



VE210

Velocity transducer for low-frequency measurements

FEATURES

- » From the Vibro-Meter® product line
- » Low-frequency compensation allows frequency response down to 0.5 Hz (-3 dB)
- » Voltage or current modulated output signal
- » No need for additional signal conditioner
- » Long-distance signal transmission with a GS1127 galvanic separation unit
- » Any transducer mounting orientation
- » Top-mounted military-standard connector
- » Fully sealed transducer: IP68 protection rating
- » Temperature range:
-25 to 80°C

APPLICATIONS

- » Designed for vibration monitoring on low-speed machines
- » Suitable for hydraulic and steam turbine applications

DESCRIPTION

The VE210 velocity transducer is designed to measure absolute vibration at low-frequencies. With a frequency response down to 0.5 Hz, it is suitable for the special monitoring requirements of hydraulic turbomachinery which generally operate at low speeds (for example, between 60 and 1000 RPM for hydroelectric turbines).

The body of the VE210 transducer includes the signal conditioner electronics, so only an EC4xx cable



VE210



assembly is required to connect the power supply to the transducer and connect the transducer's output directly to the monitoring electronics.

Good sensitivity and rugged design make the VE210 suitable for all types of low-speed industrial machinery. Its stainless steel casing and watertight sealed connector allow it to withstand damp and corrosive environments.



Information contained in this document may be subject to Export Control Regulations of the European Union, USA or other countries. Each recipient of this document is responsible for ensuring that transfer or use of any information contained in this document complies with all relevant Export Control Regulations. ECN N/A.

DESCRIPTION *(continued)*

The VE210 transducer's sensing element consists of a coil moving around a permanent magnet. This assembly produces an output voltage that is proportional to the vibration velocity.

The integrated signal conditioner contains electronic circuitry that provides low-frequency compensation that allows the transducer to operate below its resonant frequency. It also provides current-based or voltage-based output signals (factory configurable).

Current transmission (2-wire) can be used to transmit signals over a distance of up to 1000 m. With a current output, the VE210 transducer transmits the signal to a GSI127 galvanic separation unit, which provides effective insulation from differences in earth potential of up to 4 kV. Voltage transmission (3-wire) can be used to transmit signals over a distance of up to 200 m.

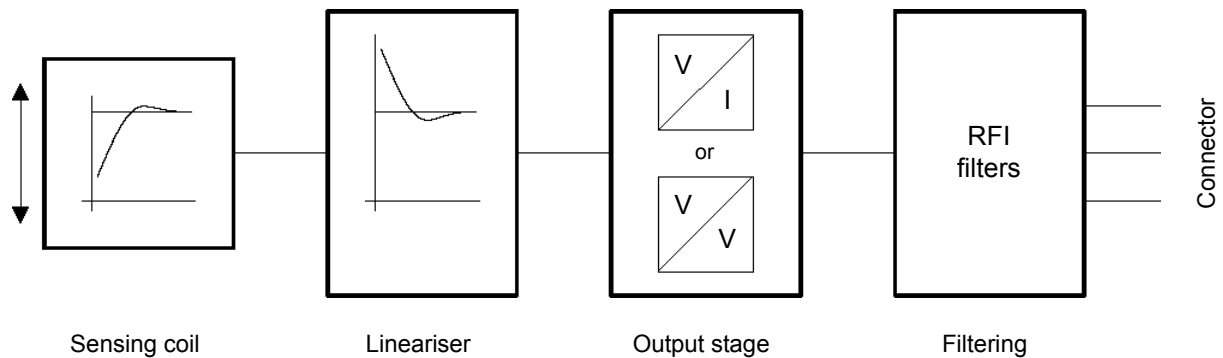
The EC4xx cables are available in lengths from 0.5 m, either with or without a flexible stainless steel hose (protection tube) for additional mechanical protection.

The EC439 is a 2-wire cable for current transmission and the EC440 is a 3-wire cable for voltage transmission. In very harsh industrial environments, the VE210 should be installed using an EC4xx with a flexible hose.

An optional TA114 mounting adaptor is also available to rigidly clamp the transducer to the machinery being monitored.

For specific applications, contact your nearest Meggitt Sensing Systems representative.

