

Data Sheet

# “PISTON TYPE” MODEL 120

Differential Pressure Gauges  
Switches & Transmitters



Supplied by

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# Mid-West<sup>®</sup> Instrument

## “Piston Type”

### Differential Pressure Gauges Switches & Transmitters

## 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

Due to precision sizing of piston and body bore, leakage across piston will not exceed 15 SCFH air at 100 PSID at ambient temperature.

- 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" (Uni-directional or Bi-directional)
- 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)



Model 120 0-30 PSID  
With Maximum Follower Pointer



Model 120  
0-50 PSID  
4-1/2" Dial



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 (0-0.35 bar)	0-110 PSID (0-7 bar)	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               | NACE MR0175                 |
| ASME B40.100               | NEMA Std. No. 250           |
| CSA-C22.2 No. 14.25 and 30 | SAE J514                    |
| EN-61010-1                 | 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 dependant on type of switch. Listings are for the entire design and not just the enclosure. Standard and weatherproof units are CE 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	121, 124 4-20mA
Power	3 W	60 W	60 W	60 W	60 W	4-20 mA Loop Power
Max Current	0.25 Amps	1.0 Amps	3.0 Amps	3.0 Amps	3.0 Amps	8-28 VDC Loop Powered 2-Wire interface
Max Voltage VAC/VDC	125	240	240	240	240	1000 Ohm max Loop resistance at 28 vdc
Setting Full Scale	•10-90%	•25-100%	•25-95%	•25-95%	•25-95%	20-100%
	^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)	N/A
Repeatability	1% F.S.	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"	N/A



# 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	0-2.0 Bar	0-10 PSID & 0-0.7 BAR
0-20 PSID	0-160 Kpa	0-2.5 Bar	0-10 PSID & 0-0.7 KG/CM2
0-25 PSID	0-250 kpa	0-4.0 Bar	0-10 PSID & 0-70 KPA
0-30 PSID	0-400 Kpa	0-6.0 Bar	0-100 PSID & 0-7 BAR
0-50 PSID	0-600 Kpa	0-7.0 Bar	0-100 PSID & 0-7 KG/CM2
0-60 PSID	0-700 Kpa		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
**0-400PSID			0-25 PSID & 0-175 KPA
			0-30 PSID & 0-2 BAR
<b>Bi-Directional</b>	<b>Bi-Directional</b>	<b>Bi-Directional</b>	0-30 PSID & 0-2 KG/CM2
5-0-5 PSID	40-0-40 Kpa	0.4-0-0.4 Bar	0-30 PSID & 0-200 KPA
10-0-10 PSID	60-0-60 Kpa	0.6-0-0.6 Bar	0-50 PSID & 0-3.5 BAR
15-0-15 PSID	100-0-100 Kpa	1-0-1 Bar	0-50 PSID & 0-3.5 KG/CM2
20-0-20 PSID	160-0-160 Kpa	1.6-0-1.6 Bar	0-50 PSID & 0-350 KPA
25-0-25 PSID	250-0-250 Kpa	2.5-0-2.5 Bar	0-75 PSID & 0-500 KPA
30-0-30 PSID	400-0-400 Kpa	4-0-4 Bar	
50-0-50 PSID	600-600 Kpa	6-0-6 Bar	
60-0-60 PSID			
100-0-100 PSID			

**Bi-Directional ranges available for Model 120 4-1/2" Dials only.**

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 (0-0.35 bar)	0-110 PSID (0-7 bar)
122	0-5 PSID (0-0.35 bar)	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) - 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:

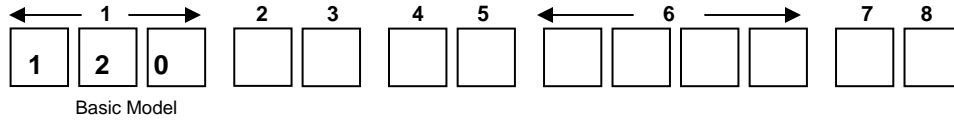
ASME B1.20.1	NACE MR0175
ASME B40.100	NEMA Std. No. 250
CSA-C22.2 No. 14.25 and 30	SAE J514
EN-61010-1	UL Std. No. 50,508 and 1203

### Standard Model Specifications: 120-AA-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 Case with Shatter Resistant Acrylic Lens,  
Accuracy ±3/2/3% Full Scale (Ascending)

**Mid-West Instrument**  
1-800-648-5778

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



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
<b>N</b>	Aluminum Bronze Body / Aluminum Bronze Piston
<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 Uni-Directional Dial w/Engineered Plastic Dial Case
<b>C</b>	4-1/2" Round Uni-Directional 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 Uni-Directional Dial w/Anodized Aluminum Housing Dial Case
<b>G</b>	4-1/2" Round Uni-Directional Dial w/Anodized Aluminum Housing Dial Case
<b>H</b>	4-1/2" Round Bi-Directional Dial w/Anodized Aluminum Housing Dial Case
<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 ( <b>Standard</b> )
<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 ( <b>Standard</b> ) ( <b>Not available on M &amp; N body materials</b> )
<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 ( <b>Back Connection</b> )
<b>9</b>	Special ( <i>Un-coded Options</i> )

Factory preset switches at no charge (Specify Setting)

## Standard Model Specifications – continued Model 120

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

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...