

# INSULATION MONITORING RELAY

Catalogue Number : IMR122



## FEATURES

- Monitors insulation resistance of unearthed IT Systems in compliance with IEC 61557-8, EN 50155, IEC 61373 and EN 45545 HL-2/3
- Threshold Resistance setting from 1K to 100Kohm
- Wide auxiliary supply voltage range 24V – 240V AC/DC
- Monitor system voltages up to 520V
- Suitable for monitoring 1 Ph, 3P3W and 3P4W unearthed supply systems
- Test / Reset function with Manual and remote facility
- Configurable Auto / Manual Reset
- LED indication for Power, insulation fault and Relay output
- 2 Relay outputs: 1C/O for fail safe and 1NO for non fail safe operation

## USER INTERFACE

1 Test and reset Key

2 LED Indications

☐ : Green LED - Auxiliary Supply  
F : Red LED - Fault Status  
R : Amber LED - Relay Status

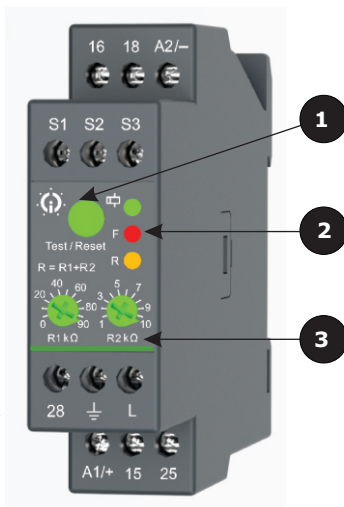
3 Threshold Resistance setting  
 $R=R1+R2$

**POT-1 (R1)**

Setting of value from 0 ohm to 90K  
In multiples of 10K

**POT-2 (R2)**

Setting of value from 1K to 10K  
In multiples of 1K



## NOTE

>The technical information provided in this document was correct at the time of publish

>Product innovation being a continuous process, we reserve the right to

## TECHNICAL SPECIFICATIONS

Auxiliary Supply Characteristics (A1/+ - A2/-)	
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	3VA @240VAC
Measurement Circuit Characteristics $L, \perp$	
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	>=135 Kohm
Internal DC resistance $R_i$	>=185 Kohm
Measuring current $I_m$ max	<= 0.1mA
Response time $\tan 0.5 \times R_{an}$ and $C_e = 1 \mu$ F	10 sec max.
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

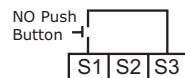
## TEST/RESET FUNCTION

The test function is only possible when there is no fault.

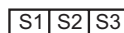
Test and Reset functionality can be performed using Test/Reset key on device or from remotely.

To perform test and reset function remotely, make connections of S1,S2,S3 terminal as follows-

**Remote Test**  
(S1- S3 momentary short)



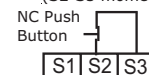
**Auto Reset**  
(S2-S3 open)



**Front Manual Reset**  
(S2-S3 short)



**Remote Manual Reset**  
(S2-S3 momentary open)



## Environmental Parameters

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

## Mechanical Parameters

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)	83 x 23 x 114 in mm
Weight (Unpacked)	140 gm Approx.

## FUNCTIONAL CHARACTERISTICS

### Relay Output Characteristics

Number of Relays	2 No's
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 1 (15,16,18)	De-energize to trip (Fail safe mode)
Relay 2 (25,28)	Energize to trip (Non fail safe mode)

## LED INDICATIONS

CONDITIONS	GREEN LED (☐)	RED LED (F)	AMBER LED (R)
<b>Startup</b>	Blink (500ms)	OFF	OFF
<b>No Fault</b>	ON	OFF	ON
<b>Insulation Fault</b>	ON	ON	OFF
<b>Test Function</b>	Fast Blink (250ms)	ON	OFF
<b>Internal system Fault</b>	Fast Blink (250ms)	Fast Blink (250ms)	OFF
<b>No fault during fault storage</b>	ON	ON	Fast Blink (250ms)

**Internal system fault-** In healthy condition if Test Key is pressed for more than 3.5 sec and system leakage capacitance is more than 2 $\mu$ F, then LED indicates internal system fault. This is for diagnosis of leakage capacitance in the system. To exit the fault indication, reset the power supply of device once.

## ELECTROMAGNETIC COMPATIBILITY

### EMI/ EMC TEST

Harmonic Current Emissions	IEC 61000-3-2 Class A
Voltage Flicker and Fluctuations	IEC 61000-3-3 Class A
ESD	IEC 61000-4-2 Level 3 Criterion A
Radiated Susceptibility	IEC 61000-4-3 Level 3 Criterion A
Electrical Fast Transients	IEC 61000-4-4 Level 3 Criterion A
Surge	IEC 61000-4-5 Level 3 Criterion A
Conducted Susceptibility	IEC 61000-4-6 Level 3 Criterion A
Power Frequency Magnetic Field	IEC 61000-4-8 Criterion A
Voltage Dips & Interruptions (AC)	IEC 61000-4-11
Voltage Dips & Interruptions (DC)	IEC 61000-4-29
Conducted Emission	EN50155:2017, EN50121-3-2 and EN55011 Class B
Radiated Emission	EN50121-3-2/EN6100-6-4, EN55011 AND EN50155, Class B
Supply Over Voltage	EN50155
Supply Variations	EN50155