BLOCK DIAGRAM



SPECIFICATIONS

General

- Operating principle : Moving coil and magnet with integrated signal conditioner. See the **Block diagram** above.
- Signal processing technique : Low-frequency compensation by the integrated signal conditioner allows the VE210 to operate below its resonant frequency
- Directionality : Sensitive to vibration along the longitudinal axis (long axis) only
- Signal transmission : Current modulated or voltage modulated output

Operating

Sensitivity

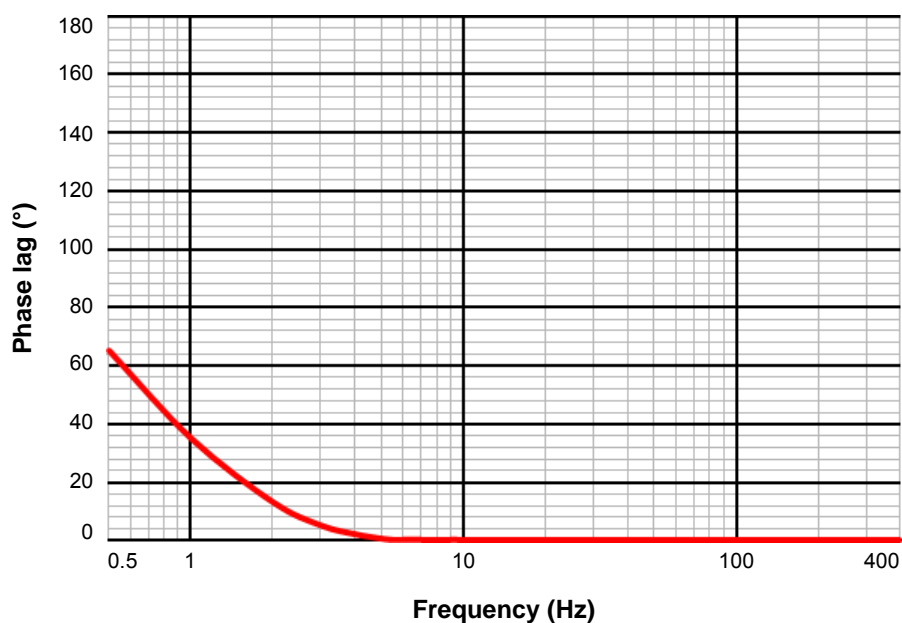
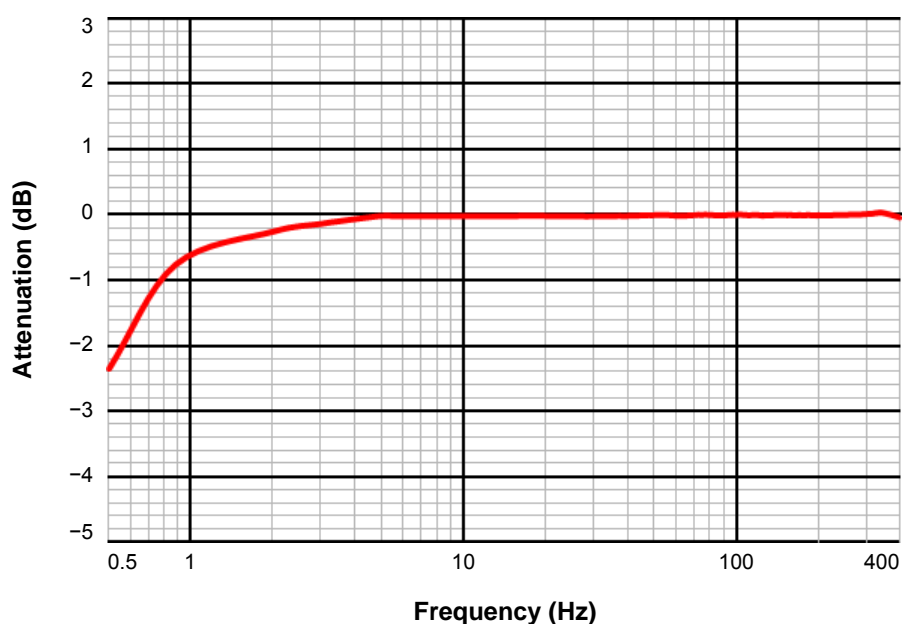
- *Current (2-wire) transmission* : 50 $\mu\text{A}/\text{mm/s}$ (1270 $\mu\text{A}/\text{in/s}$) $\pm 5\%$
- *Voltage (3-wire) transmission* : 50 $\text{mV}/\text{mm/s}$ (1270 $\text{mV}/\text{in/s}$) $\pm 5\%$

Notes: Sensitivity is given at 23°C $\pm 5^\circ\text{C}$ (73°F $\pm 9^\circ\text{F}$) for a signal of 12.7 mm/s (0.5 in/s) at 120 Hz. The VE210 is calibrated along the longitudinal axis.

