A-ISOMETER® IRDH275BM-7

with coupling device AGH675-7

Device combination for insulation monitoring in unearthed AC, AC / DC and DC systems (IT systems)

A-ISOMETER® IRDH275BM-7

Device features

- Insulation monitoring for drives including medium voltage converters up to 7.2 kV
- Two separately adjustable response values 100 kΩ…10 MΩ
- ***AMP***^{Plus} measuring principle (European Patent: EP 0 654 673 B1)
- Automatic adaptation to the system leakage capacitance
- Info key to display device settings and the system leakage capacitance
- History memory with real-time clock to store alarm messages with date and time stamp.
- BMS interface (Bender Measuring Device Interface) for data exchange with other Bender devices (RS-485 electrically isolated)
- Current output 0(4)…20mA (electrically isolated) analogously to the measured insulation value.
- Self monitoring with automatic alarm message
- Automatic self test, selectable
- Connection for kΩ indication
- Test and reset button
- Connection external test / reset button
- Two separate alarm relays with two voltage-free changeover contacts
- N / O or N / C operation
- Backlit two-line plain LC display
- Remote setting of specific parameters via Internet (option; FTC470XET required)
- With Option "W": Increased shock and vibration resistance for use in ships, in rolling stock and in seismic regions

Approvals

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AE25

Product description

The device combination A-ISOMETER® IRDH275BM-7 and the coupling device AGH675S-7 is designed to monitor the insulation resistance of unearthed medium voltage systems (IT systems). It is suitable for universal use in 3AC, combined AC / DC and DC systems. AC systems may include extensive DC-supplied loads. The AMPPlus measuring principle meets the particular requirements of modern power supplies which often include rectifiers, converters, thyristor-controlled DC drives and directly connected DC components. Taking the system leakage capacitances into account, the IRDH275BM-7 automatically adapts itself to the existing system conditions in order to optimize the measuring time.

Application

- AC, DC or AC / DC medium voltage systems
- AC / DC medium voltage systems with directly connected DC components, such as rectifiers, converters, and thyristor-controlled DC drives

Function

When the insulation resistance between the system conductors and earth falls below the set response value, the alarm relays switch and the alarm LEDs light up. Two separately adjustable alarm relays allow to distinguish between prewarning and alarm. The measured value is indicated on the LC display or an externally connectable measuring instrument. The fault message can be stored. The fault memory can be reset by pressing the reset button. By pressing the test button, the function of the device as well as the connections to earth can be tested. Pressing the info key provides additional information, such as the existing system leakage capacitance or device settings. The function of the earth connections are monitored. When a fault occurs, the system fault relay switches and the alarm LED "system fault" lights up.

The parameterization of the device can be carried out via the LC display or the function keys integrated in the front plate.

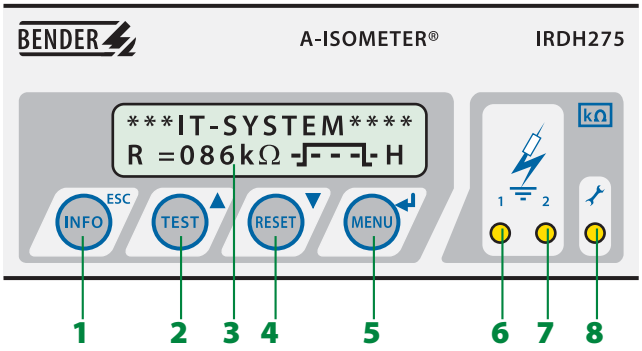
The device additionally provides the following functions:

- History memory with real-time clock to store all alarm messages with date and time stamp.
- Galvanically isolated RS-485 interface (BMS protocol) for data exchange with other BENDER devices
- Current output 0(4)…20 mA (electrically isolated)

Measuring principle

AMP^{Plus} The IRDH275BM-7 series uses the patented AMPPlus measuring principle. This measuring principle allows concise monitoring of modern power supply systems, also in case of extensive, directly connected DC components and high system leakage capacitances.

Operating elements



1 - INFO key: to query standard information
ESC key: back to the menu function, confirmation parameter change

2 - TEST button: to call up the self test.
Arrow up key: Parameter change, to move up in the menu.

3 - Two-line display for standard and menu mode

4 - RESET button: to delete stored insulation fault alarms
Arrow down key: Parameter change, to move down in the menu.

