GS-box

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Galvanic separation box

Data sheet

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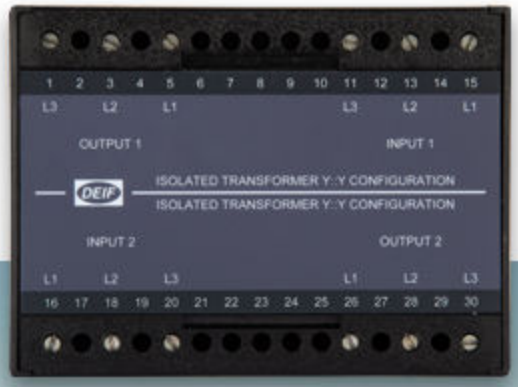

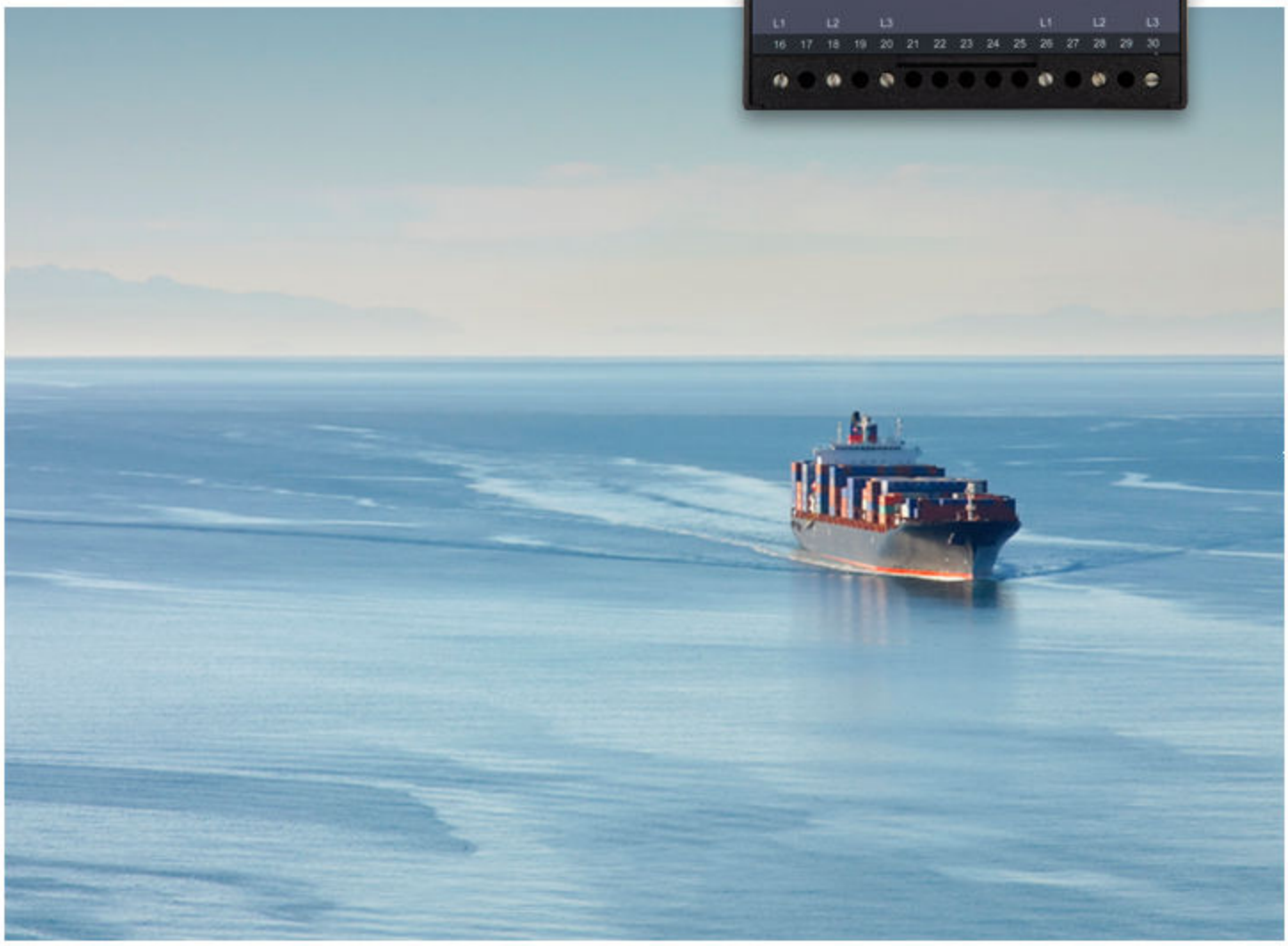

1. GS-box

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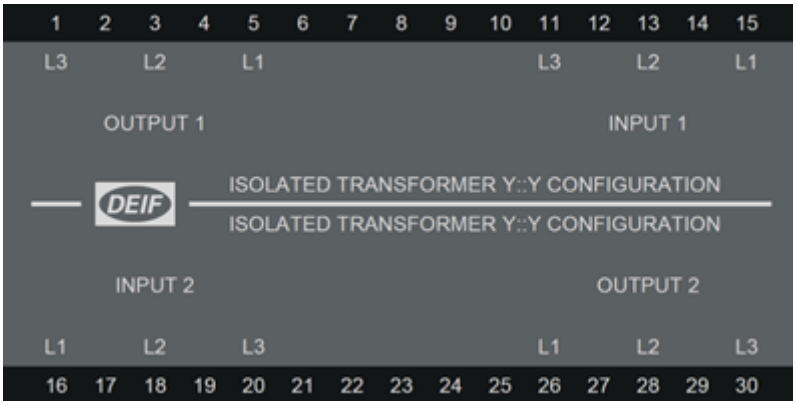
1. GS-box

1.1 About

The DEIF galvanic separation box (GS-box) is used where separation between inputs and outputs is necessary to provide a functional isolation for the voltage measurement inputs to the controller. It is used in open-delta couplings.

- Galvanic separation of three-phase busbar voltages (group 1)
- Galvanic separation of three-phase generator voltages (group 2)
- 35 mm DIN rail or base mounting

The GS-Box is used where isolation is required between the controller and the grid that the genset is connected to. All IT installations require galvanic separation. This includes marine applications where controllers are used.



NOTE The GS-box uses transformers to transfer the input voltages to an identical set of output voltages. The voltage range for the 440 V AC version is 380 to 480 V AC.

