



ISOMETER® isoRW425

Insulation monitoring device for unearthed
IT AC-, AC/DC and DC systems (IT systems)
for railway applications up to 3(N)AC, AC/DC 440 V
Software version: D0418 V2.xx



ISOMETER® isoRW425

i *Information!*
Read the corresponding manual in addition to this quickstart.
Downloadable at: www.bender.de/en/service-support/downloads

Type of device	Version	Manual No.	Art. No.
isoRW425-D4W-4	Push-wire terminal	D00052	B71037000W
isoRW425-D4W-4	Screw-type terminal	D00052	B91037000W
Mounting clip for screw fixing (1 piece per device)			B98060008

Intended use

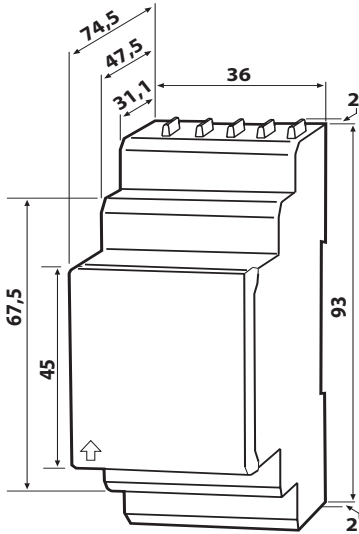
The ISOMETER® monitors the insulation resistance R_f (R mode) or the insulation impedance Z_f (Z mode) of unearthed AC/DC main circuits (IT systems) with nominal system voltages of 3(N)AC, AC, AC/DC or DC 0 ... 440 V. DC components existing in 3(N)AC, AC/DC systems do not influence the operating characteristics, when a minimum load current of DC 10 mA flows.

A separate supply voltage U_s allows deenergised systems to be monitored as well. The maximum permissible system leakage capacitance C_e is 300 μ F in R mode and 1 μ F in Z mode.

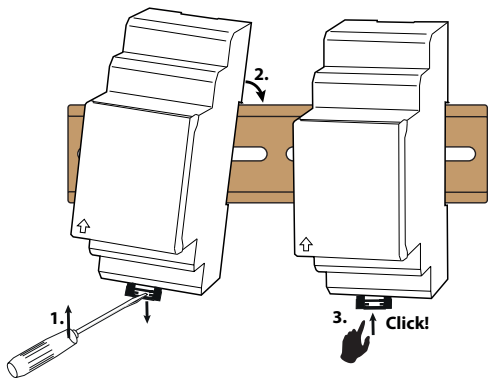
Any use other than that described in this quickstart is regarded as improper.

i *To ensure that the ISOMETER® functions correctly, an internal resistance of $\leq 1 \text{ k}\Omega$ must exist between L1/+ and L2/- via the source (e.g. the transformer) or the load.*

