

SSI Technologies – Application Note PS-AN3

MediaGauge™ Digital Pressure Gauges

Product Overview

Product Description

The MediaGauge™ digital pressure gauges have better accuracy, longer life and standard multiple functions which make it a better choice than mechanical pressure gauges.

The MediaGauge™ family of digital pressure gauges has four models. The MediaGauge™ models differ in accuracy, pressure ranges, media isolation, supply voltage, user functions and output capabilities.

All MediaGauge™ digital pressure gauges contain a piezoresistive pressure sensing element, signal conditioning circuitry for temperature and calibration compensation, a stainless steel input pressure port and a LCD back lit display. The MediaGauge™ digital pressure gauges, are made of all laser-welded 304L stainless steel and have a 316L stainless steel convoluted diaphragm (excluding the MGA-9V model) to optimize media isolation. The MGA-9V model is a lower cost digital pressure gauge with no diaphragm for use with dry air and non-corrosive gases.

Three models (MG-9V; MGA-9V and MG1-9V) are stand alone 9V battery operated with a 4 digit display. The MG-MD model is powered by an 8 - 30 Vdc external power supply and has multiple outputs: a 4 digit display; a 4-20 mA current output and a user programmable set limit switch.



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Product Overview

MediaGauge™ Family of Digital Pressure Gauges

The MG-MD is an excellent choice for process control applications where continuous monitoring and/or where a pressure set point limit switch is needed.

All MediaGauge™ digital pressure gauges come **standard** with a variety of keypad operated functions – multiple pressure unit display reading (PSI, BAR or MPA); memory storage of maximum peak pressure reading; and zero adjustment. The MG-MD model also has user programmable high and low pressure set points.

A Ft of Head pressure measurement display is available as an option on the MG-9V model.

These compact 2 1/2 to 3 inch, robust gauges measure pressures from **5 PSI to 5000 PSI**. The MediaGauge™ digital pressure gauges are well suited for a variety of industrial and commercial applications such as General Purpose, Test, Process Control, MRO, Water, Refrigeration, Fuel Cells, Pumps, Hydraulics, Pneumatics, Compressors and Agriculture.

Measurement Technology

In general, pressure measurement technology translates a force from an induced pressure into an electrical quantity. In

digital pressure gauges, the electrical quantity is then translated into pressure units and digitally displayed.

The SSI's MediaGauge™ digital pressure gauges contain an 304L stainless steel input pressure port, a piezoresistive pressure sensing element, signal conditioning circuitry for temperature and calibration compensation, and a LCD that displays the pressure measured in either PSI, BAR or MPA (kg/cm²) units.

The piezoresistive sensing element for the MG-MD, MG-9V, and MG1-9V model consists of an oil-filled micro-machined 316L stainless steel convoluted diaphragm and a silicon crystal sensor. Optimal media isolation is achieved when



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the media's pressure acts directly on the 316L stainless steel diaphragm and is then transferred through the oil to the silicon sensor.

The piezoresistive sensing element for the MGA-9V model consists of a silicon crystal sensor. The silicon crystal sensor is mounted on a 304L stainless steel housing.

Strain gauges (resistive elements) in the silicon sensor are used in a Wheatstone Bridge circuit. When the media's pressure is applied, the resistivity of the strain gauges changes proportional to the pressure applied. One leg of the bridge measures the input pressures port. The other leg of the bridge is connected to the reference port (vacuum pressure 0 PSI) the input pressure port is compared to.

Since piezoresistive pressure sensors are generally sensitive to changes in temperature, the MediaGauge™ digital pressure gauges uses signal conditioning to compensate for temperature and calibration. The output signal is then converted into one of 3 user selectable forms – PSI, BAR or MPS (kg/cm²). The pressure measurement reading is updated 3 times per second.



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Product Features

- **Accuracy:**

±0.25% Full Scale (MG-MD, MG-9V)

±1.0% Full Scale (MG1-9V, MGA-9V)

- **Standard Keypad Operated Function:**

Peak Hold: Memory storage of the maximum pressure reading

Zero Adjustment

Multiple Pressure Display Units: PSI, BAR, or MPA

High and Low Pressure Set Points (MG-MD only)

- **Operating Temperature:** -10°C to 60°C

- **Storage Temperature:** -20°C to 85°C

- **NEMA 4X Rating**

- **NIST Traceable Certificates Available**

- **Monitoring and Control Outputs:** A 4-20 mA current output and keypad programmable high/low set point controlled limit switch (MG-MD only).

