VM3 AIRFLOW

U.S. Patent No. 11125795

For Capacitive Air Gap Measuring Chains

VM™ AIRFLOW sensors are designed with apertures, thus limiting obstruction of the ventilation holes. This combination of holes makes it possible to adapt to different machine stator designs, and let cooling air pass efficiently through each sensor.

VM3 AIRFLOW 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 VM3 AIRFLOW 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.

GENERAL SPECIFICATIONS

Sensors

Operation

• Measurement type	Non-contact proximity, capacitive technology

Connection[1]

• Integral cable	Coaxial
• Connector	Male, gold-plated SMA

Environmental

• Operating temperature range	0 to 125°C [32 to 257°F]
• Absolute maximum temperature	155°C [311°F] [2]
• Resistance to industrial chemicals and solvents	Very good [3]
• Magnetic field immunity	Up to 2 Tesla (50 or 60 Hz)
• Dust and oil contamination	Films have no effect
• Humidity	Up to 95%, non-condensing

Physical Characteristics

• Sensor material	Glass reinforced laminates
• Cable material	PVDF over FEP jacket / FEP insulation

Extension Cables

Connection

• Cable type	Triaxial
• Absolute minimum length	Nominal minus 0.5 m [19.7 in]
• 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 75°C [32 to 167°F]

Physical Characteristics

- Type S cable material — PVC Jacket / PE Insulation

LIN™-300 Conditioner

Power Requirements

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

Connection

- Sensor input — Female, gold-plated SMA and grounding terminal
- Power/Output — 5-pin M12 male
- Maximum cable length - power / output cable — 300m [984 ft]

Environmental

- Operating temperature range — 0 to 55°C [32 to 131°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

[1] ***Warning***: *Due to their small size, the coaxial cable and SMA connector are delicate components and must be handled with the utmost care.*

[2] *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.*

[3] *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.*

MEASURING CHAINS TECHNICAL SPECIFICATIONS

At room temperature, unless otherwise noted

Sensor	VM3 AIRFLOW
Nominal measuring range	1 to 20 mm [39 to 787 mils]
Sensor integral cable length	0.7 m [27.5 in]
Extension cable nominal length	Type S: 10 m [32.8 ft]
Conditioner model	LIN-33AF-10S-1/20
Output	4 to 20mA
Load at output	500 Ω max.
Bandwidth	DC to 1.2 kHz (-3 dB)
Sensitivity	0.842 mA/mm [21.4 µA/mil]
Accuracy	See figure 1
Repeatability (% of reading)	± 0.3 %
Maximum temperature drift *(From 25°C [77°F] to 70% of maximum operating range of all 3 components)*	± 2% (at mid-range)

