



**NIEFA-ENERGO**

## **RECTIFIERS AND RECTIFIER FUNCTIONAL UNITS 3.3 kV**

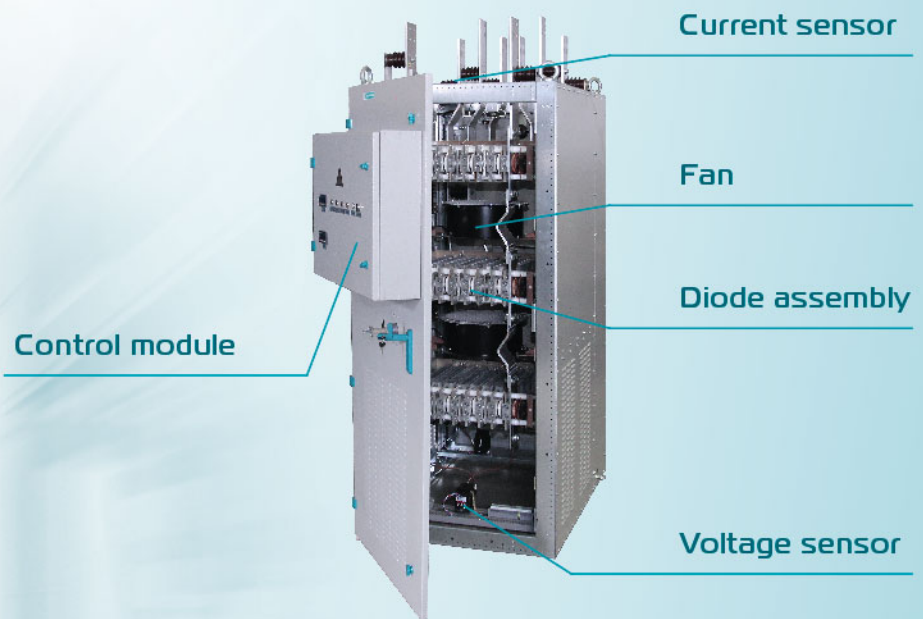


## PURPOSE AND APPLICATION

The **rectifiers of traction power supply system** are designed to convert AC into DC at railway traction substations.

One-type rectifiers can be assembled into functional units by its parallel or series connection. That's make possible to increase rectifier output power, voltage and current.

### CONSTRUCTION



The rectifiers and rectifier functional units are based on double-sided maintenance panels. Panels have a support frame of galvanized steel used as an internal earthing circuit.

The rectifiers and rectifier functional units have following types of signal lights:

- |  |   |
|--|---|
|  Auxiliary power supply |  Overheating |
|  Standby                |  Failure     |
|  Functioning            |   |

The **output current and voltage are measured** with sensors using Hall effect; the values are displayed with digital output indicators.

The **rectifiers and rectifier functional units are equipped with infrared temperature** sensors that providing to control the temperature of the semiconductor devices in the hottest point.

The **diodes diagnosing system** provides to control the diodes status (damage) before the input voltage is supplied to the rectifier.



The rectifiers and rectifier functional units have following types of protection:

- **Switching overvoltage protection**, with safety RC-circuit installed in parallel with each diode.
- **Diode/semiconductor-switch breakdown protection** (diagnosing system).
- **Overheat protection**, with temperature infrared sensors.
- **Overload protection**, with a current sensor.

## ADVANTAGES

Using coolers based on heat pipes provides high overload capacity, lighter weight and smaller size of the rectifiers.

The calibrated power mechanisms with visual control of the pressure of the semiconductor devices exclude torque wrenches and, therefore, simplify the assembling and maintenance of the rectifiers.

The special holding devices provide replacement of the semiconductor devices without disassembling of the power equipment.

Continuous monitoring of the current, voltage, temperature and damage absence of the semiconductor devices is provided.

Bus- / cable-connection of the rectifiers to the supply circuit and load is possible.

The contact connections of the interface of the power buses need no maintenance over the entire operation life due to using the disc springs with normalized pressure.