SPECIFICATIONS *(continued)*

Amplitude linearity	: $\pm 1\%$ from 1 to 10 mm/s. : $\pm 2\%$ from 10 to 100 mm/s.
Dynamic measuring range	: 100 mm/s peak from 0.5 to 400 Hz
Overload capacity (spikes)	: 100 g peak
Transverse sensitivity	: 5% max. of response along sensitive axis
Frequency range	: 0.5 to 400 Hz
Frequency response	: -30% / $+5\%$ from 0.5 to 3 Hz. : $\pm 5\%$ from 3 to 400 Hz.

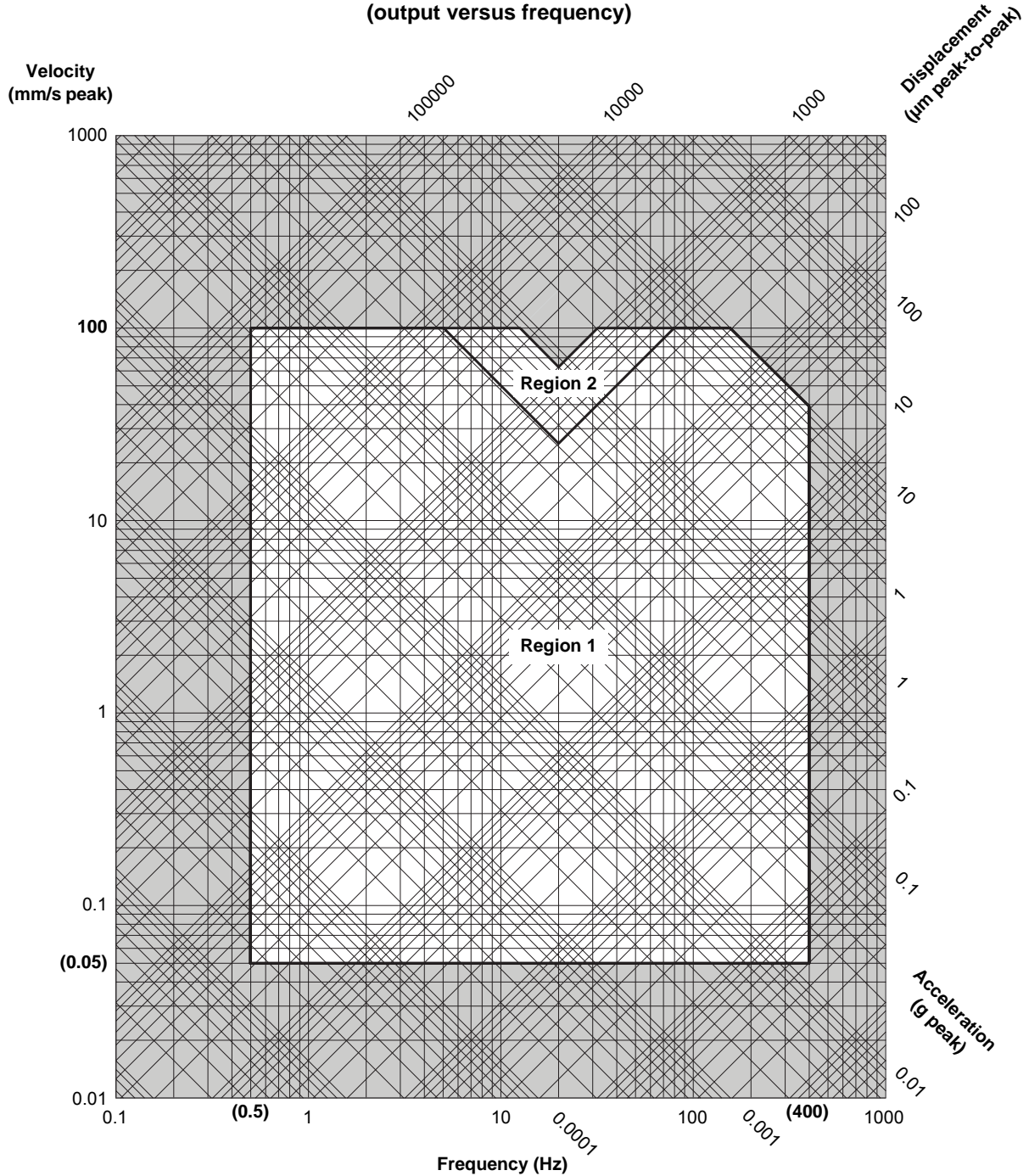
Typical frequency response curves



SPECIFICATIONS (continued)

Operating regions

VE210 operating regions
(output versus frequency)



Notes

The operating region of a VE210 depends on its mounting orientation, as follows:

- Regions 1 and 2: A VE210 mounted horizontally has a slightly larger operating region that includes both Region 1 and Region 2 (see above).
- Region 1: A VE210 mounted vertically has a slightly smaller operating region that includes Region 1 only (see above).

SPECIFICATIONS *(continued)***Environmental**

Temperature

- *Operating* : -25 to 80°C (-13 to 176°F)
- *Short-term survival* : Up to 100°C (212°F)
- *Storage* : -40 to 100°C (-40 to 212°F)

Humidity

: Hermetically sealed

Protection rating

