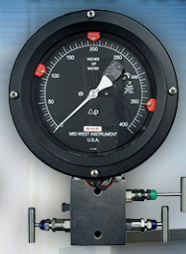
Mid-West Instrument

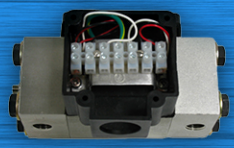
MADE IN
THE U.S.A.

DIFFERENTIAL PRESSURE GAUGES
SWITCHES & TRANSMITTER

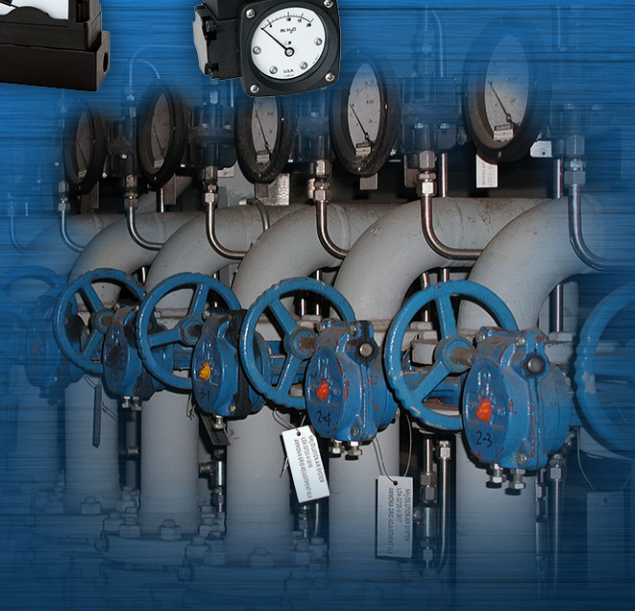
Providing product
& solutions
since 1958



FILTER MONITORING
TANK LEVEL - LIQUID LEVEL
HAZARDOUS LOCATION
FLOW MEASUREMENT



A gauge for every application!



Mid-West® Instrument

1 Year & 5 Year Product Warranties

Manufacturer warrants that all products sold shall be free from defects in workmanship and material for warranty period.

Manufacturer does not make any other warranties and expressly disclaims all other warranties, expressed or implied, the uniform commercial code, as adopted in the State of Michigan. Without limiting the generality of the foregoing, manufacturer expressly disclaims any warranty of merchantability, and any warranty of suitability or fitness for any particular or intended purpose or use. The sole and exclusive remedy shall be limited to replacement or repair of any product which has a defect in workmanship or material. In no event shall manufacturer be liable to any representative, distributor, customer, ultimate user or any other person or entity for any damages, costs, expenses or liabilities of any kind or nature, including, without limitation, direct damages, indirect damages, consequential damages, labor cost, and any expenses incurred by any distributor, customer, ultimate user or any other person or entity relating to the installation, use, repair or replacement of any product. This product warranty and disclaimer shall apply to all sales of products.

Warranty Period is dependant on product purchased

Pleases contact the sales department for complete product warranty details.

Providing DP Solutions for

over 50 Years

6500 Dobry Dr. • Sterling Heights, MI 48314 USA • Tel: 586-254-6500 Fax: 586-254-6509
Web Site: www.midwestinstrument.com • Email: sales@midwestinstrument.com
Toll Free 800-648-5778

Mid-West® Instrument

STANDARD POLICIES and CONDITIONS OF SALE

1. **Acceptance** – Quotations are firm for 30 days unless otherwise specifically noted. All orders are subject to acceptance by Mid-West Instrument at our plant.

2. **Shipping Dates** – The scheduled shipping date is established from the date we have all information necessary to properly process the subject order. Mid-West assumes no responsibility for any delays in shipment, for any reason

3. **Dimensional Data and Specifications** – Information shown in Mid-West literature is general only and the right is reserved to change dimensions or specifications, etc., at any time

4. **Methods of Shipment** – Unless otherwise specified, Mid-West's standard methods of shipment are:
   - United Parcel Service
   - United Parcel Service " Hundred Weight" Service
   - Commercial Carrier

   (NOTE: No freight bills are available on shipments by United Parcel Service. Saturday deliveries require customer contact name and phone number)

5. **Shipping Charges and F.O.B. Point** – All shipments are F.O.B. our plant, Sterling Heights, Michigan. If shipping charges are to be prepaid and added to the invoice, Mid-West reserved the right to estimate these charges. Title to invoiced items transfers upon delivery to the carrier.

6. **Notification of Shipment Charges** - A $10.00 service charge will be added to all orders requiring telephone, telegraph, etc., notification of shipment.

7. **Export Documentation Charges** – A minimum charge of $75.00 will be added to all orders requiring export documentation.

8. **Minimum Order** - $75.00 NET

9. **Cancellation and Returns** – None may be made by a purchaser without prior authorization by Mid-West, and all return shipments must be prepaid. Collect shipments will be refused.

10. **Terms**- Net 30 Days after invoice date upon approved credit. A service charge of 1-1/2% per month will be applied to all accounts over 30 days past due. This is a rate of 18% per year.

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Mid-West® Instrument

Gauges, Switches & Transmitters

"PISTON" Gauge (±2% & ±5% Full Scale Accuracy)

Model 120, 121, 122, 123, & 124…(0-5 PSID to 0-110 PSID / 0-150 PSID to 0-400 PSID)……..
Model 220… Hazardous Location Switch…(0-5 PSID to 0-100 PSID)……

"DIAPHRAGM" Gauge (±.0.50%, ±2% & ±5% Full Scale Accuracy)

Model 130, 140, & 142…(0-5" H_2O to 0-100 PSID)……
Model 240… Hazardous Location Switch…(0-5 PSID to 0-100 PSID)……
Model 522... (0-5 PSID to 0-50 PSID)……
Model 522... (3 Color Dial)…(0-5 PSID to 0-50 PSID)……
Model 555A .(3 Color Dial).DP Indicator (0-3 PSID to 0-43 PSID)……..
Model 700…Transmitter.(0-5 PSID to 0-300 PSID)……

"BELLOWS" Gauge (±1/2% & ±1% Full Scale Accuracy)

Model 105 &106…(0-10" H_2O to 0-800" H_2O) / (0-.4 PSID to 0-30 PSID)……
Model 105 Hydrogen (0-10" H_2O to 0-50" H_2O) / (0-25 mbar to 0-125 mbar)……

"BOURDON TUBE" Gauge (±1/2% & ±1% Full Scale Accuracy)

Model 109…(0-15 PSID to 0-6000 PSID)……

"TANK LEVEL" Gauge (±1% & ±2% Full Scale Accuracy)

Model 114 "Diaphragm Type" ±2% Descending …(0-20" H_2O to 0-600" H2O)……..
Model 115 &116 "Metal Bellows Style" ±1% Descending …(0-10" H_2O to 0-800" H2O)……..

"Flow" Instrumentation

800 Series (Flow Test Kits)……
Delta Tube Model 300 (Averaging Pitot Tube)……

"O.E.M" Gauges (±5% Full Scale Accuracy)

Model 126 &127(Piston Type)…(0-5 PSID to 0-20 PSID / 0-25-PSID to 0-100 PSID)……..
Model 146 (Diaphragm Type)…(0-50" H_2O to 0-30 PSID)……
Model 444 Slider Indicator…(0-5 PSID to 0-25 PSID)……
Model 555 DP Indicator…(0-3.5 PSID to 0-43 PSID)……
Model 522 (Diaphragm Type)…(0-5 PSID to 0-50 PSID……

"ACCESSORIES"

3 & 5 Valve Block Manifolds……
Model 150 Pulsation Dampener……
Non-Adjustable Ball Check Snubber……
Model 200 Pressure Limiting Valve……..
Diaphragm / Chemical Seals……

Mid-West® Instrument

Making the right decision for all your Differential Pressure Applications

Piston vs. Diaphragm

Piston

Mid-West® Instrument Piston ΔP Gauges- A precision ground magnetic piston assembly moves against a calibrated range spring in a diamond reamed bore in the gauge body as pressure differential between the high and low ports changes. A rotary magnet on the outside of the body tracks the movement of the magnetic piston and the attached pointer indicates ΔP on a dial. For applications where fluid migration from high side to low side is not tolerable select one of our many Diaphragm type ΔP gauges

Diaphragm

In our diaphragm type gauge the high and low-pressure ports are completely isolated from each other. There is no bypass and therefore they are appropriate for air, gas and liquids. They also come in a variety of sizes allowing for very sensitive measurements.

Piston Type Gauge

Piston - ± 3/2/3% or ± 5% Full Scale Accuracy. Piston type gauges allow process fluid to migrate across the piston from high to low side. The precision machining of our piston ΔP gauge limits the migration to a maximum of 15 SCFH air at 100 PSID at ambient conditions. A precision ground magnetic piston assembly moves against a calibrated range spring in a diamond reamed bore in the gauge body as pressure differential between the high and low ports changes. Any variation in pressure on either side of the piston/magnet will cause the magnet to move proportionally to the change in differential pressure. A rotary pointer magnet located close to the internal magnet, but outside the pressure housing, follows the movement of the piston magnet and indicates differential pressure on the dial. Because gas molecules are smaller, the crossover is often deemed too great for the application. In this case we recommend the use of one of our Diaphragm type gauges. **NOTE: The use of diaphragm seals is not recommended for Piston type gauges. Attempts to install such seals on these gauges will void the warranty**

Piston-Type Differential Pressure Gauges are available with one or two hermetically sealed reed switches or 4-20mA transmitter depending on model. 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. All hazardous location switches are both CSA and UL listed. The CSA & UL listings are for the entire assembly and not just the enclosure.

Diaphragm Type Gauge

Diaphragm - ± 2% or ± 5% Full Scale Accuracy. The high and low-pressure ports are completely isolated from each other. There is no bypass and therefore they are ideally suited for use on dissimilar fluids, air, gases, or liquids with a high concentration of solids, etc. They also come in a variety of sizes allowing for very sensitive measurements. The Differential Pressure is sensed by the movement of an elastomer diaphragm against a precision calibrated range spring. The change in position of the diaphragm in response to the change in Differential Pressure moves an internal magnet. This magnet, in turn, causes a rotary magnet external to the gauge body to rotate. This rotary magnet has a pointer attached which indicates the differential pressure on the dial.

Diaphragm-Type Differential Pressure Gauges are available with one or two hermetically sealed reed switches or 4-20mA transmitter depending on model. 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. Mid-West Diaphragm-type Differential Pressure Gauges can be configured for use in hazardous locations. All Hazardous Location Switches are both CSA and UL listed. The CSA & UL listings are for the entire assembly and not just the enclosure.

Bellows Type Gauge

Bellows - ± 1/2% or ± 1% Full Scale Accuracy. System pressure is applied to the internal volume of a bellows and mechanical linkage assembly. As pressure changes, the bellows and linkage assembly move to cause an electrical signal to be produced or to cause a gauge pointer to move. The major components of the Model's 105/106/115 and 116 are a two-piece body, bellows sensing element and over-pressure assembly, a torque tube assembly, a range spring and the gauge front assembly.

The body halves provide the pressure containment function. They also clamp the sensing element and over-pressure assembly between the halves, isolating the high side and low side pressures of the system. The high side body half also provides a mount for the torque tube assembly and the gauge front assembly.

The sensing element is exposed to the differential pressure and deflects in response to the differential pressure. This assembly incorporates a bidirectional relief valve which provides over-pressure protection in both directions. When over-pressured from the high side, the valve is opened by a mechanical stop as the sensing element deflects to its maximum travel. When over-pressured from the low side, the spring-loaded valve opens when the differential pressure exceeds its maximum rating.

The opening of the valve in either direction equalizes the pressure and protects the unit. A range spring is provided to adjust the spring rate of the system to suit the various differential pressure ranges of the instrument.
NOTE: The use of diaphragm seals is not recommended for model105/106 series gauge. Attempts to install such seals on these gauges will void the warranty.

Bourdon Tube Type Gauge

Bourdon Tube - ± 1/2% or ± 1% Full Scale Accuracy. System pressure is applied to the inside of a slightly flattened arc-shaped tube. As pressure increases, the tube tends to restore to its original round cross-section. This change in cross-section causes the tube to straighten. Since the tube is permanently fastened at one end, the tip of the tube traces a curve that is the result of the change in angular position with respect to the center.

Mid-West Model 109 is powered by a test quality Bourdon Tube Assembly. The assembly is encapsulated in a high pressure chamber that is fitted with a pressure connection to the inside of the Bourdon Tube and a second connection to the pressure chamber. The Model 109 indicates the difference between the pressure applied inside the Bourdon Tube and the pressure inside the chamber.

The pressure chamber for the assembly is small, close fitting and rugged. The volume displacement of the Bourdon Tube through the pressure range is near to zero (0.02 c.c.). The speed of response of the indicator to changes in differential pressure is instantaneous, even on low volume pressure systems. The low volume displacement is an important advantage for differential pressure leak detection, and when isolation diaphragms are required.

The Bourdon Tube Assembly is protected against over-range in either direction to the rated working pressure by a bi-directional relief valve. The output shaft of the gauge assembly is magnetically coupled through the solid wall of the pressure chamber to a sensitive jeweled pointer shaft in the dial housing outside the chamber. The magnetic coupling transmits the exact motion of the assembly to the pointer to give an accurate dial reading of the differential pressure. **NOTE: The use of diaphragm seals is not recommended for model 109 series gauge. Attempts to install such seals on these gauges will void the warranty.**

ASME B40.1 GAUGE ACCURACY			
Accuracy is defined as the conformity of an indication to its true value. Accuracy is a percentage of the full range. For example, a gauge that has a scale of 0-300 psi with an accuracy of ±1% would mean that the gauge is accurate to within ± (plus or minus) 3 psi.			
Accuracy Grade – ASME B40.1 (American Society of Mechanical Engineers)			
ACCURACY GRADE	**LOWER 25% OF SCALE**	**MIDDLE 50% OF SCALE**	**UPPER 25% OF SCALE**
2A	0.50%	0.50%	0.50%
1A	1%	1%	1%
B	3%	2%	3%
D	5%	5%	5%

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Mid-West® Instrument

Differential Pressure Gauges, Switches & Transmitters

Bellows & Bourdon Tube Type: Models 105/106/115/116 bellows design and Model 109 encapsulated Bourdon tube design provide a simple and highly accurate differential pressure gauge. Gauge Housings available in Aluminum, Brass, Carbon Steel and Stainless Steel 316/316L

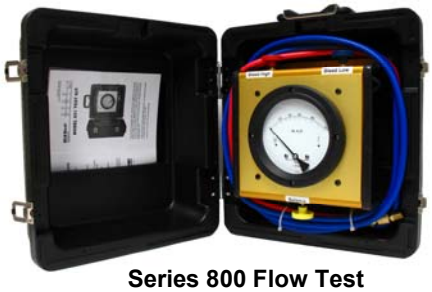
Piston Type: Differential pressure gauges and switches for use on filters, strainers, pumps etc. Available with one or two hermetically sealed reed switches in SPDT and SPST. Some units also available with 4-20 mA Transmitter. Gauge Housings available in Aluminum, 316/316L Stainless Steel, Aluminum Bronze and Monel

Diaphragm Type: Ideally suited for use on dissimilar fluids and wet gas or fluids with a high concentration of solids, etc. Available with one or two hermetically sealed reed switches in SPDT and SPST. Some units also available with 4-20 mA Transmitter. Gauge Housings available in Aluminum, Brass, 316/316L Stainless Steel, Aluminum Bronze and Monel

Hazardous Location Switches
Switching components are housed under a copper free Aluminum cover. The combination of the gauge body and the cover make up the flame-proof seal. Switches are available with 1 or 2 hermetically sealed reed switches with SPDT, SPST or DPDT relay outputs. 4-20mA Transmitter also available. Wetted parts are Aluminum or Stainless Steel

"O. E. M" Indicators & Gauges
Competitively price differential Pressure Indicators, Gauges & Switches for the O.E.M customer. Housings available in Glass reinforced Plastic, Aluminum and Stainless Steel. Working pressure of 300, 1,000 and 3,000 PSIG

Flow Instrumentation
Model 300 Averaging Pitot Tube and Models 105, 106, 130, 140, and 142 Differential Pressure gauges all available with Flow Dials.
Series 800 Flow Test Kits



Series 800 Flow Test

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3& 5 Valve Differential Pressure Manifold

Available Individually or Direct Mounted to your DP Gauge.






Basic Non-Adjustable Snubbers

Protects against surges and pressure shocks.

Pulsation Dampener

Model 150 provides infinitely adjustable dampening.
Protects against surges and pressure shocks.

Pressure Limiting Valve

Model 200 pressure limiting valve prevents instrument over-range.
Adjustable needle valve dampens pulsation.

QUICK REFERENCE GUIDE

Model Number	Sensor Type	Minimum Range	Maximum Range	Accuracy % Full Scale	Maximum Temp. (F)	MWP (PSIG)
105	Bellows	0-10" H2O	0-79.9" H2O	±1/2% or 1%	200°F	500 to 6,000
106	Bellows	0-80" H2O	0-800" H2O	±1/2% or 1%	200°F	500 to 6,000
109	Bourdon Tube	0-15 PSID	0-6000 PSID	±1/2% or 1%	200°F	500 to 6,000
114	Diaphragm	0-20" H2O	0-600" H2O	±2%	200°F	1,500 or 3,000
115	Bellows	0-10" H2O	0-69.9" H2O	±1%	200°F	500 or 1,000
116	Bellows	0-70" H2O	0-800" H2O	±1%	200°F	500 or 1,000
120	Piston	0-5 PSID	0-110 PSID	±2%	200°F	3,000 to 6,000
121	Piston	0-5 PSID	0-110 PSID	±2%	200°F	3,000 to 6,000
122	Piston	0-5 PSID	0-110 PSID	±5%	200°F	3,000
123	Piston	0-150 PSID	0-400 PSID	±2%	200°F	3,000 to 5,000
124	Piston	0-5 PSID	0-400 PSID	±2%	200°F	10,000
130	Diaphragm	0-5" H2O	0-400" H2O	±5% or 3/2/3% (Based on range)	200°F	300 or 500
140	Diaphragm	0-50" H2O	0-100 PSID	±5% or 3/2/3% (Based on Range)	200°F	1,500 or 3,000
142	Diaphragm	0-20" H2O	0-25 PSID	±3/2/3%	200°F	1,500 or 3,000
522	Diaphragm	0-5 PSID	0-50 PSID	±5%	200°F	1,000
522A	Diaphragm (3-Color Dial)	0-5 PSID	0-50 PSID	±5%	200°F	1,000
555A	Diaphragm	0-2.0 PSID	0-43 PSID	±5%	200°F	300
700	316L SS Diaphragm	0-5 PSID	0-300 PSID	±0.50%	175°F	See Bulletin
Hazardous Location Switches						
220	Piston	0-5 PSID	0-100 PSID	±3/2/3%	200°F	4,000
240	Diaphragm	0-20" H2O	0-100 PSID	±3/2/3%	200°F	1,500
O. E. M Gauges						
126	Piston	0-5 PSID	0-20 PSID	±5%	200°F	3,000
127	Piston	0-25 PSID	0-100 PSID	±5%	200°F	3,000
146	Diaphragm	0-50" H2O	0-30 PSID	±5%	200°F	1,000
444	Slider Indicator	0-5 PSID	0-25 PSID	±5%	200°F	300
555	Diaphragm	0-2.0 PSID	0-50 PSID	±5%	200°F	300
522	Diaphragm	0-5 PSID	0-50 PSID	±5%	200°F	1,000
FLOW Instrumentation						
Model 300 Delta Tube						
Series 800 Flow Test Kits						
Accessories						
Three & Five Valve S.S. Differential Pressure Manifolds						
Basic Snubber – Non-Adjustable (Available in Brass and Stainless Steel)						
Model 150 Adjustable Pulsation Dampener (Available in Brass and Stainless Steel)						
Model 200 Pressure Limiting Valve (Available in Aluminum, Brass and Stainless Steel						
Diaphragm / Chemical Seals						

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BULLETIN NO. 120/18
(SUPERSEDES BULLETIN NO. 120/11)

Mid-West® 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 H2O, PSID, bar, and Kpa
- ¼" FNPT & ½" 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 15 SCFH air at 100 PSID at ambient temperature.

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

Model 120
0-50 PSID
With Special 3 Color Dial

Model 120 0-30 PSID
With Maximum Follower Pointer

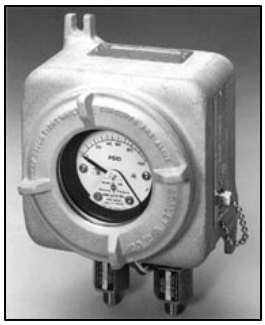
An optional maximum indication follower pointer provides automatic indication of maximum differential occurring during a time period or system cycle.
Reversed pressure ports are optionally available to facilitate installation and readability depending on which side of a filter, etc., the instrument must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

Model	Body Material	Accuracy	Min. ΔP Range	Max. ΔP Range	MWP PSIG (Bar)	Switch Options
120	Aluminum & 316L S.S.	0-2 & 0-3 PSID ±5% 0-5 to 0-110 PSID ±3/2/3%	0-2 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	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 3rd 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
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%		
	^10-100%	^25-100%	^25-100%		
	+15-90%		+25-95%	•25-95%	•25-95%
Hysterisis (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® Instrument

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

Range Type			
PSID	**Kpa**	**Bar**	**Dual Scale**
0-2 PSID	0-35 Kpa	0-1.0 Bar	0-5 PSID & 0-0.35 Kg/Cm2
0-3 PSID	0-70 Kpa	0-1.6 Bar	0-5 PSID & 0-35 KPA
0-5 PSID	0-100 Kpa	0-1.75 Bar	0-10 PSID & 0-0.7 BAR
0-10 PSID	0-160 Kpa	0-2.0 Bar	0-10 PSID & 0-0.7 KG/CM2
0-15 PSID	0-250 kpa	0-2.5 Bar	0-10 PSID & 0-70 KPA
0-20 PSID	0-400 Kpa	0.4.0 Bar	0-100 PSID & 0-7 BAR
0-25 PSID	0-600 Kpa	0-6.0 Bar	0-100 PSID & 0-7 KG/CM2
0-30 PSID	0-700 Kpa	0-7.0 Bar	0-100 PSID & 0-700 KPA
0-50 PSID			0-15 PSID & 0-1 BAR
0-60 PSID			0-15 PSID & 0-1 KG/CM2
0-75 PSID			0-15 PSID & 0-100 KPA
0-100 PSID			0-20 PSID & 0-1.4 BAR
0-110 PSID			0-20 PSID & 0-140 KPA
**0-150 PSID			0-25 PSID & 0-1.75 BAR
**0-200 PSID			0-25 PSID & 0-1.75 KG/CM2
**0-250 PSID			0-25 PSID & 0-175 KPA
**0-300 PSID			0-30 PSID & 0-2 BAR
**0-400 PSID			0-30 PSID & 0-2 KG/CM2
Bi-Directional	**Bi-Directional**	**Bi-Directional**	0-30 PSID & 0-200 KPA
5-0-5 PSID	40-0-40 Kpa	0.4-0-0.4 Bar	0-50 PSID & 0-3.5 BAR
10-0-10 PSID	60-0-60 Kpa	0.6-0-0.6 Bar	0-50 PSID & 0-3.5 KG/CM2
15-0-15 PSID	100-0-100 Kpa	1-0-1 Bar	0-50 PSID & 0-350 KPA
20-0-20 PSID	160-0-160 Kpa	1.6-0-1.6 Bar	0-75 PSID & 0-500 KPA
25-0-25 PSID	250-0-250 Kpa	2.5-0-2.5 Bar	
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			

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	0-2 PSID	0-110 PSID (0-7 bar)
122	0-2 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-OO

3000 PSIG Working Pressure, Aluminum Body & End Plugs, Stainless Steel Piston,
Ceramic Magnet, Buna-N Seals, ¼" FNPT Back Connections,
2-1/2" Round Dial, Engineered Plastic Dial Case with Shatter Resistant Acrylic Lens
Accuracy ±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.

1	2	3	4	5	6	7	8
1	2	0					

Basic Model

Range:_____




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

Model 120 - continued

6	Additional Options
O	None
A	Reversed High / Low Process Connections. *(Not available with Electrical options J & K)*
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 *(Not available with C, D, E or F electrical switch options)*
F	Carbon Steel 2" Pipe Mounting Kit *(Not available with C, D, E or F electrical switch options)*
G	Stainless Steel 2" Pipe Mounting Kit *(Not available with C, D, E or F electrical switch options)*
K	1/2" FNPT S.S. Adapter *(Not available with E or F switch option combined w/back connections)*
L	Liquid Fill *(Glycerin Fill Standard) (2) (Not available with shatterproof glass lens)*
M	Maximum Indicator Follower Pointer *(Not available w/3-1/2", 6" Dial or Liquid fill options) (Not available with shatterproof glass lens)*
N	NACE *(Available for Aluminum, Stainless Steel and Monel Gauge Bodies Only)*
Q	CRN (Canadian Registration Number) *Available on Aluminum or S.S. Body only (1)*
S	Shatter Proof Glass Lens *(4-1/2" available only with option "G" Aluminum Dial Case) (Not available with liquid fill option)*
T	Oxygen Cleaning
U	Stainless Steel Tag with S.S. Wire
V	Stainless Steel Tag and S.S. Screw *(Contact Factory on Switch Options)* *Not available on Gauge Body for Hazardous Locations*
W	Wall Mount Kit *(Not available with back connections or with C, D, E or F switch options)*
Z	Special ***(Un-coded Options)***

(1) 5000 PSI SWP for Stainless Steel

(2) Silicone Fill available please contact factory

NOTE: Not All Options Available in Combination with other Options

7	Electrical Configurations (CE Marked & ROHS Compliant, except E, F, J & K) (6)
O	None
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 **(1) (3) (4) (5)**
F	Two (2) Switches in general purpose enclosure, Division 2 Hazardous Locations **(1) (3) (4) (5)**
G	One (1) Switch & gauge in NEMA 4X plastic enclosure *(Not available with end connections)*
H	Two (2) Switches & gauge in NEMA 4X plastic enclosure *(Not available with end connections)*
J	One (1) Switch in explosion proof enclosure w/glass window cover, Div. 1 Hazardous Locations **(2) (3) (4) (5)**
K	Two (2) Switches in explosion proof enclosure w/glass window cover, Div.1 Hazardous Locations **(2) (3) (4) (5)**
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 ***(Un-coded Options)***

(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)
O	None
A	SPDT 3W, 0.25 Amp, 125 VAC/VDC *(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 ***(Un-coded Options)***

If you are in need of additional information please visit our web site at 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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Web Site: www.midwestinstrument.com • Email: sales@midwestinstrument.com

Mid-West® Instrument

Product Notes:

BULLETIN NO. 120MALBZ/18
(Supersedes Bulletin 120MALBZ/17)

Mid-West® Instrument

"Piston Type"

Differential Pressure Gauge or Switch

Model 120

Aluminum Bronze or Monel

FOR SEA WATER APPLICATIONS

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

Model 120 with
2-1/2" Dial & Switch

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

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
- ¼" 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" & 6"
- DP Ranges available in: Inches PSID, Bar, and Kpa
- Temperature Limits: -40°F(-40°C) to +200°F(+93°C)

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%
Hysterisis (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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Web Site: www.midwestinstrument.com • Email: sales@midwestinstrument.com

Standard Model Number Sequence: 120NA-02-OO

5000 PSIG Working Pressure, Aluminum Bronze Body & Piston, Monel Spring,
Ceramic Magnet, Buna-N Seals, ¼" FNPT End Connections,
2-1/2" Round Dial, Engineered Plastic Dial 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**

Gauge Body and Internal components are considered wetted parts.

1	2	3	4	5	6	7	8
1	2	0					

Basic Model

Range:_____



2	Material
M	Monel Body / Monel Piston
N	Aluminum Bronze Body / Aluminum Bronze Piston
Z	Special ***(Un-coded Options)***
3	**Dial Size & Type**
A	2-1/2" Round Dial w/Engineered Plastic Dial Case
C	4-1/2" Round Dial w/Engineered Plastic Dial Case
D	4-1/2" Bi-Directional Round Dial w/Engineered Plastic Dial Case
E	3-1/2" Round Dial w/Anodized Aluminum Dial Case
G	4-1/2" Round Dial w/Anodized Aluminum Dial Case
H	4-1/2" Bi-Directional Round Dial w/Anodized Aluminum Dial Case
J	6" Round Dial w/Engineered Plastic Dial Case
K	6" Round Bi-Directional Dial w/Engineered Plastic Dial Case
T	Non-Indicating DP Switch Only
Z	Special ***(Un-coded Options)***
4	**Seal Materials**
0	Buna-N *(Standard)*
1	Viton®-A Registered Trademark of Dupont
2	Neoprene
4	Teflon®-A Registered Trademark of Dupont
5	Ethylene Propylene
9	Special ***(Un-coded Options)***
5	**Process Connections**
2	1/4" FNPT End Connections
9	Special ***(Un-coded Options)***

Model 120 - continued

6	Additional Options
O	None
A	Reversed High / Low Process Connections.
E	Two (2) 1/4-20 Mounting Holes *(Not available with C or D electrical switch options)*
F	Carbon Steel 2" Pipe Mounting Kit *(Not available with C or D electrical switch options)*
G	Stainless Steel 2" Pipe Mounting Kit *(Not available with C or D electrical switch options)*
L	Liquid Fill *(Glycerin Fill Standard) (1) (Not available with shatterproof glass lens)*
M	Maximum Indicator Follower Pointer *(Not available with Liquid fill option) (Not available with shatterproof glass lens)*
S	Shatter Proof Glass Lens *(Available with "G" option 4-1/2" Aluminum Dial Case only) (Not available with liquid fill)*
T	Oxygen Cleaning
U	Stainless Steel Tag with S.S. Wire
V	Stainless Steel Tag and S.S. Screw
W	Wall Mount Kit *(Not available with C or D switch options)*
Z	Special ***(Un-coded Options)***
(1) Silicone Fill available please contact factory	
	NOTE: Not All Options Available in Combination with other Options

7	Electrical Configurations (CE marked & ROHS Compliant) (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
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 ***(Un-coded Options)***
(6) Contact factory for Bi-directional scales with switches	

8	Electrical Specifications (For Resistive Loads)
A	SPDT 3W, 0.25 Amp, 125 VAC/VDC *(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 ***(Un-coded Options)***

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 or contact us toll free at **1-800-648-5778** and one of our knowledgeable sales coordinators will be happy to assist you…

BULLETIN NO. 121/18
(SUPERSEDES BULLETIN NO. 121/11)

Mid-West® Instrument

"Piston Type" Model 121

Differential Pressure Switch & Transmitter

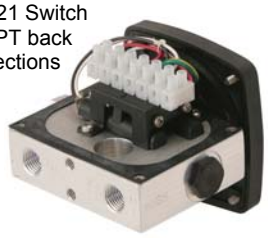
A low cost differential pressure indicating switch or transmitter for use in measuring the pressure drop across filters, strainers, separators, valves, pumps, chillers etc., and for local flow indication and control.

- 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 10,000 PSIG (700 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" & 6"
- Available DP Ranges: Inches H2O, PSID, bar, and Kpa
- Tempe rature 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 1

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 Bar) S.S. = 6,000 (400 Bar)	1 or 2 switches or 4-20mA Transmitter
	316L S.S.	±3/2/3%	0-5 PSID (0-0.35 bar)	0-100 PSID (0-7 bar)	10,000 (700 Bar)	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	60W
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

SWITCHES

Features:
1 or 2 hermetically sealed reed switches

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

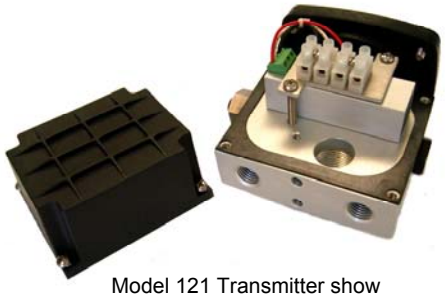
Interface:

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

Environmental Rating: Weatherproof (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/ ¼” 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: ± 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) **(4)**
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)(4)**
(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) Not available with 10,000 PSI SWP Division 2 Hazardous location switch
(4) 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) (±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

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Web Site: www.midwestinstrument.com • Email: sales@midwestinstrument.com

Mid-West® Instrument

Standard Dial Ranges: Model 121

Range Type			
PSID	**Kpa**	**Bar**	**Dual Scale**
0-5 PSID	0-100 Kpa	0-1.0 Bar	0-5 PSID & 0-35 Kpa
0-10 PSID	0-160 Kpa	0-1.6 Bar	0-10 PSID & 0-0.7 Bar
0-15 PSID	0-250 kpa	0-2.0 Bar	0-15 PSID & 0-1 Bar
0-20 PSID	0-400 Kpa	0-2.5 Bar	0-25 PSID & 0-1.75 Bar
0-25 PSID	0-600 Kpa	0-4.0 Bar	0-30 PSID & 0-2.0 Bar
0-40 PSID	0-700 Kpa	0-6.0 Bar	0-30 PSID & 0-200 Kpa
0-30 PSID		0-7.0 Bar	0-40 PSID & 0-2.8 Bar
0-50 PSID			0-40 PSID & 0-2.75 Kpa
0-60 PSID			0-60 PSID & 0-4.0 Bar
0-75 PSID			0-100 PSID & 0-7.0 Bar
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
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: 121AA-00-O-TT

3000 PSIG Working Pressure, Aluminum Body, Adjusting Screws & End Plugs, Stainless Steel Piston, Ceramic Magnet, Buna-N Seals, ¼" FNPT Back Connections, 2-1/2" Round Dial, Engineered Plastic Dial Case with Shatter Resistant Acrylic Lens, 4-20mA, 8-28 VDC Loop powered Transmitter in NEMA 4X/IP65 Plastic enclosure with terminal strip, & ½" FNPT Conduit Connection Accuracy ±3/2/3% Full Scale (Ascending)

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

Gauge Body and Internal components are considered wetted parts.

