



IT system distributions for railway tunnels

Low-voltage switchgears (energy supply for railway tunnels)

Requirements

To ensure the electrical safety is the top priority for all installations of the railway company e. g. buildings, tunnels, signal boxes etc. Therefore, the demand for reliable and reactive monitoring systems, in addition to high quality, is necessary for every electric system or equipment. To prevent failures and ensure operational reliability, it is necessary to assure an information advantage and a head start in terms of time before critical situations can occur.

Low-voltage distribution boards for the energy supply in railway tunnels have to be designed for IT system with insulation and supply voltage monitoring to ensure the system is not switched off when the first error occurs. The signalization of the first occurring error is conducted by the insulation monitoring. The system is only switched off in case of a second error. To prevent the system from switching off after the second error, the first error has to be repaired immediately.

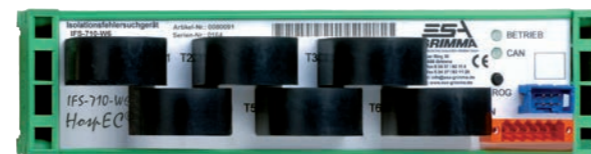


insulation monitoring IMD IFS-V1

Our solution

ESA-Grimma GmbH developed a system solution for insulation monitoring and fault detection for insulated IT systems which enables to detect, report and localize errors quickly and precisely under difficult system conditions. Furthermore, there is a residual current monitoring system for earthed systems which defective system outputs can be localized and reported with. Our solution for energy supply in railway tunnels consists of:

- main distribution board 400 V/230 V 3 AC/N 50 Hz, for one or more outputs, layout of the transformers outside the distribution board
- sub-main distribution with one or more IT system outputs 400 V/230 V 3 AC/N 50 Hz, designed for indoor installation in protection class II



insulation fault detection device IFS-710W6

Your advantage

Distribution board with:

- one or more IT system outputs 400 V/230 V 3 AC/N 50 Hz
- voltage monitoring
- insulation monitoring
- insulation fault detection per output for quick and safe fixing of errors
- central fault message



digital in- and output device MPM 32vario

Distribution board

Outer construction and installation requirements:
 switchgear combination for fixed installations earthed steel panel distribution board as wall cabinet with door for the room inside, completely ready-to-connect wired and programmed

contact protection
 protection class
 corrosion protection

IP code IP 54 according to IEC 60529
 II (protective insulated) according to DIN EN 61140
 powder coating color RAL 7035

Rated data:

rated operating voltage (V)
 rated frequency (Hz)
 ambient temperature normal temperature area (°C)