: IP68

(according to IEC 60529)

Shock acceleration

: 100 g peak (half sine-wave, 1 ms duration)

(according to IEC 60068-2-27)

Approvals

Conformity

: CE marking, European Union (EU) declaration of conformity

Electromagnetic compatibility

: EN 61000-6-2:2005.
EN 61000-6-4:2007 + A1:2011.

Electrical safety

: EC 61010-1:2010

Environmental management

: RoHS compliant (2011/65/EU)

Mechanical characteristics

Material

: Stainless steel casing

Mounting

- *Mounting base*

: M8 x 10 mm tapped hole or mounting adaptor.
See **TA114 mounting adaptor on page 10**.

- *Mounting orientation*

: Can be mounted in any direction.
See **Mounting restraints on page 5**.

Connector

: Rugged circular, threaded-ring, 3-pin connector with a watertight seal
(EN 2997 series aerospace standard)

Dimensions

: See **Mechanical drawings on page 7**

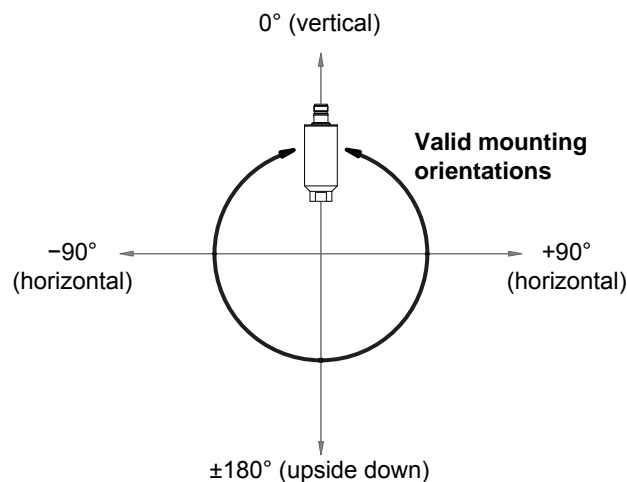
Weight

: 400 g (14 oz) approx.

Mounting restraints

Allowed mounting orientation

: Can be mounted in any direction, as shown in the drawing below



Note: The mounting orientation of a VE210 affects its operating region (see **Operating regions on page 4**).