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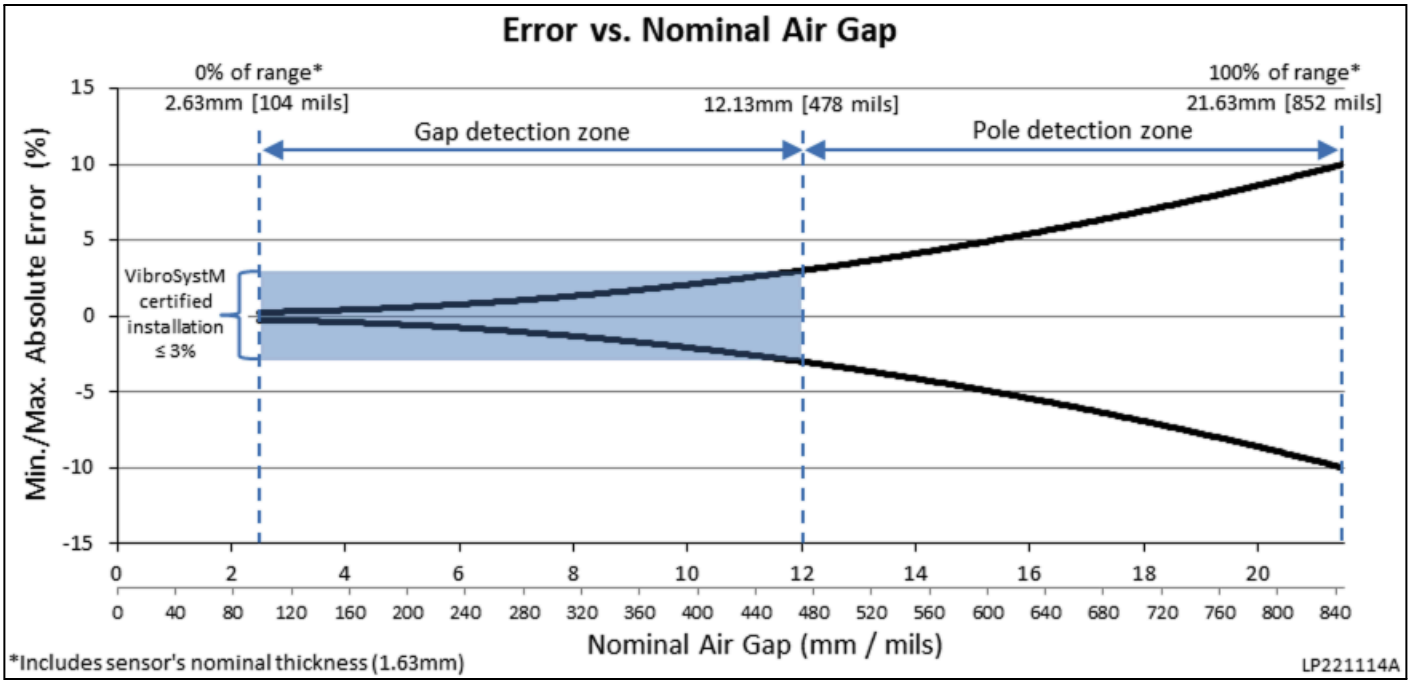
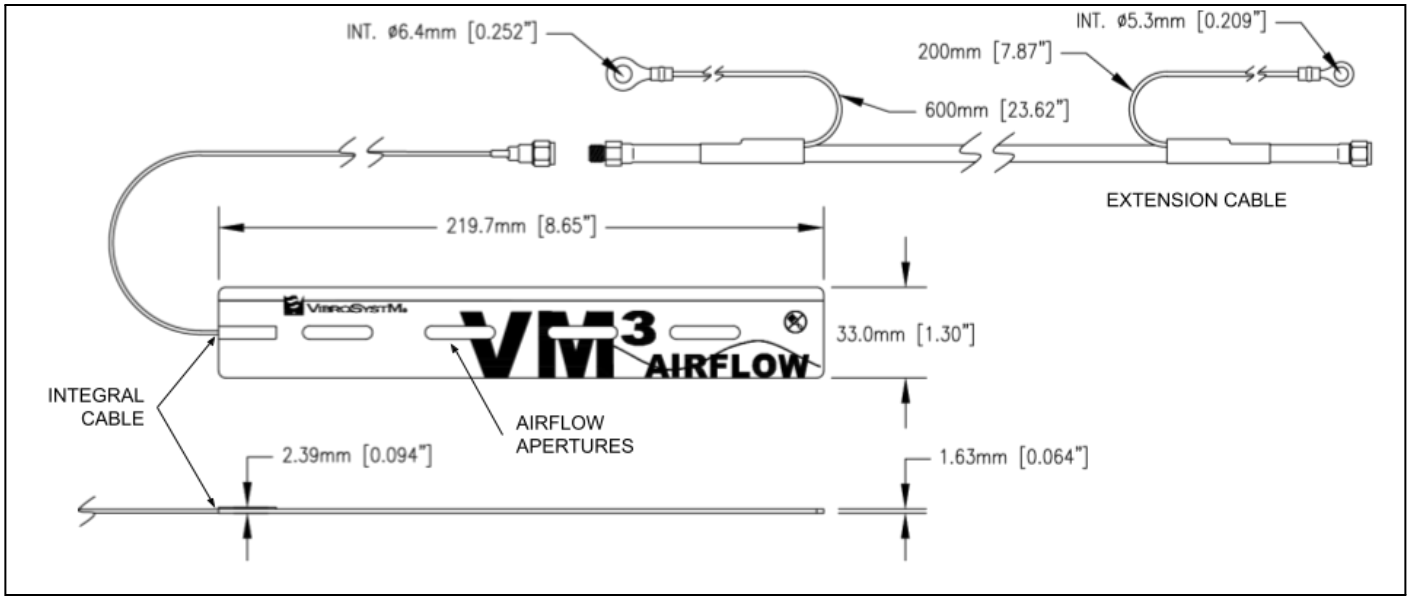
Figure 1: LIN-33AF-10S-1/20 Measuring Chain

