

SSI Technologies – Application Note PS-AN8

MediaSensor™ P51 Series ULG

Ultra Low Gage Pressure Sensors

Product Description

SSI Technologies Inc., a leading OEM supplier of automotive sensors, having delivered more than 100 million sensors to its customers, now offers a new series of **MediaSensor™** pressure sensors where ultra low pressure, cost, compact size, robust packaging, chemical compatibility and performance are critical.

These new MediaSensor™ P51 Series ULG bulk micro-machined, gage pressure sensors are designed to work at ultra low pressure ranges (**3 psi, 5 psi and 10 psi**) over an operating temperature range of -40°C to +105°C with a superior **accuracy of $\leq \pm 1.0\%$** .

The ULG series pressure sensors are cost competitive, compact, have robust packaging with a wide variety of fittings that work in both harsh and benign media. They are ideal for a variety of pressure measurement applications in the automotive, industrial and commercial industries. Two different electrical signal outputs are available for use by computers, digital panel meters, PLCs, chart recorders and other devices that can display, record or change the pressure in a closed loop system.

Product Features

- **Pressure Ranges:**
 - 3 psig (20.7kPa),
 - 5 psig (34.5 kPa)
 - 10 psig (68.9 kPa)
- **Superb Accuracy:** $\leq \pm 1.0\%$ includes Repeatability, Hysteresis and Linearity
- **Compact, Robust Package:** All laser-welded stainless steel design for optimal media isolation
- **Standard and Custom Options**



MediaSensor™ Ultra Low Pressure Sensors with integrated signal conditioning (shown with Packard Connector and Integral Harness)

- **Maximum Flexibility:** Custom ASIC provides signal conditioning for calibration and temperature compensation.
- **Electrical Connectors**
 - Packard
 - Integral Harness
- **Electronics**
 - 0.5 – 4.5 Volt output (with 5V input)
 - 1 – 5 Volt Output (with 8 – 30V input)
 - 4-20mA Output (with 8 – 30V input)

Call us at **(888) 477-4320**
or visit our

Web Site: <http://ssitechnologies.com>

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Chemical Compatibilities: Any gas or liquid compatible with 304L & 316L stainless steel.

Typical Applications

- | | | | |
|-------------------|---------------|-----------------|-------------------|
| ▪ Refrigerant | ▪ Water | ▪ Refrigeration | ▪ Pneumatics |
| ▪ Motor Oil | ▪ Waste Water | ▪ Fuel Cells | ▪ Agriculture |
| ▪ Diesel | ▪ Hydrogen | ▪ Pumps | ▪ Process Control |
| ▪ Hydraulic Fluid | ▪ Nitrogen | ▪ Hydraulics | |
| ▪ Brake Fluid | ▪ Air | | |

Typical Connections

The following torque limits should be used when mounting the MediaSensor™ pressure port.

	Recommended Torque
Straight Thread w/O-Ring:	150 in lb
NPTF Thread:	2 T.F.F.T. (Turns From Finger Tight)

MediaSensor™ Transducer (Voltage Output) connections:

- 1) Connect the Power Lead (Red) to the + terminal of the supply voltage.
- 2) Connect the Ground Lead (Black) and the – terminal of the supply voltage to – input of your voltage measurement equipment.
- 3) Connect the Vout Lead (White) to the + input of your voltage measurement equipment.



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Standard Packaging Options

THREAD SIZE	LENGTH "A"	LENGTH "B"	LENGTH "C"
1/4-18 NPT	66.6	26.0	18.0
1/8-27NPT	61.6	21.0	13.0
7/16-20UNF	59.6	19.0	11.0

Integral Harness with 22mm Hex

THREAD SIZE	LENGTH "A"	LENGTH "B"	LENGTH "C"
1/4-18 NPT	70.0	26.0	18.0
1/8-27NPT	65.0	21.0	13.0
7/16-20UNF	63.0	19.0	11.0

Packard Connector with 22mm Hex
5 Vdc Input: 0.5 – 4.5 Vdc Ratiometric Output

Harness Construction: PVC Jacketed 24 AWG Wire

Mating Packard Connector P/N 12065287 and Mating Packard Terminal P/N 12103881

THREAD SIZE	LENGTH "A"	LENGTH "B"	LENGTH "C"
1/4-18 NPT	70.0	26.0	18.0
1/8-27NPT	65.0	21.0	13.0
7/16-20UNF	63.0	19.0	11.0

