



ISOMETER® IR1575PG1

Insulation monitoring device for IT AC and DC systems with integrated test current generator for insulation fault location



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1. Important information

1.1 How to use this manual



This manual is intended for electrically skilled persons working in electrical engineering and electronics.

Always keep this manual within easy reach for future reference.

To make it easier for you to understand and revisit certain sections in this manual, we have used symbols to identify important instructions and information.

The meaning of these symbols is explained below:



*This signal word indicates that there is a **high risk** of danger that will result in **death** or **serious injury** if not avoided.*



*This signal word indicates a **medium risk of danger** that can lead to **death** or **serious injury** if not avoided.*



*This signal word indicates a **low level risk** that can result in **minor** or **moderate injury or damage to property** if not avoided.*



*This symbol denotes information intended to assist the user in making **optimum use** of the product.*

1.2 Technical support: Service and support

For commissioning and troubleshooting Bender offers you:

1.2.1 First level support

Technical support by phone or e-mail for all Bender products

- Questions concerning specific customer applications
- Commissioning
- Troubleshooting

Telephone: +49 6401 807-760*
Fax: +49 6401 807-259
In Germany only: 0700BenderHelp (Telefon und Fax)
E-Mail: support@bender.de

1.2.2 Repair service

Repair, calibration, update and replacement service for Bender products

- Repairing, calibrating, testing and analysing Bender products
- Hardware and software update for Bender devices
- Delivery of replacement devices in the event of faulty or incorrectly delivered Bender devices
- Extended warranty for Bender devices with in-house repair service or replacement device at no extra cost

Telephone: +49 6401 807-780** (technical issues)/
+49 6401 807-784**, -785** (sales)
Fax: +49 6401 807-789
E-Mail: repair@bender.de

Please send devices for the **repair service** to the following address:

Bender GmbH, Repair Service,
Londorfer Str. 65,
35305 Grünberg

1.2.3 Field service

On-site service for all Bender products

- Commissioning, parameter setting, maintenance, troubleshooting for products
- Analysis of the electrical installation in the building (power quality test, EMC test, thermography)
- Training courses for customers

Telephone: +49 6401 807-752**, -762 **(technisch)/
+49 6401 807-753** (kaufmännisch)
Fax: +49 6401 807-759
E-Mail: fieldservice@bender.de
Internet: www.bender.de

*Available from 7.00 a.m. to 8.00 p.m. 365 days a year (CET/UTC+1)

**Mo-Thu 7.00 a.m. - 4.00 p.m., Fri 7.00 a.m. - 1.00 p.m.

1.3 Training courses

Bender is happy to provide training regarding the use of test equipment.

The dates of training courses and workshops can be found on the Internet at www.bender.de -> Know-how -> Seminars.

1.4 Delivery conditions

Bender sale and delivery conditions apply. For software products the "Softwareklausel zur Überlassung von Standard-Software als Teil von Lieferungen, Ergänzung und Änderung der Allgemeinen Lieferbedingungen für Erzeugnisse und Leistungen der Elektroindustrie" (software clause in respect of the licensing of standard software as part of deliveries, modifications and changes to general delivery conditions for products and services in the electrical industry) set out by the ZVEI (Zentralverband Elektrotechnik- und Elektronikindustrie e. V.) (German Electrical and Electronic Manufacturer's Association) also applies.

Sale and delivery conditions can be obtained from Bender in printed or electronic format.

1.5 Inspection, transport and storage

Inspect the dispatch and equipment packaging for damage, and compare the contents of the package with the delivery documents. In the event of damage in transit, please contact Bender immediately.

The devices must only be stored in areas where they are protected from dust, damp, and spray and dripping water, and in which the specified storage temperatures can be ensured.

1.6 Warranty and liability

Warranty and liability claims in the event of injury to persons or damage to property are excluded if they can be attributed to one or more of the following causes:

- Improper use of the device.
- Incorrect mounting, commissioning, operation and maintenance of the device.
- Failure to observe the instructions in this operating manual regarding transport, commissioning, operation and maintenance of the device.
- Unauthorised changes to the device made by parties other than the manufacturer.
- Non-observance of technical data.
- Repairs carried out incorrectly and the use of replacement parts or accessories not approved by the manufacturer.
- Catastrophes caused by external influences and force majeure.
- Mounting and installation with device combinations not recommended by the manufacturer.

This operating manual, especially the safety instructions, must be observed by all personnel working on the device. Furthermore, the rules and regulations that apply for accident prevention at the place of use must be observed.

1.7 Disposal

Abide by the national regulations and laws governing the disposal of this device. Ask your supplier if you are not sure how to dispose of the old equipment.

The directive on waste electrical and electronic equipment (WEEE directive) and the directive on the restriction of certain hazardous substances in electrical and electronic equipment (RoHS directive) apply in the European Community. In Germany, these policies are implemented through the "Electrical and Electronic Equipment Act" (ElektroG). According to this, the following applies:

- Electrical and electronic equipment are not part of household waste.
- Batteries and accumulators are not part of household waste and must be disposed of in accordance with the regulations.
- Old electrical and electronic equipment from users other than private households
- which was introduced to the market after 13 August 2005 must be taken back by the manufacturer and disposed of properly.

For more information on the disposal of Bender devices, refer to our homepage at www.bender.de -> Service & support.

2. Safety instructions

2.1 General safety instructions

Part of the device documentation in addition to this manual is the enclosed "Safety instructions for Bender products".

2.2 Work activities on electrical installations



Only **qualified personnel** are permitted to carry out the work necessary to install, commission and run a device or system.



DANGER

Risk of fatal injury due to electric shock!

Touching live parts of the system carries the risk of

- An electric shock,
- Damage to the electrical installation,
- Destruction of the device.

Before installing and connecting the device, make sure that the installation has been *de-energised*. Observe the rules for working on electrical installations.

Observe the details of the nominal mains voltage and supply voltage according to the technical data!

If the device is used outside the Federal Republic of Germany, the applicable local standards and regulations must be complied with. The European standard EN 50110 can be used as a guide.

2.3 Intended use

The ISOMETER® is intended for:

- monitoring the insulation resistance of IT systems
- localisation of insulation faults using EDS460-D-... insulation fault evaluators

Any other use, or any use which goes beyond the foregoing, is deemed to be used other than for the intended purpose.

Use for the intended purpose also includes

- compliance with all information in the operating instructions and
- compliance with test intervals.

As a basic principle, our "General conditions of Sale and Delivery" shall apply. At the latest, these shall be available to the operator when the contract is concluded.


2.4 Directions for installation



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

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



The terminals  and KE shall be connected by a separate wire to the protective conductor (PE). If the terminals L1, L2, L3 of the device are connected to a system under operation, the terminals and KE must not be disconnected from the protective conductor (PE).

In order to check the proper connection of the device, it is recommended to carry out a functional test using an insulation fault against earth, e.g. via a suitable resistance, before starting the ISOMETER®.

The devices will be delivered with the following factory settings:

ISO SETUP:	Alarm 1/Alarm 2 = 40 k Ω /10 k Ω
ISO SETUP:	Operating principle K1/K2 = N.O. test (N/O operation with relay test)
ISO SETUP:	Memory = off
EDS SETUP:	EDS = auto
EDS SETUP:	MaxPuls = 25 mA

Please check if the basic setting of the ISOMETER® fulfils the requirements of the system to be monitored.



*When an AC system includes galvanically connected DC circuits, the following shall be considered:
Insulation faults in DC circuits can only be monitored correctly when the rectifiers carry a continuous load of 5...10 mA.*

3. Function

3.1 IR1575PG1 characteristics

- ISOMETER® for IT AC systems with galvanically connected rectifiers and for IT DC systems U_n up to 480 V (IT = unearthed electrical systems)
- Automatic adaptation to the existing system leakage capacitance C_e up to 60 mF
- **AMPPlus** measuring principle (European Patent: EP 0 654 673 B1)
- Generation of the test current necessary for selective insulation fault location
- Two separately adjustable ranges of response value of 2 k Ω ... 1 M Ω each (Alarm1, Alarm2)
- Two-line LC display
- Connection monitoring of the measuring leads to the IT system and to earth
- Automatic device self test
- Option „W“:
This option provides: improved shock and vibration resistance for use in ships, on rolling stock and in seismic environment.