400 V AC -25 %...+20 %
 50 Hz
 -25°C...+40°C

Feed equipped with

- feed for cross-section up to max. 95 mm²
- switch disconnector 100 A 4-pole

Messages according to the directive 954.9107

Operational location
 energy supply tunnel "xyz" fault

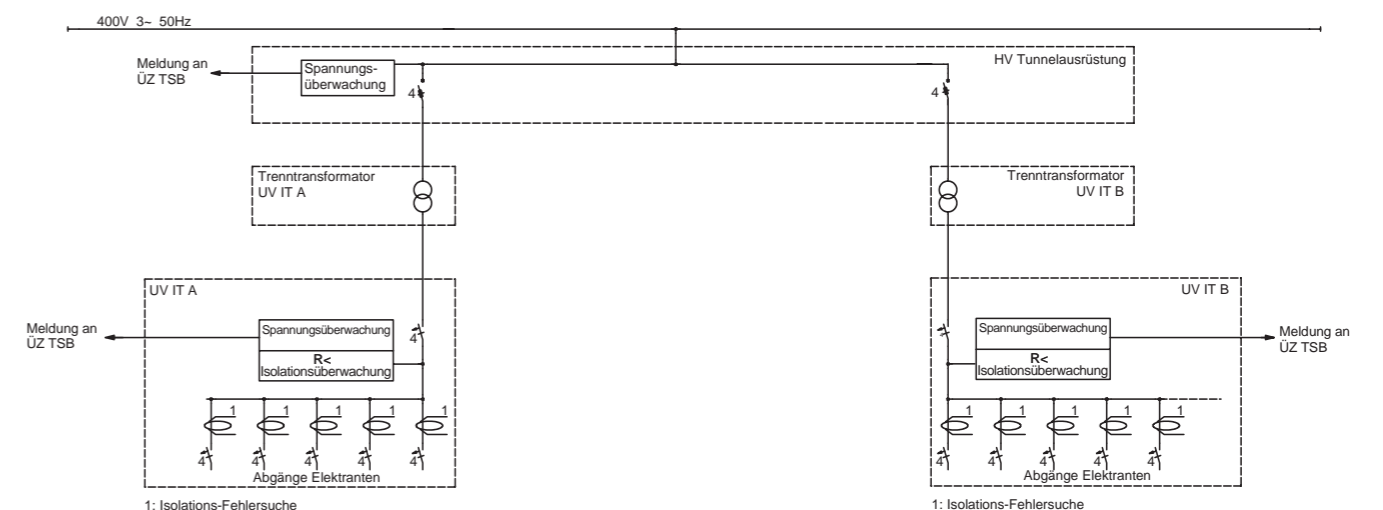
Outgoing feeder equipped with

- high performance circuit breaker 4-pole E characteristics 35 A with auxiliary switch

Technical location
 energy supply tunnel "xyz" fault
 energy supply tunnel "xyz" failure outer conductor 1
 energy supply tunnel "xyz" failure outer conductor 2
 energy supply tunnel "xyz" failure outer conductor 3
 energy supply tunnel "xyz" outgoing feeder electrant "uvw" fault
 energy supply tunnel "xyz" insulation monitoring responded
 energy supply tunnel "xyz" insulation monitoring pre-warning
 energy supply tunnel "xyz" insulation monitoring earth fault
 energy supply tunnel "xyz" insulation monitoring responded current circuit "uvw"

Monitoring

- voltage monitoring
- insulation monitoring IMD IFS-V1
- insulation fault detection device IFS-710W6
- digital in- and output device MPM 32vario



1: Isolations-Fehlersuche

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Insulation monitoring IMD IFS-V1

General operational data	
rated voltage U _e (insulation coordination according to IEC 60664-1)	AC 400 V
Insulation monitoring	
response value/hysteresis	parameterizable 50...500 kΩ/fixed 25%
fault message via	clear text/LED/signal relay/CAN-Bus
Signal relay (fault message)	
switching elements	1 change-over
Message memory	200 data sets
Kommunikationsschnittstelle / Protokoll	CAN/CAN (2.0) according to ISO 11898
Test of electromagnetic compatibility (EMC)	interference immunity according to EN 61000-6-2: March 2000 Basic standard – interference immunity industrial sector emitted interference according to EN 50081-1

Insulation fault detection device IFS-710W6

Operational data	
rated voltage (insulation coordination according to IEC 60664-1)	AC 500 V
Monitored system	
Messwandlertypen/Übersetzungsverhältnis:	
6x current transformer	1000/1
rated voltage, rated frequency, rated current current transformer	AC 20 ... 720 V, 50 ... 60 Hz, 50 A
Communication interface/protocol	
interface/protocol	CAN/CAN (2.0) nach ISO 11898
Electromagnetic compatibility (EMC)	according to DIN EN 61326-2-4:2006 (IEC 61326-2-4:2006) emitted interference according to DIN EN 61543:2007-06 (IEC 61543:2005-11), emission according to EN 55014-1 / CISPR14-1

Digital in- and output device MPM-32/Vario

General operational data	
supply voltage U _v	(via CAN-Bus or separately) 24 V DC (PELV)
Digital inputs (combined with outputs max. 32 channels)	
current consumption per input	1,5 mA
external wiring (also installation pushbutton/switch)	switching contact
Digital outputs (combined with inputs max. 32 channels)	
max. outgoing current/channel	350 mA
Displaying elements	
LEDs	34 x multi-colored. LED
Communication interface/protocol	
interface/protocol	1 x CAN/CAN 2.0 (according to ISO 11898)
Electromagnetic compatibility (EMC)	according to DIN EN 55011:2007 + A2:2007, according to DIN EN 61000-6-2:2005, according to EN 60601-1-2:2007

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 Changes in the scope of the technical progress reserved.
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