

vibro-meter®

GSI127 galvanic separation unit



GSI127
(standard
version)



KEY FEATURES AND BENEFITS

- From the vibro-meter® product line
- Power supply for sensors and/or signal conditioners with a current output or a voltage output
- 4 kV_{RMS} galvanic separation between the sensor side and the monitor side
- 50 V_{RMS} galvanic separation between the power supply and the output signal (floating output)
- High rejection of frame voltage
- µA to mV transfer function for current-signal transmission over longer distances
- V to V transfer function for voltage-signal transmission over shorter distances
- Available in standard versions and Ex versions certified for use in potentially explosive atmospheres (hazardous areas)
- Compatible with all vibro-meter sensors / measurement chains
- Also compatible with industry-standard IEP sensors and 4 to 20 mA loop-powered sensors, including vibration sensors/transmitters
- No ground connection needed

KEY BENEFITS AND FEATURES (cont'd)

- Suitable for use in functional safety contexts: SIL 2 in accordance with IEC 61508
- Removable screw-terminal connectors
- DIN-rail mounting

APPLICATIONS

- All vibro-meter sensors / measurement chains
- Safety-related applications

DESCRIPTION

The GSI127 is a galvanic separation unit from Parker Meggitt's vibro-meter® product line. It is designed for operation with the signal conditioners, charge amplifiers and electronics (attached or integrated) used by various vibro-meter measurement chains and/or sensors.

Compatible devices include the IPC707 signal conditioners (charge amplifiers) used by CAxxx piezoelectric accelerometers and CPxxx dynamic pressure sensors (and older IPC704 signal conditioners), the IQS9xx signal conditioners used by TQ9xx proximity sensors (and older IQS4xx signal ...



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DESCRIPTION (continued)

conditioners), the attached or integrated electronics used by CE_{xx} piezoelectric accelerometers, and the integrated electronics used by the VE210 velocity sensor. The GSI127 is also compatible with industry-standard IEPE (integrated electronics piezo electric) sensors such as the CE620, CE630 and PV660 vibration sensors, and 4 to 20 mA loop-powered sensors such as the CE687 and PV685 vibration sensors.

Note: The variant of the GSI127 defined by the ordering option code B11 is compatible with IQS91x signal conditioners and/or industry-standard 4 to 20 mA loop-powered sensors/transmitters.

The GSI127 galvanic separation unit is a versatile unit that can be used for the transmission of high-frequency AC signals over long distances in measurement chains using current-signal transmission or as a safety barrier unit in measurement chains using voltage-signal transmission. More generally, it may be used to supply any electronic system (sensor side) having a consumption of up to 21 mA.

The GSI127 also rejects a large amount of the frame voltage that can introduce noise into a measurement chain. (Frame voltage is the ground noise and AC noise pickup that can occur between the sensor case

(sensor ground) and the monitoring system (electronic ground)). In addition, the design of its internal power supply results in a floating output signal, thereby eliminating the need for an additional external power supply such as a APF19x.

