ISOMETER® IR155-xx10

Insulation monitoring device (IMD) for unearthed DC charging systems (IT systems), for e.g. electric vehicles

Illustration similar

IR155-xx10_D00376_01_Q_XXEN / 02.2024

BENDER

IR155-xx10

Insulation monitoring device

Part of the device documentation in addition to this quickstart is the enclosed "Safety instructions for Bender products" and the datasheet which can be downloaded from https://www.bender.de/en/service-support/download-area/.

Quick-start guide for the following devices

Type	Measured value output	Parameters	Art. No.	Datasheet No.
IR155-3210	High-Side	Continuously set value	B91068140V4	D00376
IR155-3210	HIgh-Side	Customer-specific setting	B91068140CV4	D00376
IR155-4210	High-Side	Continuously set value	B91068143	D00377
IR155-4210	HIgh-Side	Customer-specific setting	B91068143C	D00377
Accessories IR155-32xx: Fastening set Connector set			 B 9106 8500 B 9106 8501	
Accessories IR155-42xx: Befestigungsset / Fastening set Steckverbinder-Set / Connector set			 B 9106 8500 B 9106 8502	

Scope of delivery:

- IR155-3210 or -4210
- Quick Start EN
- Safety instructions

General instructions

This manual is intended for qualified personnel working in electrical engineering and electronics! Part of the device documentation, in addition to this manual, is the enclosed "Safety instructions for Bender products".

Read the manual before installing, connecting and commissioning the device. Always keep the manual within easy reach for future reference.

Indication of important instructions and information

Danger! *Indicates a high risk of danger that will result in death or serious injury if not avoided.*

Warning!
Indicates a medium risk of danger that can lead to death or serious injury, if not avoided.

Caution!
Indicates a low-level risk that can result in minor or moderate injury or damage to property if not avoide.

Information can help to optimise the use of the product.

Signs and symbols

	Disposal		Temperature range		protect from dust
	protect from wetness		Recycling		RoHS guidelines

Training courses

www.bender.de -> know-how -> Seminare.

Delivery conditions

The conditions of sale and delivery set out by Bender apply. These can be obtained from Bender in printed or electronic format.

The following applies to software products:

"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."

Inspection, transport and storage

Check the shipping and device packaging for transport damage and scope of delivery. The following must be observed when storing the devices:

Warranty and liability

Warranty and liability claims in the event of injury to persons or damage to property are excluded in case of:

- 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.
- Use of accessories and spare parts not recommended by Bender.
- Catastrophes caused by external influences and force majeure.
- Mounting and installation with device combinations not recommended by the manufacturer.

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

Disposal

Abide by the national regulations and laws governing the disposal of this device.

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

Safety

If the device is used outside the Federal Republic of Germany, the applicable local standards and regulations must be complied with. In Europe, the European standard EN 50110 applies.

DANGER! *Risk of electrocution due to electric shock! Touching live parts of the system carries the risk of:*

- A fatal electric shock
- Damage to the electrical installation
- Destruction of the device

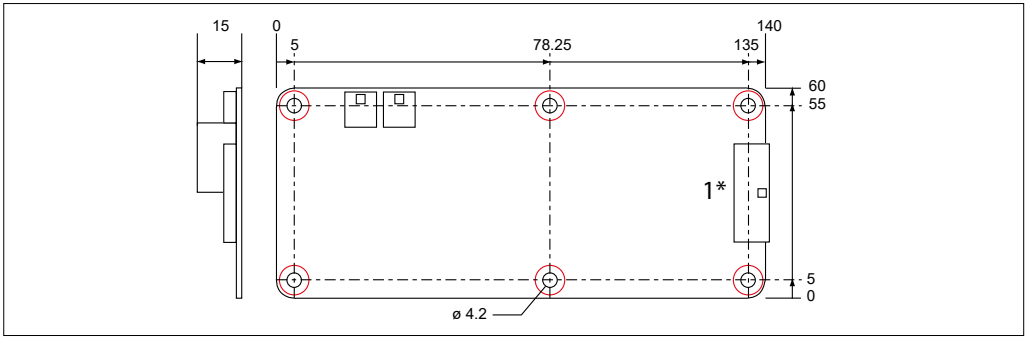
Before installing and connecting the device, make sure that the installation has been de-energised. The rules for working on electrical systems must be observed.

Intended use

The ISOMETER® IR155-xx10, hereinafter referred to as ISOMETER®, is for use in DC charging systems for hybrid or all-electric vehicles. The device monitors the insulation resistance between the insulated, active HV conductors of an electrical drive/charger system and the referenced earth. Any other use or use beyond this is considered improper.

Dimensions

PCB dimensions:
IR155-3210 (L x W x H) 140 mm x 60 mm x 15 mm
IR155-4210 (L x W x H) 140 mm x 60 mm x 17 mm



1 is 1 mm longer than the PCB dimensions*
10 mm copper circumferential on the rear side
8.4mm on the front side
DImensions in mm

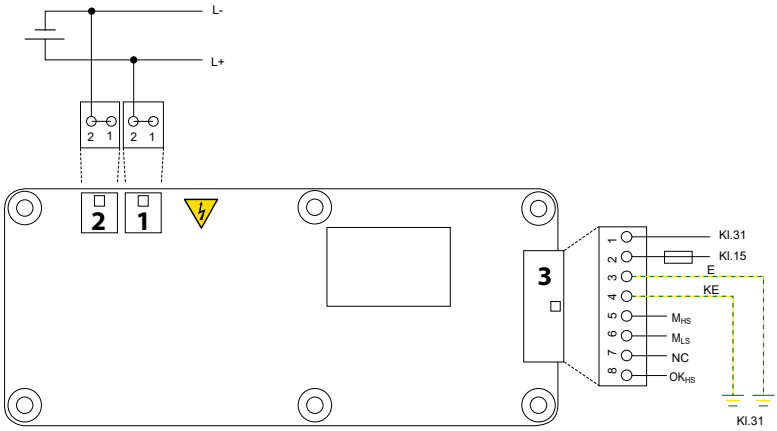
Mounting

The mounting is done by M4 metal screws with washers between the screw head and the PCB. Ensure that there is sufficient insulation between the device and the vehicle or the fixing points (min. 11.4 mm to other parts).

