

The MCT-5D Series Digital Transducer for Industrial Low Pressure I²C & SPI Protocols



DESCRIPTION

Advanced Sensors Multi Chip Technology (MCT) 5D Series incorporates the latest mixed signal ASIC (Application Specific Integrated Circuit) with a bonded silicon gage to provide a leading *Digital Output* design for Industrial Transducers. The MCT 5D Series provides a 14bit digital pressure and 11 bit digital temperature output offered in SPI and I²C protocols. The rugged design is compatible with a wide range of harsh media including refrigerants, compressed air, and hydraulic fluids. The design's superior performance provides 1% Total Error across a wide temperature range of -20 to 85°C and overall error of less than 2.5% over -40 to 125C. The flexible design incorporates many process fitting and connector types making it the ideal choice for OEM customers.

APPLICATIONS

- Hydraulic and Pneumatic
- HVAC
- Pumps and Compressors
- Refrigeration Systems
- Energy and Water Management

FEATURES

- Digital Temperature & Pressure Output
- ASIC Compensation
- Wide Temperature Range
- Hash Media Compatible
- High Accuracy
- Low Overall Errors, 1%TEB
- All Welded Design
- Custom Outputs and Ranges Available

SPECIFICATIONS

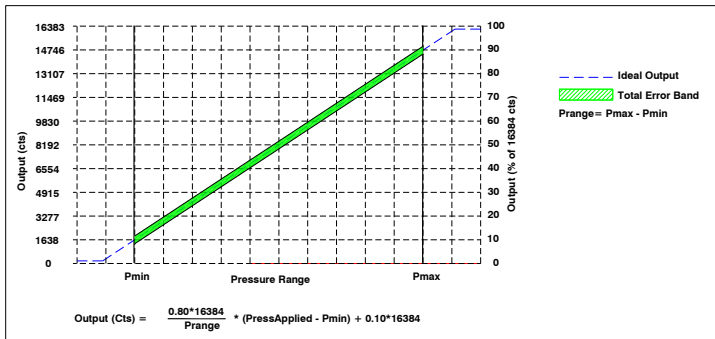
	Symbol	Min	Typical	Max	Unit	Note
Performance Specifications						
Supply Voltage		2.7V	3.3	5.50	V	
Current Consumption				3	mA	
Pressure Resolution				14	bits	
Temperature Resolution				11	bits	
Output at Pmin			1638		cts	
Output at Pmax			14746		cts	
Span	FSS		13107		cts	
Pressure Accuracy		-0.25		0.25	%FSS	2
Total Error Band	TEB	-1.0		1.0	%FSS	3
Temperature Accuracy			2.5		°C	
Long Term Stability			±0.4		%FSS	
Conversion Time			1.0		mS	4
Power On to Valid Data				<10	mS	5
Life		1kk			cycles	
Weight				120	grams	
Compensated Temperature			-20 to 85		°C	
Operating Temperature			-40 to 125		°C	

SPECIFICATIONS	Symbol	Min	Typical	Max	Unit	Note
Absolute Maximum Conditions						6
Supply Voltage		-16		16	V	
Storage Temperature		-50		150	°C	
Burst Pressure				3x	Range	
Insulation Resistance		10			MΩ	500Vdc
Wetted Materials		316L, Epoxy, Silicon				

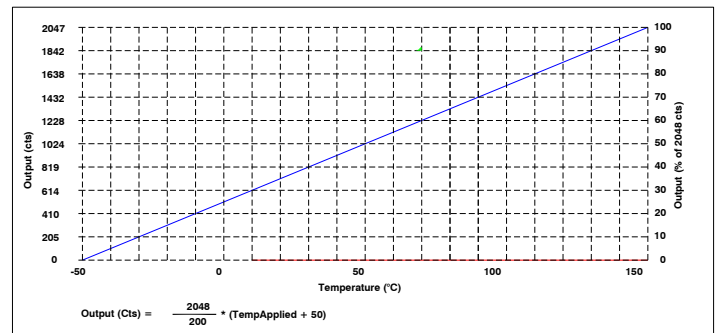
Reference Conditions: Vsupply: 3.30Vdc or 5.00, Ta=25 °C.

