



NIEFA-ENERGO

**AC SWITCHGEAR
AIR-INSULATED
27.5 kV 1S-27.5 SERIES
2x25 kV 1S-2x25 SERIES**



PURPOSE AND APPLICATION

The AC switchgears, air-insulated, indoor installation 1S-27.5 series (SWG-27.5 kV) and 1S-2x25 series (SWG-2x25 kV) are designed to distribute of the electric energy alternating current 27.5 kV and 2x25 kV at AC railway traction substations.

SWITCHGEAR PANEL TYPES

SWG- 27.5 kV

- 1S-27.5-2-WW-UHL4 two-pole circuit-breaker incoming panel
- 1S-27.5-1-FKS-UHL4 single-pole feeder circuit-breaker panel
- 1S-27.5-1-ZW-UHL4 single-pole bypass circuit-breaker panel
- 1S-27.5-2-DPR-UHL4 two-pole circuit-breaker "two lines – rail" feeder panel
- 1S-27.5-2-TN-UHL4 two single-phase voltage transformers panel
- 1S-27.5-2-SR-UHL4 two-pole section disconnecter panel
- 1S-27.5-1-PG-UHL4 glaze ice melting feeder circuit-breaker panel
- 1S-27.5-2-UFK-UHL4 two-pole filter and compensating unit circuit-breaker panel
- 1S-27.5-2-ZWR-UHL4 two-pole bypass circuit-breaker and section disconnecter panel
- 1S-27.5-3-WW-UHL4 three-pole circuit-breaker incoming panel
- 1S-27.5-3-TN-UHL4 three single-phase voltage transformers panel
- 1S-27.5-2-TSN-UHL4 two-pole circuit-breaker auxiliary transformer panel
- 1S-27.5-3-SR-UHL4 three-pole section disconnecter panel

SWG-2x25 kV

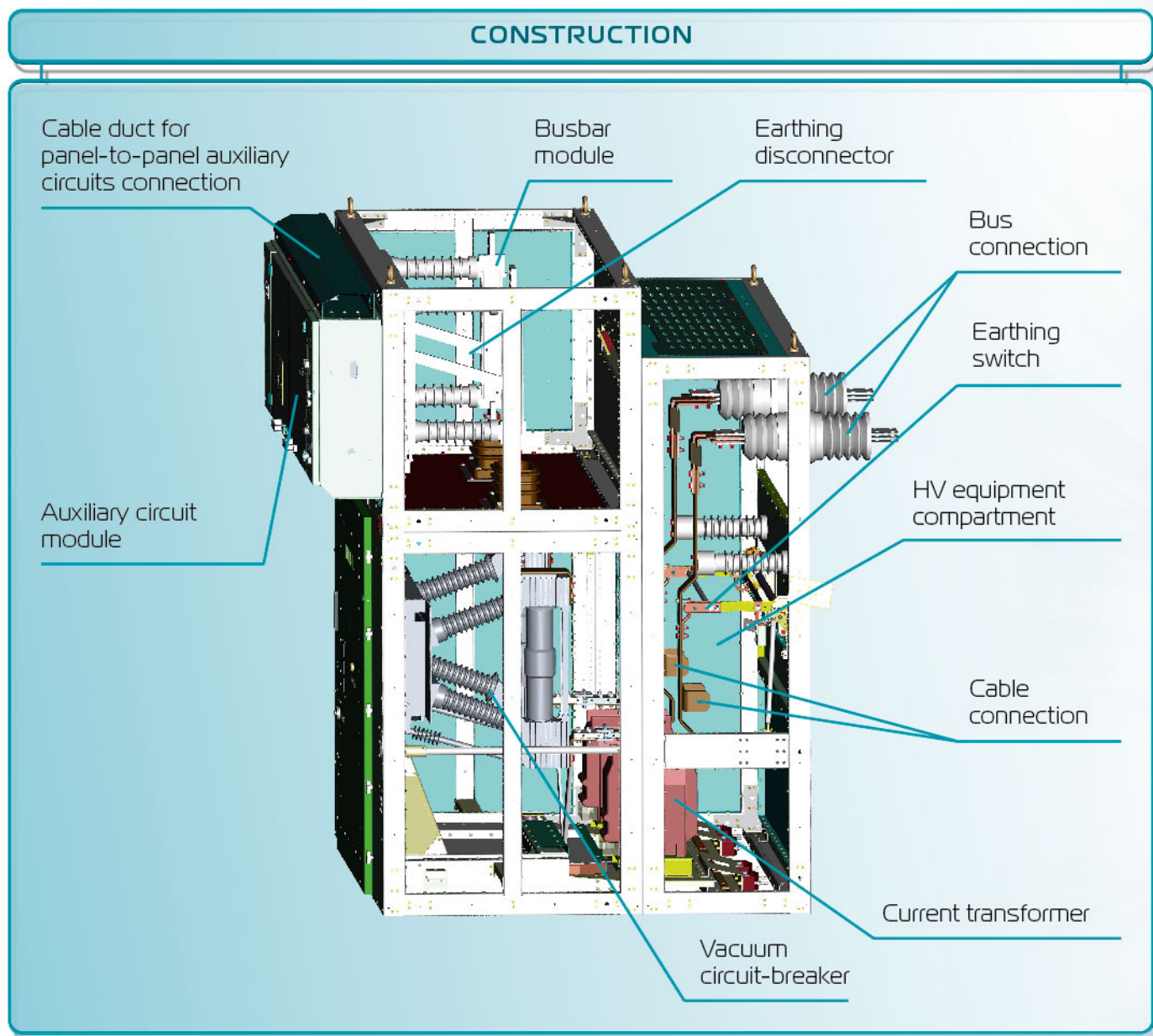
- 1S-2x25-2-WW-UHL4 two-pole circuit-breaker incoming panel
- 1S-2x25-2-FTS-UHL4 two-pole feeder circuit-breaker panel
- 1S-2x25-1-FTS-UHL4 single-pole feeder circuit-breaker panel
- 1S-2x25-2-ZW-UHL4 two-pole bypass circuit-breaker panel
- 1S-2x25-2-TN-UHL4 voltage transformers panel
- 1S-2x25-2-SR-UHL4 section disconnecter panel
- 1S-2x25-2-UFK-UHL4 two-pole filter and compensating unit circuit-breaker panel

