

High Temperature – 175°C Pressure Sensor

APS634HT



- 0-175°C Operating Temperature
- 316L Stainless Steel Absolute Pressure Sensor
- 7/16-20 UNF 3A Pressure Port, ½” Hex
- 3.3VDC Power Supply
- Pressure Out – mVDC
- Temperature Out – PT1000 RTD
- Coefficients for 3rd Order Curve Fit
- 0.25% Total Error Band
- 6000 PSIA Full Scale Pressure Range
- Media – Harsh Liquid, Air, & Gas

DESCRIPTION

The APS634HT is a piezo resistive pressure transducer designed for continuous high temperature applications. The 316L stainless-steel media isolated port allows for pressure measurement of harsh environments.

The APS634HT is characterized over the full operating pressure/temperature range. The data is fit to a 3rd order curve and the coefficients are provided with the transducer. Typical errors are less than 0.2%.

The design is simple and proves value for OEM customers. Please contact the factory for additional pressure ranges or other modifications.

APPLICATIONS

- Mil/Aero
- Industrial Automation
- Automotive Engine
- Oil and Gas Wells

Maximum Environmental Ratings

Operating Temperature 0°C to 175°C
Storage Temperature Range-55°C to 185°C

Proof pressure 3x full scale pressure
Burst pressure 5x full scale pressure

Package

The one-piece body design is made of 316L stainless steel, which allows for easy integration and long-term stability.

Stability

The media isolated silicon piezoresistive MEMS pressure sensor is welded into the 316L stainless housing. This insures a reliable high-pressure seal.

Pressure port

7/16 -20 UNF-3A

Recommended Porting Tool:

EVEREDE 01220 7/16"-20 Port Size,
SAE J1926/MS16142 Port Standard
Carbide Tipped Porting Tool

Media

The 316L media isolated pressure port is tolerant to most media including oil, air, gas, some corrosive media, and salt water.

Wetted parts

The wetted surfaces are composed of 316L stainless steel.

Pressure Range

The standard full scale pressure range is 6000 PSIA. Additional FS pressures are available. Contact the factory.

Wiring

The electrical connection wires for the APS634HT sensor are PTFE 28 AWG.

Red - V+

Black – GND

Green - mVDC

Orange – PT1000 RTD Output

APS634HT Operational Characteristics

$V_+ = 3.3V$, $V_- = 0V$, Temperature = 25°C

PARAMETER	SYMBOL	Min.	Typ.	Max.	UNITS
Supply Voltage	V_{DD}	2.7	3.3	3.8	V
Operating Temperature	T_s	0		175	C
Supply Current	I_{DD}	70	120	300	μA
Output Voltage – Typ.	V_{DD}	.05		2.6	mV DC
Accuracy					
Total Error Band		-0.250		0.250	%Full Scan
Non-Linearity (Note 2)		-.1		.1	%Full Scan

Sample Data With 3rd Order Coefficients

Linear model Poly33:

$$f(x,y) = p00 + p10*x + p01*y + p20*x^2 + p11*x*y + p02*y^2 + p30*x^3 + p21*x^2*y + p12*x*y^2 + p03*y^3$$

Coefficients (with 95% confidence bounds):

p00 =	-8.434 (-30.53, 13.66)	#2022-07-13 11:54:32#, "T3", 9, 11
p10 =	1824 (1794, 1854)	
p01 =	-0.1106 (-0.6439, 0.4227)	1, 26.43, 14, 0.0169281617
p20 =	-0.5732 (-16.09, 14.94)	1, 26.43, 750, 0.392733349
p11 =	4.648 (4.383, 4.913)	1, 26.43, 1500, 0.778081947
p02 =	-0.00937 (-0.01464, -0.004098)	1, 26.43, 2250, 1.16377883
p30 =	0.9463 (-1.625, 3.518)	1, 26.43, 3000, 1.54945956
p21 =	-0.1047 (-0.1569, -0.05253)	1, 26.43, 3759, 1.93932619
p12 =	0.004622 (0.003742, 0.005501)	1, 26.43, 4500, 2.31956297
p03 =	4.499e-05 (2.698e-05, 6.299e-05)	1, 26.43, 5250, 2.70370609
		1, 26.43, 6000, 3.08750447
		" "