1. All specification at reference conditions unless otherwise noted. Output is ratio metric to supply voltage.
2. Maximum deviation from a Best Fit Straight Line through Pmin and Pmax measured at 25 °C. Errors included Pressure Non Linearity, Pressure Hysteresis and Repeatability.
3. Maximum deviation from the Ideal Transfer Function expressed as a percentage of the %FSS over the compensated temperature range. Includes calibration errors (Offset & Span), temperature errors (Offset & Span), pressure non-linearity, pressure and thermal hysteresis.
4. The time for the output DAC to be updated with new data.
5. The time for the output DAC to have valid data after a power on reset.
6. Exceeding Absolute Maximum Specification may damage the device. Extended exposure beyond the operating conditions may affect device reliability.

PRESSURE AND TEMPERATURE TRANSFER FUNCTIONS



Pressure Transfer Function, TEB Error



Temperature Transfer Function

CONSTRUCTION

Material

Wetted	
Port	316L Stainless Steel
Die Adhesive	RTV/Epoxy
MEMS Sense Element	Glass, Silicon
External	
Housing Tube	303 Stainless Steel
Connector	PBT Glass Filled
Cable Jacket	TPE

MECHANICAL DIMENSIONS in [mm]

M12x1 IEC 61076-2-101, Binder 09 0439 387 04 Protection Class (IEC 60529): IP67

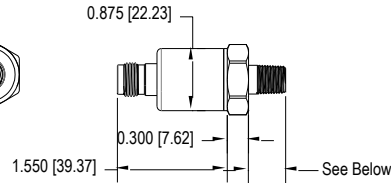
Mating M12x1 Connector 4 Position Female Type D

Voltage Regulated, Ratiometric

Pin 1: Supply +
Pin 4: Output +
Pin 3: Common

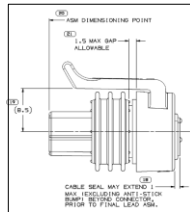
4-20mA Transmitter

Pin 1: Supply +
Pin 4: Not Connected
Pin 3: Supply -



PACKARD CONNECTOR Type A Protection Class (IEC 60529): IP66

Mating Packard Connector Housing Part Number: 12078090 Socket Part Number: 12103881

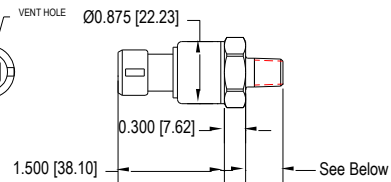


Voltage Regulated, Ratiometric

Pin A: Supply +
Pin B: Common
Pin C: Output +

4-20mA Transmitter

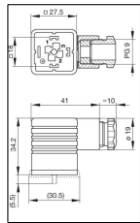
Pin A: Supply -
Pin B: Supply +
Pin C: Not Connected



HIRSCHMANN CONNECTOR DIN 43650 FORM A, Part Number 933 376-100 Protection Class (IEC 60529): IP65

Mating Hirschmann Connector

Part Number: 931 969-100
Gasket (NBR) Part Number: 730 801-002
Knurled Screw Part Number: 732 574-001

