



## VM3 & VM5 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.

VM 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 VM 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. 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

VM3: Coaxial

VM5: Triaxial with grounding wire assembly

- Connector

Coaxial integral cable

Male, gold-plated SMA

Triaxial integral cable

Male, gold-plated SMA

#### Environmental

- Operating temperature range
- Absolute maximum temperature
- Resistance to industrial chemicals and solvents
- Magnetic field immunity
- Dust and oil contamination
- Humidity

0 to 125°C [32 to 257°F]

155°C [311°F] <sup>1</sup>

Very good <sup>2</sup>

Up to 2 Tesla (50 or 60 Hz)

Films have no effect

Up to 95%, non-condensing

#### Physical Characteristics

- Sensor material
- Cable material

Glass reinforced laminates

VM3: PVDF over FEP jacket / FEP insulation

VM5: PVDF over FEP jacket / Teflon® insulation

### Extension Cables

#### Connection

- Cable type
- Absolute minimum length

Triaxial

Nominal minus 0.5 m [19.7 in]



- Connectors
  - Sensor side
  - Conditioner side
- Minimum bending radius

Female, gold-plated SMA and grounding terminal  
Male, gold-plated SMA and grounding terminal  
10 cm [4 in]

## Environmental

- 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
- Consumption
- Warm-up time

24 Vdc ±15%  
120 mA max.  
30 minutes

### Connection

- Power/Output
- Sensor input

5-pin M12 male  
Female, gold-plated SMA and grounding terminal

## Environmental

- Temperature range
  - Continuous operation
  - Storage (measuring chain)

0 to 55°C [32 to 131°F]  
-25 to 70°C [-13 to 158°F]

## Physical Characteristics

- Body
- Mounting
- Max. torque on SMA
- Status indicator

Nickel-plated aluminum  
4 oblong holes for #6 (M3.5) screws  
1.1 Nm [10 in-lb]  
Bicolor LED

## MEASURING CHAINS TECHNICAL SPECIFICATIONS

At room temperature, unless otherwise noted

Sensor	VM3 AIRFLOW	VM5 AIRFLOW
Nominal measuring range	1 to 20 mm [39 to 787 mils]	2 to 42 mm [79 to 1654 mils]
Sensor integral cable length	0.5 m [19.7 in]	
Extension cable nominal length	Type S: 10 m [32.8 ft]	
Conditioner model	LIN-33AF-10S-1/20	LIN-35AF-10S-2/42
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]	0.4 mA/mm [10,2 µA/mil]
Accuracy	See figure 1	See figure 2
Repeatability (% of reading)	± 0.3 %	± 0.3 %
Maximum temperature drift (From 25°C [77°F] to 70% of maximum operating range of all 3 components)	± 2% (at mid-range)	± 2% (at mid-range)



