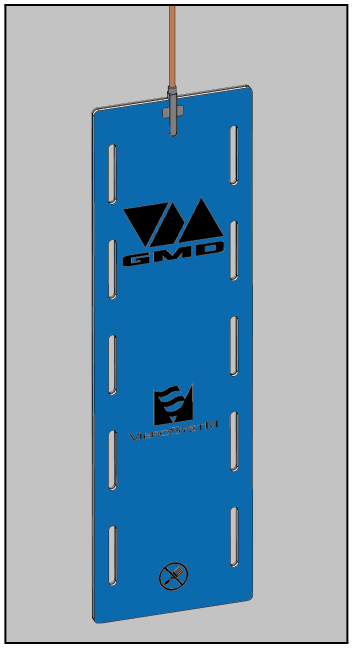
VMGMD

U.S. Patent No. 11125795

For Capacitive Air Gap Measuring Chains

Gearless Mill Drive



The VM™GMD sensor is designed with a thin body and a wide measuring range that allows monitoring of small and large air gaps.

VMGMD air gap sensors are easy to install without removing the rotor or poles. These sensors are resistant to chemicals and solvents commonly used during installation. During operation, they are immune from strong magnetic fields, carbon dust, and deposits of oil.

Each VMGMD air gap measuring chain is composed of a passive, non-contact capacitive sensor that measures the distance between its surface and a metallic target. The raw signal picked up by the sensor is sent to a conditioner through a triaxial extension cable to be converted into a linearized 4 to 20 mA signal. Different measuring ranges are available to adapt to different machine air gaps.

GENERAL SPECIFICATIONS

Sensors

Operation

• Measurement type	Non-contact proximity, capacitive technology

Connection

• Integral cable	Triaxial with grounding wire assembly
• Connector	
Triaxial integral cable	Male, gold-plated SMA

Environmental

• Operating temperature range	0 to 125°C [32 to 257°F]
• Absolute maximum temperature	155°C [311°F] [1]
• Resistance to industrial chemicals and solvents	Very good [2]
• Magnetic field immunity	Up to 2 Tesla
• Dust and oil contamination	Films have no effect
• Humidity	Up to 95%, non-condensing

Physical Characteristics

• Sensor material	Glass reinforced laminates
• Triaxial cable material	PVDF over FEP jacket / Teflon® insulation

Extension Cables

Connection

• Cable type	Triaxial
• Absolute minimum length	19 m [62.3 ft]
• Connectors	
Sensor side	Female, gold-plated SMA and grounding terminal
Conditioner side	Male, gold-plated SMA and grounding terminal
• Minimum bending radius	10 cm [4 in]

Environmental

- Operating temperature range — 0 to 125°C [32 to 257°F]

Physical Characteristics

- Type H cable material — FEP Jacket / FEP Insulation

LIN™-300 Series Conditioner

Power Requirements

- Voltage — 24 Vdc ±15%
- Consumption — 120 mA max.
- Warm-up time — 30 minutes

Connection

- Power/Output — 5-pin M12 male
- Sensor input — Female, gold-plated SMA and grounding terminal

Environmental

- Temperature range
  - Operating — 0 to 55°C [32 to 131°F]
  - Storage (measuring chain) — -25 to 70°C [-13 to 158°F]

Physical Characteristics

- Body — Nickel-plated aluminum
- Mounting — 4 oblong holes for #6 (M3.5) screws
- Max. torque on SMA — 1.1 Nm [10 in-lb]
- Status indicator — Bicolor LED

MEASURING CHAINS TECHNICAL SPECIFICATIONS

At room temperature, unless otherwise noted

Sensor	VMGMD
Nominal measuring range	2 to 42 mm [79 to 1654 mils]
Sensor integral cable length	0.5 m [19.7 in]
Extension cable nominal length	Type H: 20 m [65.6 ft]
Conditioner model	LIN-3GMD-20H-2/42
Output	4 to 20mA
Load at output	500 Ω max.
Bandwidth	DC to 1.2 kHz (-3 dB)
Sensitivity	0.4 mA/mm [10.2 µA/mil]
Accuracy	See figure 1
Repeatability (% of reading)	± 0.3 %
Maximum temperature drift *(Standard installation and under normal mill operation conditions)*	± 2% (at mid-range)

