

# Mid-West<sup>®</sup> Instrument

## “Piston Type” Differential Pressure Gauge & Switch Model 120



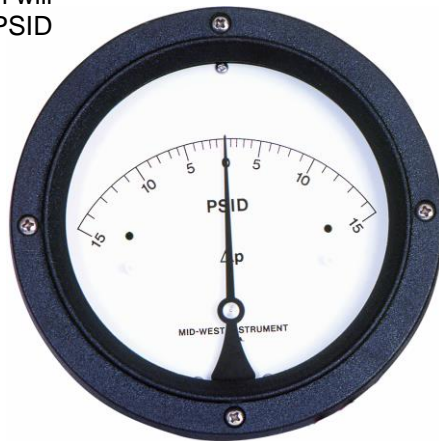
A low-cost differential pressure gauge for use in measuring the pressure drop across filters, strainers, separators, valves, pumps, chillers, etc., and for local flow indication and control.



Model 120  
0-50 PSID  
2-1/2" Dial

- Simple, rugged, compact design.
- Working pressures up to 6,000 PSIG (400 bar)
- Over-range protection to maximum pressure.
- Body Materials: Aluminum or 316L Stainless Steel with 316 stainless steel internals. Aluminum Bronze & Monel available upon request.
- Weather-resistant construction standard.
- Shatter resistant acrylic lens.
- Variety of Dial type and Sizes: 2-1/2", 3-1/2", 4-1/2" & 6"
- Available DP Ranges: Inches H<sub>2</sub>O, PSID, bar, and Kpa
- 1/4" FNPT & 1/2" FNPT Process Connections
- Multiple mounting options available
- Temperature Limits: -40°F(-40°C) to +200°F(+93°C)

Due to precision sizing of piston and body bore, leakage across piston will not exceed 32 SCFH air at 100 PSID at ambient temperature.



Model 120  
15-0-15 PSID  
4-1/2" Dial  
Bi-Directional



Model 120 0-30 PSID  
With Maximum Follower Pointer



Model 120  
0-50 PSID  
With Special 3 Color Dial

An optional maximum indication follower pointer provides automatic indication of maximum differential occurring during a time period or system cycle. Reversed pressure ports are optionally available to facilitate installation and readability depending on which side of a filter, etc., the instrument must be installed.

Model	Body Material	Accuracy	Min. ΔP Range	Max. ΔP Range	MWP PSIG (Bar)	Switch Options
120	Aluminum & 316L S.S.	±3/2/3%	0-5 PSID	0-110 PSID	ALM.= 3,000 (200) S.S. = 6,000 (400)	1 & 2 switch Hermetically Sealed

**Proof Pressure:** Two times rated working pressure at ambient temperature

**Standards:** Model 120 Gauge either conforms to and/or is designed to the requirements of the following standards:

ASME B1.20.1	EN-61010-1
ASME B40.100	NACE MR0175
NEMA Std. No. 250	SAE J514
CSA-C22.2 No. 14.25 and 30	UL Std. No. 50,508 and 1203

# “Piston Type” Differential Pressure Gauge Switch & Transmitter Options Models 120, 122, 123 & 124



The Model 120-124 Series DP gauges are available with one or two hermetically sealed reed switches or 4-20mA transmitter depending on model. (See chart below)

The switches are adjustable (see table for adjustment range) within a defined percentage of the full scale range of the gauge and are available in SPDT and SPST, normally open or normally closed configurations for various load power ratings. The switches can be set to activate or deactivate on rising or falling pressure.

The standard reed switch is enclosed in a weather-resistant plastic housing. Adjustment of the switch setting is made with an external screw adjustment.

The switch functionality will be different for gauges with bi-directional operation for positive and negative delta pressure. For example a SPDT switch with positive .P applied to the gauge, the red wire will be N.O. and the black will be N.C.. For negative .P the functionality will be reversed.