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

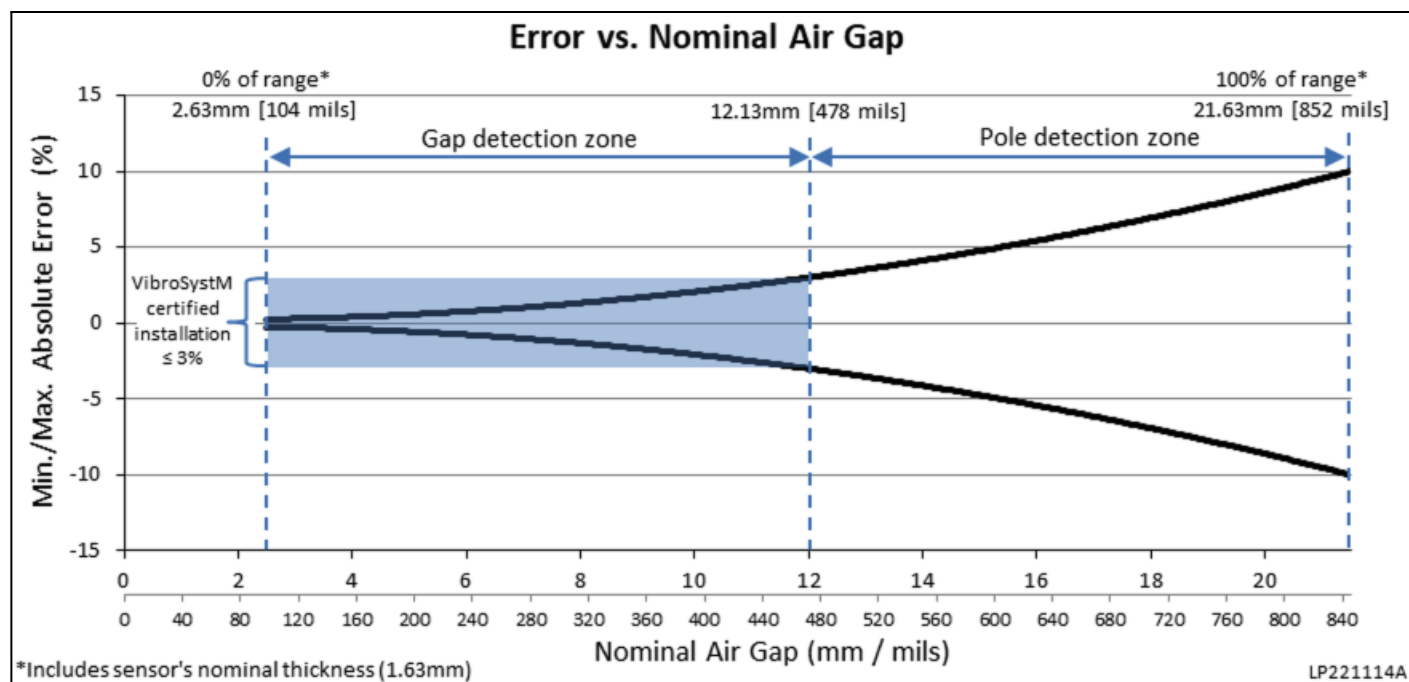
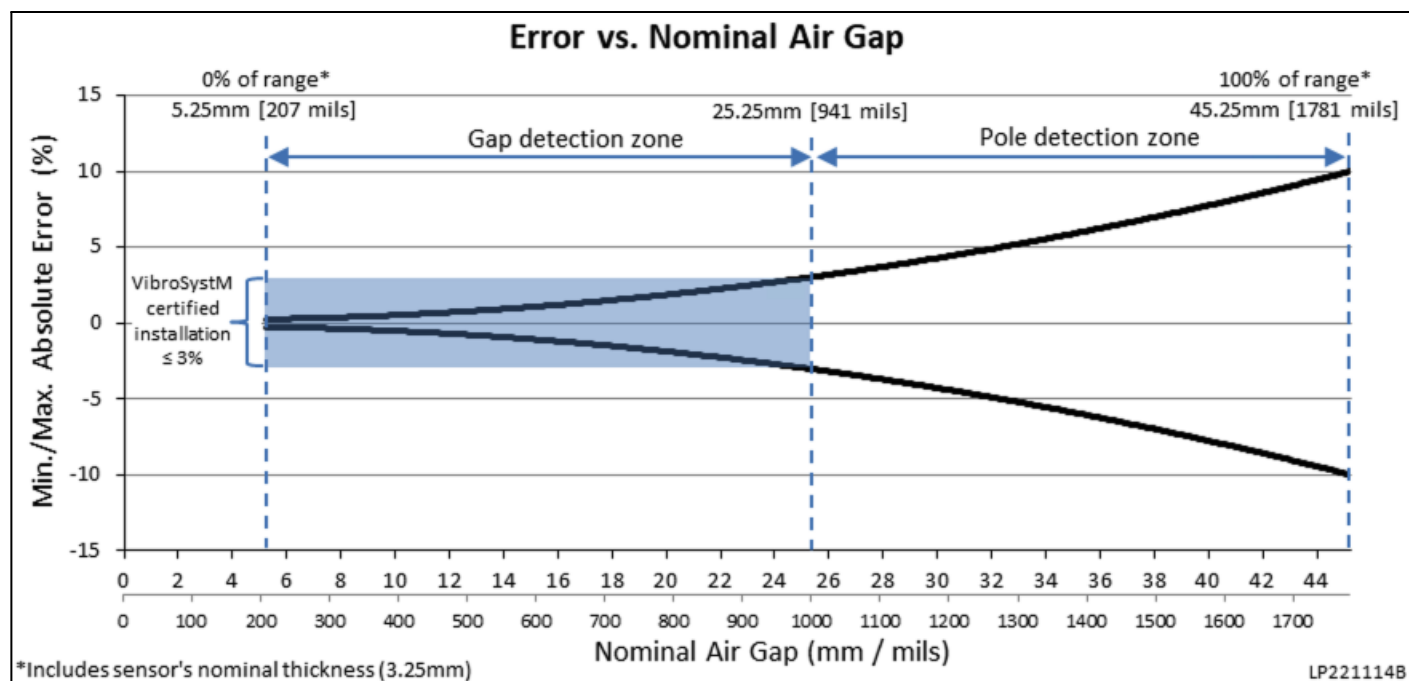