3.2 Product description

The ISOMETER® Type IR1575PG1 monitors the insulation resistance of 3(N)AC/AC and DC IT systems. AC systems monitored by the IR1575PG1 may include extensive DC supplied loads (such as converters). The device automatically adapts itself to the existing system leakage capacitance.

3.3 Function

The ISOMETER® IR1575PG1 is connected between the unearthed system and the protective conductor (PE).

The response values and other function parameters are set via the function keys. The parameters are indicated on the LC display and are stored in a non-volatile memory (EEPROM) after the setting is completed.

The IR1575PG1 superimposes a microprocessor-controlled pulsating measuring voltage on the system being monitored using the AMP measuring principle. The "adaptive measuring pulse" is a patent developed and patented by Bender (European Patent: EP 0 654 673 B1). The measuring pulse consists of positive and negative pulses of the same amplitude. The period depends on the respective system leakage capacitances and the insulation resistances of the system being monitored.

An insulation fault between IT system and earth closes the measuring circuit. After detecting the measuring values, the evaluation circuit calculates the insulation resistance which is indicated on the LC display after the measuring time.

The measuring time is determined by the system leakage capacitances, the insulation resistance, and the system-related interferences. System leakage capacitances do not influence the measuring accuracy.

If the reading is below the selected response values Alarm1/Alarm2, the associated alarm relays respond and the alarm LEDs Alarm1/2 light up and the measuring value is indicated on the display (in the event of DC insulation faults, the faulty supply line is indicated). If the terminals R1/R2 are bridged (external RESET button [NC contact] or wire bridge), the fault message will be stored. Pressing the RESET button or opening the connection R1/R2, resets the fault message, provided that the currently displayed insulation resistance is at least 25% above the actual response value. The fault memory behaviour can also be set in the "ISO SETUP" menu, under "Memory: on/off". In this case the terminals R1/R2 remain unused.

By pressing the TEST button, the function of the ISOMETER® IR1575PG1 can be tested. In this way, all essential measuring functions as well as connections to the system and to earth are checked. This self test can automatically be carried out every 24 hours. Normally, the self test is carried out after switching the supply voltage on.

Self test

In order to ensure high measuring reliability, the ISOMETER IR1575PG1 provides comprehensive self test functions. After switching the supply voltage on, all internal measuring functions, the components of the process control such as data and parameter storage as well as the connections L1 and L3 to the system and to earth are checked using the self test functions (L2 will not be monitored). The progress of the self test is shown on the display by a bar graph. Depending on the system conditions, the self test is running for approximately 15... 20 s, then the message "Test ok" appears on the LC display for approximately 2 s. Then the device returns to normal measuring mode and the currently measured value is displayed after the expiry of the measuring time.



When a device error or connection fault is detected, the message "Error" will appear on the display, the system fault LED (Alarm LED2) lights, the relay K2 (21-22-24) switches and the respective alarm message (see table) is indicated. When such a system fault occurs, a self test will be started after approximately one minute. When no more malfunction is detected, the alarm message is deleted automatically, and the system fault LED extinguishes.

During operation, the self test function can be started by pressing the TEST button (internal or external). The alarm relays Alarm1/2 only switch after starting the self test function by pressing the TEST button.

Insulation fault location

Another function of the IR1575PG1 is the generation of the test current for selective insulation fault location. When the value of the insulation resistance falls below the set response values Alarm1 and Alarm2, the IR1575PG1 generates the respective test current. In combination with an EDS460-D-... insulation fault evaluator and the associated measuring current transformers connected to it, the insulation fault can be selectively detected. If no test current > 1.5 mA can be generated, the alarm message "No EDS funct." will be indicated. This may be caused by a device defect, loss of voltage or over-temperature in the device. Another cause may be a response value selected too high resulting in an increased insulation resistance too high to generate a sufficient test current.

Alarm messages and corrective actions

Alarm message	Description	Corrective actions
System connection?	No low-resistance connection of the terminals L1, L2, L3 to the system	<ol style="list-style-type: none"> 1. Check the wiring of the terminals L1, L3 to the system 2. Press the TEST button 3. Switch the supply voltage on and off 4. Check the fuse
Connection PE?	No low-resistance connection between terminal  and KE to earth (PE)	<ol style="list-style-type: none"> 1. Check wiring of terminal  and KE to earth (PE) 2. Press the TEST button 3. Switch the supply voltage on and off
Device error x	Internal device error	<ol style="list-style-type: none"> 1. Press the TEST button 2. Switch the supply voltage on and off 3. Contact Bender
Insulation fault	The insulation resistance value has fallen below the set response value	<ol style="list-style-type: none"> 1. Reduce the response value 2. Locate and clear insulation fault (EDS460-D-...)
No EDS Funct.	A test current cannot be generated	<ol style="list-style-type: none"> 1. Check response value 2. Check supply voltage

Reset sequence control



If the on/off switching of the supply voltage is not possible for technical reasons, a RESET of the sequence control is to be carried out by pressing the buttons "RESET", "MENU" and "TEST" in succession.

Proceed as follows:

1. Press and hold down the RESET button
2. Press and hold down the MENU button
3. Press the TEST button for at least 2 s

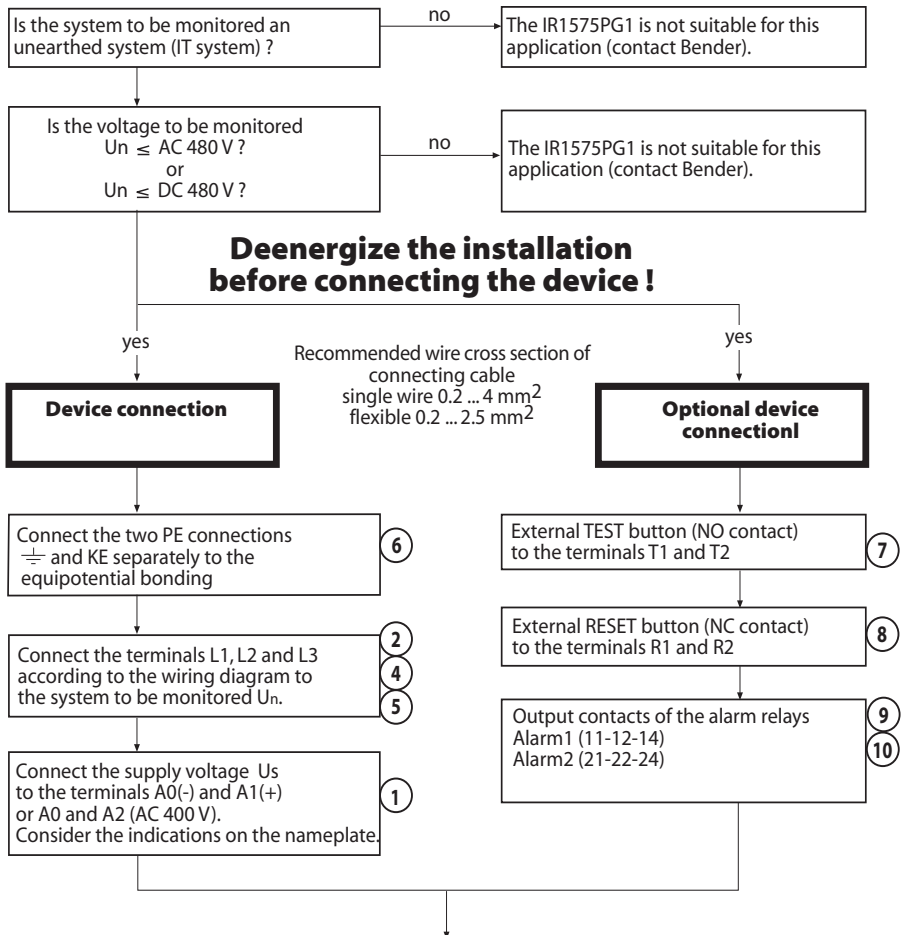
After executing the steps described above, the sequence control including the self test are restarted again.

