

# Velocity Sensor

## 5485C Datasheet



Integral Cable Configuration



Removable Cable Configuration



The Metrix 5485C is a moving-coil velocity transducer, specifically designed for continuous use in elevated temperatures. A zero-friction coil suspension provides accurate, repeatable vibration measurements over a wide range of amplitude and frequency and is built to withstand the high-g environments and cross-axis vibrations typical of gas turbines. The coil bobbin is suspended by two non-twisting, circular spider springs that provide a clean frequency response. Purely viscous electromagnetic damping is employed and eliminates friction-prone air damping. This allows improved detection of small vibration amplitudes at low frequencies.

The sensor is available in two configurations: with integral armored cable or removable armored cable via a 2-pin MIL-style threaded connector. The case is constructed of stainless steel and its robust internals are hermetically sealed to ensure durability in the most hostile environments. The product is approved for use in Zone 2 / Div 2 hazardous areas without use of intrinsic safety barriers. It is also approved for use in Zone 0/1 and Div. 1 areas with use of an appropriate intrinsic safety barrier.

### APPLICATIONS

- Gas Turbines
- Furnace Fans
- Machines with continuous or intermittent surface temperatures above 120° C

### FEATURES

- Self-generating, no power required
- Native velocity output – handles impulsive signals better than integrated accelerometers
- Stainless steel housing
- Eliminates friction-prone air damping
- Analog performance delivers excellent resolution
- Approved for use in hazardous areas
- Available with integral or removable cable

### SPECIFICATIONS

Axis Orientation	Any
Sensitivity	105, 145, 150, or 200 mV/in/sec (see ordering options)
Sensitivity vs. Temperature	Less than 0.02%/°C
Cross-Axis Sensitivity	Less than 10%
Service Temperature	-54 to + 375 ° C (-65 to +707 ° F)
Frequency Response	(-3dB) 15 Hz to 2000 Hz
Maximum g-level	50g
Maximum Displacement	1.8 mm (70 mils) pk-pk
Case-to-Coil Isolation (min)	100 MΩ @ 20° C 10 MΩ @ 200° C 1 MΩ @ 375° C
Case Sealing	Welded; heretically sealed
Material	Housing: 416 Stainless Steel Connector: 316 Stainless Steel Cable Armor: 302 Stainless Steel
Weight	Sensor: 0.2 kg (0.5 lb) Armored Cable: 0.2 kg/m (0.13 lb/ft)
Connector Type	Sensor: 2-pin MIL-style* (male) 4850 Cable: 2-pin MIL-style* (female) Integral Cable: none (cable is not detachable)

\* This connector is specific to high-temperature velocity sensors and removable cables. If the 5485C is to be connected to other instrumentation, the integral and removable cables terminate in flying leads (see Figures 1 and 2) allowing user installation of other connector types as required.

### APPROVALS

CE Mark	Yes
CSA	Class I, Groups A-D <sup>1</sup> (intrinsically safe) Class I, Groups C-D <sup>2</sup> (explosion-proof) Class I, Div 2, Groups A-D <sup>3</sup> (non-incendive)
IECEX	Ex ia IIC T* Ga <sup>1,4</sup> (intrinsically safe) Ex na IIC T (non-incendive)
ATEX	
UL	Class I, Groups A-D <sup>1</sup> (intrinsically safe) Class I, Div 2, Groups A-D <sup>3</sup> (non-incendive)
GOST-R and GOST-K	Ex ia IIC T* Ga <sup>1,4</sup> (intrinsically safe)

#### Notes:

- Intrinsically safe when installed with appropriate intrinsic safety barrier per Metrix drawing 7623.
- Explosion-proof when installed in housing (XXXX) and wired through rigid conduit directly to monitor in safe area.
- Non-incendive when installed per Metrix drawing 8096.
- Temperature Classification (T\*) for the 5485C varies as a function of the ambient temperature. Essentially, the 5485C's surface temperature will not rise more than 40° C above its ambient surroundings, up to its rated maximum operating temperature of 375° C. See table below.

