

This document is intended as a reference guide for installing and using a BENDER isoLR275 ground fault detector and AGH-LR voltage coupler for ungrounded low-resistance systems. This document includes installation, setup, and usage instructions. For complete details, including installation, setup, settings, and troubleshooting, refer to the isoLR275 user manual, document number TGH1468en. This document is intended as a supplement and not a replacement to the complete user manual.

Only qualified maintenance personnel shall operate or service this equipment. These instructions should not be viewed as sufficient for those who are not otherwise qualified to operate or service this equipment. This document is intended to provide accurate information only. No responsibility is assumed by BENDER for any consequences arising from use of this document.



## Installation

### Mounting

The isoLR275 and AGH-LR are designed for DIN rail mounting. See reverse side for dimensions.

### Wiring - General

See figure 1 for basic wiring schematic. Use of the AGH-LR voltage coupler is required. Use minimum AWG 24, maximum AWG 12 wire. For more information, refer to the isoLR275 user manual.

⚠ DANGER

**HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

- Disconnect all power before servicing.
- Observe all local, state, and national codes, standards, and regulations.

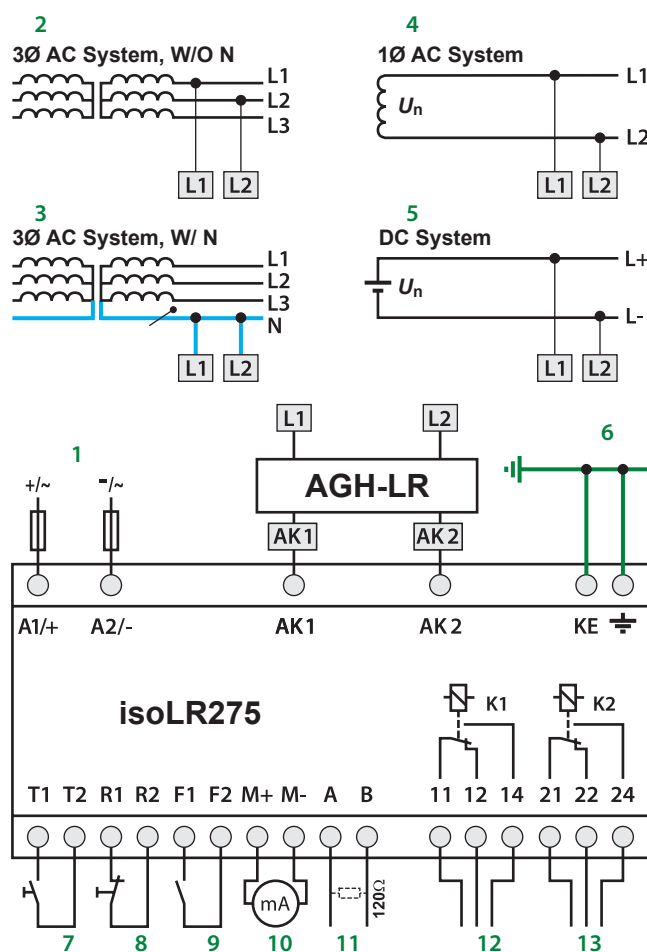


Figure 1 - isoLR275 and AGH-LR wiring diagram

- |  |  |
|--|--|
| <ol style="list-style-type: none"> <li>1. External supply voltage; 6A fuse recommended for internal device protection</li> <li>2. Connection to three-phase AC system without neutral</li> <li>3. Connection to three-phase AC system with neutral</li> <li>4. Connection to single-phase AC system</li> <li>5. Connection to DC system</li> <li>6. Equipment ground connection</li> </ol> | <ol style="list-style-type: none"> <li>7. External TEST terminal, N/O contact</li> <li>8. External RESET terminal, N/O contact</li> <li>9. STANDBY terminals: Closing F1/F2 will stop measurements</li> <li>10. Analog outputs: 0... 400 <math>\mu</math>A on standard version, 0/4... 20 mA on "B" version</li> <li>11. RS-485 interface</li> <li>12. Alarm relay K1: SPDT contact</li> <li>13. Alarm relay K2: SPDT contact</li> </ol> |
|--|--|