The basic design and functional unit of SWG is the panel containing all the necessary components of the primary and auxiliary circuits.

The panel types, quantity and mutual arrangement of the SWG's are determined in the substation design.

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

SWG panels with circuit-breakers are equipped with smart protection and control terminals of InTer type.



ADVANTAGES

OPERATIONAL SAFETY

- The integrated mechanical and electromagnetic interlocks exclude the operational personnel's errors.
- All switching of the high-voltage panel devices is performed with the door closed.

OPERATIONAL RELIABILITY

- The contact connections in the panels need no maintenance over the entire operation life due to the using the disc springs with normalised pressure in connection points of buses and devises.

OPERATIONAL ECONOMY

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

CONVINIENT INSTALLATION, ADJUSTMENT AND OPERATION

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





Two-pole circuit-breaker
incoming panel
1S-27.5-2-WW-UHL4



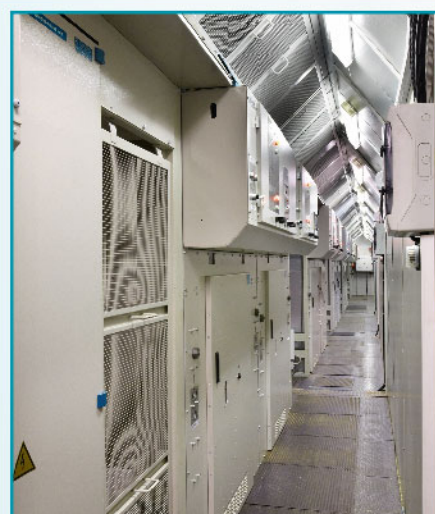
Two-pole feeder
circuit-breaker panel
1S-2x25-2-FTS-UHL4



27.5 kV switchgear containers (modules) "Beregovaya" AC traction substation,
North-Caucasian Railway



2x25 kV switchgear containers (modules) "Buryatskaya" AC traction substation,
Trans-Baikal Railway



BASIC SPECIFICATIONS

Parameter	SWG-27.5 kV	SWG-2x25 kV
Nominal voltage (linear), kV	27,5	-
Maximum operational voltage (linear), kV	29	-
Nominal voltage HV part - earthed part, kV	-	27,5
Maximum operational voltage HV part - earthed part, kV	-	29
Nominal voltage between busbars, kV	-	55
Maximum operational voltage between busbars, kV	-	58
Nominal current of SWG panel's main circuits, A	630; 1250; 1600; 2000	1250
Nominal current of busbars, A	1600; 2000; 2500	1250
Nominal short-circuit breaking current, kA	20	
Thermal withstand current (short time), kA *	20	
Nominal electrodynamic withstand current of the main circuit, 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 high-voltage connections	Cable, bus	
IP code	IP20	
Climatic version and location category	UHL4 (boreal climate, from +5 to +45 degrees Celsius)	

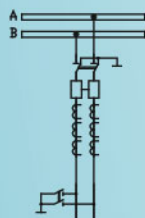
* time of the thermal resistance current flow is 3 s max for main circuits, 1 s max for earthing blade.