- **Battery Saver Mode:** A battery power saver mode is incorporated into the 9V stand alone models to automatically shut the LCD display off after 5 minutes on the MG-9V or 3 minutes for the MGA-9V and MG1-9V.

For more details on a particular MediaGauge™ Model, refer to the appropriate MediaGauge™ application note on our website—www.ssitechnologies.com.



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Specifications common to SSI MediaGauge™ Digital Pressure Gauges

Package	NEMA 4X
Operating Temperature	-10°C to +60°C (-14°F to +140°F)
Storage Temperature	-20°C to +85°C (-4°F to +185°F)

Specification Differences in SSI MediaGauge™ Digital Pressure Gauges

	MG-9V	MG1-9V	MGA-9V	MG-MD
Pressure Ranges	15, 50, 75, 100, 200, 300, 500, 750, 1000, 1500, 2000, 3000 PSI	5, 30, 100, 200, 500, 1000, 3000, 5000 PSI	30, 100, 300 PSI	15, 50, 75, 100, 200, 300, 500, 750, 1000, 1500, 2000, 3000 PSI
Accuracy	± 0.25 % Full Scale	± 1.0 % Full Scale	± 1.0 % Full Scale	± 0.25 % Full Scale
Output Type	4 Digit LCD	4 Digit LCD	4 Digit LCD	4 Digit LCD, 4-20 mA current output, and a NPN limit switch
Keypad Operated Functions	Multiple Pressure Units (PSI, BAR, MPA); Peak Hold; Zero Adjustment <i>Note: Ft of Head Option is available</i>	Multiple Pressure Units (PSI, BAR, MPA); Peak Hold; Zero Adjustment	Multiple Pressure Units (PSI, BAR, MPA); Peak Hold; Zero Adjustment	Multiple Pressure Units (PSI, BAR, MPA); Peak Hold; Zero Adjustment; High and Low Pressure Set points <i>Note: Ft of Head Option is available</i>
Supply Voltage	9 Volt Battery	9 Volt Battery	9 Volt Battery	8 - 30 Vdc
Battery Saver Mode Automatic Shutoff Time	5 minutes	3 minutes	3 minutes	N/A
Media Isolation	316L SS Diaphragm	316L SS Diaphragm	No Diaphragm	316L SS Diaphragm
Port	304L SS Port 22mm 1/4 - 18 NPT or 22mm 1/8 – 27 NPT	316L SS Port 22mm 1/4 - 18 NPT	304L SS Port 22mm 1/4 - 18 NPT	304L SS Port 22mm 1/4 - 18 NPT or 22mm 1/8 – 27 NPT
Chemical Compatibilities	Any gas or liquid chemically compatible to 304L SS and 316L SS	Any gas or liquid chemically compatible to 316L SS	Dry Air and Non-Corrosive Gases	Any gas or liquid chemically compatible to 304L SS and 316L SS
Package	3" with black ABS Thermoplastic case	2 1/2" with black ABS Thermoplastic case	2 1/2" with black ABS Thermoplastic case	3" with black ABS Thermoplastic case
Typical Applications	General Purpose, Test, MRO, Process Controls, Refrigeration; Fuel Cells; Pumps; Hydraulics; Pneumatics; Compressors; Waste Water, Agriculture	General Purpose, Test, MRO, Process Controls, Refrigeration; Fuel Cells; Pumps; Hydraulics; Pneumatics; Compressors; Waste Water, Agriculture	Process Control; Compressors	General Purpose, Test, MRO, Process Controls, Refrigeration; Fuel Cells; Pumps; Hydraulics; Pneumatics; Compressors; Waste Water, Agriculture

