized joint characteristics（Provided by the consigner）

a) -制造商：江苏宇辉电力科技有限公司
Manufacturer: Jiangsu Yuhui Electric Power Technology Co., Ltd.
-型号 Type: YJJTI2
-名称：127/220kV 交联聚乙烯绝缘电力电缆用整体预制橡胶绝缘件直通接头
Designation: 127/220kV Straight joint for XLPE insulation power cable
-制造日期 Manufacturing date:2024

b) -$U_0/U/U_m$：127/220/252 (kV)

c) -接头类型 Type of joint：预制式 Prefabricated
-应力锥材料 Material of stress cone:硅橡胶 Silicone rubber

d) -导体连接 Conductor connector :压接 Compressed

e) -接头外保护盒 Joint outer protection: 有 Yes
-接头是否用在潮湿环境 May be subjected to wet conditions in service: 是 Yes

| 型号和规格 Type and Size | 电缆 Cable：ZA-YJLW03-Z 127/220 1×2500<br>附件 Accessories：见附录 C 和 E See annex C, E | 报告编号 Reference No. | CT24-01488W1 |
|---|---|---|---|

C7 GIS 终端(短)特性(委托方提供) GIS termination（short type） characteristics（Provided by the consigner）

a) -制造商：江苏宇辉电力科技有限公司
Manufacturer: Jiangsu Yuhui Electric Power Technology Co., Ltd.
-型号 Type: YJZGG/S
-名称：127/220kV 交联聚乙烯绝缘电力电缆用干式绝缘 GIS 终端(短型)
Designation: 127/220kV Dry type GIS termination for XLPE insulation power cable (short type)
-制造日期 Manufacturing date:2024

b) -$U_0/U/U_m$：127/220/252 (kV)

c) -绝缘体类型 Type of insulator：环氧树脂 Epoxy resin insulator
-干式 Dry type：是 Yes
-绝缘体长度 Length of insulator: 620mm
-金属圆筒内径 Internal diameter of the metal cylinder ($d_5$): 400mm

d) -应力锥类型 type of stress relief cone: 预制 Prefabricated
-应力锥材料 Material of stress relief cone: 硅橡胶 Silicone rubber

e) -终端外使用的绝缘介质类型 Type of insulating media to be used in the cable connection enclosure:
六氟化硫 $SF_6$

C8 GIS 终端(长)特性(委托方提供) GIS termination （long type） characteristics（Provided by the consigner）

a) -制造商：江苏宇辉电力科技有限公司
Manufacturer: Jiangsu Yuhui Electric Power Technology Co., Ltd.
-型号 Type: YJZGG/L
-名称：127/220kV 交联聚乙烯绝缘电力电缆用干式绝缘 GIS 终端(长型)
Designation: 127/220kV Dry type GIS termination for XLPE insulation power cable (long type)
-制造日期 Manufacturing date:2024

b) -$U_0/U/U_m$：127/220/252 (kV)

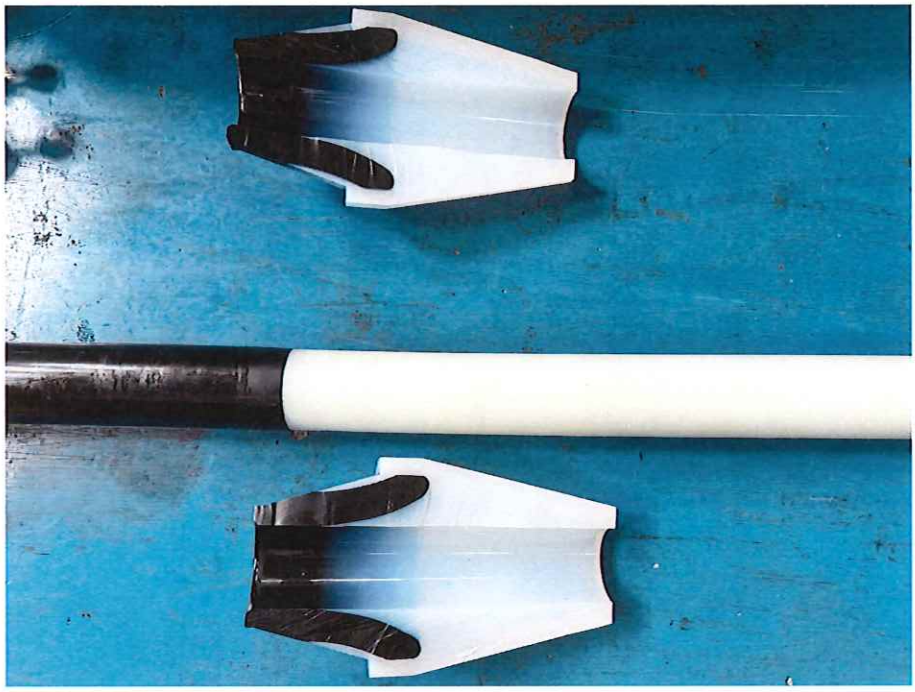
c) -绝缘体类型 Type of insulator：环氧树脂 Epoxy resin insulator
-干式 Dry type：是 Yes
-绝缘体长度 Length of insulator :960mm
-金属圆筒内径 Internal diameter of the metal cylinder ($d_5$): 400mm

d) -应力锥类型 type of stress relief cone: 预制 Prefabricated
-应力锥材料 Material of stress relief cone: 硅橡胶 Silicone rubber

e) -终端外使用的绝缘介质类型 Type of insulating media to be used in the cable connection enclosure:
六氟化硫 $SF_6$

| 型号和规格<br>Type and Size | 电缆 Cable：ZA-YJLW03-Z 127/220 1×2500<br>附件 Accessories：见附录 C 和 E See annex C, E | 报 告 编 号<br>Reference No. | CT24-01488W1 |
|---|---|---|---|

