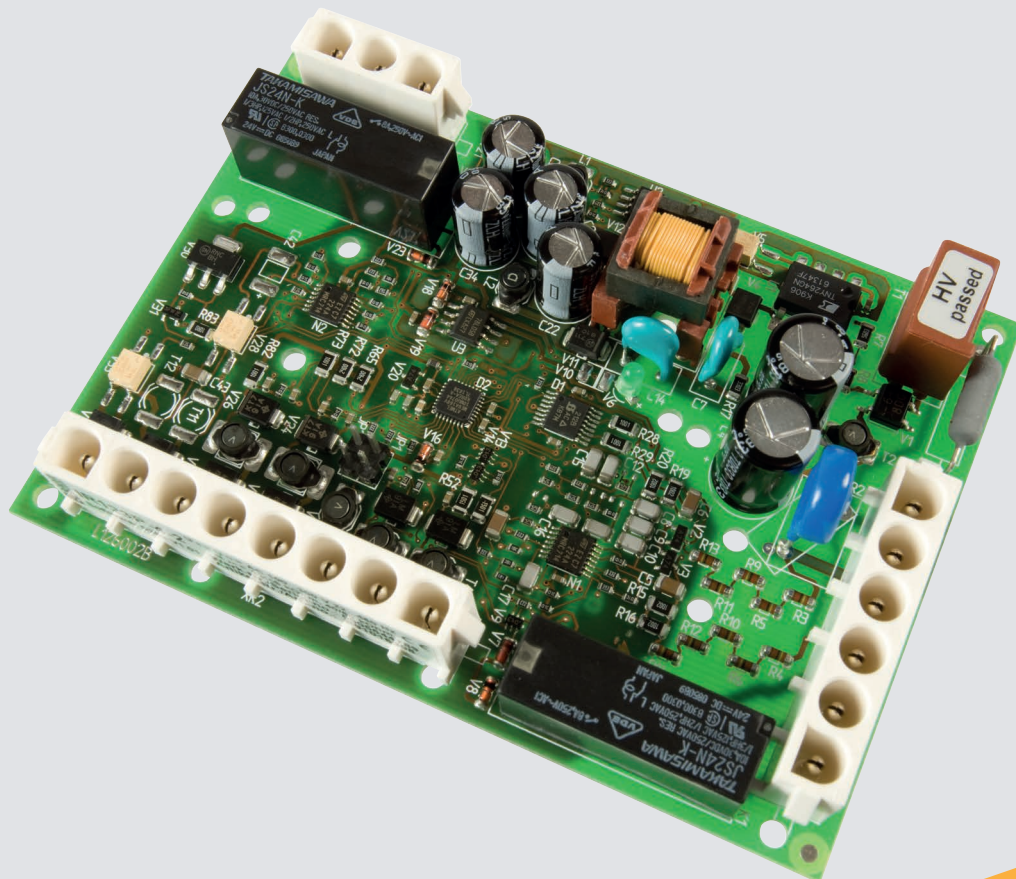
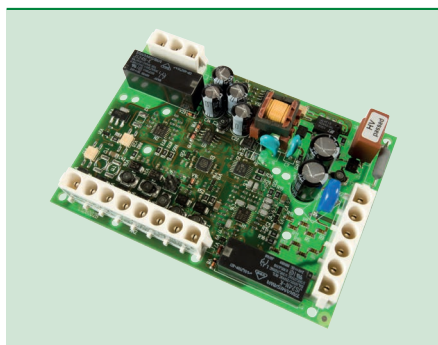


ISOMETER® IR123P

Insulation monitoring device for mobile generators





ISOMETER® IR123P

Device features

- Insulation monitoring for unearthed DC systems (IT systems) 100...300 V
- Automatic adaptation to the existing system leakage capacitance
- Optimised measurement technique for low-frequency control processes
- Electrically isolated PWM output for the kΩ measuring value
- Optocoupler output for signalling the device status
- Automatic device self test
- Certonal coating
- Permanently set response value for the insulation resistance 23/46 kΩ
- Second response range 40/80 kΩ selectable via jumper

Product description

The ISOMETER® IR123P monitors the insulation resistance R_F of an unearthed AC system of 100...300 V against earth, that is supplied by a mobile generator according to DIN VDE 0100-551. The IR423 is suitable for AC systems with operating frequencies of 22...65 Hz as well as for AC systems including DC components. The maximum permissible system leakage capacitance C_{emax} is 5 μF .