SPECIFICATIONS (continued)

Signal transmission

Current output	: 2-wire transmission supports distances up to 1000 m, with a GSI127 galvanic separation unit
• Sensitivity	: 50 μ A/mm/s
• Dynamic range	: ± 5 mA max.
• Standing current	: 12 mA \pm 1 mA
• Impedance (at 100 Hz)	: ≥ 100 k Ω
Voltage output	: 3-wire transmission supports distances up to 200 m
• Sensitivity	: 50 mV/mm/s
• Dynamic range	: ± 5 V max.
• Standing voltage	: $-7.5 V_{DC} \pm 5\%$
• Impedance (at 100 Hz)	: 1 k Ω

Power supply

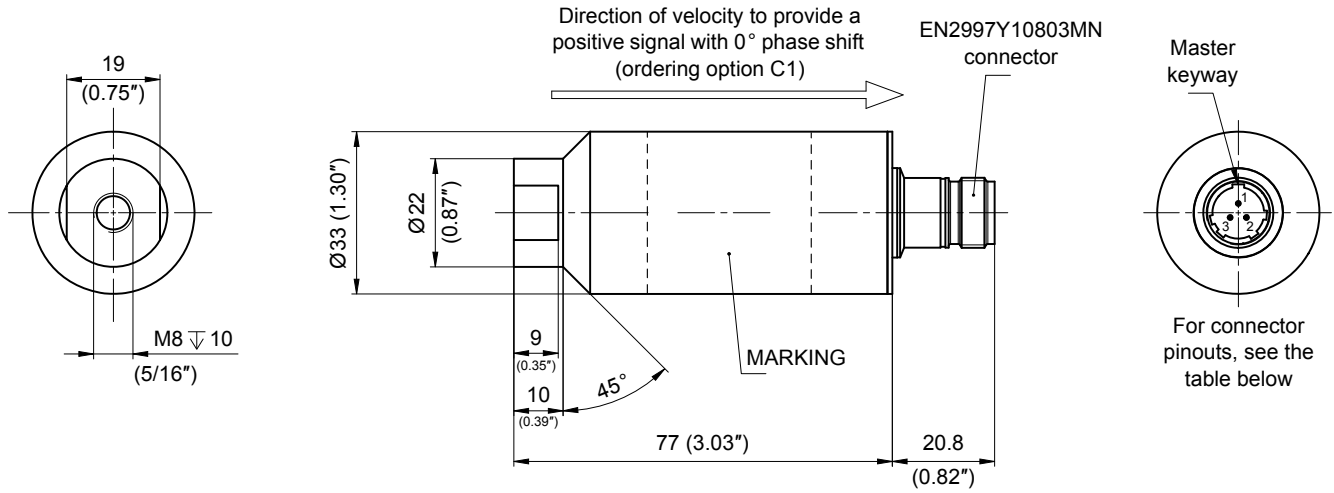
Voltage	: $-24 V_{DC} \pm 25\%$ (-18 to $-30 V_{DC}$)
Current	:
• Current (2-wire) transmission	: ≤ 17 mA
• Voltage (3-wire) transmission	: 7 mA typ.

Cable assemblies

Cable length	: User-specified lengths from 0.5 m. See Mechanical drawings on page 7.
Cable type	
• EC439	: 2-wire cable (K341) for current transmission
• EC440	: 3-wire cable (K341) for voltage transmission
Temperature range	: -50 to 120°C (-58 to 248°F)
Connector	: Rugged circular, threaded-ring, 3-pin connector to mate with the VE210 (EN 2997 series aerospace standard)
Optional protection	: The flexible stainless steel hose (protection tube) provides additional mechanical protection, but is not leak-tight

