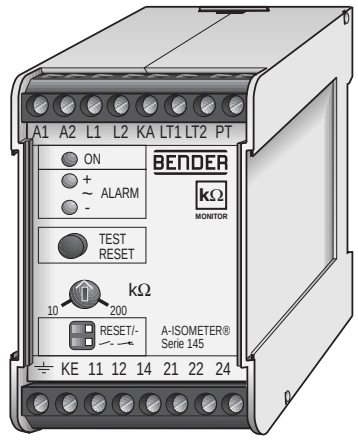
GROUND FAULT MONITOR

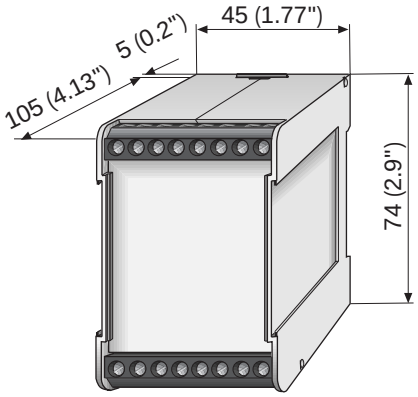
for Ungrounded AC & DC Systems from 0...300V

IR145Y-...

VDE IEC



Dimension Diagram (mm)



DIN Rail mounting as per DIN EN 50 022

- For Ungrounded (floating) AC and DC systems from AC 0 to 300 V/ DC 0 to 290 V
- Automatic adaption to the system leakage capacitance up to 20µF
- AMP-measuring principle (patent pending)
- Adjustable set-point ranges:

  IR145Y-3.. - 1kΩ...20kΩ
  IR145Y-4.. - 10kΩ...200kΩ
- Operation and alarm LEDs and Test/Reset button
- Two voltage-free change over contacts
- Connection monitoring
- UL / CSA listed, Meets VDE/IEC standards, CE mark

Product Description

The BENDER IR145Y continuously monitors the insulation resistance level of ungrounded (floating) AC-, DC- and AC/DC systems up to AC 300 V or DC 290 V. The alarm set-point is steplessly adjustable from either 1kΩ...20kΩ for the IR145Y-3.. or from 10kΩ...200kΩ for the IR145Y-4...

The device is particularly suited for AC control circuits with extensive, directly connected rectifiers as well as for DC control circuits. The AMP measuring method signals insulation faults in AC- and DC systems with the same response sensitivity.

The devices are fitted into plastic casings for quick assembly onto support DIN 35/15 rail or for screw mounting.

Operational Information

Within the BENDER IR145Y a measuring signal is generated which is connected to the system via the terminals L1/L2 and is connected to ground via the terminals ⏚/KE . These connections are monitored continuously. If one of these connections is interrupted, it will be indicated by flashing alarm LEDs and alarm relay.

The measuring signal consists of positive and negative pulses of the same amplitude. The period depends on the respective leakage capacitances and insulation resistance of the system to be monitored.

Insulation faults in DC circuits which are directly connected to the AC system are only monitored correctly when the rectifiers carry a load current > 5...10 mA.

The measuring circuit is closed via ohmic insulation faults. When the insulation value falls below the preset response value, the alarm LEDs "ALARM" illuminate and the alarm relay switches state. The alarm LEDs indicate either "AC ground fault", "DC + ground fault" or "DC - ground fault".

If the fault indication shall be stored, the terminal LT1/LT2 have to be bridged by an external reset button (NC contact) or by selecting "with fault memory" at the respective DIP switch on the front plate. The fault memory can be reset by pushing the [TEST/RESET] button located at the front plate or the external reset button for a short period provided that the insulation resistance exceeds the set response value by at least 25%. By pushing the internal test button or the external test button (NO contact), the correct function of the measuring circuit, the alarm LEDs and the alarm relay can be checked.

Bender Industrial Products - 700 Fox Chase - Coatesville, PA 19320 - Toll-free: (800) 356-4266 - Fax: (610) 383-7100

Technical Data IR145Y-...

