

NPMPD钢轨电位限制装置

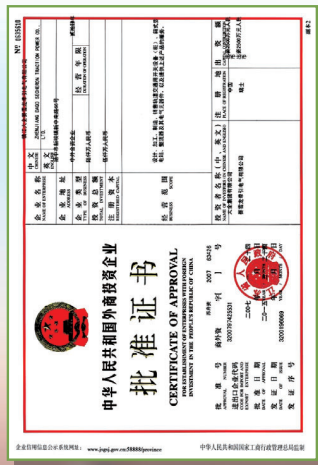
NPMPD Over Voltage Protection Device



Swiss Technology International Product

城轨交通直流牵引供电技术的领先者

Leading DC Traction Power Supply for Mass Transit Projects



主要用户 References

长春轻轨环线一期工程
 Changchun Urban Railway Phase 1 Project
 天津津滨快速轨道交通工程
 Tianjin Urban Railway Line Jinbin Project
 武汉轻轨一期工程
 Wuhan Tramway Phase 1 Project
 南京地铁一期工程
 Nanjing Metro Phase 1 Project
 北京地铁八通线工程
 Beijing Metro Line Batong Project

重庆轻轨较新线一期工程
 Chongqing Tramway Line jiaoxin Phase 1 Project
 天津地铁一号线工程
 Tianjin Metro Line 1 Project
 广州地铁四号线工程
 Guangzhou Metro Line 4 Project
 上海地铁八号线工程
 Shanghai Metro Line 8 Project
 天津有轨电车试验线工程
 Tianjin Trolleybus test line Project

公司简介

Company Introduction

瑞士赛雪龙牵引电气有限公司（以下简称瑞士赛雪龙）成立于1879年，专门从事直流牵引系统及其元器件的设计、研发、生产、销售及服务，在开发轨道交通产品和系统方面有逾100多年的历史。如今，瑞士赛雪龙已成为直流牵引供电技术的领先者，直流快速断路器等主要元器件的市场份额位居前列，其产品服务于全世界的城轨交通用户。

大全集团有限公司（以下简称大全），中国电气工业领军企业，于1998年携手瑞士赛雪龙，在中国生产制造具有最新国际水平的直流开关设备，已服务于中国轨道交通行业20多年。

鉴于双方良好的合作和信任，以及对中国市场的信心，两家公司进一步走到了一起，于2007年1月成立了镇江大全赛雪龙牵引电气有限公司（以下简称大全赛雪龙）。合资公司在原有的KMB和MB直流开关柜的基础上，继续引进瑞士赛雪龙SIK箱式牵引整流变电站、SAPD静调电源柜、DSS直流隔离开关柜、SCMS杂散电流监测系统、ZELPD接地漏电保护装置、VES多工位供电接地系统、OMLA直流开关设备智能运维管理系统等其它产品，满足不同用户日益多元化的需求。至2021年底，大全赛雪龙已为国内40多个城市120多条地铁或轻轨提供了直流开关柜产品和服务，深得广大用户好评。

随着合资公司的成立，公司有能力和中国的客户提供更优质的解决方案，为中国正日益快速发展的轨道交通事业提供优质产品和高效服务。

Secheron S.A (hereinafter called Secheron), established in 1879, headquartered in Switzerland, is specialized in design, research, production, sales and service of components and systems of DC traction power. Secheron has been developing components and systems for rail transit for over 100 years. Today, Secheron has become the leader of DC traction power market. The core products as DC circuit-breaker have large market share and are applied in rail transit projects all over the world.

Daqo Group Co. Ltd.(hereinafter called Daqo), one of the leaders in china electrical industry, started cooperation with Secheron in 1998, has been manufacturing DC switchgear equipment with the latest international level quality, and providing service for China rail transit industry for more than 20 years.

The two companies jointly established a joint venture company named Zhenjiang Daqo Secheron Traction Power Co., Ltd. (hereinafter called ZDS) in January 2007. In addition to DC switchgear type KMB and MB, ZDS introduced prefabricated traction rectifier substation type SIK, static adjustable power device type SAPD, DC disconnecter switchgear type DSS, SCMS stray current monitoring system, ZELPD earth leakage protective device, VES Multi position power grounding system, OMLA DC switchgear equipment intelligent operation and maintenance management system and other products to meet the diversified demand of customers. By the end of 2021, ZDS has provided DC switchgear products and services for more than 120 metro or light rails in over 40 cities in China, which is well received by customers.

As the establishment of ZDS, we have enough capability to provide more excellent solutions to customers and to provide high quality products and top-ranking service for China mass transit industry which develops quickly.



北京地铁一 / 二号线改造工程
Beijing Metro Line 1&2 Retrofit Project
北京地铁十号线工程
Beijing Metro Line 10 Project
杭州地铁一号线工程
Hangzhou Metro Line 1 Project
深圳地铁五号线工程
Shenzhen Metro Line 5 Project
西安地铁一 / 二号线工程
Xi'an Metro Line 1&2 Project

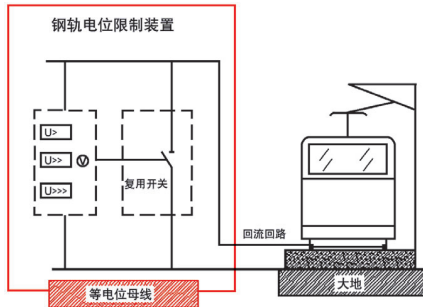
广州地铁广佛线工程
Guangzhou Metro Line Guangfo Project
成都地铁一 / 二号线工程
Chengdu Metro Line 1&2 Project
苏州地铁一号线工程
Suzhou Metro Line 1 Project
武汉地铁二 / 四号线工程
Wuhan Metro Line 2&4 Project
宁波地铁一号线工程
Ningbo Metro Line 1 Project