附录D 主要的试验照片 Annex D Key photos during test

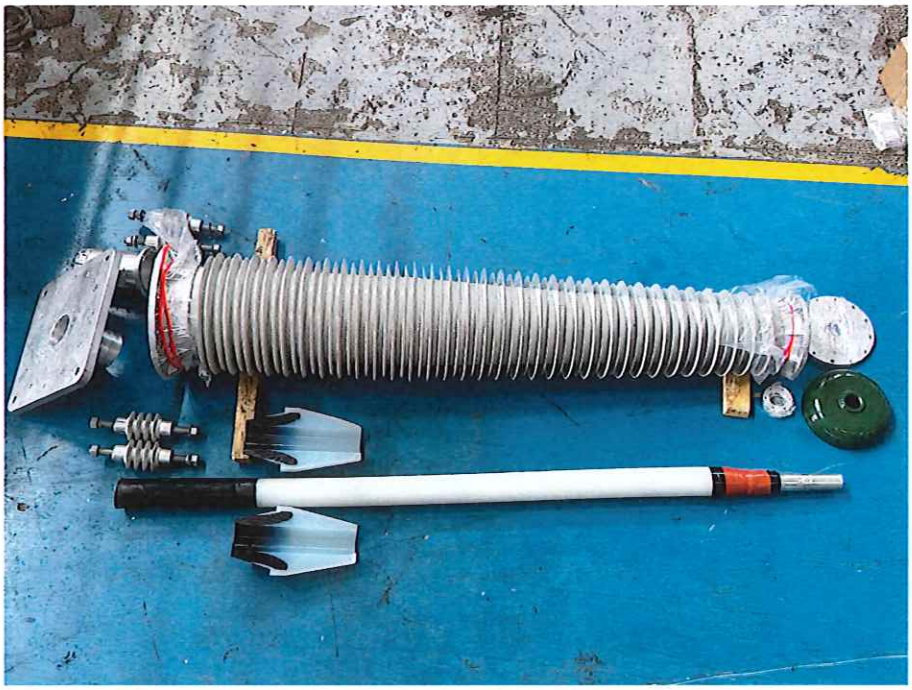


D1 瓷套式终端检查 Examination for porcelain type outdoor termination (1/2)

D2 瓷套式终端检查 Examination for porcelain type outdoor termination (2/2)

| 型号和规格<br>Type and Size | 电缆 Cable：ZA-YJLW03-Z 127/220 1×2500<br>附件 Accessories：见附录 C 和 E See annex C, E | 报 告 编 号<br>Reference No. | CT24-01488W1 |
|---|---|---|---|

D3 复合套式终端检查 Examination for composite type outdoor termination (1/2)



D4 复合套式终端检查Examination for composite type outdoor termination (2/2)

| 型号和规格<br>Type and Size | 电缆 Cable：ZA-YJLW03-Z 127/220 1×2500<br>附件 Accessories：见附录 C 和 E See annex C, E | 报 告 编 号<br>Reference No. | CT24-01488W1 |
|---|---|---|---|

D5 绝缘接头检查 Examination for sectionalized joint (1/2)

D6 绝缘接头检查 Examination for sectionalized joint (2/2)

| 型号和规格<br>Type and Size | 电缆 Cable：ZA-YJLW03-Z 127/220 1×2500<br>附件 Accessories：见附录 C 和 E See annex C, E | 报 告 编 号<br>Reference No. | CT24-01488W1 |
|---|---|---|---|

D7 直通接头检查 Examination for straight joint (1/2)

D8 直通接头检查 Examination for straight joint (2/2)

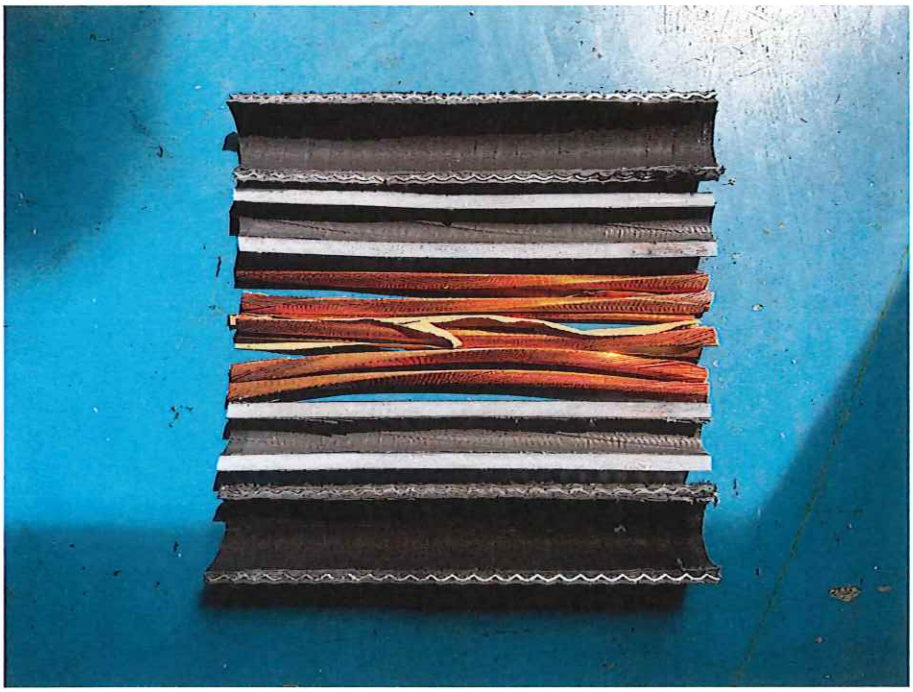
| 型号和规格<br>Type and Size | 电缆 Cable：ZA-YJLW03-Z 127/220 1×2500<br>附件 Accessories：见附录 C 和 E See annex C, E | 报 告 编 号<br>Reference No. | CT24-01488W1 |
|---|---|---|---|