Application

- Monitoring of unearthed AC systems (IT systems) in mobile generators

Function

The ISOMETER® IR123P generates a pulsating measuring voltage which is superimposed on the IT system being monitored via the terminals L1/L2 and KE/E. The currently measured insulation resistance is available as a pulse-width-modulated signal of maximum 10 mA at terminal M+. Ohmic insulation faults close the measuring circuit between the IT system and earth. If the value falls below response value R_{an2} (prewarning), the alarm relay K2 will switch. If the value falls below response value R_{an1} (alarm), the alarm relay K1 and the optocoupler output "OK" (terminals OK+/OK-) will switch. The maximum current load of the output is 10 mA. Both optocouplers can be connected to an external operating voltage of ≤ 24 V.

Approvals



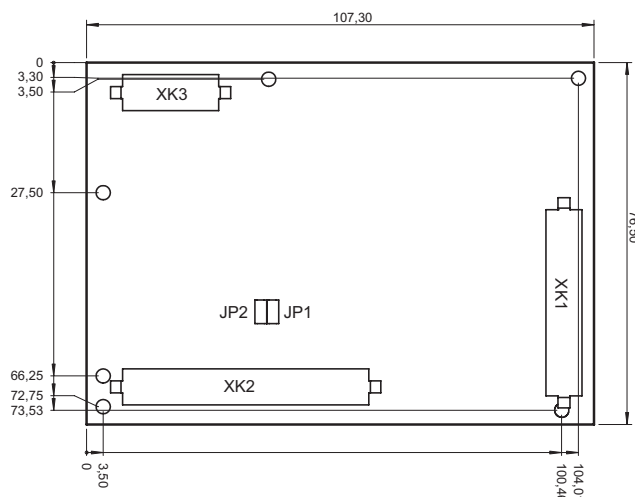
Ordering information

Connection	Nominal system voltage U_n	Supply voltage $U_S^{1)}$	Type	Art. No.
	AC	AC		
Connectors	100...300 V, 22...460 Hz	$U_S = U_n$	IR123P-4-2	B 9101 6308