哈尔滨地铁2号线一期工程
Haerbin Metro Line 2 Phase 1 Project
厦门地铁3号线工程
Xiamen Metro Line 3 Project
福州地铁2号线工程
Fuzhou Metro Line 2 Project
贵阳地铁2号线一期工程
Guiyang Metro Line 2 Phase 1 Project
兰州地铁1号线一期工程
Lanzhou Metro Line 1 Phase 1 Project

概述

在直流牵引系统中，由于操作电流和短路电流的存在，可能会引起回流回路（运行轨）与大地之间产生超出安全许可的接触电压。

这种情况下，就需要在回流回路（运行轨）与大地之间装配一套钢轨电位限制装置，也称短路装置，以限制运行轨的电位，避免超出安全许可的接触电压的发生。



Cassette

In DC traction system impermissible touch voltages may occur between the return circuit and the structure earth due to operational and short-circuit currents.

In this case, a short-circuit device must be used as a voltage protection device between the return circuit and the structure earth, preventing the existence of impermissible touch voltage.

主要特性

采用常规高性能直流接触器（或晶闸管与直流接触器并联的复用开关），满足欧洲标准 EN 的安全要求。

- 采用晶闸管短路器，低维护。
- 反应迅速，可以最大限度地保证人员及设备安全。
- 设计紧凑，安装简便。
- 现场无需更多调试，出厂时已具备投运条件。

Main Features

Fulfills all the criteria of EN, due to the application of DC contactor of excellent performance (or a hybrid switch consisting of thyristor and DC contactor parallel connected)

- Low maintenance due to application of a thyristor.
- Maximum personnel and equipment protection due to fast reaction.
- Simple installation due to compact design.
- No commissioning needed because NPMPD is supplied ready for operation.

技术参数

Technical data

直流接触器	DC contactor		
额定操作电流	Rated operational current	800A/1250A/1500A	
机械寿命(操作循环次数)	Mechanical endurance (time of operation cycle)	1.5x10 ⁶	
操作频率(操作循环次数/小时)	Operation frequency (time of operation cycle per hour)	120	
额定短路电流	Rated short-circuit current	DC600V, 50kA/80kA, 250ms	
* 特殊技术参数另行协商 Special technical data according to the negotiation between two parties			
电压监测及触发时间	Voltage monitoring and reaction time		
U>	整定范围 Adjustable scope	25~300V DC	时间 Time 0.15s-99h
U>> (不低于6段)	整定范围 Adjustable scope	25~300V DC	时间 Time 0.1s
U>>>	整定范围 Adjustable scope	600V DC ± 50V DC	时间 Time <0.0002s
操作电压	Control voltage	220V AC/DC	
柜体	Cubicle	钢板 Steel plate	
外形尺寸(宽×深×高)	Overall dimension (W x D x H)	600(800)x600x2200mm	
颜色	Color	RAL7032/RAL7035	
防护等级	Ingress protection	IP40/IP54	
重量	Weight	250kg~300kg	

应用

- 保护人员安全
- 防止乘客站台发生超出安全许可的接触电压
- 保护设施安全
- 防止设施区域发生高的接触电压
- 监测回流回路的电位

元件组成

钢轨电位限制装置主要包含下列功能元件：

- 复用开关，由直流接触器、晶闸管(选件)组成
- 多级电压测量元件
- 控制及测试逻辑电路

功能描述

当发生超出安全许可的接触电压时，钢轨电位限制装置就将钢轨与大地短路，从而保证人员和设施的安全。

正常情况下，直流接触器的触头是开断的，晶闸管元件也处于不导通状态。钢轨与大地之间的电压由三级独立的电压测量元件(分别用U>、U>>和U>>>符号代表)来检测、显示和判断(可根据要求扩展为6段)。

闭锁

当钢轨电位限制装置达到预先设定的连续短路次数后，该装置将进入闭锁状态(恒定合闸状态)。闭锁状态只能由手动复位。

与远程监控系统的接口

钢轨电位限制装置可以通过无源接点向远程监控系统上传如下信息：

- 钢轨电位限制装置状态“开断”
- 钢轨电位限制装置状态“短接”
- 短路装置状态“闭锁”
- 钢轨电位限制装置故障
- 控制回路和辅助回路的电源故障
- 报警信号

Applications

- Personnel protection.
- Prevention of impermissible voltage at passenger station.
- Protection of installation.
- Removal of high touch voltage in the equipment area.
- Monitoring of return circuit potential.

Construction

The NPMPD consists of the following principal components:

- Hybrid switch, consisting of a DC contactor and thyristor.
- Multilevel voltage monitoring components.
- Control and test logic circuit.

Function

The NPMPD connects the return circuit and the structure earth when impermissibly high touch voltage occurs. This ensures the safety of personnel and protection of installation.

In normal conditions the contact of the DC contactor is open and the thyristor is not conducting. The voltage between the return circuit and the equipotential bonding busbar is measured, indicated and evaluated by the voltage monitoring device U>, U>> and U>>> (It can be extended to 6 settings as required).

Locking

When the pre-adjusted maximum value for the number of short-circuit is reached, the NPMPD enters into the locked states (permanent closed states). The locking must be manually reset.

The Interface with Remote Monitoring and Control System

The NPMPD can transmit the following information to remote monitoring and control system by no-power contact.

- “Open” status
- “Short-circuit” status
- “Locking” status
- “Faulty” status
- Power supply fault of control and auxiliary circuit
- Alarms

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