4. Commissioning flow chart

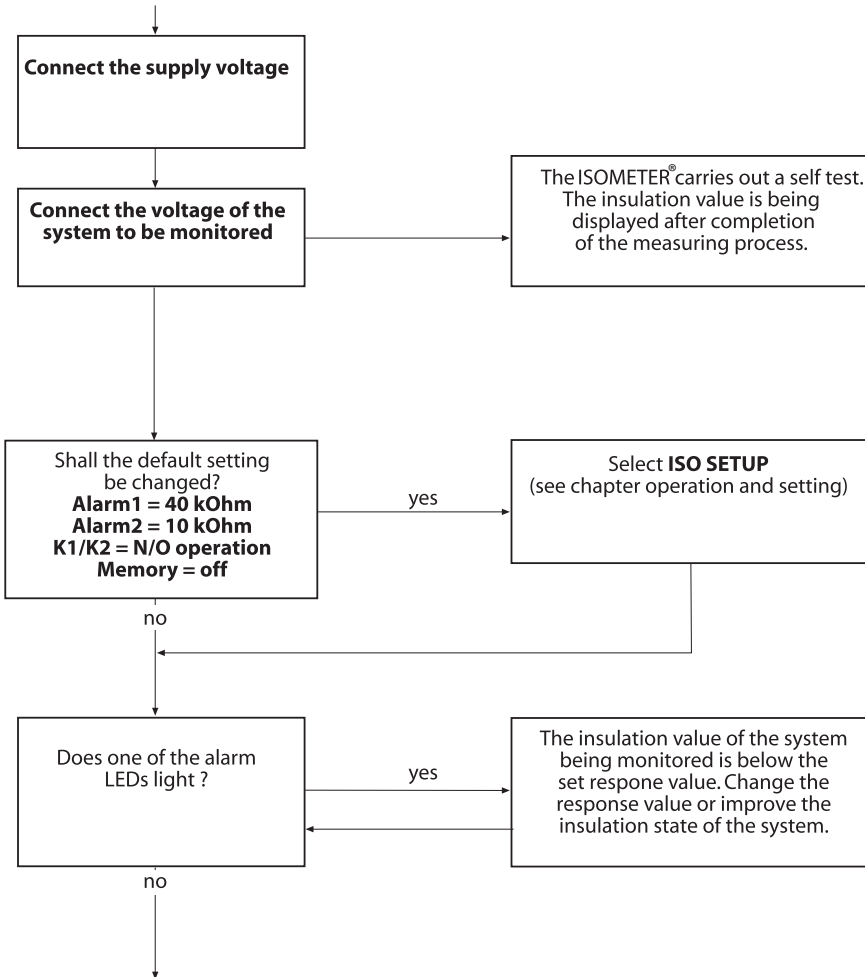
4.1 Commissioning of the ISOMETER® functionality

The encircled figures in the three pages of the flow charts correspond to the figures in the legend to wiring diagram (see [page 22](#)).

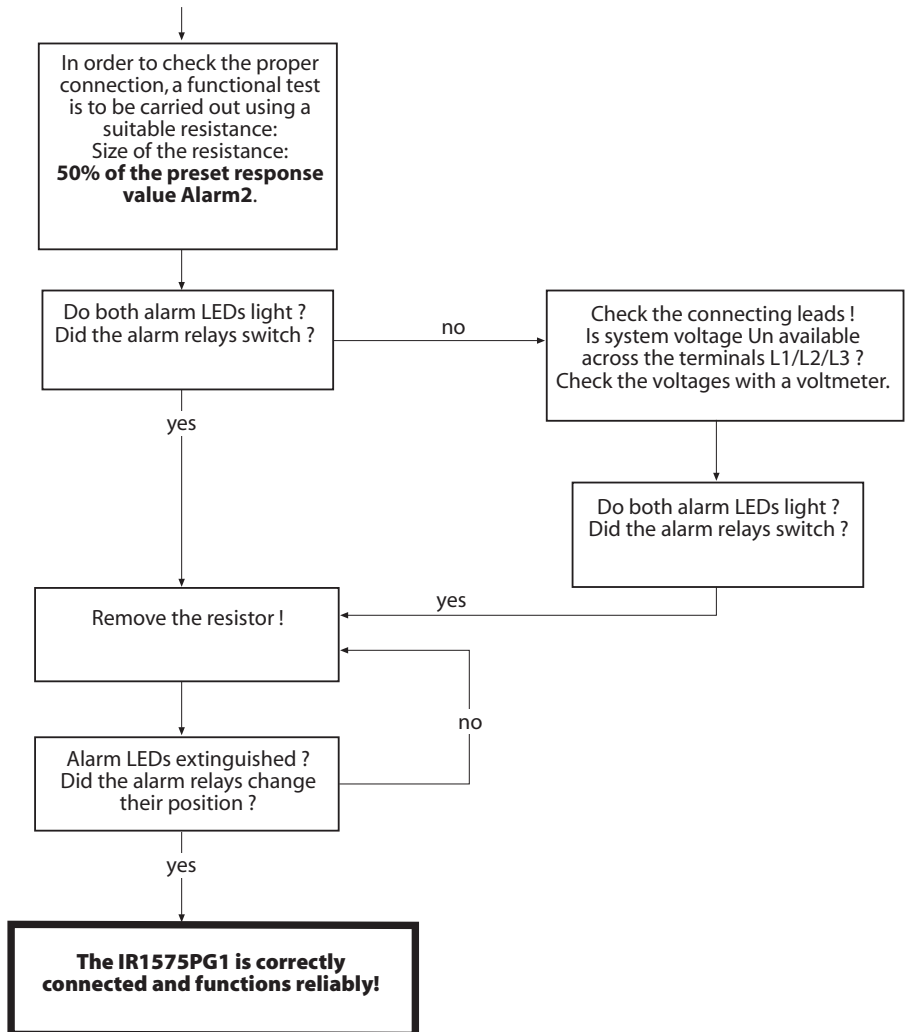
Commissioning of the ISOMETER® (1)



Commissioning of the ISOMETER® (2)

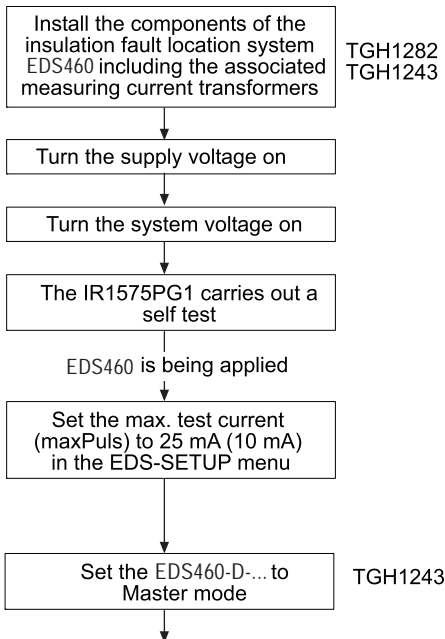


Commissioning of the ISOMETER® (3)