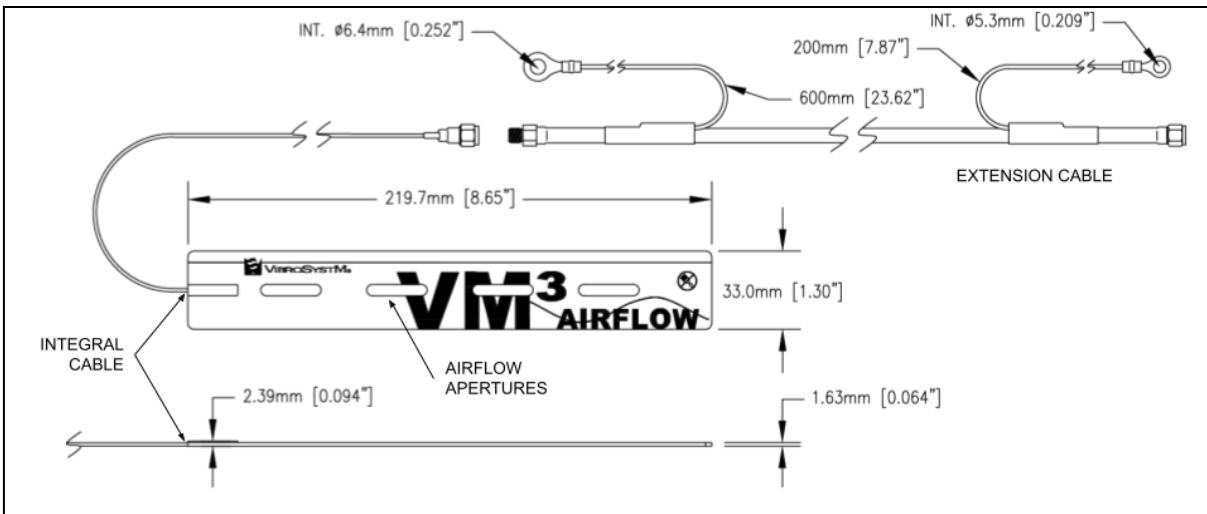
Figure 2: LIN-35AF-10S-2/42 Measuring Chain



