

## 5485C 高温速度传感器

### 安装手册



2-针接头版本  
(要求匹配4850-XXXX 电缆)



集成铠装电缆版本



### 概述

Metrix 5485C 高温速度传感器适用于最高 375°C 工况环境。该传感器专为燃气轮机及其他表面温度较高、需要采集振动速度信号的机械设备设计。传感器采用动圈式结构设计，无需外接供电，可自行生成与振动速度成正比的感应信号。

### 特征

- 自供电，无需外部电源
- 不锈钢外壳
- 零摩擦 — 无限模拟分辨率

### 应用

- 大型工业燃气轮机
- 高炉风机监测

### 危险区域

UL 本安适用于 Class 1, Div. 1, Grps (A-D); 无火花适用于 Class 1, Div. 2, Grps. (A-D).  
CSA 本安适用于: Class 1, Div. 1, Grps (A-D);  
ATEX/IECEX 本安适用于: EEx ia IIC T1-T6 Ga.

## 安装

传感器的灵敏轴可任意方向安装。为确保对高频振动有纯净的响应，必须使用 4 颗 #6（或 3 mm）内六角螺钉，将传感器牢固安装在平整加工面上。如需使用安装支架，支架须为刚性结构，避免在通频带内产生虚假机械谐振。

## 接线

在普通非危险场所，传感器应按照第 4 页（图纸 7623，第 2 张）进行接线。

在危险场所，接线方式取决于区域防爆等级划分。

1. 在 Class I, Div 1, Groups A, B, C & D 或 IEC Zone 0, Group IIC 危险区域，可按照第 5 页（图纸 7623，第 3 张）要求，将传感器通过齐纳二极管安全栅连接至安全区接收器。
2. 在 Class I, Div 2, Groups A, B, C & D 位置，传感器可按第 (1) 种方式接线；若遵照第 6 页（图纸 8096）要求布线，也可不配置安全栅直接接线。

## ATEX/IECEx 输入实体参数

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

## 特定使用条件

对于 Ex ia 和 Ex nA：为确保温度等级及安全性能，供电电源必须遵守以下规定：

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

温度等级和环境温度范围可按以下规定有所不同：

最低环境温度	最高环境温度	温度组别
-54°C	45°C	T6
	60°C	T5
	95°C	T4
	160°C	T3
	260°C	T2
	375°C	T1

对于 Ex ia 防爆型式：终端接线时，一体式电缆的**外露引线**防护等级至少须达到 IP20。

对于 Ex nA 防爆等级：一体式电缆的外露引线接线端，防护等级至少应达到 IP54，且需符合 EN 60079-15 及 EN/IEC 60529 标准要求。

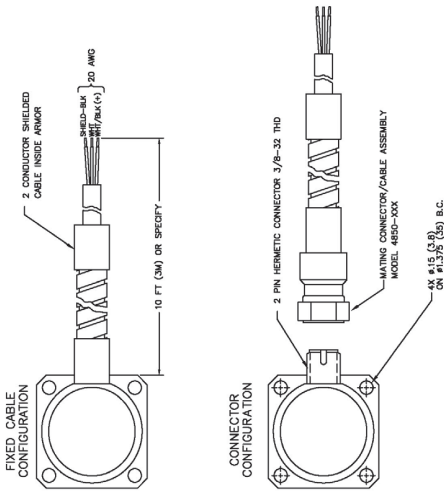
对于 Ex nA 防爆等级：必须采取外部措施，确保最大额定输入的超出量不超过 40%。

对于 Ex nA 防爆等级：严禁在设备**带电运行**时插拔 / 断开连接器。



**SPECIFICATIONS**

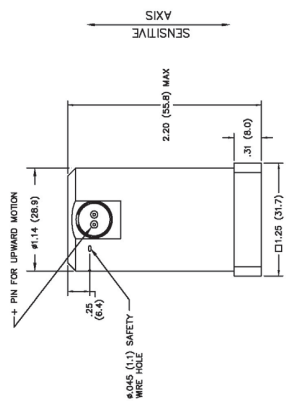
TYPE: SPRING SUSPENDED DUAL COIL BOBBIN IN PERMANENT MAGNETIC FIELD. NO SLIDING PARTS. ZERO FRICTION.  
 AXIS ORIENTATION: ANY  
 SENSITIVITY: SEE TABLE A (+/- 5% AT 100 Hz)  
 CROSS AXIS SENSITIVITY: LESS THAN 10%  
 EXTERNAL FIELD SENSITIVITY: < .005 IPS/GAUSS AT 60HZ  
 COIL RESISTANCE: (25° C) = SEE TABLE A  
 TEMPERATURE LIMITS: (SEE SHEET 3, NOTE 10).  
 CONTINUOUS: -54° C TO 275° 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 200° C: 0.55  
 AT 375° C: 0.4  
 CASE TO COIL ISOLATION: 10 MICROMIS. MIN.  
 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**