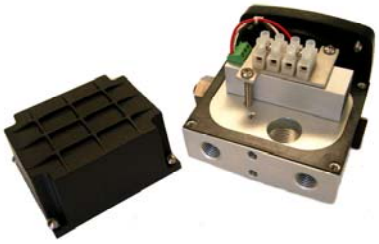
1	2	3	4	5	6	7	8
1	2	1					

Basic Model

Range:_____

2	Material
A	Aluminum Body / Stainless Steel Piston
S	316 S.S Body / Stainless Steel Piston
Z	Special ***(Un-coded Options)***
3	**Dial Size & Type**
A	2-1/2" Round Dial w/Engineered Plastic Dial Case
C	4-1/2" Round Dial w/Engineered Plastic Dial Case
E	3-1/2" Round Dial w/Anodized Aluminum Dial Case
G	4-1/2" Round Dial w/Anodized Aluminum Dial Case
J	6" Round Dial w/Engineered Plastic Dial Case
T	Non-Indicating DP Switch Only
Z	Special ***(Un-coded Options)***
4	**Seal Materials**
0	Buna-N *(Standard)*
1	Viton®-A Registered Trademark of Dupont
2	Neoprene
4	Teflon®-A Registered Trademark of Dupont
5	Ethylene Propylene
6	Perfluorelastomers
9	Special ***(Un-coded Options)***
5	**Process Connections**
0	1/4" FNPT Back Connections *(Standard)*
2	1/4" FNPT End Connections
3	1/4" FNPT Bottom Connections
4	1/2" FNPT End Connections
6	7/16"-20 Straight Thread "O" Ring Port *(Back Connection Only)*
9	Special ***(Un-coded Options)***

Model 121 - continued



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 *(Glycerin Fill Standard) (2) (Not available with shatterproof glass lens)*
M	Maximum Indicator Follower Pointer *(Not available w/3-1/2", 6" Dial or Liquid fill options) (Not available w/shatterproof glass lens)*
N	NACE
Q	CRN (Canadian Registration Number) *(1)*
S	Shatter Proof Glass Lens *(4-1/2" available with "G" option Aluminum Dial Case only) (Not available with liquid fill option)*
T	Oxygen Cleaning
U	Stainless Steel Tag with S.S. Wire
W	Wall Mount Kit *(Not available with back connections)*
Z	Special ***(Un-coded Options)***
	(1) 5000 PSIG SWP for Stainless Steel
	(2) Silicone Fill available please contact factory
	Note: Not All Options Available in Combination with other Options

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 ***(Un-coded Options)***
	(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
	(3) Contact factory for flow applications with transmitter configuration

8	Electrical Specifications (For Resistive Loads)
A	SPDT 3W, 0.25 Amp, 125 VAC/VDC *(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 ***(Un-coded Options)***

MID-WEST **INSTRUMENT** has been serving a variety of industries 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 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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Mid-West® Instrument

Product Notes:

BULLETIN NO. 122/18
(SUPERSEDES BULLETIN NO. 122/17)

Mid-West® Instrument

"Piston Type"
Differential Pressure Gauge & Switch
Model 122

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 122
With Special
3 color dial

- Simple, rugged, compact design.
- Working pressure up to 3,000 PSIG (200 bar)
- Over-range protection to maximum pressure.
- Body material: Aluminum with 316 stainless steel internals.
- 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 H2O, PSID, bar, and Kpa
- ¼" FNPT End Process Connections
- Panel Mountable, Wall mount available as option
- 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 122
0-50 PSID
4-1/2" Dial

Model 122 0-30 PSID
2-1/2" Dial w/Maximum
Follower Pointer

Model 122
0-15 PSID

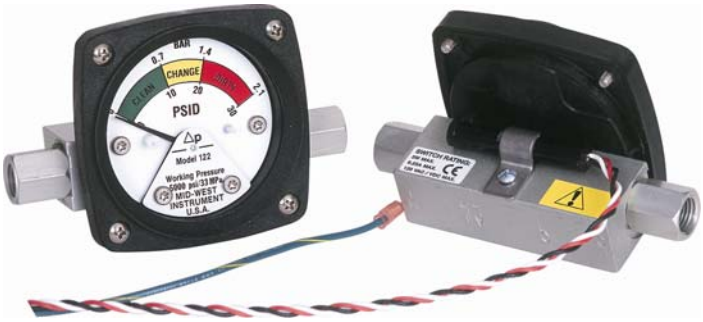
An optional maximum indication follower pointer provides automatic indication of maximum differential occurring during a time period or system cycle.
Reversed pressure ports are optionally available to facilitate installation and readability depending on which side of a filter, etc., the instrument must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

Model	Body Material	Accuracy	Min. ΔP Range	Max. ΔP Range	MWP PSIG (Bar)	Switch Options
122	Aluminum	±5%	0-2 PSID (0-0.13 bar)	0-110 PSID (0-7 bar)	3,000 (200)	1 & 2 switch Hermetically Sealed

Proof Pressure: Two times rated working pressure at ambient temperature
Standards: Model 122 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 Option
Model 122



Model 122 Gauge with switches have one or two Single Pole Single Throw (SPST) or Single Pole Double Throw (SPDT) reed switches with the resistive ratings specified in the table below.

A provision to connect a protective conductor terminal is provided on the Low port end of the gauge body. A 6-32 screw, 18 Awg, green/yellow wire, and a #6 terminal is provided.

Note: Switches can be set below the defined minimum set point how ever the switch may not remain activated at maximum PSID. If the unit is set below the defined minimum set point, the customer should verify that the switch remains activated from the set point to over range of the gauge.

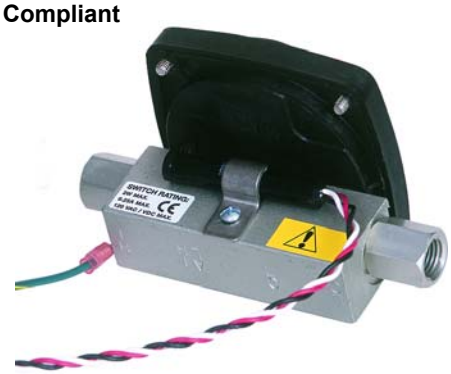
Provide standard protection techniques for the switch contacts for capacitive and inductive loads. Use current limiting techniques near the switch to protect the contacts due to high inrush (i.e.; in line resistor or inductor) for long cable interfaces. Provide clamping devices at or near inductive loads (i.e.; relay).

Maximum wire length between the 3W switch and its load should not exceed 70 – 100 feet or 120 VAC applications. Contact the factory for assistance regarding this condition.

WARNING:
Electrical connections should be performed by qualified personnel and meet representative national electrical code.

WARNING:
Failure to connect to the protective conductor terminal may result in a shock hazard.

ROHS Compliant



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

REED SWITCH RATINGS (Resistive Load) CE

Type	SPDT	SPST NO	SPDT
Option	**A**	**E**	**H**
Power	3 W	60 W	60 W
Max Current	0.25 Amps	3.0 Amps	1.0 Amps
Max Voltage VAC/VDC 125		240	240
Setting Full Scale	10-100%	25-100%	25-100%
Hysterisis (Max / Norm)	10% / 5% (FS)	15% / 8% (FS)	25% / 13% (FS)
Repeatability	1% F.S.	1% F.S.	1% F.S.
Leads 22 Awg	(3) 24"	(2) 24"	(3) 24"

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Mid-West® Instrument

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

Range Type			
PSID	**Kpa**	**Bar**	**Dual Scale**
0-2 PSID	0-35 Kpa	0-1.0 Bar	0-5 PSID & 0-0.35 Kg/Cm2
0-3 PSID	0-70 Kpa	0-1.6 Bar	0-5 PSID & 0-35 KPA
0-5 PSID	0-100 Kpa	0-1.75 Bar	0-10 PSID & 0-0.7 BAR
0-10 PSID	0-160 Kpa	0-2.0 Bar	0-10 PSID & 0-0.7 KG/CM2
0-15 PSID	0-250 kpa	0-2.5 Bar	0-10 PSID & 0-70 KPA
0-20 PSID	0-400 Kpa	0.4.0 Bar	0-100 PSID & 0-7 BAR
0-25 PSID	0-600 Kpa	0-6.0 Bar	0-100 PSID & 0-7 KG/CM2
0-30 PSID	0-700 Kpa	0-7.0 Bar	0-100 PSID & 0-700 KPA
0-50 PSID			0-15 PSID & 0-1 BAR
0-60 PSID			0-15 PSID & 0-1 KG/CM2
0-75 PSID			0-15 PSID & 0-100 KPA
0-100 PSID			0-20 PSID & 0-1.4 BAR
0-110 PSID			0-20 PSID & 0-140 KPA
**0-150 PSID			0-25 PSID & 0-1.75 BAR
**0-200 PSID			0-25 PSID & 0-1.75 KG/CM2
**0-250 PSID			0-25 PSID & 0-175 KPA
**0-300 PSID			0-30 PSID & 0-2 BAR
**0-400 PSID			0-30 PSID & 0-2 KG/CM2
Bi-Directional	**Bi-Directional**	**Bi-Directional**	0-30 PSID & 0-200 KPA
5-0-5 PSID	40-0-40 Kpa	0.4-0-0.4 Bar	0-50 PSID & 0-3.5 BAR
10-0-10 PSID	60-0-60 Kpa	0.6-0-0.6 Bar	0-50 PSID & 0-3.5 KG/CM2
15-0-15 PSID	100-0-100 Kpa	1-0-1 Bar	0-50 PSID & 0-350 KPA
20-0-20 PSID	160-0-160 Kpa	1.6-0-1.6 Bar	0-75 PSID & 0-500 KPA
25-0-25 PSID	250-0-250 Kpa	2.5-0-2.5 Bar	
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			

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	0-2 PSID	0-110 PSID (0-7 bar)
122	0-2 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: 122AA-02-OO

3000 PSIG Working Pressure, Aluminum Body, Stainless Steel Piston, Ceramic Magnet,
Buna-N Seals, ¼" FNPT End Connections, 2-1/2" Round Dial,
Engineered Plastic Dial Case with Shatter Resistant Acrylic Lens
Accuracy ±5% Full Scale (Ascending)

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

Gauge Body and Internal components are considered wetted parts.

1	2	3	4	5	6	7	8
1	2	2					

Basic Model

Range:_____

2	Material
A	Aluminum Body / Stainless Steel Piston
Z	Special ***(Un-coded Options)***
3	**Dial Size & Type**
A	2-1/2" Round Dial w/Engineered Plastic Dial Case
C	4-1/2" Round Dial w/Engineered Plastic Dial Case
E	3-1/2" Round Dial w/Anodized Aluminum Dial Case
G	4-1/2" Round Dial w/Anodized Aluminum Dial Case
J	6" Round Dial w/Engineered Plastic Dial Case
T	Non-Indicating DP Switch Only
Z	Special ***(Un-coded Options)***
4	**Seal Materials**
0	Buna-N *(Standard)*
1	Viton®-A Registered Trademark of Dupont
2	Neoprene
4	Teflon®-A Registered Trademark of Dupont
5	Ethylene Propylene
9	Special ***(Un-coded Options)***
5	**Process Connections**
2	1/4" FNPT End Connections *(Standard)*
9	Special ***(Un-coded Options)***

Model 122 - continued

6	Additional Options
O	None
A	Reversed High / Low Process Connections.
E	Two (2) 1/4-20 Mounting Holes
L	Liquid Fill *(Glycerin Fill Standard) (1) (Not available with shatterproof glass lens)*
M	Maximum Indicator Follower Pointer *(Not available w/3-1/2", 6" Dial or Liquid fill options) (Not available w/shatter proof glass lens)*
S	Shatter Proof Glass Lens *(4-1/2" available with "G" option Aluminum Dial Case only) (Not available with liquid fill option)*
T	Oxygen Cleaning
U	Stainless Steel Tag with S.S. Wire
V	Stainless Steel Tag and S.S. Screw
W	Wall Mount Kit
Z	Special ***(Un-coded Options)***
	(1) Silicone Fill available please contact factory
	Note: Not All Options Available in Combination with other Options
7	**Electrical Configurations (All options CE Marked & ROHS Compliant)**
O	None
M	One (1) Reed Switch **(Clamp-On)**
N	Two (2) Reed Switches **(Clamp-On)**
Z	Special ***(Un-Coded Options)***
	Note: M & N Options have 22 AWG leads – 24" Lengths
8	**Electrical Specifications (For Resistive Loads)**
O	None
A	SPDT 3W, 0.25 Amp, 125 VAC/VDC *(Switch adjustable range of 10-100%)*
E	SPST 60W, 3.0 Amp, 240 VAC/VDC *(Normally Open) (Switch adjustable range of 25-100%)*
H	SPDT 60W, 1.0 Amp, 240 VAC/VDC *(Switch adjustable range of 25-100%)*
Z	Special ***(Un-Coded Options)***

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 most of our product line 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.

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Mid-West® Instrument

Product Notes:

BULLETIN NO. 123/18
(SUPERSEDES BULLETIN NO. 123/17)

Mid-West® Instrument

"Piston Type"
Differential Pressure Gauge & Switch
Model 123

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 123
0-400 PSID
2-1/2" Dial

- Simple, rugged, compact design.
- Working pressure up to 5,000 PSIG (340 bar)
- Over-range protection to maximum pressure.
- Body materials: Aluminum or 316L Stainless Steel with 316 stainless steel internals.
- 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 H2O, PSID, bar, and Kpa
- ¼" FNPT & ½" 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 15 SCFH air at 100 PSID at ambient temperature.

Model 123 0-400 PSID
Shown with 2 Std. Switches

Model 123
0-300 PSID 4-1/2" Dial

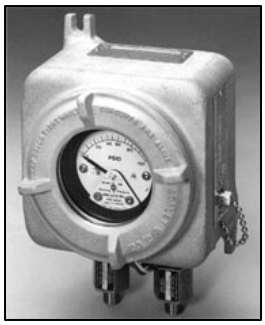
An optional maximum indication follower pointer provides automatic indication of maximum differential occurring during a time period or system cycle. Reversed pressure ports are optionally available to facilitate installation and readability depending on which side of a filter, etc., the instrument must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

Model	Body Material	Accuracy	Min. ΔP Range	Max. ΔP Range	MWP PSIG (Bar)	Switch Options
123	Aluminum & 316L S.S.	±3/2/3%	0-150 PSID (0-10 bar)	0-400 PSID (0-27 bar)	ALM. = 3,000 (200) S.S. = 5,000 (340)	1 & 2 switch Hermetically Sealed

Proof Pressure: Two times rated working pressure at ambient temperature
Standards: Model 123 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.

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%		
	^10-100%	^25-100%	^25-100%		
	+15-90%		+25-95%	•25-95%	•25-95%
Hysterisis (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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Web Site: www.midwestinstrument.com • Email: sales@midwestinstrument.com

Standard Model Number Sequence: 123AA-02-OO

3000 PSIG Working Pressure, Aluminum Body & End Plugs, Stainless Steel Piston, Ceramic Magnet, Buna-N Seals, ¼" FNPT End Connections, 2-1/2" Round Dial, Engineered Plastic Dial Case with Shatter Resistant Acrylic Lens
Accuracy ±3/2/3% Full Scale (Ascending)

Range: 0-150 PSID to 0-400 PSID (0-10.3 bar to 0-27.5 bar)

Gauge Body and Internal components are considered wetted parts.

1	2	3	4	5	6	7	8
1	2	3					

Basic Model

Range:_____

2	Material
A	Aluminum Body / Stainless Steel Piston
S	316 S.S Body / Stainless Steel Piston
Z	Special ***(Un-coded Options)***
3	**Dial Size & Type**
A	2-1/2" Round Dial w/Engineered Plastic Dial Case
C	4-1/2" Round Dial w/Engineered Plastic Dial Case
G	4-1/2" Round Dial w/Anodized Aluminum Dial Case
J	6" Round Dial w/Engineered Plastic Dial Case
T	Non-Indicating DP Switch Only
Z	Special ***(Un-coded Options)***
4	**Seal Materials**
0	Buna-N *(Standard)*
1	Viton®-A Registered Trademark of Dupont
2	Neoprene
5	Ethylene Propylene
9	Special ***(Un-coded Options)***
5	**Process Connections**
2	1/4" FNPT End Connections *(Standard)*
4	1/2" FNPT End Connections
9	Special ***(Un-coded Options)***

Model 123 - continued

6	Additional Options
O	None
A	Reversed High / Low Process Connections.
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 *(Not available with C, D, E or F electrical switch options)*
F	Carbon Steel 2" Pipe Mounting Kit *(Not available with C, D, E or F electrical switch options)*
G	Stainless Steel 2" Pipe Mounting Kit *(Not available with C, D, E or F electrical switch options)*
L	Liquid Fill *(Glycerin Fill Standard) (2) (Not available with shatterproof glass lens)*
M	Maximum Indicator Follower Pointer *(Not available w/6" Dial or Liquid fill options) (Not available w/shatter proof glass lens)*
N	NACE
Q	CRN (Canadian Registration Number) *(1)*
S	Shatter Proof Glass Lens *(4-1/2" available only with option "G" Aluminum Dial Case) (Not available with liquid fill option)*
T	Oxygen Cleaning
U	Stainless Steel Tag with S.S. Wire
V	Stainless Steel Tag and S.S. Screw
W	Wall Mount Kit *(Not available with E&F switch option)*
Z	Special ***(Un-coded Options)***

(1) 2,500 PSIG SWP Aluminum Body, 4,000 PSIG SWP Stainless Steel Body

(2) Silicone Fill available please contact factory

NOTE: Not All Options Available in Combination with other Options

7	Electrical Configurations (CE Marked & ROHS Compliant, except E & F)
O	None
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 *(1)*
F	Two (2) Switches in general purpose enclosure, Division 2 Hazardous Locations *(1)*
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 ***(Un-coded Options)***

8	Electrical Specifications (For Resistive Loads)
O	None
A	SPDT 3W, 0.25 Amp, 125 VAC/VDC *(Switch adjustable range of 15-90%)*
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 25-95%)*
Z	Special ***(Un-coded Options)***

Factory preset switches at no charge (Specify Setting)

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Mid-West understands that in today's demanding environment, flexibility, quick response time and the ability to ship most of our product line 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 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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BULLETIN NO. 124/18
(SUPERSEDES BULLETIN NO. 124/17)

Mid-West® Instrument

"Piston Type"

Differential Pressure Gauges
Switches & Transmitters

Model 124

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 124
0-75 PSID Shown with
End Connections & Transmitter

- Simple, rugged, compact design.
- Working pressure up to 10,000 PSIG (690 bar)
- Over-range protection to maximum pressure.
- Body materials: 316L Stainless Steel with 316 stainless steel internals.
- 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 H2O, PSID, bar, and Kpa
- ¼" FNPT & ½" FNPT Process Connections
- Multiple mounting options available
- Temperature Limits: -40°F(-40°C) to +200°F(+93°C)
- Transmitter Option: -20°F(-28°C) to +150°F(+65°C)

Model 124
Terminal Switch
exposed.

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 124
0-300 PSID 4-1/2" Dial

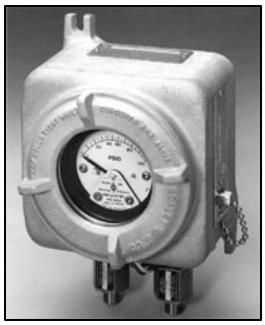
An optional maximum indication follower pointer provides automatic indication of maximum differential occurring during a time period or system cycle. Reversed pressure ports are optionally available to facilitate installation and readability depending on which side of a filter, etc., the instrument must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

Model	Body Material	Accuracy	Min. ΔP Range	Max. ΔP Range	MWP PSIG (Bar)	Switch Options
124	316L Stainless Steel	±3/2/3%	0-5 PSID (0-0.35 bar) 0-150 PSID (0-10.0 bar)	0-110 (0-7.0 bar) 0-400 (0-27.0 bar)	10,000 (690)	1 & 2 switch Hermetically Sealed or 4-20 mA Transmitter

Proof Pressure: Two times rated working pressure at ambient temperature
Standards: Model 124 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 3rd 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%			
	^10-100% ^25-1	00% ^25-1	00%			
	+15-90%		+25-95%	•25-95%	•25-95%	20-100%
Hysterisis (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

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Mid-West® 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
			0-30 PSID & 0-2 BAR
Bi-Directional	**Bi-Directional**	**Bi-Directional**	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)
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	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 Number Sequence: 124SA-00-OO

10,000 PSIG Working Pressure, 316L Stainless Steel Body, Stainless Steel Piston,
Ceramic Magnet, Buna-N Seals, ¼" FNPT Back Connections, 2-1/2" Round Dial,
Engineered Plastic Dial Case with Shatter Resistant Acrylic Lens
Accuracy ±3/2/3% Full Scale (Ascending)

Range: 0-5 PSID to 0-110 PSID (0-.35 bar to 0-7.0 bar)

Range: 0-150 PSID to 0-400 PSID (0-10.3 bar to 0-27.5 bar) *(End connections only)*

Gauge Body and Internal components are considered wetted parts.

1	2	3	4	5	6	7	8
1	2	4					

Basic Model

Range:_____

2	Material
S	316 S.S Body / Stainless Steel Piston
Z	Special ***(Un-coded Options)***
3	**Dial Size & Type**
A	2-1/2" Round Dial w/Engineered Plastic Dial Case
C	4-1/2" Round Dial w/Engineered Plastic Dial Case
E	3-1/2" Round Dial w/Anodized Aluminum Dial Case
G	4-1/2" Round Dial w/Anodized Aluminum Dial Case
J	6" Round Dial w/Engineered Plastic Dial Case
T	Non-Indicating DP Switch Only
Z	Special ***(Un-coded Options)***
4	**Seal Materials**
0	Buna-N *(Standard)*
1	Viton®-A Registered Trademark of Dupont
5	Ethylene Propylene
9	Special ***(Un-coded Options)***
5	**Process Connections**
0	1/4" FNPT Back Connections *(Standard)*
2	1/4" FNPT End Connections
4	1/2" FNPT End Connections
9	Special ***(Un-coded Options)***

Model 124 - continued

6	Additional Options
O	NONE
A	Reversed High / Low Process Connections *(Not available with switch or transmitter)*
E	Two (2) 1/4-20 Mounting Holes
F	Carbon Steel 2" Pipe Mounting Kit
G	Stainless Steel 2" Pipe Mounting Kit
K	1/2" FNPT S.S. Adapter *(Back Connections Only)*
L	Liquid Fill *(Glycerin Fill Standard) (1) (Not available with shatterproof glass lens)*
M	Maximum Indicator Follower Pointer *(Not available with 3-1/2", 6" Dial or Liquid fill) (Not available with shatterproof glass lens)*
N	NACE
S	Shatter Proof Glass Lens *(4-1/2" available with "G" option Aluminum Dial Case only)(Not available with liquid fill option)*
T	Oxygen Cleaning
U	Stainless Steel Tag with S.S. Wire
W	Wall Mount Kit *(Not available with back connections)*
Z	Special ***(Un-coded Options)***
	(1) Silicone Fill available please contact factory
	NOTE: Not All Options Available in Combination with other Options
7	**Electrical Configurations (All switches CE Marked & ROHS Compliant)**
O	NONE
C	One (1) Reed switch in NEMA 4X/IP65 Plastic enclosure with terminal strip *(1/2" FNPT Conduit Connection)*
D	Two (2) Reed switches in NEMA 4X/IP65 Plastic enclosure with terminal strip *(1/2" FNPT Conduit Connection)*
T	4-20 mA Transmitter in NEMA 4X/IP65 Plastic enclosure with terminal strip *(1/2" FNPT Conduit Connection)* Temperature Limit: -20°F(-28°C) to +150°F(+65°C)
Z	Special ***(Un-coded Options)***
8	**Electrical Specifications (For Resistive Loads)**
O	NONE
A	SPDT 3W, 0.25 Amp, 125 VAC/VDC *(Switch adjustable range of 15-90%)*
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%)*
T	4-20 mA Transmitter (8-28 VDC Loop Power) *(±2% accuracy from 20% to 100% of scale. Ascending)*
Z	Special ***(Un-coded Options)***

Factory preset switches at no charge (Specify Setting)

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BULLETIN NO. 220/18
(SUPERSEDES BULLETIN NO. 220/11)

Mid-West® Instrument

"Piston Type" Model 220

"Hazardous Locations"

Indicating / Non-Indicating
Differential Pressure Switch or Transmitter

- Low cost piston type differential pressure switch for use in measuring or controlling the pressure drop cross filters, strainers, separators, valves and pumps.
- Simple rugged compact design
- Working Pressure 4,000 PSIG (275 bar)
- Over-range protection to maximum pressure.
- 316 S.S. wetted pressure containing body assembly.
- Wetted Internals – 316 Stainless Steel and Ceramic moving components.
- Weather resistant gauge construction standard.
- Dial Size: 4-1/2" with Shatter resistant acrylic lens.
- Five Year Limited Warranty

- Field wireable terminal strip interface.
- Up to 10A 120/240 VAC switching with DPDT Relay outputs.
- Hermetically Sealed Switch Outputs up to 3 Amps in SPST configuration and up to 1 Amp in SPDT configuration
- SPST outputs available in Normally Open or Normally Closed configurations
- Up to (2) independent adjustable switch points.
- 4-20 mA Transmitter with 8-28 Vdc loop power
- ½" FNPT conduit cable interface with internal terminal strip
- CSA & UL Certified to US and Canadian standards.
- CSA & UL Certified:
  - Class I, Division 1 / Groups B, C & D
  - Class II, Division 1 / Groups E, F & G
  - Class I, Division 2 / Groups A, B, C & D
  - Class II, Division 2 / Groups F & G
- Certified for ATEX / IECEx
  - Ex d IIB + H_2 Ex tb IIIC, IP65 (3000 PSIG SWP)
  - Division 2 Units are NEMA 4X

Model	Body Material	Accuracy	Min. ΔP Range	Max. ΔP Range	MWP PSIG (Bar)	Switch Options
220	316L S.S.	±3/2/3%	0-5 PSID (0-0.35 bar)	0-100 PSID (0-7 bar)	**4,000 (275)	1 or 2 switches or 4-20mA Transmitter

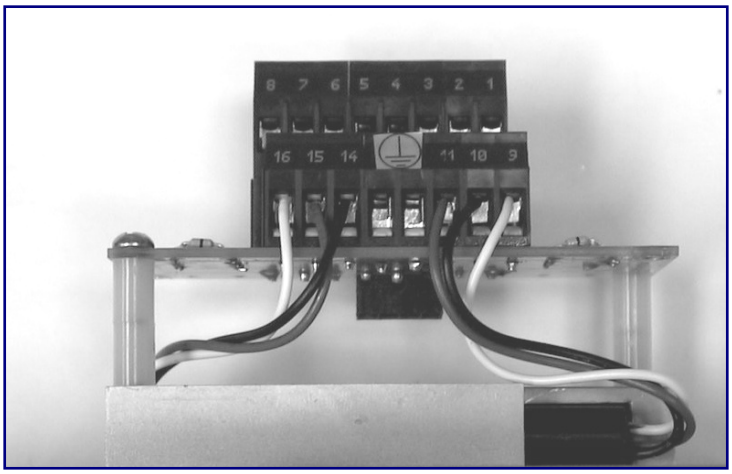
****3,000 PSIG SWP for ATEX RATED UNITS**

NOTE: Due to precision sizing of the piston and the body, bore leakage across the piston will not exceed 15 SCFH air at 100 PSID at ambient conditions. **This gauge should not be used in Hazardous Environments with low process port open to atmosphere.**

“Piston Type”
Differential Pressure Gauge
Switch Options
Model 220

The switching components are housed under a copper free Aluminum cover the combination of the gauge body and the cover make up the flame-proof seal. Electrical interface to the internal field wire terminal strip is via ½” NPT industry standard conduit connection located through the gauge body.

The hazardous environment indicating differential pressure switch is available with one or two hermetically sealed reed switches with optional one or two DPDT relay outputs. Each switch is independently adjustable within a defined percentage of the full scale range of the gauge and is available in SPDT and SPST (normally open or normally closed) for various load power ratings. The switches can be set to activate or deactivate on rising or falling differential pressure. If the optional relay output is specified, an input operating voltage must also be specified.



OUTPUT RATINGS (Resistive Load)

Type	SPST	SPDT	SPDT	DPDT Relay
Electrical Specification Input Option	A	A	A	B,C,D,E,F,G,H
Electrical Specification Output Option	E, F or G	H	A	R
*Power	60 W	60 W	3W	N/A
Maximum Current	3 Amps	1.0 Amps	0.25 Amps	10 Amps
Max. Volts VAC/VDC	240	240	125	277 / 30
Setting (Full Scale) **	15% to 90%	25% to 90%	10% to 90%	15% to 90%
Hysteresis Full Scale	20% / 9% (Max / Nom)	20% / 18% (Max / Nom)	10% / 6% (Max / Nom)	20% / 10% (Max / Nom)
Repeatability	1% Full Scale	1% Full Scale	1% Full Scale	1% Full Scale

* Product of the switching voltage and current shall not exceed the power rating of device
**For ranges ≥60 PSID, minimum adjustability = 25%

Warning: **The suitability of the application and installation of this differential pressure switch is the responsibility of the end user. The applicable certifications, listings apply to the differential pressure switch only.**

“Piston Type”
Differential Pressure Gauge
Transmitter Option
Model 220

Model 220 Transmitter provides a simple low cost loop powered 8-28 Vdc two wire 4-20 mA transmitter with highly visible local display allowing for monitoring at the unit and in the control room.

The transmitter utilizes the same CSA, UL and ATEX rated sensor and explosion proof housing as on the Model 240 explosion proof switch. Although the transmitter option in not yet listed, the sensors and explosion proof housing are rated Class I, Division 1 Groups B, C & D. Class II, Division 1 Groups E, F & G and Ex d IIB + H2, Ex tb IIIC, IP65 (3000 PSIG SWP). Each transmitter is individually calibrated to the gauge using an 11 point calibration linearization technique.

TRANSMITTER SPECIFICATIONS				
Transmitter Specifications:	**Comments:**			
Differential Pressure Range	0-5 PSID to 0-100 PSID			
Leakage	15SCFH @ 100 PSID Max Hi to Lo			Not recommended for use with Lo port left open to atmosphere
Pressure (Ratings)				
Max Working	3000 PSIG			
Gauge Accuracy	2%			ASME B40.100 GRADE B
Operating Temperature (Max.)	-20°F -150°F			
ELECTRICAL:				
	Min	**Typ**	**Max**	
Transmitter Accuracy (FSR)			2%	Upper 80% of Full Scale Range
Supply Voltage (3) (Vdc)	8		28	Pin 3 Reverse Polarity Protected
Output Current (ma)				
Zero Floating (2)	4.0 – 20.1 ma	4.0 – 21.0	4.0 – 22.0	Pin 2
Zeroed (1 connected to 2)		8		
Voltage (Pin 2 to 1)	4.8		6.3	
Zero Time (seconds)	2			
Max Loop Resistance (ohms)			1000	
Max Loop Resistance Formula	((Vs – 8) / 20) *1000)			
INTERFACE:				
Electrical:				
Connections:	4 Position Terminal Strip; ½” NPT Conduit 1= Rtn, 2= Zero, 3 = 8-28 Vdc In, 4= Chassis			22 Awg – 12Awg Wire
Environmental Rating:	Explosion-proof Enclosure rated Class I, Div I, Groups B, C, D; Class II, Div I, Groups E, F, & G **			
Certifications:	Ex d IIB + H2 T6 (-30°C ≤ Ta ≤ 65°C)Gb Ex tb IIIC IP65 T85ºC (-30ºC ≤ Ta ≤ 65ºC)Gd ATEX and IECEx			

PROOF PRESSURE: 8,000 PSI. (6,000 PSI for Transmitter)

TEMPERATURE LIMITS: -40°F (-40°C) to +185°F (+85°C)– For electrical Input Options A in combination with electrical output options A, E, F, G & H. 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.

