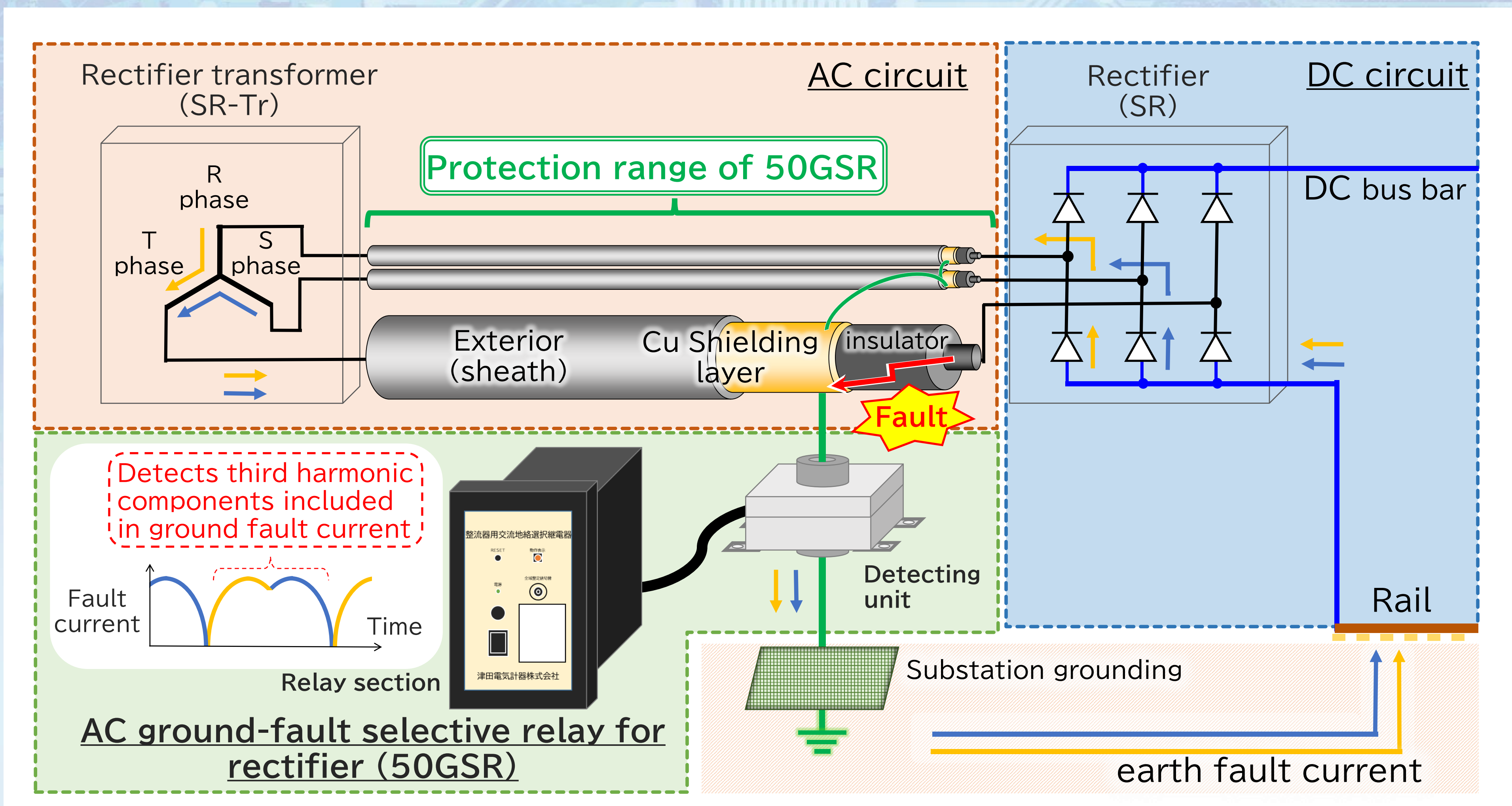


AC Ground Fault Selective Relay for Rectifier

Over Current Relay For AC Cable Ground(Product name: 50GSR)

This device detects ground faults in substations for DC electric power lines. Protects against AC line ground faults between the rectifier transformer and the rectifier, which had insufficient protection in a conventional manner. This device detects the third harmonic component in the earth fault current.