** if there are no current transformer's limits.

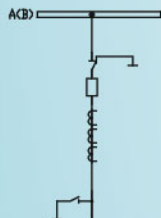
SWG-27.5 kV and SWG-2x25 kV panels	Dimensions (WxDxH), mm, maximum	Weight, kg, maximum
Single-pole panels	1350x1960x2450	1100
Two-pole panels (excluding the two-pole section disconnector panel and the two-pole bypass circuit-breaker and section disconnector panel)	1600x1960x2450	1300
Two-pole section disconnector panel	2400x1960x2450	1400
Two-pole bypass circuit-breaker and section disconnector panel	4000x1960x2450	2600
Three-pole panels (excluding the three-pole section disconnector panel)	1600x1960x2450	1400
Three-pole section disconnector panel	2400x1960x2450	1450

TYPICAL DIAGRAMS SWG-27.5 kV

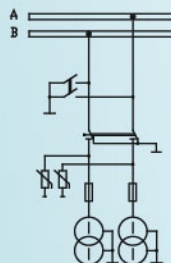
Two-pole circuit-breaker auxiliary transformer panel 1S-27.5-2-TSN-UHL4
Two-pole circuit-breaker "two lines – rail" feeder panel 1S-27.5-2-DPR-UHL4:
Two-pole circuit-breaker incoming panel 1S-27.5-2-WW-UHL4



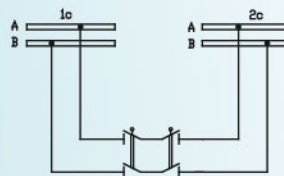
Single-pole feeder circuit-breaker panel 1S-27.5-1-FKS-UHL4
The single-band backup switch cell 1S-27.5-1-ZW-UHL4
Glaze ice melting feeder circuit-breaker panel 1S-27.5-1-PG-UHL4



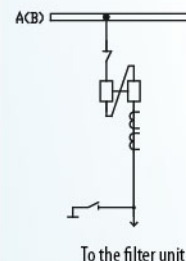
Two single-phase voltage transformers panel The cell of two single-phase voltage transformers 1S-27.5-2-TN-UHL4



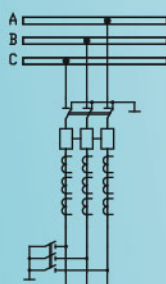
Two-pole section disconnecter panel 1S-27.5-2-SR-UHL4



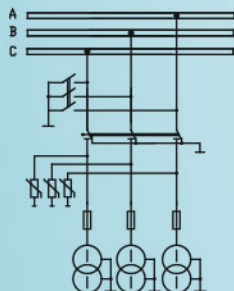
Two-pole filter and compensating unit circuit-breaker panel 1C-27.5-2-UFK-UHL4



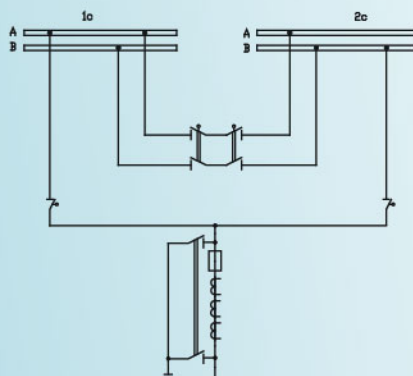
Three-pole circuit-breaker incoming panel 1S-27.5-3-WW-UHL4



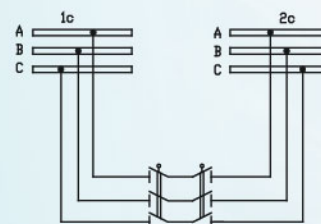
Three single-phase voltage transformers panel 1S-27.5-3-TN-UHL4



Two-pole bypass circuit-breaker and section disconnecter panel 1S-27.5-2-ZWR-UHL4

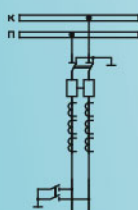


Three-pole section disconnecter panel 1S-27.5-3-SR-UHL4

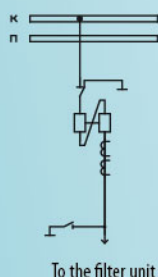


TYPICAL DIAGRAMS SWG-2x25 kV

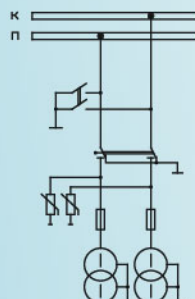
Two-pole circuit-breaker incoming panel 1S-2x25-2-WW-UHL4
Two-pole feeder circuit-breaker panel 1S-2x25-2-FTS-UHL4
Two-pole bypass circuit-breaker panel 1S-2x25-2-ZW-UHL4



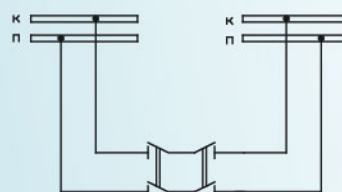
Two-pole filter and compensating unit circuit-breaker panel 1S-2x25-2-UFK-UHL4



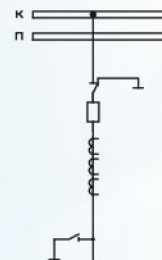
Voltage transformers panel 1S-2x25-2-TN-UHL4



Section disconnecter panel 1S-2x25-2-SR-UHL4



Single-pole feeder circuit-breaker panel 1S-2x25-1-FTS-UHL4





NIEFA-ENERGO

3, build 2, Doroga na Metallostroy,
promzona "Metallostroy", Metallostroy,
Saint-Petersburg, 196641, Russia
<http://www.nfenergo.ru>

Phone: (812) 464-65-93
(812) 464-45-92
Fax: (812) 464-46-34
E-mail: info@nfenergo.ru