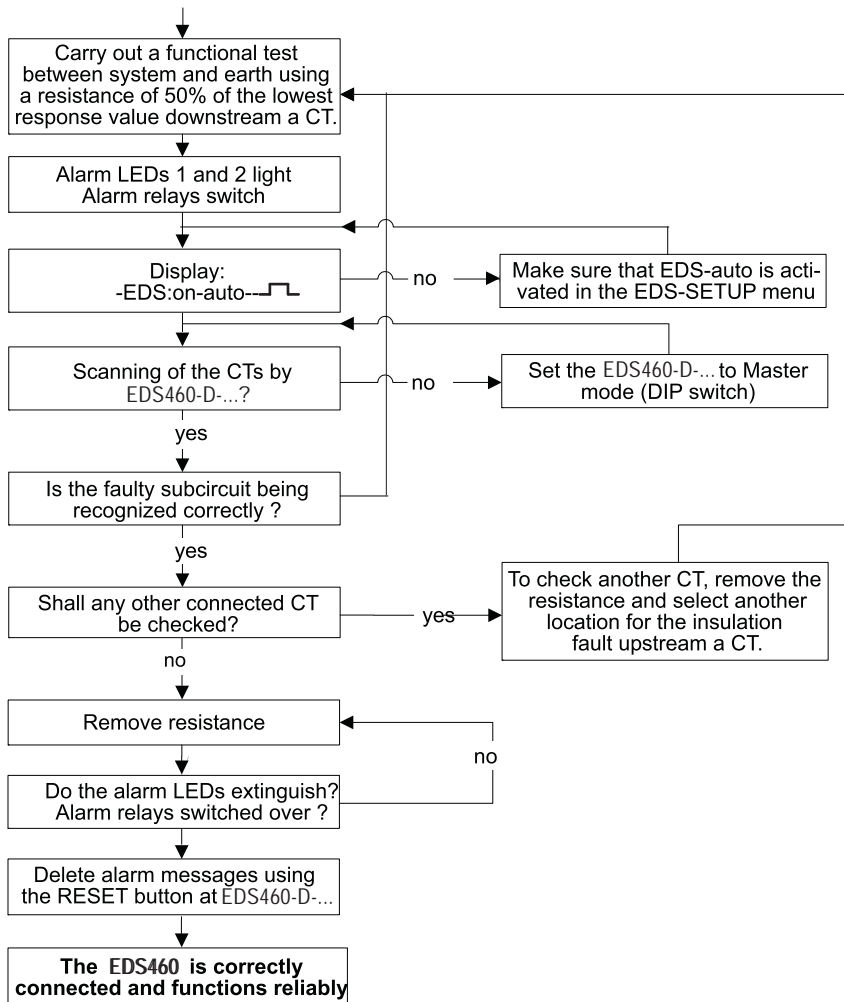


4.2 Commissioning of the insulation fault location function (EDS) (1)

Disconnect the electrical installation before connecting the device !



4.3 Commissioning of the insulation fault location function (EDS) (2)



5. Connection

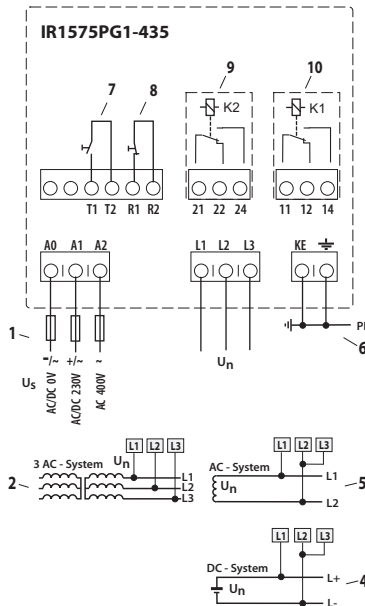
5.1 Wiring

IR1575PG1 has plug-in terminals.

Connect the terminals A0/A1 respectively A0/A2 to the supply voltage U_s in accordance with IEC 60364-4-43. The connections to the supply voltage shall be provided with protective devices to afford protection in the event of a short circuit (a 6 A fuse is recommended).

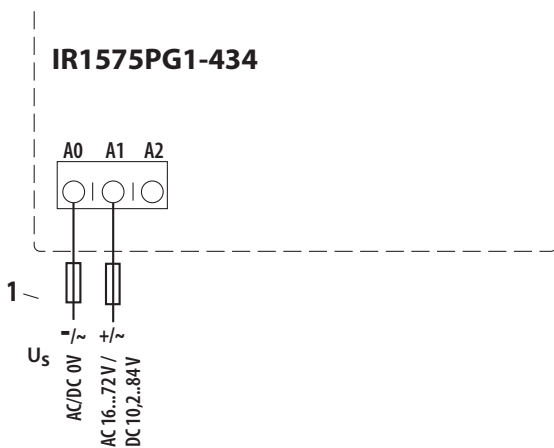
Devices for protection against short circuit in conformity with IEC 60364-4-473 for the IT system coupling L1/L2/L3 can be omitted if the wiring is carried out in such a manner as to reduce the risk of a short-circuit to a minimum (a short-circuit-proof and insulation-fault-proof wiring is recommended).

Only one ISOMETER® may be connected to an external TEST or RESET button. A galvanic parallel connection of several TEST and RESET inputs for collective testing of ISOMETER®s is not permitted.



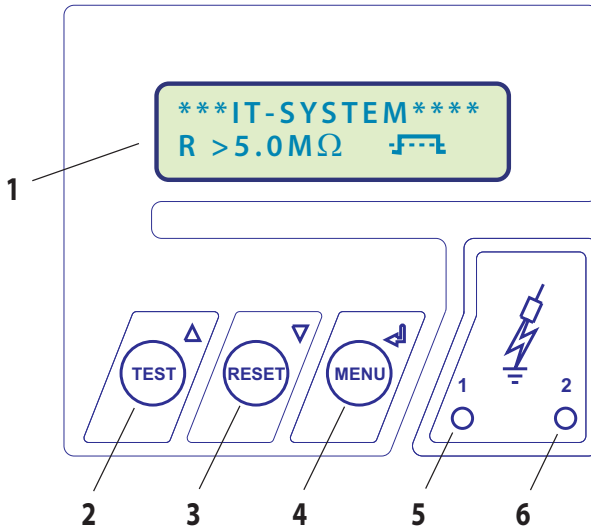
Legend to wiring diagram:

- 1 Supply voltage U_s (see name plate, Technical Data on [page 38](#) or the ordering details) via 6 A fuse:
- 2 Connection of the 3AC system to be monitored:
connect the terminals L1, L2, L3 to the conductors L1, L2, L3
- 4 Connection of the DC system to be monitored:
connect L1 to conductor L+, terminal L2, L3 to conductor L-
- 5 Connection of the AC system to be monitored:
connect terminal L1 to conductor L1, terminals L2, L3 to conductor L2
- 6 Separate connection of ---|---|--- and KE to PE
- 7 External TEST button (N/O contact)
- 8 External RESET button (NC contact or wire jumper),
when the terminals are open, the alarm message will not be stored,
Factory setting: Memory off !
- 9 Alarm relay: Alarm2
- 10 Alarm relay: Alarm1



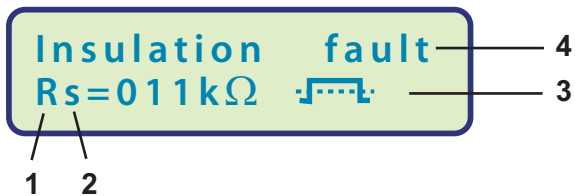
6. Operation and setting

6.1 Operating elements and displays IR1575PG1



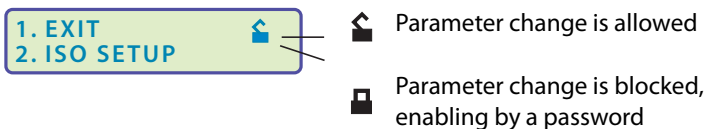
- 1 Two-line display for standard and menu mode
- 2 TEST button: to activate the self test/
Up key: parameter change, moving up in the menu
- 3 RESET button: to delete insulation fault alarms/
Down key: parameter change, moving down in the menu
- 4 MENU key: activating the menu system/
Enter key: confirmation parameter change
- 5 Alarm LED 1 lights: insulation fault, first warning level reached
- 6 Alarm LED 2 lights: insulation fault, second warning level reached, or system fault message

6.1.1 Display in the standard mode



- 1 Indication of the insulation resistance in kΩ
- 2 Additional information about the insulation resistance:
 - „+“ = insulation fault at L+
 - „-“ = insulation fault at L-
 - „S“ = new measurement is running
- 3 = Polarity of the measuring pulse (AMP)
- 4 Messages:
 - Insulation fault
 - Connection system?
 - Connection PE??
 - Device error x
 - No EDS function

6.1.2 Display in the Menu mode



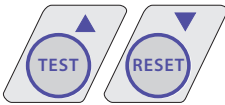
6.1.3 Display in the EDS mode



- 1 Indication of an insulation fault
- 2 EDS operating modes:
 - EDS:on-----
 - EDS:on-auto--
 - EDS:on-1cycle--
 - ┌─┐ = Polarity of the test current

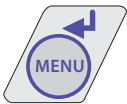
6.1.4 Function keys

Two functions are assigned to each function key. In addition to the encircled basic functions, all keys allow navigation within the menu.