-40°F (-40°C) to +160°F (+70°C) – For output option R (Relay Output)

-20°F (-30°C) to +150°F (+65°C) – For output option 4-20 mA Transmitter

STANDARDS: The Model 220 Series differential pressure gauge either conforms to and/or is designed to the requirements of the following standards: ASME B1.20.1, ASME B40.100, CSA-C22.2 No. 14, 25 and 30, UL Std. No. 50, 508, 698, and 1203, NEMA Std. No. 250, SAE J514, EN60079-0, EN60079-1 & EN13463-1, IEC 60079-31

Mid-West® Instrument

Standard Dial Ranges: Model 220

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
			0-15 PSID & 0-100 KPA
			0-20 PSID & 0-1.4 BAR
			0-20 PSID & 0-140 KPA
			0-25 PSID & 0-1.75 BAR
			0-25 PSID & 0-1.75 KG/CM2
			0-25 PSID & 0-175 KPA
			0-30 PSID & 0-2 BAR
			0-30 PSID & 0-2 KG/CM2
			0-30 PSID & 0-200 KPA
			0-50 PSID & 0-3.5 BAR
			0-50 PSID & 0-3.5 KG/CM2
			0-50 PSID & 0-350 KPA
			0-75 PSID & 0-500 KPA

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
220	0-5 PSID (0-0.35 bar)	0-100 PSID (0-7 bar)

PROOF PRESSURE: 16,000 PSI.

TEMPERATURE LIMITS: **-40°F (-40°C) to +185°F (+85°C)**– For electrical Input Options A in combination with electrical output options A, E, F, G & H. 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.

-40°F (-40°C) to +160°F (+70°C) – For output option R (Relay Output)
-20°F (-30°C) to +150°F (+65°C) – For output option 4-20 mA Transmitter

STANDARDS: The Model 240 Series differential pressure gauge either conforms to and/or is designed to the requirements of the following standards:

ASME B1.20.1
ASME B40.100
CSA-C22.2 No. 14, 25 and 30
UL Std. No. 50, 508, 698, and 1203
NEMA Std. No. 250
SAE J514
EN60079-0, EN60079-1 & EN61241-0
EN61241-1, EN13463-1

Standard Model Number Sequence: 220SC-02-O-JAA

4000 PSIG Working Pressure, 316 S.S. wetted pressure containing body assembly, Stainless Steel/Ceramic Magnet internals, Buna-N Seals, ¼" FNPT End Connections, 4-1/2" Round Dial, Engineered Plastic Dial Case with Shatter Resistant Acrylic Lens, **(1)** 3W 125 VAC/VDC SPDT reed switch with terminal strip, aluminum explosion proof switch enclosure and ½" FNPT electrical access. Accuracy ±3/2/3% Full Scale (Ascending)

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

Gauge Body and Internal components are considered wetted parts.

← 1 →	2	3	4	5	← 6 →	7	← 8 →
2 2 0							

Basic Model

Range:_____



2	Material
S	316/316L S.S Wetted Pressure Containing Body Assembly Wetted Internals: Stainless Steel Piston & Ceramic moving components
Z	Special ***(Un-coded Options)***
3	**Dial Size & Type**
C	4-1/2" Round Dial w/Engineered Plastic Dial Case
F	4-1/2" Round Dial w/Anodized Aluminum Dial Case
T	Non-Indicating DP Switch Only
Z	Special ***(Un-coded Options)***
4	**Seal Materials**
0	Buna-N *(Standard)*
1	Viton®-A Registered Trademark of Dupont
2	Neoprene
5	Ethylene Propylene
6	Perfluorelastomers
9	Special ***(Un-coded Options)***
5	**Process Connections**
2	1/4" FNPT End Connections *(Standard)*
7	1/2" FNPT End Connections
9	Special ***(Un-coded Options)***
6	**Additional Options**
O	None
F	Carbon Steel 2" Pipe Mounting Kit
G	Stainless Steel 2" Pipe Mounting Kit
M	Maximum Indicator Follower Pointer *(Not available with Electrical Configurations R & S)*
Q	CRN **(Canadian Registration Number)**
S	Shatter Proof Glass Lens *(4-1/2" Available with option "G" Aluminum Dial Case only)*
T	Oxygen Cleaning
U	Stainless Steel Tag with S.S. Wire
V	Stainless Steel Tag with S.S. Screws
Z	Special ***(Un-Coded Options)***

NOTE: Not All Options Available in Combination with other Options

Model 220 - continued

7	"MODEL 220" ELECTRICAL CONFIGURATIONS (T6 Temperature Class unless specified)
A	One (1) Control switch in NEMA-4X enclosure **(1) (6) (8)**
B	Two (2) Control switches in NEMA-4X enclosure **(1) (6) (7) (8)**
J	One (1) Control switch in NEMA 7 (Explosion Proof Enclosure) **(2)**
K	Two (2) Control switches in NEMA 7 (Explosion Proof Enclosure) **(2) (7)**
R	One (1) Control switch in Ex d Enclosure (CE marked) ATEX / IECEx **(2) (9)**
S	Two (2) Control switches in Ex d Enclosure (CE marked) ATEX / IECEx **(2) (7) (9)**
T	4-20 mA Transmitter in NEMA7/EExd (Explosion Proof Enclosure) **(9)** *(Temperature Limits -20°F to +150°F)*
Z	Special **(10)**
8	**"INPUT OPTIONS" ELECTRICAL SPECIFICATIONS (Select (1) input and (1) output option)**
A	No Input power for reed outputs A, E, F, G & H
B	5/6 VDC
C	12 VDC
D	24 VDC
E	48 VDC *Specify with option "R" below*
F	24 VAC
G	120 VAC
H	240 VAC *(T4-ATEX; T4A-NORTH AMER.) TEMP CLASS*
T	8-28 Vdc Loop Power **(Option T only)**
	"OUTPUT OPTIONS" ELECTRICAL SPECIFICATIONS (Resistive Load) (3)
A	SPDT, 3W, 0.25 Amp., 125 VAC/VDC *(Switch Adjustable 15-90% of full scale ascending)*
E	SPST, 60W, 3.0 Amp., 240 VAC/VDC *(Normally Open) (Switch Adjustable 15-90% of full scale ascending)*
F	SPST, 60W, 3.0 Amp., 240 VAC/VDC *(Normally Closed) (Switch Adjustable 15-90% of full scale ascending)*
G	SPST, 60W, 3.0 Amp., 240 VAC/VDC *One (1) Normally Open, One (1) Normally Closed (B, K, & S Electrical Configurations only) (Switch Adjustable 15-90% of full scale ascending)*
H	SPDT, 60W, 1.0 Amp., 240 VAC/VDC *(Switch Adjustable 25-90% of full scale ascending)*
R	DPDT, Relay, 10A @ 30 VDC, 120/240 VAC *(Switch Adjustable 15-90% of full scale ascending)* **(8) (10)**
T	4-20 mA Transmitter in general purpose enclosure, 3rd Party Certified Division 2 Hazardous Locations *with Terminal Strip / 1/2" FNPT Conduit Connection (±2% accuracy from 20-100% of full scale ascending)*
Z	Special (Contact Factory)

(1) Complete Assy. **3rd Party Certified**. Rated Class I, Div II, Groups A, B, C & D; Class II Div II Groups F&G *(R output excluded)*

(2) Complete Assy. **3rd Party Certified.** Rated Class I, Div I, Groups B, C & D; Class II Div I Groups E, F&G

(3) For output options A through H, the product switching voltage and current shall not exceed power rating.

(6) Enclosure Type 4/4X

(7) For electrical configuration B, K & S, SPDT relay output only

(8) Electrical configuration A & B in combination with Output Option R **is not** rated for Hazardous Locations

(9) Atex / IECEx Rated CE marked Ex d IIB + H_2 , Ex tb IIIC, IP65 (3000 PSIG SWP) KOSHA CERTIFIED

(10) For Electrical configurations: B, K, & S, you must use SPDT relay output only.

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 most of our product line 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 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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Mid-West® Instrument

Product Notes:

BULLETIN NO. 130/18
(SUPERSEDES BULLETIN NO. 130/17)

Mid-West® Instrument

"Diaphragm Type"
Differential Pressure Gauge & Switch
Model 130

Shown here with Range 0-5" H2O

Model 130 is a rugged general purpose differential pressure gauge with a 4-1/2" round dial.

Common Applications: Tank Level Monitoring Horizontal or Vertical Flow, Liquid Level, Indication/Balancing, Filter Monitoring for Gases, Water Treatment Applications and Vacuum Application

0-130 GPM
Flow Gauge Scale

"A World Leader in Differential Pressure Gauges & Switches

The low range capability of the **Model 130** is ideally suited for flow, liquid level and vacuum applications. Magnetic coupling between the sensing element and the indicating pointer provides for complete isolation of the process fluid within the pressure capsule. The few internal metal parts are 316L Stainless Steel.

Shown with Engineered Plastic Body

Model 130:

- Housing materials: Glass-Reinforced Engineered Plastic, Aluminum, Brass and 316L Stainless Steel
- Accuracy: 0-5" thru 0-9.9" H2O ±5% Full Scale Ascending 0-10" thru0-400" H2O ±2% Full Scale Ascending
- Weather-resistant construction standard.
- Use on virtually all reasonably clean liquids or gases.
- Over-range protection to full rated working pressure.
- Diaphragm design allows use of dissimilar fluids on high and low side of gauge.
- Can be used with vacuum or pressure applications
- Shatter resistant lens.
- 4-1/2" Engineered Plastic dial assembly standard.
- ¼" FNPT & ½" FNPT Process Connections
- DP Ranges available in: Inches H2O, PSID, mbar, and Kpa
- Available with Square Root dials for flow measurement

Shown with S.S. Cast Body

Model	Accuracy	Min. ΔP Range	Max. ΔP Range	MWP PSIG (bar)	Optional Switches
130	±2% or ±5%	0-5" H20 (0-12.4 mbar)	0-400" H20 (0-1 bar)	*300 (20) **500 (34)	1 & 2 Switches Hermetically Sealed

*Glass-Reinforced Engineered Plastic **Aluminum, Brass and Stainless Steel

Switches available on Aluminum, Brass & 316 S.S. bodies only.

“Diaphragm Type”
Differential Pressure Gauge
Switch Options
Model 130

Model 130 in Explosion Proof (left)
and NEMA 4X (right) enclosures

Shown w/Aluminum Body &
(1) Reed Switch in Condulet enclosure

Model 130 is available in Aluminum, Brass and 316SS bodies only with one or two hermetically sealed reed switches for low and/or high limit alarm. These CSA listed switches are Single Pole Double Throw (SPDT) with adjustable set points. Switches can be set to activate/deactivate on rising or falling pressure. Switches are enclosed in a weather resistant housing. Switch setting is readily made with a screw adjustment.

CSA listed control switching is available in non-corrosive molded plastic enclosures.
These are oil tight, dust tight and watertight per NEMA Type 4X standards.

CSA listed control switching is available in an explosion-proof enclosure which complies with NEC Class I, Groups C and D; Class II Groups E, F, and G; NEMA 7 and 9 standards. These are machined cast-aluminum enclosures with 1/2" FNPT conduit connection and 24" wire leads.

Shown w/Aluminum Body &
(1) Reed Switch with
Condulet enclosure and
Plug-In Connector
(Din 46350-PG 11)

Model	130
Type	SPDT
Power 3	W
Max Current	0.25 Amps
Max Voltage VAC/VDC	125 VAC/VDC
Setting Full Scale	10-90%
Hysterisis (Max / Norm)	10% / 5% (FS)
Repeatability 1%	F.S.
Connections	(3) 24" Leads 22 AWG

Factory preset switch at no extra charge (Specify Setting)
Specify increasing or decreasing range to be set.

Shown in NEMA 4X
Plastic enclosures

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 130 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

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Mid-West® Instrument

Standard Dial Ranges: Model 130

Range Type				
IN H_2O	PSID	Kpa	mbar	Flow Scales
0-5”	0-5	0-1.6	0-16	0-1.0
0-10”	0-10	0-2.5	0-25	0-1.25
0-15”	0-15	0-4.0	0-40	0-1.5
0-20"		0-6.0	0-60	0-1.75
0-25"		0-10	0-100	0-2.0
0-30"		0-16	0-160	0-2.5
0-40"		0-25	0-250	0-3.0
0-50"		0-40	0-400	0-3.5
0-60"		0-60	0-600	0-4.0
0-75"		0-100	0-1000	0-4.5
0-100"				0-5.0
0-135"				0-5.5
0-150"				0-6.0
0-200"				0-6.5
0-300"				0-7.0
0-400"				0-7.5
				0-8.0
				0-8.5
				0-9.0
				0-9.5
				0-10
Available Multipliers for Flow Dials: X10, X100, X1000, and X10,000				
Note: Not all ranges available in all diaphragm materials				

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 dual scale dials, multiple color dials and special decals.
Please consult factory for complete information.

Model	Min. ΔP Range	Max. ΔP Range
130	0-5" H2O (0-12.4 mbar)	0-400" H2O (0-1 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 gauge either conforms to and/or is 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

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Standard Model Number Sequence: 130-PC-00-OO

Glass-Reinforced Engineered Plastic Body, 316 Stainless Steel Internal Metal Parts
Ceramic Magnet, Buna-N Diaphragm and Seals, ¼" Steel Compression Tube Fittings,
4-1/2" Round Dial, Engineered Plastic Dial Case with Shatter Resistant Acrylic Lens,
(Aluminum, Brass & Stainless Steel Bodies-Dual ¼" FNPT Top & Bottom)

Accuracy ±5% Full Scale (Ascending) 0-5" H_2O to 0-9.9" H_2O or equivalent
Accuracy ±3/2/3% Full Scale (Ascending) 0-10" H_2O to 0-400" H_2O or equivalent

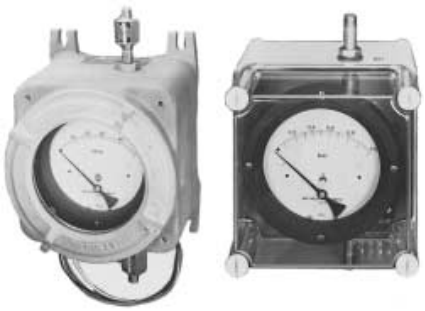
Range 0-5 IN H_2O to 0-400 IN H_2O (0-12.4 mbar to 0-1 bar)

Gauge Body and Internal components are considered wetted parts.

1	1	1	2	3	4	5	6	6	6	6	7	8
1	3	0										

Basic Model

Range:_____



2	Material
P	Glass-Reinforced Engineered. Plastic Body / 316 S.S. Internal Metal Parts *(Not available with switches)*
A	Aluminum Body / 316 Stainless Steel Internal Metal Parts
B	Brass Body / 316 Stainless Steel Internal Metal Parts
S	316 Stainless Steel Body / 316 Stainless Steel Internal Metal Parts
Z	Special ***(Un-coded Options)***
3	**Dial Size & Type**
C	4-1/2" Round Dial w/Engineered Plastic Dial Case
E	3-1/2" Round Dial w/Anodized Aluminum Housing Dial Case
G	4-1/2" Round Dial w/Anodized Aluminum Housing Dial Case
T	Non-Indicating DP Switch Only
Z	Special ***(Un-coded Options)***
4	**Seal Materials**
0	Buna-N *(Standard)*
1	Viton ®-A Registered Trademark of Dupont *(0-20" H2O to 0-400" H2O)*
2	Silicone *(0-5" H2O to 0-100" H2O)*
4	Neoprene *(0-5" H2O to 0-100" H2O)*
5	Ethylene Propylene *(0-20" H2O to 0-400" H2O)*
9	Special ***(Un-coded Options)***
5	**Process Connections**
0	1/4" (2) (Carbon Steel Compression Tube Fittings Standard on "P" Gauge Body) 1/4" FNPT (4) *(Standard on A, B, & S. Gauge Bodies)*
1	1/4" (2) 316 Stainless Steel compression tube fittings
2	1/4" FNPT Brass Adapters *(Available on Model P, Engineered plastic body only)*
3	1/4" FNPT (2) Stainless Steel Adapters *(Available on Model P, Engineered plastic body only)*
9	Special ***(Un-coded Options)***

Factory preset switches at no charge (Specify Setting)

Model 130 - continued

6	Additional Options
O	NONE
B	Drain & Bleed Plugs, (2) 316 S.S. *(Model 130 P only)*
D	Drain & Bleed in NEMA 4X enclosure
F	Carbon Steel 2" Pipe Mounting Kit
G	Stainless Steel 2" Pipe Mounting Kit
H	Hastelloy C Internal wetted Metal parts & fittings. *(Available with Glass Reinforced Plastic body only)*
K	1/2" FNPT S.S. Adapter (2) *(Available on "A", "B", & "S" Gauge Body)*
M	Maximum Indicator Follower Pointer *(Not available with 3-1/2" Dial)*
N	NACE *(Available on Aluminum and Stainless Steel Bodies only)*
Q	CRN (Canadian Registration Number) *(Available on Glass Reinforced Plastic and S.S. gauge bodies only)*
S	Shatter Proof Glass Lens *(4-1/2" available with "G" option Aluminum Dial Case only)*
T	Oxygen Cleaning
U	Stainless Steel Tag with S.S. Wire
V	Stainless Steel Tag and S.S. Screw
W	Wall Mount Kit
Z	Special ***(Un-coded Options)***
	NOTE: Not All Options Available in Combination with other Options
7	**Electrical Configurations (CE and ROHS marked, except N & P)** **Switch option not available for 130-PC Models**
O	None
H	One (1) Reed Switch with Condulet Enclosure
I	Two (1) Reed Switches with Condulet Enclosure
J	One (1) Reed Switch with Condulet Enclosure with Plug-in connector (DIN 43650/IP65-PG11)
K	Two (1) Reed Switches with Condulet Enclosure with Plug-in connector (DIN 43650/IP65-PG11)
L	One (1) Switch in NEMA 4X Plastic Enclosure
M	Two (2) Switches in NEMA 4X Plastic Enclosure
N	One (1) Switch in explosion proof enclosure with glass window cover. CSA & UL Listed **(1)**
P	Two (2) Switches in explosion proof enclosure with glass window cover. CSA & UL Listed **(1)**
Z	Special ***(Un-coded Options)***
(1) Complete assembly 3rd Party Certified Class I, Div.1, Groups C & D; Class II, Div. 1, Groups E, F, & G.	
8	**Electrical Specifications (For Resistive Loads)**
A	SPDT 3W, 0.25 Amp, 125 VAC/VDC *(Switch adjustable range of 10-90%)*
Z	Special ***(Un-coded Options)***
NOTE: The use of diaphragm seals is not recommended for Model 130 gauges	
WARNING: Attempts to install such seals on Model 130 gauges will void warranty	

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 1,000,000 DP Gauges 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 most of our product line 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.

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Mid-West® Instrument

"Diaphragm Type"

Differential Pressure Gauges for
Ammonia Service Application

When it comes to tough application solutions Mid-West Instrument provides the answer!!

Model 130
Range 0-5" H2O

The Use of Differential Pressure gauges for Ammonia service in PowerGen emission control is a critical application. The use of special materials along with over 7 years of ammonia service experience has enabled our customers to have confidence that we provide a quality gauge that works not only at start up but for years to come in this harsh environment. Mid-West Instrument has optimized the internal wetted parts as well as the external parts to hold up to the rigors of this environment. We have optimized the design to improve removal of condensate from the system. Neoprene and Ethylene Propylene elastomers are highly recommended in Ammonia service especially at elevated temperatures.

Model 130 Polysulfone or Stainless Steel is ideally suited for Ammonia service applications. Magnetic coupling between the sensing element and the indicating pointer provides for complete isolation of the process fluid within the pressure capsule. The Model 130 also has Over-range protection to full rated working pressure.

Model	Accuracy	Min. ΔP Range	Max. ΔP Range	Safe Working Pressure PSIG (Bar)	Optional Switches
130	±2% or *5%	0-5" H20 (0-12.4 mbar)	0-400" H20 (0-1 bar)	*300 (20) **500 (34)	1 or 2
* ±5% Range 0-5" to 0-9.9" H2O			* PolySulfone Engineered Plastic **Stainless Steel		
(Optional Switches available on Stainless Steel body only.)					

Body Materials	Glass Reinforced Ploysulfone Engineered Plastic or 316 Stainless steel
Seal & Diaphragm (under 20" H2O)	Neoprene Diaphragm & Seals
Seal & Diaphragm (over 20" H2O)	Ethylene Propylene Diaphragm & Seals
Wetted Parts	Body material & 316L Stainless Steel internal metal parts
Process Connections	1/4" FNPT S.S. Adapters (Polysulfone Body)
Process Connections	1/2" FNPT S.S. Adapters (316 Stainless Steel Body)
Mounting	Panel Mount (Std.) Pipe Mount Optional
Lens	Shatter Resistant Acrylic
Gauge Front	4-1/2" Engineered Plastic (Ammonia Service Tested)
Temperature Limits	-40°F to +200°F

Contact Mid-West at 1-800-648-5778 for assistance with your Ammonia Service application.

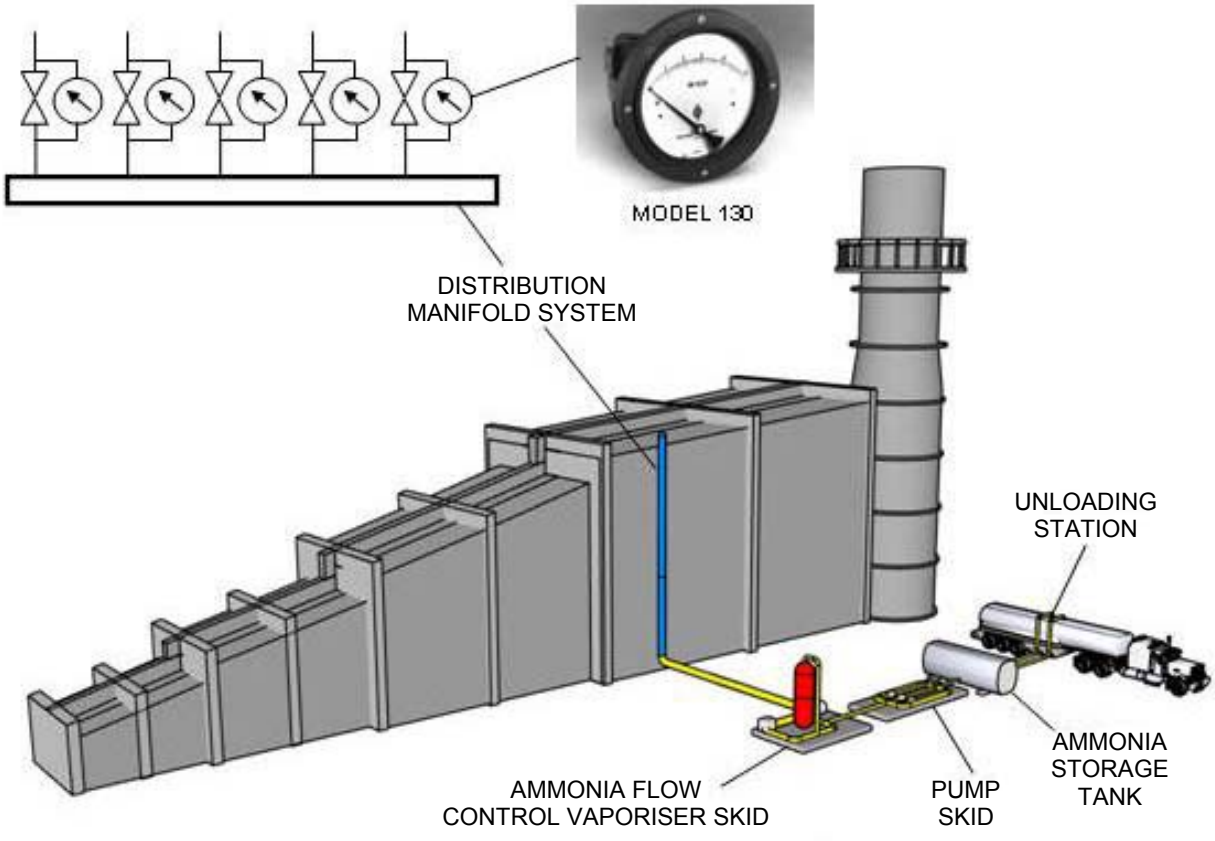
SCR Post-Combustion NOx Control
Model 130-PC or 130-SC

Nitrogen oxides (NOx) are a combustion by-product of fossil fuels burned to produce energy. NOX emissions are regulated under the Clean Air Act.

A Selective Catalytic Reduction System (SCR) is a post combustion technology used to reduce NOx emissions. Ammonia (NH3) is injected into the flue gas. This mixture flows through a catalyst bed where the NH3 and the NOx react to form nitrogen and water vapor.

Aqueous or anhydrous ammonia is pumped from a tank and sprayed into a vaporizer where it is heated and mixed with air. The ammonia-air mixture flows through a distribution manifold system into an injection grid. The injection grid distributes the mixture into the flue gas stream.

The amount of ammonia is adjusted to produce the desired degree of reaction with the NO**x**. Mid-West Instrument model 130-PC or 130-SC are used to balance the flow of the ammonia-air mixture throughout distribution manifold system. The model 130-PC or 130-SC are also used to monitor an ammonia filter prior to injection into the vaporizer.



The list below represents just a few
Model 130 Ammonia Service Gauge Customers

Deltak, Big River Electric Corp, Express Integrated Technologies, Peerless Mfg
Georgia Power, Ozonia North America, Marathon Petroleum, Hopkins Power Plant
Black Hills Generation, Conoco Philips, Alstom Power, TVA, Mid-American Power
Excel Energy, Babcock & Wilcox, Southern Company, Notre, Wahlco, Black & Vetch

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Mid-West® Instrument

Product Notes:

BULLETIN NO. 140/18
(SUPERSEDES BULLETIN NO. 140/17)

Mid-West® Instrument

"Diaphragm Type"
Differential Pressure Gauges
Switches & Transmitters
Model 140

Model 140 Diaphragm type DP Gauge provides outstanding capabilities not previously available in a modestly priced differential pressure gauge/switch.

Common Applications: Filter/Strainer Monitoring, Compressed Air, Hydraulic, Refrigerant, Pump Performance Testing, Heat Exchanger Pressure Drop Monitoring, Water Treatment Applications, Tank Level Monitoring Horizontal or Vertical, Flow Monitoring & Balancing

Ideally suited for use on dissimilar fluids and wet gas or fluids with a high concentration of solids, etc.

Model 140 0-30 PSID with 2-1/2" Dial

"A World Leader in Differential Pressure Gauges, Switches & Transmitters

Features:

- Total separation of high and low pressures by a Convoluted Elastomer Diaphragm.
- Over range protection to full rated working pressure.
- Body Materials: Aluminum, Brass or 316L stainless steel Hasteloy available upon request.
- Internal metal parts 316 stainless steel.
- ¼" FNPT & ½" FNPT Process Connections
- Sensor magnetically coupled to the indicating pointer and optional switches.
- Weather-resistant construction standard.
- Shatter resistant acrylic lens.
- Variety of Dial type and Sizes: 2-1/2", 3-1/2", 4-1/2" & 6"
- DP Ranges available in: Inches H2O, PSID, bar, and Kpa
- Available with Square Root dials for flow measurement
- Multiple mounting options available
- Temperature Limits: -40°F(-40°C) to +200°F(+93°C)

Model 140 0-30 PSID & 0-200 kPa with 2-1/2" Dial & Special Color Dial

Model 140 0-40 PSID & 0-2.8 Bar with 4-1/2" Dial& maximum follower pointer

Model	Accuracy	Min. ΔP Range	Max. ΔP Range	Max. Line Pressure PSIG (bar)	Optional Switches
140	±5% 0-50" H2O to 0-399" H2O ±3/2/3% 0-15 PSID to 0-100 PSID	0-50" H2O (0-125 mbar bar)	0-100 PSID (0-7 bar)	3000 (200)**	1 or 2 Switches or 4-20 mA Transmitter

**** Brass Body Working Pressure rated @ 1500 PSIG (103 bar)**

“Diaphragm Type”
Differential Pressure Gauge
Switch & Transmitter Options
Model 140

Model 140 shown with “AA” switch option
(1) Reed switch located inside NEMA 4x enclosure with 7 position terminal strip. An opening at rear of enclosure accepts ½” flexible weather-proof or conduit connector (supplied by customer).

Model 140 shown with “EA” switch option.
(1) Reed switch in general purpose enclosure Division 2 Hazardous locations with 7 position terminal strip. An opening at rear of enclosure accepts ½” flexible weather-proof or conduit connector (supplied by customer).

Model 140 “Delta Meter” is available with either one or two hermetically sealed reed switches for either high alarm, low alarm, or both and a 4-20mA transmitter depending on model. The switches are Single Pole Double Throw (SPDT) or Single Pole Single Throw (SPST) with adjustable set points. Switches can be set to activate/deactivate on rising or falling pressure. CE Marked and ROHS Compliant

Model 140 standard switch enclosure is non-corrosive molded plastic that is oil tight, dust tight, and water tight per NEMA 4X. External access to the switch adjustment is provided. Also available 3rd party certified Hazardous Location switches rated Class I, Division 1, Groups C & D, Class II, Division Groups E, F, & G and Class I, Division 2, Groups A, B, C, & D, Class II, Division 2, Groups F & G are available.

Model 140 shown with “TT” switch option.
(1) 4-20 mA Transmitter (8-28 VDC Loop Power) with 7 position terminal strip. An opening at rear of enclosure accepts ½” flexible weather-proof or conduit connector (supplied by customer).

Model Type	SPDT	SPST NO	Transmitter 4-20mA
Power	3 W	25 W	4-20 mA Loop Power
Max Current	0.25 Amps	0.5 Amps	8-28 VDC Loop Powered 2-Wire interface
Max Voltage VAC/VDC	125 VAC/VDC	230 VAC/VDC	1000 Ohm max Loop resistance at 28 vdc
Setting Full Scale	15-90% 15-9	0%	20-100%
Hysterisis (Max / Norm)	10% / 5% (FS)	15% / 8% (FS)	N/A
Repeatability	1% F.S.	1% F.S.	1% F.S
Connections T	erminal Strip	Terminal Strip	Terminal Strip

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Mid-West® Instrument

Standard Dial Ranges: Model's 140 & 142

Range Type				
IN H_2O	PSID	Kpa	bar	Flow Dials
0-20"	0-5	0-16	0-1.0	0-1.0
0-25"	0-10	0-25	0-1.6	0-1.5
0-30"	0-15	0-40	0-2.5	0-2.0
0-40"	0-20	0-60	0-4.0	0-2.5
0-50"	0-25	0-100	0-6.0	0-5.0
0-60"	0-30	0-160	0-7.0	0-10
0-75"	0-50	0-250		
0-100"	0-60	0-400		
0-135"	0-75	0-600		
0-150"	0-100	0-700		
0-200"				
0-300"				
0-400"				
Available Multipliers for Flow Dials: X10, X100, X1000, and X10,000				
Note: Not all ranges available in all diaphragm materials				

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
140	0-50" H2O (0-125 mbar)	0-100 PSID (0-7 bar)
142	0-20" H2O (0-50 mbar)	0-25 PSID (0-1.7 bar)

Proof Pressure: Two times rated working pressure at ambient temperature

Temperature Limits:
Gauge with or without switch: -40°F (-40°C) to +200°F (+93°C)
Gauge with transmitter:-20°F to +150°F (-20°C to +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 140-142 gauges either conform to and/or are designed to the requirements of the following standards:

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

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Standard Model Number Sequence: 140-AA-00-OO

3000 PSIG Working Pressure, Aluminum body, 316L Stainless Steel Internal Metal Parts, Ceramic Magnets, Buna-N Diaphragm and Seals, Teflon Guide Bushings, ¼" FNPT Back Connections, 2-1/2" Round Dial, Engineered Plastic Dial Case with Shatter Resistant Acrylic Lens

Accuracy ±5% F.S. (Ascending) 0-50" H_2O to 0-399" H_2O or equivalent
Accuracy ±3/2/3% F.S (Ascending) 0-15 PSID to 0-100 PSID or equivalent
Range 0-50" H_2O to 0-100 PSID (0-125 mbar to 0-7.0 bar)

Gauge Body and Internal components are considered wetted parts.

