

# Mid-West<sup>®</sup> Instrument

## “Piston Type”

### Differential Pressure Gauge or Switch

## Model 120



### FOR SEA WATER APPLICATIONS

Ideally suited for use on Sea Water or salt Water applications.

Model 120 Shown  
With 2-1/2" Dial & Switch



**Features:**

- Simple, rugged, compact design.
- Working pressure 5,000 PSIG (340 bar)
- Over-range protection to maximum pressure.
- Over range protection to full rated working pressure.
- Body Materials: Aluminum/Bronze, or Monel
- 1/4" FNPT FNPT End Connection (std)
- Weather-resistant construction standard.
- Shatter resistant acrylic lens.
- Variety of Dial type and Sizes: 2-1/2", 3-1/2" & 4-1/2"
- DP Ranges available in: Inches PSID, Bar, and Kpa
- 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 15 SCFH air at 100 PSID at ambient temperature.



Model 120 shown  
with Customer colored Dial



Model 120 Shown  
With 4-1/2" 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	Accuracy	Available ΔP Range	Max. Line Pressure PSIG	Optional Switches
120	±5%	0-5 PSID, 0-10 PSID 0-15 PSID, 0-20 PSID 0-25 PSID, 0-30 PSID 0-50 PSID, 0-100 PSID	5,000	1 & 2 switch Hermetically Sealed

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



1 & 2 Switch  
Examples shown



The Model 120 Series DP gauge is available with one or two hermetically sealed reed switches. (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.

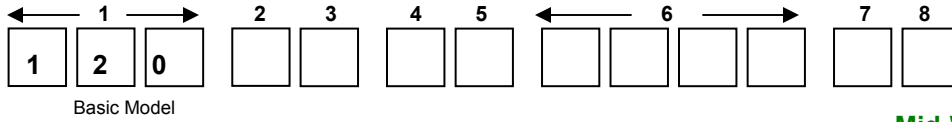
Location for a single SPDT (grommet or conduit) switch will be on the bottom of the gauge body for a normal port and on the top for a reverse port. Locations for a single SPST (grommet or conduit) N.O. or SPST N.C. switch will be on the bottom and top respectively for a normal port gauge. The locations will be reversed for a reverse port gauge. A non-indicating (no dial) differential pressure switch is also available.

Model Type	120 SPDT	120 SPDT	120 SPST NO	120 SPST NC	120 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%
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"

### Standard Model Specifications: 120-NA-02-00

5000 PSIG Working Pressure, Aluminum Bronze Body & Piston, Monel Spring, Ceramic Magnet, Buna-N Seals, 1/4" FNPT End Connections, 2-1/2" round dial, Engineered Plastic Case with Shatter Resistant Acrylic Lens, Accuracy ±5% Full Scale (Ascending)

**Ranges: 0-10 PSID, 0-15 PSID, 0-10 PSID, 0-25 PSID and 0-30 PSID**



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

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



<b>2</b>	<b>Material</b>
<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>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>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 (Standard)
<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>9</b>	Special ( <i>Un-coded Options</i> )
<b>5</b>	<b>Process Connections</b>
<b>2</b>	1/4" FNPT End Connections
<b>9</b>	Special ( <i>Un-coded Options</i> )

## Standard Model Specifications – continued Model 120

6	Additional Options
<b>O</b>	None
<b>A</b>	Reversed High / Low Process Connections.
<b>E</b>	Two (2) 1/4-20 Mounting Holes (not available with C or D electrical switch options)
<b>F</b>	Carbon Steel 2" Pipe Mounting Kit (not available with C or D electrical switch options)
<b>G</b>	Stainless Steel 2" Pipe Mounting Kit (not available with C or D electrical switch options)
<b>L</b>	Liquid Fill (4-1/2" available with "G" option Aluminum Dial Case only) (not available with shatterproof lens)
<b>M</b>	Maximum Indicator Follower Pointer (not available with Liquid fill option) (not available with shatterproof lens)
<b>S</b>	Shatter Proof Glass Lens (Available only with option "G" 4-1/2" Aluminum Dial Case) (not available with liquid fill)
<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 (Contact Factory on Switch Options) Not on Gauge Body for Hazardous Locations
<b>W</b>	Wall Mount Kit (not available with C or D switch options)
<b>Z</b>	Special ( <b>Un-coded Options</b> )
<b>NOTE: Not All Options Available in Combination with other Options</b>	
7	Electrical Configurations (CE marked) (6)
<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>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 ( <b>Un-coded Options</b> )
(6) Contact factory for Bi-directional scales with switches	
8	Electrical Specifications (For Resistive Loads)
<b>A</b>	SPDT 3W, 0.25 Amp, 125 VAC/VDC (standard) (Switch adjustable range of 10-90%)
<b>E</b>	SPST 60W, 3.0 Amp, 240 VAC/VDC (Normally Open) (Switch adjustable range of 25-95%)
<b>F</b>	SPST 60W, 3.0 Amp, 240 VAC/VDC (Normally Closed) (Switch adjustable range of 25-95%)
<b>G</b>	SPST 60W, 3.0 Amp, 240 VAC/VDC (1) Normally Open, (1) Normally Closed (Switch adjustable range of 25-95%)
<b>H</b>	SPDT 60W, 1.0 Amp, 240 VAC/VDC (Switch adjustable range of 25-100%)
<b>Z</b>	Special ( <b>Un-coded Options</b> )