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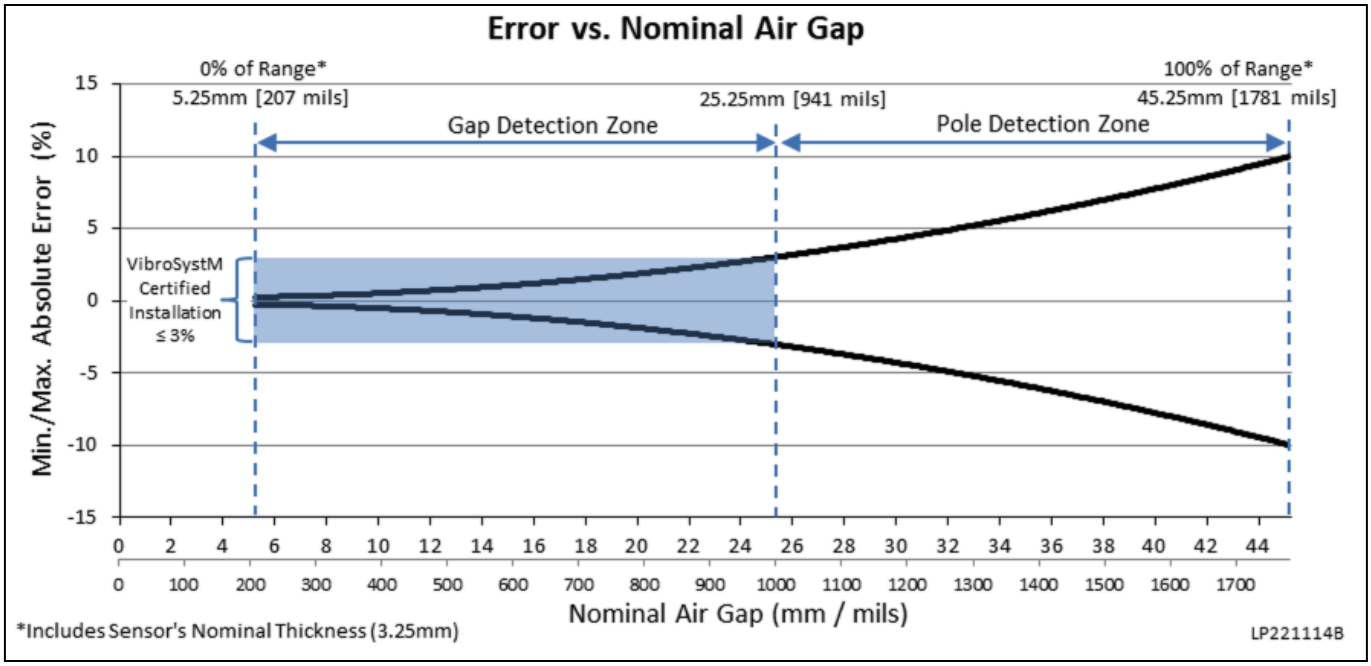
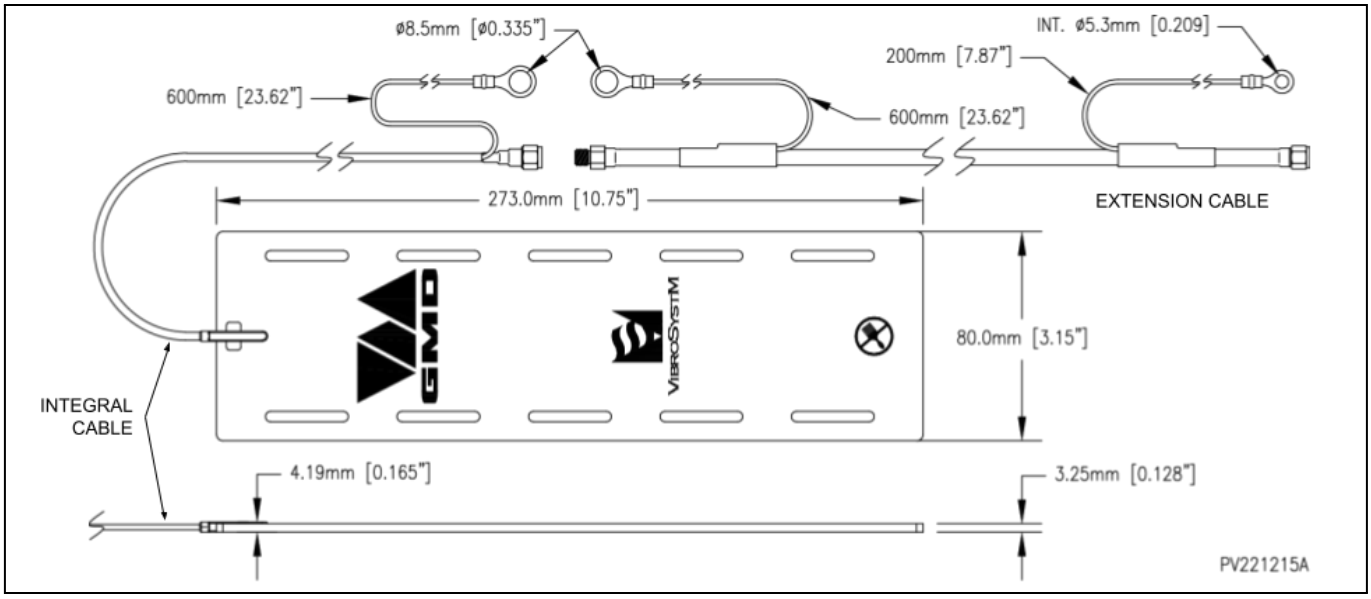
Figure 1: LIN-3GMDAF-20H-2/42 Measuring Chain