Pressing the TEST key starts the ISOMETER® self test.

Pressing the RESET button resets insulation fault alarm messages stored in the ISOMETER®. This function is only available after activating the fault memory in the ISO-Setup menu or after bridging R1/R2. Furthermore, the ISOMETER® can only be reset when the currently measured insulation value is 25% above the set response value.



Pressing the MENU key opens the menu system.

The UP/DOWN keys and the ENTER key are used for menu system control:



Up key:
Moving up in the menu, increasing parameters.



Down key:
Moving down in the menu, reducing a parameter.



ENTER key
Selecting a menu item or sub menu item, confirming or storing a parameter change and going back to the associated sub menu item or going to the next input area.

If the menu is not closed, the device changes to the display mode after approximately 5 minutes.

For the sake of clarity, only the following symbols are used to represent the functions ENTER and UP/DOWN:



6.2 Menu structure

Switchover to the menu mode

After pressing the MENU key, you can change from the standard mode to the menu mode. From the menu mode you can link to the different sub menus.

Navigation within the menu

Select the desired menu item using the UP/DOWN keys. The selected menu item is indicated by a flashing cursor. Press the ENTER key to open the associated sub menu.

Use the UP/DOWN keys again to select the desired parameters. Move the cursor to the edit field by pressing the ENTER key.

If you have reached the end of the main menu list, it will be indicated by the "Arrow UP" symbol.

Changing the parameters

When password protection is activated, indicated by the symbol "padlock closed", the first thing to enter is the correct password before the parameters can be changed using the UP/DOWN keys. Entering the correct password once allows all parameters to be changed as long as you do not leave the menu.

Changing the parameter usually has an immediate effect on the measuring and alarm functions. The changed parameter is stored in a volatile memory by pressing the ENTER key after returning to the sub menu (flashing cursor in column 1).

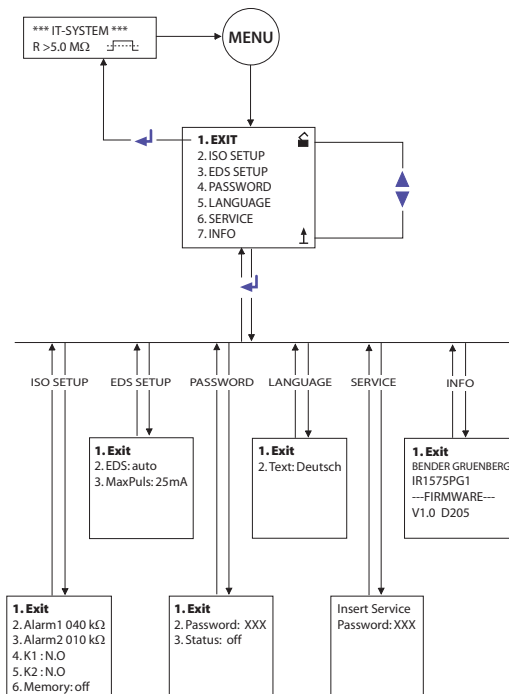
During menu operations, all measuring and alarm functions carry on working as usual in the background.

Changing from the menu mode to the standard mode

Select the menu item "EXIT" and press the ENTER key to leave the respective menu and to move to the next higher level. This is either the main menu or the standard mode.

If you stay in the main menu or a sub menu longer than five minutes, the device will automatically switchover from the menu to the standard mode.

6.2.1 Diagram menu structure



6.3 ISO SETUP menu: ISOMETER® default settings

The alarm functions Alarm1 and Alarm2 (prewarning and main alarm), the operating principle of the alarm relays K1 and K2 (N.O = N/O operation, N.C = N/C operation), and fault memory behaviour can be set in this menu.

6.3.1 Response values Alarm1 and Alarm2

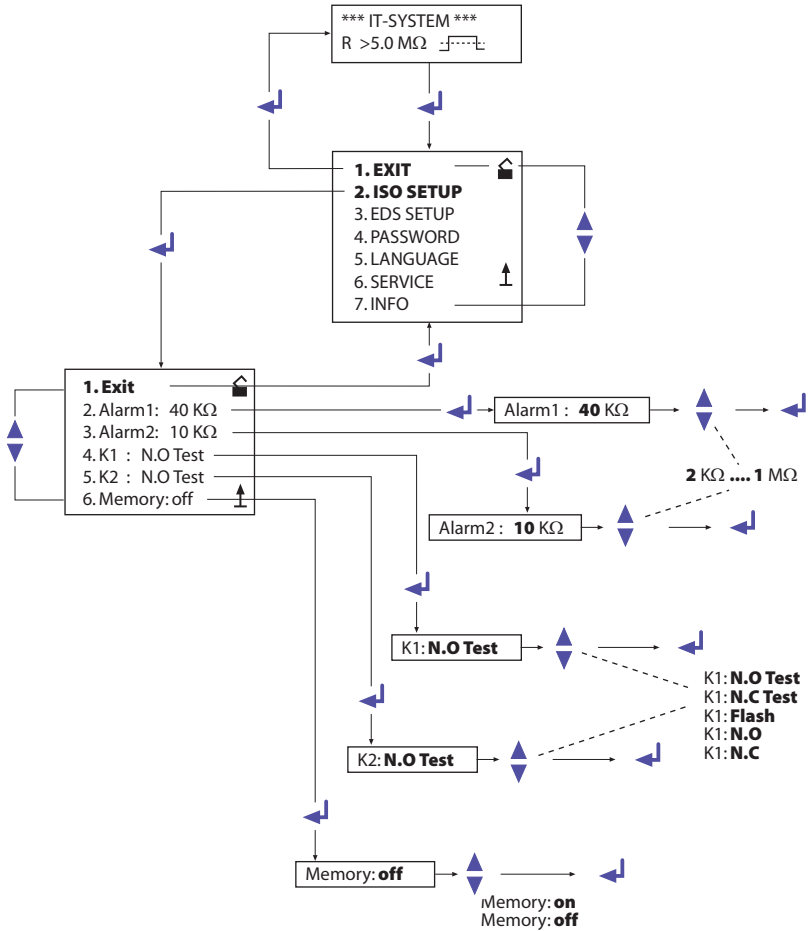
The alarm values Alarm1 und Alarm2 are set using the UP/DOWN keys and saved pressing the ENTER key.

6.3.2 Operating principle of the alarm relays

By default K1/K2 is set to N.O Test, that means N/O operation. The supplement "Test" points out that the setting of the alarm relays changes during a manual self test. If, for any reason, the alarm relays are to be prevented from switching during a manual self test, select N.C or N.O.

K1: N.C Test	= N/C operation contacts 11-12-14, including relay test (the alarm relay is energized during normal operation)
K1: N.O Test	= N/O operation contacts 11-12-14, including relay test (the alarm relay is deenergized during normal operation)
K1: N.C	= N/C operation contacts 11-12-14, without relay test (the alarm relay is energized during normal operation)
K1: N.O	= N/O operation contacts 11-12-14, without relay test (the alarm relay is deenergized during normal operation)
K1: Flash	= Flashing function contacts 11-12-14 (The alarm relay and the LED flash (0.5 Hz) when an alarm message occurs)
K2: N.C Test	= N/C operation contacts 21-22-24, including relay test (the alarm relay is energized during normal operation)
K2: N.O Test	= N/O operation contacts 21-22-24, including relay test (the alarm relay is deenergized during normal operation)
K2 : N.C	= N/C operation contacts 21-22-24, without relay test (the alarm relay is energized during normal operation)
K2 : N.O	= N/O operation contacts 21-22-24, without relay test (the alarm relay is deenergized during normal operation)
K2 : Flash	= Flashing function contacts 21-22-24 (the alarm relay and the LED flash (0.5 Hz) when an alarm message occurs)

6.3.3 Diagram ISO SETUP



During the 24 h self test, the relays are not switched over.