D9 GIS终端检查 Examination for GIS termination (1/3)

D10 GIS终端检查 Examination for GIS termination (2/3)

| 型号和规格<br>Type and Size | 电缆 Cable：ZA-YJLW03-Z 127/220 1×2500<br>附件 Accessories：见附录 C 和 E See annex C, E | 报 告 编 号<br>Reference No. | CT24-01488W1 |
|---|---|---|---|

D11 GIS终端检查 Examination for GIS termination (3/3)

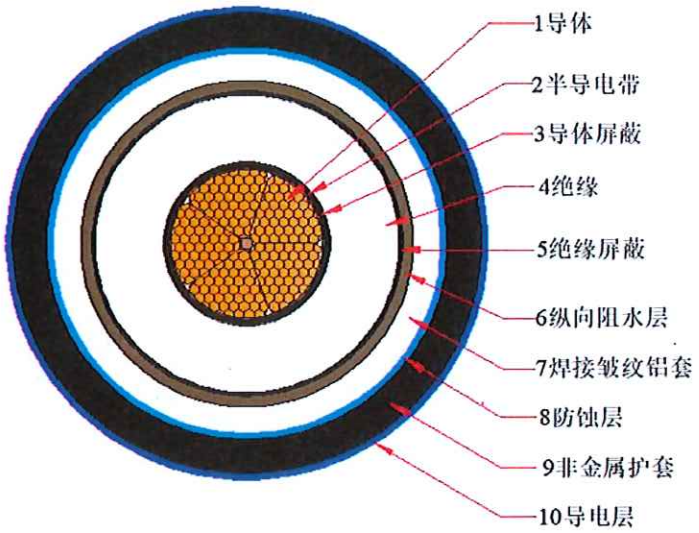


D12电缆检查 Examination for cable (1/1)

| 型号和规格 Type and Size | 电缆 Cable：ZA-YJLW03-Z 127/220 1×2500<br>附件 Accessories：见附录 C 和 E See annex C, E | 报 告 编 号 Reference No. | CT24-01488W1 |
|---|---|---|---|