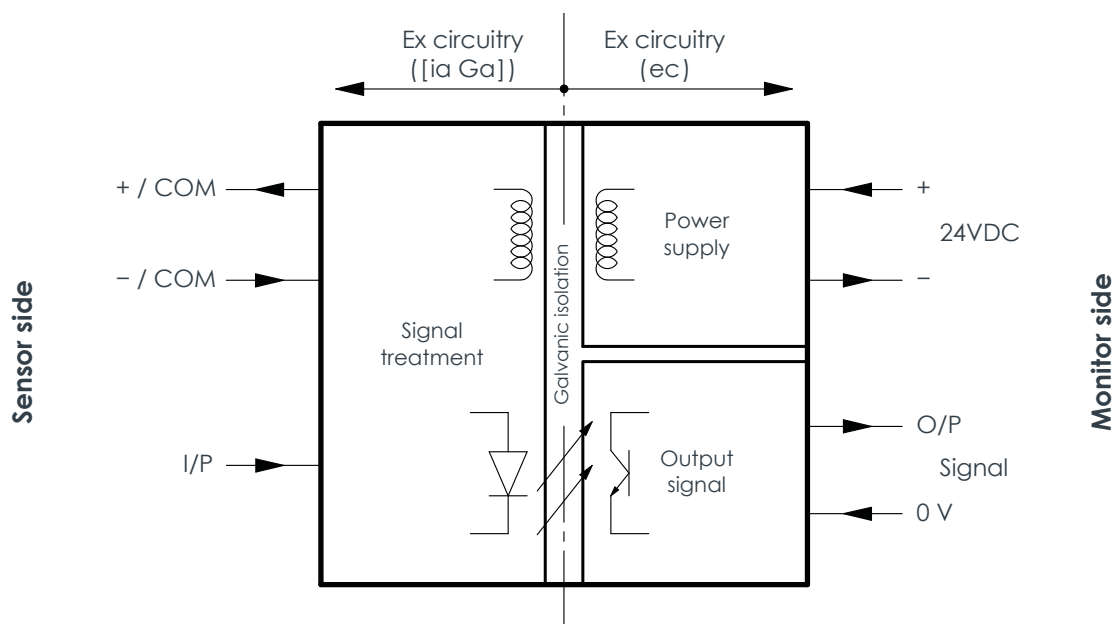
Ex versions of the GSI127 are certified to be installed in an Ex Zone 2 (“Ex ec”) when supplying measurement chains installed in Ex environments up to Zone 0 (“[ia Ga]”). These units can also eliminate the need for additional external Zener barriers.

The GSI127 housing features removable screw-terminal connectors that can unplugged from the main body of the housing to simplify installation and mounting. It also features a DIN-rail mounting adaptor for direct mounting on a DIN rail.

In addition, the GSI127 incorporates diagnostics that automatically and remotely indicates the health/status of the measurement chain so you always know when measurements can be trusted. The diagnostics (SIL 2 “by design”) bring enhanced reliability and significant risk reduction, making the GSI127 suitable for use in safety-related applications (functional safety contexts).

For specific applications, contact your local Parker Meggitt representative.

BLOCK DIAGRAM



SPECIFICATIONS

Environmental

General

Temperature

- Operating : -20 to 70°C (-4 to 158°F)
- Storage : -40 to 85°C (-40 to 185°F)

Humidity

- Operating : 90% max. non-condensing
- Storage : 95% max. non-condensing

Protection rating

(according to IEC 60529)

: IP20.

Note: The GSI127 is suitable for indoor use only unless it is installed in an industrial housing or enclosure that ensures a higher level of environmental protection.

Vibration

(according to IEC 60068-2-6)

: 2 g peak above resonant frequency and 0.35 mm peak below (10 to 55 Hz, 6 hours/axis)

Shock acceleration

(according to IEC 60068-2-27)

: 15 g peak (half sine impulse, 11 ms duration, 3 shocks/axis)


Altitude

: 4000 m (13 100 ft) max.

Note: Reduced air density affects cooling ability.

Potentially explosive atmospheres (ordering option code A2)

Available in Ex approved versions for use in hazardous areas

Type of protection Ex ec: increased safety		
Europe	EC type examination certificate	 II 3 (1) G Ex ec [ia Ga] IIC T4 Gc LCIE 13 ATEX 3037 X
International	IECEx certificate of conformity	Ex ec [ia Ga] IIC T4 Gc IECEx LCIE 13.0026X
North America	cCSAus certificate of compliance	<i>Pending</i>
South Korea	KGS certificate of conformity	<i>Pending</i>
United Kingdom	Type examination certificate *	<i>Pending</i>

* UKCA marking is not engraved/marked on the product.

 **For specific parameters of the mode of protection concerned and special conditions for safe use, refer to the Ex certificates that are available from Parker Meggitt.**

 **When using protection mode “Ex ec” (increased safety), the user must ensure that the GSI127 is installed in an industrial housing or enclosure that ensures a protection rating of at least IP54 (or equivalent).**

 **For the most recent information on the Ex certifications that are applicable to this product, refer to the Ex product register (PL-1511) document that is available from Parker Meggitt.**

Note: Some certifications and approvals are pending!