Packard Connector with 22mm Hex
8 - 30 Vdc Input : 1 - 5 Vdc Output

THREAD SIZE	LENGTH "A"	LENGTH "B"	LENGTH "C"
1/4-18 NPT	80.0	26.0	18.0
1/8-27NPT	75.0	21.0	13.0
7/16-20UNF	73.0	19.0	11.0

Packard Connector with 22mm Hex
8 - 30 Vdc Input : 4 - 20 mA Output

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Performance Specifications (all values at 22°C unless noted otherwise)

Output Type	0.5 to 4.5 Volts	1 – 5 Volts	4-20mA
Accuracy ¹	<± 1.00% FS	<± 1.00% FS	<± 1.00% FS
Thermal Error ² (-40°C to 105°C)	<± 2.00% FS	<± 2.00% FS	<± 2.00% FS
Stability (Typical)	<± 0.25% FS / Year	<± 0.25% FS / Year	<± 0.25% FS / Year
Zero Pressure Offset ³	0.50 V	1.0 V	4.0 mA
Full Scale Output (Output @ Pressure Range)	4.5 V	5.0 V	20mA
Operating Temperature	-40 to 105°C	-40 to 105°C	-40 to 105°C
Storage Temperature	-40 to 105°C	-40 to 105°C	-40 to 105°C
Proof Pressure	3 X FS	3 X FS	3 X FS
Burst Pressure	10 X FS	10 X FS	10 X FS
<i>Gage Pressure Transducers</i>			

Electrical Specifications

Output Type	0.5 to 4.5 Volts	1 – 5 Volts	4-20mA
Supply Voltage	5 +/- 0.5	8 to 30 Volts	8 to 30 Volts
Supply Current	< 6 mA	< 3 mA	N/A
Output Current	0.45mA Max(Sink or Source)	0.45mA Max(Sink or Source)	N/A
Response Time	< 1 ms	< 1ms	< 1ms

Reliability and Environmental Performance

	Test Conditions	Value	Units
Pressure/Temperature Cycles ⁴	0 to FS @ 8Hz; and -40°C to 85°C	>1.8x10	Cycles
Thermal Shock	85°C to -40°C, 0.5 hr soaks at Temp. (2s Transfer)	250	Cycles
Vibration	10 to 2050 Hz, 20 Sinusoidal, 3 Axes	144	Hours
EMC Compatibility	10 Volts/meter per EN 61000-4-3		
Humidity	85°C and 90% to 95% R. H.	250	Hours
Weight	Model 51 with ¼ - 18 NPT 304L Stainless Port	≤85	Grams

¹Includes hysteresis, repeatability, & non-linearity (BFSL)

²Additional error over temperature

³Transducer output @ 0 Psig,

⁴Pressure cycling performed at rated full scale pressure.



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MediaSensor™ Series ULG Ultra Low Pressure Sensor Ordering System

The following explains SSI's ultra low pressure sensor order number sequence.

Example → **P51 - 5G - UA - P - 4.5V**

<u>Product Family</u>	<u>Pressure Ranges¹</u>	<u>Port Configuration</u>		<u>Connector</u>	<u>Output Options²</u>
<ul style="list-style-type: none"> P51- MediaSensor 	<ul style="list-style-type: none"> 3 PSIG 5 PSIG 10 PSIG Custom Call Factory 	<u>Hex</u> <ul style="list-style-type: none"> UA 7/8 in UB 7/8 in UC 7/8 in UD 7/8 in UE 5/8 in 	<u>Port</u> <ul style="list-style-type: none"> 7/16 - 20UNF 2A 1/8 - 27 NPT 1/4 -18 NPT 1/8 - 27 NPTF 3/8 - 24 UNF-2B 	<ul style="list-style-type: none"> P – Packard 1 6 – 6” Integral Harness 112 – 12” Integral Harness 118 – 18” Integral Harness 124 – 24” Integral Harness 136 – 36” Integral Harness 172 – 72” Integral Harness 	<ul style="list-style-type: none"> 4.5V – 0.5 to 4.5V (5V input only) 5V – 1 to 5V (8 to 30V input only) 20mA – 4 - 20mA (8 to 30V input only)

Notes:

- 1) G designates Gage Pressure
- 2) Calibration of the transducer is as follows:
 - a. Gage Transducers are calibrated to have 0.5 Vdc or 1 Vdc, or 4mA respectively at 0 Psig

To place an order or to view our other pressure sensors, please see our website <http://www.ssitechnologies.com> for a listing of our distribution partners and Regional Sales Managers

For custom orders or specifications not listed, call SSI toll-free at **1- 888- 477- 4320**