To provide the operating personnel's safety, the panel doors are equipped with electromagnetic interlock.



Rectifier  
V-MPP-D-1.6k-3.3k UHL4



Rectifier  
V-MPP-D-3.15k-3.3k UHL4



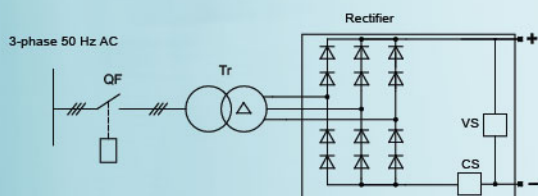
Rectifier functional unit  
BL-V-MPP-D-3.15k-3.3k UHL4

## BASIC SPECIFICATIONS

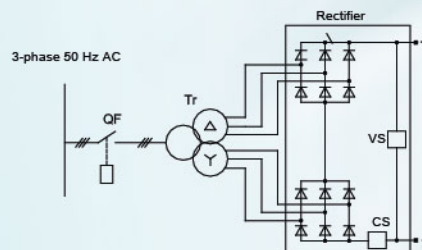
	V-MPP-D-1.6k-3.3k UHL4 V-TPP-D-1.6k-3.3k UHL4	V-MPP-D-3.15k-3.3k UHL4 BL-V-MPP-3.15k-3.3k UHL4	BL-V-MPP-3.15k-3.3k UHL4 BL-V-TPP-3.15k-3.3k UHL4
Nominal rectified voltage, kV	3,3		
Nominal rectified current, kA	1,6	3,15	
Cooling	Forced		
Rectification circuit	Bridge, 6/12-pulse		
Input voltage phases	3 or 6		
Nominal voltage of the auxiliary circuits, V (AC or DC)	DC 110 or 220 AC 220 or 380		
Efficiency coefficient in nominal mode, %, minimum	99,6		
Thermal withstand current of the main circuits with current breaking actuation time up to 0.25 sec, kA, minimum	12,5	25	
Climatic version and location category	UHL4 (boreal climate, from +5 to +45 degrees Celsius)		
IP code	IP20		
Peak withstand current of the main circuits, kA, minimum	20	40	
Dimensions (W x D x H), mm, maximum	1010x1460x2400	1455x1520x2400	1890x1460x2400
Weight, kg, maximum	540	1080	1200

## TYPICAL DIAGRAMS

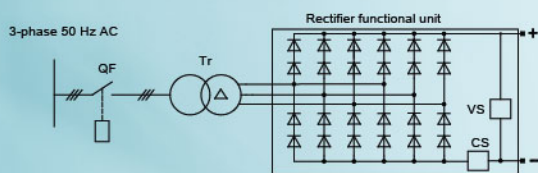
6-pulse circuit  
V-TPP-D-1.6k-3.3k UHL4



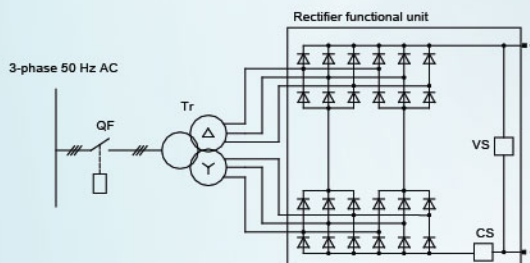
12-pulse series circuit  
V-MPP-D-1.6k-3.3k UHL4  
V-MPP-D-3.15k-3.3k UHL4



6-pulse parallel circuit  
BL-V-TPP-3.15k-3.3k UHL4



12-pulse series-parallel circuit  
BL-V-MPP-3.15k-3.3k UHL4



**NIEFA-ENERGO**



3, build 2,  
Doroga na Metallostroy,  
promzona "Metallostroy",  
Metallostroy,  
Saint-Petersburg, 196641, Russia

Phone: (812) 464-65-93  
(812) 464-45-92  
Fax: (812) 464-46-34  
E-mail: [info@nfenergo.ru](mailto:info@nfenergo.ru)  
<http://www.nfenergo.ru>