1	2	3	4	5	6	7	8
1 4 0							

Basic Model

Range:_____

2	Material
A	Aluminum Body / 316 Stainless Steel Internal Metal Parts & Teflon Guide Bushings
B	Brass Body / 316 Stainless Steel Internal Metal Parts & Teflon Guide Bushings
S	316 Stainless Steel Body / 316 Stainless Steel Internal Metal Parts & Teflon Guide Bushings
Z	Special ***(Un-coded Options)***
3	**Dial Size & Type**
A	2-1/2" Round Dial w/Engineered Plastic Dial Case
C	4-1/2" Round Dial w/Engineered Plastic Dial Case
E	3-1/2" Round w/Anodized Aluminum Dial Case
G	4-1/2" Round w/Anodized Aluminum Dial Case
J	6" Round w/Engineered Plastic Dial case *(Not Certified for Hazardous Location Switch Options C & D)*
T	Non-Indicating DP Switch Only
Z	Special ***(Un-coded Options)***
4	**Seal Materials**
0	Buna-N *(Standard)*
1	Viton®-A Registered Trademark of Dupont
2	Silicone
5	Ethylene Propylene
9	Special ***(Un-coded Options)***
5	**Process Connections**
0	1/4" FNPT Back Connections *(Standard)*
2	Dual 1/4" FNPT Top & Bottom Connections **(Non-Electrical Option Units Only)**
3	1/4" FNPT Bottom Connections
4	7/16"-20 straight thread O-Ring **(Back Connections only)**
7	1/2" FNPT End Connections *(2000 PSIG SWP for S.S. & Aluminum Gauge Body) (Not available with C & D switch options)*
8	1/4" FNPT End Connections *(2000 PSIG SWP for S.S. & Aluminum Gauge Body) (Not available with C & D switch options)*
9	Special ***(Un-coded Options)***

Model 140 - continued

6	Additional Options
O	None
A	Reversed High / Low Process Connections. *(Not available with electrical options C, D, T & W)*
E	Two (2)1/4-20 Mounting Holes
F	Carbon Steel 2" Pipe Mounting Kit *(Not available with reversed port switch option)*
G	Stainless Steel 2" Pipe Mounting Kit *(Not available with reversed port switch option)*
K	1/2" FNPT Stainless Steel Adapters *(Not available with end connections)*
L	Liquid Fill *(Glycerin Fill Standard) (2) (Not available with shatterproof glass lens)*
M	Maximum Indicator Follower Pointer *(Not available w/3-1/2", 6" Dial or Liquid fill options)(Not available w/shatterproof glass lens)*
N	NACE *(Available for Aluminum & Stainless Steel Gauge Bodies only)*
Q	CRN (Canadian Registration Number) *Available for Aluminum or S.S. Body only (1)*
S	Shatter Proof Glass Lens *(4-1/2" available only available with option "G" Aluminum Dial Case) (Not available with liquid fill)*
T	Oxygen Cleaning
U	Stainless Steel Tag with S.S. Wire
V	Stainless Steel Tag and S.S. Screw *(Contact factory on switch options)*
W	Wall Mount Kit
X	Chemical Seals
Z	Special ***(Un-coded Options)***
	(1) 2,000 PSIG SWP for Aluminum Body
	(2) Silicone Fill available please contact factory
	NOTE: Not All Options Available in Combination with other Options
7	**Electrical Configurations (CE Marked & ROHS Compliant, except C, D, T & W)**
O	None
A	One (1) Reed Switch in NEMA 4X/IP66 Enclosure
B	Two (2) Reed Switches in NEMA 4X/IP66 Enclosure
C	One (1) Switch in Explosion Proof Enclosure. Division 1 Hazardous Locations **(1)**
D	One (2) Switches in Explosion Proof Enclosure. Division 1 Hazardous Locations **(1)**
E	One (1) Reed Switch in NEMA 4X/IP66 Aluminum Enclosure, Division 2 Hazardous Locations **(2)(3)**
F	Two (2) Reed Switches in NEMA 4X/IP66 Aluminum Enclosure, Division 2 Hazardous Locations **(2)(3)**
T	4-20 mA Transmitter in NEMA-4X/IP66 aluminum enclosure
W	4-20 mA Transmitter in general purpose enclosure, Division 2 Hazardous Locations **(2)(3)(4)**
Z	Special ***(Un-coded Options)***
	(1) Complete assembly 3rd Party Certified Class I, Div.1, Groups C & D; Class II, Div. 1, Groups E, F, & G.
	(2) Complete assembly 3rd Party Certified Class I, Div.2, Groups A, B, C, & D; Class II, Div.2, Groups F and G.
	(3) 1625 PSI SWP for NACE in combination with E, F and W electrical configuration
	(4) Contact factory for tank level or flow applications with transmitter configuration
8	**Electrical Specifications (For Resistive Loads)**
O	None
A	SPDT 3W, 0.25 Amp, 125 VAC/VDC *(Switch adjustable range of 15-90%)*
B	SPST, 25W, 0.5 Amp., 230 VAC/VDC *(Normally Open) (Switch adjustable range of 15-90%)*
T	4-20 mA Transmitter (8-28 VDC Loop Power) *(± 2% Accuracy from 20-100% of scale, Ascending)*
Z	Special ***(Un-coded Options)***

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 1,000,000 DP Gauges 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 most of our product line 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 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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Mid-West® Instrument

Product Notes:

BULLETIN NO. 142/18
(SUPERSEDES BULLETIN NO. 142/11)

Mid-West® Instrument

"Diaphragm Type"
Differential Pressure Gauges
Switches & Transmitters
Model 142

Model 142 Diaphragm type DP Gauge provides outstanding capabilities not previously available in a modestly priced differential pressure gauge/switch.

Common Applications: Filter/Strainer Monitoring, Compressed Air, Hydraulic, Refrigerant, Pump Performance Testing, Heat Exchanger Pressure Drop Monitoring, Water Treatment Applications, Tank Level Monitoring Horizontal or Vertical, Flow Monitoring & Balancing

Ideally suited for use on dissimilar fluids and wet gas or fluids with a high concentration of solids, etc.

Model 142 0-20" H2O with 2-1/2" Dial

Features:

- Total separation of high and low pressures by a Convoluted Elastomer Diaphragm.
- Over range protection to full rated working pressure.
- Body Materials: Aluminum, Brass or 316L stainless steel Hasteloy available upon request.
- Internal metal parts 316 stainless steel.
- ¼" FNPT & ½" FNPT Process Connections
- Sensor magnetically coupled to the indicating pointer and optional switches.
- Weather-resistant construction standard.
- Shatter resistant acrylic lens.
- Variety of Dial type and Sizes: 2-1/2", 3-1/2", 4-1/2" & 6"
- DP Ranges available in: Inches H2O, PSID, bar, and Kpa
- Available with Square Root dials for flow measurement
- Multiple mounting options available
- Temperature Limits: -40°F(-40°C) to +200°F(+93°C)

"A World Leader in Differential Pressure Gauges, Switches & Transmitters

Model 142 with 2-1/2" Dial & 4-20mA Transmitter

Model 142 0-100" H2O with 4-1/2" Dial

Model	Accuracy	Min. ΔP Range	Max. ΔP Range	Max. Line Pressure PSIG (bar)	Optional Switches
142	±3/2/3%	0-20" H_20 (0-50 mbar)	0-25 PSID (0-1.7 bar)	3000 (200)**	1 or 2 Switches or 4-20 mA Transmitter

**** Brass Body Working Pressure rated @ 1500 PSIG (103 bar)**

“Diaphragm Type”

Differential Pressure Gauge
Switch & Transmitter Options

Model 142

Model 142 shown with “EA” switch option
(1) Reed switches located inside General Purpose Enclosure, Division 2 Hazardous location with 7 position terminal strip. An opening at rear of enclosure accepts ½” flexible weather-proof or conduit connector (supplied by customer).

Model 142 shown with “AA” switch option
(1) Reed switch located inside NEMA 4x enclosure with 7 position terminal strip. An opening at rear of enclosure accepts ½” flexible weather-proof or conduit connector (supplied by customer).

Model 142 “Delta Meter” is available with either one or two hermetically sealed reed switches for either high alarm, low alarm, or both and a 4-20mA transmitter depending on model. The switches are Single Pole Double Throw (SPDT) or Single Pole Single Throw (SPST) with adjustable set points.
Switch can be set to activate/deactivate on rising or falling pressure. CE Marked & ROHS Compliant

Model 142 standard switch enclosure is non-corrosive molded plastic that is oil tight, dust tight, and water tight per NEMA 4X. External access to the switch adjustment is provided. Also available 3rd party Certified switches rated Class I, Division 2, Groups A, B, C & D, Class II, Division 2, Groups F, & G are.

Model 142 shown with “TT” switch option.
(1) 4-20 mA Transmitter (8-28 VDC Loop Power) with 7 position terminal strip. An opening at rear of enclosure accepts ½” flexible weather-proof or conduit connector (supplied by customer).

Model Type	SPDT	SPST NO	Transmitter 4-20mA
Power	3 W	25 W	4-20 mA Loop Power
Max Current	0.25 Amps	0.5 Amps	8-28 VDC Loop Powered 2-Wire interface
Max Voltage VAC/VDC	125 VAC/VDC	230 VAC/VDC	1000 Ohm max Loop resistance at 28 vdc
Setting Full Scale	15-95%	15-95%	20-100%
Hysterisis (Max / Norm)	10% / 5% (FS)	15% / 8% (FS)	N/A
Repeatability	1% F.S.	1% F.S.	1% F.S
Connections	Terminal Strip	Terminal Strip	Terminal Strip

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Standard Dial Ranges: Model's 140 & 142

Range Type				
IN H_2O	PSID	Kpa	bar	Flow Dials
0-20"	0-5	0-16	0-1.0	0-1.0
0-25"	0-10	0-25	0-1.6	0-1.5
0-30"	0-15	0-40	0-2.5	0-2.0
0-40"	0-20	0-60	0-4.0	0-2.5
0-50"	0-25	0-100	0-6.0	0-5.0
0-60"	0-30	0-160	0-7.0	0-10
0-75"	0-50	0-250		
0-100"	0-60	0-400		
0-135"	0-75	0-600		
0-150"	0-100	0-700		
0-200"				
0-300"				
0-400"				
Available Multipliers for Flow Dials: X10, X100, X1000, and X10,000				
Note: Not all ranges available in all diaphragm materials				

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
140	0-50" H2O (0-125 mbar)	0-100 PSID (0-7 bar)
142	0-20" H2O (0-50 mbar)	0-25 PSID (0-1.7 bar)

Proof Pressure: Two times rated working pressure at ambient temperature

Temperature Limits:
Gauge with or without switch: -40°F (-40°C) to +200°F (+93°C)
Gauge with transmitter:-20°F to +150°F (-20°C to +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 140-142 gauges either conform to and/or are designed to the requirements of the following standards:

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

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Standard Model Number Sequence: 142-AJ-00-OO

3000 PSIG Working Pressure, Aluminum body, 316L Stainless Steel Internal Metal Parts,
Ceramic Magnets, Buna-N Diaphragm and Seals, Teflon Guide Bushings, ¼" FNPT Back Connections,
6" Round Dial, Engineered Plastic Dial Case with Shatter Resistant Acrylic Lens
Accuracy ±3/2/3% Full Scale (Ascending)

Range 0-20" H_2O to 0-25 PSID (0-50 mbar to 0-1.7 bar)

Gauge Body and Internal components are considered wetted parts.

1		2	3	4	5	6				7	8
1	4	2									

Basic Model

Range:_____

2	Material
A	Aluminum Body / 316 Stainless Steel Internal Metal Parts & Teflon Guide Bushings
B	Brass Body / 316 Stainless Steel Internal Metal Parts & Teflon Guide Bushings
S	316 Stainless Steel Body / 316 Stainless Steel Internal Metal Parts & Teflon Guide Bushings
Z	Special ***(Un-coded Options)***
3	**Dial Size & Type**
A	2-1/2" Round Dial w/Engineered Plastic Dial Case
C	4-1/2" Round Dial w/Engineered Plastic Dial Case
E	3-1/2" Round Dial w/Anodized Aluminum Dial Case
G	4-1/2" Round Dial w/Anodized Aluminum Dial Case
J	6" Round Dial w/Engineered Plastic Dial Case
T	Non-Indicating DP Switch Only
Z	Special ***(Un-coded Options)***
4	**Seal Materials**
0	Buna-N ***(Standard)***
1	Viton®-A Registered Trademark of Dupont
5	Ethylene Propylene
9	Special ***(Un-coded Options)***
5	**Process Connections**
0	1/4" FNPT Back Connections *(Standard)*
2	Dual 1/4" FNPT Top & Bottom Connections *(Non-Electrical Option Units Only)*
3	1/4" FNPT Bottom Connections
4	7/16"-20 straight thread O-Ring *(Back Connections only)*
7	1/2" FNPT End Connections *(2000 PSIG SWP for S.S. & Aluminum Gauge Body)*
8	1/4" FNPT End Connections *(2000 PSIG SWP for S.S. & Aluminum Gauge Body)*
9	Special ***(Un-coded Options)***

Model 142 - continued

6	Additional Options
O	NONE
A	Reversed High / Low Process Connections. *(Not available with T or W transmitter options)*
E	Two (2) 1/4-20 Mounting Holes
F	Carbon Steel 2" Pipe Mounting Kit *(Not available with reverse port switch option)*
G	Stainless Steel 2" Pipe Mounting Kit *(Not available with reverse port switch option)*
K	1/2" FNPT Stainless Steel Adapters *(Not available with end connections)*
L	Liquid Fill *(Glycerin Fill Standard) (2) (Not available with shatterproof glass lens)*
M	Maximum Indicator Follower Pointer *(Not available w/3-1/2", 6" Dial or Liquid fill options) (Not available with shatterproof glass lens)*
N	NACE Available for Aluminum & Stainless Steel Gauge Bodies only. *(1,500 PSIG SWP)*
Q	CRN (Canadian Registration Number) *(1)*
R	Special 54 mm Port Spacing for direct mount manifolds.
S	Shatter Proof Glass Lens *(4-1/2" available with "G" option Aluminum Dial Case only)(Not available with liquid fill option)*
T	Oxygen Cleaning
U	Stainless Steel Tag with S.S. Wire
V	Stainless Steel Tag and S.S. Screw *(Contact factory on switch options)*
W	Wall Mount Kit *(Not available with back connections)*
X	Chemical Seals
Z	Special ***(Un-coded Options)***
	(1) 1,375 PSIG SWP for Aluminum , Brass and Stainless steel Bodies
	(2) Silicone Fill available please contact factory
	NOTE: Not All Options Available in Combination with other Options

7	Electrical Configurations (CE and ROHS marked, except T & W)
O	None
A	One (1) Reed Switch in NEMA 4X/IP66 Enclosure
B	Two (2) Reed Switches in NEMA 4X/IP66 Enclosure
E	One (1) Reed Switch in NEMA 4X/IP66 Aluminum Enclosure, Division 2 Hazardous Locations **(1)(2)**
F	Two (2) Reed Switches in NEMA 4X/IP66 Aluminum Enclosure, Division 2 Hazardous Locations **(1)(2)**
T	4-20 mA Transmitter in NEMA-4X/IP66 aluminum enclosure **(3)**
W	4-20 mA Transmitter in general purpose enclosure, Division 2 Hazardous Locations **(1)(2)(3)**
Z	Special ***(Un-coded Options)***
	(1) Complete assembly 3rd Party Certified Class I, Div.2,Groups A, B, C, & D; Class II, Div.2, Groups F and G.
	(2) 1375 PSIG SWP for E, F & W Hazardous locations electrical configurations
	(3) Contact factory for tank level or flow applications with transmitter configuration

8	Electrical Specifications (For Resistive Loads)
A	SPDT 3W, 0.25 Amp, 125 VAC/VDC *(Switch adjustable range of 15-95%)*
B	SPST, 25W, 0.5 Amp., 230 VAC/VDC *(Normally Open) (Switch adjustable range of 15-95%)*
T	4-20 mA Transmitter (8-28 VDC Loop Power) *(± 2% Accuracy from 20-100% of scale, Ascending)*

MID-WEST **INSTRUMENT** has been serving a variety of industries (Power, Chemical, Petro-Chemical, HVAC, Water Filtration etc…) for over 50 years. Over 2,000,000 DP Gauges 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 most of our product line 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.

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Mid-West® Instrument

Product Notes:

BULLETIN NO.142MALBZ-18
(SUPERSEDES BULLETIN NO. 140/142-17)

Mid-West® Instrument

"Diaphragm Type"

Differential Pressure Gauge, Switch, or Transmitter

Model 142

Aluminum Bronze & Monel

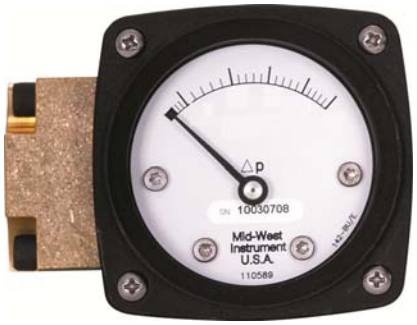
5 YEAR WARRANTY

FOR SEA WATER APPLICATIONS

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

MADE IN USA

Pictures do not represent actual body material



Model 142
with 2-1/2" Dial

Features:

- Total separation of high and low pressures by a Convoluted Elastomer Diaphragm.
- Over range protection to full rated working pressure.
- Body Materials: Aluminum/Bronze or Monel
- Monel Spring & Internal metal parts
- ¼" FNPT FNPT Process Connection (std)
- Sensor magnetically coupled to the indicating pointer and optional switches.
- Weather-resistant construction standard.
- Shatter resistant acrylic lens.
- Variety of Dial type and Sizes: 2-1/2", 3-1/2", 4-1/2" & 6"
- DP Ranges available in: Inches H2O, PSID, bar, and Kpa
- Temperature Limits: -40°F(-40°C) to +200°F(+93°C)

"A World Leader in Differential Pressure Gauges, Switches & Transmitters

Model 142
with 2-1/2" Dial
& 4-20mA Transmitter

Model 142 0-100" H2O
with 4-1/2" Dial

Model	Accuracy	Available ΔP Ranges	Max. Line Pressure PSIG	Optional Switches
142	±3/2/3%	0-100" H_20, 0-5 PSID, 0-10 PSID 0-15 PSID, 0-20 PSID	1000	1 or 2 Switches or 4-20 mA Transmitter

“Diaphragm Type”

Differential Pressure Gauge
Switch & Transmitter Options

Model 142

Model 142 available with “AA” switch option
(1) Reed switch located inside NEMA 4x enclosure with 7 position terminal strip. An opening at rear of enclosure accepts ½” flexible weather-proof or conduit connector (supplied by customer).

Model 142 available with “BA” switch option
(2) Reed switches located inside NEMA 4x enclosure with 7 position terminal strip. An opening at rear of enclosure accepts ½” flexible weather-proof or conduit connector (supplied by customer).

Model 142 “Delta Meters” are available with either one or two hermetically sealed reed switches for either high alarm, low alarm, or both and a 4-20mA transmitter depending on model. The switches are Single Pole Double Throw (SPDT) or Single Pole Single Throw (SPST) with adjustable set points. Switches can be set to activate/deactivate on rising or falling pressure.

Mode 142 standard switch enclosure is non-corrosive molded plastic that is oil tight, dust tight, and water tight per NEMA 4X/IP66. External access to the switch adjustment is provided. 4-20 mA Transmitter enclosures is Aluminum that is oil tight, dust tight, and water tight per NEMA 4X/IP66 as well. An external zero pin is available for simple remote zeroing. Switch leads are 24", 18 Awg, and are color coded where applicable.

Model 142 shown with “TT” transmitter option.
4-20 mA Transmitter in NEMA 4X/IP66 Aluminum Enclosure. 7 position terminal strip and opening at rear of enclosure accepts ½” flexible weather-proof or conduit connector (supplied by customer).

Model Type	142 SPDT	142 SPST NO	142 Transmitter 4-20mA
Power	3 W	25 W	4-20 mA Loop Power
Max Current	0.25 Amps	0.5 Amps	8-28 VDC Loop Powered 2-Wire interface
Max Voltage VAC/VDC	125 VAC/VDC	230 VAC/VDC	1000 Ohm max Loop resistance at 28 vdc
Setting Full Scale	15-95% 15-9	5%	20-100%
Hysterisis (Max / Norm)	10% / 5% (FS)	15% / 8% (FS)	N/A
Repeatability	1% F.S.	1% F.S.	1% F.S
Connections	(3) 24" Leads 22 AWG	(2) 24" Leads 22 AWG	Terminal Strip

6500 Dobry Dr. • Sterling Heights, MI 48314 USA • Tel: 800-648-5778 Tel: 586-254-6500 Fax: 586-254-6509
Web Site: www.midwestinstrument.com • Email: sales@midwestinstrument.com

Standard Model Number Sequence: 142-MA-00-OO

1000 PSIG Working Pressure, Monel body, Monel Internal Metal Parts,
Ceramic Magnets, Buna-N Diaphragm and Seals, Teflon Guide Bushings, ¼" FNPT Back Connections,
2-1/2" Round Dial, Engineered Plastic Dial Case with Shatter Resistant Acrylic Lens
Accuracy ±3/2/3% Full Scale (Ascending)

Ranges Model 142: 0-100" H_2O, 0-5, 0-10, 0-15, & 0-20 PSID

Gauge Body and Internal components are considered wetted parts.

1	2	3	4	5	6	7	8
1 4 2							

Basic Model

Range:_____

Pictures do not represent actual body material

2	Material
M	Monel Body / Monel Internal Metal Parts & Teflon Guide Bushings
N	Aluminum/Bronze Body / Monel Internal Metal Parts & Teflon Guide Bushings
Z	Special ***(Un-coded Options)***
3	**Dial Size & Type**
A	2-1/2" Round Dial w/Engineered Plastic Dial Case
C	4-1/2" Round Dial w/Engineered Plastic Dial Case
E	3-1/2" Round Dial w/Anodized Aluminum Dial Case
G	4-1/2" Round Dial w/Anodized Aluminum Dial Case
J	6" Round Dial w/Engineered Plastic Dial Case
T	Non-Indicating DP Switch Only
Z	Special ***(Un-coded Options)***
4	**Seal Materials**
0	Buna-N *(Standard)*
1	Viton®-A Registered Trademark of Dupont
5	Ethylene Propylene
9	Special ***(Un-coded Options)***
5	**Process Connections**
0	1/4" FNPT Back Connections *(Standard)*
2	Dual 1/4" FNPT Top & Bottom Connections *(Non-Electrical Option Units Only)*
3	1/4" FNPT Bottom Connections
4	7/16"-20 straight thread O-Ring *(Back Connections only)*
9	Special ***(Un-coded Options)***

Model 142 - continued

6	Additional Options
O	NONE
A	Reversed High / Low Process Connections. *(Not available with transmitter options T)*
E	Two (2) 1/4-20 Mounting Holes
F	Carbon Steel 2" Pipe Mounting Kit *(Not available with reverse port switch option)*
G	Stainless Steel 2" Pipe Mounting Kit *(Not available with reverse port switch option)*
L	Liquid Fill *(Glycerin Fill Standard) (1) (Not available with shatterproof glass lens)*
M	Maximum Indicator Follower Pointer *(Not available w/3-1/2", 6" Dial or Liquid fill options) (Not available with shatterproof lens)*
S	Shatter Proof Glass Lens *(4-1/2" available with "G" option Aluminum Dial Case only) (Not available with liquid fill)*
T	Oxygen Cleaning
U	Stainless Steel Tag with S.S. Wire
V	Stainless Steel Tag and S.S. Screw *(Contact factory on switch options)*
W	Wall Mount Kit *(Not available with back connections)*
Z	Special ***(Un-coded Options)***
(1) Silicone Fill available please contact factory	
	NOTE: Not All Options Available in Combination with other Options
7	**Electrical Configurations**
O	None
A	One (1) Reed Switch in NEMA 4X/IP66 Enclosure
B	Two (2) Reed Switches in NEMA 4X/IP66 Enclosure
T	4-20 mA Transmitter in NEMA-4X/IP66 aluminum enclosure **(3)**
Z	Special ***(Un-coded Options)***
(3) Contact factory for tank level or flow applications with transmitter configuration	
8	**Electrical Specifications (For Resistive Loads)**
A	SPDT 3W, 0.25 Amp, 125 VAC/VDC *(Switch adjustable range of 15-95%)*
B	SPST, 25W, 0.5 Amp., 230 VAC/VDC *(Normally Open) (Switch adjustable range of 15-95%)*
T	4-20 mA Transmitter (8-28 VDC Loop Power) *(± 2% Accuracy from 20-100% of scale, Ascending)*
Z	Special ***(Unc-oded Options)***

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 2,000,000 DP Gauges 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 most of our product line 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 or contact us toll free at **1-800-648-5778** and one of our knowledgeable sales coordinators will be happy to assist you.

BULLETIN NO. 140MALBZ-18
(SUPERSEDES BULLETIN NO. 140/142-17)

Mid-West® Instrument

"Diaphragm Type"

Differential Pressure Gauge, Switch, or Transmitter

Model 140

Aluminum Bronze & Monel

5 YEAR WARRANTY

FOR SEA WATER APPLICATIONS

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

MADE IN USA

Pictures do not represent actual body material

Model 140
with 2-1/2" Dial

Features:

- Total separation of high and low pressures by a Convoluted Elastomer Diaphragm.
- Over range protection to full rated working pressure.
- Body Materials: Aluminum/Bronze or Monel
- Monel Spring & Internal metal parts
- ¼" FNPT FNPT Process Connection (std)
- Sensor magnetically coupled to the indicating pointer and optional switches.
- Weather-resistant construction standard.
- Shatter resistant acrylic lens.
- Variety of Dial type and Sizes: 2-1/2", 3-1/2", 4-1/2" & 6"
- DP Ranges available in: Inches H2O, PSID, bar, and Kpa
- Temperature Limits: -40°F(-40°C) to +200°F(+93°C)

"A World Leader in Differential Pressure Gauges, Switches & Transmitters

Model 140
with 2-1/2" Dial
& 4-20mA Transmitter

Model 140
0-40 PSID & 0-2.8 Bar
with 4-1/2" Dial and
Maximum Follower Pointer

Model	Accuracy	Available ΔP Ranges	Max. Line Pressure PSIG	Optional Switches
140	±3/2/3%	0-25 PSID, 0-30 PSID, 0-40 PSID	1000	1 or 2 Switches or 4-20 mA Transmitter

“Diaphragm Type”
Differential Pressure Gauge
Switch & Transmitter Options
Model 140

Model 140 available with “AA” switch option
(1) Reed switch located inside NEMA 4x enclosure with 7 position terminal strip. An opening at rear of enclosure accepts ½” flexible weather-proof or conduit connector (supplied by customer).

Model 140 available with “BA” switch option
(2) Reed switches located inside NEMA 4x enclosure with 7 position terminal strip. An opening at rear of enclosure accepts ½” flexible weather-proof or conduit connector (supplied by customer).

Model 140 “Delta Meters” are available with either one or two hermetically sealed reed switches for either high alarm, low alarm, or both and a 4-20mA transmitter depending on model. The switches are Single Pole Double Throw (SPDT) or Single Pole Single Throw (SPST) with adjustable set points. Switches can be set to activate/deactivate on rising or falling pressure.

Mode 140 standard switch enclosure is non-corrosive molded plastic that is oil tight, dust tight, and water tight per NEMA 4X/IP66. External access to the switch adjustment is provided. 4-20 mA Transmitter enclosures is Aluminum that is oil tight, dust tight, and water tight per NEMA 4X/IP66 as well. An external zero pin is available for simple remote zeroing.

Model 140 shown with “TT” transmitter option.
4-20 mA Transmitter in NEMA 4X/IP66 Aluminum Enclosure. 7 position terminal strip and opening at rear of enclosure accepts ½” flexible weather-proof or conduit connector (supplied by customer).

Model Type	140 SPDT	140 SPST NO	140 Transmitter 4-20mA
Power	3 W	25 W	4-20 mA Loop Power
Max Current	0.25 Amps	0.5 Amps	8-28 VDC Loop Powered 2-Wire interface
Max Voltage VAC/VDC	125 VAC/VDC	230 VAC/VDC	1000 Ohm max Loop resistance at 28 vdc
Setting Full Scale	15-90% 15-9	0%	20-100%
Hysterisis (Max / Norm)	10% / 5% (FS)	15% / 8% (FS)	N/A
Repeatability	1% F.S.	1% F.S.	1% F.S
Connections	Terminal Strip	Terminal Strip	Terminal Strip

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Web Site: www.midwestinstrument.com • Email: sales@midwestinstrument.com

Standard Model Number Sequence: 140-MA-00-OO

1000 PSIG Working Pressure, Monel body, Monel Internal Metal Parts,
Ceramic Magnets, Buna-N Diaphragm and Seals, Teflon Guide Bushings, ¼" FNPT Back Connections,
2-1/2" Round Dial, Engineered Plastic Dial Case with Shatter Resistant Acrylic Lens
Accuracy ±3/2/3% Full Scale (Ascending)

Dial Ranges: 0-25, 0-30, 0-40 PSID

Gauge Body and Internal components are considered wetted parts.

1	2	3	4	5	6	7	8
1 4 0							

Basic Model

Range:_____

Pictures do not represent actual body material

2	Material
M	Monel Body / Monel Internal Metal Parts & Teflon Guide Bushings
N	Aluminum/Bronze Body / Monel Internal Metal Parts & Teflon Guide Bushings
Z	Special ***(Un-coded Options)***
3	**Dial Size & Type**
A	2-1/2" Round Dial w/Engineered Plastic Dial Case
C	4-1/2" Round Dial w/Engineered Plastic Dial Case
E	3-1/2" Round Dial w/Anodized Aluminum Dial Case
G	4-1/2" Round Dial w/Anodized Aluminum Dial Case
J	6" Round Dial w/Engineered Plastic Dial Case
T	Non-Indicating DP Switch Only
Z	Special ***(Un-coded Options)***
4	**Seal Materials**
0	Buna-N ***(Standard)***
1	Viton®-A Registered Trademark of Dupont
5	Ethylene Propylene
9	Special ***(Un-coded Options)***
5	**Process Connections**
0	1/4" FNPT Back Connections ***(Standard)***
2	Dual 1/4" FNPT Top & Bottom Connections ***(Non-Electrical Option Units Only)***
3	1/4" FNPT Bottom Connections
4	7/16"-20 straight thread O-Ring ***(Back Connections only)***
9	Special ***(Un-coded Options)***

Model 140 - continued

6	Additional Options
O	NONE
A	Reversed High / Low Process Connections. *(Not available with transmitter options T)*
E	Two (2) 1/4-20 Mounting Holes
F	Carbon Steel 2" Pipe Mounting Kit *(Not available with reverse port switch option)*
G	Stainless Steel 2" Pipe Mounting Kit *(Not available with reverse port switch option)*
L	Liquid Fill *(Glycerin Fill Standard) (1) (Not available with shatterproof glass lens)*
M	Maximum Indicator Follower Pointer *(Not available w/3-1/2", 6" Dial or Liquid fill options) (Not available with shatterproof lens)*
S	Shatter Proof Glass Lens *(4-1/2" available with "G" option Aluminum Dial Case only) (Not available with liquid fill)*
T	Oxygen Cleaning
U	Stainless Steel Tag with S.S. Wire
V	Stainless Steel Tag and S.S. Screw *(Contact factory on switch options)*
W	Wall Mount Kit *(Not available with back connections)*
Z	Special ***(Un-coded Options)***
(1) Silicone Fill available please contact factory	
	NOTE: Not All Options Available in Combination with other Options

7	Electrical Configurations
O	None
A	One (1) Reed Switch in NEMA 4X/IP66 Enclosure
B	Two (2) Reed Switches in NEMA 4X/IP66 Enclosure
T	4-20 mA Transmitter in NEMA-4X/IP66 aluminum enclosure **(3)**
Z	Special ***(Un-coded Options)***
(3) Contact factory for tank level or flow applications with transmitter configuration	

8	Electrical Specifications (For Resistive Loads)
A	SPDT 3W, 0.25 Amp, 125 VAC/VDC *(Switch adjustable range of 15-90%)*
B	SPST, 25W, 0.5 Amp., 230 VAC/VDC *(Normally Open) (Switch adjustable range of 15-90%)*
T	4-20 mA Transmitter (8-28 VDC Loop Power) *(± 2% Accuracy from 20-100% of scale, Ascending)*
Z	Special ***(Un-Coded Options)***

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 2,000,000 DP Gauges 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 most of our product line 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 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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BULLETIN NO. 240/18
(SUPERSEDES BULLETIN NO. 240/17)

Mid-West® Instrument

"Diaphragm Type" Model 240

"Hazardous Locations"

Indicating / Non-Indicating
Differential Pressure Switch or Transmitter

- A low cost Diaphragm type differential pressure switch for use in measuring or controlling the pressure drop cross filters, strainers, separators, valves and pumps.
- Working Pressure 1,500 PSIG (275 bar)
- Over-range protection to maximum pressure.
- Aluminum or 316 Stainless Steel wetted pressure containing body assembly.
- Wetted Internals – 316 Stainless Steel and Ceramic moving components.
- Weather resistant gauge construction standard.
- Dial Size: 4-1/2" with Shatter resistant acrylic lens.
- Five Year Limited Warranty

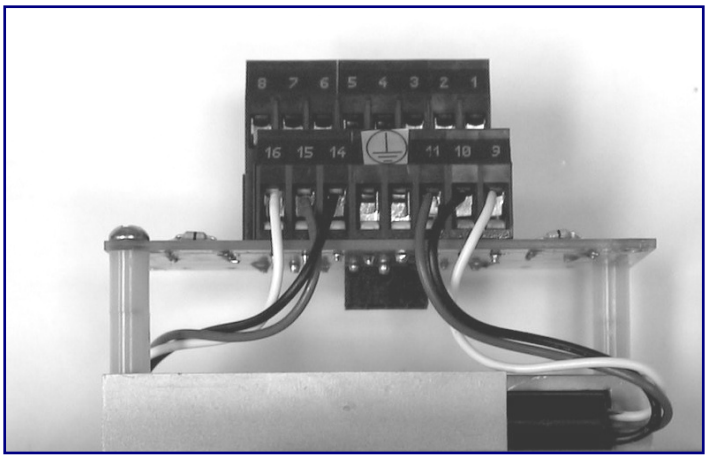
- Field wireable terminal strip interface.
- Up to 10A 120/240 VAC switching with DPDT Relay outputs.
- Hermetically Sealed Switch Outputs up to 3 Amps in SPST configuration and up to 1 Amp in SPDT configuration
- SPST outputs available in Normally Open or Normally Closed configurations
- Up to (2) independent adjustable switch points.
- 4-20 mA Transmitter with 8-28 Vdc loop power
- ½" Conduit interface
- CSA & UL Certified to US and Canadian standards.
- CSA & UL Certified:
  Class I, Division 1 / Groups B, C & D
  Class II, Division 1 / Groups E, F & G
  Class I, Division 2 / Groups A, B, C & D
  Class II, Division 2 / Groups F & G
- Certified for ATEX / IECEx
  Ex d IIB + H_2 Ex tb IIIC, IP65
  Division 2 Units are NEMA 4X

Model	Body Material	Accuracy	Min. ΔP Range	Max. ΔP Range	MWP PSIG (Bar)	Switch Options
240	Aluminum & 316L S.S.	±3/2/3%	0-20" H2O (0-50 mbar bar)	0-100 PSID (0-7 bar)	1,500 (100)	1 or 2 switches or 4-20mA Transmitter

“Diaphragm Type”
Differential Pressure Gauge
Switch Options
Model 240

The switching components are housed under a copper free Aluminum cover the combination of the gauge body and the cover make up the flame-proof seal. Electrical interface to the internal field wire terminal strip is via ½” NPT industry standard conduit connection located through the gauge body.

