

5485C HIGH-TEMPERATURE VELOCITY TRANSDUCER

Installation Manual



2-PIN CONNECTOR VERSION
(requires mating Model 4850-XXXX cable)



FIXED ARMORED CABLE VERSION



OVERVIEW

The Metrix 5485C High-Temperature Velocity Sensor is suitable for use in temperatures up to 375°C. It is designed for gas turbines and other machinery with high surface temperatures where a velocity signal is desired. The sensor's moving-coil design requires no external power as it self-generates a signal proportional to vibration velocity.

FEATURES

- Self generating, no power required
- Stainless Steel Housing
- Zero friction - infinite analog resolution

APPLICATIONS

- Large industrial gas turbines
- Furnace fan monitoring

HAZARDOUS AREAS

UL intrinsically safe for Class 1, Div. 1, Grps (A-D); Non-incendive for Class 1, Div. 2, Grps. (A-D). CSA intrinsically safe for: Class 1, Div. 1, Grps (A-D); ATEX/IECEx intrinsically safe for: EEx ia IIC T1-T6 Ga.

INSTALLATION

The sensitive axis of the transducer can be oriented in any direction. To ensure clean response to high frequency vibrations, the transducer must be securely mounted to a flat machined surface using four #6 (or 3mm) socket head screws. If a bracket is required, it should be of rigid construction to prevent spurious mechanical resonances in the pass band.

WIRING

In ordinary, nonhazardous locations the transducer should be wired according to Page 4 (drawing 7623, Sheet 2).

In hazardous locations the wiring method depends upon the area classification.

1. In Class I, Div 1, Groups A, B, C & D or IEC Zone 0, Group IIC hazardous locations, the transducer may be connected through a zener diode safety barrier to the safe area receiver in accordance with Page 5 (drawing 7623, Sheet 3).
2. In Class I, Div 2, Groups A, B, C & D locations the transducer may be wired as in (1), or it can be wired without a safety barrier if wired in accordance with Page 6 (drawing 8096).

ATEX/IECEX INPUT ENTITY PARAMETERS

- $U_i = 28\text{v}$
- $I_i = 120\text{mA}$
- $P_i = 625\text{ mW}$
- $C_i = 0$
- $L_i = 0.88\text{mH max.}$

SPECIFIC CONDITIONS OF USE

For Ex ia and Ex nA: In order to ensure temperature classification and safety, the power supply must adhere to the following:

- $U_o \leq 28\text{V}$
- $I_o \leq 120\text{mA}$
- $P_o \leq 0.625\text{W}$

The temperature classifications and ambient temperature range can vary as follows:

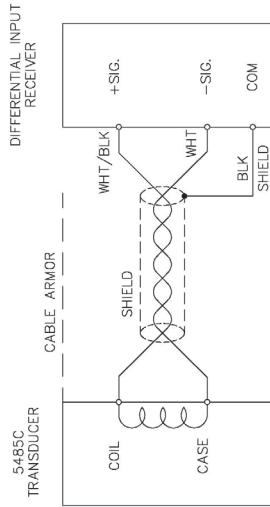
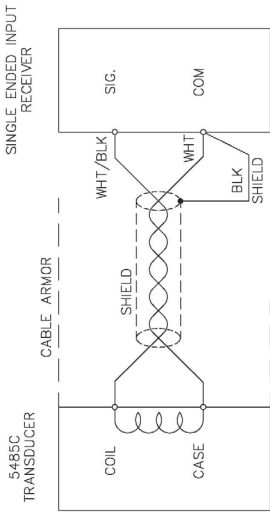
Max. Low Ambient Temp.	Max. High Ambient Temp.	Temp. Classification
-54°C	45°C	T6
	60°C	T5
	95°C	T4
	160°C	T3
	260°C	T2
	375°C	T1

For Ex ia: When terminated, the flying leads of the integral cable must be afforded a degree of protection of at least IP20.

For Ex nA: The terminations of the flying leads of the integral cable must be afforded a degree of protection of at least IP54 in accordance with the requirements of EN 60079-15 and EN/IEC 60529.

