



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

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

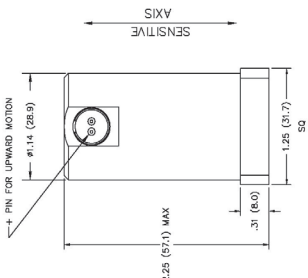
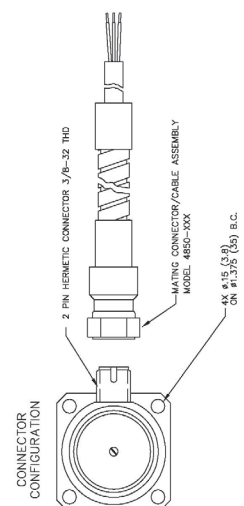
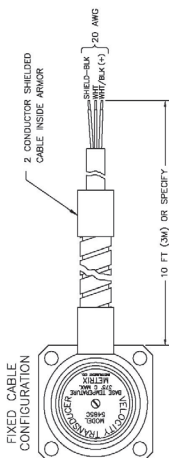
SPECIFIC CONDITIONS OF USE

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



SPECIFICATIONS

TYPE: SPRING SUSPENDED DUAL COIL BOBIN IN PERMANENT MAGNETIC FIELD. NO SLIDING PARTS. ZERO FRICTION. AXIS ORIENTATION: ANY
 SENSITIVITY: SEE TABLE A (+/- - 5% AT 100 HZ)
 CROSS AXIS SENSITIVITY: LESS THAN 10%
 EXTERNAL FIELD SENSITIVITY: < .005 IPS/GAUSS AT 60HZ
 COIL RESISTANCE: (25° C) = SEE TABLE A

TEMPERATURE LIMITS: CONTINUOUS: -54° C TO 375° C
 INTERMITTENT: -54° C TO 400° C
 FREQUENCY RANGE: 15 HZ TO 2000 HZ
 DISPLACEMENT LIMIT: 0.07 (1.8) PK - PK
 SENSITIVITY SHIFT VS POSITION: 5% MAX.
 SENSITIVITY VS TEMPERATURE: -.02%/°C, MAX.
 ACCELERATION LIMITS: 0 TO 50 G's
 DAMPING (ELECTRO-MAGNETIC): AT 20° C: 0.8
 AT 375° C: 0.55
 AT 375° C: 0.4

CASE TO COIL ISOLATION: 10 MEGOHMS MIN. AT 375° C.
 CASE MATERIAL: STAINLESS STEEL. HERMETIC SEAL.
 WEIGHT: 7.5 OZ. (.21 KG)
 HAZARD RATING: SEE SHEET 3
 SEE SHEETS 2 AND 3 FOR WIRING.

TABLE A

MODEL	SENSITIVITY	COIL RESISTANCE	TERMINATION
5485C-001	1.00MV/IPS	105 OHMS	FIXED CABLE
5485C-002	1.45MV/IPS	73 OHMS	CONNECTOR
5485C-003	1.45MV/IPS	107 OHMS	FIXED CABLE
5485C-004	1.45MV/IPS	107 OHMS	CONNECTOR
5485C-005	2.00MV/IPS	135 OHMS	CONNECTOR
5485C-007	150MV/IPS	105 OHMS	FIXED CABLE
5485C-008	150MV/IPS	105 OHMS	CONNECTOR

* -XXX INDICATES CABLE LENGTH IN FEET
 (EX. -010 = 10 FEET)

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

METRIX
 HOUSTON, TEXAS, U.S.A.

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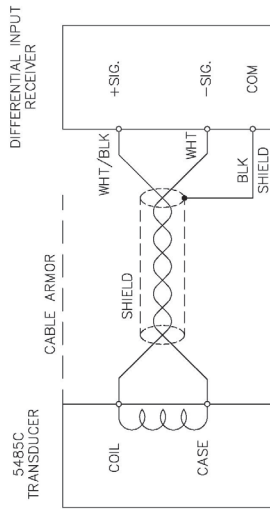
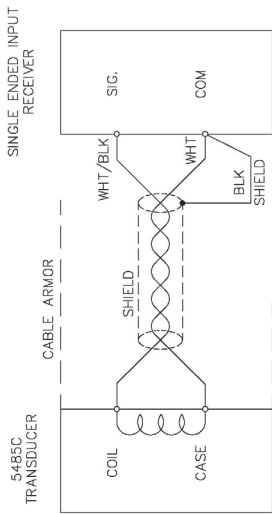
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 SURFACE FINISH: 32

