

DC Switch block KONDC-SB40

The KONDC-SB40 DC Switch block 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 ensure the reliable distribution of traction voltage and protection of the corresponding contact network section.

KEY FEATURES:

- Withdrawable high-speed circuit breaker (HSCB) in a connectorized design
- Motorized feeder and bypass disconnectors
- Built-in interlocks – provides enhanced operational safety and control
- Integrated USZMR relay & PLC controllers – protects equipment and personnel from failures and operational errors
- Simple and intuitive control and monitoring, with real-time measurement display and status signaling on the front panel
- Modular design allows seamless expansion of the rectifier station by adding additional switch blocks

The modular switchgear block is enclosed in a metal housing. The modular design allows for the expansion of the rectifier station by adding the required number of blocks. New blocks are integrated by side-mounting them to existing units, with each block separated by a non-flammable transparent insulation barrier. The top section of the block features a perforated steel plate for cooling, while the bottom section is open to facilitate cable management.

The DC switch block is enclosed in a self-standing metal cabinet with front access to all components. The high-speed circuit breaker, disconnectors, and grounding switch are safely operated via dedicated control buttons and indicators on the front panel, which also features LED indicators and an ammeter for real-time monitoring. For maintenance and servicing, equipment access is facilitated by opening the upper and lower doors of the switch block.



Modular Switch block system

The upper section, located behind the front door, houses the control, monitoring, and protection systems, including protective MCB breakers for 48 V DC and 24 V DC auxiliary power supplies, signal terminal blocks, a USZMR relay for feeder field protection and control, and a central PLC controller for automation and system management.

The USZMR protection and control relay enables local and remote communication, real-time measurement, system control, and signaling. It integrates line testing, automatic reclosing, and essential protection functions, all of which can be programmed according to contact network conditions. These include overcurrent, short-circuit, surge, thermal, undervoltage, and overvoltage protection.

The relay continuously monitors the voltage levels of the busbars and feeders, as well as the insulation status of feeder cables, ensuring reliable operation and fault detection. The central PLC controller provides comprehensive system management, overseeing disconnector operation, position monitoring of disconnectors and the breaker cart, and voltage detection at the feeder cable head.

In the lower section, the DC high-speed circuit breaker (HSCB) is installed on a withdrawable cart, which integrates the automatic reclosing system, enabling efficient servicing, maintenance, and quick breaker replacement.

The motorized feeder and bypass disconnectors are housed in a dedicated compartment within the switch block, alongside the main and auxiliary copper busbars, a negative busbar for measurement, and a grounding busbar. At the bottom of the switch block, the surge arrester, grounding switch, and feeder cable connection points for the contact network section are positioned for easy access and reliable operation.

KONDC-SB40 DC Switch block



TECHNICAL SPECIFICATIONS

	KONDC-SB40 DC Switch block
Voltage	
Contact network voltage	660 - 750 VDC
Auxiliary DC power supply (control & protection)	48 VDC
Auxiliary DC power supply (signaling)	24 VDC
Feeder current	2500 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 Main & Auxiliary Busbars (INe)	2500 A
Nominal ground fault current (INcwe)	40 kA / 250 ms
Circuit breakers & disconnectors	
High-speed circuit breaker (HSCB)	Withdrawable breaker Gerapid 2607, type H/L/B, INe = 2600 A, INss = 50 kA, UNe = 1000 V, UNi = 2000 V
Feeder disconnecter	Motorized Disconnector STOL4021-MO-L-048DC-2-8-A, Ith = 4000 A, INe = 4000 A, UNe = 1800 V
Bypass disconnecter	Motorized Disconnector STOL4021-MO-L-048DC-2-8-A, Ith = 4000 A, INe = 4000 A, UNe = 1800 V
Grounding switch	Manually operated grounding switch STOZ1031-MAB-R-024DC-4-B, Ith = 1000 A, INcwe = 50 kA, UNe = 3600 V
General data	
Protection & test functions	Short-circuit protection, overcurrent protection, thermal protection for feeder cables, surge protection, undervoltage and overvoltage protection, surge arrester, feeder testing, automatic reclosing, relay self-diagnostics.
Control & monitoring	Voltage and current of the busbars and feeders, insulation and temperature monitoring of two feeder cables, and fuse failure detection in the line testing circuit
Local breaker & disconnector operation	Via push buttons with electronic interlocks preventing incorrect operations
Local equipment status indication	Ammeter, LED indicators, graphical display, USZMR relay event log, trip counter, 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	600 x 1500 x 2200 mm, 740 kg