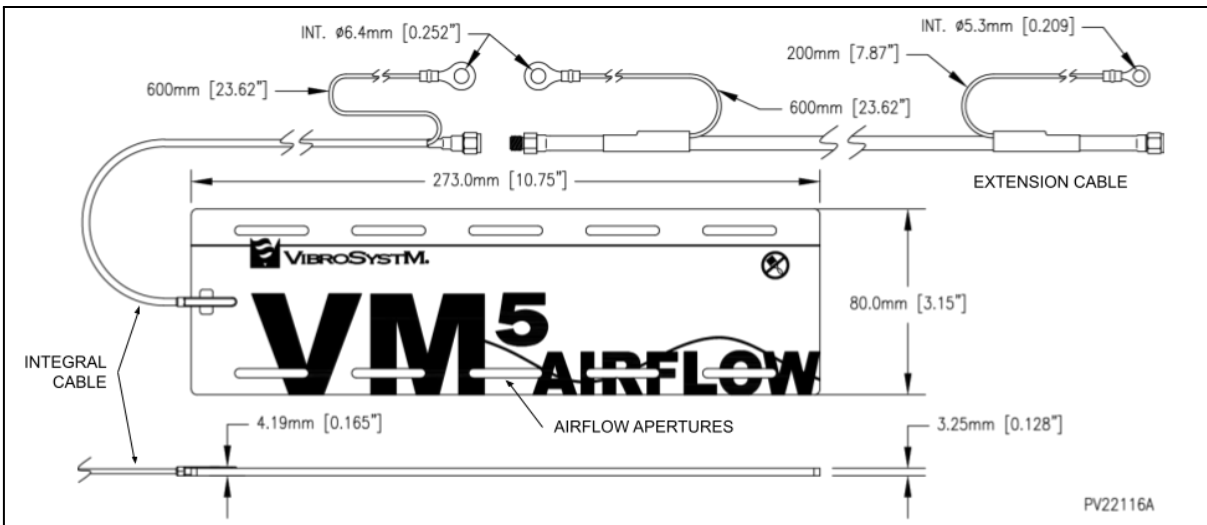


## VM AIRFLOW MEASURING CHAINS OVERVIEW

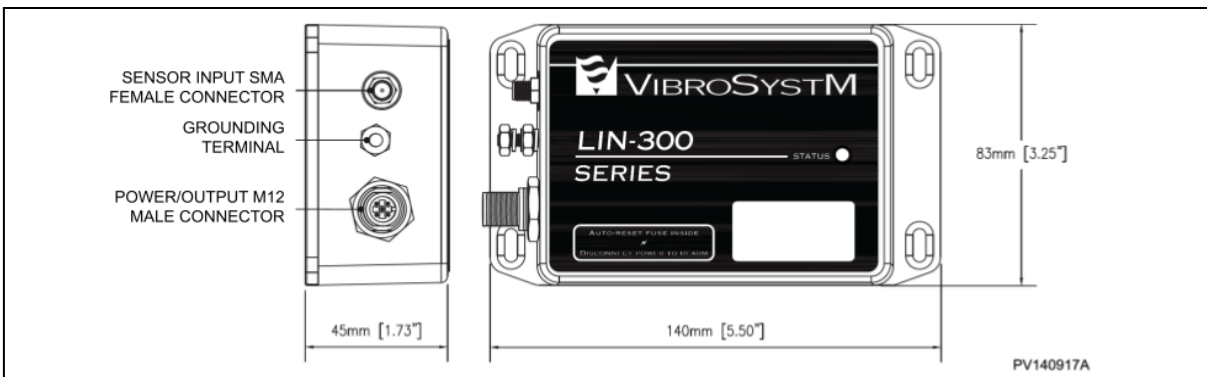
### VM3 AIRFLOW Sensor with Extension Cable



### VM5 AIRFLOW Sensor with Extension Cable



### LIN-300 Series Conditioner





## PRODUCT INFORMATION

Product Number	Description
<b>LIN-33AF-10S-1/20 AIRFLOW Measuring Chain</b>	
VSM-VM3AF	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)
<b>LIN-35AF-10S-2/42 AIRFLOW Measuring Chain</b>	
VSM-VM5AF	VM5 AIRFLOW air gap sensor (2-42 mm)
VSM-L35AF-10S-2/42	LIN-35AF-10S conditioner (2-42 mm)
VSM-CBL-5AF-10S	Cable / Triaxial - SMA/SMA / (10 m/32.8 ft)

<sup>1</sup> 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.

<sup>2</sup> 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.