SCALE: 1:1

DATE: 11-13-2018
 DRAWN BY: S.H. WILSON
 CHECKED BY: S.H. WILSON
 APPROVED BY: S.H. WILSON

QUANTITY: 1
 ORDER NO.: 7623 U

DESCRIPTION: VELOCITY TRANSDUCER
 MODEL: 5485C



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

METRIX

INDUSTRIAL TROUBLE SHOOTING
SPECIFIC TO THE METRIX 5485C,
HIGH TEMPERATURE
VELOCITY TRANSDUCER
MIRINIS (MART. LOGS/MS)

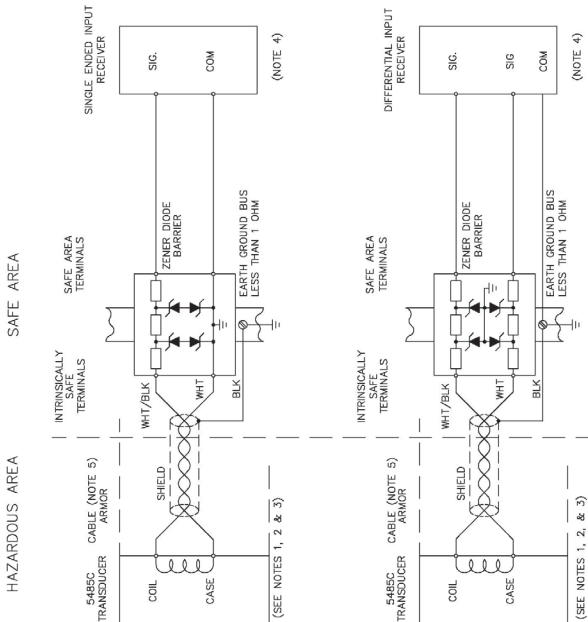
REV. 4.1.1

7623

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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 I, GROUPS A, B, C, & D) WHEN USED WITH ZENER DIODE BARRIER. THE ZENER DIODE BARRIER MUST BE RATED FOR A VOLTAGE OF 28 VOLTS OR A MAXIMUM SHORT CIRCUIT CURRENT OF 0.25 A ACROSS THE INTRINSICALLY SAFE TERMINALS.
- INTRINSICALLY SAFE SYSTEM WHEN USED WITH UNPROTECTED INTERNAL CAPACITANCE (CI) = 0.88 nHt MAX. MAX. POWER (Pmax) = 0.625 W (UL ONLY)

SUCH THAT THE FOLLOWING CONDITIONS ARE SATISFIED:

$V_{oc} \leq V_{max}$ $I_{sc} \leq I_{c}$ + Coable $P_{max} \geq P_o$
 $I_{sc} \leq 5 \text{ Wmax}$ $C_i \leq C_i + C_{cable}$
 Use 5 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 nHt MAX. OR 22 VOLTS MAX., 300 OHMS MIN., 30 OHMS MIN.

3. CENELEC (CEC) CERTIFIED IECa to IEC 18

Minimum Sensitivity	Max. Voltage	Max. Current	Max. Power
105 mV/Pa	28 Vdc	39 mA	48 ohms
145 mV/Pa	28 Vdc	77 mA	68 ohms
195 mV/Pa	28 Vdc	115 mA	89 ohms
200 mV/Pa	28 Vdc	130 mA	87 ohms

- THE RECEIVER MUST NOT BE SUPPLIED FROM THE SAME POWER SOURCE AS THE TRANSDUCER WITH RESPECT TO GROUND UNDER NORMAL OR FAULT CONDITIONS EXCEEDING 250 Vrms.
- CABLE LENGTH BETWEEN TRANSDUCER AND RECEIVER INCLUDING THE LENGTH OF THE GROUND FAULT CURRENT BARRIER SHALL NOT EXCEED 1000 FT. (300 FT).
- ASSOCIATED AND INTRINSICALLY SAFE APPARATUS MUST BE INSTALLED IN ACCORDANCE WITH 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 GROUNDING SYSTEM IN ACCORDANCE WITH THE ELECTRICAL CODE, OR OTHER LOCAL INSTALLATION CODES, AND THE DISTANCE FROM THE POINT OF THE GROUND FAULT 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
WIRING (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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