

# Insulation Monitoring Relay

- Monitors insulation resistance of unearthed IT Systems in compliance with IEC 61557-8, EN 50155, IEC 61373 and EN 45545 HL-2/3
- Suitable for monitoring 1 Ph, 3P3W and 3P4W unearthed supply systems
- Measuring input L-PE with line voltages upto 520V AC
- Wide auxiliary supply voltage range 24V – 240V AC/DC
- Adjustable trip resistance value from 1K to 100Kohm
- 2 Relay outputs (1C/O + 1NO) for fail safe and non fail safe operation
- Test / Reset function with Manual and remote facility
- Configurable Auto / Manual Reset
- LED indication for insulation fault , Power and Relay output
- DIN Rail / Base Mounting



## Ordering Information

Cat. No.	Description
IMR122	Insulation Control, Rated Voltage 0-520 VAC System with 2 output (1C/O + 1NO), Control Voltage 24-240VAC/DC

# Insulation Monitoring Relay




<b>Cat. No.</b>	<b>IMR122</b>
<b>Auxiliary Supply Characteristics</b>	<b>A1 - A2</b>
Rated Supply voltage $U_s$	24V to 240V AC/DC
Supply voltage tolerance	-15 to +10%
Rated frequency $F_s$	DC or 15 to 400 Hz
Frequency range	13.5 to 440 Hz
Typical Power Consumption	
<b>Measurement Circuit Characteristics</b>	<b>L, PE</b>
Monitoring function	Insulation resistance monitoring of IT system
Measuring principle	Superimposed DC voltage
Nominal voltage $U_n$ of distribution system to be monitored	0 to 450V AC
Voltage range of the distribution system to be monitored	0 to 520V AC
Rated frequency $f_n$ of the distribution system to be monitored	50-60 Hz
Tolerance of the rated frequency $f_n$	45-65 Hz
System leakage capacitance $C_e$ max.	10 $\mu$ F
Adjustment range of the specified response value $R$ (threshold) min.-max.	1-100 k $\Omega$
Adjustment resolution	1 k $\Omega$
Tolerance of the adjusted threshold value	+/- 5%
Hysteresis related to threshold value	25% ; min 2 Kohm
Internal impedance $Z_i$ @50Hz	$\geq$ 135 Kohm
Internal DC resistance $R_i$	$\geq$ 185 Kohm
Measuring voltage $U_m$	15V
Tolerance of measuring voltage $U_m$	+/-10 %
Measuring current $I_m$ max	$\leq$ 0.1mA
Response time $t_{an}$ 0.5 x $R_{an}$ and $C_e = 1 \mu$ F	max. 10 s
Repeat accuracy (constant parameters)	$<$ 0.1 % of full scale
Accuracy of $R_a$ (measured value) within the operation temperature range	at 1-10 k $\Omega$ RF 5 $\Omega$ / K at 10-100 k $\Omega$ RF 0.05 % / K
<b>Relay output Characteristics</b>	
Number of Relays	2 nos.
Contact arrangement	Relay 1 : 1 C/O (15,16,18) Relay 2 : NO (25,28)
Contact rating	NO - 5A @250VAC/ 30 VDC NC - 3A @250VAC/30 VDC
Mechanical Life	$1 \times 10^7$ Operations
Electrical Life	$1 \times 10^5$ Operations
Relay operation	Relay 1 (15,16,18) : Fail safe mode ( De-energize to trip) Relay 2 (25,28) : Non fail safe mode (Energize to trip)

# Insulation Monitoring Relay



## USER INTERFACE

<b>Threshold Resistance setting</b>	
POT-1 (R1)	Setting of threshold resistance value from 0 ohm to 90K In multiples of 10K
POT-2 (R2)	Setting of threshold resistance value from 1K ohm to 10K In multiples of 1K
Final threshold value R	$R = R1 + R2$
<b>LED Indications</b>	
Auxiliary supply voltage (⌘)	Green LED
Fault Indication (F)	Red LED
Relay status Indication (R)	Amber LED
<b>Test-Reset Functionality</b>	
<b>S1 - S2 - S3</b>	
Inbuilt common key	To test and reset functionality
Potential free terminal S1, S2, S3	S1-S3 short- Remote Test S2-S3 short - Manual Reset from front S2-S3 -short through switch -Remote Reset S2-S3- Open- Auto Reset
Reset type	Manual reset and Auto reset
<b>Environmental Parameters</b>	
Operating Temperature	-25 °C to 70 °C
Storage Temperature	-40 °C to 85 °C
Humidity	95% RH (Without condensation)
Altitude	< 2000 meters
Pollution Degree	3
Over voltage category	III
<b>Mechanical Parameters</b>	
Operating Mode	Continuous operation
Degree of protection	
Enclosure	IP 40
Terminals	IP 20
Housing	UL94-00
Mounting	Din rail
Mounting position	any
Dimensions (L X W X D) in mm	83 x 23 x 114
Weight (Unpacked)	140 gm approx.
Certification	
Standard	EN 50155, IEC 61557-8, IEC 61326-2-4