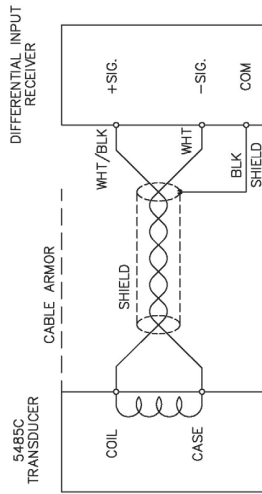
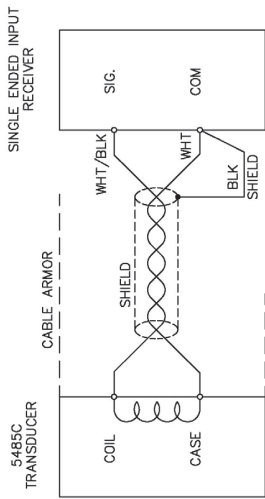
MODEL	SENSITIVITY	COIL RESISTANCE	TERMINATION
5485C-000	7.0 OHMS	7.0 OHMS	FIXED CABLE CONNECTOR
5485C-001	1.55M/IPS	1.55M/IPS	FIXED CABLE CONNECTOR
5485C-002	1.45M/IPS	1.45M/IPS	FIXED CABLE CONNECTOR
5485C-003	1.35M/IPS	1.35M/IPS	FIXED CABLE CONNECTOR
5485C-004	1.25M/IPS	1.25M/IPS	FIXED CABLE CONNECTOR
5485C-005	1.15M/IPS	1.15M/IPS	FIXED CABLE CONNECTOR
5485C-006	1.05M/IPS	1.05M/IPS	FIXED CABLE CONNECTOR

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



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

**METRIX** METRIX, TEXAS  
 SPECIFICATION, MODEL 5485C,  
 HIGH TEMPERATURE  
 VELOCITY TRANSDUCER  
 DRAWING NO. 7623 W  
 SHEET 1 OF 3



AGENCY APPROVED PRODUCT  
DO NOT DEVIATE FROM  
DOCUMENTATION, CONNECTION,  
OR LISTED PARTS

<b>METRIX</b> <small>INSTRUMENT DATA</small>	SPECIFICATION, MODEL 5485C, 5485C-1, 5485C-2, VELOCITY TRANSDUCER WIRING (ORDINARY LOCATIONS)
7623	7623
C	W
REV	SHEET 2 OF 3

10. UL LISTED AND CSA CERTIFIED FOR THE FOLLOWING TEMPERATURES AND AMBIENT AS INDICATED BELOW.

CLASSIFICATION	TEMPERATURE	AMBIENT TEMPERATURE (To)
T8	-54°C ≤ To ≤ +46°C	
T5	-54°C ≤ To ≤ +46°C	
T4	-54°C ≤ To ≤ +46°C	
T3	-54°C ≤ To ≤ +46°C	
T2	-54°C ≤ To ≤ +46°C	
T1	-54°C ≤ To ≤ +46°C	

- NOTES:
- UL LISTED AND CSA CERTIFIED AS INTRINSICALLY SAFE (CLASSIFICATION T8) WHEN USED WITH ZENER DIODE BARRIER HAVING A MAXIMUM OPEN CIRCUIT VOLTAGE OF 28 Vdc OR A MAXIMUM SHORT CIRCUIT CURRENT OF 250 mA. SEE SECTION 18 FOR TEMPERATURES AND AT THE DESIGNATED AMBIENT TEMPERATURES IN NOTE 10.

ENTITY PARAMETERS OF TRANSDUCER:

MAX. VOLTAGE (Vmax) = 28 Vdc  
 MAX. CURRENT (Imax) = 250 mA  
 UNPROTECTED INTERNAL CAPACITANCE (CI) = 0.0 fF  
 UNPROTECTED INTERNAL INDUCTANCE (LI) = 0.88 nH MAX.  
 MAX. POWER (Pmax) = 0.825 W (UL UNLT)

SUCH THAT THE FOLLOWING CONDITIONS ARE SATISFIED:  
 $V_{oc} \leq V_{max}$      $I_{sc} \leq I_{max}$      $L_a \geq 2 L_i + L_{cable}$      $P_{max} \geq P_o$

If Po of the ASSOCIATED APPARATUS IS NOT KNOWN, IT MAY BE CALCULATED USING THE FORMULA  $P_o = (V_{oc} - V_{oc0})/R_o = (I_{sc} - I_{sc0})/R_o$ .