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

**MID-WEST INSTRUMENT** has been serving a variety of industries (Power, Chemical, Petro-Chemical, HVAC, Water Filtration etc...) for over 50 years. Over 700,000 piston type units have been produced bearing the Mid-West name or private branded for our OEM customers!

Mid-West understands that in today's demanding environment, flexibility, quick response time and the ability to ship product in 2 weeks or less is essential to our customers. Standard configurations can be customized and modified to suit our customer's needs for ease of installation or retrofit.

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...

# Mid-West<sup>®</sup> Instrument

## “Piston Type” Model 121 Differential Pressure Switch & Transmitter

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

- ½ NPT conduit connection with heavy duty Switch or Transmitter cover and terminal strip
- Choice of 1 or 2 magnetically actuated hermetically sealed reed switches to provide high and low limit alarm or control or 4-20mA transmitter.
- Transmitter accuracy ± 2% full scale (from 20% to 100% of scale, ascending)
- Body materials: Aluminum or 316L Stainless Steel with 316 stainless steel internals.
- Weather-resistant construction standard.
- Working pressure up to 6,000 PSIG (400 bar)
- Over-range protection to maximum pressure.
- Shatter resistant acrylic lens.
- Variety of Dial type and Sizes: 2-1/2”, 3-1/2” & 4-1/2”
- Available DP Ranges: Inches H2O, PSID, bar, and Kpa
- Temperature Limits:  
-40°F (-40°C) to +200°F (+93°C) (Switch Options)  
-20° F to + 150° F (Transmitter Option)

**Transmitter now  
CSA Listed for  
Division 2 Hazardous  
Location Service**



Model 121 0-75 PSID  
2-1/2” Dial. Shown with  
End Connections & Transmitter



Model 121 Switch  
¼” FNPT back  
connections



Model 121  
0-50 PSID 4-1/2” Dial  
& Transmitter



Model	Body Material	Gauge Accuracy	Min. ΔP Range	Max. ΔP Range	MWP PSIG (Bar)	Switch Options
121	Aluminum & 316L S.S.	±3/2/3%	0-5 PSID (0-0.35 bar)	0-100 PSID (0-7 bar)	ALM. = 3,000 (200) S.S. = 6,000 (400)	1 or 2 switches or 4-20mA Transmitter

### Model 121 Indicating Switch(es) or 4-20mA Transmitter SPECIFICATIONS

#### TRANSMITTER

##### Features:

Microprocessor based, external zero interface:  
8-28 Vdc loop powered, 2 wire interface

##### Electrical:

Accuracy ±2% (from 20% to 100% of scale, ascending)  
Supply Voltage 8-28 Vdc  
Output 4-20mA  
Max Loop Resistance 1000 Ohms

##### Interface:

4 position terminal strip for 16-22 Awg wire  
Pin 1 – return, Pin 2 = zero, Pin 3 = 8-28 Vdc, Pin 4-chassis  
1/2” NPT conduit connection

**Environmental:** Weatherproof

**Rating:** (NEMA 4X, IP65)

#### SWITCHES

##### Features:

1 or 2 hermetically sealed reed switches

##### Electrical:

0-3W, 25 Amp  
125 VAC (Adjustable 15-95% F.S.)  
60W, 3.0 Amp  
240 VAC (Adjustable 20-95% F.S.)