Location for a single SPDT (grommet or conduit) switch will be on the bottom of the gauge body for a normal port and on the top for a reverse port. Locations for a single SPST (grommet or conduit) N.O. or SPST N.C. switch will be on the bottom and top respectively for a normal port gauge. The locations will be reversed for a reverse port gauge.

A non-indicating (no dial) differential pressure switch is also available.

Hazardous Location switches are 3<sup>rd</sup> Party Certified Class I Div 2 or Class I Div 1 dependent on type of switch. Listings are for the entire design and not just the enclosure. Standard and weatherproof units are CE/UKCA marked for conformance with the Low Voltage Directive to harmonized standard EN 61010-1.

Transmitters feature Microprocessor based, external zero interface, 8-28 Vdc loop powered, 2 wire interface. Standard output of 4-20mA with a max loop resistance of 1000 Ohms.

Model Type	•120, ^122,+123, +124 SPDT	•120,^122, •123, SPDT	•120, ^122,+123, +124 SPST NO	•120, •123,•124 SPST NC	•120, •123,•124 SPST NO/NC
Power	3 W	60 W	60 W	60 W	60 W
Max Current	0.25 Amps	1.0 Amps	3.0 Amps	3.0 Amps	3.0 Amps
Max Voltage VAC/VDC	125	240	240	240	240
Setting Full Scale	•10-90%	•25-100%	•25-95%	•25-95%	•25-95%
	^10-100%	^25-100%	^25-100%		
	+15-90%		+25-95%		
Hysteresis (Max / Norm)	10% / 5% (FS)	20% / 13% (FS)	15% / 8% (FS)	15% / 8% (FS)	15% / 8% (FS)
Repeatability	1% F.S.	1% F.S.	1% F.S.	1% F.S.	1% F.S.
Leads 22 Awg	(3) 24"	(3) 24"	(2) 24"	(2) 24"	(2) 24"



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# Mid-West<sup>®</sup> Instrument

## Standard Dial Ranges: Model 120, 122, 123, 124

Range Type			
PSID	Kpa	Bar	Dual Scale
0-5 PSID	0-35 Kpa	0-1.0 Bar	0-5 PSID & 0-0.35 Kg/Cm2
0-10 PSID	0-70 Kpa	0-1.6 Bar	0-5 PSID & 0-35 KPA
0-15 PSID	0-100 Kpa	0-1.75 Bar	0-10 PSID & 0-0.7 BAR
0-20 PSID	0-160 Kpa	0-2.0 Bar	0-10 PSID & 0-0.7 KG/CM2
0-25 PSID	0-250 kpa	0-2.5 Bar	0-10 PSID & 0-70 KPA
0-30 PSID	0-400 Kpa	0.4.0 Bar	0-100 PSID & 0-7 BAR
0-50 PSID	0-600 Kpa	0-6.0 Bar	0-100 PSID & 0-7 KG/CM2
0-60 PSID	0-700 Kpa	0-7.0 Bar	0-100 PSID & 0-700 KPA
0-75 PSID			0-15 PSID & 0-1 BAR
0-100 PSID			0-15 PSID & 0-1 KG/CM2
0-110 PSID			0-15 PSID & 0-100 KPA
**0-150 PSID			0-20 PSID & 0-1.4 BAR
**0-200 PSID			0-20 PSID & 0-140 KPA
**0-250 PSID			0-25 PSID & 0-1.75 BAR
**0-300 PSID			0-25 PSID & 0-1.75 KG/CM2
**0-400 PSID			0-25 PSID & 0-175 KPA
<b>Bi-Directional</b>	<b>Bi-Directional</b>	<b>Bi-Directional</b>	0-30 PSID & 0-2 BAR
5-0-5 PSID	40-0-40 Kpa	0.4-0-0.4 Bar	0-30 PSID & 0-2 KG/CM2
10-0-10 PSID	60-0-60 Kpa	0.6-0-0.6 Bar	0-30 PSID & 0-200 KPA
15-0-15 PSID	100-0-100 Kpa	1-0-1 Bar	0-50 PSID & 0-3.5 BAR
20-0-20 PSID	160-0-160 Kpa	1.6-0-1.6 Bar	0-50 PSID & 0-3.5 KG/CM2
25-0-25 PSID	250-0-250 Kpa	2.5-0-2.5 Bar	0-50 PSID & 0-350 KPA
30-0-30 PSID	400-0-400 Kpa	4-0-4 Bar	0-75 PSID & 0-500 KPA
50-0-50 PSID	600-600 Kpa	6-0-6 Bar	
60-0-60 PSID			
100-0-100 PSID			