## SAFETY DATA

### Voltage Withstand test

Test Voltage between I/P and O/P	IEC 61010-1 2kV
Test Voltage between all terminals and enclosure	IEC 61010-1 2kV
Impulse Voltage between I/P and O/P	IEC 61010-1 6kV
Impulse Voltage between I/P and Measuring circuit	IEC 61010-1 6kV
Impulse Voltage between O/P and Measuring circuit	IEC 61010-1 6kV
Insulation Resistance	IEC 60255-27 >100MΩ at 500VDC
Leakage Current	<3.5mA UL508
Single Fault test	IEC 61010-1
Fire safety	EN 45545-2, HL-2/3

### 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".

## ENVIRONMENTAL DATA

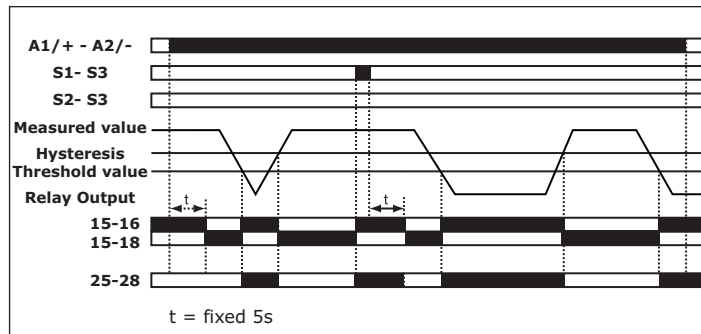
Cold Heat	IEC 60068-2-1
Dry Heat	IEC 60068-2-2
Damp Heat, Cyclic	IEC 60068-2-30
Vibration, Shock and Bump	EN61373 Category 1, Class B, Body Mounted

## OPERATION

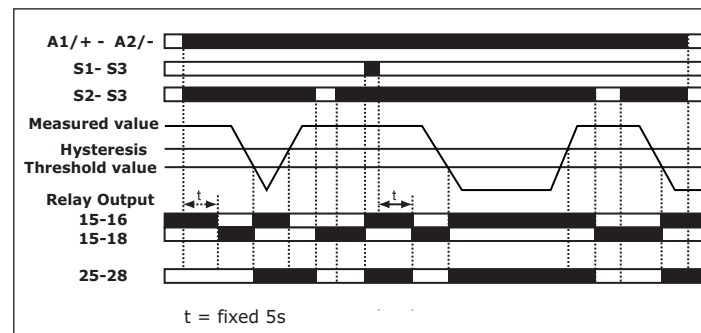
- >The system to be monitored is connected to terminal L. The earth potential is connected to terminal  $\perp$
- >Once the control supply voltage(A1-A2) has been applied the insulation monitoring relay runs through a system test routine and Green LED start blinking.
- >The system is diagnosed and the settings are tested. If no internal or external faults are found after this test routine is completed, the output relay energizes and Amber LED (R) get ON.
- >If the measured value goes below the set threshold value, the output relay de-energizes and Fault Red LED (F) get ON.
- >If the measured value above the threshold value plus hysteresis, then output relay re-energizes and Amber LED (R) get ON.

## FUNCTION DIAGRAM

### A) AUTO RESET



### B) MANUAL RESET



## E-WASTE REGULATORY NOTICE

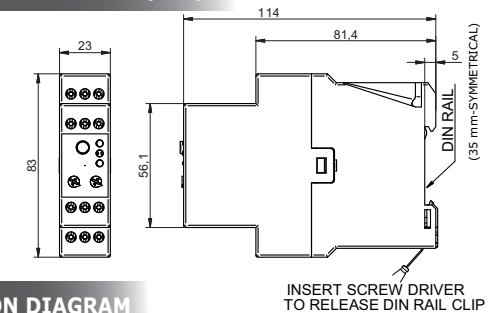


Kindly treat, recycle or dispose of this equipment in an environmentally sound manner after End of Life, as per WEEE (Waste Electrical and Electronic Equipment) regulations or as per local norms; or hand it over to General Industrial Controls Pvt. Ltd, through website <https://www.gicindia.com/get-in-touch/>

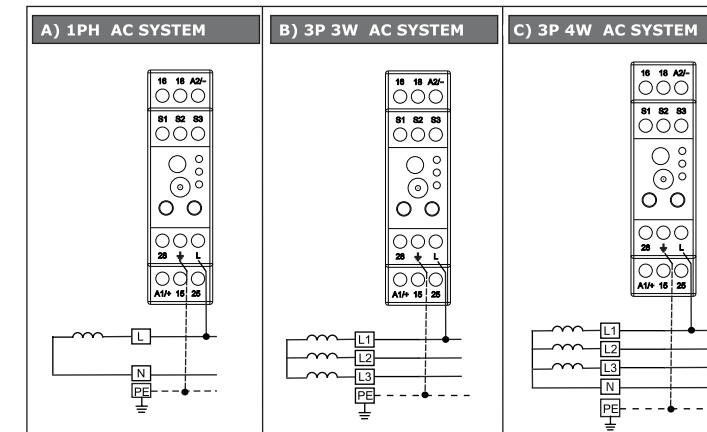
## CAUTION

- >Do not touch the terminals while power is being supplied
- >Tighten terminal screws with the specified torque
- >Always follow instructions stated in product leaflet
- >Before installation, ensure that specifications agree with intended application
- >During installation, keep 10mm distance on both sides of product from adjacent devices
- >Suitable dampers should be provided in the event of excessive vibrations
- >Only qualified persons are authorized to install the product
- >Use slow blow fuse of 250mA rating in series with product supply
- >Device should be kept away from wet, dust & humidity environments
- >Device manufacturer will not be responsible if any incident occur due to negligence of cautions

## MOUNTING DIMENSION (mm)



## CONNECTION DIAGRAM



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

## TERMINAL TORQUE AND CAPACITY

$\varnothing$ 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