On the occurrence of a system fault, the Alarm LED 2 lights and relay K2 will be automatically activated as a system fault relay.

6.3.4 Memory setting (on/off)

Memory: on = Fault memory is activated.

Reset the device using the RESET button after clearing the fault.

Memory: off = Fault memory deactivated (factory setting)

6.4 EDS SETUP menu: default settings for fault location

All appropriate settings for insulation fault location systems (EDS) can be set in this menu.

6.4.1 EDS on / auto / 1cycle / off

The following start and stop conditions for the EDS system can be selected here:

- on

The EDS system is activated and continuously operating, regardless of the insulation value and the alarm messages of the ISOMETER®. This setting is particularly suitable for fault location using a portable insulation fault location system such as EDS3060, for example.

- auto

The EDS system will automatically be activated as soon as the level of Alarm 1 and Alarm 2 goes above or below the normal level and remains active as long as the test current is above 5 mA. To measure the insulation fault value using the ISOMETER®, insulation fault location is cyclically interrupted for approximately 5 minutes (factory setting).

- 1cycle

The EDS system will automatically be activated when the level of the response value falls below the response values Alarm 1 and Alarm 2. It remains active until every EDS460-D-... has measured all channels once and when the test current is above 5 mA during the measurement.

- off

The EDS system is constantly switched off.

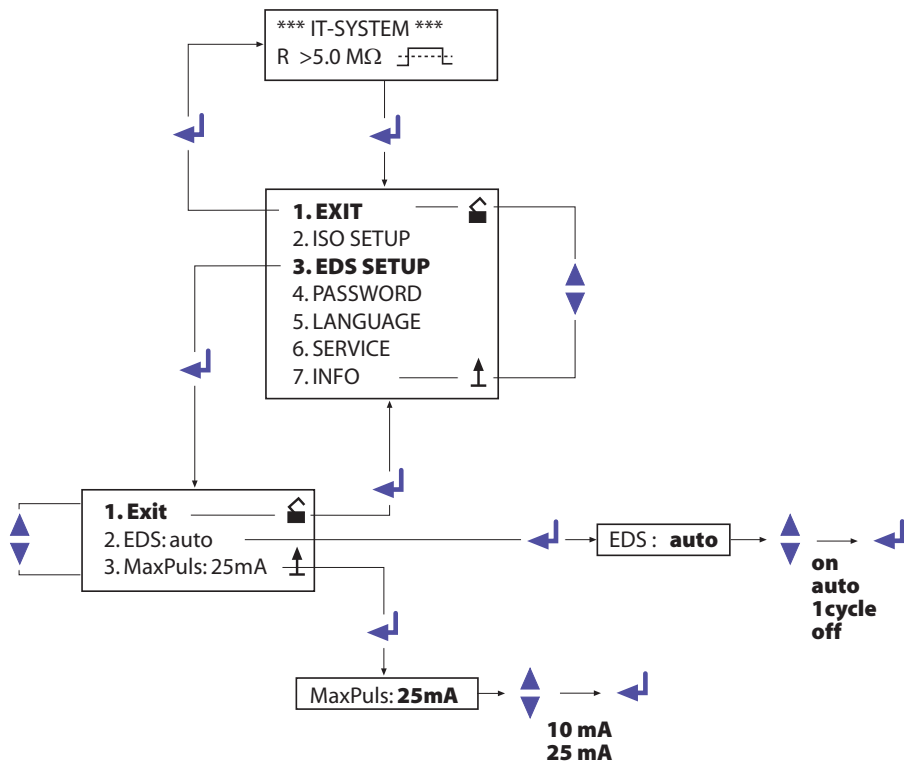
6.4.2 maxPuls: 10/25 mA

The maximum test current can be set here.

- 10 mA and 25 mA for EDS460 systems, preferably 25 mA.

10 mA are recommended to be set when sensitive electrical equipment such as control relays are supplied by the system (factory setting 25mA).

6.4.3 Diagram EDS-SETUP



6.5 PASSWORD menu

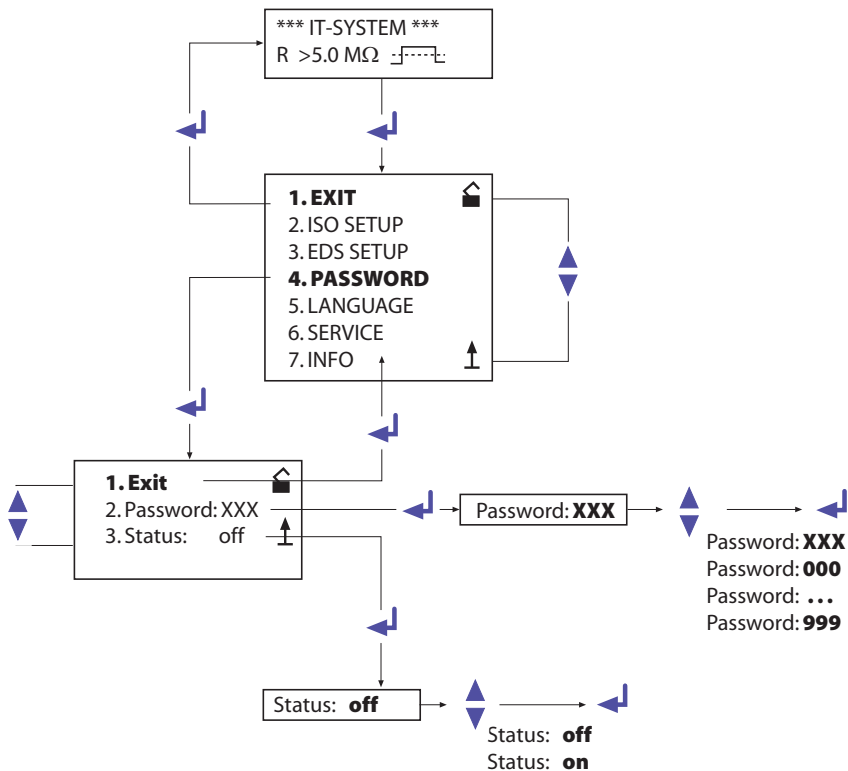
6.5.1 Password activation and setting

A "password" query can be activated in this menu to protect the ISOMETER® against unauthorized settings and modifications.

Use the arrow keys to select the desired password (menu item 2. Password: xxx) and confirm with ENTER.

For password activation, select menu item "3. Status: on" using the ENTER key. By default the password is deactivated „3. Status: off“.

6.5.2 Diagram PASSWORD



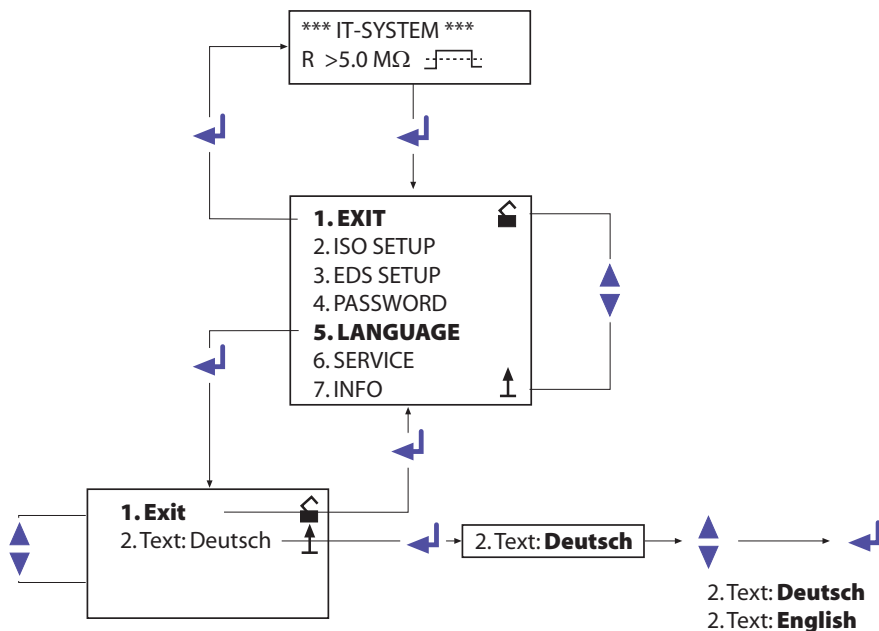
6.6 LANGUAGE menu

6.6.1 Language setting

This menu item offers a selection of two languages for the indication of fault messages. Choose between English and German language.