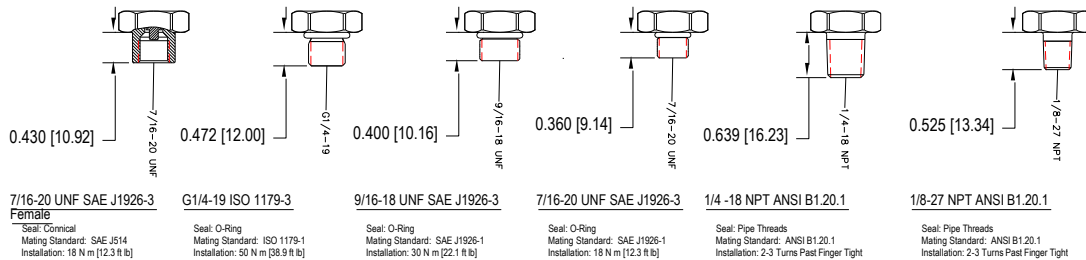
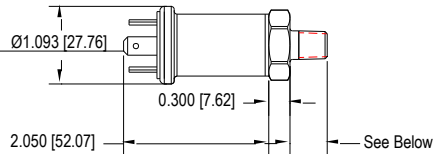
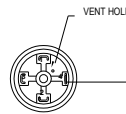


Voltage Regulated, Ratiometric

Pin 1: Supply +
Pin 2: Common
Pin 3: Output +
Pin 4: Case

4-20mA Transmitter

Pin 1: +Supply
Pin 2: -Supply
Pin 3: Not Connected
Pin 4: Case



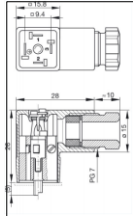
HIRSCHMANN CONNECTOR

DIN 43650 FORM C, Part Number 933 114-100

Protection Class (IEC 60529): IP65

Mating Hirschmann Connector

Part Number: 933 024-100
Gasket (NBR) Part Number: Supplied

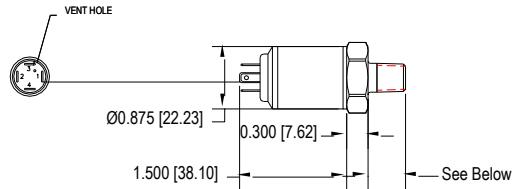


Voltage Regulated, Ratiometric

Pin 1: Supply+
Pin 2: Common
Pin 3: Output+
Pin 4: Case

4-20mA Transmitter

Pin 1: +Supply
Pin 2: -Supply
Pin 3: Not Connected
Pin 4: Case



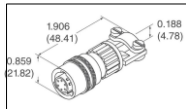
BENDIX CONNECTOR

MIL-C-26482, Part Number PT02A-10

Protection Class (IEC 60529): IP65

Mating Bendix Connector

Part Number: PT06A-10-6S

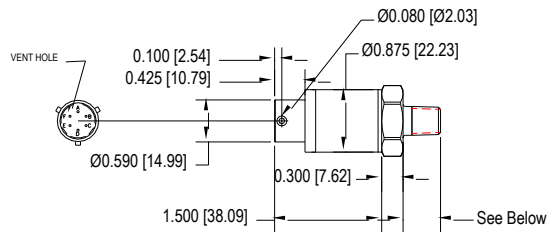


Voltage Regulated, Ratiometric

Pin A: Supply+
Pin B: Output+
Pin C: Common
Pin D: Common
Pin E: Not Connected
Pin F: Vent