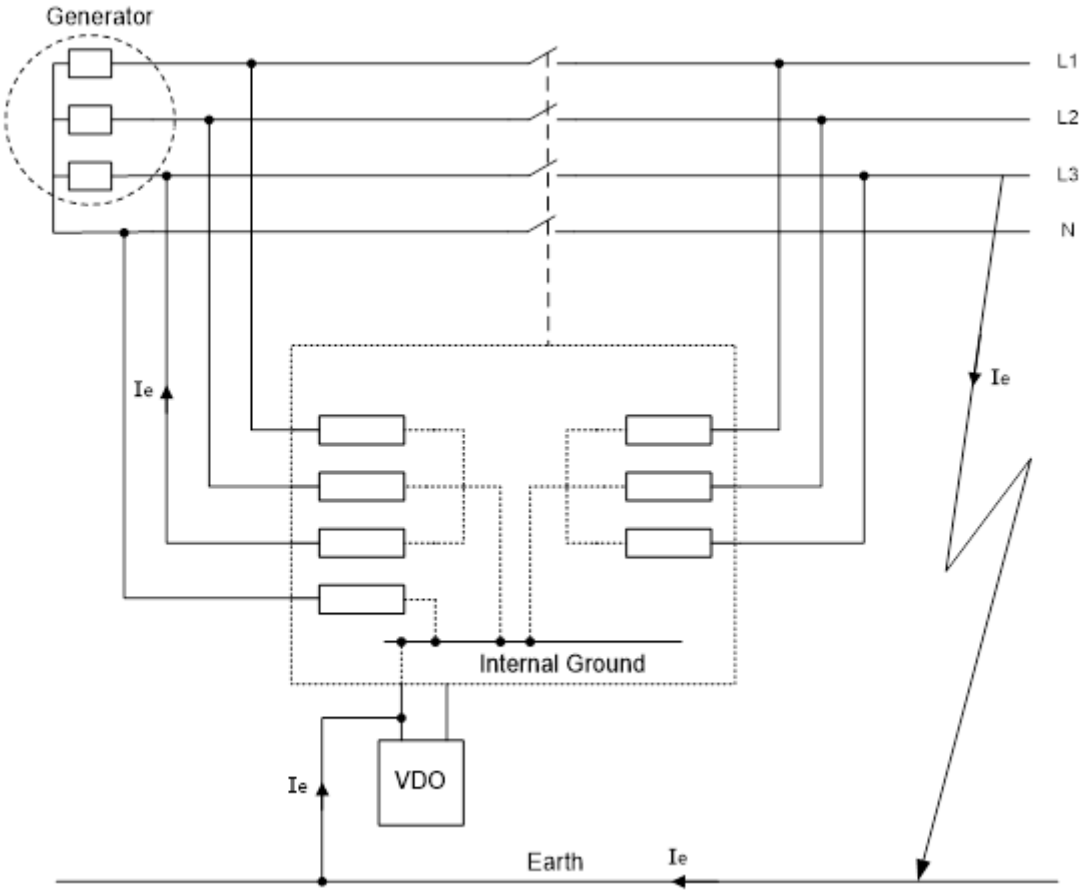
NOTICE

Loss of calibration

Do not open the GS-Box and/or adjust any of the six internal potentiometers. This will result in a loss of calibration.

1.2 Where to use the GS-box

Example of the GS-box internal connections



The neutral and generated neutral for the three voltage measurements are connected to the internal ground. If there is a ground connection (in this example, the VDO) the internal ground is connected directly to earth, without any galvanic separation.

If there is no ground fault, everything is OK. However, if the earth leakage is at the VDO and the busbar also has an earth leak, then a current loop is generated. The fault changes the internal ground reference and causes measurement and internal disturbances.

NOTE All inputs are connected to the internal ground. Any displacement of the reference therefore affects all connected inputs.