附录 E 样品信息（委托方提供） Annex E Drawing of sample（Provided by the consigner）

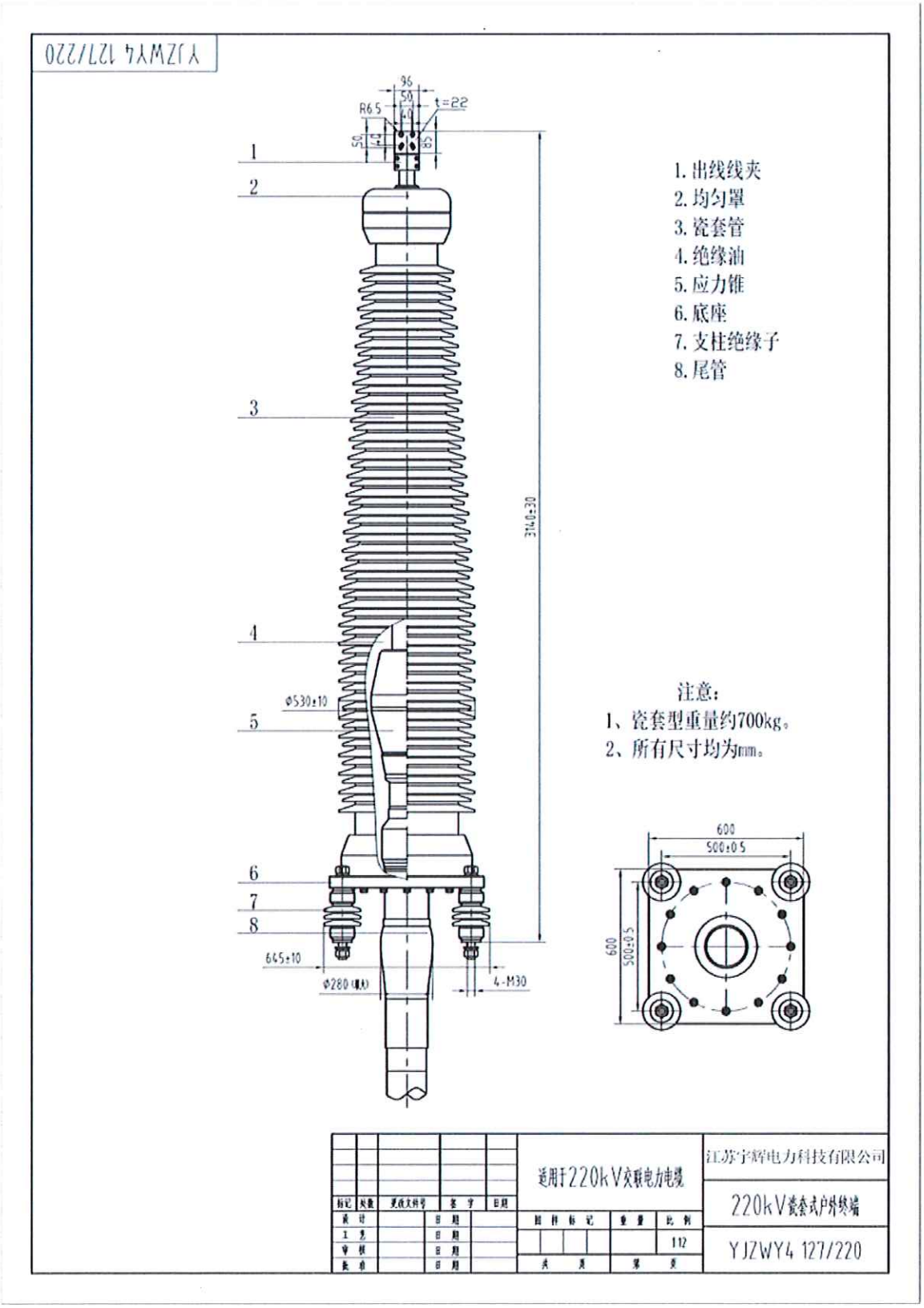
E1 电缆结构图 Drawing of cable




| 序号 No. | 电缆结构 Component | 标称厚度 Nominal Thickness /mm | 标称外径 Nominal Diameter /mm |
|---|---|---|---|
| 1 | 5 分割导体<br>5 Segments milliken conductor | - | 60.6 |
| 2、3 | 导体屏蔽（绕包+挤包）<br>Conductor screen（Wrapping +Extruded） | 2×0.2<br>1.7 | 65.6 |
| 4 | XLPE 绝缘<br>XLPE insulation | 24.0 | 114.0 |
| 5 | 绝缘屏蔽<br>Insulation screen | 1.0 | 116.0 |
| 6 | 半导电缓冲阻水带<br>Semi-conducting water blocking tape | 2×2.0 | 127.2 |
| 7 | 皱纹铝套<br>Corrugated aluminum sheath | 2.8 | 144.8 |
| 8 | 电缆沥青<br>Cable asphalt | 0.25 | |
| 9 | 外护套<br>Oversheath | 5.0 | 156.4 |
| 10 | 半导电层<br>Semi-conducting layer | 0.1 | |

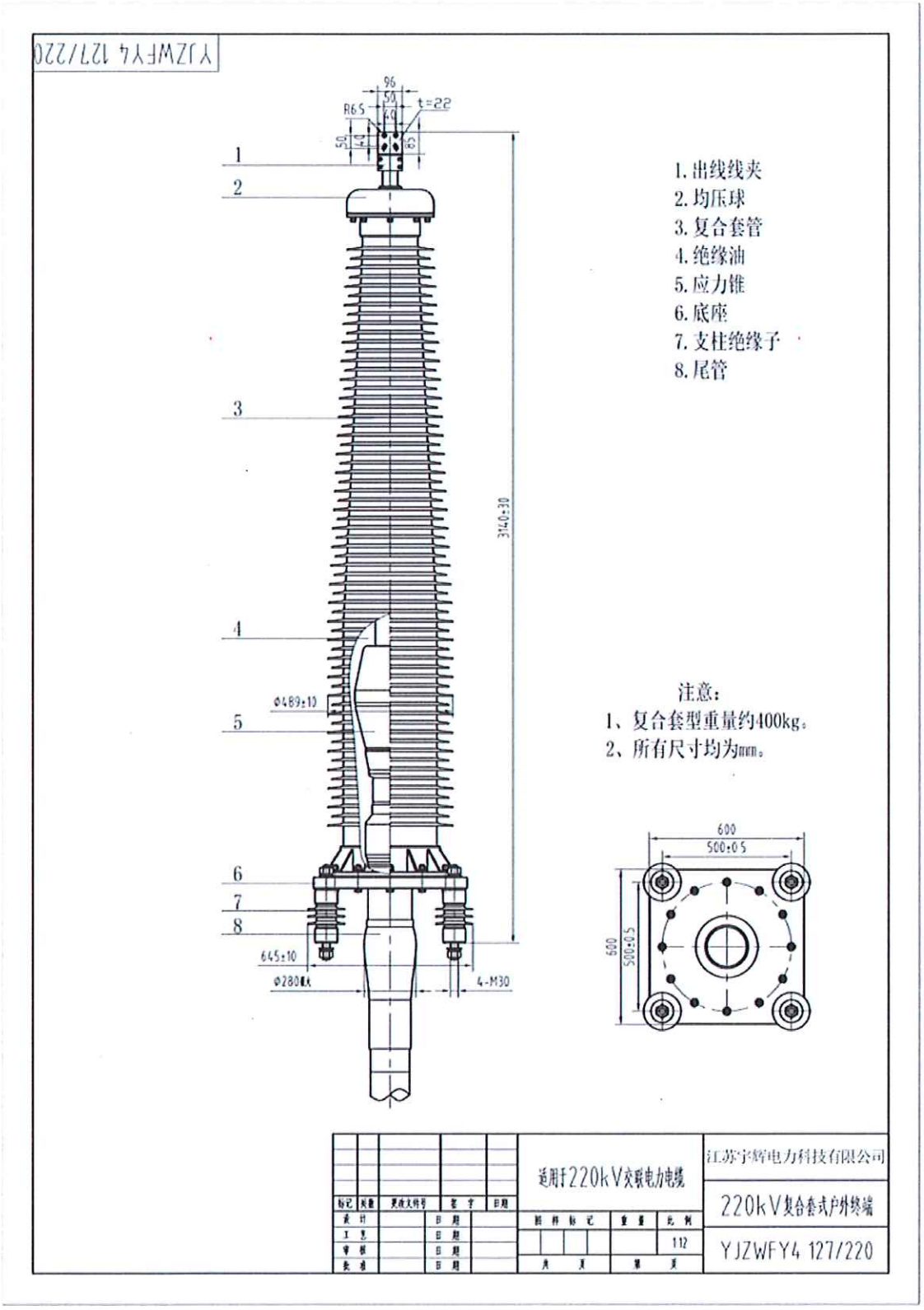
| 型号和规格<br>Type and Size | 电缆 Cable：ZA-YJLW03-Z 127/220 1×2500<br>附件 Accessories：见附录 C 和 E See annex C, E | 报 告 编 号<br>Reference No. | CT24-01488W1 |
|---|---|---|---|