Ambient Temperature (Ta)	Temp. Classification
-54° C ≤ Ta ≤ +45° C	T6
-54° C ≤ Ta ≤ +60° C	T5
-54° C ≤ Ta ≤ +95° C	T4
-54° C ≤ Ta ≤ +160° C	T3
-54° C ≤ Ta ≤ +260° C	T2
-54° C ≤ Ta ≤ +375° C	T1

### ORDERING INFORMATION

#### Removable Cable Version (Requires Cable 4850, Ordered Separately) 5485C-AAA

A	A	A	OUTPUT TYPE
0	0	2	105 mV/in/s (4.14 mm/sec), 73 Ω coil resistance
0	0	4	145 mV/in/s (5.71 mm/sec), 102 Ω coil resistance
0	0	6	200 mV/in/s (7.87 mm/sec), 135 Ω coil resistance
0	0	8	150 mV/in/s (5.91 mm/sec), 105 Ω coil resistance

#### Integral Cable Version (cable 4850 not required) 5485C-AAA-BBB

A	A	A	OUTPUT TYPE
0	0	1	105 mV/in/s (4.14 mm/sec), 73 Ω coil resistance
0	0	3	145 mV/in/s (5.71 mm/sec), 102 Ω coil resistance
0	0	5	200 mV/in/s (7.87 mm/sec), 135 Ω coil resistance
0	0	7	150 mV/in/s (5.91 mm/sec), 105 Ω coil resistance
B	B	B	CABLE LENGTH (in feet)
0	1	0	10 feet (3 m)
0	2	0	20 feet (6.1 m)
0	6	0	60 feet (18.3 m)
X	X	X	Other lengths in feet; min length 2 feet; max length 60 feet; must be ordered in 2-foot increments (e.g., AAA=042 for 42' length is allowed; AAA=043 for 43' length is not allowed)

#### High-Temperature Armored Cable Assembly 4850-AAA

A	A	A	CABLE LENGTH (in feet)								
0	1	0	10 feet (3 m)								
0	2	0	20 feet (6.1 m)								
0	6	0	60 feet (18.3 m)								
X	X	X	Other lengths in feet; min length 2 feet; max length 100 feet; allowable ordering length increments summarized below:								
			<table border="1"> <thead> <tr> <th>Cable Length</th> <th>Allowable Increments</th> </tr> </thead> <tbody> <tr> <td>2 – 20 feet</td> <td>1 foot (e.g., AAA=018 for 18' and AAA=019 for 19')</td> </tr> <tr> <td>20 – 60 feet</td> <td>2 feet (e.g., AAA=042 for 42' and AAA=044 for 44')</td> </tr> <tr> <td>60 – 100 feet</td> <td>5 feet (e.g., AAA=075 for 75' and AAA=080 for 80')</td> </tr> </tbody> </table>	Cable Length	Allowable Increments	2 – 20 feet	1 foot (e.g., AAA=018 for 18' and AAA=019 for 19')	20 – 60 feet	2 feet (e.g., AAA=042 for 42' and AAA=044 for 44')	60 – 100 feet	5 feet (e.g., AAA=075 for 75' and AAA=080 for 80')
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### ACCESORIES

#### 8531-AAA 4-hole to 1/4"-28 UNF mounting stud adapter kit

A			ATTACHMENT TYPE
0	0	1	Shipped loose
0	0	2	Shipped pre-attached to 5485C sensor

Allows 5485C to be mounted on a 1" diameter machined flat spot with in a 1/4-28 UNF tapped hole in the center. Adapter includes mounting plate, 1/4-28 stud, and four 8-32 cap screws / lock washers. Material: 303 stainless steel.



8531 ADAPTER  
(INSTALLED)



8531 ADAPTER  
(LOOSE)