MECHANICAL DRAWINGS

VE210 velocity transducer



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

Connector pinouts

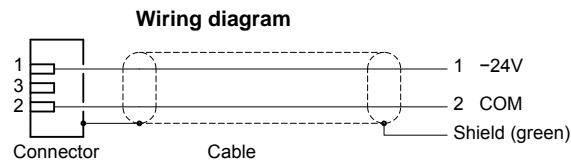
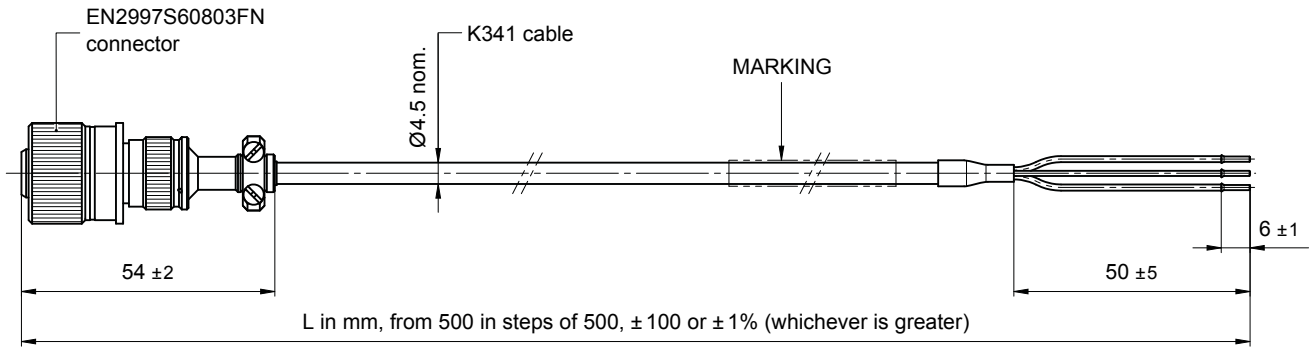
Pin	Signal transmission	
	Current (2-wire)	Voltage (3-wire)
1	Power supply and signal output	Power supply
2	COM	COM
3	---	Output signal

MECHANICAL DRAWINGS (continued)

EC439 cable assembly

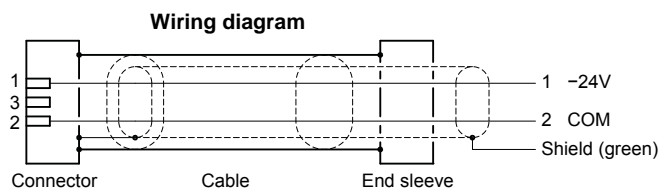
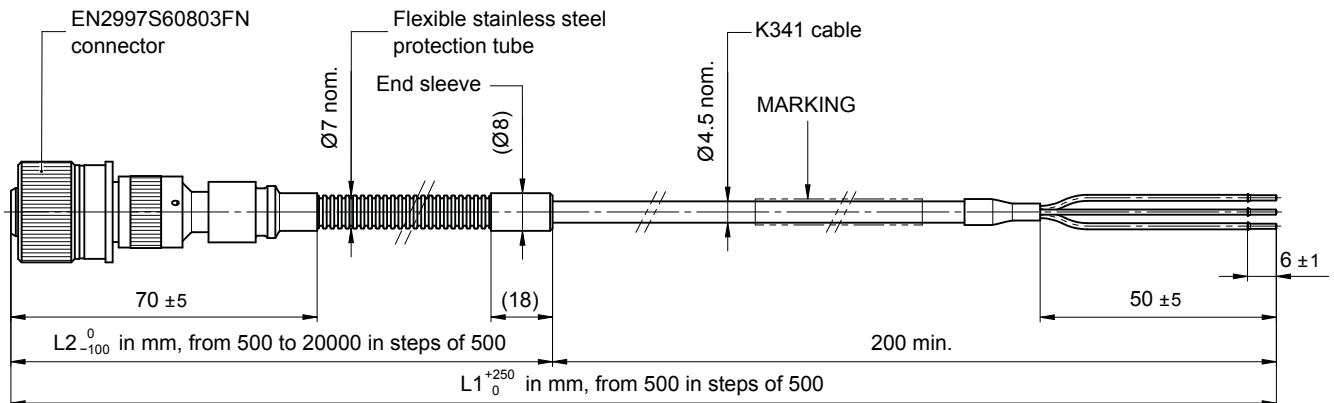
EC439 cable assembly without a flexible hose (protection tube)

Ordering number: 922 - 439 - 000 - 001



EC439 cable assembly with a flexible hose (protection tube)