The above mentioned ranges are some of the most popular requested today. Mid-West Instrument can provide special un-cataloged dial range requirements. As well as multiple scale dials, multiple color dials and special decals. Please consult factory for complete information.

Model	Min. ΔP Range	Max. ΔP Range
120	0-5 PSID	0-110 PSID (0-7 bar)
122	0-5 PSID	0-100 PSID (0-7 bar)
**123	0-150 PSID (0-10 bar)	0-400 PSID (0-27.0 bar)
**124	0-5 PSID (0-0.35 bar) 0-150 PSID (0-10 bar)	0-110 PSID (0-7 bar) 0-400 PSID (0-27.0 bar)

**Proof Pressure:** Two times rated working pressure at ambient temperature

**Temperature Limits:** -40°F(-40°C) to +200°F(+93°C)

Transmitter Option: -20°F(-28°C) to +150°F(+65°C)

These limits are based on the entire instrument being saturated to these temperatures. System (process) temperatures may exceed these limitations with proper installation. Contact our customer service representative for details.

**Standards:** Model 120 -124 Series gauges either conform to and/or are designed to the requirements of the following standards:

ASME B1.20.1

ASME B40.100

CSA-C22.2 No. 14.25 and 30

EN-61010-1

NACE MR0175

NEMA Std. No. 250

SAE J514

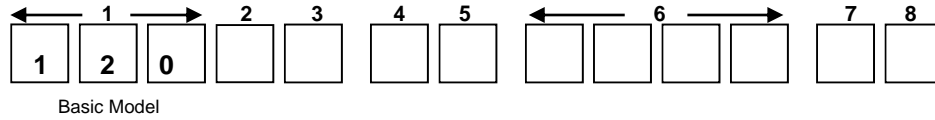
UL Std. No. 50,508 and 1203

## Standard Model Number Sequence: 120AA-00-00

3000 PSIG Working Pressure, Aluminum Body & End Plugs, Stainless Steel Piston,  
Ceramic Magnet, Buna-N Seals, 1/4" FNPT Back Connections,  
2-1/2" Round Dial, Engineered Plastic Dial Case with Shatter Resistant Acrylic Lens  
Accuracy  $\pm 3/2/3\%$  Full Scale (Ascending)