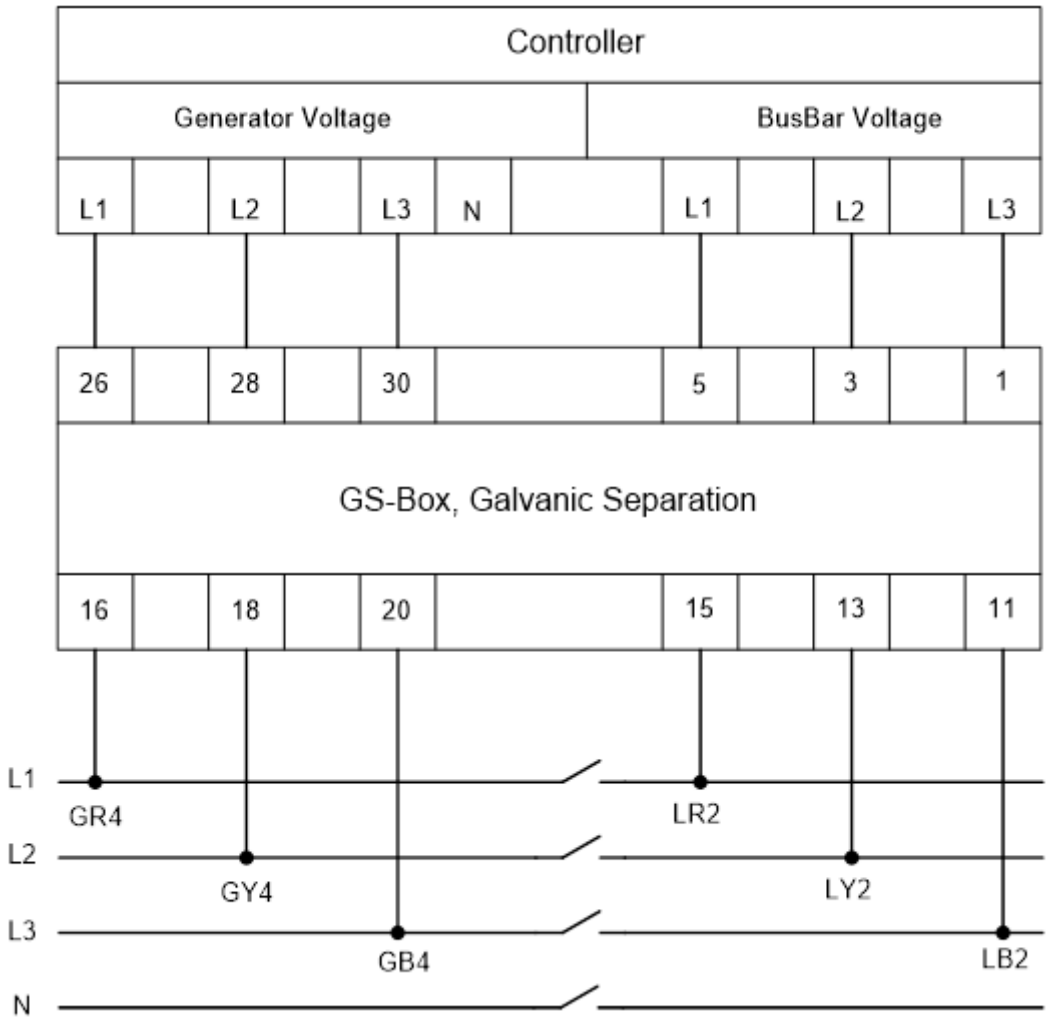
NOTICE

Internal ground displacement

In the worst case, displacements of the internal ground can stop the genset from synchronising. This is because the voltage is outside the synchronisation window.

The best solution to earth faults is to locate the fault. However, this can sometimes be very difficult or impossible. In these cases, you can use the GS-Box to create galvanic separation between the voltage measurements and the earth.

1.3 Single-line diagram



NOTE If you have earth problems, to avoid interruption from earth faults, you must remove the generator voltage neutral connection from the controller.

1.4 Warnings

CAUTION

Read the instructions

Read these instructions before installation of the GS-box, to avoid personal injury and damage to equipment.

Safety during installation and operation

When you install and operate the equipment, you may have to work with dangerous voltages. The installation must only be carried out by authorised personnel who understand the risks involved in working with electrical equipment.

DANGER!

Hazardous live voltages

Do not touch any terminals, especially the AC terminals, as this could lead to injury or death.

Electrostatic discharge

Electrostatic discharge can damage the terminals. You must protect the terminals from electrostatic discharge during the installation. When the box is installed and connected, these precautions are no longer necessary.

1.5 Legal information

DEIF takes no responsibility for installation or operation of the GS-Box. Contact the company responsible for installation or operation if there is any doubt about how to install or operate the GS-Box.

Warranty

NOTICE

Warranty

The GS-box is not to be opened by unauthorised personnel. If opened anyway, the warranty will be lost, and the GS-box calibration can also be lost.

Disclaimer