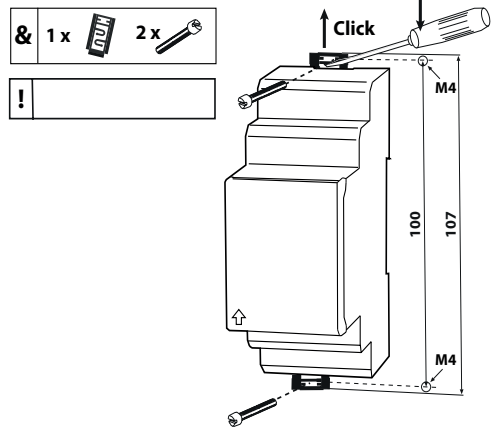
Installation



A

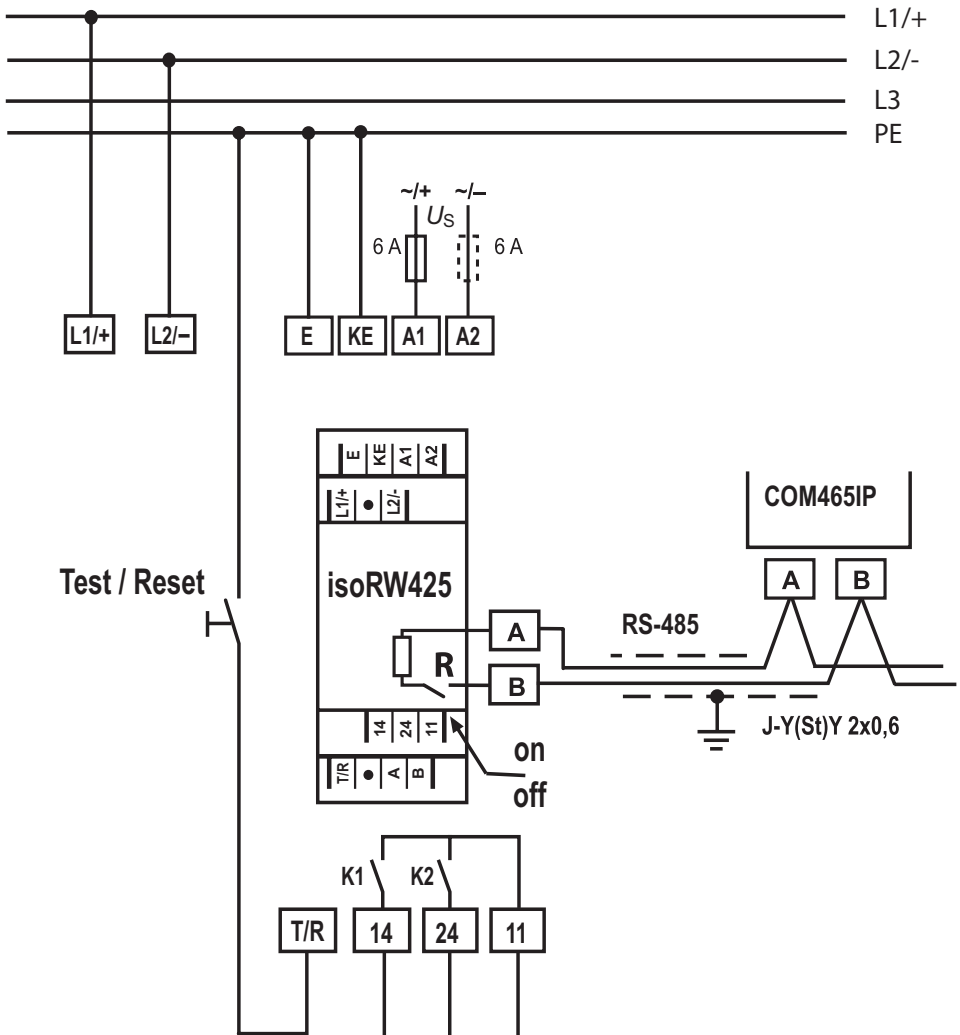


B



All dimensions in mm

Wiring diagram



Wiring diagram legend

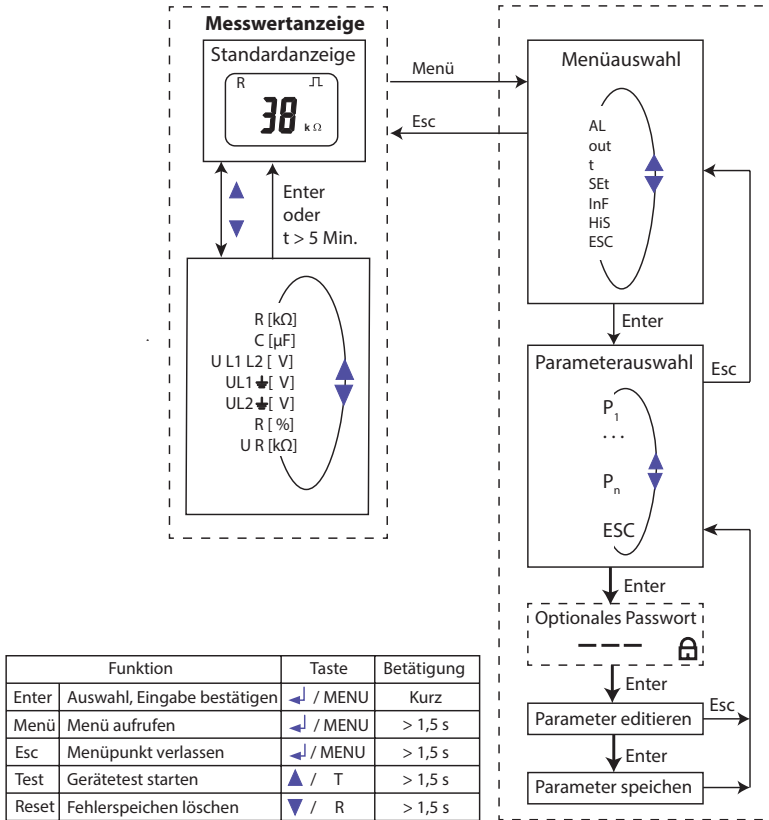
Terminal	Connections
A1, A2	Connection to the supply voltage U_s via a fuse: If supplied from an IT system, both lines have to be protected by a fuse.*
E, E, KE	Connect each terminal separately to PE: The same wire cross section as for „A1“, „A2“ is to be used.
L1/+ , L2/-	Connection to the 3(N)AC, AC or DC system to be monitored
T/R	Connection for external combined test and re-set button
11, 14	Connection to alarm relay „K1“
11, 24	Connection to alarm relay „K2“
A, B	RS-485 communication interface with selectable terminating resistance Example: Connection of a BMS-Ethernet-Gateway COM465IP


*** For UL applications:**

Only use 60/75°C copper lines!

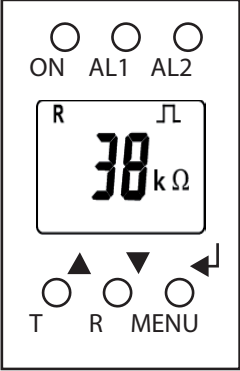
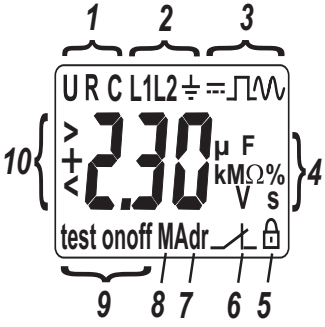
For UL and CSA applications, it is mandatory to use 5 A fuses for the protection of the supply voltage U_s .

Menu overview



Menu item	Parameter
AL	Querying and setting response values
out	Configuring fault memory, alarm relays and interface
t	Setting delay times and self-test cycles
SEt	Setting device control parameters
InF	Querying software version