## Wiring - Multiple isoPV Devices in Arrays with a Common Bus

Only one isoLR275 detector at a time may be online and measuring in a complete isolated system. Circuits connected to a common bus, which may or may not be connected simultaneously, require special connections in order to ensure that only one device is on at a time. These requirements may be accomplished in one of two ways:

- Option 1: Connecting each device's F1/F2 standby terminals and manually controlling the switching with control logic
- Option 2: Automating the switching by connecting each device together via RS-485

For option 1, closing the F1/F2 terminal set puts the device into standby mode. Using control logic from the tiebreaker will allow for manual control to ensure that only one device is on when the tiebreaker is closed.

Option 2 automates the process. Complete the following steps:

1. Connect each isoLR275 in series with each other via the "A" and "B" terminals. Use RS-485 cable.
2. The devices at the beginning and the end of the chain require activating the termination resistor. Switch the "Ron" DIP switch to "ON."
3. Each device requires a unique communication address. Under the menu option "COM SETUP > Addr." set one device to address 1. Set the address for each other device sequentially. Each address must be unique.
4. For each device, under the menu option COM SETUP > ISONet, set this option to "ON." This setting automates the process of ensuring only one device is measuring at any time. See the reverse side of this document for more information on menu settings.

### Wiring - Contacts

Using a normally closed or normally open contact utilizes two factors: wiring out of the proper terminal, and setting the respective contact to normally energized or deenergized operation. Refer to the chart below for relay conditions.

The energized state of the contact may be changed by setting options ISO SETUP > K1 and ISO SETUP > K2. In the device's settings, option "N/O" refers to normally deenergized, and option "N/C" refers to normally energized.

Device Relay Conditions			
Relay Operation Setting	Device Alarm State	K1 STATE	K2 STATE
Normally deenergized mode (N/D) Non-failsafe mode "N/O" in device settings menu	Power ON, normal state (no alarms)	11-12 CLOSED 11-14 OPEN	21-22 CLOSED 21-24 OPEN
	Power OFF	11-12 CLOSED 11-14 OPEN	21-22 CLOSED 21-24 OPEN
	Power ON, alarm state	11-12 OPEN 11-14 CLOSED	21-22 OPEN 21-24 CLOSED
Normally energized mode (N/E) Failsafe mode "N/C" in device settings menu	Power ON, normal state (no alarms)	11-12 OPEN 11-14 CLOSED	21-22 OPEN 21-24 CLOSED
	Power OFF	11-12 CLOSED 11-14 OPEN	21-22 CLOSED 21-24 OPEN
	Power ON, alarm state	11-12 CLOSED 11-14 OPEN	21-22 CLOSED 21-24 OPEN

### Menu Structure Flow Chart

Figure 5 shows the structure of the menu built into the isoPV. The menu is used for viewing alarms, viewing the status of the system, and making any necessary settings changes. Use the supplied gray boxes to take note of applied settings for future reference. Note that some settings do not have more than one selectable option - these are special options tuned specifically for low resistance, ungrounded systems.