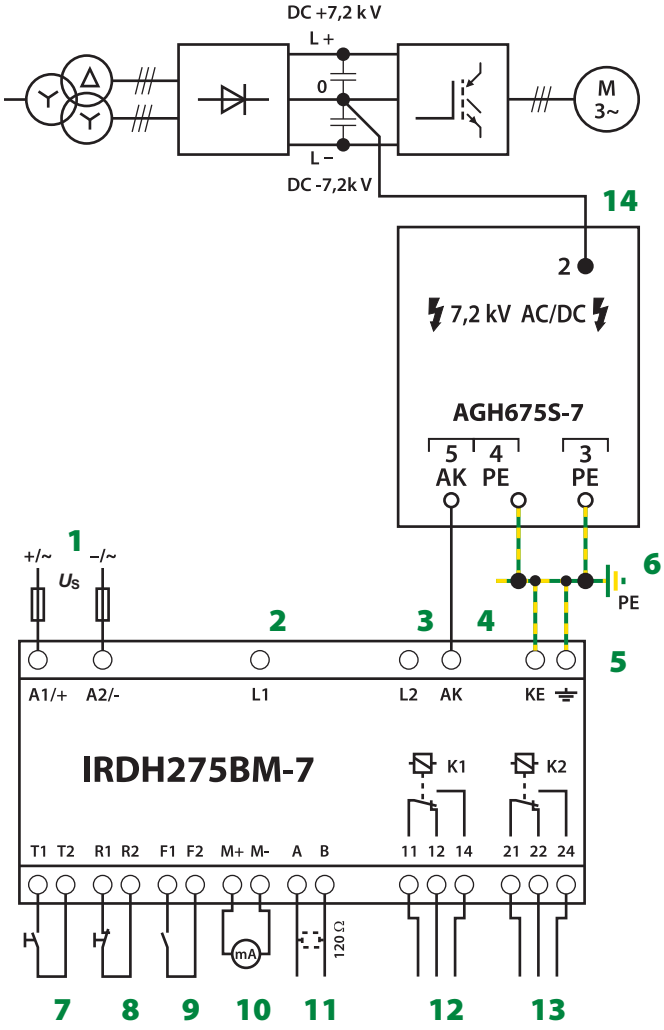
5 - MENU key: to call up the menu system.
Enter key: to confirm parameter change.

6 - Alarm LED 1 lights: Insulation fault,
first warning level reached.

7 - Alarm LED 2 lights: Insulation fault,
second warning level reached.

8 - System fault LED lights: IRDH275 or earth terminal defective

Wiring diagram – system connection / example



1 - Supply voltage U_S (see ordering information) via 6 A fuse

2,3 - Terminals L1, L2 are not wired!

4 - Connection to the coupling device AGH675S-7:
Connect terminal AK with terminal 5 of the coupling device.

5 - Separate connection of E and KE to PE

6 - Separate connection of the terminals 3 and 4 of the AGH675S-7 to PE

7 - External test button (N / O contact)

8 - External reset button (N / C contact or wire jumper). When the terminals are open, the fault message will not be stored.

9 - STANDBY by means of the function input F1, F2:
when the contact is closed, insulation measurement does not take place.

10 - Current output, electrically isolated: 0…20 mA or 4…20 mA

11 - Serial interface RS-485 (termination with a 120 Ω resistor)

12 - Alarm relay 1; available changeover contacts.

13 - Alarm relay 2 (system fault relay); available changeover contacts.

14 - Connection of the coupling device to the converter:
Terminal 2 to the mid-point of the DC intermediate circuit.

Technical data A-ISOMETER® IRDH275BM-7

Insulation coordination acc. to IEC 61800-5-1: 2003

Rated voltage with AGH675S-7	AC 7.2 kV

Voltage ranges

Nominal system voltage U_n mit AGH675S-7	0…7.2 kV
Rated frequency f_n	DC, 0.2…460 Hz
Supply voltage U_S	DC 19.2…72 V
Frequency range of U_S	42…460 Hz
Power consumption	≤ 14 VA

Response values

Response value R_{an1} (Alarm1) / R_{an2} (Alarm2)	100 kΩ…10 MΩ / 100 kΩ…10 MΩ
Relative percentage error	0 %…+ 20 %
Response time t_{an}	≤ 5 min.
Hysteresis	25 %

Measuring circuit

Measuring voltage U_m	≤ 50 V
Measuring current I_m (at R_F = 0 Ω)	≤ 21 µA
Internal DC resistance R_i	≥ 2.4 MΩ
Impedance Z_i at 50 Hz	≥ 2,4 MΩ
Permissible system leakage capacitance C_e	≤ 5 µF
Factory setting	2 µF

Displays

Display, backlit	two-line display
Number of characters	2 x 16
Display range, measuring value	50 kΩ…10 MΩ
Relative percentage error	± 10 %

Outputs / Inputs

Test / reset button	internal / external
Cable length test and reset button	≤ 10 m
Current output for measuring instrument SKMP	scale centre point = 2.8 MΩ
Current output (load)	0 / 4…20 mA (≤ 500 Ω)
Relative percentage error, current output (100 kΩ…10 MΩ)	± 15 %

Interfaces

Interface / protocol IRDH275B	RS-485 / BMS
Connection terminals A / B	
Cable length	≤1200 m
Recommended cable (shielded, shield on one side connected to PE)	JY(ST)Y 2 x 0.6
Terminating resistor	120 Ω (0.5 W)
Device address, BMS bus	1…30 (factory setting = 3)