If the device is mounted on a metal surface or on conductive subsurface, this subsurface has to be at earth potential (Kl.31; vehicle mass).

Torx, T20 with a maximum tightening torque of 4 Nm for the screws. Furthermore, a maximum of 10 Nm tightening torque to the PCB at the mounting points.

Wiring diagramm



HV system DC 0 … 800 V (only -xx10)
MHS only on variants -xx10
MLS only on variants -3203 / -4203

Number	Connector (-3210)	Connector (-4210)	Pin-No.	Description
1	XLA+	XLB+	1+2 (L+)	Line voltage
2	XLA-	XLB-	1+2 (L-)	Line voltage
3	XK1A	XK1B	1 (Kl.31)	Chassis ground
			2 (Kl.15)	Supply voltage
			3 (Kl. 31)	Chassis ground
			4 (Kl. 31)	Chassis ground (separate line)
			5 (M_{HS})	Data Out, PWM (high side)
			6 (n.c.)	
			7 (n.c.)	
			8 (OK_{HS})	Status Output (high side)

Necessary crimp tongs:
-3210: (TYCO) 91501-1
-4210: (Molex) 2002182200
20 – 30 AWG (Samtec) CAT-HT-179-2030

Technical data

Insulation coordination acc. to IEC 60664-1

Protective separation (reinforced insulation) ..... between (L+/L-) – (Kl. 31, Kl. 15, E, KE, M_{HS}, OK_{HS})
Voltage test ..... AC 3500 V/1 min

Supply/IT system being monitored

Supply voltage U_S ..... DC 10…36 V
Nominal supply voltage ..... DC12/24 V
Max. operating current I_S ..... 150 mA
Max. current I_k ..... 2 A
..... 6 A/2 ms inrush current
HV voltage range (L+/L-) U_n ..... AC 0…800 V (peak value)
..... 0…560 V r.m.s. (10 Hz…1 kHz)
..... DC 0…1000 V
UL 2231 ..... DC 0…800 V
Power consumption ..... < 2 W

Response values

Response value hysteresis (AMP) ..... 25 %
Response value Ran ..... 100…200 kΩ
Undervoltage detection ..... 0…500 V

EMC

Load dump protection ..... < 40 V*
Measurement method ..... Bender-AMP technology
Factor averaging Fave (output M) ..... 1…10 (factory set: 10)

* For voltages above an additional central protecion is necessary.

ESD protection

Contact discharge – directly to terminals ..... ≤ 10 kV
Contact discharge – indirectly to environment ..... ≤ 25 kV
Air discharge – handling of the PCB ..... ≤ 6 kV

Connection

IR155-3210

On-board connectors ..... TYCO-MICRO MATE-N-LOK
..... 1 x 2-1445088-8
..... (Kl. 31, Kl.15, E, KE, MHS, OKHS)
..... 2 x 2-1445088-2 (L+, L-)
Crimp contacts ..... TYCO-MICRO MATE-N-LOK Gold
..... 14 x 1-794606-1
..... Conductor cross section: AWG 20…24
Enclosure for crimp contacts ..... TYCO-MICRO MATE-N-LOK receptor HSG single R -1445022-8
..... TYCO-MICRO MATE-N-LOK receptor HSG single R -1445022-2

IR155-4210

Connectors ..... Samtec Mini Mate Housing, IPD1-08-S-K
..... (Kl. 31B, Kl.15, E, KE, MHS, OKHS)
..... Molex Mini Fit Jr. Housing, 39-01-2025, (L+, L-)
Crimp contacts ..... Samtec Mini Mate Gold, CC79R2024-01-L, AWG 20…24
..... Molex Mini Fit Jr. Gold, 39-00-0089, AWG 16

General data

Operating mode/mounting ..... continuous operation/any position
Temperature range ..... -40…+105 °C
Voltage failure ..... ≤ 2 ms
Flammability class acc. to UL 94 ..... V-0

Standards and regulations*

- IEC 61557-8 2007-01
- IEC 61010-1 2010-06
- IEC 60664-1 2004-04
- IEC 61326-2-4 2010-05
- ISO 6469-3 2001-11
- ISO 23273-3 2006-11
- ISO 16750-1 2006-08
- ISO 16750-2 2010-03
- ISO 16750-4 2010-04
- e1 acc. 72/245/EWG/EEC 2009/19/EG/EC
- DIN EN 60068-2-38 Z/AD:2010
- DIN EN 60068-2-30 Db:2006
- DIN EN 60068-2-14 Nb:2010
- DIN EN 60068-2-64 Fh:2009
- DIN EN 60068-2-27 Ea:2010
- UL2231-1 2002
- UL2231-2 2002

*Normative exclusion

The device went through an automotive test procedure in combination with multi customer requirements reg. ISO16750-x.

The standard IEC61557-8 will be fulfilled by creating the function for LED warning and test button at the customer site if necessary.

EU Declaration of Conformity

The full text of the EU Declaration of Conformity is available via the QR Code:

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