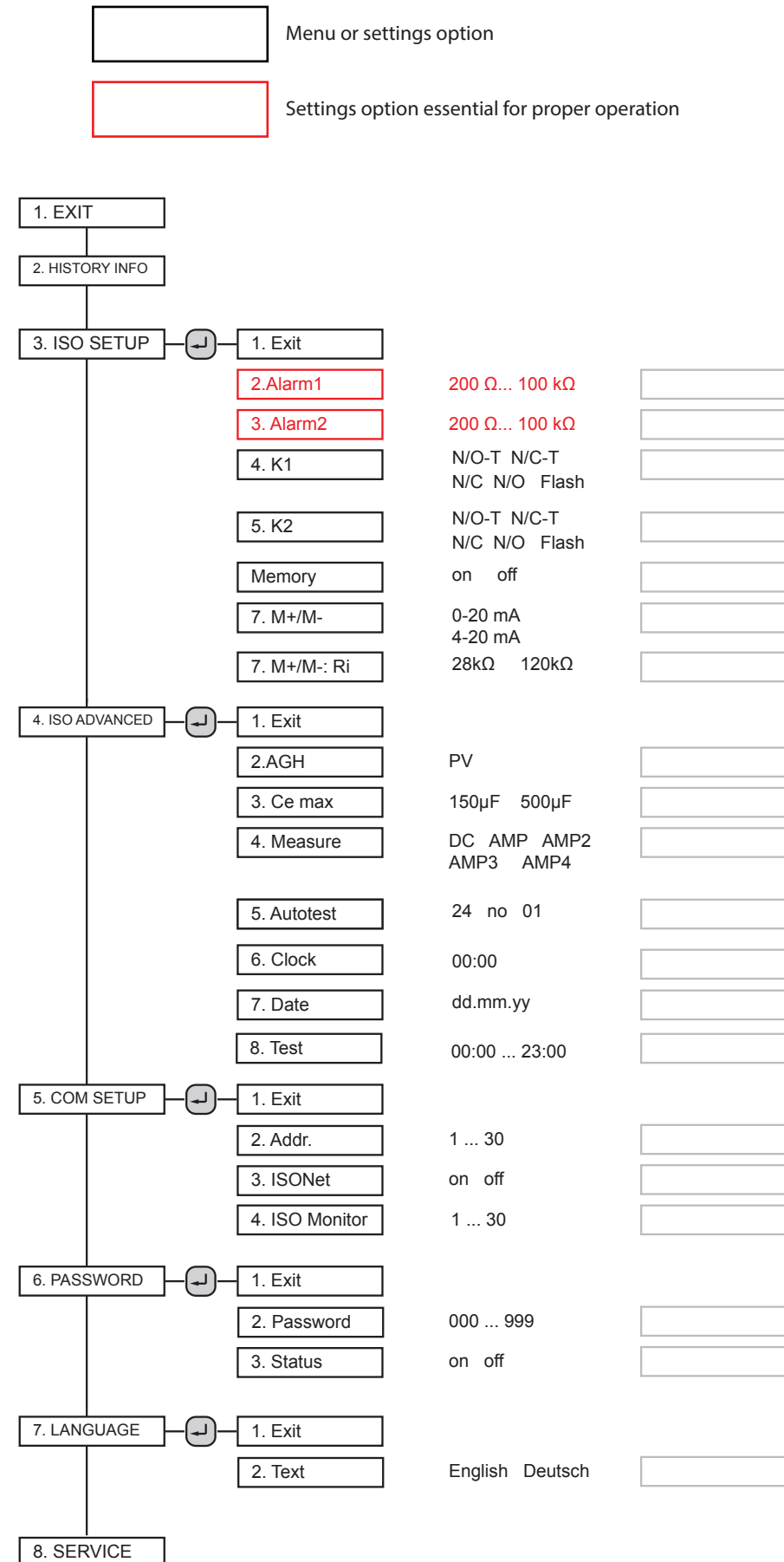


Figure 2 - isoLR275 menu flow chart

### Dimensions

Dimensions in inches (mm).

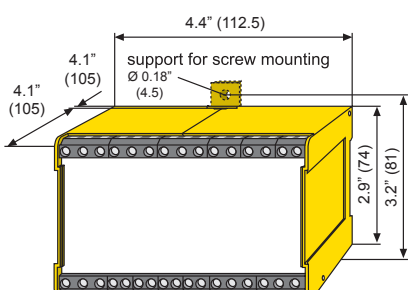


Figure 3 - isoLR275 dimensions in inches (mm)