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The English version of this document always contains the most recent and up-to-date information about the product. DEIF does not take responsibility for the accuracy of translations, and translations might not be updated at the same time as the English document. If there is a discrepancy, the English version prevails.

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2. Appendix A

2.1 Type certificate

Galvanic Separation ML-2: For 35 mm DIN rail or base mounting

Technical specifications

Function	Galvanic separation of three-phase busbar voltages (input/output group 1) Galvanic separation of three-phase generator voltages (input/output group 2) The separation between inputs and outputs provides a functional isolation for voltage measurement inputs to Multi-line 2 units used in open-delta couplings. The input voltages are transferred to an identical set of output voltages via transformers.
Input voltage (UIN) **Overload** **Load**	3 × 110 to 440 V AC (phase-phase) 1.2 × U_{MAX}, continuously, 2 × U_n for 10 s Max. 0.8 VA per phase
Ouput voltage (U_{OUT})	3 × 110 to 440 V AC (phase-phase)
Frequency range	40...45...65...70 Hz
Accuracy	U_{OUT} = U_{IN} ±1 %
Conditions of use	This unit, *Galvanic Separation ML-2*, is only for use with Multi-line 2.

Type test specifications

		According to
Insulation to ground	500 V DC, >100 MΩ	DNV, GL and LR
Vibration	2 to 13.2 Hz: 3 mm 13.2 to 100 Hz: 1.0 g	DNV, GL and LR test 1
Shock	6 attempts with 50 g (in all 3 axes)	IEC 68-2-27, test: Ea
Climate	HSE	DIN 4004
Protection	Case: IP40 Terminals: IP20	IEC/EN 60529
Temperature	-10 to 55 °C (nominal) -25 to 70 °C (operating) -40 to 70 °C (storage)	DNV, GL and LR
Test voltage	50 Hz, 1 min., between: • Inputs and outputs: 1725 V AC • Group 1 and group 2: 4400 V AC • All circuits and ground: 3250 V AC	Functional isolation, 250% of max. U_{IN} EN/IEC 61010-1 EN/IEC 61010-1
EMC	Immunity	EN 50082-1/2
	Emission	EN 50081-1/2