For Ex nA: External provision must be made to ensure that the maximum rated input is not exceeded by more than 40%.

For Ex nA: The connector must not be disconnected whilst the equipment is energised.

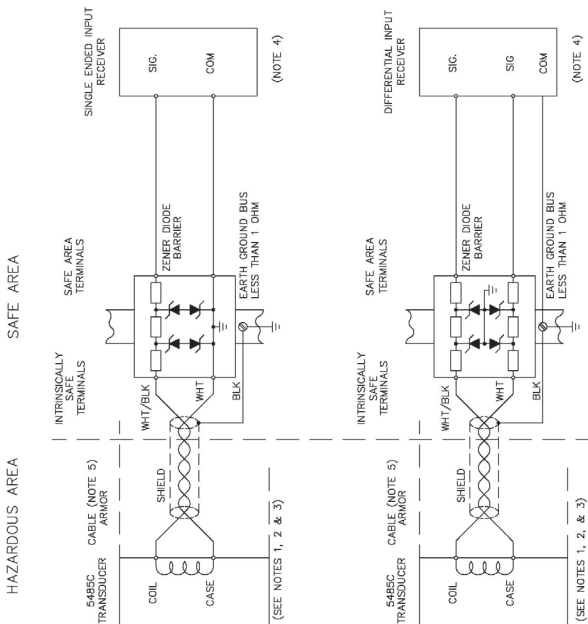


AGENCY APPROVED PRODUCT
DO NOT DEVIATE FROM
DOCUMENTED CONSTRUCTION
ON LISTED PARTS

METRIX	
METRIX TOOL & DIE	
SPECIFICATIONS FOR METRIX 5485C, HIGH TEMPERATURE WELDED TRANSDUCER (MIRINEX PART: 10000000)	
REV. 0	7623
DATE: 4-13	

AGENCY APPROVED PRODUCT
DO NOT REMOVE FROM
DOCUMENTED CONSTRUCTION
OR LISTED PARTS

WARNING: TO PREVENT IGNITION OF FLAMMABLE OR COMBUSTIBLE
ATMOSPHERE, DISCONNECT POWER BEFORE SERVICING



NOTES:

- UNLISTED AND CSA CERTIFIED AS INTRINSICALLY SAFE (CLASS 1, GROUPS A, B, C, & D) WHEN USED WITH ZENER DIODE BARRIER. THE ZENER DIODE BARRIER MUST BE VOLTAGE OF 28 VOLTS OR A MAXIMUM SHORT CIRCUIT CURRENT OF 0.25 A. ACROSS THE INTRINSICALLY SAFE AREA.
- INTRINSICALLY SAFE SYSTEM WHEN USED WITH UNPROTECTED INTERNAL CAPACITANCE (CI) = 0.88 nH MAX. MAX. POWER (Pmax) = 0.625 W (UL ONLY)

SUCH THAT THE FOLLOWING CONDITIONS ARE SATISFIED:

$V_{oc} \leq V_{max}$ $I_{sc} \geq I_{ci} + I_{cable}$ $P_{max} \geq P_o$
 $I_{sc} \leq 5 \text{ Wmax}$ $C_i \geq C_i + C_{cable}$
 $I_{sc} \leq 5 \text{ Wmax}$

F Po OF THE ASSOCIATED APPARATUS IS NOT KNOWN, IT MAY BE CALCULATED USING THE FORMULA $P_o = (V_{oc} \times I_{sc})/4 = (I_{sc}^2 \times R_i)/4$.

3. CSA CERTIFIED INTRINSICALLY SAFE SYSTEM WHEN USED WITH UNPROTECTED INTERNAL CAPACITANCE (CI) = 0.88 nH MAX. MAX. POWER (Pmax) = 0.625 W (UL ONLY).