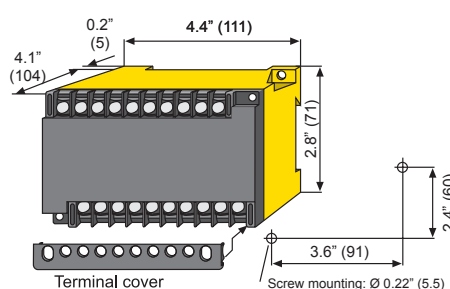
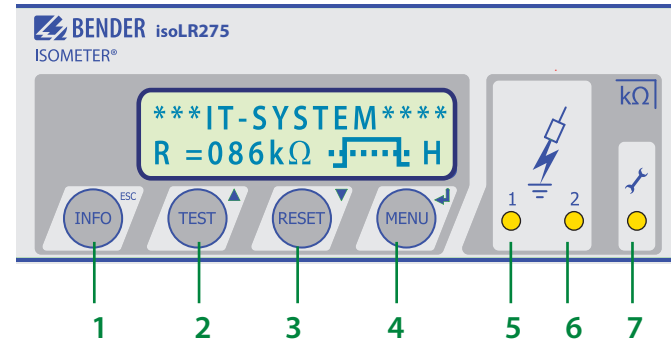


Figure 4 - AGH-LR dimensions in inches (mm)

### Front Panel Display



1. INFO / ESC key: Displays system information / goes back a step in menu
2. TEST / UP key: Initiates self-test / moves up in menu
3. RESET / DOWN key: Resets device when latching mode is active / moves down in menu
4. MENU / ENTER key: Opens the main menu / confirms changes in menu
5. LED "ALARM 1": Illuminates when alarm 1 is active.
6. LED "ALARM 2": Illuminates when alarm 2 is active.
7. LED "ERROR": Illuminates when a device error has occurred.

### Device Setup Tips

- Ensure that all menu options in red in the menu structure flow chart are set correctly. Incorrect settings may lead to improper readings. For alarm trip values, use the factory defaults when possible.
- The optimal measuring principle under menu option ISO ADVANCED > Measure has been factory set for large, low-resistance ungrounded systems. Refer to isoLR275 user manual for more information on this setting.
- Options ISO SETUP > K1 and ISO SETUP > K2 refer to the energized state of the output relays K1 and K2 during operation. Refer to the section "Wiring - Contacts" on the reverse side of this document for more information. The menu options stand for:
  - N/C: Normally energized operation (failsafe mode)
  - N/O: Normally deenergized operation (nonfailsafe mode)
  - N/C-T: Normally energized operation, switches during self-test
  - N/O-T: Normally deenergized operation, switches during self-test
  - Flash: During alarm, contact switches app. every 2 seconds

### Analog Outputs

isoLR275 models feature a 0 - 20 mA or 4 - 20 mA output, selectable in the main menu under ISO SETUP > M+/M-. Under menu option ISO SETUP > M+/M-: Ri, the midpoint of the equation may be set to 28 kΩ or 120 kΩ. When using an externally connected analog meter, ensure the midpoint setting is the same as the external meter. For integrating into control systems, use the midpoint value appropriate for the system's requirements.

#### 0 - 20 mA output

$$R_F = \frac{20 \text{ mA} \times R_I}{I} - R_I$$

$R_F$  Insulation resistance in kΩ  
 $I$  Current output in mA  
 $R_I$  Midpoint setting

#### 4 - 20 mA output

$$R_F = \frac{16 \text{ mA} \times R_I}{I - 4 \text{ mA}} - R_I$$

$R_F$  Insulation resistance in kΩ  
 $I$  Current output in mA  
 $R_I$  Midpoint setting

### Ordering Information

Ordering Information			
Part No.	System Voltage	Supply Voltage	Ordering No.
isoLR275-327 and AGH-LR-3	3(N)AC 0...793 V / DC 0...1100 V	DC 19.2...72 V	B 9106 5702W
isoLR275-335 and AGH-LR-3	3(N)AC 0...793 V / DC 0...1100 V	AC 88...264 / DC 77...286 V	B 9106 5703W

### Technical Data

Refer to isoLR275 series user manual (document TGH1468en) or isoLR275 series datasheet (document NAE1012110) for detailed technical information.