Insulation	
Rated insulation voltage	AC 250 V
Rated impulse voltage / disturbance grade	4 kV/3
Operation class	continuous operation
Monitored System	
Rated mains voltage U_N	
- IR145Y-3..	DC or AC 15 ... 400 Hz, 0 ... 138 V
- IR145Y-4..	DC 0... 290 V or AC 15 ... 400 Hz, 0 ... 300 V
Supply Voltage	
Supply voltage U_S	
- IR145Y-313 or IR145Y-413	120V AC, 50..60Hz
- IR145Y-314 or IR145Y-414	230V AC, 50..60Hz
- IR145Y-321 or IR145Y-421	9.6 ... 84V DC
Operating range U_S	AC 0.8 ... 1.15 x U_S
Alarm Response Values	
Response value R_{ALARM}	
- IR145Y-3..	1 ... 20 kΩ
- IR145Y-4..	10 ... 200 kΩ
Hysteresis	25% of R_{ALARM}
Response time (R_E=0kΩ, C_E=1µF)	
- IR145Y-3	3 s
- IR145Y-4	5 s
Max. mains leakage capacitance	20 µF
Measuring Circuit	
Measuring voltage U_M (peak value)	13 V
Measuring current I_M	
- IR145Y-3..	0.47 mA
- IR145Y-4..	0.11 mA
Internal DC resistance/impedance	
- IR145Y-3.. (Ri/Zi)	28/22 kΩ
- IR145Y-4.. (Ri/Zi)	120 /94 kΩ
Max. admissible stray DC voltage U_{eff}	
- IR145Y-3..	138 V
- IR145Y-4..	300 V
Alarm Relay	
Switching components	2 voltage-free SPDT contacts
Rated contact voltage	AC 250 V/DC 300 V
Rated current	UC 5 A
Break capacity AC 230V, p.f. = 0.4	AC 2 A
Break capacity DC 220 V and L/R = 0.04 s	DC 0.2 A
Operating mode	Normally Energized / De-energized
Adjustment by factory	Normally De-energized
Testing	
Dielectric test: Test voltage	2 kV
Impulse voltage test acc. to IEC255-5	class III
Electrical disturbance test acc. to IEC255-5	class III
Elec. fast transient burst acc. to IEC801-4	severity degree 2
Shock resistance acc. IEC68-2-27	15g / 11sec
Vibration strength acc. to IEC68-2-6	10...150Hz / 0.15mm - 2g
Bumping acc. to IEC68-2-29	40g / 6msec
Environmental Conditions	
Ambient temperature, during operation	-10°C ... +55°C
Storage temperature range	-40°C ... +70°C
General Data	
Type of connection	screw terminals
Wire size, solid	14 AWG
Wire size, stranded with end sleeve	16 AWG
Mounting	DIN rail or screw (#990 056)
Weight	1 lb

Note:

Please check for correct supply voltage.

Only one insulation monitoring device may be used in each interconnected system.

In order to check the proper connection of the device, it is recommended to carry out a functional test using a genuine ground fault, e.g. via a suitable resistance, before starting the operation.

When insulation and voltage tests are to be carried out, the device must be isolated from the system for the test period.

The terminal KA must be connected by a separate wire to one phase conductor (L1 or L2 or L+ or L-) of the network to be monitored. This connection allows to monitor the system connection to the measuring circuit. In any case, there must be a connection between L1/L2/KA for connection monitoring (e.g. via the winding of the isolating transformer).

Electrical equipment shall only be installed by qualified personnel in consideration of the current safety regulations.

Ordering Guide

Type	Supply voltage U_S	Art. No.
IR145Y-313	AC 120V	910 35505
IR145Y-314	AC 230V	910 35502
IR145Y-321	DC 9.6 ... 84V	910 35504
IR145Y-413	AC 120V	910 36505
IR145Y-414	AC 230V	910 36502
IR145Y-421	DC 9.6 ... 84V	910 36504
IR145Y-411	AC 24V	910 36519
IR145Y-423	DC 77-286V	910 36517