Switching elements

Switching components	2 changeover contacts: K1 (Alarm 1), K2 (Alarm 2, system fault)
Operating principle K1, K2 (Alarm 1 / Alarm 2)	N / O or N / C operation
Factory setting (Alarm 1 / Alarm 2)	N / O operation
Electrical service life, number of cycles	12000
Contact class	IIB in accordance with DIN IEC 60255-0-20
Rated contact voltage	AC 250 V / DC 300 V
Making capacity	AC / DC 5 A
Breaking capacity	2 A, AC 230 V, cos phi = 0.4 0.2 A, DC 220 V, L / R = 0.04 s
Minimum contact current at DC 24 V	2 mA (50 mW)

General data

Shock resistance IEC 60068-2-27 (during operation)	15 g / 11 ms
Bumping IEC 60068-2-29 (during transport)	40 g / 6 ms
Vibration resistance IEC 60068-2-6 (during operation)	1 g / 10…150 Hz
Vibration resistance IEC 60068-2-6 (during transport)	2 g / 10…150 Hz
Ambient temperature (during operation)	10 °C…+ 55 °C
Ambient temperature (during storage)	40 °C…+ 70 °C
Climatic class acc. to DIN IEC 60721-3-3	3K5
Operating mode	continuous operation
Mounting	display oriented
Connection	screw-type terminals
Technical data IRDH275BM-7 with AGH675S-7	TGH1395 / 01.2006
Connection, rigid / flexible	0.2…4 mm² / 0.2…2.5 mm²
Connection, flexible with ferrule, without / with plastic sleeve	0.25…2.5 mm²
Conductor sizes (AWG)	24…12
Degree of protection, internal components / terminal (DIN EN 60529)	IP30 / IP20
Type of enclosure	X112, free from halogen
DIN rail mounting acc. to	DIN EN 60715 / IEC 60715
Flammability class	UL94 V-0
Product standards	DIN EN 61557-8: 1998-05 EN 61557-8: 1997-03, IEC 61557-8: 1997-02, ASTM F1669M-96
Operating manual	TGH1395
Weight	approx. 510 g

Option "W"

Shock resistance IEC 60068-2-27 (during operation)	30 g / 11 ms
Bumping IEC 60068-2-29 (during transport)	40 g / 6 ms
Vibration resistance IEC 60068-2-6	1.6 mm / 10…25 Hz – 4 g / 25…150 Hz
Ambient temperature (during operation)	- 10 °C…+ 55 °C
Ambient temperature (during storage)	- 40 °C…+ 85 °C
Screw mounting	2 x M4

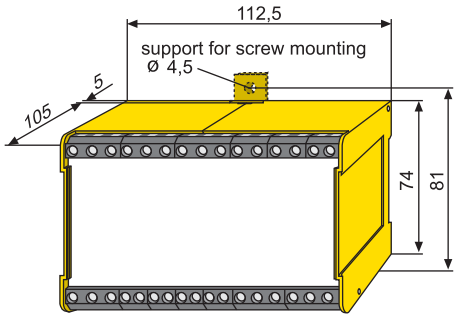
Values marked with * are absolute values

Ordering information				
Type	**Nominal voltage**	**Supply voltage**	**Cable length**	**Art. No.**
IRDH275BM-727	--	DC 19.2…72 V		B 9106 5120
AGH675S-7-2000	AC 0…460 Hz / DC 0…7.2 kV	--	2000 mm	B 913 054
AGH675S-7-500	AC 0…460 Hz / DC 0…7.2 kV	--	500 mm	B 913 056

Accessories – External kΩ measuring instruments (20 mA)		
Type	**SKMP *2**	**Art. No.**
	2.8 MΩ	

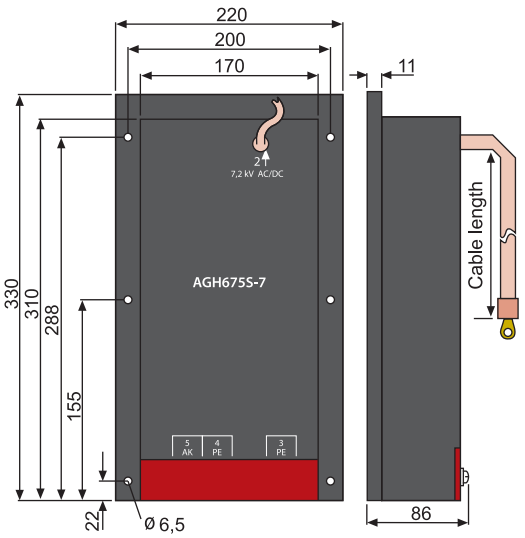
Dimension diagram XM112

Dimensions in mm



Dimension diagram AGH675S-7

Dimensions in mm



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