The hazardous environment indicating differential pressure switch is available with one or two hermetically sealed reed switches with optional one or two DPDT relay outputs. Each switch is independently adjustable within a defined percentage of the full scale range of the gauge and is available in SPDT and SPST (normally open or normally closed) for various load power ratings. The switches can be set to activate or deactivate on rising or falling differential pressure. If the optional relay output is specified, an input operating voltage must also be specified.



OUTPUT RATINGS (Resistive Load)

Type	SPST	SPDT	SPDT	DPDT Relay
Electrical Specification Input Option	A	A	A	B,C,D,E,F,G,H
Electrical Specification Output Option	E	H	A	R
*Power	60 W	60 W	3W	N/A
Maximum Current	3 Amps	1.0 Amps	0.25 Amps	10 Amps
Max. Volts VAC/VDC	240	240	125	277 / 30
Setting (Full Scale) **	15% to 100%	25% to 100%	15%-100%	15% to 100%
Hysteresis Full Scale	20% / 9% (Max / Nom)	25% / 18% (Max / Nom)	15% / 6% (Max / Nom)	20% / 10% (Max / Nom)
Repeatability	1% Full Scale	1% Full Scale	1% Full Scale	1% Full Scale

* Product of the switching voltage and current shall not exceed the power rating of device
**For ranges ≥60 PSID, minimum adjustability = 25%

Warning: **The suitability of the application and installation of this differential pressure switch is the responsibility of the end user. The applicable certifications, listings apply to the differential pressure switch only.**

"Diaphragm Type"
Differential Pressure Gauge
Transmitter Option
Model 240

Model 240 Transmitter provides a simple low cost loop powered 8-28 Vdc two wire 4-20 mA transmitter with highly visible local display allowing for monitoring at the unit and in the control room.

The transmitter utilizes the same CSA, UL and ATEX rated sensor and explosion proof housing as on the Model 240 explosion proof switch. Although the transmitter option in not yet listed, the sensors and explosion proof housing are rated Class I, Division 1 Groups B, C & D. Class II, Division 1 Groups E, F & G and Ex d IIB + H2, Ex tb IIIC, IP65. Each transmitter is individually calibrated to the gauge using an 11 point calibration linearization technique.

TRANSMITTER SPECIFICATIONS					
Transmitter Specifications:	**Comments:**				
Differential Pressure Range	0-20" H2O to 0-100 PSID				
Leakage	None, Diaphragm Isolated Hi to Lo				
Pressure (Ratings)					
Max Working	1500 PSIG				
Gauge Accuracy	2%				ASME B40.100 GRADE B
Operating Temperature (Max.)	-20°F -150°F				
ELECTRICAL:					
	Min	**Typ**	**Max**		
Transmitter Accuracy (FSR)			2%		Upper 80% of Full Scale Range
Supply Voltage (3) (Vdc)	8		28		Pin 3 Reverse Polarity Protected
Output Current (ma)					
Zero Floating (2)	4.0 – 20.1 ma	4.0 – 21.0	4.0 – 22.0		Pin 2
Zeroed (1 connected to 2)		8			
Voltage (Pin 2 to 1)	4.8		6.3		
Zero Time (seconds)	2				
Max Loop Resistance (ohms)			1000		
Max Loop Resistance Formula	((Vs – 8) / 20) *1000)				
INTERFACE:					
Electrical:					
Connections:	4 Position Terminal Strip; ½" NPT Conduit 1= Rtn, 2= Zero, 3 = 8-28 Vdc In 4= Chassis				22 Awg – 12Awg Wire
Environmental Rating:	Explosion-proof Enclosure rated Class I, Div I, Groups B, C, D; Class II, Div I, Groups E, F, & G **				
Certifications:	Ex d IIB + H2 T6 (-30°C ≤ Ta ≤ 65°C)Gb Ex tb IIIC IP65 T85ºC (-30ºC ≤ Ta ≤ 65ºC)Gd ATEX and IECEx				KOSHA Certified

PROOF PRESSURE: 3,000 PSI.

TEMPERATURE LIMITS: -40°F (-40°C) to +185°F (+85°C)– For electrical Input Options A in combination with electrical output options A, E, & H. 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.

-40°F (-40°C) to +160°F (+70°C) – For output option R (Relay Output)

-20°F (-30°C) to +150°F (+65°C) – For output option 4-20 mA Transmitter

STANDARDS: The Model 240 Series differential pressure gauge either conforms to and/or is designed to the requirements of the following standards: ASME B1.20.1
ASME B40.100 GRADE B
CSA-C22.2 No. 14, 25 and 30
UL Std. No. 50, 508, 698, and 1203
NEMA Std. No. 250
SAE J514
EN60079-0, EN60079-1 & EN13463-1
IEC60079-31

Mid-West® Instrument

Standard Dial Ranges: Model 240

Range Type				
IN H_2O	PSID	Kpa	bar	Flow Dials
0-20"	0-5	0-16	0-1.0	0-1.0
0-25"	0-10	0-25	0-1.6	0-1.5
0-30"	0-15	0-40	0-2.5	0-2.0
0-40"	0-20	0-60	0-4.0	0-2.5
0-50"	0-25	0-100	0-6.0	0-5.0
0-60"	0-30	0-160	0-7.0	0-7.5
0-75"	0-50	0-200		0-10
0-100"	0-60	0-250		
0-135"	0-75	0-400		
0-150"	0-100	0-600		
0-200"		0-700		
0-300"				
0-400”				
Available Multipliers for Flow Dials: X10, X100, X1000, and X10,000				
Note: Not all ranges available in all diaphragm materials				

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
240	0-20" H2O (0-50 mbar)	0-100 PSID (0-7 bar)

PROOF PRESSURE: 6,000 PSI.

TEMPERATURE LIMITS: **-40°F (-40°C) to +185°F (+85°C)**– For electrical Input Options A in combination with electrical output options A, E, & H. 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.

-40°F (-40°C) to +160°F (+70°C) – For output option R (Relay Output)
-20°F (-30°C) to +150°F (+65°C) – For output option 4-20 mA Transmitter

STANDARDS: The Model 240 Series differential pressure gauge either conforms to and/or is designed to the requirements of the following standards:

ASME B1.20.1
ASME B40.100 GRADE B
CSA-C22.2 No. 14, 25 and 30
UL Std. No. 50, 508, 698, and 1203
NEMA Std. No. 250
SAE J514
EN60079-0, EN60079-1 & EN61241-0
EN61241-1, EN13463-1

Standard Model Number Sequence: 240-AC-02-O-JAA

1500 PSIG Working Pressure, Aluminum wetted pressure containing body assembly, Stainless Steel/Ceramic Magnet internals, Buna-N Seals, ¼" FNPT End Connections, 4-1/2" Round Dial Engineered Plastic Dial case w/Shatter Resistant Acrylic Lens, **(1)** 3W 125 VAC/VDC SPDT reed switch with terminal strip, aluminum explosion proof switch enclosure and ½" FNPT electrical access. Accuracy ±3/2/3% Full Scale (Ascending)

Range 0-20 IN. H_2O to 0-100PSID (0-50 mbar to 0-7.0 bar)

Gauge Body and Internal components are considered wetted parts.

1	2	3	4	5	6	7	8
2	4	0					

Basic Model

Range:_____




2	Material
A	Aluminum Wetted Pressure Containing Body, Stainless Steel / Ceramic Magnet Internals
S	316/316L S.S Wetted Pressure Containing Body Assembly Stainless Steel / Ceramic Magnet Internals
Z	Special ***(Un-coded Options)***
3	**Dial Size & Type**
C	4-1/2" Round Dial w/Engineered Plastic Dial Case
F	4-1/2" Round Dial w/Anodized Aluminum Dial Case
T	Non-Indicating DP Switch Only *(With select electrical options)*
Z	Special ***(Un-coded Options)***
4	**Seal Materials**
0	Buna-N *(Standard)*
1	Viton®-A Registered Trademark of Dupont
5	Ethylene Propylene
9	Special ***(Un-coded Options)***
5	**Process Connections**
2	1/4" FNPT End Connections *(Standard)*
7	1/2" FNPT End Connections
9	Special ***(Un-coded Options)***
6	**Additional Options**
O	None
F	Carbon Steel 2" Pipe Mounting Kit
G	Stainless Steel 2" Pipe Mounting Kit
M	Maximum Indicator Follower Pointer *(Not available with Electrical Configurations R, S & T)*
Q	CRN **(Canadian Registration Number)**
S	Shatter Proof Glass Lens *(Available with 4-1/2" Aluminum Dial Case only)*
T	Oxygen Cleaning
U	Stainless Steel Tag with S.S. Wire
V	Stainless Steel Tag with S.S. Screw
Z	Special ***(Un-Coded Options)***

NOTE: Not All Options Available in Combination with other Options

Model 240 - continued

7	"MODEL 240" ELECTRICAL CONFIGURATIONS (T6 Temperature Class unless specified)
A	One (1) Control switch in NEMA-4X enclosure **(1) (6) (8)**
B	Two (2) Control switches in NEMA-4X enclosure **(1) (6) (7) (8)**
J	One (1) Control switch in NEMA 7 (Explosion Proof Enclosure) **(2)**
K	Two (2) Control switches in NEMA 7 (Explosion Proof Enclosure) **(2) (7)**
R	One (1) Control switch in Ex d Enclosure (CE marked) ATEX / IECEx **(2) (9)**
S	Two (2) Control switches in Ex d Enclosure (CE marked) ATEX / IECEx **(2) (7) (9)**
T	4-20 mA Transmitter in NEMA7/EExd (Explosion Proof Enclosure) **(9)** *(Temperature Limits -20°F to +150°F) Transmitter not yet CSA or UL certified*
Z	Special ***(Un-coded Options)***
8	**"INPUT OPTIONS" ELECTRICAL SPECIFICATIONS (Select (1) input and (1) output option)**
A	No Input power for reed outputs A, E, F, G & H
B	5/6 VDC
C	12 VDC
D	24 VDC
E	48 VDC — **Specify with option "R" below**
F	24 VAC
G	120 VAC
H	240 VAC *(T4-ATEX; T4A-NORTH AMER.) TEMP CLASS*
T	8-28 Vdc Loop Power **(Option T only)**
	"OUTPUT OPTIONS" ELECTRICAL SPECIFICATIONS (Resistive Load) (3)
A	SPDT, 3W, 0.25 Amp., 125 VAC/VDC *(Switch Adjustable 15-100% of full scale ascending) 60 PSID & Above 25-100% of full scale ascending*
E	SPST, 60W, 3.0 Amp., 240 VAC/VDC (Normally Open) *(Switch Adjustable 15-100% of full scale ascending) 60 PSID & Above 25-100% of full scale ascending*
H	SPDT, 60W, 1.0 Amp., 240 VAC/VDC *(Switch Adjustable 25-100% of full scale ascending)*
R	DPDT, Relay, 10A @ 30 VDC, 120/240 VAC **(7) (8)** *(Switch Adjustable 15-100% of full scale ascending) 60 PSID & Above 25-100% of full scale ascending*
T	4-20 mA Transmitter in general purpose enclosure, 3rd Party Certified Division 2 Hazardous Locations with Terminal Strip / 1/2" FNPT Conduit Connection *(±2% accuracy from 20-100% of full scale ascending)*
Z	Special (Contact Factory)

(1) Complete Assy. **3rd Party Certified**. Rated Class I, Div II, Groups A, B, C & D; Class II Div II Groups F&G *(R output excluded)*

(2) Complete Assy. **3rd Party Certified.** Rated Class I, Div I, Groups B, C & D; Class II Div I Groups E, F&G

(3) For output options A through H, the product switching voltage and current shall not exceed power rating.

(6) Enclosure Type 4/4X

(7) For electrical configuration B, K & S, SPDT relay output only

(8) Electrical configuration A & B in combination with Output Option R **is not** rated for Hazardous Locations

(9) Atex / IECEx Rated CE marked Ex d IIB + H_2 , Ex tb IIIC, IP65 (3000 PSIG SWP) KOSHA CERTIFIED

(10) Not Available with Electrical Configurations R & S

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 1,000,000 DP Gauges 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 most of our product line 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 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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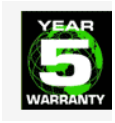
Web Site: www.midwestinstrument.com • Email: sales@midwestinstrument.com

Mid-West® Instrument

"Diaphragm Type" Model 522
Differential Pressure Gauge & Switch



Range: 0-5 PSID to 0-50 PSID
Available Dial Scales: PSID and Dual Scale PSID/kPa or PSID/bar

Model 522 Diaphragm Type DP Gauge provides outstanding capabilities in a modestly priced differential pressure gauge/switch.

Suited for use on dissimilar fluids, wet gas and process fluids with particulates present.

Common Applications: Filter/Strainer Monitoring, Compressed Air, Hydraulic, Refrigerant, Pump Performance Testing, Heat Exchanger Pressure Drop Monitoring, Water Treatment Applications.

Gauge Features:

- Aluminum, 316 / 316L S.S. or Acetal Gauge Body.
- Wetted Parts: 316 SS, Ceramic, & Acetal components
- Seal & Diaphragm Material: Buna-N or Viton
- ALUM. & S.S. Bodies / Safe Working Pressure: 1000 PSIG
- Acetal Body / Safe Working Pressure: 500 PSIG
- ¼" FNPT Process Connections (End Connected)
- Weather-resistant construction standard.
- 2-1/2"or 4-1/2" Black on White Dial
  (Dial Color Breaks Optional)
- Shatter Resistant Acrylic Lens
- **Optional:** (2)10-32 mounting holes on back of gauge body 1.75" apart x .330" Depth
- Accuracy ±5% Full Scale (ascending)

Shown with special option color dial

NOTE: Reverse pressure should be avoided.

Switch Option:

- Hermetically Sealed Switch
- (1) DIN 43650/IP65-PG9 NEMA 4X Plug-in Connector Switch**
  Compression plug accepts 4.5 to 7mm cable
- **"LA"** = Output: SPDT, 3W, 0.25 Amp, 125 VAC/VDC
  Switch Adjustable from 25%-75% of Full Scale Range
- **"LE"** = Output: SPST, 60W, 3 Amp, 240 VAC/VDC, Normally Open
  Switch Adjustable from 40%-95% of Full Scale Range
- CE and ROHS Marked for conformance with the Low Voltage Directive(73/23/EEC)

**Product of the switching voltage & current shall not exceed 60W

DIN
Connector Shown

Operation: Differential pressure is sensed by flexible elastomer diaphragm and a calibrated spring. A magnetic coupling transmits the sensing element motion to an indicating pointer. This prohibits the possibility of fluid leaking into the gauge case, while assuring total isolation of the process fluid within the pressure capsule. The diaphragm assures total separation between high and low pressure signals.

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: All Model 522 Series differential pressure gauges either conform to and/or are designed to the requirements of the following standards: ASME B1.20.1, ASME B40.100 GRADE B, NEMA Std. 250, EN-61010-1 UL Std. No. 50 & 508, CSA-C22.2 No. 14

The use of diaphragm seals is not recommended.
Attempts to install such seals on this gauge will void the warranty

Mid-West® Instrument

"LA" Switch Set Point		"LE" Switch Set Point		DIAL RANGE	
Min Set Pt.	Max Set PT.	Min Set Pt.	Max Set PT.	PSID	DUAL SCALE
1.25 PSID	3.75 PSID	2 PSID	4.75 PSID	0-5 PSID	0-5 PSID & 0-0.35 bar
2.50 PSID	7.50 PSID	4 PSID	9.50 PSID	0-10 PSID	0-5 PSID & 0-35 kPa
3.75 PSID	11.25 PSID	6 PSID	14.25 PSID	0-15 PSID	0-10 PSID & 0-0.7 bar
5.00 PSID	15.00 PSID	8 PSID	19.00 PSID	0-20 PSID	0-10 PSID & 0-70 kPa
6.25 PSID	18.75 PSID	10 PSID	23.75 PSID	0-25 PSID	0-15 PSID & 0-1 bar
7.50 PSID	22.50 PSID	12 PSID	28.50 P:SID	0-30 PSID	0-15 PSID & 0-100 kPa
10.00 PSID	30.00 PSID	16 PSID	38.00 PSID	0-40 PSID	0-20 PSID & 0-1.4 bar
12.50 PSID	37.50 PSID	20 PSID	47.50 PSID	0-50 PSID	0-20 PSID & 0-140 kPa
					0-25 PSID & 0-1.75 bar
					0-25 PSID & 0-175 kPa
					0-30 PSID & 0-2 bar
					0-30 PSID & 0-200 kPa
					0-40 PSID & 0-2.75 bar
					0-40 PSID & 0-275 kPa
					0-50 PSID & 0-3.5 bar
					0-50 PSID & 0-350kPa

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

Model	Min. ΔP Range	Max. ΔP Range
522	0-5 PSID (0-0.35 bar)	0-50 PSID (0-3.5 bar)

Working Pressure: 1000 PSI (69 bar) for Aluminum & Stainless Steel
500 PSI (34.5 bar) for Acetal

Proof Pressure: 2000 PSI (138 bar) for Aluminum & Stainless Steel
1000 PSI (69 bar) for Acetal

Max Differential Pressure (Hi to Low) 200 PSID (13.8 bar)

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 522 Series gauge either conforms to and/or is designed to the requirements of the following standards:

ASME B1.20.1	ASME B40.100
NEMA Std. No. 250	CSA-C22.2 No. 14
EN-61010-1	UL Std. No. 50, 508

Standard Model Number Sequence: 522AA-02-OO

1000 PSIG Working Pressure, Aluminum body, 316L Stainless Steel, Ceramic Magnets & Acetal Internal Parts, Buna-N Diaphragm and Seals, ¼" FNPT End Connections
2-1/2" Round Dial w/Engineered Plastic Dial Case with Shatter Resistant Acrylic Lens
Accuracy ±5% Full Scale (Ascending)

Range 0-5 PSID to 0-50 PSID (0-0.35 bar to 0-3.5 bar)

1	2	3		4	5		6		7	8
			–			–		–		

Basic Model **Range:_____**




2	Material
A	Aluminum Body / 316 Stainless Steel, Ceramic & Acetal Internal Parts
p	Acetal (Plastic) Body / 316 Stainless Steel, Ceramic & Acetal Internal Parts
S	316 Stainless Steel Body / 316 Stainless Steel, Ceramic & Acetal Internal Parts
3	**Dial Size & Type**
A	2-1/2" Round, Black on White Dial w/Engineered Plastic Dial Case *(Standard)*
C	4-1/2" Round, Black on White Dial w/Engineered Plastic Dial Case
T	Non-Indicating DP Switch Only
4	**Seal Materials**
0	Buna-N *(Standard)*
1	Viton®-A Registered Trademark of Dupont
5	**Process Connections**
2	1/4" FNPT End Connections
6	**Options**
O	None
E	(2) 10-32 Mounting Holes, Spaced 1.75" apart x .330" Deep
K	½" FNPT Stainless Steel Adapters
Q	CRN (Canadian Registration Number) *(1) Aluminum & Stainless steel Bodies Only.*
	(1) 1,000 PSIG SWP for Aluminum & Stainless Steel Bodies
7	**Electrical Configuration**
O	None
L	(1) Switch in standard enclosure with plug-in connector (DIN43650/IP65-PG9)NEMA 4X
8	**Electrical Specification**
A	SPDT, 3W, .025 Amp, 125 VAC/VDC *Switch Adjustable from 25%-75% of Full Scale Range*
E	SPST, 60W, 3.0 Amp, 240 VAC/VDC *(Normally Open) Switch Adjustable from 40%-95% of Full Scale Range*

Factory Preset of switch available at no charge (Specify switch setting on the order)

Mid-West understands that in today's demanding environment, flexibility, quick response time and the ability to ship most of our product line in 2 weeks or less is essential to our customers. If you are in need of additional information visit our web site at 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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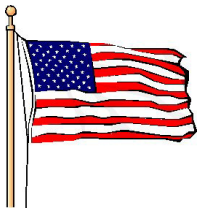
Mid-West® Instrument

Product Notes:

BULLETIN NO. 522A/18
(SUPERSEDES BULLETIN NO. 522A/14

Mid-West® Instrument

"Diaphragm Type" Model 522



Differential Pressure Gauge & Switch

Range: 0-5 PSID to 0-50 PSID

0-25 PSID

Colored bands allow you to quickly identify pressure drop across element.

Divided into three sections, each clearly marked for ease of understanding. Used to indicate critical pressure drops or when to change or clean a filter.

Suited for use in Air, Gas, Dissimilar fluids, Wet Gas and process fluids with particulates present.

Gauge Features:

- Aluminum, 316 / 316L Stainless Steel and Acetal/Plastic Gauge Bodies
- Wetted Parts: 316 SS, Ceramic, & Acetal components
- Seal & Diaphragm Material: Buna-N **(Viton available upon request)**
- Safe Working Pressure: 1000 PSIG
- ¼" FNPT Process Connections (End Connected)
- Weather-resistant construction standard.
- 2-1/2" Engineered Plastic Dial w/ Shatter Resistant Acrylic Lens

3 Color Dial Scale.

Green Clean / Yellow Change / Red Dirty

- (2)10-32 mounting holes on back of gauge body 1.75" apart x .330" Depth
- Accuracy ±5% Full Scale (ascending)

NOTE: Reverse pressure should be avoided.

0-10 PSID

Switch Option:

- Hermetically Sealed Switch
- (1) DIN 43650/IP65-PG9 NEMA 4X Plug-in Connector Switch** Compression plug accepts 4.5 to 7mm cable
- **"LA"** = Output: SPDT, 3W, 0.25 Amp, 125 VAC/VDC **Switch Adjustable from 25%-75% of Full Scale Range**
- **"LE"** = Output: SPST, 60W, 3 Amp, 240 VAC/VDC, Normally Open **Switch Adjustable from 40%-95% of Full Scale Range**
- CE Marked & ROHS Compliant for conformance with the Low Voltage Directive(73/23/EEC)

**Product of the switching voltage & current shall not exceed 60W

0-10 PSID with Switch

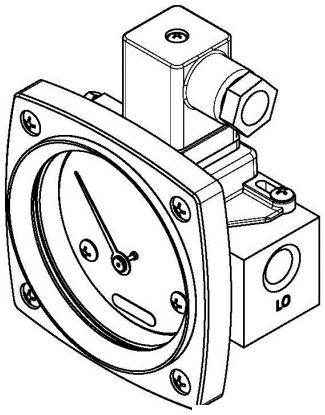
Model 522 Series differential pressure gauge either conforms to/or are designed to the requirements of the following standards:

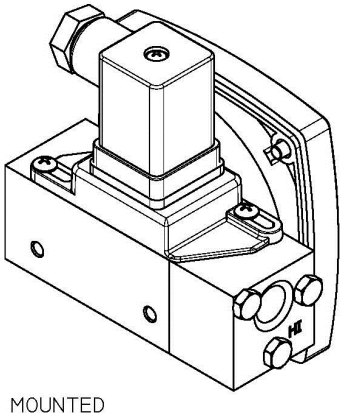
ASME B1.20.1, ASME B40.100
NEMA Std. 250, EN-61010-1
UL Std. No. 50 & 508, CSA-C22.2 No. 14

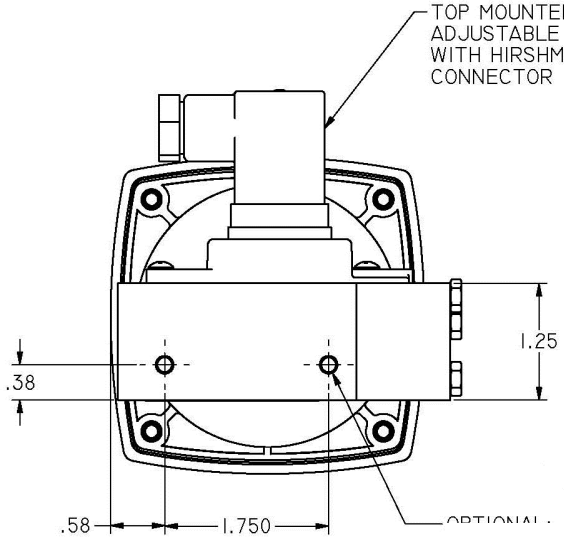
ALM. Model No.	Acetal Plastic Model No.	S.S. Model No.	PSID Range	Transition Points		
				Green Clean	Yellow Change	Red Dirty
BUNA-N Seal & Diaphragm						
522A-005	522P-005	522S-005	0-5	0-3.0	3.0-4.0	4.0-5.0
522A-010	522P-010	522S-010	0-10	0-5.0	5.0-7.0	7.0-10.0
522A-015	522P-015	522S-015	0-15	0-7.5	7.5-11.0	11.0-15.0
522A-020	522P-020	522S-020	0-20	0-10	10.0-15.0	15.0-20.0
522A-025	522P-025	522S-025	0-25	0-11.0	11.0-18.5	18.5-25.0
522A-030	522P-030	522S-030	0-30	0-13.0	13.0-20.0	20.0-30.0
522A-050	522P-050	522S-050	0-50	0-20	20.0-30.0	30.0-50.0
VITON Seal & Diaphragm						
522A-005V	522P-005V	522S-005V	0-5	0-3.0	3.0-4.0	4.0-5.0
522A-010V	522P-010V	522S-010V	0-10	0-5.0	5.0-7.0	7.0-10.0
522A-015V	522P-015V	522S-015V	0-15	0-7.5	7.5-11.0	11.0-15.0
522A-020V	522P-020V	522S-020V	0-20	0-10	10.0-15.0	15.0-20.0
522A-025V	522P-025V	522S-025V	0-25	0-11.0	11.0-18.5	18.5-25.0
522A-030V	522P-030V	522S-030V	0-30	0-13.0	13.0-20.0	20.0-30.0
522A-050V	522P-050V	522S-050V	0-50	0-20	20.0-30.0	30.0-50.0
BUNA-N Seal & Diaphragm with Switch						
522A-005-LA	522P-005-LA	522S-005-LA	0-5	0-3.0	3.0-4.0	4.0-5.0
522A-005-LE	522P-005-LE	522S-005-LE				
522A-010-LA	522P-010-LA	522S-010-LA	0-10	0-5.0	5.0-7.0	7.0-10.0
522A-010-LE	522P-010-LE	522S-010-LE				
522A-015-LA	522P-015-LA	522S-015-LA	0-15	0-7.5	7.5-11.0	11.0-15.0
522A-015-LE	522P-015-LE	522S-015-LE				
522A-020-LA	522P-020-LA	522S-020-LA	0-20	0-10	10.0-15.0	15.0-20.0
522A-020-LE	522P-020-LE	522S-020-LE				
522A-025-LA	522P-025-LA	522S-025-LA	0-25	0-11.0	11.0-18.5	18.5-25.0
522A-025-LE	522P-025-LE	522S-025-LE				
522A-030-LA	522P-030-LA	522S-030-LA	0-30	0-13.0	13.0-20.0	20.0-30.0
522A-030-LE	522P-030-LE	522S-030-LE				
522A-050-LA	522P-050-LA	522S-050-LA	0-50	0-20	20.0-30.0	30.0-50.0
522A-050-LE	522P-050-LE	522S-050-LE				
VITON Seal & Diaphragm with Switch						
522A-005V-LA	522P-005V-LA	522S-005V-LA	0-5	0-3.0	3.0-4.0	4.0-5.0
522A-005V-LE	522P-005V-LE	522S-005V-LE				
522A-010V-LA	522P-010V-LA	522S-010V-LA	0-10	0-5.0	5.0-7.0	7.0-10.0
522A-010V-LE	522P-010V-LE	522S-010V-LE				
522A-015V-LA	522P-015V-LA	522S-015V-LA	0-15	0-7.5	7.5-11.0	11.0-15.0
522A-015V-LE	522P-015V-LE	522S-015V-LE				
522A-020V-LA	522P-020V-LA	522S-020V-LA	0-20	0-10	10.0-15.0	15.0-20.0
522A-020V-LE	522P-020V-LE	522S-020V-LE				
522A-025V-LA	522P-025V-LA	522S-025V-LA	0-25	0-11.0	11.0-18.5	18.5-25.0
522A-025V-LE	522P-025V-LE	522S-025V-LE				
522A-030V-LA	522P-030V-LA	522S-030V-LA	0-30	0-13.0	13.0-20.0	20.0-30.0
522A-030V-LE	522P-030V-LE	522S-030V-LE				
522A-050V-LA	522P-050V-LA	522S-050V-LA	0-50	0-20	20.0-30.0	30.0-50.0
522A-050V-LE	522P-050V-LE	522S-050V-LE				

Operation: Differential pressure is sensed by flexible elastomer diaphragm and a calibrated spring. A magnetic coupling transmits the sensing element motion to an indicating pointer. This prohibits the possibility of fluid leaking into the gauge case, while assuring total isolation of the process fluid within the pressure capsule. The diaphragm assures total separation between high and low pressure signals.

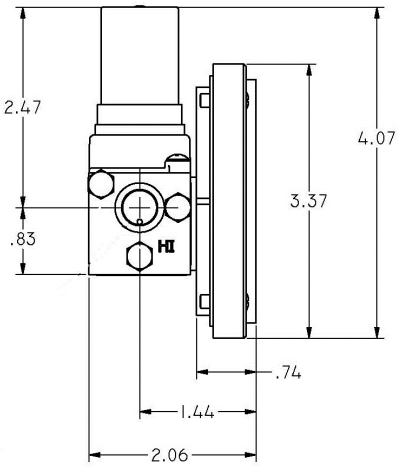
Dimensional Drawings

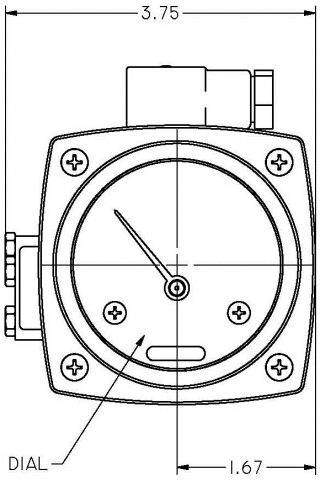






(7) MIN. THREADS
(2) MOUNTING HOLES





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.