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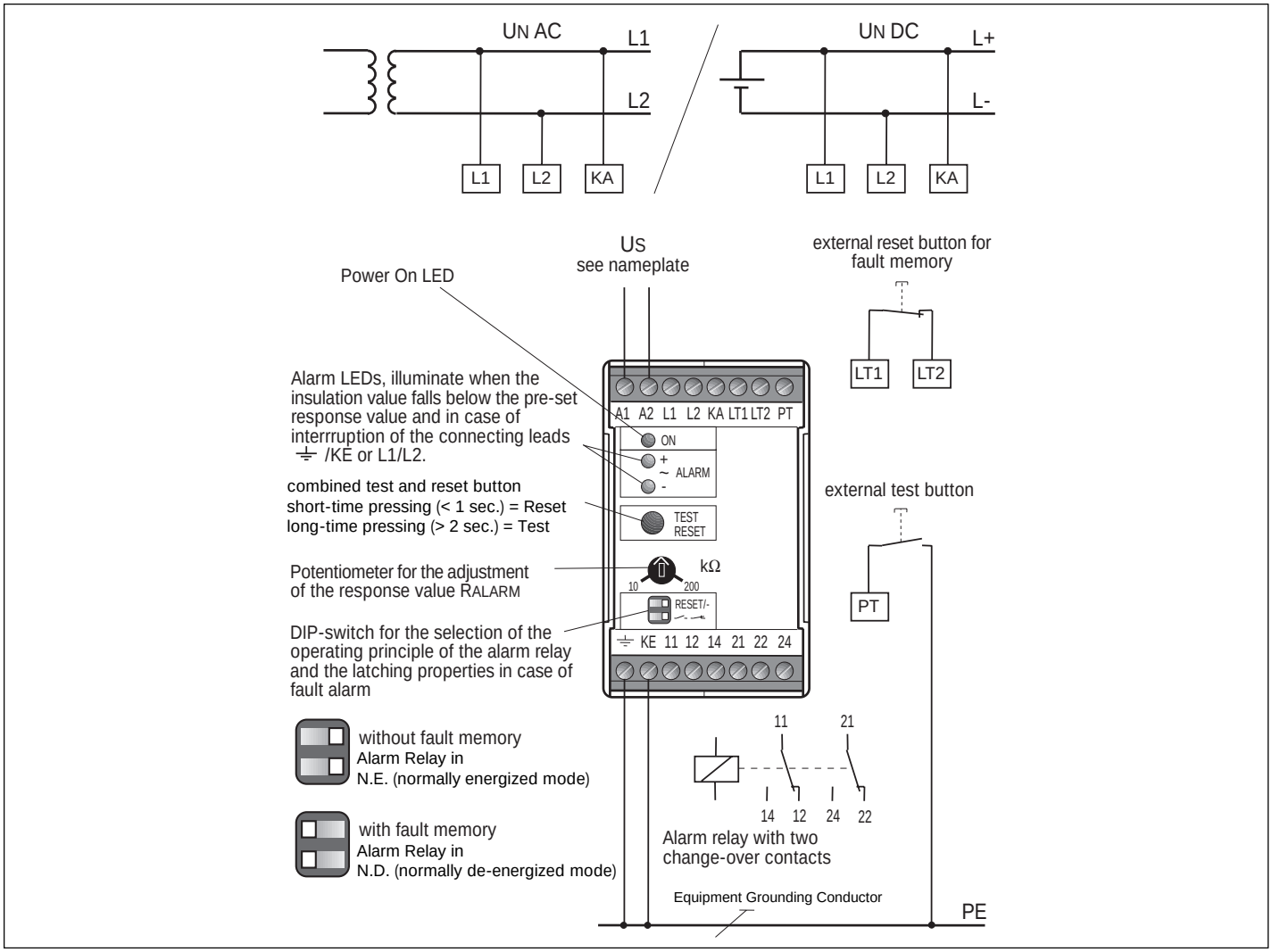
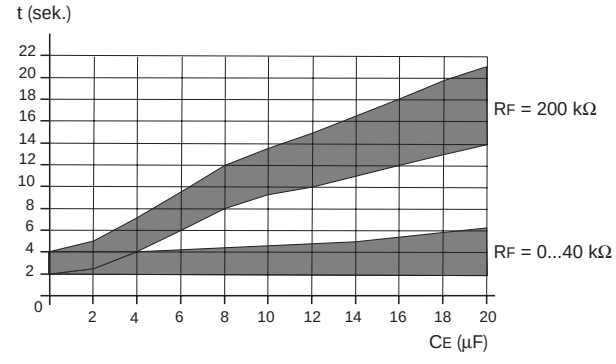
Wiring Diagram



Measuring Time



C_E system leakage capacitance
R_F insulation fault resistance
t measuring time

For checking the measuring circuit, the BENDER A-ISOMETERs are equipped with connection monitoring. The following fault indications are possible:

Fault Indication	Alarm LED +	Alarm LED -	Alarm relay
AC faults	x	x	x
DC faults L+	x		x
DC faults L-		x	x
Interruption ⏚/KE or L1/L2	o	o	x
o = flashing x = continuous indication			

If one of these fault indications occurs, the connections have to be checked as possible.

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