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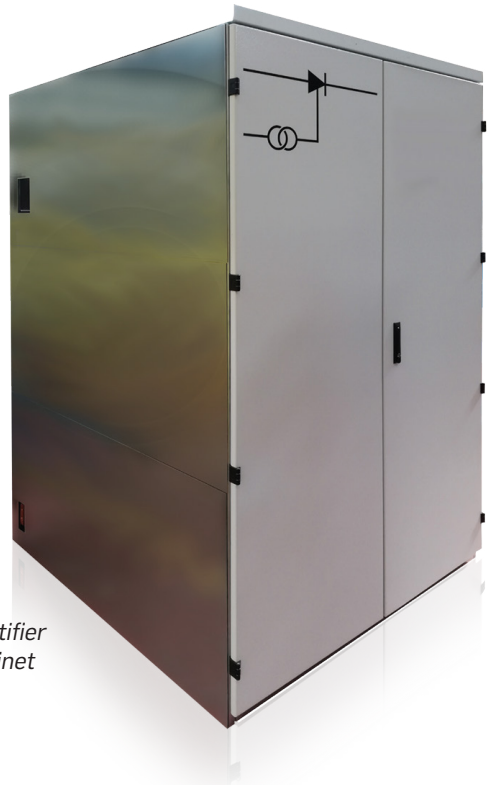
ELECTRONICS AND INFORMATICS

Rectifier

KONRECT 3000A-12P

The rectifier is an integral component of the 660 V DC power distribution system in rectifier stations for public electric urban transport. Its primary function is to supply traction voltage in rectifier stations, ensuring reliable operation of electric traction vehicles.



Rectifier cabinet

KEY FEATURES:

- Maximum power supply reliability
- Flexible busbar and cable connection options (top, bottom, or side) based on installation requirements
- Modular design allows seamless expansion of the rectifier station by adding additional switch blocks
- Robust, non-controlled six-pulse diode rectifier requiring minimal maintenance
- Parallel rectifier configuration allows for increased power capacity
- Natural convection cooling for enhanced reliability and efficiency

The rectifier is enclosed in a self-standing metal cabinet with front access to all components. Its modular design enables the addition of the required number of feeder (plus) panels on one side and return (minus) panels on the other, which are side-mounted to the rectifier cabinet. Depending on the substation configuration, connection to the plus panel can also be made via cables from the lower left or lower right section of the rectifier cabinet.

For maintenance and servicing, access to the diode branches and output damping elements is provided by opening the rectifier door. A perforated steel plate is positioned at the top of the cabinet to improve cooling efficiency, while the bottom remains open to allow for the rectifier transformer busbar connection. Depending on substation design, the rectifier transformer feeder busbar connection can be positioned at the top of the rectifier.

The rectifier is powered via feeder busbars from either: a three-phase, triple-winding rectifier transformer with two secondary windings, or two identical three-phase, double-winding rectifier transformers. As a result, the rectifier has two three-phase voltage input connections, requiring a 30° electrical phase shift between the two supply sources.

The rectifier incorporates a dual full-wave diode bridge, generating a 12-pulse DC output voltage. The phase shift between the two three-phase AC supply voltages enables 12-pulse rectification. Each bridge consists of 12 diodes, mounted on dedicated heat sinks. Each diode is protected by a series-connected fuse, which includes a blown-fuse indicator. The DC output circuit is equipped with a damping assembly and protective fuses to ensure safe operation.

The rectifier cabinets must be isolated from ground and protected against ground faults. The rectifier is switched on by closing the medium-voltage (MV) circuit breaker, which supplies power to the rectifier transformers. The output voltage is then fed to the contact network of the public transport system by closing the rectifier and return disconnectors in the return panel, followed by closing the disconnectors and circuit breakers in the feeder (positive) panels.

The MV switchgear circuit breakers protect the rectifiers from overload conditions, while the circuit breakers in the feeder panels provide protection against faults caused by short circuits or overloads in the contact network. The return panel houses monitoring equipment for the rectifier output voltage and total current, as well as fuse status monitoring for diode branches and damping elements.

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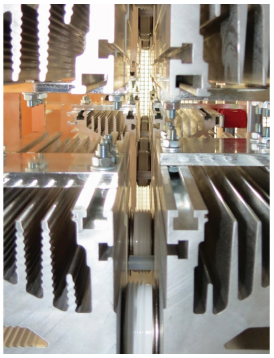

TECHNICAL SPECIFICATIONS	
	KONRECT 3000A-12P Rectifier
Input	
Voltage	2 × 518 VAC / 650 VAC (three-phase) with 30° electrical phase shift between the two voltages
Permissible voltage tolerance	±10%
Nominal frequency and permissible tolerance	50 Hz
Nominal current	2 x 1115 A
Output	
Nominal voltage	660 VDC
Minimum voltage (at full load)	600 VDC
Maximum voltage (no-load condition)	750 VDC
Nominal power	2000 kW
Nominal current	3000 A
Load class	V (1.5 x IN / 2 h; 2 x IN / 1 min)
Overload current (2 h)	4500 A / 2 h
Overload current (1 min)	6000 A / 1 min
Diode fuse type	1100 A, 1000 VAC
Overvoltage protection	Unique RC protection against AC and DC overvoltage, connected to DC busbars
General data	
Remote communication	Voltage measurement and fuse monitoring for diode branches and damping elements in the return panel, transmitted via 1.5 mm² wiring and terminal blocks
Cooling method	Natural convection cooling (AN)
Storage temperature	20 do+70°C
Operating temperature	0°C to +40°C
Maximum operating altitude	Up to 1000 m
Humidity (non-condensing)	Up to 90% at 30°C
Compliance with international standards	HRN EN 60146, HRN EN 62590
Mechanical protection rating	Front & rear protection IP20, side panel protection IP30
Colour	Light gray front surface, RAL 7035
Dimensions (width x depth x height)	1300 x 1500 x 2200 mm
Weight	1300 kg

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