E2 瓷套式户外终端结构图 Drawing of porcelain type outdoor termination



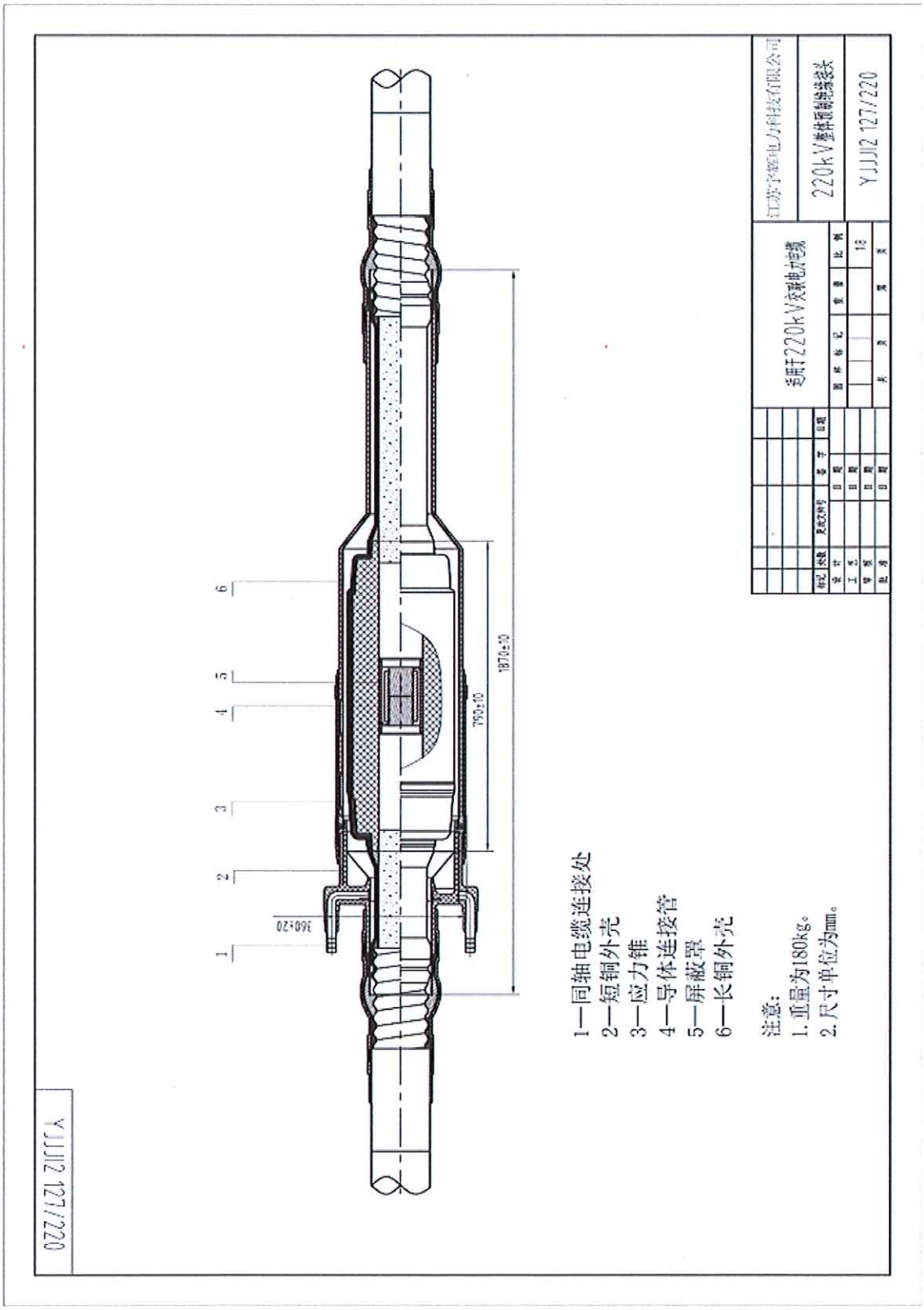
| 型号和规格<br>Type and Size | 电缆 Cable：ZA-YJLW03-Z 127/220 1×2500<br>附件 Accessories：见附录 C 和 E See annex C, E | 报 告 编 号<br>Reference No. | CT24-01488W1 |
|---|---|---|---|