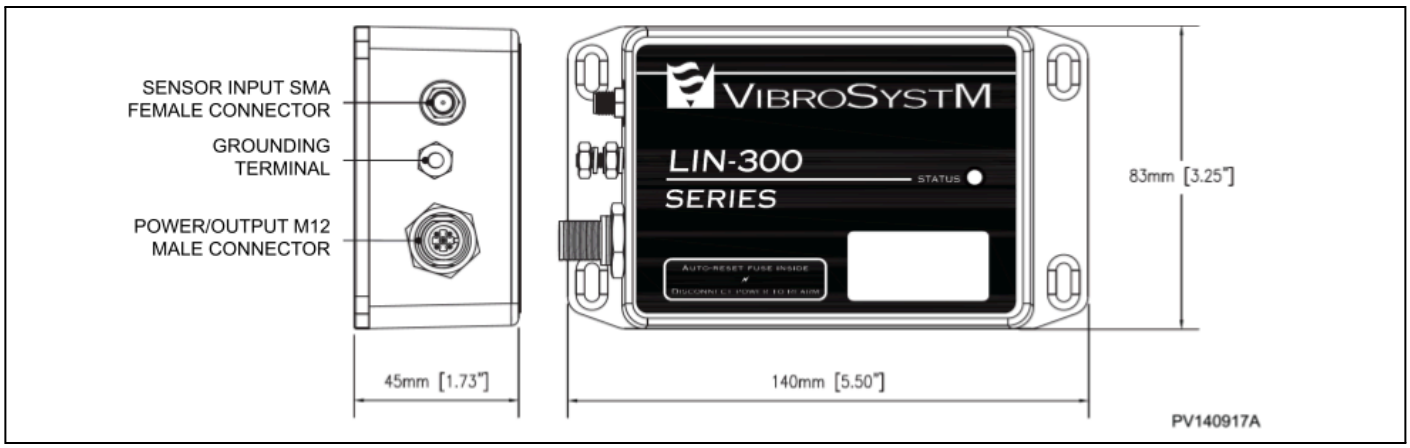


VM AIRFLOW MEASURING CHAINS OVERVIEW

VM3 AIRFLOW Sensor with Extension Cable

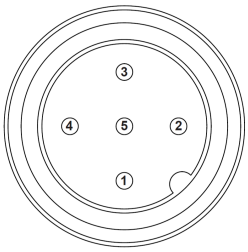


LIN-300 Series Conditioner



M12 CONNECTOR PINOUT

The following table shows the pin assignment for the A-coded, M12 male connector on the signal conditioner. The signal cable must be assembled as follows:



M12 Connector Pin	Color Code	Designation	Specifications
1	Brown	Power Supply	+24 Vdc
2	White	Current Output	4-20 mA
3	Blue	Common	0 V
4	Black	Not Used	
5	Not Used		

TRANSIT / STORAGE GENERAL CONDITIONS

Specifications valid only in original VibroSystM factory packaging.

- Transit / Short term storage (< 3 months) -20 to 60°C [-4 to 140°F], up to 95% RH, non-condensing
- Long term storage 0 to 35°C [32 to 95°F], up to 75% RH, non-condensing

PRODUCT INFORMATION

Product Number	Description
LIN-33AF-10S-1/20 AIRFLOW Measuring Chain	
VSM-VM3AF/L	VM3 AIRFLOW air gap sensor (1-20 mm)
VSM-L33AF-10S-1/20	LIN-33AF-10S conditioner (1-20 mm)
VSM-CBL-3AF-10S	Cable / Triaxial - SMA/SMA / (10 m/32.8 ft)