HiS	Querying and clearing the history memory
ESC	Going to the next higher menu level

Display elements

Device front/display	Function
	<p>ON green - On AL1 yellow - alarm AL2 yellow - alarm</p> <hr/> <p>▲ Up button T Test button (press > 1.5 s)</p> <hr/> <p>▼ Down button R Reset button (press > 1.5 s)</p> <hr/> <p>↵ ENTER MENU MENU button (press > 1.5 s)</p>
	<p>1 U: Nominal system voltage U_n R: Insulation resistance R_f C: System leakage capacitance C_e</p> <hr/> <p>2 Monitored conductor</p> <hr/> <p>3 = : Voltage type DC □ : Disturbance-free measurement value update ~ : Voltage type AC</p> <hr/> <p>4 Measured values and units</p> <hr/> <p>5 Password protection is activated.</p> <hr/> <p>6 In menu mode, the operating mode of the respective alarm relay is displayed.</p> <hr/> <p>7 Communication interface With measured value: isoData operation</p> <hr/> <p>8 The fault memory is activated.</p> <hr/> <p>9 Condition symbols</p> <hr/> <p>10 Identification for response values and response value violation</p>

Technical data

()* = Factory settings

Insulation coordination acc. to IEC 60664-1/IEC 60664-3

Rated voltage	440 V
Overtoltage category.....	III

Supply voltage

Supply voltage U_s	AC 100...240 V/DC 24...240 V
Tolerance of U_s	-30...+15 %
Frequency range U_s	47...63 Hz
Power consumption.....	≤ 3 W, ≤ 9 VA