E3 复合式户外终端结构图 Drawing of composite type outdoor termination



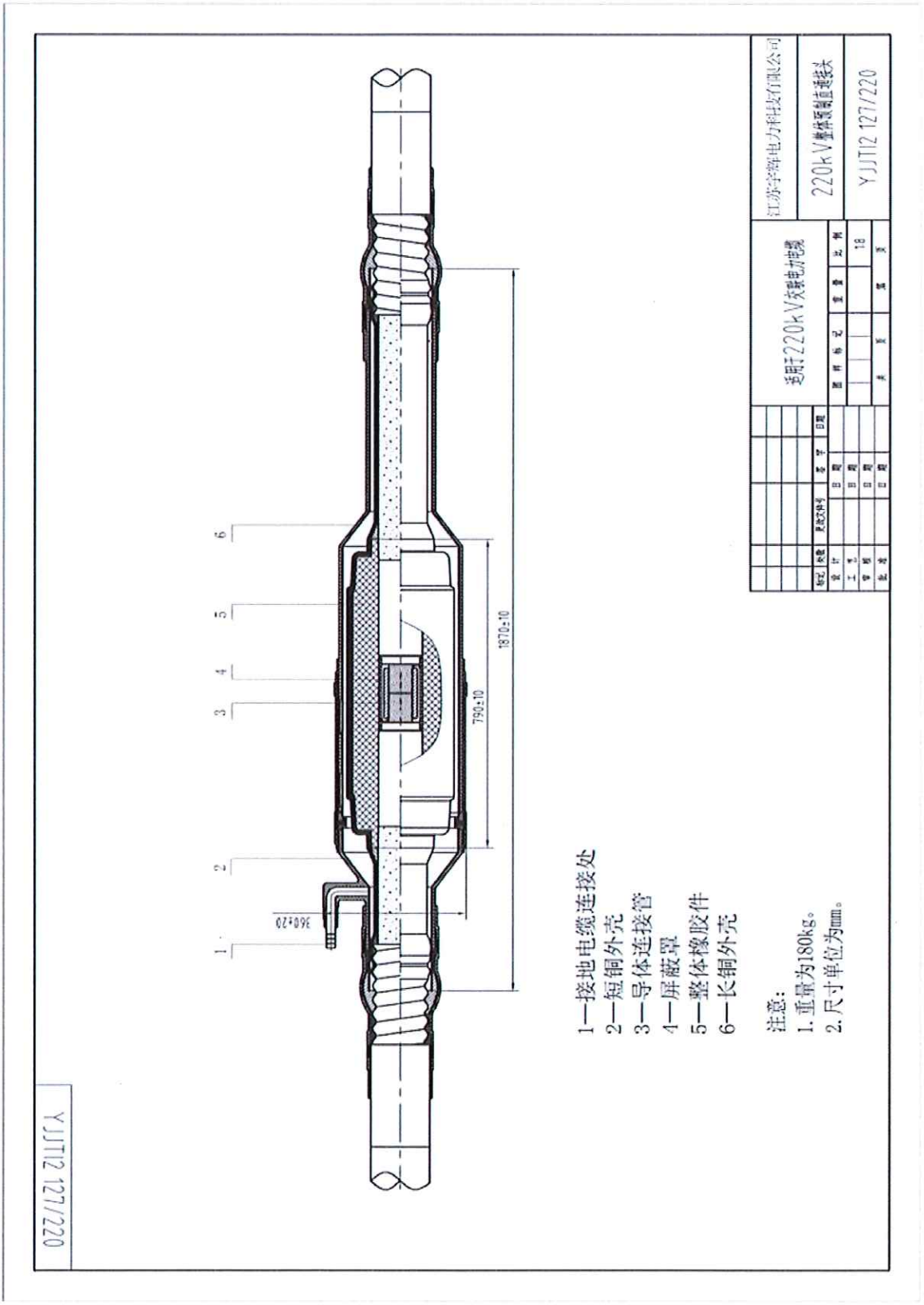
| 型号和规格<br>Type and Size | 电缆 Cable：ZA-YJLW03-Z 127/220 1×2500<br>附件 Accessories：见附录 C 和 E See annex C, E | 报 告 编 号<br>Reference No. | CT24-01488W1 |
|---|---|---|---|