The device menu is indicated in English language and cannot be changed by the language setting.

6.6.2 Diagram Language



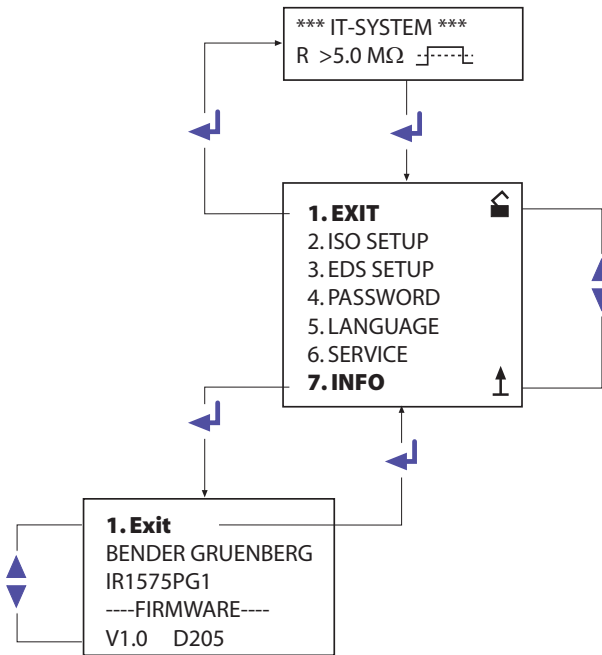
6.7 SERVICE menu

This menu item is intended for Bender service staff and is secured by a password against erroneous settings. It is intended to provide fast fault clearance by qualified experts.

6.8 INFO menu

This menu allows to query the type of the device addressed. In addition, the display indicates the software version applied.

6.8.1 Diagram INFO

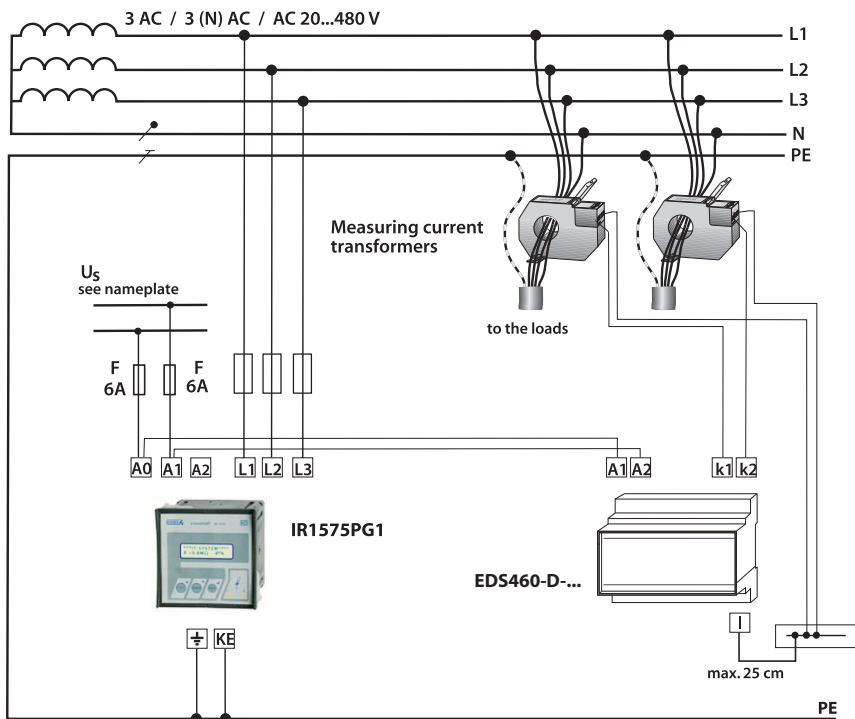


7. Operation with EDS device EDS460-D-...

The illustration below shows an IR1575PG1 in combination with EDS460-D-... without bus capability and the associated measuring current transformers for insulation fault location. In many cases, the device can be operated using the default settings. When an EDS460-D-... is used, it must operate in the Trigger-Auto mode.

For details about the test current setting „MaxPuls“ in the EDS SETUP menu, refer to "chapter 5.4.2 maxPuls: 10 / 25 mA".

For further use of the IR1575PG1 in combination with EDS systems, the following technical manuals are available: EDS460-490_D00085... for EDS460, ProjektierungEDS_PROSP... for configuration of EDS460 systems.



8. Technical data IR1575PG1

8.1 Data in tabular form

Insulation coordination acc. to IEC 60664-1

Rated voltage	AC 500 V
Rated impulse voltage/pollution degree	4 kV/3

Voltage ranges

IR1575PG1...:

Nominal system voltage U_n	AC/3 AC 20... 480 V
Nominal frequency f_n	30... 460 Hz
Nominal system voltage U_n	DC 20... 480 V

IR1575PG1-435:

Supply voltage U_s at A0/A1 (see name plate)	AC 88... 264 V
Frequency range of U_s	42... 460 Hz
Supply voltage U_s at A0/A2 (see name plate)	AC 340... 460 V
Frequency range of U_s	47... 63 Hz
Supply voltage U_s at A0/A1 (see name plate)	DC 77... 286 V

IR1575PG1-434:

Supply voltage U_s at A0/A1 (see name plate)	AC 16... 72 V
Frequency range of U_s	42... 460 Hz
Supply voltage U_s at A0/A1 (see name plate)	DC 10,2... 84 V

IR1575PG1...:

Power consumption	≤ 5 VA
-------------------------	-------------

Response values

Response value R_{an1} (Alarm 1)	2 k Ω ... 1 M Ω
Response value R_{an2} (Alarm 2)	2 k Ω ... 1 M Ω
Specified response value (2 k Ω ... 10 k Ω)	+2 k Ω
Specified response value (10 k Ω ... 1 M Ω)	0%... +20%
Response time t_{an} at $R_F = 0,5 \times R_{an}$ and $C_e = 1 \mu F$	≤ 5 s
Measuring time	see characteristic curves
Hysteresis (2 k Ω ... 10 k Ω)	+2 k Ω
Hysteresis (10 k Ω ... 1 M Ω)	25%

Measuring circuit for insulation measurement

Measuring voltage U_m	≤ 20 V
Measuring current I_m (bei $R_F = 0 \text{ W}$)	≤ 170 μA
Internal DC resistance R_i	≥ 119 k Ω
Internal impedance Z_i , at 50 Hz.....	≥ 119 k Ω
Permissible extraneous DC voltage U_{fg}	≤ DC 680 V
Permissible system leakage capacitance C_e	≤ 60 μF

Measuring circuit for insulation fault location (EDS)

Test current I_p DC	10/25 mA
Test pulse/break	2 s/4 s

Displays

Display, illuminated	two-line display
Number of characters	2 x 16
Display range measuring value	1 k Ω . . . 5 M Ω
Absolute error (1 k Ω . . . 10 k Ω).....	±1 k Ω
Relative percentage error (10 k Ω . . . 5 M Ω)	±10 %

Outputs/inputs

TEST/ RESET button	internal/external
--------------------------	-------------------

Switching elements

Switching elements	2 changeover contacts
Operating principle	N/O or N/C operation
Factory setting (Alarm1/Alarm2)	N/O operation
Admissible number of operations/h	12 000 cycles
Contact class.....	IIB (DIN EN 60255-23)
Rated contact voltage	AC 250 V/DC 300 V
Making capacity	UC 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