Ordering number: 922 - 439 - 000 - 101



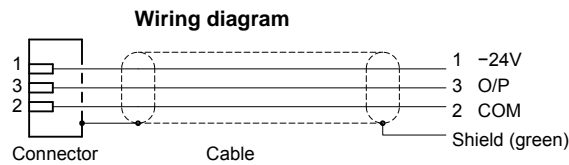
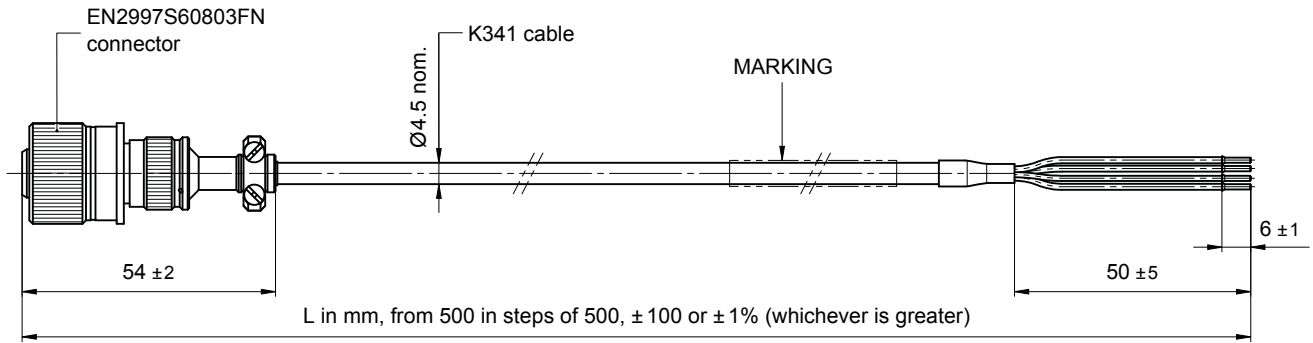
Note: All dimensions are in mm (in) unless otherwise stated.

MECHANICAL DRAWINGS (continued)

EC440 cable assembly

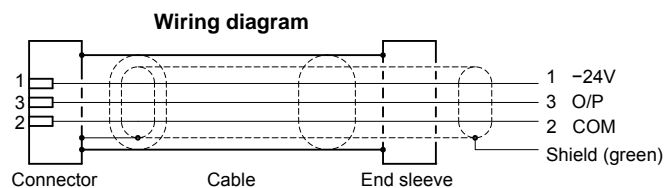
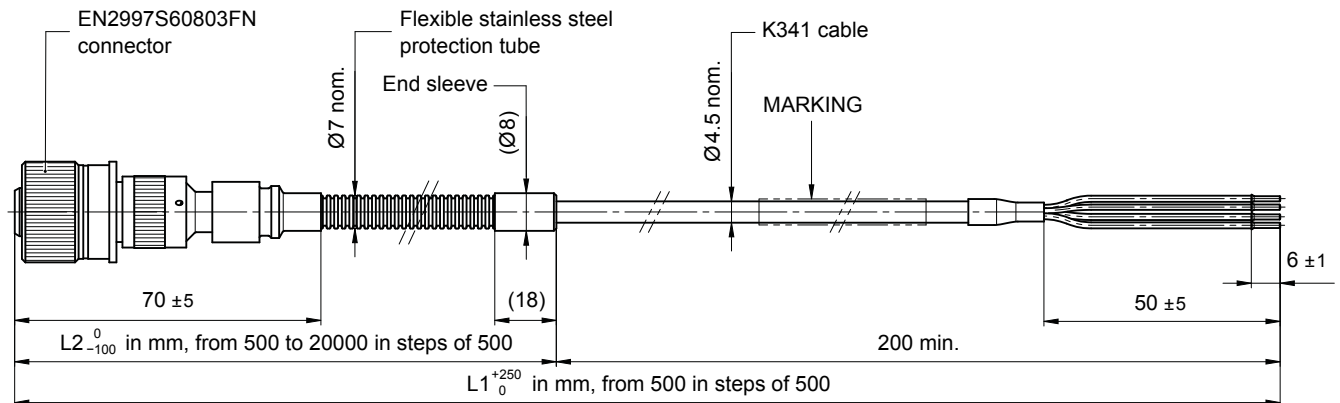
EC440 cable assembly without a flexible hose (protection tube)

Ordering number: 922 - 440 - 000 - 001



EC440 cable assembly with a flexible hose (protection tube)