Purpose and role of equipment

When a ground fault occurs due to cable insulation breakdown in the AC line between the rectifier transformer (SR-Tr) and the silicon rectifier (SR), the ground fault may not be detected depending on the resistance value of the ground fault point, and the ground fault may continue, leading to fire or equipment failure. Therefore, the development of a protective relay that detects ground faults has been desired.

Fault current detection by 3rd harmonic

As a result of conducting transient simulations and artificial fault tests using actual facilities, we discovered that ground fault currents have been including third harmonic components, which do not occur in a healthy state, flow in the cable ground wire when a ground fault occurs, and we developed a device that can detect such currents.

If the resistance of the ground fault point is small, the 64P may activate. However, it is possible for our device to distinguish between a ground fault in a DC circuit and an AC circuit by the operation or non-operation of this device, then early recovery can be expected when a ground fault occurs.

Compatible with bus ducts

The AC power line between the rectifier transformer and the rectifier can be either cable or bus duct.

Built-in backup power supply

This device maintains the ground fault detection function even if the control power supply is stopped due to a ground fault.



Specifications

Name of product	AC ground-fault selective relay for rectifier (50GSR)
Equipment Configuration	Relay unit: 1 unit Detection unit: 1 or 2 units
Detection object	Cable sheath earth 3-phase lumped ground wire on the secondary side of transformer for silicon rectifier or bus duct grounding wire on the secondary side of transformer for silicon rectifier
Frequency fluctuation	Fundamental component: ± 1 Third harmonic component: ± 1
Constant value	Ground fault current 3rd harmonic component: 5A Ground fault current overall RMS value (entire area): OFF (not used), 20A, 50A, 100A
Detection accuracy	Operating current value: $\pm 20\%$ (relative to the settled value) Return current value: 80% or less (relative to setpoint)
Operating Time	50ms or less (at 150% of setpoint input)

Relay section

Model	XGS-11	XGS-12
Frequency (esp. of waveforms)	50Hz	60Hz
Detection accuracy	Operating current value: $\pm 20\%$ (relative to the settled value) Return current value: 80% or less (relative to setpoint)	
Display	Power indicator: 1 green light Ground fault current detection indicator: Operation indicator (orange)	
Output	Ground fault current 3rd harmonic component detection display: 1a (no-voltage contact) Ground fault current total effective value (all areas) detection display: 1a (no-voltage contact)	
Control power supply	DC 100V/110V (fluctuation range 80V-132V)	
Location of use	indoor (court, pool, etc.)	
Ambient temperature	0°C to 40°C	
Relative humidity	30 to 80%RH (with no condensation)	
Dimensions/Mass	H237mm x W151mm x D279mm / Approx. 4.2kg	



XGS-11/XGS-12

Detecting unit

Model	YGS-11	YGS-12
Connector position	connector popping out	Connector under-feed
Rated primary feed-through current	AC500A (CT ratio: 500A/1A)	
Overcurrent Intensity	40x (20000A) for 1 sec.	
Detection accuracy	Ground fault current 3rd harmonic component detection display: 1a (no-voltage contact) Ground fault current total effective value (all areas) detection display: 1a (no-voltage contact)	
Detection section pull-out cable length	Maximum 50m	
Display	Power indicator: 1 green light Ground fault current detection indicator: Operation indicator (orange)	
Output	Ground fault current 3rd harmonic component detection: ± 15 Ground fault current overall RMS value (entire area): ± 15	
Location of use	indoor (court, pool, etc.)	
Ambient temperature	-20°C to 40°C	
Relative humidity	30 to 90%RH (with no condensation)	
Dimensions/Mass	H134mm x W125mm x D175mm (Primary through-hole $\phi 37$ mm) / Approx. 1.5kg	



YGS-12