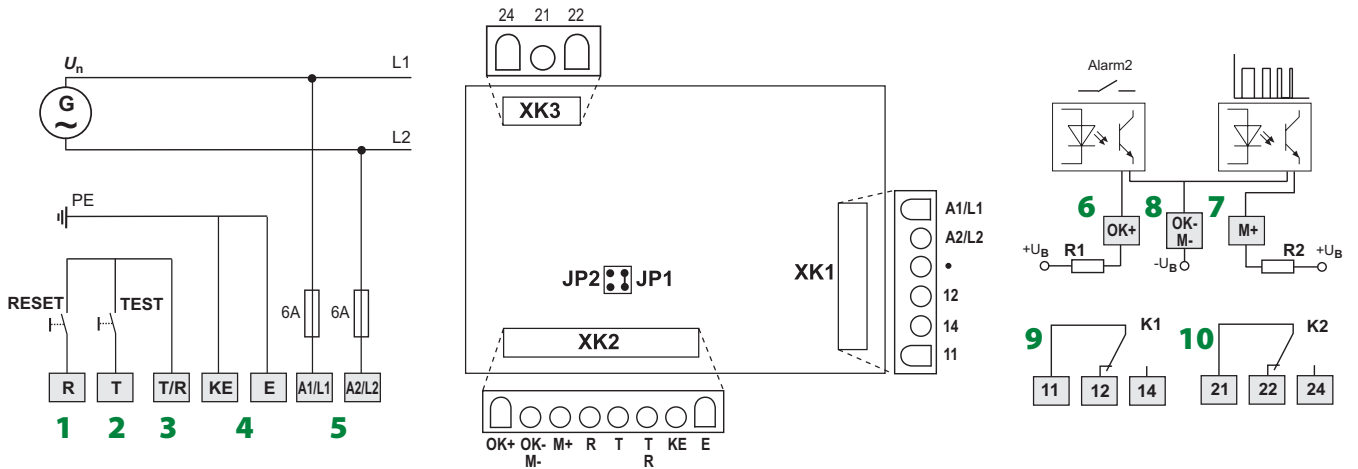
* Absolute values

Dimension diagram

Dimensions in mm



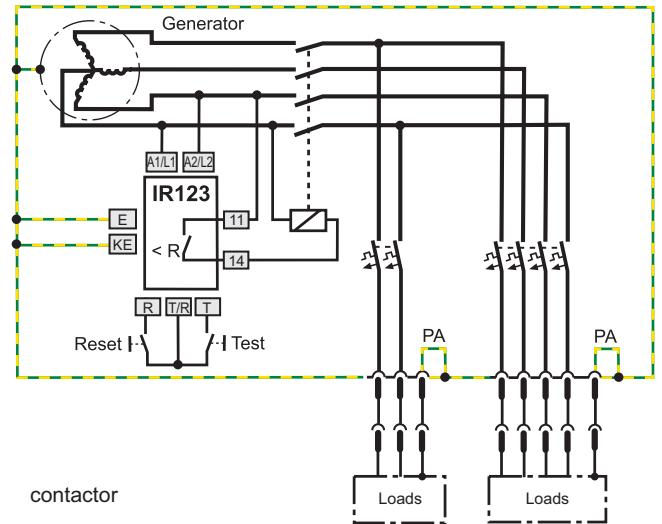
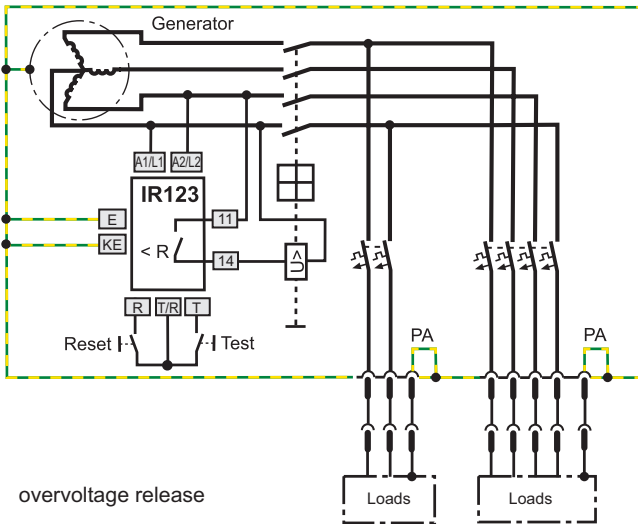
Wiring diagram



- 1 - Input for reset button "R" (N/O contact)
- 2 - Input for test button "T" (N/O contact)
- 3 - Common input for test and reset button "T/R"
- 4 - Connect the leads E and KE separately to PE
- 5 - Supply voltage $U_S = U_n$
Connection to the IT system to be monitored

- 6 - Digital output optocoupler "OK+": Alarm 2;
Connect external operating voltage U_B : max. +24 V
- 7 - Pulse-width-modulated output optocoupler "M+": measured value
Connect external operating voltage U_B : max. +24 V
- 8 - Common reference point $-U_B$ "OK-, M-" for OK+ and M+
- 9 - Alarm relay "K1"
- 10 - Alarm relay "K2"