SPECIFICATIONS (*continued*)

Approvals

Conformity	: European Union (EU) declaration of conformity (CE marking)
Electromagnetic compatibility (EMC)	: EMC compliant (2014/30/EU): EN 61000-6-2:2005. EN 61000-6-4:2007 + A1:2011.
Electrical safety	: EN 61010-1:2010
Environmental management	: RoHS compliant (2011/65/EU)
Hazardous areas	: Ex approved versions (see Potentially explosive atmospheres on page 3)
Functional safety	: SIL 2 in accordance with IEC 61508

Note: Some certifications and approvals are pending!

Electrical

Power supply (to GSI127)

Input voltage range	: 24 V _{DC} nominal (20 to 28 V _{DC})
Power consumption	: < 3.1 W
Current consumption	: < 130 mA (with 24 V _{DC} power supply)
Overvoltage protection	: > 30 V _{DC}
Supply impedance (sensor side)	
• Ordering option codes B01-B11	: < 30 Ω
• Ordering option code B21	: > 50 kΩ

Note: The GSI127 should be powered (energized) using a limited-power, low-voltage power supply such as a APFxxx 24 V_{DC} power supply or other suitable power supply unit.

In safety-related applications, a GSI127 must be powered using a limited-power, low-voltage power supply with a safe limitation of 60 V_{DC} (nominal), even in the event of a single fault with the power supply.

Input signal (sensor side)

Supply (to measurement chain)

• Ordering option codes B01-B03 and B11	: 20 V _{DC} ± 1 V _{DC} / 21 to 30 mA _{DC} . Note: 30 mA _{DC} is the maximum (short-circuit) current.
• Ordering option code B04	: 21 V _{DC} ± 1 V _{DC} / 20 to 30 mA _{DC} . Note: 30 mA _{DC} is the maximum (short-circuit) current.
• Ordering option code B05	: -21 V _{DC} ± 1 V _{DC} / 20 to 30 mA _{DC} . Note: 30 mA _{DC} is the maximum (short-circuit) current.
• Ordering option code B21	: 8 mA _{DC} ± 0.5 mA _{DC} / 22 to 30 V _{DC} . Note: 30 V _{DC} is the maximum (open-circuit) voltage.

Input dynamic range

• Ordering option codes B01-B03 and B11	: 2 to 20.75 mA _{DC}
• Ordering option code B04	: 1.3 to 19 V _{DC}
• Ordering option code B05	: -1.3 to -19 V _{DC}
• Ordering option code B21	: 1.3 to 20.3 V _{DC}

SPECIFICATIONS *(continued)*

Output signal (monitor side)

Output voltage dynamic range (with 10 k Ω load)	: 0.8 to 20.8 V _{DC}
Output impedance	: < 30 Ω , protected against short-circuits
Power supply voltage rejection ratio (PSRR)	
• 10 Hz to 400 Hz	: \geq 60 dB
• 400 Hz to 20 kHz	: \geq 46 dB

Transfer characteristics

Galvanic separation

• Sensor side and monitor side	: 4 kV _{RMS}
• Power supply and output signal	: 50 V _{RMS}

Sensitivity and offset (zero)

• Ordering option code B01	: 1 V/mA and 2 V _{DC}
• Ordering option code B02	: 1 V/mA and -5 V _{DC}
• Ordering option code B03	: 3.2 V/mA and -48 V _{DC}
• Ordering option code B04	: 1 V/V and 0 V _{DC}
• Ordering option code B05	: -1 V/V and 0 V _{DC}
• Ordering option code B11	: 0.5 V/mA and 0 V _{DC}
• Ordering option code B21	: 1 V/V and 0 V _{DC}

Note: See also Accuracy, Output offset and other parameters in **DC transfer on page 5**, and **AC transfer on page 6**.

Transfer function	: $Output\ value = (Input\ value \times Sensitivity) + Offset$
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Where:

Output value is the value of the analog voltage output signal from the GSI127.

Input value is the value of the analog input signal (current or voltage) to the GSI127.

Sensitivity is the transfer sensitivity for a particular variant of the GSI127, as defined by the ordering option code.

Offset is the output offset for a particular variant of the GSI127, as defined by the ordering option code.