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Mid-West® Instrument

Product Notes:

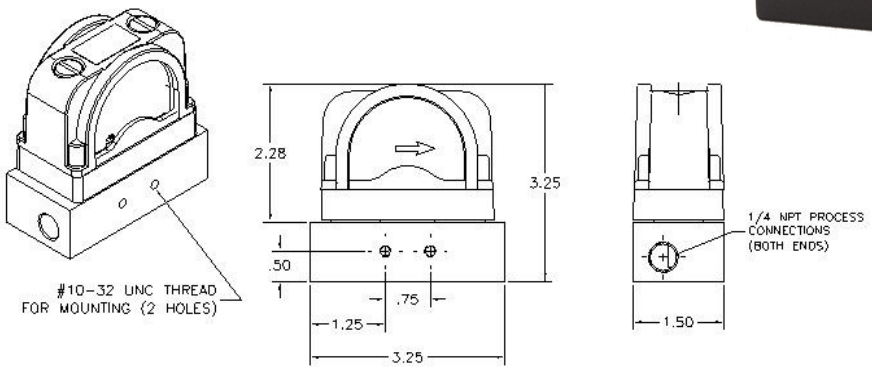
BULLETIN NO. 555A/18
(SUPERSEDES BULLETIN NO.555A/17)

Mid-West® Instrument

Differential Pressure Indicator

Model 555A

Colored bands allow you to quickly identify pressure drop across element.
Divided into three sections, each clearly marked for ease of understanding.
Commonly used to indicate when to change or clean a filter.
Example: 555A-10.0 changes from green to yellow at 5 PSID and from yellow to red at 7.5 PSID.
Mounting block has ¼" FNPT in-line process connections for ease of installation.
Accuracy is ±5% Full Scale



Model No. Buna-N	Model No. Viton	DP Range	Transition Points		
			Green	Yellow	Red
555A-3.5	555A-3.5V	0-3 PSID	0-2.0	2.0-2.5	2.5-3.5
555A-5.0	555A-5.0V	0-5 PSID	0-3.0	3.0-4.5	4.5-5.0
555A-10.0	555A-10.0V	0-10 PSID	0-5.0	5.0-7.5	7.5-10.0
555A-12.0	555A-12.0V	0-12 PSID	0-6.0	6.0-9.0	9.0-12.0
555A-15.0	555A-15.0V	0-15 PSID	0-7.5	7.5-12.0	12.0-15.0
555A-25.0	555A-25.0V	0-25 PSID	0-11.0	11.0-18.5	18.5-25.0
555A-30.0	555A-30.0V	0-30 PSID	0-13.0	13.0-20.0	20.0-30.0
555A-43.0	555A-43.0V	0-43 PSID	0-19.5	19.5-29.5	29.5-43.0

SPECIFICATIONS:			Comments:
	Pressure (Ratings)		
	Maximum Working	300 PSIG	
	Maximum Differential	150 PSID	
	Accuracy	± 5% of Rated Differential Pressure Range	Calibrated at Color Transitions
	Operating Temperature (Max.)	93°C (200°F)	
	Materials of Construction		
	Body Material	Glass Filled Nylon (GFN)	
	Wetted Internals	Stainless Steel, Ceramic, & GFN	
	Elastomers	Buna-N or Viton	
	Movement	Magnetic Piston and Follower Pointer	
	Dial	Plastic Lens with 3 Color Dial	
	INTERFACE:		
	Process Connections:	¼" FNPT End Connections. To switch HIGH and LOW pressure connections: (Remove Indicator from base and rotate 180° - Retighten plastic bolts to 20-25 inch pounds.)	Flow Direction Identified on Dial. (Arrow Points to Low Pressure Port)

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Mid-West® Instrument

Product Notes:

BULLETIN NO. 700/18
Supersedes Bulletin 700/11

Mid-West® Instrument

Differential Pressure Transmitter

Range 0-5 PSID (0- 0.35 Bar) thru 0-300 PSID (0-20 Bar)

Product Features

Use with Liquid or Gas media compatible with material of construction
Full stainless steel construction, compact size, easy installation
Laser welded, fully-sealed construction: NEMA 4X (IP65)
Utilizes Piezoresistive Differential Pressure Sensor Isolated Diaphragm
Zero and Span Adjustable
CE Certified to EMI / EMC Directive
LCD or LED display available upon request
(Available with DIN Connector & 4-20mA Output Only)
Maximum Overpressure (+) Hi-Side equals 2 times specified DP range
Maximum Overpressure (-) Low-Side is equal to specified DP range
Maximum Static Pressure 2,900 PSI

It is recommended to install a 3 valve manifold between point of measurement and the transmitter.

Materials of Construction

- **Pressure Port & Housing:** 321 Stainless Steel
- **Diaphragm:** 316L Stainless Steel
- **O-ring:** Viton
- **Process Connections:** ¼" Female BSPP (STD)
- **Fill liquid:** Silicon Oil

Available Electrical Specifications:

- **Power Supply:** 2-Wire 15~28 VDC
  2-Wire 18~28 VDC, 2-Wire 20-28 VDC,
  3-Wire 15~28 VDC
- **Output Signals:** 2-Wire 4~20mADC,
  3-Wire, 0~5VDC, 1~5VDC, 0~5VDC
  0~10VDC, 0-10mADC and 0-20m ADC
- **Electrical Connections:**
  Din Plug 43650 or 1.5m 4-pin cable
- Response Time: (10%~90%) ≤1ms
- Insulation Resistance 100MΩ, 50VDC

LCD or LED
3-1/2 Digit Display

¼" BSPP x ¼" FNPT
¼" BSPP x ½" FNPT
S.S. Adapters Available

Description	Range	% / Unit	
Accuracy (LIN, HYS, & REP.)	5～300 PSID	0.50% Full Scale	
Zero Thermal Drift	0～15 PSID	±.03% Full Scale / °C Typ.	
	30～300 PSID	±.02% Full Scale / °C Typ.	
FS Thermal Drift	0～15 PSID	±.03% Full Scale / °C Typ.	
	30～300 PSID	±.02% Full Scale / °C Typ.	
Stability	≤ 30 PSI	0.50%	%FS / Year
	≤ 30 PSI	0.20%	
Static Pressure Effect	±0.05%		FS, ea. 15 PSI
Compensation Temperature	0~50		°C
Operating Temperature	-10~80		
Storage Temperature	-40~120		

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Mid-West® Instrument

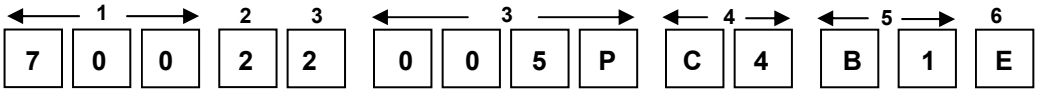
MODEL SPECIFICATIONS

Example Model Number Sequence: 700-22-005P-C4-B1-E

321 Stainless Steel Pressure Port & Housing, 316 Stainless Steel Diaphragm
Viton O'Rings, ¼" Female BSPP Connections, DIN 43650/IP65 Plug-In Type Connector
Electrical Input & Output: 2-wire 15~28VDC / 4~20mADC
Accuracy ±0.5% Full Scale

Range: 0-5 PSID (0-0.35 Bar) to 0-300 PSID (0-20 Bar)

Gauge Body and Internal components are considered wetted parts.



Basic Model

1	Description
700	Differential Pressure Transmitter
710	Differential Pressure Transmitter with LCD Readout **(Available with DIN Connector & 4-20mA Output only)**
715	Differential Pressure Transmitter with LED Readout **(Available with DIN Connector & 4-20mA Output only)**
2	**Materials of Construction**
22	Pressure Port & Housing = 321 Stainless Steel / Diaphragm = 316L Stainless steel
3	**Differential Pressure Range**
PSID = **P**	5, 10, 15, 30, 50, 100, 150 & 300
BAR = **B**	.35, .70, 1.0, 2.0, 3.5, 7.0, 10.0 & 20.0
kPa = **K**	35, 70, 100, 200, 350 & 700
4	**Process Connections**
C4	1/4" Female BSPP (STD) Optional adapters listed below
5	**Electrical Connections**
B1	DIN 43650/IP65 Plug-In Type
B2	Cable Connection / Standard Length 1.5m
6	**Power Supply Input / Output**
E	2-Wire 15-28 VDC / 4-20mADC / LCD Display 18-28 VDC / LED Display 20-28 VDC
F	3-Wire 15-28 VDC / 1-5 VDC
J	3-Wire 15-28 VDC / 0-5 VDC
Q	3-Wire 15-28 VDC / 0-10mADC
U	3-Wire 15-28 VDC / 0-20mADC
V	3-Wire 15-28 VDC / 0-10 VDC
	316 S.S. Adapters (Includes Viton O'ring)
113319	¼" Male BSPP x ¼" FNPT 316 S.S. Adapter
113320	¼" Male BSPP x ½" FNPT 316 S.S. Adapter

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BULLETIN NO. 105-106/18
(SUPERSEDES 105-106/12)

Mid-West® Instrument

"Bellows Type"

Differential Pressure Gauges & Switches

Model's 105 & 106

Dry Gauge Design with
No Internal Liquid Fill

® Industrial Control

Over Range Protection high-low and low-high to rated working pressure with use of a bi-directional relief valve

Model 105/106 DP Range: 0-10" H2O to 0-30 PSID (25 mbar to 3.0 bar)

- Diaphragm Bellows design provides a simple, compact, accurate, direct-acting, low range high accuracy differential pressure indicator.
- Easier and less expensive to service/repair than competitive units.
- Working pressures of 500, 1500, 3000, or 6000 PSIG (400 bar).
- Housing materials: Aluminum, Brass, Carbon Steel, or 316L S.S.
- Internals: Stainless Steel Diaphragm Bellows.
- Available: Elastomers: Buna-N, Viton, Neoprene, Ethylene Propylene
- Mechanical over-range protection high to low and low to high.
- Weather resistant case of Engineered Plastic / Shatter resistant acrylic lens
- Panel Mounting Kit Standard
- Uni-directional or Bi-directional dials are readily available.
- Gauges are optionally available with one or two switches which offer's the ability to have alarm or control.

Model's 105/106 (± 1/2% or ± 1% Full Scale Accuracy) System pressure is applied to the internal volume of a bellows and mechanical linkage assembly. As pressure changes, the bellows and linkage assembly move to cause an electrical signal to be produced or to cause a gauge pointer to move. The major components are a two-piece body, multiple diaphragm/bellows sensing element and over-pressure assembly, a torque tube assembly, a range spring and the gauge front assembly. The body halves provide the pressure containment function. They also clamp the sensing element and over-pressure assembly between the halves, isolating the high side and low side pressures of the system. The high side body half also provides a mount for the torque tube assembly and the gauge front assembly.

Model	Accuracy	Min. ΔP Range	Max. ΔP Range	Safe Working Pressure PSIG (bar)	Optional Switches
105	±1/2% or 1%	0-10" H20 (0-25 mbar)	0-79.9" H2O (0-200 mbar)	500-6000 (34-400)	1 or 2
106	±1/2% or 1%	0-80" H20 (0-200 mbar)	0-800" H20 (0-30 PSID)	500-6000 (34-400)	1 or 2

Model's 105/106 assembly incorporates a bi-directional relief valve which provides over-pressure protection in both directions. When over-pressured from the high side, the valve is opened by a mechanical stop as the sensing element deflects to its maximum travel. When over-pressured from the low side, the spring-loaded valve opens when the differential pressure exceeds its maximum rating. The opening of the valve in either direction equalizes the pressure and protects the unit. A range spring is provided to adjust the spring rate of the system to suit the various differential pressure ranges of the instrument.

Mid-West® Instrument

Models 105 & 106

"Bellows Type"

Differential Pressure Switch Options

® Industrial Control Equipment

LOCKED LOGIC" SOLID STATE ALARM-CONTROL FOR ALL 105 & 106 GAUGES

SNAP ACTING MICRO-SWITCH for MODEL106 Range: 0-80" to 0-800" H2O.
(NOTE SWITCH OPTIONS FOR 6" DIAL SIZE ONLY)

If your application requires switching in addition to local indication, our all solid state ***"Locked Logic"*** system is the most accurate available. With no moving cams, levers, etc. it does not affect the accuracy of the gauge on which it is installed. Switch accuracy is the same as the gauge accuracy. Visible set pointers are provided, adjustable to within 5% of full scale of each other. The set points are adjustable from 5 to 95% of full scale. Internal adjustment is standard. 1-2 Independently adjustable switches with Set Point Feedback , SPDT or DPDT Output options, Adjustable deadband option for single SPDT or DPDT output (2 set pointers) Accuracy of Gauge unaffected by the switch. Locked Logic switches require input power to operate.

Model 106 can also be equipped with one ore two independently adjustable SPDT snap acting **Micro-Switches** which can be set on decreasing or on increasing pressure. A switch adjustment screw and a switch lock screw is accessible after removal of the lens and bezel (removal of 4 screws). Interface to the snap acting micro-switch is via color coded 18 AWG flying leads and a ½' FNPT conduit connection. Snap acting Micro switches do not require input power to operate.
NOTE: Snap Acting Micro-Switches are not available with Bi-Directional Range Gauges

NOTE : It is strongly recommended that a 3-Valve differential pressure manifold be used in plumbing your model 105/106 to your system. Properly used it should insure that your instrument is not over-ranged or damaged by pressure shocks during pressurization. It will later zeroing, ranging and calibration checking.
It is a good practice to purge or flush the instrument loop prior to connecting the instrument.

OPTION	INTERFACE	MARKINGS	ENVIRONMENTAL	COMMENTS
A, B	1/2" FNPT Conduit with 24" LNG, 18 AWG Colored Flying Leads, 3/4" FNPT for (2) DPDT Outputs	NONE	Weather-proof Housing NEMA 4	**Requires Input Power to Operate.**
C, D	1/2" FNPT Conduit with 24" LNG, 18 AWG Colored Flying Leads, 3/4" FNPT for (2) DPDT Outputs	Class I, Groups B, C & D Class II, Groups E, F & G	Explosion-proof Housing NEMA 7	**Requires Input Power to Operate.**
G, H	1/2" FNPT Conduit with 18" LNG, 18 AWG Colored Flying Leads	NONE	CSA Listed Weather-proof Housing NEMA 4	**Does not require Input Power to Operate.**
J, K	1/2" FNPT Condulet Enclosure with 18" LNG, 18 AWG Colored Flying Leads	NONE	CSA Listed Weather-proof Housing NEMA 4	**Does not require Input Power to Operate.**

Mid-West® Instrument

Standard Dial Ranges Models: 105 & 106

Range Type			
PSID	H_2O	Kpa	Bar
0-.50	0-10"	0-25	0-.5
0-1	0-20”	0-35	0-1.0
0-2	0-30"	0-60	0-1.75
0-3	0-40"	0-100	0-2.0
0-5	0-50"	0-135	
0-10	0-60"		
0-15	0-70"		
0-20	0-80"		
0-25	0-100"		
0-30	0-150"		
	0-200"		
	0-250"		
	0-300"		
	0-400"		
	0-500"		
	0-600"		
	0-800”		

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 dual scale dials, multiple color dials and special decals. Please consult factory for complete information.

Uni-Directional Dial Ranges are available in either LINEAR or SQUARE ROOT FLOW SCALES with any appropriate legend (I.E. PSID, Kpa, IN H_2O, GPM, SCFM, ETC) at no extra charge			LINEAR Bi-Directional Dials are available with any appropriate Legend at No Charge	
0-0.5	0-30	0-300	1.0-0-1.0	75-0-75
0-1.0	0-35	0-400	2.0-0-2.0	100-0-100
0-1.6	0-40	0-500	5.0-0-5.0	150-0-150
0-2.0	0-50	0-600	10-0-10	200-0-200
0-3.0	0-60	0-700	15-0-15	300-0-300
0-4.0	0-70	0-800	25-0-25	400-0-400
0-5.0	0-75	0-900	30-0-30	750-0-750
0-6.0	0-80	0-1000	50-0-50	1000-0-1000
0-7.0	0-100	0-1500		
0-8.0	0-135	0-1600		
0-10	0-150	0-2000		
0-15	0-160	0-3000		
0-20	0-200	0-4000		
0-25	0-250	0-5000		
		0-6000		

Model	Min. ΔP Range	Max. ΔP Range
105	0-10" H_20 (0-25 mbar)	0-79.9" H2O (0-200 mbar)
106	0-80" H_20 (0-200 mbar)	0-800" H_20 (0-30 PSID) (0-2 bar)

Standards: Models 105/106 gauges either conform to and/or are designed to the requirements of the following standards:

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

Standard Model Number Sequence: 105-FE-00-OO / 106-FE-00-OO

1500 PSIG Working Pressure, Aluminum Body, Stainless Steel Bellows, Stainless Steel Internals
Buna-N Seals, ¼" FNPT Dual Top & Bottom Connections, 6" Uni-Directional Round Dial,
Weather Resistant Engineered Plastic Case with Shatter Resistant Acrylic Lens,
Accuracy ±1% Full Scale (Ascending)

Range 105: 0-10 IN H_2O to 0-79.9 IN H_2O (0-.4 PSID to 0-2.9 PSID)
Range 106: 0-80 IN H_2O to 0-800 IN H_2O (0-3 PSID to 0-30 PSID)

Gauge Body and Internal components are considered wetted parts

1	2	3	4	5	6	7	8	9
1 0 5								

Basic Model

Range:_____




2	Material (Not All Options Available in Combination with other Options)
F	1500 PSIG, Aluminum Body, Stainless Steel Internals
G	3000 PSIG, Aluminum Body, Stainless Steel Internals
M	1500 PSIG, Mild Carbon Steel Body, Stainless Steel Internals
N	3000 PSIG, Mild Carbon Steel Body, Stainless Steel Internals
Q	1500 PSIG, 316 Stainless Steel Body, Stainless Steel Internals
R	3000 PSIG, 316 Stainless Steel Body, Stainless Steel Internals
T	6000 PSIG, 316 Stainless Steel Body, Stainless Steel Internals
X	1500 PSIG, Brass Body, Stainless Steel Internals
Y	500 PSIG, Brass Body, Stainless Steel Internals
3	**Dial Size Type**
E	Accuracy ±1% Full Scale Uni-Directional Dial w/Engineered Plastic Dial Case **(Standard)**
F	Accuracy ±1% Total Span Bi-Directional Dial w/Engineered Plastic Dial Case
G	Accuracy ±1/2% Full Scale Uni-Directional Dial w/Engineered Plastic Dial Case *(30" WC & above only)***
Z	Special ***(Un-coded Options)*** *Note **G" Option not available for square root dials*
4	**Seal Materials**
0	Buna-N *(Standard)*
1	Viton®-A Registered Trademark of Dupont
5	Neoprene
9	Special ***(Un-coded Options)***
5	**Process Connections**
0	1/4" FNPT Top & Bottom Connections *(Standard)*
9	Special ***(Un-coded Options)***

Proof Pressure: Two times rated working pressure or 10,000 PSI whichever is lower at ambient temperature.

Temperature Limits:
"Gauge Only" -40°F (-40°C) to +200°F (+95°C)
"Locked Logic Switch" -40°F (-40°C) to +160°F (+70°C)
"Micro Switch" -20°F (-29°C) to +185°F (+85°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.

Model 105 / 106 - continued

6	Additional Options
O	NONE
F	Carbon Steel 2" Pipe Mounting Kit
G	Stainless Steel 2" Pipe Mounting Kit
H	1/4" Carbon Steel Compression Tube Fittings
J	1/4" Stainless Steel Compression Tube Fittings
K	1/2" FNPT Stainless Steel Adapters
N	NACE *(Available for Aluminum & Stainless Steel Gauge Bodies only)*
Q	CRN (Canadian Registration Number) *Available only for Model 105Q and Model 106Q*
S	Shatter Proof Glass Lens
T	Oxygen Cleaning
U	Stainless Steel Tag with S.S. Wire
V	Stainless Steel Tag and S.S. Screw
W	Wall Mount Kit
Y	4-1/2" Dial Case
Z	Special ***(Un-coded Options)***
7	**Electrical Configurations Note: G,H,J & K switch option (high port on right when facing dial)**
A	One (1) Switch in Weather Proof enclosure
B	Two (2) Switches in Weather Proof enclosure
C	One (1) Switch in explosion proof enclosure Class 1, Groups B, C, & D *(Pipe Mounting Kit Standard)*
D	Two (2) Switch in explosion proof enclosure Class 1, Groups B, C, & D *(Pipe Mounting Kit Standard)*
G	One (1) Micro-Switch in Weather Resistant Enclosure **(2)** *(MODEL 106 0-80" to 0-800" H2O only) Accuracy ±2%*
H	Two (2) Micro-Switches in Weather Resistant Enclosure *(MODEL 106 0-80" to 0-800" H2O only) 0-80" - 199" H2O Accuracy ±4% / 0-200" H2O and above Accuracy ±2%* **(1) (2)**
J	One (1) Micro-Switch in Weather Resistant Housing with Condulet Enclosure **(2)** *(MODEL 106 0-80" to 0-800" H2O only) Accuracy ±2%*
K	Two (2) Micro-Switches in Weather Resistant Housing with Condulet Enclosure *(MODEL 106 0-80" to 0-800" H2O only) 0-80" - 199" H2O Accuracy ±4% / 0-200" H2O and above Accuracy ±2%* **(1) (2)**
Z	Special ***(Un-coded Options)***

(1) Accuracies & repeatability values for (2) switch units are based upon (1) switch set low (approx. 25% for FSR) and (1) switch set high
(2) CSA Listed, Type 4, Industrial Control Equipment

8	"Input Options" Electrical Specifications (Select (1) input and (1) output option)
A	8-28 Vdc
B	115 VAC 50/60 Hz
C	220/240 VAC 50/60Hz
N	No Input Required for Micro-Switch Options: G, H, J & K
Z	Special ***(Un-coded Options)***
9	**"Output Options" (Resistive Load)**
	(Resistive load) – 10 Amp @ 28 VDC, 115/230 VAC (50/60 Hz) (1/2" NPT, 24" Flying Leads standard interface) (1/2" NPT, 24" Flying for two (2) DPDT switches)
A	SPDT Relays
C	SPST Relays
D	Adjustable Deadband, one (1) SPDT output (two (2) control switches only)
E	Adjustable Deadband, one (1) DPDT output (two (2) control switches only)
	Micro Switch Electrical Interface: 18", 18 Awg, 600 V, 105°C / Color coded wire leads from 1/2" FNPT Connection
M	SPDT Micro-Switch Contact Ratings:**(MAX)** 4 Amps @ 30 VDC / 3 Amps @ 240VAC / 5 Amps @ 120 VAC
Z	Special ***(Un-coded Options)***
	Factory preset switches at no charge (specify setting) Contact factory for bi-directional scales

NOTE: The use of Diaphragm seals is not recommended for Model 105/106 gauges.
Attempts to install such seals on these gauges will void warranty.

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Product Notes:

Mid-West® Instrument

Now Available!

Model 105
TANK LEVEL GAUGE for
LIQUID HYDROGEN SERVICE




No Liquid Fill required

<u>Over-Range Protection</u>
High over Low
and Low over High!


Mid-West Model 105 bellows design provides a simple, compact, accurate, direct-acting, low range differential pressure level indicator. Accuracy ±1% of Full Scale

Range Model 105: 0-10” H_2O to 0-50” H_2O (25 mbar to 125 mbar)

Benefits:

- Stainless Steel Gauge Front, Stainless Steel Body with Shatter-Proof Glass Lens.
  - Provides superior safety and corrosion resistance.
- Dry gauge design with no internal liquid fill
  - No costly clean up from liquid fill leaking
  - No chance of unacceptable or incompatible fill fluid being in the gauge.
  - No gauge damage/accuracy loss caused by liquid fill expansion or contraction when exposed to temperature extremes in Hydrogen level applications.
- Single bellows design is more compact and light weight.
  - Substantial weight savings over competitive range gauges.
  - Can be panel mounted in a one piece panel.
  - Can be mounted on tanks using std. 2” pipe mount brackets or ¾” pipe nipple brackets.
- Mid-West Instrument performs Helium leak testing on units for Hydrogen service.

Product Description:

The Model 105 design is an all-stainless steel differential pressure gauge capable of operating at low differential pressures. Safe working pressure is 1500 PSIG standard. The DPI is equipped with a Bi-directional Over Pressure Relief Valve (OPV). When the Differential Pressure exceeds 130% of the range the OPV equalizes the pressure between the Hi and Lo side’s ¼” FNPT Dual top and bottom connections are provided as standard. The DPI is also equipped with a Micro adjust pointer, If necessary the pointer can be re-zeroed. Body is made of stainless steel with 316 Stainless Steel internals. Viton Seals are provided as standard with other elastomers available. Dial is 6” diameter with white lettering on a black dial.(white dial with black lettering optional) The temperature limits are rated at -40°C to 200°F. Proof pressure is two times working pressure at ambient temperatures.

Product Features:

- Ability to create custom dials for horizontal and vertical tanks
- Various Dial layouts available: ***Single Scale, Dual Scale and Tri-Scale***
- Micro-Adjust pointer (if necessary the pointer can be re-zeroed)
- In house Oxygen Cleaning (optional)
- Private Labeling (optional)
- White ink on Black dial or Black ink on White dial
- **Industry best lead time reduces inventory requirements**

Gauge Specifications

	105
Accuracy	±1% of Full Scale
DP Range	0-10" H2O to 0-50" H2O (25 mbar to 125 mbar)
Safe Working Pressure	1500 PSIG (3000 PSIG optional)
Body Material	316 Stainless Steel
Dial Case & Bezel	316 Stainless Steel
Internals	316 Stainless Steel Multiple Bellows
Port	Dual Top and Bottom, 1/4" FNPT connections with optional snubbers
Seals	Viton® Standard, other elastomers available
Dial	6" Black dial with White lettering (White dial with Black lettering optional)
Standard Mounting	Panel Mountable
Optional Mounting	2" Pipe Mount
Warranty	Five Year

60 YEARS experience in the field of supplying quality Differential Pressure Gauges.

Proof Pressure: Two times working pressure at ambient temperatures

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

Standards:

ASME B1.20.1 **CSA-C22.2 No.14** **NEMA Std. No. 250**
ASME B40.100 **UL Std. No. 50** **SAE J514**

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Mid-West® Instrument

"Bourdon Tube Type"

Differential Pressure Gauge & Switches

Model 109

"LOCKED LOGIC" ALARM CONTROLS
(Available with 1 or 2 switches for alarm & control)

Over Range Protection high-low and low-high to rated working pressure by use of a bi-directional relief valve

Model 109 DP Range: 0-15 PSID (0-1.0 bar) to 0-6000 PSID (0-400 bar)

- Bourdon Tube design provides a simple, compact, accurate, direct-acting, high accuracy differential pressure indicator.
- Easier and less expensive to service/repair than competitive units.
- Working pressures of 500, 1500, 3000, or 6000 PSIG (400 bar).
- Housing materials: Aluminum, Brass, Carbon Steel, or 316L Stainless Steel
- Internals: Copper-Alloy or Stainless Steel Bourdon Tube.
- Available Elastomers: Buna-N, Viton, Neoprene, Ethylene Propylene
- Mechanical over-range protection to maximum working pressure
- Weather resistant dial case of Engineered Plastic with Shatter resistant acrylic lens
- Panel Mounting Standard
- Uni-directional or Bi-directional dials are readily available.
- Gauges are optionally available with one or two switches which offer's the ability to have alarm or control.

Model 109 (± 1/2% or ± 1% Full Scale Accuracy) System pressure is applied to the inside of a slightly flattened arc- shaped tube. As pressure increases, the tube tends to restore to its original round cross-section. This change in cross-section causes the tube to straighten. Since the tube is permanently fastened at one end, the tip of the tube traces a curve that is the result of the change in angular position with respect to the center. Powered by a test quality Bourdon Tube assembly, the assembly is encapsulated in a high pressure chamber that is fitted with a pressure connection to the inside of the Bourdon Tube and a second connection to the pressure chamber.

Model	Accuracy	Min. ΔP Range	Max. ΔP Range	Safe Working Pressure PSIG (bar)	Optional Switches
109	±1/2% or 1%	0-15 PSID (0-1.0 bar)	0-6000 PSID (0-400 bar)	500-6000 (34-400)	1 or 2

Model 109 assembly incorporates a bi-directional relief valve which provides over-pressure protection in both directions. When over-pressured from the high side, the valve is opened by a mechanical stop as the sensing element deflects to its maximum travel. When over-pressured from the low side, the spring-loaded valve opens when the differential pressure exceeds its maximum rating. The opening of the valve in either direction equalizes the pressure and protects the unit. A range spring is provided to adjust the spring rate of the system to suit the various differential pressure ranges of the instrument.

"Bourdon Tube Type"
Differential Gauge Switch Options
Model 109

"LOCKED LOGIC" SOLID STATE ALARM-CONTROL FOR ALL 109 GAUGE
(NOTE - 6" DIAL SIZE ONLY)

If your application requires switching in addition to local indication, our all solid state "Locked Logic" system is the most accurate available. With no moving cams, levers, etc. it does not affect the accuracy of the gauge on which it is installed. Switch accuracy is the same as the gauge accuracy. Visible set pointers are provided, adjustable to within 5% of full scale of each other. The set points are adjustable from 5 to 95% of full scale. Internal adjustment is standard. 1-2 Independently adjustable switches with Set Point Feedback. SPDT or DPDT Output options, Adjustable deadband option for single SPDT or DPDT output (2 set pointers) Accuracy of Gauge unaffected by the switch

OPTION	INTERFACE	MARKINGS	ENVIRONMENTAL	COMMENTS
A, B	1/2" Conduit with 24" 18 AWG Color Coded Flying Leads 3/4" FNPT for (2) DPDT Outputs	None	NEMA 4X	Requires Input Power to operate.
C, D	1/2" Conduit with 24" 18 AWG Color Coded Flying Leads 3/4" FNPT for (2) DPDT Outputs	NONE Class I, Div 1, Groups B, C, & D Class II, Div 1, Groups E, F, & G.	NEMA 4X NEMA 7(OPTIONAL)	Explosion-proof enclosure. Requires Input Power to Operate.

	"MODEL 109 ELECTRICAL CONFIGURATIONS
A	One (1) Switch in Weather Proof enclosure
B	Two (2) Switches in Weather Proof enclosure
C	One (1) Switch in explosion proof enclosure Class I, Groups B, C, & D **(Pipe Mounting Kit Standard)**
D	Two (2) Switch in explosion proof enclosure Class I, Groups B, C, & D **(Pipe Mounting Kit Standard)**
	"INPUT OPTIONS" ELECTRICAL SPECIFICATIONS (Select (1) input and (1) output option)
A	8-28 Vdc
B	115 VAC 50/60 Hz
C	220/240 VAC 50/60Hz
Z	Special ***(Un-Coded Options)***
	"OUTPUT OPTIONS" ELECTRICAL SPECIFICATIONS (Resistive Load)
	(Resistive load) – 10 Amp @ 28 VDC, 115/230 VAC (50/60 Hz) (1/2" NPT, 24" Flying Leads standard interface) (1/2" NPT, 24" Flying for two (2) DPDT switches)
A	SPDT Relays
C	DPDT Relays
D	Adjustable deadband, one (1) SPDT output (two (2) control switches only)
E	Adjustable deadband, one (1) DPDT output (two (2) control switches only)

Factory preset switches at no charge (Specify Setting)

Proof Pressure: Two times rated working pressure or 10,000 PSI whichever is lower at ambient temperature.

Temperature Limits: **"Gauge Only"** -40°F (-40°C) to +200°F (+95°C)
"Locked Logic Switch" -40°F (-40°C) to +160°F (+70°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 109 gauge either conforms to and/or is designed to the requirements of the following standards:

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

Mid-West® Instrument

Standard Dial Ranges Model: 109

Range Type					
PSID	H_2O	Kpa	Bar	Bi-Directional	Dual Scale
0-15	0-400"	0-160	0-1.6	15-0-15 PSID	0-15 PSID & 0-1 Kg/cm2
0-20	0-500"	0-200	0-2.0	25-0-25 PSID	0-25 PSID & 0-1.75 Kg/cm2
0-25	0-600"	0-250	0-2.5	30-0-30 PSID	0-30 PSID & 0-200 Kpa
0-30		0-400	0-4.0	50-0-50 PSID	0-50 PSID & 0-350 Kpa
0-50		0-600	0-6.0	75-0-75 PSID	0-60 PSID & 0-400 Kpa
0-60		0-700	0-7.0	100-0-100 PSID	0-100 PSID & 0-700 Kpa
0-75				150-0-150 PSID	0-100 PSID & 0-7 Kg/cm2
0-100				200-0-200 PSID	
0-150				300-0-300 PSID	
0-200				400-0-400 PSID	
0-250				750-0-750 PSID	
0-300				1000-0-1000 PSID	
0-500					
Up to 6000					

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 dual scale dials, multiple color dials and special decals. Please consult factory for complete information.

