



**NIEFA-ENERGO**

**DC SWITCHGEAR  
AIR-INSULATED 3.3 kV  
KV SERIES**



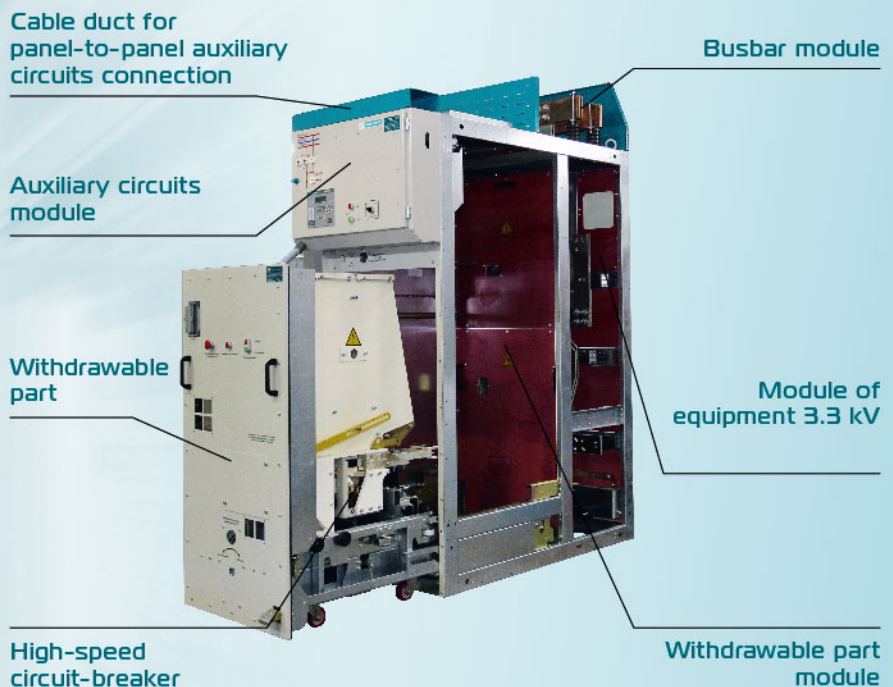
## PURPOSE AND APPLICATION

The DC switchgear, air-insulated, indoor installation KV-3.3 kV series (SWG – 3.3 kV) is designed to distribute of the electric energy direct current 3.3 kV at DC railway traction substations.

### DC switchgear panel types

- Feeder circuit-breaker panel **KV-3.3-FKS-UHL4**
- Rectifier panel **KV-3.3-KR-UHL4**
- Section disconnector panel **KV-3.3-SR-UHL4**
- Filter panel **KV-3.3-FU-UHL4**
- Preventive heating panel **KV-3.3-PP-UHL4**

### CONSTRUCTION



## ADVANTAGES

### OPERATIONAL SAFETY

- The integrated mechanical and electromagnetic interlocks exclude the operational personnel's errors.
- All switching of equipment 3.3 kV in the DC switchgear panels is performed with the doors closed.
- The automatic curtains (lockable) prevent access to the energized panel parts.

### OPERATIONAL RELIABILITY

- The contact connections in the panels need no maintenance due to the use of the disc springs with normalized pressure during all the operational life in connection points of buses and devices 3.3 kV.



## OPERATIONAL ECONOMY

- The one-sided maintenance of the DC switchgear panels supposes reduced room area and minimal dimensions of the substation design.
- The DC switchgear panels require minimum maintenance (periodical inspection, regreasing of the friction surfaces, dust and dirt removal).
- The design of the panels of galvanized steel excludes corrosion over the entire operational life.
- The operational life of the DC switchgear panels is at least 25 years.

## CONVENIENT INSTALLATION, ADJUSTMENT AND OPERATION

- The panels may be installed on a straight floor with hard surface in permanent buildings or in special containers (modules).
- The design allows front access to all the necessary units and elements during assembling, adjusting and further operation.

The ready-to-operate DC switchgear panels are mechanically coupled to each other and supplied together with a kit of fabricated buses and cables for quick electrical connection.