**Range 0-5 PSID to 0-110PSID (0.35 to 7.0 bar)**

*Gauge Body and Internal components are considered wetted parts.*



Range: \_\_\_\_\_



<b>2</b>	<b>Material</b>
<b>A</b>	Aluminum Body / Stainless Steel Piston
<b>S</b>	316 S.S Body / Stainless Steel Piston
<b>M</b>	Monel Body / Monel Piston <i>(See Bulletin_120MALBZ for complete specifications)</i>
<b>N</b>	Aluminum Bronze Body / Aluminum Bronze Piston <i>(See Bulletin_120MALBZ for complete specifications)</i>
<b>Z</b>	Special <i>(Un-coded Options)</i>
<b>3</b>	<b>Dial Size &amp; Type</b>
<b>A</b>	2-1/2" Round Dial w/Engineered Plastic Dial Case
<b>C</b>	4-1/2" Round Dial w/Engineered Plastic Dial Case
<b>D</b>	4-1/2" Round Bi-Directional Dial w/Engineered Plastic Dial Case
<b>E</b>	3-1/2" Round Dial w/Anodized Aluminum Dial Case
<b>G</b>	4-1/2" Round Dial w/Anodized Aluminum Dial Case
<b>H</b>	4-1/2" Round Bi-Directional Dial w/Anodized Aluminum Dial Case
<b>J</b>	6" Round Dial w/Engineered Plastic Dial Case <i>(Not available with G, H, J or K Switch Options)</i>
<b>K</b>	6" Round Bi-Directional Dial w/Engineered Plastic Dial Case <i>(Not available with G, H, J or K Switch Options)</i>
<b>T</b>	Non-Indicating DP Switch Only
<b>Z</b>	Special <i>(Un-coded Options)</i>
<b>4</b>	<b>Seal Materials</b>
<b>0</b>	Buna-N <i>(Standard)</i>
<b>1</b>	Viton®-A Registered Trademark of Dupont
<b>2</b>	Neoprene
<b>4</b>	Teflon®-A Registered Trademark of Dupont
<b>5</b>	Ethylene Propylene
<b>6</b>	Perfluorelastomers
<b>9</b>	Special <i>(Un-coded Options)</i>
<b>5</b>	<b>Process Connections</b>
<b>0</b>	1/4" FNPT Back Connections <i>(Standard) (Not available on M &amp; N body materials)</i>
<b>2</b>	1/4" FNPT End Connections
<b>3</b>	1/4" FNPT Bottom Connections
<b>4</b>	1/2" FNPT End Connections
<b>6</b>	7/16"-20 Straight Thread "O" Ring Port <i>(Back Connection Only)</i>
<b>9</b>	Special <i>(Un-coded Options)</i>