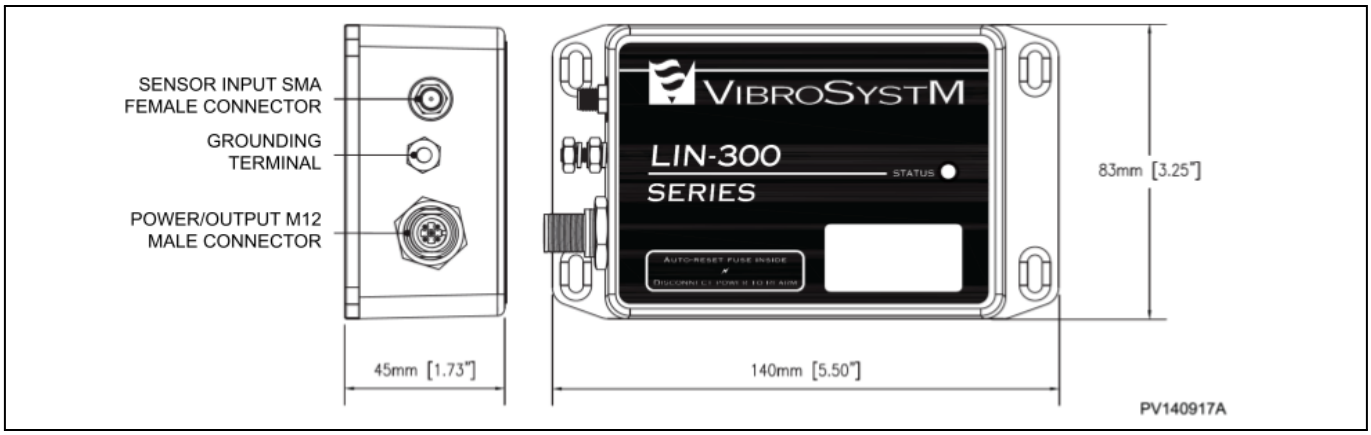


VMGMD MEASURING CHAINS OVERVIEW

VMGMD Sensor with Extension Cable



LIN-300 Series Conditioner



PRODUCT INFORMATION

Product Number	Description
LIN-3GMD-20H-2/42 Measuring Chain	
VSM-VMGMDAF	VMGMD air gap sensor (2-42 mm)
VSM-L3GMDAF-20H-2/42	LIN-3GMD-20H-2/42 conditioner (2-42 mm)
VSM-CBL-GMDAF-20H	Cable / Triaxial GMD - SMA/SMA / (20 m/65.6 ft)

[1] *Applicable to the sensor body in the event of a fault, for a short period of time (<3h per event). If left continuously at temperature above operating range, premature aging of the sensor will occur.*

[2] *Compatible with acetone, alcohol isopropyl, and paint thinner. Do not soak or submerge. Tests any other product on a small area of the sensor before using it. If in doubt, contact VibroSystM for support.*