- CSA CERTIFIED BARRIER RATED 14 VOLTS MAX., 50 OHMS MIN. OR 22 VOLTS MAX., 300 OHMS MIN.
- GENELEC (BASEEFA) CERTIFIED EEA I/C TC

TRANSDUCER ENTITY PARAMETERS OF TRANSDUCER:

SENSITIVITY	Vmax	Leq	Ri
100 mV/gga	28 Vdc	.39 nH	48 ohms
150 mV/gga	28 Vdc	.27 nH	68 ohms
200 mV/gga	28 Vdc	1.50 nH	87 ohms

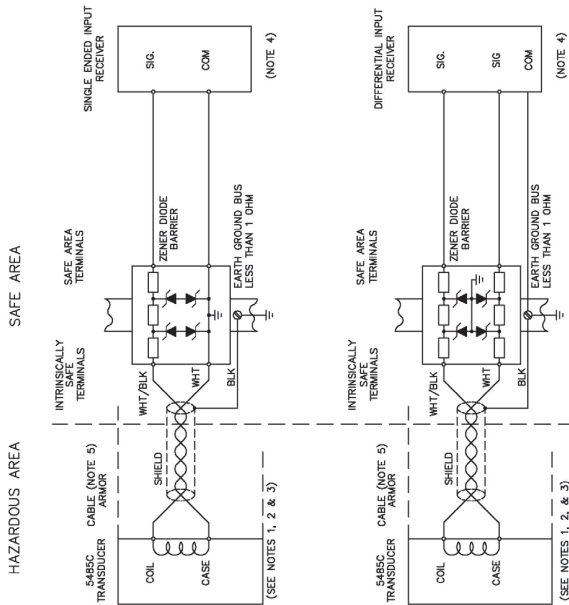
- THE RECEIVER MUST NOT BE SUPPLIED FROM A SOURCE OF POTENTIAL FAULT CONDITIONS EXCEEDING 250 VRMS.
- CABLE LENGTH BETWEEN TRANSDUCER AND ZENER DIODE BARRIER SHALL NOT EXCEED 1000 FT. (300 m).

- ASSOCIATED AND INTRINSICALLY SAFE APPARATUS MUST BE INSTALLED IN ACCORDANCE WITH ITS MANUFACTURER'S CONTROL DRAWING AND ARTICLE 504 OF THE NATIONAL ELECTRICAL CODE (ANSI/NFPA 70) OR THE CANADIAN ELECTRICAL CODE 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 ASSOCIATED APPARATUS USING THE NATIONAL ELECTRICAL CODE (ANSI/NFPA 70) OR THE CANADIAN ELECTRICAL CODE, OR OTHER LOCAL INSTALLATION CODES. THE ASSOCIATED APPARATUS MUST BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE.

- WHERE MULTIPLE GROUNDS EXIST FROM THE SAME PIECE OF INTRINSICALLY SAFE EQUIPMENT TO ASSOCIATED APPARATUS, THEY MUST BE INSTALLED IN SEPARATE CABLES. SEE THE CONTROL DRAWING REFER TO ARTICLE 504.50(B) OF THE NATIONAL ELECTRICAL CODE (ANSI/NFPA 70) AND INSTRUMENT SOCIETY OF AMERICA RECOMMENDED PRACTICE, ISA RP-228 FOR INSTALLING INTRINSICALLY SAFE EQUIPMENT.

- ASSOCIATED APPARATUS MUST NOT BE USED IN HAZARDOUS AREAS UNLESS IT IS CERTIFIED BY THE ASSOCIATED APPARATUS CERTIFICATION



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

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

	METRIX MODEL 5485C SPECIFICATION, MODEL 5485C, HIGH TEMPERATURE, INTRINSICALLY SAFE, WIRING (HAZARDOUS LOCATIONS)
	7623
SHEET 3 OF 3	



## 传感器校验与标定规程

将 5485C 传感器安装至振动试验台，按下表核对有效值（RMS）输出。

校准校验表 1 ips peak @ 150Hz		
校准灵敏度 mV/in/s	校准灵敏度 mV/mm/s	RMS 输出 mV Min/Max.
105	4.14	67/81
145	5.71	93/112
150	5.91	95/167
200	7.87	127/156

测试应在可溯源至 NIST 标准的振动台上进行，振动参数：1 ips、150Hz。

Metrix 建议本规程每三年执行一次。



**注：**由于现场传感器校验存在诸多困难，灵敏度  $\pm 5\%$  的技术指标放宽至  $\pm 10\%$ 。

需将传感器寄回美国德克萨斯州休斯顿市 Metrix 公司，进行原厂计量校准核验。

## 环境相关信息



本电子设备依照高标准品质规范制造，确保在按预期用途使用时能够安全可靠运行，受产品自身特性影响，该设备可能含有少量一旦排放至环境中便会危害环境及人体健康的物质，因此废弃电子电气设备（简称 WEEE）严禁混入普通生活垃圾丢弃，产品上粘贴的带叉垃圾桶标识用以提醒使用者须遵循当地 WEEE 法规要求进行废弃处置，若对处置流程存有疑问，可联系 Metrix 客户服务中心咨询。

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