DC transfer

Accuracy	: \pm 1% (at ambient temperature)
Sensitivity drift	: \pm 50 ppm/ $^{\circ}$ C (over operating temperature range)
Linearity error (best straight-line INL)	: < 0.2%
Output offset (middle of DC range)	: \pm 200 mV _{DC}
Output offset drift (middle of DC range)	: \pm 2 mV/ $^{\circ}$ C (over operating temperature range)

SPECIFICATIONS *(continued)*

AC transfer

Bandwidth	
• Frequency band (± 0.5 dB)	: DC to 20 kHz
• -3 dB cut-off frequency (typical)	: 30 kHz
Accuracy	: ± 0.5 dB (over bandwidth from DC to 20 kHz)
Linearity error (total harmonic distortion (THD))	: < -46 dB (0.5%) (over bandwidth from DC to 20 kHz)
Full-scale dynamic signal to noise ratio (SNR_{FSD})	: > 80 dB (from 10 to 2 kHz)

Connectors

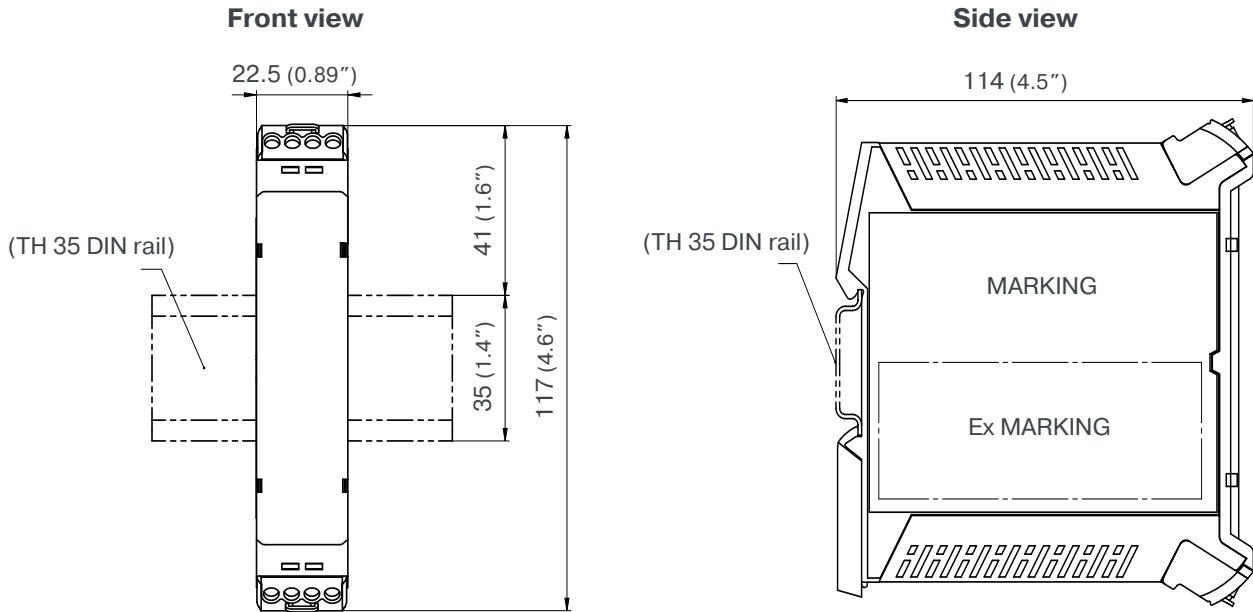
Screw-terminal connector (input, top)	: 4 contacts for sensor-side signals
Screw-terminal connector (output, bottom)	: 4 contacts for monitor-side signals
Electrical connections	
• IEC	: 400 V / 0.2 to 2.5 mm ²
• UL	: 300 V / 10 A / 26 to 12 AWG
Clamping range (min. to max.)	: 0.2 to 2.5 mm ² (26 to 12 AWG)
Tightening torque (min. to max.)	: 0.4 to 0.6 N·m (0.30 to 0.44 lb-ft)

Note: The GSI127 features removal screw-terminal connectors that can unplugged from the main body of its housing to simplify installation and mounting.