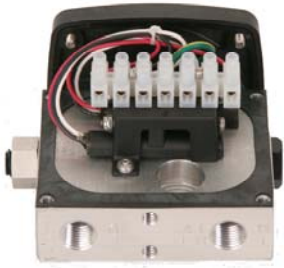
##### Interface:

7 position terminal strip for 16-22 Awg wire  
1/2” NPT conduit connection

**Environmental:** Weatherproof

**Rating:** (NEMA 4X, IP65)

# “Piston Type” Differential Pressure Switch & Transmitter Options Model 121



Open back view  
Model 121 reed switch  
with terminal strip



Model 121 Transmitter show  
with NEMA 4X plastic cover



Open view Model 121 Transmitter  
4-20 mA terminal strip  
w/ 1/4" FNPT end connections

Piston-Type Differential Pressure Gauges are available with one or two hermetically sealed reed switches. The switches are adjustable 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. Switches are "CE" marked per the EU low voltage directive. Models 121 can be configured for use in Hazardous Locations.

Piston Type DP Gauge:  $\pm 2\%$  Full Scale Accuracy. They are primarily designed for liquid applications. They exhibit a slight amount of bypass as the fluid crosses from the high to the low pressure port. Because gas molecules are smaller, the crossover is often deemed too great for the application. Due to precision sizing of piston and body bore, leakage across the piston will not exceed 15 SCFH air at 100 PSID at ambient conditions.

Available Electrical Configurations
One (1) Reed switch in NEMA 4X/IP65 Plastic enclosure with terminal strip (1/2" FNPT Conduit Connection)
Two (2) Reed switches in NEMA 4X/IP65 Plastic enclosure with terminal strip (1/2" FNPT Conduit Connection)
One (1) Switch in general purpose enclosure, Division 2 Hazardous Locations (1) (2)
Two (2) Switches in general purpose enclosure, Division 2 Hazardous Locations (1) (2)
4-20 mA Transmitter in NEMA 4X/IP65 Plastic enclosure with terminal strip (1/2" FNPT Conduit Connection) (3)
4-20 mA Transmitter in NEMA 4X/IP65 Plastic enclosure. Division 2 Hazardous Locations with terminal strip (1/2" FNPT Conduit Connection) (1) (2) (3)
(1) Complete assembly 3rd Party Certified Class I, Div.2, Groups A, B, C, & D; Class II, Div.2, Groups F and G.
(2) 5000 PSIG SWP for Stainless Steel: 3000 PSIG SWP for Aluminum
(3) Contact factory for flow applications with transmitter configuration
Available Electrical Specifications (For Resistive Loads)
SPDT 3W, 0.25 Amp, 125 VAC/VDC (standard) (Switch adjustable range of 15-95%)
SPST 60W, 3.0 Amp, 240 VAC/VDC (Normally Open) (Switch adjustable range of 20-95%)
SPST 60W, 3.0 Amp, 240 VAC/VDC (Normally Closed) (Switch adjustable range of 20-95%)
SPST 60W, 3.0 Amp, 240 VAC/VDC (1) Normally Open, (1) Normally Closed (Switch adjustable range of 20-95%)
4-20 mA Transmitter (8-28 VDC Loop Power) ( $\pm 2\%$ accuracy from 20% to 100% of scale. Ascending)

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

**Temperature Limits:**

**Switch Options:** -40°F to + 200°F

**Transmitter Options:** -20° F TO + 150° F

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 121 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 |

# Mid-West<sup>®</sup> Instrument

## Standard Dial Ranges: **Model 121**

Range Type		
PSID	Kpa	Bar
0-5 PSID	0-100 Kpa	0-1.0 Bar
0-10 PSID	0-160 Kpa	0-1.6 Bar
0-15 PSID	0-250 kpa	0-2.0 Bar
0-20 PSID	0-400 Kpa	0-2.5 Bar
0-25 PSID	0-600 Kpa	0-4.0 Bar
0-30 PSID	0-700 Kpa	0-6.0 Bar
0-50 PSID		0-7.0 Bar
0-60 PSID		
0-75 PSID		
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
121	0-5 PSID (0-0.35 bar)	0-100 PSID (0-7 bar)

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

**Temperature Limits:**

**Switch Options:** -40°F to + 200°F

**Transmitter Options:** -20° F TO + 150° F

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 121 Gauge either conforms to and/or is designed to the requirements of the following standards:

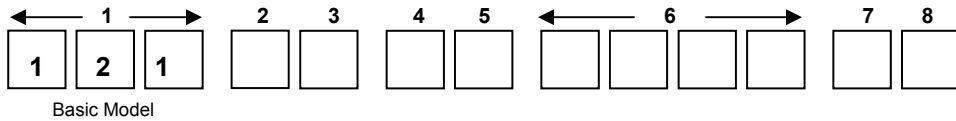
- |                            |                             |
|----------------------------|-----------------------------|
| ASME B1.20.1               | NACE MR0175                 |
| ASME B40.100               | NEMA Std. No. 250           |
| CSA-C22.2 No. 14.25 and 30 | SAE J514               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

