INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS

MAINTENANCE

All electric equipment and systems, including the maintenance, must meet the electrotechnical requirements.

All electrical defects must be eliminated without delay. If it is evident that people, property or environment are exposed to danger, the defective systems or equipment must be discarded immediately. Use of defective equipment is prohibited!

PERIODIC INSPECTIONS

Periodic inspections are carried out after the commissioning inspection, which thoroughness and frequency depend on the age of the plant or its part, on the conditions having effect on the possible occurrence of defect and the extent of the caused danger.

Recommended inspection times are

- check of the condition of earthing conductor after 3-7 years
- check of the condition and settings of over-current protection after 5 years
- check that the internal earthings of switchboard meet the requirements

Items to be checked are: connections, earthings of instrument transformers and condition and cross-section of protective conductor.

Periodic inspections are:

- visual inspections
- test runnings
- measurements
- other tests

If otherwise not recommended, the inspection is carried out once a year. For extreme conditions the period between inspections can be six months.

The frequency of inspection and maintenance depends on
- operational cycles
- load current
- reliability requirements of operation
- environmental conditions

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Work to be performed	**Measured testing and limit values Work and auxiliary materials**
General visual inspection	
Environmental conditions	Room temperature ≤ 35°C • agressive gases in the air • relative humidity ≤ 50 % at 40°C • dust and condensation • snow load outdoors
Accessibility	• service corridors • exits
Loading capacity	• circulation of air is free • max. temperature inside switchboard ≤ 60 °C • vents are not obstructed
Mechanical condition of switchboard	
External parts	• surface treatment • parts (apparatus parts, covers) are not missing • doors of cable and apparatus compartments are closed • vents are not obstructed • enclosure class
Internal parts	• incoming and outgoing units are performed according to documentation • condition of insulation materials • no cracks and/or changes in colour • creepage distances and clearances meet the requirements • min. clearance ≥ 8 mm • min. creepage distance ≥ 12,5 mm • switchboard is clean and dustfree
Mechanical functions	• functioning of control units • functioning of mechanical safety lockings • functioning of door lockings and locking devices

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Work to be performed	**Measured testing and limit values** **Work and auxiliary materials**

Cabling	• min. bending radii
	• condition of insulation
	• sealing of cable entries
	• fixing of cables
	• cables do not rest against sharp edges
	• cable supports and auxiliary cable routes
	• tightness of connections
	  • no changes in colour
	  • thermographic survey
	  • joint grease is not running

Safety in use	To be checked • markings meet the operation conditions • warning labels • protections against contact are in order • tools and testing equipment meet the requirements • mechanical and electrical interlockings
Connections of earthing and protective conductors	• PE/N-disconnection • markings
Checking of functioning of control devices	According to circuit diagram
Checking of measuring circuit	According to circuit diagram
Components	
The most important objects to be checked and serviced are described in the instructions attached to the delivery	Objects to be checked and serviced • contacts, bearings • breaking chambers • earthing knives • magnets and coils • interlockings • auxiliary contacts • leverages and their joints • insulations