Model	Min. ΔP Range	Max. ΔP Range
109	0-15 PSID (0-1.0 bar)	0-6000 PSID (0-400 bar)

Uni-Directional Dial Ranges are available in either LINEAR or SQUARE ROOT FLOW SCALES with any appropriate legend (I.E. PSID, Kpa, IN H_2O, GPM, SCFM, ETC) at no extra charge			LINEAR Bi-Directional Dials are available with any appropriate Legend at No Charge	
0-0.5	0-30	0-300	1.0-0-1.0	75-0-75
0-1.0	0-35	0-400	2.0-0-2.0	100-0-100
0-1.6	0-40	0-500	5.0-0-5.0	150-0-150
0-2.0	0-50	0-600	10-0-10	200-0-200
0-3.0	0-60	0-700	15-0-15	300-0-300
0-4.0	0-70	0-800	25-0-25	400-0-400
0-5.0	0-75	0-900	30-0-30	750-0-750
0-6.0	0-80	0-1000	50-0-50	1000-0-1000
0-7.0	0-100	0-1500		
0-8.0	0-135	0-1600		
0-10	0-150	0-2000		
0-15	0-160	0-3000		
0-20	0-200	0-4000		
0-25	0-250	0-5000		
		0-6000		

Standard Model Number Sequence: 109-FE-00-OO

1500 PSIG Working Pressure, Aluminum Body, Stainless Steel Bourdon Tube, Stainless Steel Internals
Buna-N Seals, ¼" FNPT Back Connections (Stainless Steel), 6" Uni-Directional Round Dial,
Weather Resistant Engineered Plastic Case with Shatter Resistant Acrylic Lens,
Accuracy ±1% Full Scale (Ascending)

Range: 0-15 PSID to 0-6000 PSID (0-1.0 bar to 0-400 bar)

Gauge Body and Internal components are considered wetted parts

1	2	3	4	5	6	7	8	9
1	0	9						

Basic Model

Range:_____


2	Material
C	1500 PSIG, Aluminum Body, Copper Alloy Internals *(1/4" FNPT Connections / Carbon Steel)*
D	3000 PSIG, Aluminum Body, Copper Alloy Internals *(1/4" FNPT Connections / Carbon Steel)*
F	1500 PSIG, Aluminum Body, S.S. Internals *(1/4" FNPT Connections / 316 Stainless Steel)*
G	3000 PSIG, Aluminum Body, S.S. Internals *(1/4" FNPT Connections / 316 Stainless Steel)*
M	1500 PSIG, Mild Carbon Steel Body, S.S. Internals *(1/4" FNPT Connections / 316 Stainless Steel)*
N	3000 PSIG, Mild Carbon Steel Body, S.S. Internals *(1/4" FNPT Connections / 316 Stainless Steel)*
Q	1500 PSIG, 316 Stainless Steel Body, S.S. Internals *(1/4" FNPT Connections / 316 Stainless Steel)*
R	3000 PSIG, 316 Stainless Steel Body, S.S. Internals *(1/4" FNPT Connections / 316 Stainless Steel)*
T	6000 PSIG, 316 Stainless Steel Body, S.S. Internals *(1/4" FNPT Connections / 316 Stainless Steel)*
U	1500 PSIG, Brass Body, Copper Alloy Internals *(1/4" FNPT Connections / 316 Stainless Steel)*
V	500 PSIG, Brass Body, Copper Alloy Internals *(1/4" FNPT Connections / 316 Stainless Steel)*
X	1500 PSIG, Brass Body, S.S. Internals *(1/4" FNPT Connections / 316 Stainless Steel)*
Y	500 PSIG, Brass Body, S.S. Internals *(1/4" FNPT Connections / 316 Stainless Steel)*
3	**Dial Size Type**
E	Accuracy ±1% Full Scale Uni-Directional Dial w/Engineered Plastic Dial Case *(Standard)*
F	Accuracy ±1% Total Span Bi-Directional Dial w/Engineered Plastic Dial Case *(±3% above 1500-0-1500 PSI)*
G	Accuracy ±1/2% Full Scale Uni-Directional Dial w/Engineered Plastic Dial Case *(Not available above 1000 PSID)*
Z	Special ***(Un-coded Options)*** *Note: **G" Option not available for square root dials*
4	**Seal Materials**
0	Buna-N *(Standard)*
1	Viton®-A Registered Trademark of Dupont
2	Neoprene
5	Ethylene Propylene
6	Perfluorelastomers
9	Special ***(Un-coded Options)***
5	**Process Connections**
0	1/4" FNPT Back Connections *(Standard)*
5	1/2" FNPT Back Connections *(Stainless Steel)*
9	Special ***(Un-coded Options)***

Model 109 - continued

6	Additional Options
O	NONE
B	Drain & Bleed Connections (1/8" FNPT) Brass
C	Drain & Bleed Connections (1/8" FNPT) 316 Stainless Steel
F	Carbon Steel 2" Pipe Mounting Kit *(Standard on Explosion Proof Locked Logic Units)*
H	1/4" Carbon Steel Compression Tube Fittings
J	1/4" Stainless Steel Compression Tube Fittings
L	Liquid Fill
N	NACE *(Available for Aluminum & Stainless Steel Gauge Bodies only)*
Q	CRN (Canadian Registration Number) *(Available only on Model 109- body materials F, M and Q)*
S	Shatter Proof Glass Lens
T	Oxygen Cleaning
U	Stainless Steel Tag with S.S. Wire
V	Stainless Steel Tag and S.S. Screw
W	Wall Mount Kit
Y	4-1/2" Dial Case
Z	Special ***(Un-coded Options)***
7	**Electrical Configurations**
O	NONE
A	One (1) Switch in Weather Proof enclosure
B	Two (2) Switches in Weather Proof enclosure
C	One (1) Switch in explosion proof enclosure Class I, Groups B, C, & D *(Pipe Mounting Kit Standard)*
D	Two (2) Switch in explosion proof enclosure Class I, Groups B, C, & D *(Pipe Mounting Kit Standard)*
8	**"Input Options" Electrical Specifications (Select (1) input and (1) output option)**
A	8-28 Vdc
B	115 VAC 50/60 Hz
C	220/240 VAC 50/60Hz
Z	Special (Un-coded Options)
9	**"Output Options" (Resistive Load)**
	(Resistive load) – 10 Amp @ 28 VDC, 115/230 VAC (50/60 Hz)
	(1/2" NPT, 24" Flying Leads standard interface)
	(1/2" NPT, 24" Flying for two (2) DPDT switches)
A	SPDT Relays
C	SPST Relays
D	Adjustable deadband, one (1) SPDT output (two (2) control switches only)
E	Adjustable deadband, one (1) DPDT output (two (2) control switches only)
Z	Special (Un-coded Options)
	Not All Options Available in Combination with other Options

NOTE: The use of Diaphragm seals is not recommended for Model 109 gauge.
Attempts to install such seals on these gauges will void warranty.

MID-WEST INSTRUMENT has been serving a variety of industries (Power, Chemical, Petro-Chemical, HVAC, Water Filtration etc… for over 50 years. Over 1,000,000 DP Gauges 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 most of our product line 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 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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Web Site: www.midwestinstrument.com • Email: sales@midwestinstrument.com

Mid-West® Instrument

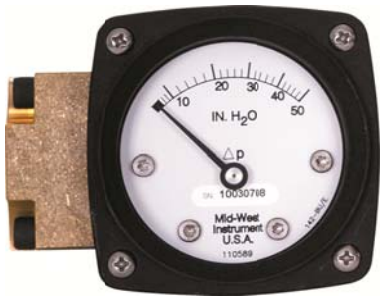
Product Notes:

Mid-West® Instrument

Elastomer Diaphragm Type Tank Level Gauges
Level Gauge, Switch and Transmitter
Model 114

Model 114 Diaphragm type Tank Level Gauges provide outstanding capabilities not previously available in a modestly priced Tank Level Gauge, Gauge/Switch & Gauge/Transmitter

6" Dial
0-80 IN H2O



2-1/2" Dial
0-50" H2O

4-1/2" Dial
0-40" & 0-100%
(3) Color special

Dial Scale Range: 0-20" H_2O to 0-600" H_2O

Model 114 diaphragm design provides a simple, accurate, differential pressure gauge for tank level measurement. Full Scale Accuracy of ±2% descending in accordance with ASME B40.100

Typical applications include; Level measurement in closed tanks for the Industrial Liquid Gas Industry. Use with gaseous and liquid media, provide they are not highly viscous. Various Dial scales available to match a wide variety of gases such as He, Ar, O_2, N_2, CO_2, and Helium

For Tank Level LNG applications see Bulletin No. 240/18 for our Model 240 rated Class I, Div I & Class I, Div II. Certified CSA, ATEX & KOSHA

BENEFITS:

"Engineered Plastic Gauge Front" to provide corrosion resistance in "over the road Trailers" outdoor and salt air environments.

Gauge weight savings over competitive Liquid Helium range gauges
- Allows more product to be transported in mobile trailers
- Easier and less labor to panel mount

Low & High range capabilities
- Ideal for He, Ar, O_2, N_2, CO_2, and Helium tank level applications
- For use on Stationary, Over the Road, ISO/IMO containers and LNG bulk tanks

Industry best lead time reduces inventory requirements

Adaptable to wide variety of mounting configurations:

Three Different Dial Sizes: 2-1/2", 4-1/2" and 6"

Private Brand and Custom Dials available: *Single Scale, Dual Scale, and Tri-Scale*

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Elastomer Diaphragm Type

Tank Level Gauge
Switch & Transmitter Options

Shown on Brass Bodv

Model 114 "AA" switch option
(2) Reed switches located inside NEMA 4x enclosure with 7 position terminal strip. An opening at rear of enclosure accepts ½" flexible weather-proof or conduit connector (supplied by customer).

Shown on Aluminum Body

Model 114 "TT" transmitter option.
4-20mA, 4 position terminal strip. 8-28 VDC Loop Power. ±2% Accuracy 20% to 100% of scale. An opening at rear of enclosure accepts ½" flexible weather-proof or conduit connector (supplied by customer).

Switch & Transmitter options are available with In-line, back or bottom process connections only.

Model 114 Tank Level Gauges are available with either one or two hermetically sealed reed switches for either high alarm, low alarm, or both and a 4-20mA transmitter depending on model. Switch housing is made of non-corrosive molded plastic, Transmitter housing is made of Aluminum. Both are oil tight, dust tight, and water tight per NEMA 4X/IP65. The switches are available as Single Pole Double Throw (SPDT) or Single Pole Single Throw (SPST) with adjustable set points. Switches can be set to activate/deactivate on falling pressure. 4-20mA transmitter is available with 4-2mA output (8-28 Loop Power)

Electrical Specification	SPDT	SPST NO	Transmitter 4-20mA
Power	3 Watt	25 Watt	4-20 mA Loop Power
Max Current	0.25 Amps	0.5 Amps	8-28 VDC Loop Powered 2-Wire interface
Max Voltage VAC/VDC	125 VAC/VDC	240 VAC/VDC	1000 Ohm max Loop resistance at 28 vdc
Setting Full Scale	10-90%	10-90%	20-100%
Hysterisis (Max/Nom)	10% / 5% (FS)	15% / 8% (FS)	N/A
Repeatability	1% F.S.	1% F.S.	1% F.S
Connections	Terminal Strip	Terminal Strip	Terminal Strip

Proof Pressure: 5,500 PSI at ambient temperature

Maximum Temperature Limits: +200°F (Gauge only and Gauge switch combination)
+150°F (Transmitter)
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: 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 SAE J514
EN-61010-1 UL Std. No. 50,508 and 1203 CSA-C22.2 No. 14.25 and 30

OVER 60 YEARS experience in the field of supplying quality Differential Pressure Gauges.
Tank Level applications are for stationary, over the road, ISO/IMO containers and LNG bulk tanks

Product Description:

Model 114 design is a metal / elastomer diaphragm type differential pressure gauge capable of operating at low differential pressures. Safe working pressure is 1375 PSIG (STD).

You have an Elastomer Seal and Diaphragm choice of Buna-N, Viton or Ethylene Propylene. Dial sizes available are 2-1/2", 4-1/2" or 6" diameter with black lettering on a white dial.

Model#114 6" Dial mounted to
Model 107470 3-Valve Manifold
½" FNPT Process connections

MODEL 114 MANIFOLD OPTIONS

Model 107473 3-Valve
Direct Mount Manifold with optional
straight pressure gauge port
1/4" FNPT Process connections

Model 114 w/4-1/2" Dial mounted to
Model 113343 3-Valve Mini-Manifold
¼" FNPT Process connections

Model 114 with direct mount manifold,
3/4" NPT stub mount with optional
(customer provided) pressure gauge

Model 114 can be direct mounted to anyone of 4 different manifolds.
See Bulletin MFLD/18
For more Information

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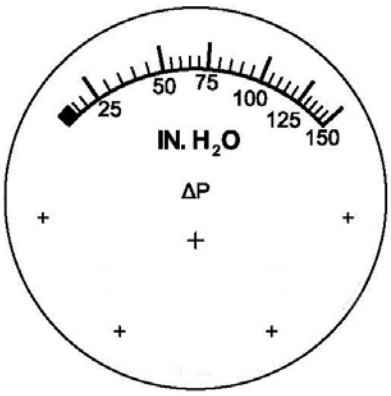
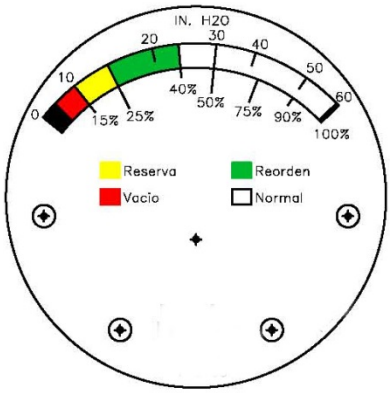
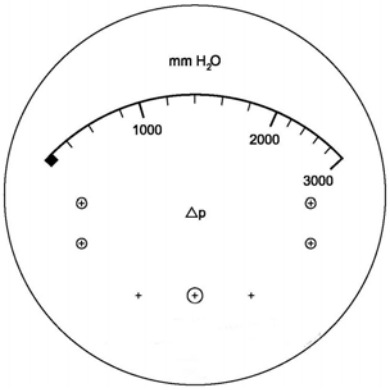
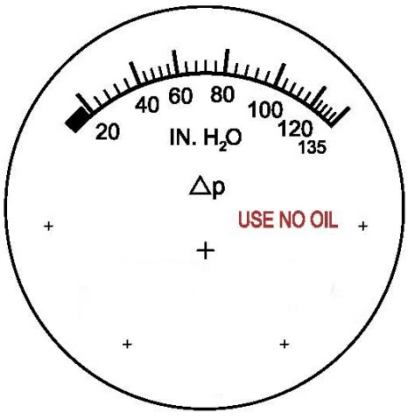
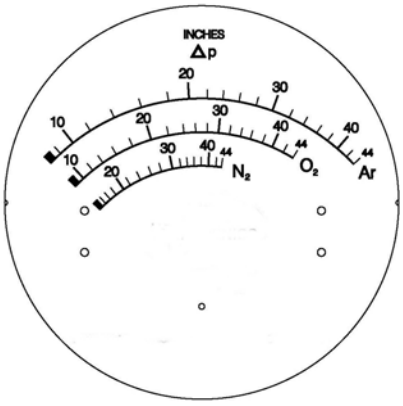
Samples of various Special Tank Level gauge scales quoted upon request.

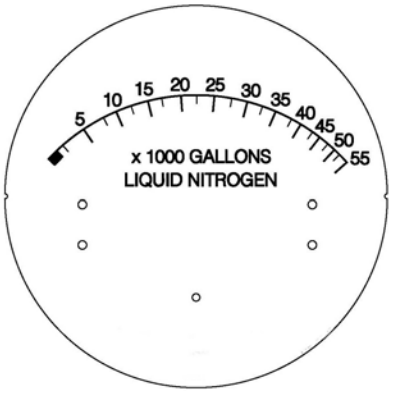


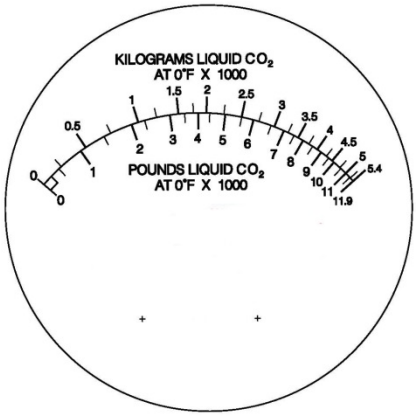


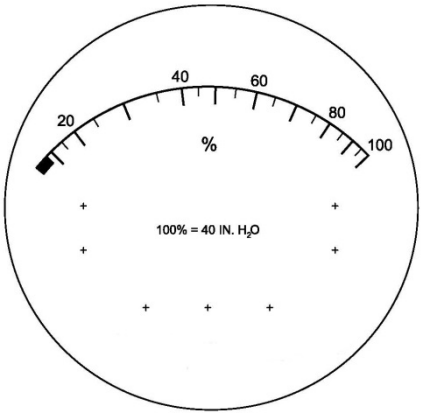


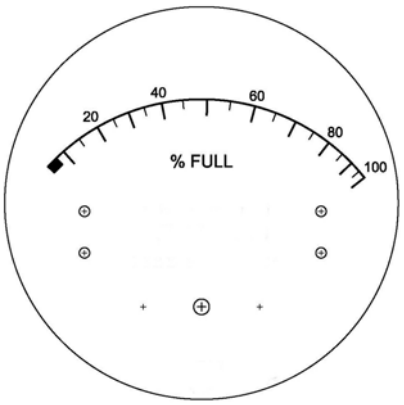


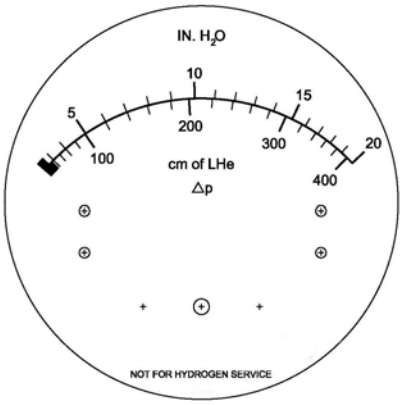


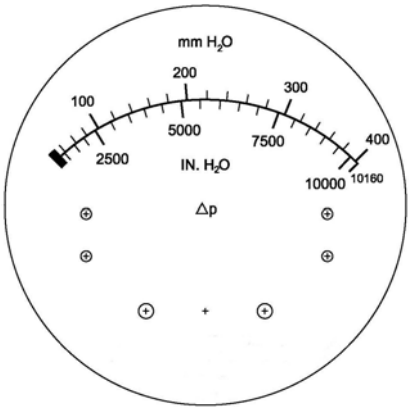












Mid-West® Instrument

Standard Tank Level Ranges: Model 114

IN H_2O	Dual Scale (IN/CM)	CM H2O
0-20"	0-80 IN H2O/0-200 CM H2O	0-200
0-25"	0-100 IN H2O/0-250 CM H2O	0-250
0-30"	0-150 IN H2O/0-380 CM H2O	0-380
0-40"	0-200 IN H2O/0-500 CM H2O	0-500
0-50"	0-300 IN H2O/0-750 CM H2O	0-750
0-60"	0-400 IN H2O/0-1000 CM H2O	0-1000
0-80"	0-500 IN H2O/0-1270 CM H2O	0-1270
0-100"	0-600 IN H2O/0-1500 CM H2O	0-1500
0-150"	**Dual Scale** (IN/MM)	**MM H2O**
0-200"	0-80 IN H2O/0-2000 MM H2O	0-2000
0-300"	0-100 IN H2O/0-2500 MM H2O	0-2500
0-400"	0-150 IN H2O/0-3800 MM H2O	0-3800
0-500”	0-200 IN H2O/0-5000 MM H2O	0-5000
0-600”	0-300 IN H2O/0-7500 MM H2O	0-7500
	0-400 IN H2O/0-10000 MM H2O	0-10000
	0-500 IN H2O/0-12700 MM H2O	0-12700
	0-600 IN H2O/0-15000 MM H2O	0-15000
	Special Un-Cataloged Dial Requirements available upon request. Additional Costs may apply	

Note: Other Scales available in PSID, kPa, Bar etc. Please check with your Sales coordinator

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
114	0-20" H2O (0-50 CM H2O)	0-600” H2O (0-1500 CM H2O)

Proof Pressure: Four times rated working pressure at ambient temperature

Maximum Temperature Limits:
Gauge with or without switch: +200°F (+93°C)
Gauge with transmitter: +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 114 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

Example Model Number Sequence: 114-BJ-12-DT-O

1375 PSIG Working Pressure, Brass body, 316L Stainless Steel Internal Metal Parts, Ceramic Magnets, Viton Diaphragm and Seals, Teflon Guide Bushings
¼" FNPT Dual Top & Bottom Connections, ¾ NPT Stub Mount, Oxygen Cleaned
6" round dial, Engineered Plastic Case with Shatter Resistant Acrylic Lens
Accuracy ±2% F.S (Descending)

Model 114: Range 0-20" H2O to 0-600" H2O

Gauge Body and Internal components are considered wetted parts.

Basic Model			2	3	4	5	6				7	8
1	1	4										

Range:_____

2	Material
A	Aluminum Body / 316 Stainless Steel Internal Metal Parts & Teflon Guide Bushings
B	Brass Body / 316 Stainless Steel Internal Metal Parts & Teflon Guide Bushings
S	316/316L Stainless Steel Body / 316 Stainless Steel Internal Metal Parts & Teflon Guide Bushings
Z	Special ***(Un-coded Options)***
3	**Dial Size & Type**
A	2-1/2" Round, Black on White Dial w/Engineered Plastic Dial Case
C	4-1/2" Round, Black on White Dial w/Engineered Plastic Dial Case
G	4-1/2" Round, Black on White Dial in Anodized Aluminum Dial Case
J	6" Round, Black on White Dial w/Engineered Plastic Dial Case
T	Non-Indicating DP Switch Only
Z	Special ***(Un-coded Options)***
4	**Seal Materials**
0	Buna-N — *Minimum Temperature Limits -40°F (-40°C)*
1	Viton®-A Registered Trademark of Dupont — *Minimum Temperature Limits -4°F (-20°C)*
5	Ethylene Propylene — *Minimum Temperature Limits -40° F (-40°C)*
9	Special ***(Un-coded Options)***
5	**Process Connections**
0	1/4" FNPT Back Connections
2	1/4" FNPT Dual Top & Bottom Connections *(Non-Electrical Option Units Only)*
3	1/4" FNPT Bottom Connections
8	1/4" FNPT End (In-Line) Connections
9	Special ***(Un-coded Options)***

Standard process connections = Hi on left side and Lo on right side when facing gauge

Model 114 - continued

6	Additional Options
O	None
D	3/4" NPT Stainless Steel Stub Mount *(Not available in conjunction with Switch, Transmitter or Back Process connections)*
F	Carbon Steel 2" Pipe Mounting Kit
G	Stainless Steel 2" Pipe Mount Kit
Q	CRN (Canadian Registration Number)
S	Shatter Proof Glass Lens *(Available only with option "G" 4-1/2" Aluminum Dial Case)*
T	Oxygen Cleaning
U	Stainless Steel Tag with S.S. Wire
V	Stainless Steel Tag and Screws
Z	Special ***(Un-coded Options)***
	NOTE: NOT ALL OPTIONS AVAILABLE IN COMBINATION WITH OTHER OPTIONS
7	**Electrical Configurations (CE Marked & ROHS Compliant except option "T")**
O	None
A	One (1) Reed Switch in NEMA 4X/IP66 Enclosure
B	Two (2) Reed Switches in NEMA 4X/IP66 Enclosure
T	4-20 mA Transmitter in NEMA-4X/IP66 aluminum enclosure **(1)**
Z	Special ***(Un-coded Options)***
	(1) Contact factory for tank level applications with transmitter configuration
8	**Electrical Specifications (For Resistive Loads) Switch adjustable range 10-90% of Scale Descending**
O	None
A	SPDT 3W, 0.25 Amp, 125 VAC/VDC *(MAXIMUM TEMPERATURE LIMIT +200° F / +93°C)*
B	SPST, 25W, 0.5 Amp., 230 VAC/VDC *(Normally Open) (MAXIMUM TEMPERATURE LIMIT +200° F / +93°C)*
T	4-20 mA Transmitter (8-28 VDC Loop Power) *(± 2% Accuracy from 20-100% of scale)* *(MAXIMUM TEMPERATURE LIMIT +150° F / +65°C)*
Z	Special ***(Un-coded Options)***

Factory preset switches at no charge (Specify Setting) <u>If not specified switch will be set at 50% of full scale range</u>

Non-Adjustable Snubber fittings available upon request. **See Bulletin NO. 150/18**

MID-WEST INSTRUMENT has been serving a variety of industries (Cryogenic Level, Power, Chemical, Petro-Chemical, HVAC, Water Filtration etc…) for over 60 years. Over 1,000,000 DP Gauges 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 most of our product line 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 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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Mid-West® Instrument

Product Notes:

BULLETIN NO. 115-116/18
(SUPERSEDES BULLETIN NO. 115-116/17)

Mid-West® Instrument

MADE IN USA

"Bellows Type Tank Level"

Differential Pressure Level Gauge & Switch

Model 115/116

Industrial Controls

Model 115, 0-10" H_2O to 0-69.9" H_2O (25 mbar to 2.5 PSID)
Model 116, 0-70" H_2O to 0-800" H_2O (2.5 PSID to 30 PSID)

Model 115/116 multiple diaphragm/bellows design provides a simple, highly accurate, direct-acting, differential pressure indicator. Full Scale Accuracy of ±1%.

Typical applications include; Level measurement in closed tanks for the Industrial Liquid Gas Industry. Use with gaseous and liquid media, provide they are not highly viscous. Various Dial scales available to match a wide variety of gases such as He, Ar, O_2, N_2, CO_2, Helium and Hydrogen

BENEFITS:

"Engineered Plastic" gauge front and stainless steel body bolts provide corrosion resistance in "over the road Trailers" outdoor and salt air environments.

Up to a 30 lb. weight savings over competitive Liquid Helium range gauges

- Allows more product to be transported in mobile trailers
- Easier and less labor to panel mount

Low & High range capabilities

- Ideal for He, Ar, O_2, N_2, CO_2, Helium and Hydrogen tank level applications
- For use on Stationary, Over the Road, ISO/IMO containers and LNG bulk tanks

Industry best lead time reduces inventory requirements

Adaptable to wide variety of mounting configurations

Private Brand and Custom Dials available: *Single Scale, Dual Scale, and Tri-Scale*

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OVER 50 YEARS experience in the field of supplying quality Differential Pressure Gauges. Tank Level applications are for stationary, over the road, ISO/IMO containers and LNG bulk tanks

Product Description:

Model 115 and 116 design is an all-metal differential pressure gauge capable of operating at low differential pressures. Safe working pressure is 500 PSIG (STD) 1,000 PSIG (optional)

The DPI is equipped with a Bi-directional Over Pressure Relief Valve (OPV). When the Differential Pressure exceeds 130% of the range the OPV equalizes the pressure between the Hi and Lo sides. ¼" FNPT Dual top and bottom connections are provided as standard. The DPI is also equipped with a Micro adjust pointer, If necessary the pointer can be re-zeroed. Body is made of brass with 316 Stainless Steel internals. Viton Seals are provided as standard. The Dial is 6" diameter with white lettering on a black dial.(white dial with black lettering optional) The 115/116 temperature limits are rated at -40°C to 200°F. Proof pressure is Two Times working pressure at ambient temperature.

Model 116 can be equipped with one ore two independently adjustable SPDT snap acting Micro-Switches which can be set on decreasing or on increasing pressure. A switch adjustment screw and a switch lock screw is accessible after removal of the lens and bezel (removal of 4 screws). Interface to the snap acting micro-switch is via color coded 18 AWG flying leads and a ½' FNPT conduit connection. Model116 with switch temperature limits are rated at -20°C to +185°F

Model 115 shown with Optional model 107467 S.S. Direct Mount 3-Valve manifold with pressure gauge port

Model 116 shown with Optional model 107467 S.S. Direct Mount 3-Valve manifold with (Customer supplied) pressure gauge

MANIFOLD SPECIFICATIONS:

Pressure rating: 6000 PSIG (414 bar) @ 200°F (93°C) or 4000 PSIG (276 bar) @ 500°F (260°C)
Mini-Manifold: 3000 PSIG (207 bar) @ 200°F (93°C)
Isolated stem threads: Adjustable packing below stem keeps process fluid away.
Ensures leak proof long service life. Bubble-tight shutoff.
Instrument Connections: Standard 3-Valve 107470, 5-Valve 107469 = ½" FNPT
3-Valve Mini 113343 & Direct Mount 107467 & = ¼" FNPT
Process Connections: Standard 3-Valve 107470 & 5-Valve 107469 = ½" FNPT
3-Valve Mini 113343 & Direct Mount 107467 = ¼" FNPT
Replaceable seat design: Standard 3/16 inch diameter orifice.
Bonnet cap protection: Increases valve life protecting stem threads from atmospheric corrosion.
Rolled stem threads: Increased strength and life
No more stem blowouts: Backseat stem design prevents blowout problems.
Less Parts: Less leak points and less fugitive emissions.
Test Ports: 3 & 5 Valve Manifold = 1/4" FNPT ports which may be used as test connections
3-Valve Mini-Manifold does not have port test connections.
Gland Packing PTFE/Graphite, Integral (Body Material) Seat, and Stainless Steel Body

Model 115 & 116 can be direct mounted to anyone of 4 different manifolds.

See Bulletin MFLD/18
For more Information

Mid-West® Instrument

Standard Tank Level Gauge Ranges: Model 115/116

Range Type					
PSID	H2O	Kpa	Bar	Dual Scale IN/CM	CM & MMH2O
0-2	0-10"	0-2.5	0-.35	0-80 IN H2O/0-200 CM H2O	0-200 CM H2O
0-3	0-20"	0-5	0-.7	0-100 IN H2O/0-250 CM H2O	0-380 CM H2O
0-5	0-30"	0-7	0-1.0	0-150 IN H2O/0-380 CM H2O	0-500 CM H2O
0-10	0-40"	0-10	0-1.4	0-200 IN H2O/0-500 CM H2O	0-1000 CM H2O
0-15	0-50"	0-15	0-1.75	0-300 IN H2O/0-750 CM H2O	0-1024 CM H2O
0-20	0-60"	0-20	0-2.0	0-400 IN H2O/0-1000 CM H2O	0-1250 CM H2O
0-25	0-70"	0-25		0-500 IN H2O/0-1270 CM H2O	0-1500 CM H2O
0-30	0-80"	0-30		0-600 IN H2O/0-1500 CM H2O	0-1524 CM H2O
	0-100"	0-40		0-700 IN H2O/0-1800 CM H2O	0-2500 MM H2O
	0-120"	0-70		0-800 IN H2O/0-2050 CM H2O	0-3,000 MM H2O
	0-150"	0-100			0-5,000 MM H2O
	0-200"	0-140			0-7,600 MM H2O
	0-250"	0-150			0-10,000 MM H2O
	0-300"	0-200			0-12,700 MM H2O
	0-400"				0-15,000 MM H2O
	0-450"				
	0-500"				
	0-600"				
	0-700"				
	0-800"				

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 115 Range Conversions						
"H2O	CM H2O	MM H2O	PSID	Bar	mBar	Kpa
0-10	0-25	0-254	0-.36	0-.02	0-25	0-2.5
0-15	0-38	0-381	0-.54	0-.03	0-37	0-3.7
0-20	0-50.8	0-508	0-.72	0-.05	0-50	0-5
0-25	0-64	0-635	0-.90	0-.06	0-62	0-6.2
0-30	0-76.2	0-762	0-1.08	0-.07	0-75	0-7.5
0-40	0-101.6	0-1016	0-1.44	0-.09	0-100	0-10
0-50	0-126.5	0-1265	0-1.80	0-.12	0-125	0-12
0-60	0-152.6	0-1525	0-2.17	0-.15	0-150	0-15
Model 116 Range Conversions						
0-70	0-180	0-1775	0-2.5	0-.17	0-174	0-17.3
0-80	0-200	0-2032	0-2.9	0-.20	0-200	0-20
0-100	0-250	0-2540	0-3.6	0-.25	0-250	0-25
0-150	0-380	0-3810	0-5.4	0-.37	0-373	0-37
0-200	0-500	0-5080	0-7.2	0-.50	0-498	0-50
0-300	0-760	0-7620	0-10.8	0-.75	0-747	0-75
0-400	0-1000	0-10,200	0-14.5	0-.99	0-996	0-100
0-500	0-1270	0-12,700	0-18.0	0-1.2	0-1245	0-124
0-600	0-1500	0-15,240	0-21.6	0-1.5	0-1494	0-150
0-700	0-1800	0-17,750	0-25.3	0-1.74	0-1740	0-174
0-800	0-2000	0-20,300	0-28.9	0-200	0-2000	0-200

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Listed below are examples of tank level dial ranges requested and provided to our customers based on their specific requirements. Mid-West has the capability to provide special dials to fit your specific needs.