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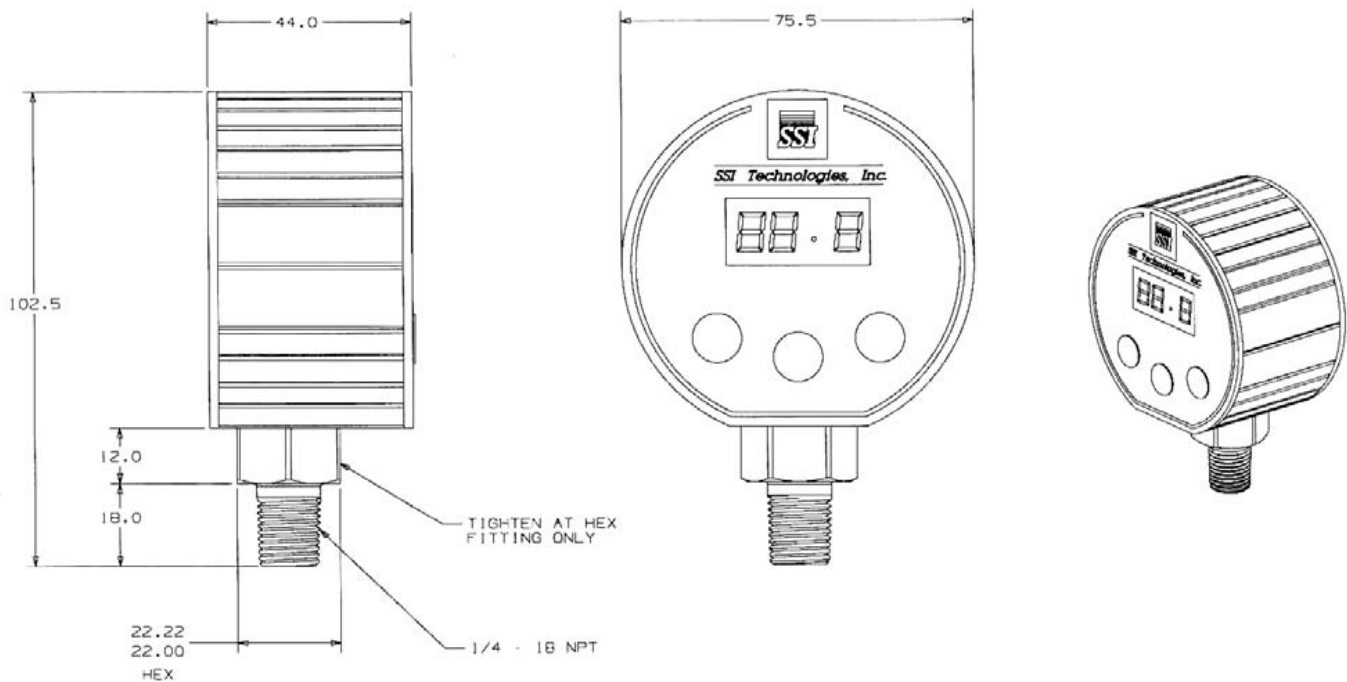


RoHS

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MediaGauge™ Digital Pressure Gauges

Product Overview



MediaGauge™ (MG-9V and MG-MD) with 22mm Hex and 1/4" - 18 NPT Process Connection

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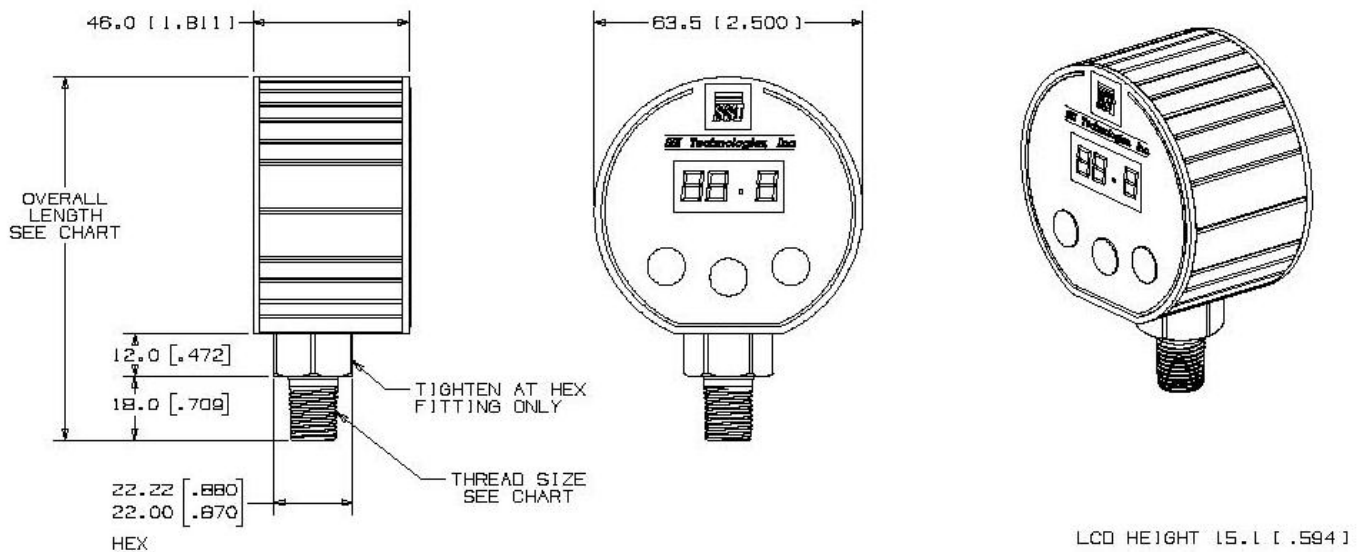