Monitored IT system

Nominal system voltage U_n	3(N)AC, AC 0...440 V/DC 0...440 V
Nominal system voltage range U_n (UL508)	AC/DC 0...400 V
Tolerance of U_n	AC +15 %, DC +10 %
Frequency range of U_n	DC, 15...460 Hz

Response values

Response value R_{an1}	2...990 kΩ (40 kΩ)*
Response value R_{an2}	1...980 kΩ (10 kΩ)*
Relative uncertainty R_{an}	±15 %, at least ±1 kΩ
Hysteresis R_{an}	25 %, at least 1 kΩ
Response value Z_{an1}	11...500 kΩ (off)*
Response value $Z_{an2} >$	10...490 kΩ (off)*
Relative uncertainty Z_{an}	±15 %, at least ±1 kΩ
Hysteresis Z_{an}	25 %, at least 1 kΩ
Undervoltage detection $U <$	10...499 V (off)*
Overtoltage detection $U >$	11...500 V (off)*
Relative uncertainty U	±5 %, at least ±5 V
Relative uncertainty depending on the frequency ≥ 400 Hz	-0,015 %/Hz
Hysteresis U	5 %, at least 5 V

Time response

Response time t_{an} at $R_F = 0.5 \times R_{an}$ and $C_e = 1 \mu F$ acc. to IEC 61557-8	≤ 10 s
Response time t_{an} at $Z_F = 0.5 \times Z_{an}$	≤ 5 s
Start-up delay t	0...10 s (0 s)*
Response delay t_{on}	0...99 s (0 s)*
Delay on release t_{off}	0...99 s (0 s)*

Interface

Interface/protocol	RS-485/BMS, Modbus RTU, isoData
Baud rate	BMS (9.6 kBit/s), Modbus RTU (selectable), isoData (115.2 kBits/s)
Cable length (9.6 kBits/s)	≤ 1,200 m
Cable: twisted pairs, shield connected to PE on one side	min. J-Y(St)Y 2 x 0.6
Terminating resistor.....	120 Ω (0.25 W), internal, can be connected
Device address, BMS bus, Modbus RTU	3...90 (3)*

Connection

Connection type.....screw-type or push-wire terminal

Screw-type terminals:

Nominal current.....≤ 10 A

Tightening torque..... 0.5 .. 0.6 Nm (5 .. 7 lb-in)

Conductor sizesAWG 24-12

Stripping length.....8 mm

Rigid/flexible0.2 .. 2.5 mm²Flexible with ferrules with/without plastic sleeve0.25 .. 2.5 mm²Multi-conductor rigid.....0.2 .. 1.5 mm²Multi-conductor flexible.....0.2 .. 1.5 mm²Multi-conductor flexible with ferrules without plastic sleeve.....0.25 .. 1.5 mm²Multi-conductor flexible with TWIN ferrules with plastic sleeve.....0.25 .. 1.5 mm²**Push-wire terminals:**

Nominal current.....≤ 10 A

Conductor sizesAWG 24-14

Stripping length.....10 mm

Rigid0.2 .. 2.5 mm²Flexible without ferrules.....0.75 .. 2.5 mm²Flexible with ferrules with/without plastic sleeve0.25 .. 2.5 mm²Multi-conductor flexible with TWIN ferrules with plastic sleeve.....0.5 .. 1.5 mm²

Opening force50 N

Test opening, diameter.....2.1 mm

Other

Operating modecontinuous operation

Mountingcooling slots must be ventilated vertically

Degree of protection, built-in components (DIN EN 60529)IP30

Degree of protection, terminals (DIN EN 60529)IP20

Standards, approvals and certifications

The ISOMETER® has been developed in compliance with the following standards:

- DIN EN 61557-8 (VDE 0413-8): 2015-12/Ber1: 2016-12
- IEC 61557-8 -8: 2014/COR1: 2016



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