

KONČAR

ELECTRONICS AND
INFORMATICS

DC Return cable panel

KONDC-MP

The KONDC-MP DC Return cable panel is an integral part of the 660 V DC power distribution system in rectifier stations for public electric urban transport.

Its primary function is to receive return cables from contact network return points.

KEY FEATURES:

- Motorized rectifier disconnecter
- Multiple manual feeder disconnectors – equipped with magnetic interlocks for secure switching
- Built-in interlocks – provides enhanced operational safety and control
- Integrated USZMR relay & PLC controllers – protects equipment and personnel from failures and operational errors
- Intuitive control & monitoring – voltage, total rectifier current, and individual feeder current measurements are displayed on the front panel
- Modular design – allows for seamless integration with existing rectifiers for simplified installation.

The KONDC-MP DC Return cable panel is housed in a metal enclosure, with an open-bottom design for efficient return cable connection. The system's modular design allows for expansion by side-mounting additional rectifier panels within the rectifier station.

The self-standing metal cabinet provides front access to all components. Safe operation is ensured through motorized rectifier disconnecter control, equipment status monitoring, and individual feeder current measurement, all accessible via the front panel through dedicated push buttons, indicators, LED displays, a voltmeter, ammeters, and an alarm monitoring panel.

Opening the switch block cabinet door grants access to manual disconnectors and control, monitoring, and protection equipment, facilitating maintenance and servicing operations.



DC Return panel cabinet

The upper section of the switchgear block, housed behind a transparent insulated panel, contains measuring transducers for voltage and current monitoring, touch voltage measurement, and leakage current detection. It also includes protection and control equipment, such as protective MCB breakers for 48 V DC and 24 V DC auxiliary power supplies, signal terminal blocks for system alerts and diagnostics, the USZMR protection and control relay for DC return cable panel safety management, and two central PLC controllers for automation and operational control.

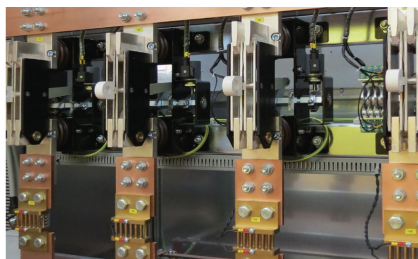
The USZMR protection and control relay enables local and remote communication, measurement, system control, signaling, and safety functions, including touch voltage protection and leakage current detection with adjustable time delay. It monitors rectifier and busbar voltages and detects blown fuses in rectifier damping elements and diode branches.

The central PLC controllers manage disconnectors based on signals received from DC feeder panels and MV switchgear systems, ensuring automated and coordinated operation.

The motorized rectifier disconnecter, located at the center of the KONDC-MP DC Return cable panel, is connected to manual feeder disconnectors via copper busbars. All disconnectors are equipped with mechanical interlocks, preventing unintended operations and ensuring compliance with medium-voltage transformer switchgear interlock conditions, which significantly improves personnel safety during maintenance. Beyond the manual return disconnectors, the system includes measurement shunts and connection points for return cables from the contact network.

At the bottom of the panel, there is a surge arrester and a grounding busbar to further protect the system.

KONDC-MP DC Return cable panel



TECHNICAL SPECIFICATIONS	
	KONDC-MP DC Return cable panel
Voltage	
Contact network voltage	660 - 750 VDC
Auxiliary DC power supply (control & protection)	48 VDC
Auxiliary DC power supply (signaling)	24 VDC
Total current capacity	4000 A
Nominal ratings	
Nominal voltage (Un) / upper nominal voltage (UNe)	750 VDC / 900 VDC
Nominal insulation voltage (UNm)	1200 VDC
Nominal short-time withstand current (INcw)	50 kA / 250 ms, 70 kA peak
Nominal short-circuit current (INss)	50kA
Peak short-circuit current (INss)	70 kA
Contact network peak time constant (TNC)	31.5 ms
Nominal operating current of main busbars (INe)	4000 A
Nominal operating current of return busbars (INe)	2000 A
Disconnectors & switching equipment	
Rectifier disconnecter	Motorized Disconnector STOL4021-MO-L-048DC-2-8-A, Ith = 4000 A, INe = 4000 A, UNe = 1800 V
Return cable disconnecter	Manually Operated Disconnector STOL2021-MAB-R-024DC-8-B-H, Ith = 2000 A, INe = 2000 A, UNe = 1800 V
General data	
Protection & test functions	Touch voltage protection, leakage current protection, adjustable time delay, surge arrester – provides system overvoltage protection
Rectifier protection & monitoring	Monitors rectifier voltage, current, feeder currents, and blown fuses in diode branches and damping elements
Local disconnecter control	Operated via push buttons and insulated rods, with magnetic interlocks preventing incorrect operations
Local equipment status indication	Voltmeter, ammeters, LED indicators, graphical display, USZMR relay event log, signal panel, and schematic diagram
Remote monitoring & control signals	SCADA interface with programmable volt-free relay contacts (4 inputs, 4 outputs).
Compliance with standards	HRN EN 50123-6
Cooling method	Natural convection cooling
Environmental conditions	Storage temperature: -20°C to +70°C, operating temperature: 0°C to +40°C, maximum operating altitude: 1000 m
Relative humidity (non-condensing)	Up to 90% at 30°C
Mechanical protection rating	Front & rear IP20, side panels IP30
Colour	Light gray front surface, RAL 7035
Dimensions (W × D × H) & Weight	1300 x 1500 x 2200 mm, 650 kg