### Standard Model Specifications: 121-AA-00-O(TT)

3000 PSIG Working Pressure, Aluminum Body, Adjusting Screws & 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, 4-20mA, 8-28 VDC Loop powered Transmitter in NEMA 4X/IP65 Plastic enclosure with terminal strip, & 1/2" FNPT Conduit Connection, Accuracy ±3/2/3% Full Scale (Ascending)

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

**Range 0-5 PSID to 0-100PSID (0-.35 bar to 0-7.0 bar)**



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



2	Material
<b>A</b>	Aluminum Body / Stainless Steel Piston
<b>S</b>	316 S.S Body / Stainless Steel Piston
<b>Z</b>	Special ( <i>Un-coded Options</i> )
3	Dial Size & Type
<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>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>T</b>	Non-Indicating DP Switch Only
<b>Z</b>	Special ( <i>Un-coded Options</i> )
4	Seal Materials
<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> )
5	Process Connections
<b>0</b>	1/4" FNPT Back Connections ( <b>Standard</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 121



6	Additional Options
O	None
F	Carbon Steel 2" Pipe Mounting Kit
G	Stainless Steel 2" Pipe Mounting Kit
K	1/2" FNPT Stainless Steel Adapter
L	Liquid Fill (4-1/2" available with "G" option Aluminum Dial Case only) (not available with shatterproof lens)
M	Maximum Indicator Follower Pointer (Not available with Liquid fill option) (not available with shatterproof lens)
N	NACE
Q	CRN (Canadian Registration Number) (2)
S	Shatter Proof Glass Lens (Available only with 4-1/2" Aluminum Dial Case) (not available with liquid fill)
T	Oxygen Cleaning
U	Stainless Steel Tag with S.S. Wire
W	Wall Mount Kit (Not available with back connections)
Z	Special ( <i>Un-coded Options</i> )
7	Electrical Configurations
A	One (1) Reed switch in NEMA 4X/IP65 Plastic enclosure with terminal strip (1/2" FNPT Conduit Connection)
B	Two (2) Reed switches in NEMA 4X/IP65 Plastic enclosure with terminal strip (1/2" FNPT Conduit Connection)
E	One (1) Switch in general purpose enclosure, Division 2 Hazardous Locations (1) (2)
F	Two (2) Switches in general purpose enclosure, Division 2 Hazardous Locations (1) (2)
T	4-20 mA Transmitter in NEMA 4X/IP65 Plastic enclosure with terminal strip (1/2" FNPT Conduit Connection) (3)
W	4-20 mA Transmitter in NEMA 4X/IP65 Plastic enclosure. Division 2 Hazardous Locations with terminal strip (1/2" FNPT Conduit Connection) (1) (2) (3)
Z	Special ( <i>Un-coded Options</i> )
	(1) Complete assembly 3rd Party Certified Class I, Div.2, Groups A, B, C, & D; Class II, Div.2, Groups F and G.
	(2) 5000 PSIG SWP for Stainless Steel: 3000 PSIG SWP for Aluminum
	(3) Contact factory for flow applications with transmitter configuration
8	Electrical Specifications (For Resistive Loads)
A	SPDT 3W, 0.25 Amp, 125 VAC/VDC (standard) (Switch adjustable range of 15-95%)
E	SPST 60W, 3.0 Amp, 240 VAC/VDC (Normally Open) (Switch adjustable range of 20-95%)
F	SPST 60W, 3.0 Amp, 240 VAC/VDC (Normally Closed) (Switch adjustable range of 20-95%)
G	SPST 60W, 3.0 Amp, 240 VAC/VDC (1) Normally Open, (1) Normally Closed (Switch adjustable range of 20-95%)
T	4-20 mA Transmitter (8-28 VDC Loop Power) ( ±2% accuracy from 20% to 100% of scale. Ascending)
Z	Special ( <i>Un-coded Options</i> )

MID-WEST INSTRUMENT has been serving a variety of industries (Power, Chemical, Petro-Chemical, HVAC, Water Filtration etc...) for over 50 years. Over 700,000 piston type units have been produced bearing the Mid-West name or private branded for our OEM customers!

Mid-West understands that in today's demanding environment, flexibility, quick response time and the ability to ship product in 2 weeks or less is essential to our customers. Standard configurations can be customized and modified to suit our customer's needs for ease of installation or retrofit.

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...