Physical

Mounting	: Suitable for TH 35 DIN rails (according to EN 50022 / IEC 60715). For example, TH 35-7.5 or TH 35-15.
Electrical connections	: Removable screw-terminal connectors (see Connectors on page 6)
Housing	
• Material	: Polyamide (PA 66 GF 30)
• Color	: Standard versions: Gray. Ex approved versions: Gray with the electrical connections to the sensor side indicated by blue.
Dimensions	: See Mechanical drawings on page 7
Weight	: 140 g (0.31 lb) approx.

MECHANICAL DRAWINGS



Notes

All dimensions are in mm (in) unless otherwise stated.

For standard versions of the GSI127, the housing is completely gray in color.

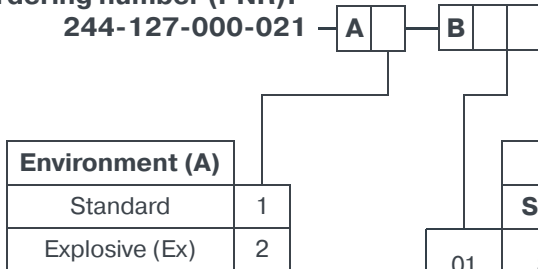
For Ex approved versions of the GSI127, the housing is gray in color but with a screw-terminal connector (top) for sensor-side signals (electrical connections) that is blue in color.

ORDERING INFORMATION

To order please specify

Type	Designation	Part number (PNR)
GSI127	Galvanic separation unit	See below

Ordering number (PNR):
244-127-000-021



	Transfer function (B)		
	Sensitivity	Zero	Description
01	Standard	5 mA → 7 V	For use with vibro-meter CExxx with a current output ¹
02	1 V/mA	12 mA → 7 V 13 mA → 8 V	For use with vibro-meter IPCxxx or VE210 with a current output ²
03	3.2 V/mA	15 mA → 0 V	For use with vibro-meter IQS90x (or IQS4xx) with a current output ³
04	1 V/V	---	For use with vibro-meter IPCxxx with a voltage output ⁴
05	-1 V/V	---	For use with vibro-meter IQS90x (or IQS4xx) or VE210 with a voltage output ⁵
11	0.5 V/mA	---	For use with vibro-meter IQS91x or industry-standard 4 to 20 mA loop-powered sensors/transmitters ⁶
21	1 V/V	---	For use with industry-standard IEPE sensors ⁷

Notes

1. Only CExxx piezoelectric accelerometers with a current output signal require a GSI127. For example, CE134, CE281 and CE31x piezoelectric accelerometers.
2. A IPCxxx signal conditioner or VE210 velocity sensor with a current output signal is typically used for signal transmission over longer distances. For example, IPC707. Note: For a IPC707 without diagnostics, the nominal current output signal (DC) is 12 mA (→ 7 V). For a IPC707 with diagnostics, the nominal current output signal (DC) is 13 mA (→ 8 V). Refer to the IPC707 data sheet for further information.
3. A IQS90x (or IQS4xx) signal conditioner with a current output signal is typically used for signal transmission over longer distances. For example, IQS900.
4. A IPCxxx signal conditioner with a voltage output signal is typically used for signal transmission over shorter distances. For example, IPC707. Note: For a IPC707 without diagnostics, the nominal voltage output signal (DC) is 7 V. For a IPC707 with diagnostics, the nominal voltage output signal (DC) is 8 V. Refer to the IPC707 data sheet for further information.
5. A IQS90x (or IQS4xx) signal conditioner or VE210 velocity sensor with a voltage output signal is typically used for signal transmission over shorter distances. For example, IQS900.
6. For use with IQS910 signal conditioner ("transmitter" with a 4 to 20 mA current-loop signal) or industry-standard 4 to 20 mA loop-powered sensors, that is, current-loop sensors/transmitters. For example, CE687 and PV685 vibration sensors.
7. For use with industry-standard IEPE (integrated electronics piezo electric) sensors, that is, constant-current voltage-output sensors. For example, CE620, CE630 and PV660 vibration sensors.

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Parker Meggitt joined the Parker Aerospace Group in September 2022 following the successful acquisition of Meggitt PLC, a world leader in aerospace, defense and energy. This includes the Meggitt facility in Fribourg, Switzerland, operating as the legal entity Meggitt SA (formerly Vibro-Meter SA). Accordingly, the vibro-meter® product line is now owned by Parker.



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