EMC immunity	acc. to EN 61326
EMC emission.....	acc. to EN 61326
Shock resistance acc. to IEC 60068-2-27 (during operation)	15 g/11 ms
Bumping acc. to IEC 60068-2-29 (during transport)	40 g/6 ms
Vibration resistance acc. to IEC 60068-2-6 (during operation)	1 g/10 . . . 150 Hz
Vibration resistance acc. to IEC 60068-2-6 (during transport)	1 g/10 . . . 150 Hz

Ambient temperature (during operation)	-10 °C . . . +55 °C
Ambient temperature (when stored)	-40 °C . . . +70 °C
Climatic class acc. to IEC 60721-3-3.....	3K23
Operating mode.....	continuous operation
Position	depending on the display position
Connection.....	plug-in terminals
Wire cross section of connecting cable, rigid/flexible.....	0.2 . . . 4 mm ² /0.2 . . . 2.5 mm ²
Connection, flexible with ferrules, without/with plastic collar.....	0.25 . . . 2.5 mm ²
Conductor sizes (AWG)	24 . . . 12
Degree of protection, internal components (DIN EN 60529)	IP30
Degree of protection, terminals (DIN EN 60529).....	IP20
Enclosure	for panel mounting 96 x 96 mm
Flammability class	UL94 V-2
Weight	ca. 480 g

Option „W“

Shock resistance acc. to IEC 60068-2-27 (during operation)	30 g/11 ms
Bumping acc. to IEC 60068-2-29 (during transport)	40 g/6 ms
Vibration resistance acc. to 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 (when stored)	-40 °C . . . +85 °C

8.2 Standards and approvals

The ISOMETER® was designed in consideration of the following standards:

- EN 60664-1
- EN 61326-2-4
- EN 61557-1
- EN 61557-8

Subject to change! The specified standards take into account the edition valid until 03.2021 unless otherwise indicated.

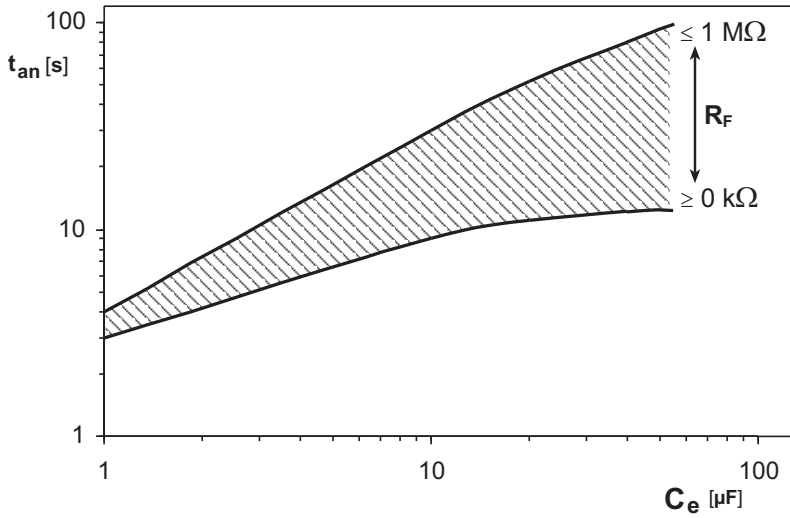


8.3 Characteristic curves

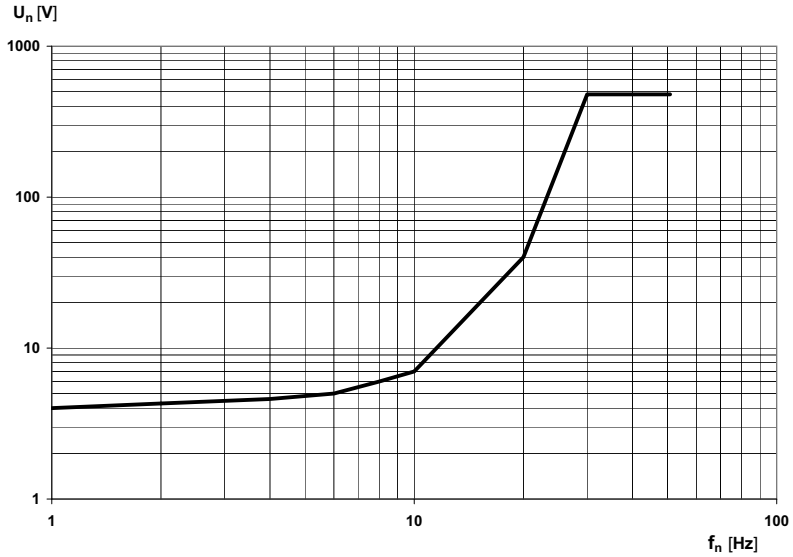
ISOMETER® reponse times in relation to system leakage capacitances:

$$C_e = 1 \dots 60 \mu\text{F}, U_n = 0 \dots 480 \text{ V}/50 \text{ Hz}$$

IR1575

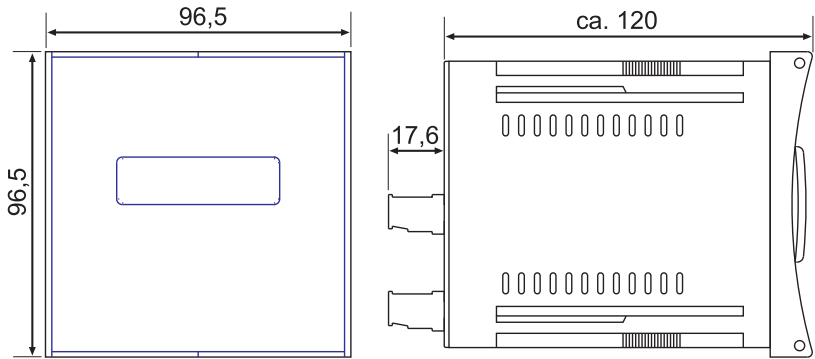


Max. AC voltage between the IT system and earth in the frequency range < 50 Hz:



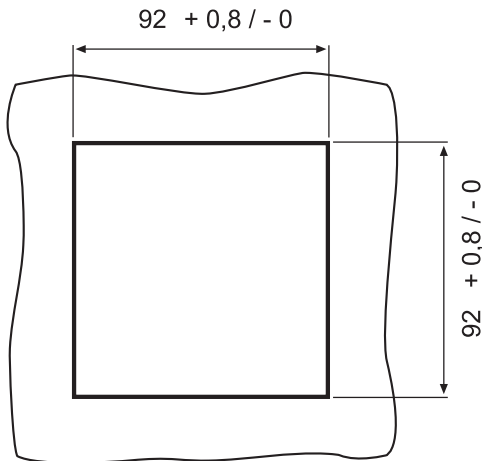
Response values for the insulation fault location system EDS460 are available in the device documentation of EDS460 (EDS460-490_D00085...).

8.4 Dimension diagram enclosure IR1575PG1



All dimensions in mm

suitable for panel mounting,
the illustration below shows the necessary cutout:



All dimensions in mm

8.5 Ordering details

8.5.1 Standard version

Type	Nominal voltage U_n	Supply voltage U_s	Art. No.
IR1575PG1-435	3/(N) AC 20...480 V AC 20...480 V	AC 88...264 V AC 340...460 V DC 77...286 V	B91064002
IR1575PG1W-435	3/(N) AC 20...480 V AC 20...480 V	AC 88...264 V AC 340...460 V DC 77...286 V	B91064002W
IR1575PG1-434	3/(N) AC 20...480 V AC 20...480 V	AC 16...72 V DC 10,2...84 V	B91064004

Devices with ending "W" provide improved shock and vibration resistance. A special varnish of the electronics provides higher resistance against mechanical stress and moisture. This makes the devices suitable for use in ships, on rolling stock and in seismic environment.

8.5.2 Label for modified versions

There will only be a label in this field when the ISOMETER® differs from the standard version.



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