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MediaGauge™ (MGA-9V and MG1 -9V) with 22mm Hex and 1/4" - 18 NPT Process Connection

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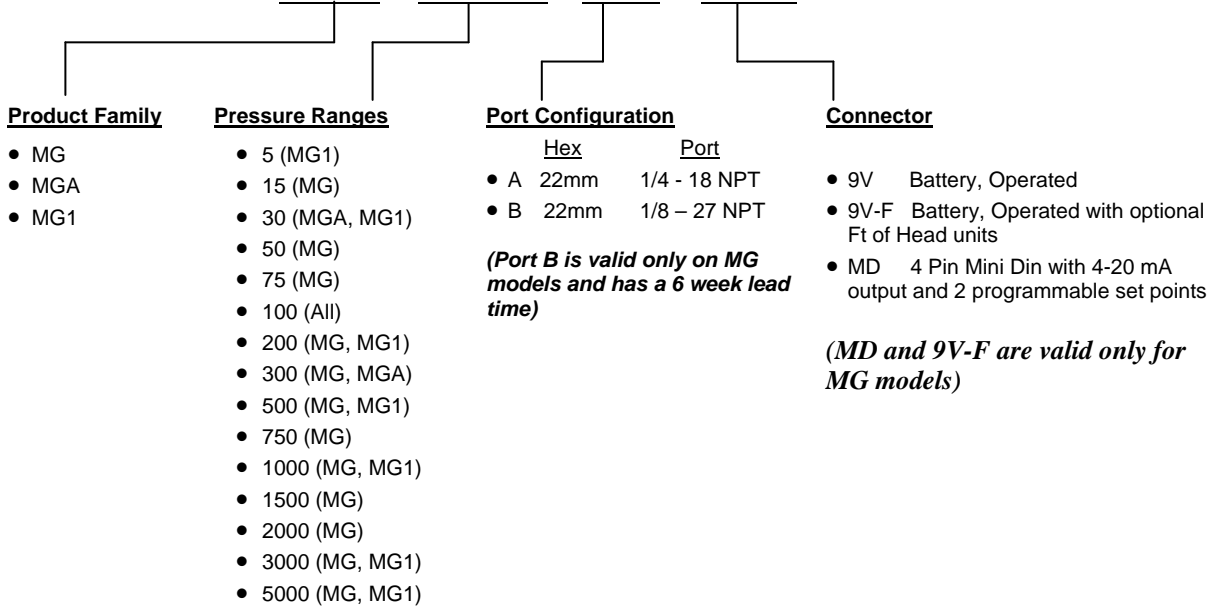
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Digital Pressure Gauge Ordering System

The following explains SSI's MediaGauge™ Digital Pressure Gauges order number sequence.

Example → **MG - 500 - A - 9V**



Ft of Head Options

MG 100 – A – 9V – F
200 – A – 9V – F
300 – A – 9V – F

Rubber Boot Options:

Order P/N 14405.1 for Model MG
Order P/N 24610.1 for Models MGA and MG1