<b>6</b>	<b>Additional Options</b>
<b>O</b>	None
<b>A</b>	Reversed High / Low Process Connections. <i>(Not available with Electrical options J &amp; K)</i>
<b>C</b>	Mounting Holes in Gauge Body for Field Mounting Electrical Configurations Options A & B
<b>D</b>	Mounting Holes in Gauge Body for Field Mounting Electrical Configurations Options L & M
<b>E</b>	Two (2) 1/4-20 Mounting Holes <i>(Not available with C, D, E or F electrical switch options)</i>
<b>F</b>	Carbon Steel 2" Pipe Mounting Kit <i>(Not available with C, D, E or F electrical switch options)</i>
<b>G</b>	Stainless Steel 2" Pipe Mounting Kit <i>(Not available with C, D, E or F electrical switch options)</i>
<b>K</b>	1/2" FNPT S.S. Adapter <i>(Not available with E or F switch option combined w/back connections)</i>
<b>L</b>	Liquid Fill <i>(Glycerin Fill Standard) (2) (Not available with shatterproof glass lens)</i>
<b>M</b>	Maximum Indicator Follower Pointer <i>(Not available w/3-1/2", 6" Dial or Liquid fill options) (Not available with shatterproof glass lens)</i>
<b>N</b>	NACE <i>(Available for Aluminum, Stainless Steel Gauge Bodies Only)</i>
<b>Q</b>	CRN (Canadian Registration Number) <i>Available on Aluminum or S.S. Body only (1)</i>
<b>S</b>	Shatter Proof Glass Lens <i>(4-1/2" available only with option "G" Aluminum Dial Case) (Not available with liquid fill option)</i>
<b>T</b>	Oxygen Cleaning
<b>U</b>	Stainless Steel Tag with S.S. Wire
<b>V</b>	Stainless Steel Tag and S.S. Screw <i>(Contact Factory on Switch Options) (Not Available on gauge body for Hazardous Locations)</i>
<b>W</b>	Wall Mount Kit <i>(Not available with back connections or with C, D, E or F switch options)</i>
<b>Z</b>	Special <i>(Un-coded Options)</i>
	<i>(1) 5000 PSI SWP for Stainless Steel</i>
	<i>(2) Silicone Fill available please contact factory</i>
	<b>NOTE: Not All Options Available in Combination with other Options</b>
<b>7</b>	<b>Electrical Configurations (CE/UKCA Marked &amp; ROHS Compliant, except E, F, J &amp; K) (6)</b>
<b>O</b>	None
<b>A</b>	One (1) Switch in standard enclosure with grommet Wire Seal
<b>B</b>	Two (2) Switch in standard enclosures with grommet Wire Seal
<b>C</b>	One (1) Switch in standard enclosure with 1/4" FNPT electrical connection NEMA 4X
<b>D</b>	Two (2) Switch in standard enclosures with 1/4" FNPT electrical connection NEMA 4X
<b>E</b>	One (1) Switch in general purpose enclosure, Division 2 Hazardous Locations <b>(1) (3) (4) (5)</b>
<b>F</b>	Two (2) Switches in general purpose enclosure, Division 2 Hazardous Locations <b>(1) (3) (4) (5)</b>
<b>G</b>	One (1) Switch & gauge in NEMA 4X plastic enclosure <i>(Not available with end connections)</i>
<b>H</b>	Two (2) Switches & gauge in NEMA 4X plastic enclosure <i>(Not available with end connections)</i>
<b>J</b>	One (1) Switch in explosion proof enclosure w/glass window cover, Div. 1 Hazardous Locations <b>(2) (3) (4) (5)</b>
<b>K</b>	Two (2) Switches in explosion proof enclosure w/glass window cover, Div.1 Hazardous Locations <b>(2) (3) (4) (5)</b>
<b>L</b>	One (1) Switch in standard enclosure with plug-in connector (DIN 43650/IP65-PG11)
<b>M</b>	Two (2) Switch in standard enclosures with plug-in connector (DIN 43650/IP65-PG11)
<b>Z</b>	Special <i>(Un-coded Options)</i>
	<b>(1)</b> Complete assembly 3rd Party Certified Class I, Div.2, Groups A, B, C, & D; Class II, Div.2, Groups F and G.
	<b>(2)</b> Complete assembly 3rd Party Certified Class I, Div.1, Groups C & D; Class II, Div. 1, Groups E, F, & G.
	<b>(3)</b> 5000 PSIG SWP for Stainless Steel: 3000 PSIG SWP for Aluminum
	<b>(4)</b> Not available in M and N material options
	<b>(5)</b> 1/2" FNPT conduit connection
	<b>(6)</b> Contact factory for Bi-directional scales with switches
<b>8</b>	<b>Electrical Specifications (For Resistive Loads)</b>
<b>O</b>	None
<b>A</b>	SPDT 3W, 0.25 Amp, 125 VAC/VDC <i>(Switch adjustable range of 10-90%)</i>
<b>E</b>	SPST 60W, 3.0 Amp, 240 VAC/VDC <i>(Normally Open) (Switch adjustable range of 25-95%)</i>
<b>F</b>	SPST 60W, 3.0 Amp, 240 VAC/VDC <i>(Normally Closed) (Switch adjustable range of 25-95%)</i>
<b>G</b>	SPST 60W, 3.0 Amp, 240 VAC/VDC <b>(1) Normally Open, (1) Normally Closed (Switch adjustable range of 25-95%)</b>
<b>H</b>	SPDT 60W, 1.0 Amp, 240 VAC/VDC <i>(Switch adjustable range of 25-100%)</i>
<b>Z</b>	Special <i>(Un-Coded Options)</i>

**Factory preset switches at no charge (Specify Setting)**

If you are in need of additional information please visit our web site at [www.midwestinstrument.com](http://www.midwestinstrument.com) or contact us toll free at **1-800-648-5778** and one of our knowledgeable sales coordinators will be happy to assist you...

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