Goodness of fit:

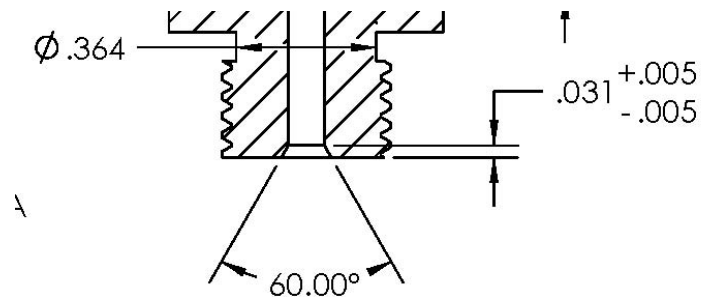
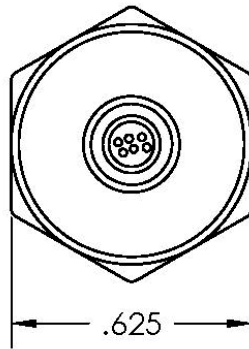
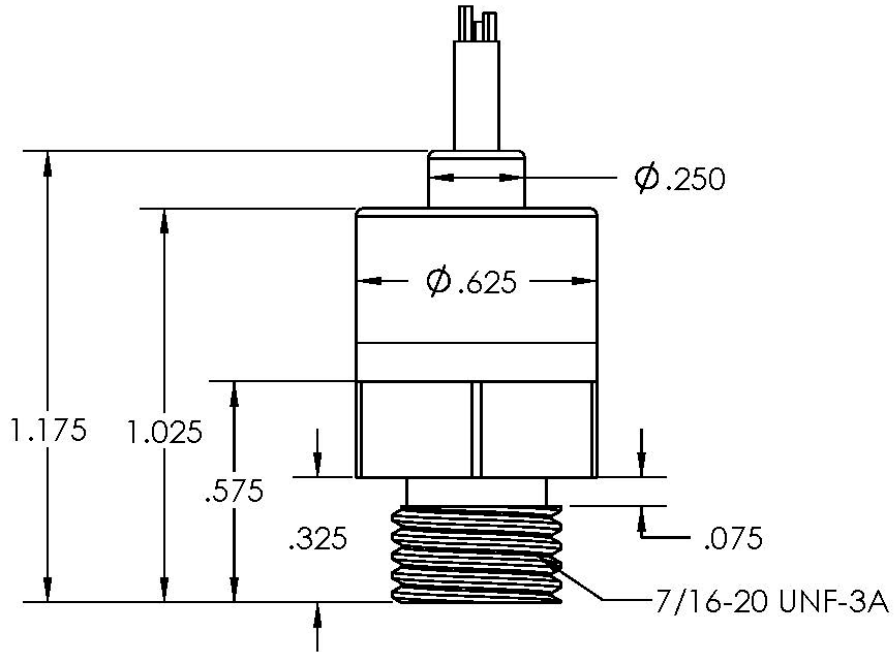
SSE: 385.8
 R-square: 1
 Adjusted R-square: 1
 RMSE: 3.32