Application example with overvoltage release or contactor



Setting K1/K2 for **overvoltage release**:
N/O operation

Setting K1/K2 for **contactor**: N/C operation

Technical data

Insulation coordination acc. to IEC 60664-1

Rated insulation voltage	250 V
Rated impulse voltage/pollution degree	2.5 kV/3
Protective separation (reinforced insulation) between: (A1/L1, A2/L2, E, KE, T/R, T, R, M+, M-/OK-, OK+) - (11-12-14) - (21-22-24)	
Voltage test acc. to IEC 61010-1	2.21 kV

Supply voltage

Supply voltage U_S	= U_N
Power consumption	≤ 3 VA

IT system being monitored

Nominal system voltage U_N	AC 100...300 V
Nominal frequency f_N	22...460 Hz

Response values

Response value R_{an2} (Alarm 2)	(46 k Ω)*
Response value R_{an1} (Alarm 1)	(23 k Ω)*
Second response range, adjustable via jumper JP1	80/40 k Ω
Relative percentage error	±15 %
Hysteresis	+25 %

Time response

Response time t_{an} at $R_F = 0.5 \times R_{an}$ and $C_e = 1 \mu\text{F}$	≤ 1 s
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Measuring circuit

Measuring voltage U_m	±12 V
Measuring current I_m (at $R_F = 0 \Omega$)	≤ 200 μA
Internal DC resistance R_i	≥ 62 k Ω
Impedance Z_i at 50 Hz	≥ 60 k Ω
Permissible extraneous DC voltage U_{fg}	≤ DC 300 V
Permissible system leakage capacitance C_e	≤ 5 μF

Memory

Fault memory (alarm relay)	on / off (on)*
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Inputs

Reset button	N/O contact
Test button	N/O contact
Cable length external test/reset button	3 m

Switching elements

Number of switching elements	2 (changeover contacts K1, K2)
Operating principle K1/K2	N/C or N/O operation (N/O operation)*
Electrical endurance, number of cycles	10000

Interfaces

Optocoupler, alarm	$U_{CE} 24 \text{ V}, I_C 10 \text{ mA}$
Optocoupler, measured value	$U_{CE} \leq \text{DC } 24 \text{ V}, I_C \leq 10 \text{ mA}$
	PWM signal, duty cycle 0 % = ∞ k Ω
	PWM signal, duty cycle 50 % = 120 k Ω
	PWM signal, duty cycle 100 % = 0 k Ω

Contact data acc. to IEC 60947-5-1:

Rated operational voltage AC	230 V	230 V	
Utilisation category AC	AC 13	AC 14	
Rated operational current AC	5 A	3 A	
Rated operational voltage DC	220 V	110 V	24 V
Utilisation category DC	DC 12	DC 12	DC 12
Rated operational current DC	0.1 A	0.2 A	1 A
Minimum current	1 mA at AC/DC ≥ 10 V		

Environment/EMC

EMC	acc. to IEC 61326-2-4
Operating temperature	-25...+60 °C
Climatic categories acc. to IEC 60721, valid for one encapsulated p.c.b.:	
Stationary use (IEC 60721-3-3)	3K5 (except condensation and formation of ice)
Transport (IEC 60721-3-2)	2K3 (except condensation and formation of ice)
Storage (IEC 60721-3-1)	1K4 (except condensation and formation of ice)
Classification of mechanical conditions acc. to IEC 60721, valid for one encapsulated p.c.b.:	
Stationary use (IEC 60721-3-3)	3M7
Transport (IEC 60721-3-2)	2M2
Storage (IEC 60721-3-1)	1M3
Connection	connectors Universal MATE-N-LOK 3-pole TE Connectivity Nr. 350789-1 6-pole TE Connectivity Nr. 641831-1 8-pole TE Connectivity Nr. 641828-1

Other

Operating mode	continuous operation
Mounting	any position
Dimensions of the p.c.b., L x W x H, without connectors 107.5 x 76.5 x 20 mm, with connectors 107.5 x 76.5 x 35 mm	
Enclosure	without
Documentation number	D00113
Weight	≤ 150 g

() * = factory setting



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