E4 绝缘接头结构图 Drawing of sectionalized joint



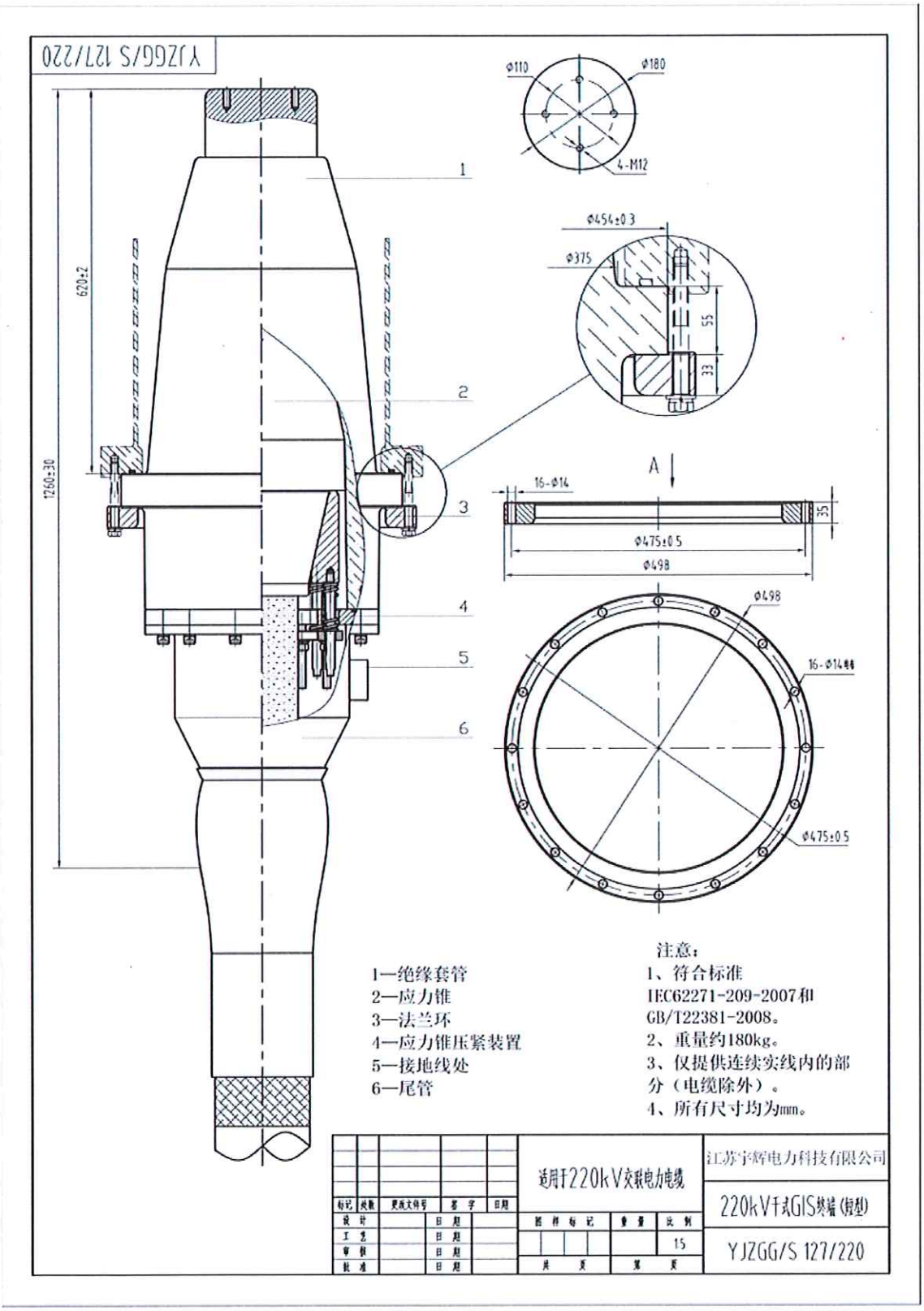
| 型号和规格 Type and Size | 电缆 Cable：ZA-YJLW03-Z 127/220 1×2500<br>附件 Accessories：见附录 C 和 E See annex C, E | 报告编号 Reference No. | CT24-01488W1 |
|---|---|---|---|