4-20mA Transmitter

Pin A: B: Supply+
Pin C: D: Supply-
Pin E: Not Connected
Pin F: Vent



FLYING LEADS

300 V Overall Foil Shield
Multiconductor, PVC, PVC

Protection Class (IEC 60529): IP65

Voltage Regulated, Ratiometric

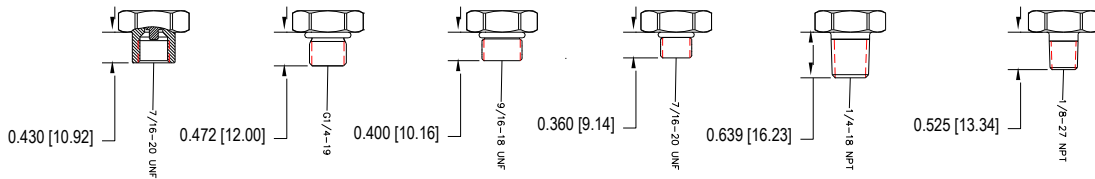
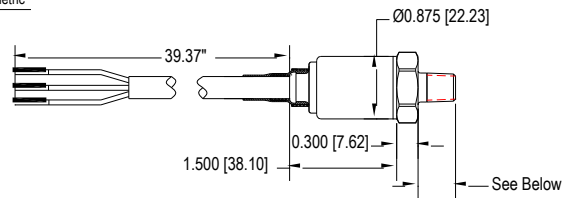
RED: Supply+
GRN: Output+
WHT: No Connection
BLK: Common

4-20mA Transmitter

RED: Supply+
BROWN: SDAMISO
YELLOW: Supply-
GREEN: SCK/SCLK
PINK: SS/INT

Digital I2C / SPI

RED: Supply+
BROWN: SDAMISO
YELLOW: Supply-
GREEN: SCK/SCLK
PINK: SS/INT



7/16-20 UNF SAE J1926-3 Female

Seal: Conical
Mating Standard: SAE J514
Installation: 18 N m [12.3 ft lb]

G1/4-19 ISO 1179-3

Seal: O-Ring
Mating Standard: ISO 1179-1
Installation: 50 N m [38.9 ft lb]

9/16-18 UNF SAE J1926-3

Seal: O-Ring
Mating Standard: SAE J1926-1
Installation: 30 N m [22.1 ft lb]

7/16-20 UNF SAE J1926-3

Seal: O-Ring
Mating Standard: SAE J1926-1
Installation: 18 N m [12.3 ft lb]

1/4-18 NPT ANSI B1.20.1

Seal: Pipe Threads
Mating Standard: ANSI B120.1
Installation: 2-3 Turns Past Finger Tight

1/8-27 NPT ANSI B1.20.1

Seal: Pipe Threads
Mating Standard: ANSI B120.1
Installation: 2-3 Turns Past Finger Tight

PART NUMBERING FOR ORDERS

Series	Port Type	Pressure range (psi)	Pressure Units	Pressure Type (Range Availability) [Package Availability]	Calibrated Voltage	Digital Protocol	Electrical Connection	Options	
MCT-5D	N1 = 1/8 -27 NPT N2 = 1/4-18NPT S1 = 7/16-20UNF S2 = 9/16-18UNF G1 = G1/8 F1 =Female, 7/16-20UNF	0100	L=millibar	G= Gage (All Ranges) [All Port Types] A=Absolute (All Ranges) [All Port Types]	3=3.3Vdc 5-5.0Vdc	I1=I2C, 0x28H I2=I2C, 0x38H I3=I2C, 0x48H S1=SPI Protocol	M1=Micro M12 P2=Packard, Power B HA=Hirschmann Form A HC=Hirschmann Form C B1=Bendix F1=Flying leads, 1 Meter Fx=Flying leads, x=#of Meter	-L Low Power	
		0200							
		0300							
		0400							
		0500							
		0002							P=PSI
		0005							
		0010							
		0015							
		0030							
		0050							
		0100							B=Bar
0150									
0300									
0500									
0500									
0.50	M=mPa								
1.00									
1.60									
2.50									
4.00									

Part Number Example: **MCT-5D N116.0BG3IP1**

1/8NPT, 0-16Bar , Gage, 3.3Vdc, I2c Protocol, Packard Connector, Pmin=0, Pmax=16Bar

WARRANTY

Pressure sensors have a limited one-year warranty to the original purchaser. AVSensors will repair or replace, at its option, without charge those items it finds defective. This is the buyer's sole remedy and is in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose. In no event shall AVSensors be liable for consequential, special, or indirect damages. This warranty does not apply to units that have been modified, misused, neglected or installed where the application exceeds published ratings. Specifications may change without notice. The information supplied is believed to be accurate and reliable as of this printing, however, we assume no responsibility for its use.