# Insulation Monitoring Relay



## EMI / EMC Test

Harmonic Current Emissions	IEC 61000-3-2
Voltage Flicker and Fluctuations	IEC 61000-3-3
ESD	IEC 61000-4-2
Radiated Susceptibility	IEC 61000-4-3
Electrical Fast Transients	IEC 61000-4-4
Surge	IEC 61000-4-5
Conducted Susceptibility	IEC 61000-4-6
Power Frequency Magnetic Field	IEC 61000-4-8
Voltage Dips & Interruptions (AC)	IEC 61000-4-11
Conducted Emission	EN 50155:2017, EN 50121-3-2 and EN 55011
Radiated Emission	EN 50155 and EN 50121-3-2/ EN 6100-6-4, EN 55011
Supply variations	EN 50155
Supply Over voltage	EN 50155

## Safety test

### Voltage Withstand test (Dielectric Strength)

a) Test Voltage between I/P and O/P	IEC 60255-27
b) Test Voltage between all terminals and enclosure	IEC 60255-27
c) Rated Impulse Voltage between I/P and O/P	IEC 60255-27
d) Rated Impulse voltage between I/P and measuring circuit	IEC 60255-27
e) Rated Impulse voltage between O/P and measuring circuit	IEC 60255-27

<b>Fire Safety</b>	EN 45545-2, HL-2/3
--------------------	--------------------

### NOTE:

Specifying Target Hazard Level:  
The material used complies with EN 45545-2 for fire protection on railway vehicles. IMR122 product belongs mainly to component class EL10, and therefore, requirement R26 applies and is achieved by using V0 material in our construction. According to Clause 4.1 of EN 45545-2, the targeted Hazard Level will be "HL3".

<b>Insulation resistance</b>	IEC 60255-27
------------------------------	--------------

a) between input and output	
b) between all terminals and enclosure	
Leakage current	<3,5mA UL508
Single Fault test	IEC 61010-1

## Environmental Testing

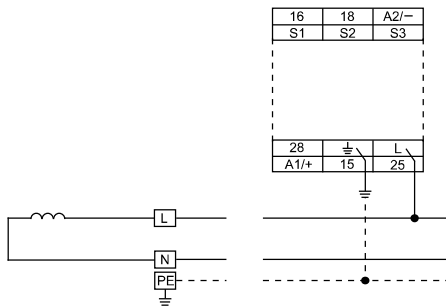
Cold Heat	IEC 60068-2-1
Dry Heat	IEC 60068-2-2,
Damp heat, cyclic	IEC 60068-2-30
Vibration, Shock and bump	EN 50155 and EN 61373 Category 1, Class B

# Insulation Monitoring Relay

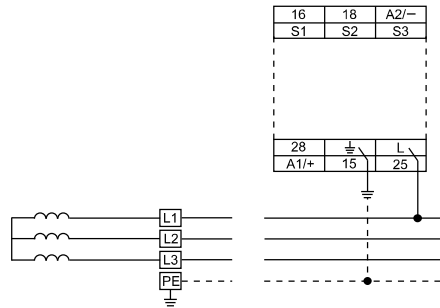


## CONNECTION DIAGRAM

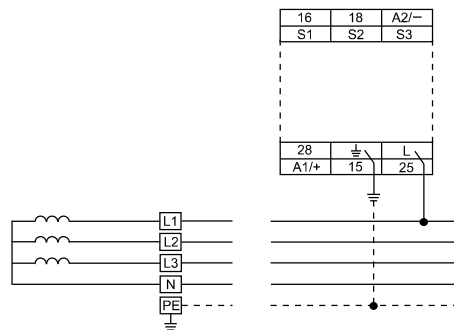
### 1 Phase AC System



### 3 Phase 3-Wire AC system

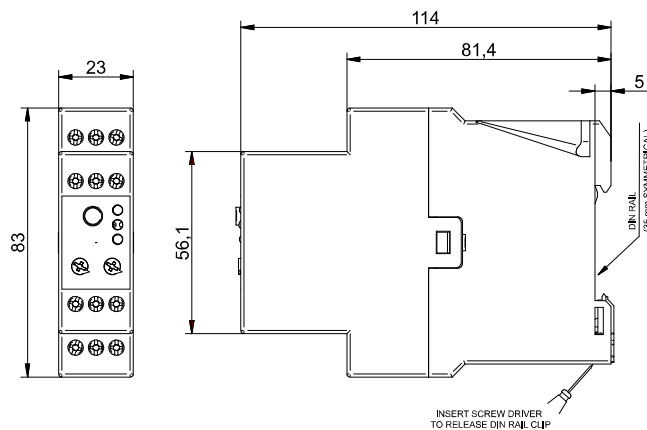


### 3 Phase 4-Wire AC system





Note :- Connection of measuring input 'L' to any of the conductors

## MOUNTING DIMENSION (mm)



## TERMINAL TORQUE & CAPACITY

 Ø 3.5 mm...4.0mm	0.6 N.m (5.3 Lb.in)
	1 x 4.0 mm <sup>2</sup> Solid/Stranded Wire
AWG	1 x 20 to 10