There are two possible versions of the inputs 3.3 kV in the panel: cable-type and bus-type. The panels with circuit-breakers are equipped with smart protection and control terminals for 3.3 kV of InTer-3.3 type. On the Customer's request, panels with bypass bus +3.3 kV may be manufactured.

### BASIC SPECIFICATIONS

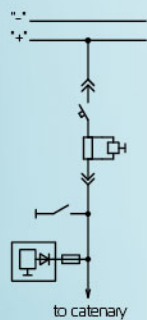
Nominal voltage, kV	3,3
Nominal current of the main panel's circuits, A	4000, 6300
Nominal current of busbars, A	5000, 6300
Circuit-breaker types	VAB-206*
Thermal withstand current (short time), kA	31,5
Time of thermal withstand current flow, sec, maximum	2
Nominal electrodynamic withstand current of the main circuits, kA	41
Nominal voltage of the auxiliary circuits, V	
DC	110, 220
AC, 50 Hz	220
Insulation type	Air
Maintenance conditions	One-side
Type of linear connections 3.3 kV	Cable, bus
IP code	IP20
Climatic version and location category	UHL4 (boreal climate, from +5 to +45 degrees Celsius)

\* on the Customer's request, circuit-breakers of other types may be installed: Gerapid, IR6000, UR40.

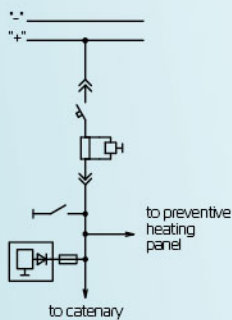
Panels of the switchgear, KV series	Dimensions (W x D x H), mm, maximum	Weight, kg, maximum
Feeder circuit-breaker panel KV-3.3-FKS-UHL4	800 x 1740 x 2460	1000
Rectifier panel KV-3.3-KR-UHL4	1600 x 1740 x 2460	1400
Section disconnecter panel KV-3.3-SR-UHL4	800 x 1740 x 2460	500
Filter panel KV-3.3-FU-UHL4	2200 x 1740 x 2460	2050
Preventive heating panel KV-3.3-PP-UHL4	800 x 1740 x 2460	650

## TYPICAL DIAGRAMS

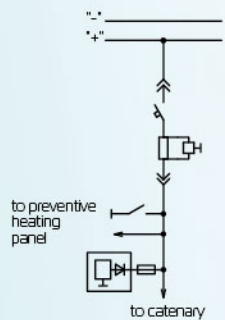
Feeder circuit-breaker panel



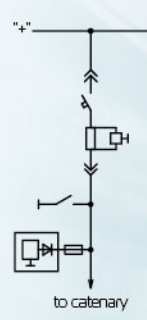
Feeder circuit-breaker panel



Feeder circuit-breaker panel



Feeder circuit-breaker panel



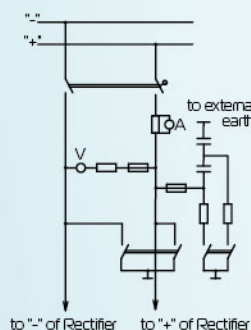
Section disconnector panel



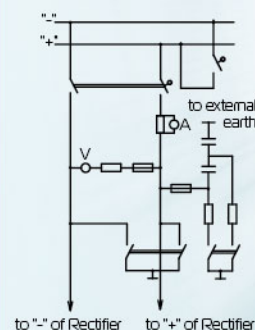
Section disconnector panel



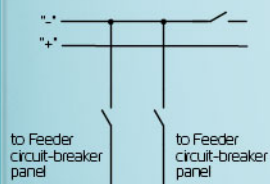
Rectifier panel



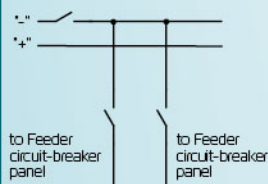
Rectifier panel



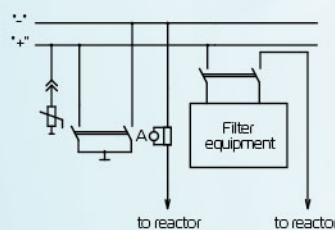
Preventive heating panel



Preventive heating panel



Filter panel



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