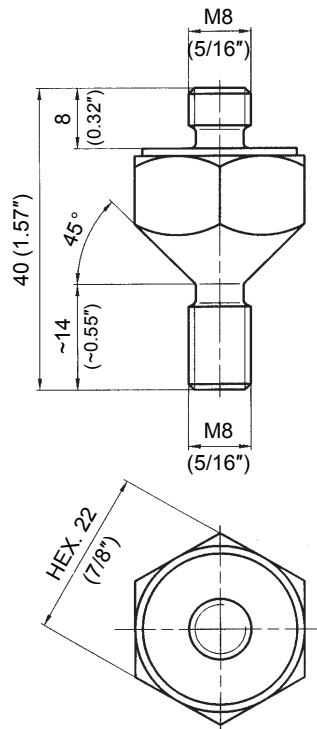
Ordering number: 922 - 440 - 000 - 101



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

MECHANICAL DRAWINGS (continued)

TA114 mounting adaptor



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

ORDERING INFORMATION

To order please specify

Type	Designation	Ordering number
VE210	Velocity transducer	See below

Ordering number: 410 - 210 - 000 - 012 - **A** - **B** - **C**

Environment (A)	
Standard	1

Phase shift (C)	
0°	1
180°	2

Signal transmission	Sensitivity (B)	
Current output (2-wire)	50 µA/mm/s	1
Voltage output (3-wire)	50 mV/mm/s	2

EC439	2-wire cable assembly for current transmission	922-439-000-001 922-439-000-101
	– without a flexible hose (protection tube) – with a flexible hose (protection tube). Refer to sales drawings 922-439-000D001 and 922-439-000D101. Note: Cable length must be specified when ordering.	
EC440	3-wire cable assembly for voltage transmission	922-440-000-001 922-440-000-101
	– without a flexible hose (protection tube) – with a flexible hose (protection tube). Refer to sales drawings 922-440-000D001 and 922-440-000D101. Note: Cable length must be specified when ordering.	
TA114	Mounting adaptor	800-114-000-01

Headquartered in the UK, Meggitt PLC is a global engineering group specializing in extreme environment components and smart sub-systems for aerospace, defence and energy markets.

Meggitt Sensing Systems is the operating division of Meggitt specializing in sensing and monitoring systems, which has operated through its antecedents since 1927 under the names of ECET, Endevo, Ferroperm Piezoceramics, Lodge Ignition, Sensorex and Vibro-Meter. Today, these operations are integrated under one strategic business unit called Meggitt Sensing Systems, headquartered in Switzerland and providing complete systems, using these renowned brands, from a single supply base.

The Meggitt Sensing Systems facility in Fribourg, Switzerland was formerly known as Vibro-Meter SA, but is now Meggitt SA. This site produces a wide range of vibration and dynamic pressure sensors capable of operation in extreme environments, leading-edge microwave sensors, electronics monitoring systems and innovative software for aerospace and land-based turbo-machinery.



All statements, technical information, drawings, performance rates and descriptions in this document, whilst stated in good faith, are issued for the sole purpose of giving an approximate indication of the products described in them, and are not binding on Meggitt SA (Meggitt Sensing Systems) unless expressly agreed in writing. Before acquiring this product, you must evaluate it and determine if it is suitable for your intended application. You should also check our website at www.meggittsensing.com/energy for any updates to data sheets, Ex certificates, product drawings, user manuals, service bulletins and/or other instructions affecting the product. Unless otherwise expressly agreed in writing with Meggitt SA, you assume all risks and liability associated with use of the product. Any recommendations and advice given without charge, whilst given in good faith, are not binding on Meggitt SA.

Meggitt SA (Meggitt Sensing Systems) takes no responsibility for any statements related to the product which are not contained in a current Meggitt Sensing Systems publication, nor for any statements contained in extracts, summaries, translations or any other documents not authored and produced by Meggitt SA. Meggitt SA reserves the right to alter any part of this publication without prior notice.

In this publication, a dot (.) is used as the decimal separator and thousands are separated by thin spaces. Example: 12345.67890.

Sales offices

Your local agent

Head office

Meggitt Sensing Systems has offices in more than 30 countries. For a complete list, please visit our website.

Meggitt SA
Route de Moncor 4
PO Box 1616
1701 Fribourg
Switzerland

Tel: +41 26 407 11 11
Fax: +41 26 407 13 01

energy@ch.meggitt.com
www.meggittsensing.com/energy



ISO 9001
FS 584089



ISO 14001
BUREAU VERITAS
Certification