E5 直通接头结构图 Drawing of straight joint



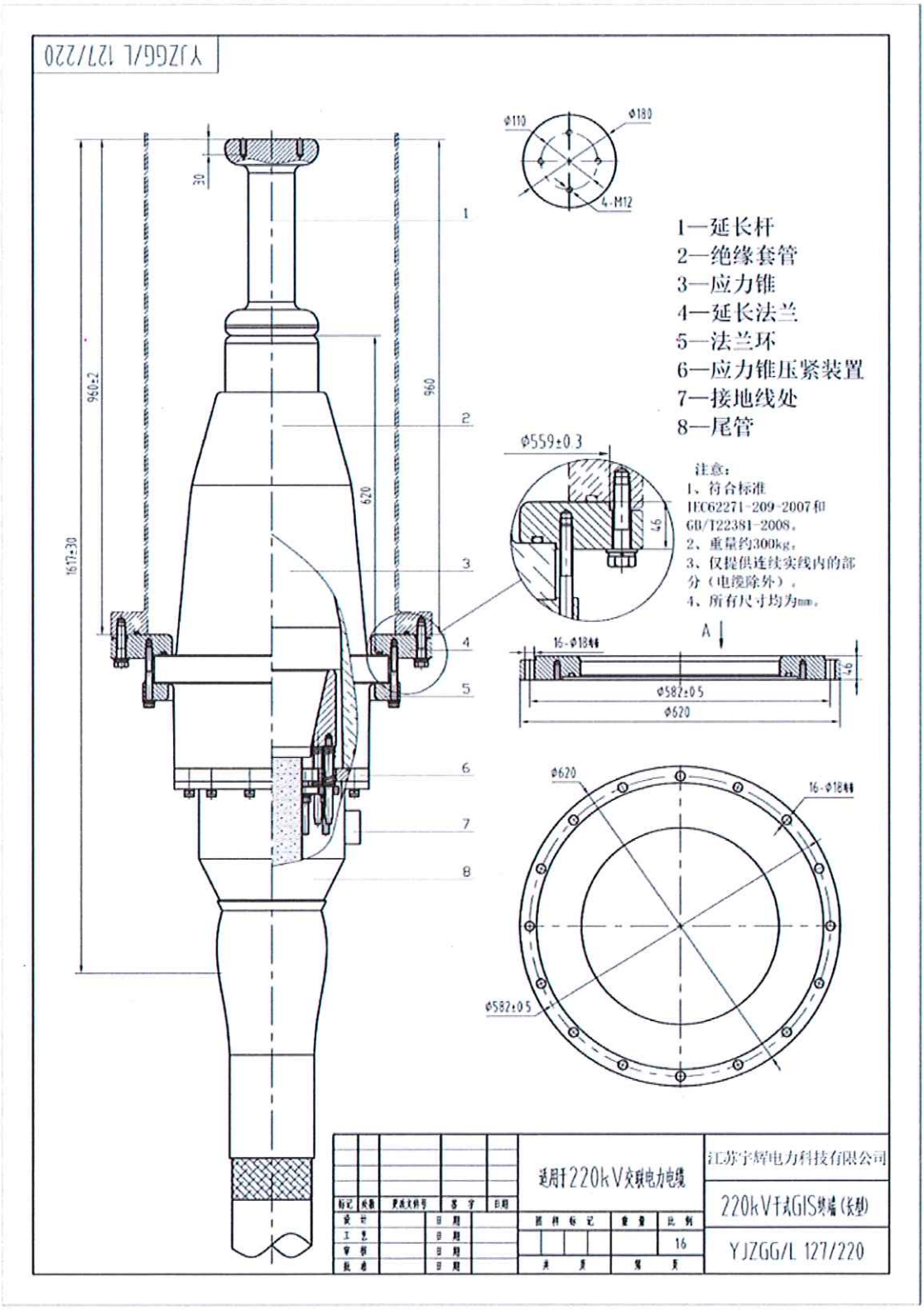
| 型号和规格 Type and Size | 电缆 Cable：ZA-YJLW03-Z 127/220 1×2500<br>附件 Accessories：见附录 C 和 E See annex C, E | 报告编号 Reference No. | CT24-01488W1 |
|---|---|---|---|

E6 GIS 终端（短型）结构图 Drawing of GIS termination（Short Type）



| 型号和规格<br>Type and Size | 电缆 Cable：ZA-YJLW03-Z 127/220 1×2500<br>附件 Accessories：见附录 C 和 E See annex C, E | 报 告 编 号<br>Reference No. | CT24-01488W1 |
|---|---|---|---|

E7 GIS 终端（长型）结构图 Drawing of GIS termination（Long Type）



附件：
Appendix

# 主 要 检 测 设 备 清 单
# List of key test equipment

报告编号：CT24-01488W1
Reference No.: CT24-01488W1

| 设备编号<br>No. of equipment | 设 备 名 称<br>Name of equipment | 下次检定日期<br>Next calibration date |
|---|---|---|
| JL0220 | 电子天平 | 2025-05-21 |
| JL0303 | 拉力试验机 | 2025-04-21 |
| JL0364 | 数字直流电桥 | 2025-07-17 |
| JL0601 | 介损tgδ、电容测量电桥 | 2024-07-24 |
| JL0660 | 连续变倍体视显微镜 | 2025-02-18 |
| JL0727 | 电缆绝缘和护套几何参数全自动测试系统 | 2024-09-24 |
| JL0987 | 数显千分尺 | 2025-06-03 |
| SB0516 | 碳黑测定仪 | 2025-04-10 |
| SB6775 | 管材内压力试验装置 | 2024-11-06 |
| ZJ0328 | 电缆半导电电阻测试装置 | 2025-04-16 |
| ZJ0345 | 热延伸试验装置 | 2025-06-27 |
| ZJ0393 | 热老化试验箱 | 2025-03-01 |
| ZJ0547 | 高温压力试验装置 | 2024-09-14 |
| ZJ0653 | 高压串联谐振测试装置 | 2025-01-25 |
| ZJ0654 | 冲击电压发生器 | 2025-01-09 |
| ZJ0680 | 冲击电压发生器 | 2024-10-06 |
| ZJ0698 | 串联谐振试验系统 | 2025-01-25 |
| ZJ6030 | 腐蚀扩展试验装置 | 2024-12-12 |
| ZJ6205 | 局部放电检测系统 | 2024-11-22 |
| ZJ6273 | 循环加热系统 | 2025-07-15 |
| ZJ6316-1 | 真空表 | 2025-07-02 |
| ZJ6316-4 | 压力表 | 2025-07-02 |
| ZJ6318 | 电磁干扰测量接收机 | 2025-09-21 |
| ZJ6331 | 电缆成束燃烧试验装置 | 2024-10-25 |
| ZJ6335 | 挤出外套刮磨试验机 | 2024-12-05 |
| ZJ6443 | 绝缘套弯曲测试台 | 2025-06-23 |
| ZJ6443-1 | 静态数字电阻应变测试仪 | 2025-03-10 |
| ZJ6496 | 单根垂直燃烧试验装置 | 2025-04-10 |
| ZJ8057-1 | 直流高压发生器 | 2024-10-19 |