3. CENELEC (CEC) CERTIFIED IEC61010-10

Receiver Sensitivity	Max. Voltage (Vmax)	Max. Current (Isc)	Max. Power (Pmax)	Max. Capacitance (Ci)
105 mV/ps	28 Vdc	39 mA	48 ohms	48 ohms
145 mV/ps	28 Vdc	28 mA	68 ohms	68 ohms
195 mV/ps	28 Vdc	21 mA	87 ohms	87 ohms
200 mV/ps	28 Vdc	1.50 mA	1.50 ohms	1.50 ohms

- THE RECEIVER MUST NOT BE SUPPLIED FROM INTRINSICALLY SAFE SYSTEMS. THE RECEIVER MUST BE PROTECTED FROM OVERCURRENTS WITH RESPECT TO GROUND UNDER NORMAL OR FAULT CONDITIONS EXCEEDING 250 WMS.
- CABLE LENGTH BETWEEN TRANSDUCER AND RECEIVER SHALL NOT EXCEED 1000 FT. (300 FT).
- ASSOCIATED AND INTRINSICALLY SAFE APPARATUS MUST BE INSTALLED ACCORDING TO THE NATIONAL ELECTRICAL CODE (ANSI/NFPA 70) FOR INSTALLATION IN THE UNITED STATES, OR SECTION 18 OF THE CANADIAN ELECTRICAL CODE FOR INSTALLATIONS IN CANADA.
- WHEN REQUIRED BY THE MANUFACTURER'S CONTROL DRAWING, THE ASSOCIATED APPARATUS MUST BE CONNECTED TO THE INTRINSICALLY SAFE SYSTEM USING THE CANADIAN ELECTRICAL CODE (ANSI/NFPA 70), THE CANADIAN ELECTRICAL CODE, OR OTHER LOCAL INSTALLATION CODES, AND THE MINIMUM CLEARANCE OF THE GROUND PATH MUST BE LESS THAN 1 OHM.
- WHERE MULTIPLE CIRCUITS EXTEND FROM THE SAME PIECE OF INTRINSICALLY SAFE EQUIPMENT TO ASSOCIATED APPARATUS, THEY MUST BE INSTALLED IN SEPARATE CABLES OR IN ONE CABLE HAVING TO ARTICLE 504.30(3) OF THE NATIONAL ELECTRICAL CODE (ANSI/NFPA 70) AND NATIONAL ELECTRICAL CODE (ANSI/NFPA 70) AND INSTRUMENT SOCIETY OF AMERICA RECOMMENDED PRACTICE ISA RPT28 FOR INSTALLING INTRINSICALLY SAFE EQUIPMENT.
- ASSOCIATED APPARATUS MUST NOT BE USED IN COMBINATION, UNLESS PERMITTED BY THE ASSOCIATED APPARATUS CERTIFICATION

METRIX
INDUSTRIAL TOOLS, U.S.A.

SPECIFICATION MODEL 5485C,
INTRINSICALLY SAFE VELOCITY TRANSDUCER
WRONG (HAZARDOUS LOCATIONS)

76223 U

1 SHEET OF 3


SENSOR VERIFICATION CALIBRATION PROCEDURE

Mount the 5485C on a shaker table and verify the RMS output per table below.

CALIBRATION VERIFICATION TABLE 1 ips peak @ 150Hz		
Calibrated Sensitivity mV/in/s	Calibrated Sensitivity mV/mm/s	RMS Output mV Min/Max.
105	4.14	67/81
145	5.71	93/112
150	5.91	95/167
200	7.87	127/156

The test should be performed on a NIST traceable shaker at 1 ips, 150Hz.

Metrix recommends that this procedure be performed every 3 years.

 **NOTE:** Due to the difficulties of field sensor verification, the +/- 5% sensitivity specification is relaxed to +/- 10%. The sensor should be returned to Metrix, Houston, Texas for metrology verification of factory calibration.

ENVIRONMENTAL INFORMATION



This electronic equipment was manufactured according to high quality standards to ensure safe and reliable operation when used as intended. Due to its nature, this equipment may contain small quantities of substances known to be hazardous to the environment or to human health if released into the environment. For this reason, Waste Electrical and Electronic Equipment (commonly known as WEEE) should never be disposed of in the public waste stream. The "Crossed-Out Waste Bin" label affixed to this product is a reminder to dispose of this product in accordance with local WEEE regulations. If you have questions about the disposal process, please contact Metrix Customer Service.

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