1, 60.57, 14, 0.0263509324
1, 60.57, 750, 0.373459957
1, 60.57, 1500, 0.728143925
1, 60.57, 2250, 1.08221525
1, 60.57, 3000, 1.43726586
1, 60.57, 3759, 1.79685129
1, 60.57, 4500, 2.14847283
1, 60.57, 5250, 2.50471431
1, 60.57, 6000, 2.86152992
" "
1, 90.11, 14, 0.0300213751
1, 90.11, 750, 0.355103419
1, 90.11, 1500, 0.687293542
1, 90.11, 2250, 1.01855777
1, 90.11, 3000, 1.35044762
1, 90.11, 3759, 1.68645295
1, 90.11, 4500, 2.01511599
1, 90.11, 5250, 2.34784548
1, 90.11, 6000, 2.68139219
" "
1, 125.05, 14, 0.0412978434
1, 125.05, 750, 0.332586393
1, 125.05, 1500, 0.638536799
1, 125.05, 2250, 0.945146065
1, 125.05, 3000, 1.2523014
1, 125.05, 3759, 1.55742189
1, 125.05, 4500, 1.86676537
1, 125.05, 5250, 2.1744388
1, 125.05, 6000, 2.4829886
" "
1, 150.18, 14, 0.0501379703
1, 150.18, 750, 0.319873227
1, 150.18, 1500, 0.604026275
1, 150.18, 2250, 0.893507063
1, 150.18, 3000, 1.18252905
1, 150.18, 3759, 1.47618145
1, 150.18, 4500, 1.76311089
1, 150.18, 5250, 2.05403824
" "

Example of Calculated Pressures With Errors

Temp	Pressure	Vout	Error	
			PSI	% FS
26.43	14	0.016928	-0.252463	-0.004207717
26.43	750	0.392733	1.007843	0.016797384
26.43	1500	0.778082	1.064544	0.017742392
26.43	2250	1.163779	0.500364	0.008339404
26.43	3000	1.54946	-0.294662	-0.004911038
26.43	3759	1.939326	-0.565226	-0.009420441
26.43	4500	2.319563	-0.692193	-0.011536544
26.43	5250	2.703706	-0.114956	-0.001915941
26.43	6000	3.087504	-0.509814	-0.008496893
60.57	14	0.026351	-0.392233	-0.006537215
60.57	750	0.37346	-1.403755	-0.02339591
60.57	1500	0.728144	-2.373075	-0.039551249
60.57	2250	1.082215	-0.78192	-0.013032001
60.57	3000	1.437266	0.21171	0.003528498
60.57	3759	1.796851	1.695809	0.028263483
60.57	4500	2.148473	2.338126	0.038968774
60.57	5250	2.504714	2.213243	0.036887388
60.57	6000	2.86153	-0.096296	-0.00160494
90.11	14	0.030021	1.232119	0.020535324
90.11	750	0.355103	1.765446	0.029424102
90.11	1500	0.687294	-1.165279	-0.019421321
90.11	2250	1.018558	-1.917426	-0.031957102
90.11	3000	1.350448	-2.608879	-0.043481313
90.11	3759	1.686453	-1.960129	-0.032668812
90.11	4500	2.015116	-1.50771	-0.025128502
90.11	5250	2.347845	0.25363	0.004227159
90.11	6000	2.681392	0.486565	0.008109417
125.05	14	0.041298	-1.520887	-0.025348124
125.05	750	0.332586	4.757483	0.079291386
125.05	1500	0.638537	3.237304	0.053955059
125.05	2250	0.945146	0.442918	0.007381972
125.05	3000	1.252301	-2.698387	-0.044973115
125.05	3759	1.557422	13.22745	0.220457561
125.05	4500	1.866765	-4.041648	-0.0673608
125.05	5250	2.174439	-2.731964	-0.04553274
125.05	6000	2.482989	-2.293281	-0.038221345
150.18	14	0.050138	-7.534829	-0.12558049
150.18	750	0.319873	-2.546524	-0.042442065
150.18	1500	0.604026	2.551794	0.042529908
150.18	2250	0.893507	-0.402374	-0.006706238
150.18	3000	1.182529	-0.694582	-0.01157636
150.18	3759	1.476181	-2.013219	-0.033553645
150.18	4500	1.763111	-1.668815	-0.027813577
150.18	5250	2.054038	-0.397657	-0.006627612
150.18	6000	2.345002	3.647308	0.06078847

Mechanical Dimensions (inches)



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