Range	
0-100,000LBS CO2/0-46,000 KGS	0-28,000 LBS N2O
0-100% CARBON DIOXIDE	0-28,000LBS CO2/0-12,800 KGS
0-100% CO2	0-3,935 LBS CO2/0-1,785 KGS
0-100% LINEAR	0-36,000 LBS CO2/0-16,000 KGS
0-100,000 LBS CO2	0-400 IN H20/0-10,160 MM H20
0-100,000 LBS CO2/0-46,000 KGS	0-42,000 LBS CO2/0-19,000 KGS
0-100,000 LBS CO2/0-50 TONS	0-42,000 LBS N2O/0-21 TONS
0-100,000 LBS N2O	0-4300 GALLONS
0-100,000 LBS N2O/0-100%	0-5,500 LBS CO2/0-2,500 KGS
0-11 IN H2O/0-220 CM HE	0-50 IN H2O/0-1140 KG LOX
0-11 IN H2O/0-220 LHE	0-50,000 TONS & 0-100,000 LBS CO2
0-11 IN H2O/0-28 CM H2O	0-52,000 LBS CO2/0-24,000 KGS
0-11,000 LITRES 02/N2/AR	0-52,000 LBS CO2/0-26,000 TONS
0-12,000 Lbs CO2 / 0-6 TONS	0-56,000 LBS CO2/0-25,000 KGS
0-12,000 LBS CO2/0-5,400 KGS	0-6,000 LBS CO2/0-2,700 KGS
0-12,000 LBS CO2/0-5,500 KGS	0-60,000 LBS CO2
0-12,000 LBS CO2/0-6 TONS	0-60,000 LBS CO2/0-100%
0-120,000 LBS CO2/0-55,000KGS	0-60,000 LBS CO2/0-27,500 KGS
0-13,000 LBS CO2	0-60,000 LBS CO2/0-28,000 KGS
0-13,000 LBS H2O	0-60,000 LBS CO2/0-30,000 KGS
0-13000 LBS N2O	0-63 METRIC TONNES
0-16,000 LBS CO2/0-7,200 KGS	0-7,000 LBS CO2/0-3,150 KGS
0-182,000 LBS CO2 / 0-82,500 KGS	0-7,500LBS CO2/0-3,400 KGS
0-20,000 LBS CO2/0-9,000 KGS	0-70,000 Lbs CO2 / 0-35 TONS
0-200 IN H20/0-5,080 MM H20	0-70,000 LBS CO2/0-35 TONS
0-270 METRIC TONNES	0-700 IN H2O
0-28,000 LBS CO2	0-75 IN H2O/0-190 CM H2O
0-28,000 Lbs CO2 / 0-14,000 TONS	0-75 IN H2O/0-190 CM H2O
0-28,000 LBS CO2/0-12,800 KGS	0-76,000 LBS CO2/0-34,500 KGS
0-28,000 LBS H2O	0-8,000 LBS CO2 / 0-3,600 KGS

Proof Pressure:
Two times working pressure at ambient temperatures

Temperature Limits:

Gauge w/o/ switch -40°F to 200°F
Gauge with Snap Acting Switch -20°F to 185°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 115/116 Series gauges either conform to and/or are designed to the requirements of the following standards:

ASME B1.20.1	CSA-C22.2 No.14	NEMA Std. No. 250
ASME B40.100	UL Std. No. 50	SAE J514

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Model 115/116 Tank Level Gauge

Industrial Controls

0-10" H_2O
Single Scale

Ar, O_2, N_2
Tri-Scale Dial

Optional
¾" FNPT
Stub Mount Shown
Shown on Model 116

Model 115
Brass Body

Model 116
Cast Brass Body

	115	**116
Accuracy	±1% of Full Scale	
DP Range	0-10" H2O to 0-69.9" H2O (25 mbar to 2.5 PSID)	0-70" H2O to 0-800" H2O (2.5 PSID to 30 PSID)
Safe Working Pressure	1500 PSIG	500 PSIG (Standard) 1000 PSIG (Optional)
Body Material	Brass	Brass
Internals	316 S.S. Welded Multiple Diaphragm	316 S.S. Convoluted Bellows
Port	Dual Top and Bottom, 1/4" FNPT connections with optional snubbers	
Seals	Viton Standard, other elastomers available	
Dial	6" Black dial with White lettering (White dial with Black lettering optional)	
Warranty	One Year	
****Model 116 Snap Acting Micro-Switch for Alarm (optional) Ranges: 0-80" H2O & above.**		
Aluminum, Carbon Steel, & Stainless Steel Body Materials Available... Ask about Model's 105, and 106 (SWP of 1,500 & 3,000 PSIG)		

Industrial Controls

MICRO - SWITCH SPECIFICATION

Model 116 Electrical 0-80" H_2O and above

Input Voltage:	None Required		
Set Pointers:	Quantity Adjustment:	1 3% to 100% of Full Scale	With visual set point set on decreasing pressure
Output(s)	Contact(s) Contact Rating:	1 SPDT 4 Amps Maximum 3 Amps Maximum 5 Amps	@ 30 VDC @ 240 VAC @ 120 VAC
Temperature:	Operating:	-20°F to +185°F	
Environment:	Standard:	Weather-Proof Housing	NEMA 4
Electrical Interface:	Standard:	18", 18 Awg., 600 V 105C Color Coded Wire Leads	1/2" FNPT
Gauge Accuracy:	2%	Including Effects of the switch	
Switch Repeatability:	2%	Maximum	

Proof Pressure:
Two times working pressure at ambient temperatures

Temperature Limits: Gauge w/o/ switch -40°F to 200°F
Gauge with Snap Acting Switch -20°F to 185°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 115/116 Series gauges either conform to and/or are designed to the requirements of the following standards:

ASME B1.20.1	CSA-C22.2 No.14	NEMA Std. No. 250
ASME B40.100	UL Std. No. 50	SAE J514

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Standard Model Number Sequence: 116BB-10-APT-O

500 PSIG Working Pressure, Brass Body, Stainless Steel Bellows, Stainless Steel Internals
Viton Seals, ¼" FNPT Dual Top & Bottom Process Connections, 6" Uni-Directional Round Dial,
Brass snubber fittings mounted in bottom process connections, Panel mount gauge front
Weather Resistant Engineered Plastic Case with Shatter Resistant Acrylic Lens,
Oxygen Cleaned, Accuracy ±1% Full Scale (Ascending)

Range 115: 0-10" H_20 to 0-69.9" H_20 (0-125 mbar to 0-2.5 PSID)
Range 116: 0-70" H_20 to 0-800" H_20 (0-2.5 PSID to 0-30 PSID)

Gauge Body and Internal components are considered wetted parts.

1	1	6	2	3	4	5	6	6	6	6	7	8
1	1	6										

Basic Model

Range:_____





2	Material
B	500 PSIG, Brass Body, Stainless Steel Internals
Z	Special ***(Un-coded Options)***
3	**Dial Size Type**
B	Accuracy ±1% Full Scale Uni-Directional, White on Black Dial
W	Accuracy ±1% Full Scale Uni-Directional, Black on White Dial
Z	Special ***(Un-coded Options)***
4	**Seal Materials**
0	Buna-N
1	Viton®-A Registered Trademark of Dupont **(Standard)**
5	Ethylene Propylene
9	Special ***(Un-coded Options)***
5	**Process Connections / Orientation**
0	¼" FNPT Dual Top & Bottom (Hi port on the right side when facing the dial) *(Standard)*
1	¼" FNPT Dual Top & Bottom (Hi port on the left side when facing the dial)
9	Special ***(Un-coded Options)***
6	**Additional Options**
O	None
A	Brass snubber fittings mounted in bottom process connections *(Standard)*
B	Brass snubber fittings mounted in top process connections
D	¾" NPT S.S. Stub Mount Bracket
F	Carbon Steel 2" Pipe Mounting Kit
J	3-Valve S.S. Mini-Manifold #113343 mounted to bottom process connections *(1/4" FNPT Process Connections)*
K	3-Valve S.S. Manifold #107470 mounted to bottom process connections *(1/2" FNPT Process Connections)*
L	3-Valve S.S. Direct Mount Manifold mounted to bottom process connections *(1/4" FNPT Process Connections)*
P	Panel Mount Kit
Q	CRN *(Canadian Registration Number)*
S	Shatter Proof Glass Lens
T	Oxygen Cleaning
U	Stainless Steel Tag with S.S. Wire
Z	Special ***(Un-coded Options)***

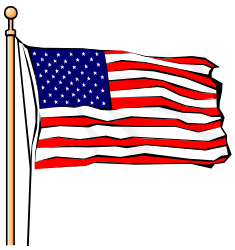
Model 115/116 - continued

7	Electrical Configurations
O	None
A	One (1) Switch in Weather Resistant Enclosure *Accuracy ±2% (Descending Pressure)*
B	Two (2) Switches in Weather Resistant Enclosure *Accuracy ±4%* 0-80" – 199" H2O only. (Descending Pressure) *Accuracy ±2%* 0-200" H2O and above.. (Descending Pressure)
C	One (1) Switch in Weather Resistant Housing with Condulet Enclosure *Accuracy ±2% (Descending Pressure)*
D	Two (2) Switches in Weather Resistant Housing with Condulet Enclosure *Accuracy ±4%* 0-80" – 199" H2O only. (Descending Pressure) *Accuracy ±2%* 0-200" H2O and above.. (Descending Pressure)
Z	Special ***(Un-coded Options)***
Switches CSA Listed, Type 4, Industrial Control Equipment *Accuracies and repeatability values for 2 switch units are based upon one switch set low (approximately 25% for FSR) and one switch set High approx. 75% FSR.).*	

8	Electrical Specifications
A	SPDT Micro Switch High Current Contact Ratings.(MAX): 4 Amps Maximum @ 30 VDC 3 Amps maximum @ 240 VAC 5 Amps @ 120 VAC
Z	Special ***(Un-coded Options)***
Electrical Interface: 18", 18 Awg, 600 V, 105°C / Color coded wire leads from 1/2" FNPT Connection Operating Temperature: -20° F to +185° F	
Factory preset switches at no charge (specify setting)	

The Mid-West Instrument Advantage:

- "Engineered Plastic" gauge front and optional stainless steel body bolts provide superior corrosion resistance.
- Up to a 30 lb. weight savings over competitive range gauges
- Easier and less labor to panel mount
- Dry gauge design with no internal liquid fill
- No gauge damage/accuracy loss caused by liquid fill expansion/contraction when exposed to temperature shocks.
- Low range capability
- Industry best lead time reduces inventory requirements



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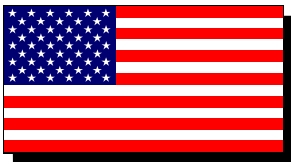
Bulletin No. 805/18
Supersedes Bulletin No. 805/14

Mid-West® Instrument

MODEL 805

PRECISION FLOW TEST KIT



Made In USA

Functions & Applications:

High accuracy portable test kit for precise flow indication and leak detection. This kit is equipped with a precise (±1% of full scale) accuracy Bellows Type differential pressure gauge. Popular applications include but are not limited to: measuring the pressure drop across various types of equipment i.e. filters, balancing HVAC systems, checking pump performance, orifice plates, checking calibration of transmitters, or reading flow directly when ordered with a square root dial etc. When being used the gauge should be placed in as nearly vertical position as possible. This gauge is position sensitive and accuracy may be less than stated, if not in a vertical position.

Product Features/Benefits:

- Over 30 Years of Input from Professional Testing Technicians
- Soft-Seated Brass Needle Valves (with replaceable valve seats)
- Test kit is protected with 90 micron filters to minimize plugging with scale, sand, etc. Filter elements can be cleaned or replaced
- Durable Molded Plastic Carrying Case with Removable lid
- Test Procedures are Laminated in Clear Plastic
- 5 Year Warranty

Specifications:

- Gauge Type: Bellows Differential Pressure
- Dial Size: 4-1/2” Standard (6” Optional)
- Range (4-1/2") 0-10” thru 0-79.9” H2O ranges available
- Differential Pressure Accuracy :
  ±1% Full Scale (Ascending) Std **(Accuracy: ±1/2% Full Scale available)**
- Working Pressure: 500 PSIG (Standard)
- Gauge Material: Aluminum Body & Copper Alloy Internals
- Wetted Internals: Buna-N Seals, Aluminum & Copper Alloy
- Hoses & End Fittings: Nitrile Jacket and liner. Schrader 1/4" brass coupler **(Connects with 1/4” 37° Flare Male Fittings)**
- Valves: Soft-Seated Brass
- Tubing & Fittings: Nylon & Brass
- Hose Length: 10' long (3 meter)
- Filters: 90 Micron Brass **(Order Replacement Filter Kit No. 98008)**
- Approximate Shipping Wgt: 15 lbs / 6.8 kg
- Case: Polyethylene
- Dimensional Data: 13.75" x 15.5” x 8.5"
- Temperature Limitations: Maximum 150°F/65°C
  Freezing Temperatures must be avoided

Model 805 plumbed for water service only. Please contact the factory for assistance on kits for use with other liquids or gases.

MODEL 805 TEST KIT
BASIC OPERATING INSTRUCTIONS

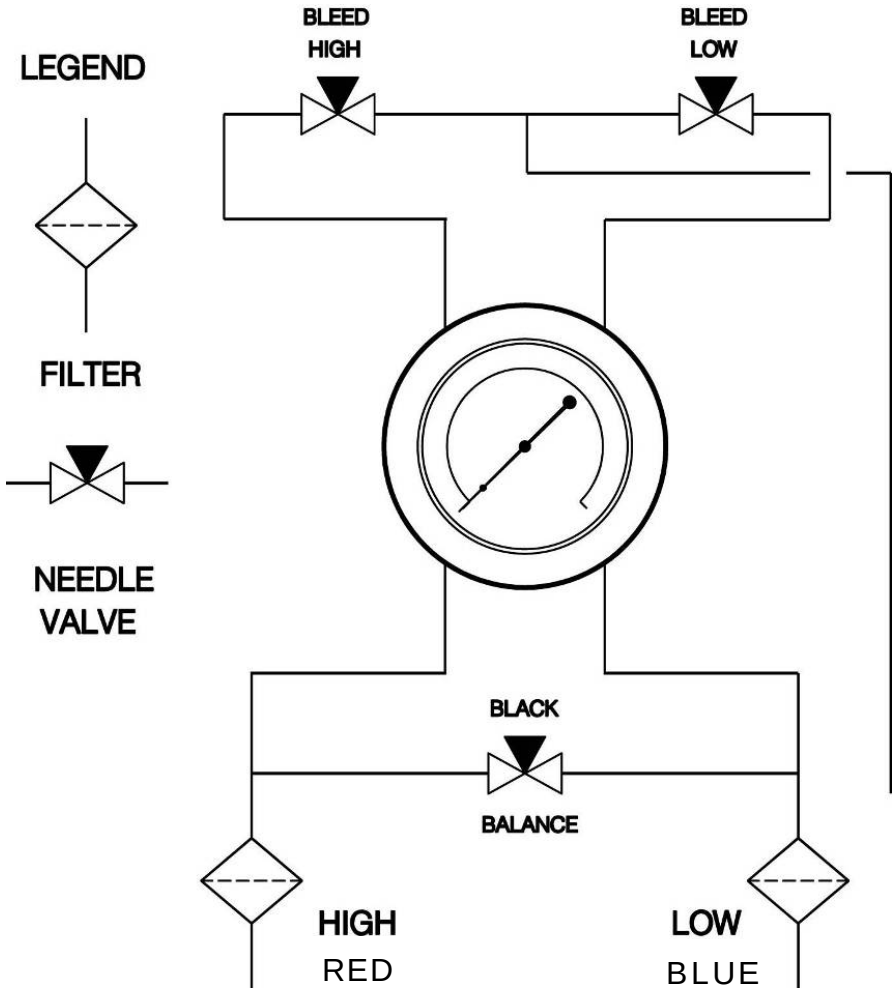
1. Connect hoses to test connections – red high pressure hose upstream, green low pressure hose downstream.
2. Open balance valve **(bottom of panel)**
3. Pull free end of clear plastic tubing from kit.
4. Open high and low bleed valves alternately to purge air from system. Bleed water discharges from convenient clear plastic flexible tubing.
5. When bleeding shows all air removed – close bleed valves, balance valve and read differential pressure.
6. When test is complete – open balance valve before disconnecting hoses from test connections.
7. Hoses are stored by coiling them around the test gauge panel.
8. Place clear plastic tubing inside case before closing lid.

For convenience I handling, the cover of the test kit is removable. Depress the pin spring of the top hinge, pull the hinge slightly apart and slide the cover off. To reinstall, reverse this procedure.

NOTE: The 805 Test Kit is equipped with in line filters near the ends of the hoses. If the gauges respond slowly to changes in the differential pressure the filter elements may be partially plugged.

To remedy this, unscrew the two halves of the filter housing and remove brass filter element. It may be cleaned by flushing with mild detergent and water. If, after reassembly this has not satisfactorily improved the response time a replacement filter element kit #98008 should be installed.

MODEL 805 TEST KIT SCHEMATIC DIAGRAM



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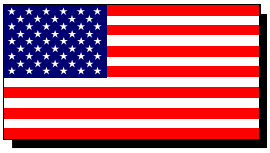
Bulletin No. 806/18
Supersedes Bulletin No. 806/14

Mid-West® Instrument

MODEL 806

PRECISION FLOW TEST KIT



Made In USA

Functions & Applications:

High accuracy portable test kit for precise flow indication and leak detection. This kit is equipped with a precise (±1% of full scale) accuracy Bellows Type differential pressure gauge. Popular applications include but are not limited to: measuring the pressure drop across various types of equipment i.e. filters, balancing HVAC systems, checking pump performance, orifice plates, checking calibration of transmitters, or reading flow directly when ordered with a square root dial etc. When being used the gauge should be placed in as nearly vertical position as possible. This gauge is position sensitive and accuracy may be less than stated, if not in a vertical position.

Product Features/Benefits:

- Over 30 Years of Input from Professional Testing Technicians
- Soft-Seated Brass Needle Valves (with replaceable valve seats)
- Test kit is protected with 90 micron filters to minimize plugging with scale, sand, etc. Filter elements can be cleaned or replaced
- Durable Molded Plastic Carrying Case with Removable lid
- Test Procedures are Laminated in Clear Plastic
- 5 Year Warranty

Specifications:

- Gauge Type: Bellows Differential Pressure
- Dial Size: 4-1/2” Standard (6” Optional)
- Range (4-1/2") 0-80” thru 0-400” H2O ranges available
- Differential Pressure Accuracy:
  ±1% Full Scale (Ascending) Std. (**Accuracy: ±1/2% Full Scale available)**
- Working Pressure: 500 PSIG (Standard)
- Gauge Material: Aluminum Body & Copper Alloy Internals
- Wetted Internals: Buna-N Seals, Aluminum & Copper Alloy
- Hoses & End Fittings: Nitrile Jacket and liner. Schrader 1/4" brass coupler
  (Connects with 1/4” 37° Flare Male Fittings)
- Valves: Soft-Seated Brass
- Tubing & Fittings: Nylon & Brass
- Hose Length: 10' long (3 meter)
- Filters: 90 Micron Brass **(Order Replacement Filter Kit No. 98008)**
- Approximate Shipping Wgt: 15 lbs / 6.8 kg
- Case: Polyethylene
- Dimensional Data: 13.75" x 15.5” x 8.5"
- Temperature Limitations: Maximum 150°F/65°C
  Freezing Temperatures must be avoided

Model 806 plumbed for water service only. Please contact the factory for assistance on kits for use with other liquids or gases.

MODEL 806 TEST KIT
BASIC OPERATING INSTRUCTIONS

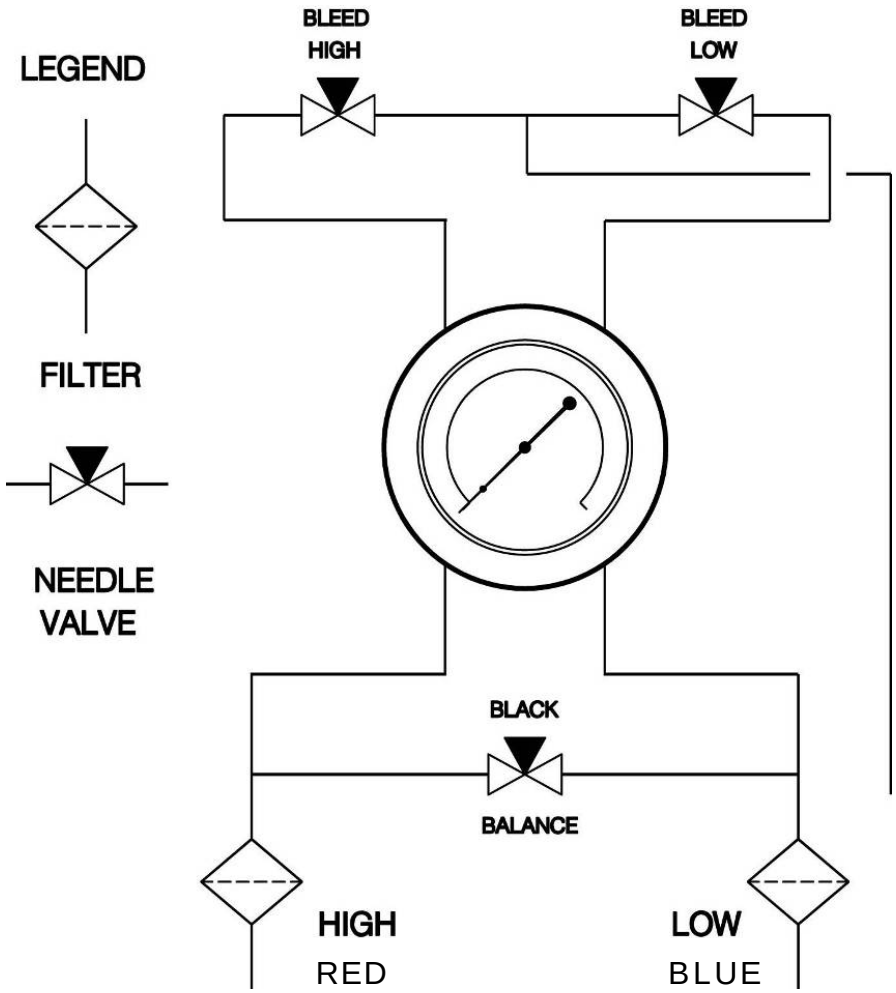
1. Connect hoses to test connections – red high pressure hose upstream, green low pressure hose downstream.
2. Open balance valve **(bottom of panel)**
3. Pull free end of clear plastic tubing from kit.
4. Open high and low bleed valves alternately to purge air from system. Bleed water discharges from convenient clear plastic flexible tubing.
5. When bleeding shows all air removed – close bleed valves, balance valve and read differential pressure.
6. When test is complete – open balance valve before disconnecting hoses from test connections.
7. Hoses are stored by coiling them around the test gauge panel.
8. Place clear plastic tubing inside case before closing lid.

For convenience I handling, the cover of the test kit is removable. Depress the pin spring of the top hinge, pull the hinge slightly apart and slide the cover off. To reinstall, reverse this procedure.

NOTE: The 806 Test Kit is equipped with in line filters near the ends of the hoses. If the gauges respond slowly to changes in the differential pressure the filter elements may be partially plugged.

To remedy this, unscrew the two halves of the filter housing and remove brass filter element. It may be cleaned by flushing with mild detergent and water. If, after reassembly this has not satisfactorily improved the response time a replacement filter element kit #98008 should be installed.

MODEL 806 TEST KIT SCHEMATIC DIAGRAM



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Bulletin No. 809/18
Supersedes Bulletin No. 809/14

Mid-West® Instrument

MODEL 809

PRECISION FLOW TEST KIT

Made In USA

Functions & Applications:

High accuracy portable test kit for precise flow indication and leak detection. This kit is equipped with a precise (±1% of full scale) accuracy Bourdon Tube Type differential pressure gauge. Popular applications include but are not limited to: measuring the pressure drop across various types of equipment i.e. filters, balancing HVAC systems, checking pump performance, orifice plates, checking calibration of transmitters, or reading flow directly when ordered with a square root dial etc. When being used the gauge should be placed in as nearly vertical position as possible. This gauge is position sensitive and accuracy may be less than stated, if not in a vertical position.

Product Features/Benefits:

- Over 30 Years of Input from Professional Testing Technicians
- Soft-Seated Brass Needle Valves (with replaceable valve seats)
- Test kit is protected with 90 micron filters to minimize plugging with scale, sand, etc. Filter elements can be cleaned or replaced
- Durable Molded Plastic Carrying Case with Removable lid
- Test Procedures are Laminated in Clear Plastic
- 5 Year Warranty

Specifications:

- Gauge Type: “Bourdon Tube” Differential Pressure
- Dial Size: 4-1/2” Standard (6” Optional)
- Range (4-1/2") 0-15 PSID thru 0-500 PSID ranges available
- Differential Pressure Accuracy:
  ±1% Full Scale (Ascending) Std (**Accuracy: ±1/2% Full Scale available)**
- Working Pressure: 500 PSIG (Standard)
- Gauge Material: Aluminum Body & Copper Alloy Internals
- Wetted Internals: Buna-N Seals, Aluminum & Copper Alloy
- Hoses & End Fittings: Nitrile Jacket and liner. Schrader 1/4" brass coupler **(Connects with 1/4” 37° Flare Male Fittings)**
- Valves: Soft-Seated Brass
- Tubing & Fittings: Nylon & Brass
- Hose Length: 10' long (3 meter)
- Filters: 90 Micron Brass **(Order Replacement Filter Kit No. 98008)**
- Approximate Shipping Wgt: 15 lbs / 6.8 kg
- Case: Polyethylene
- Dimensional Data: 13.75" x 15.5” x 8.5"
- Temperature Limitations: Maximum 150°F/65°C
  Freezing Temperatures must be avoided

Model 809 plumbed for water service only. Please contact the factory for assistance on kits for use with other liquids or gases.

MODEL 809 TEST KIT
BASIC OPERATING INSTRUCTIONS

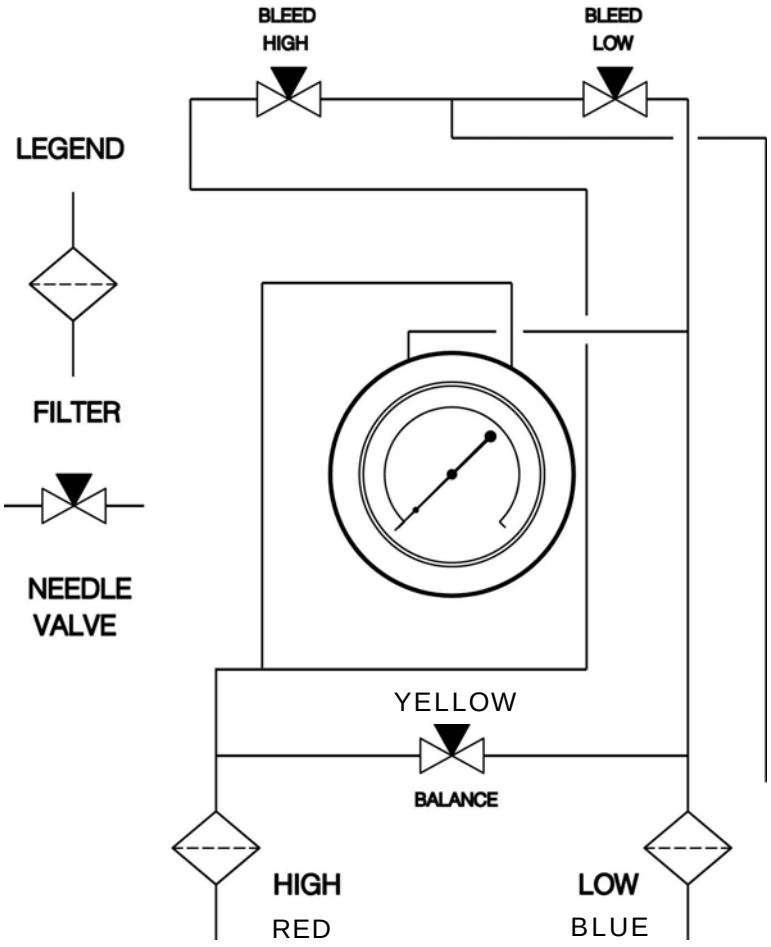
1. Connect hoses to test connections – red high pressure hose upstream, green low pressure hose downstream.
2. Open balance valve **(bottom of panel)**
3. Pull free end of clear plastic tubing from kit.
4. Open high and low bleed valves alternately to purge air from system. Bleed water discharges from convenient clear plastic flexible tubing.
5. When bleeding shows all air removed – close bleed valves, balance valve and read differential pressure.
6. When test is complete – open balance valve before disconnecting hoses from test connections.
7. Hoses are stored by coiling them around the test gauge panel.
8. Place clear plastic tubing inside case before closing lid.

For convenience I handling, the cover of the test kit is removable. Depress the pin spring of the top hinge, pull the hinge slightly apart and slide the cover off. To reinstall, reverse this procedure.

NOTE: The 809 Test Kit is equipped with in line filters near the ends of the hoses. If the gauges respond slowly to changes in the differential pressure the filter elements may be partially plugged.

To remedy this, unscrew the two halves of the filter housing and remove brass filter element. It may be cleaned by flushing with mild detergent and water. If, after reassembly this has not satisfactorily improved the response time a replacement filter element kit #98008 should be installed.

MODEL 809 TEST KIT SCHEMATIC DIAGRAM



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Bulletin No. 82018
Supersedes Bulletin No. 820/14

Mid-West® Instrument

MODEL 820
PRECISION FLOW TEST KIT

Made In USA

Functions & Applications:

Rugged Medium Duty Portable Test Kit. This test kit is equipped with a piston type differential pressure gauge. Popular applications include but are not limited to, measuring pressure drop across various types of equipment, filters, checking pump performance, balancing valves, checking equipment for excessive pressure drop, leakage, etc.

Product Features/Benefits:

- Over 30 Years of Input from Professional Testing Technicians
- Test kit is protected with 90 micron filters to minimize plugging with scale, sand, etc. Filter elements can be cleaned or replaced
- Durable Molded Plastic Carrying Case
- Test Procedures are Laminated in Clear Plastic
- 5 Year Warranty

Specifications:

- Gauge Type: “Piston” Differential Pressure
- Dial Size: 2-1/2”
- Range: 0-5 PSID thru 0-100 PSID ranges available
- Differential pressure Accuracy: ±3/2/3% Full Scale (Ascending)
- Working Pressure: 500 PSIG (Standard)
- Gauge Material: Aluminum Body & 316 S.S. Internals
- Wetted Internals: Buna-N Seals, Aluminum & 316 Stainless Steel
- Hoses & End Fittings: Nitrile Jacket and liner. Schrader 1/4" brass coupler **(Connects with 1/4” 37° Flare Male Fittings).**
- Tubing & Fittings: Nylon & Brass
- Hose Length: 5' long (1.5 meter)
- Filters: 90 Micron Brass **(Order Replacement Filter Kit No. 98008)**
- Approximate Shipping Wgt: 3.5 lbs / 1.6 kg
- Case: Polyethylene
- Dimensional Data: 12.25" x 6” x 7"
- Temperature Limitations: Maximum 150°F/65°C **Freezing Temperatures must be avoided**

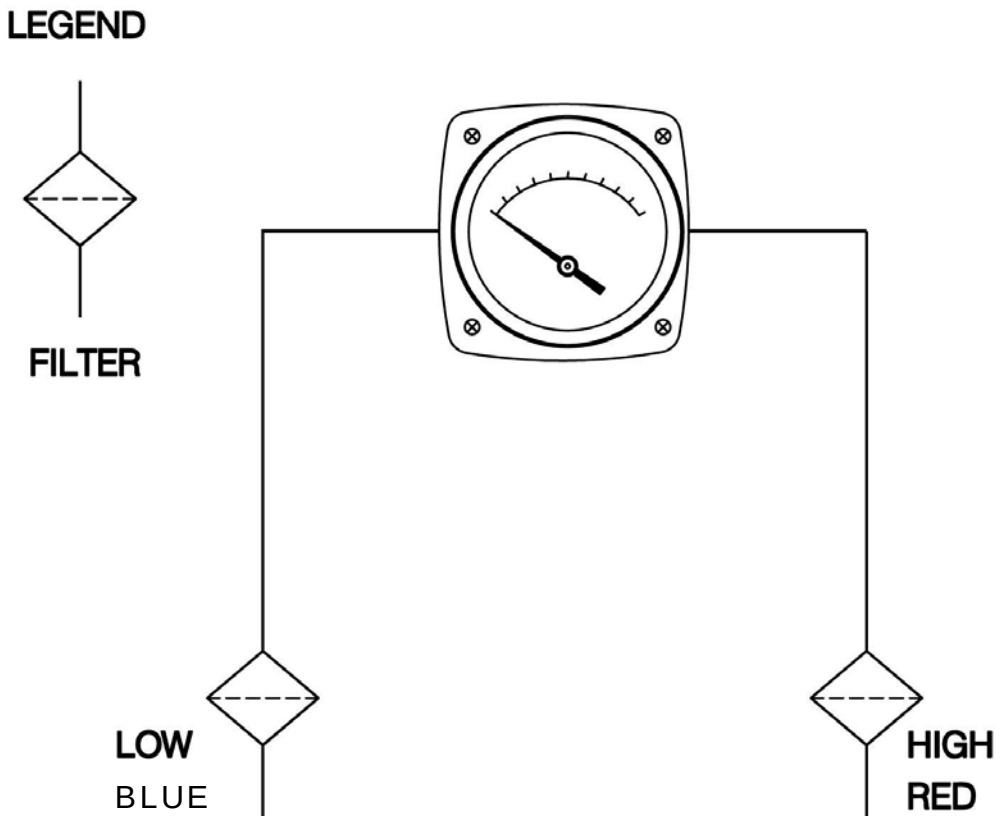
MODEL 820 TEST KIT
BASIC OPERATING INSTRUCTIONS

1. Connect hoses to test connections – red high pressure hose upstream and green low pressure hose downstream
2. Open valves on device being tested and read differential.
3. Upon completion of test close valves, disconnect hoses and store them in test kit case.

NOTE: The 820 Test Kit is equipped with in line filters near the ends of the hoses. If the gauges respond slowly to changes in the differential pressure the filter elements may be partially plugged.

To remedy this, unscrew the two halves of the filter housing and remove brass filter element. It may be cleaned by flushing with mild detergent and water. If, after reassembly this has not satisfactorily improved the response time a replacement filter element kit #98008 should be installed.

MODEL 820 TEST KIT
SCHEMATIC DIAGRAM



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Bulletin No. 831/18
Supersedes Bulletin No. 831/14

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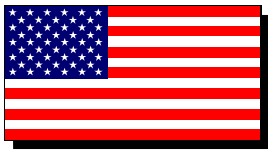
MODEL 831
PRECISION FLOW TEST KIT



Made In USA

Functions & Applications:

Sensitive yet rugged medium duty portable test kit. This test kit is equipped with a diaphragm type differential pressure gauge. Ideally suited for applications where differential pressures of 0-5" to 0-400" H_2O may be encountered. Popular applications are balancing heating & cooling systems, checking pump performance, leakage, checking equipment for excessive pressure drop, (i.e. filters, balancing valves, averaging pitot tubes, orfice plates etc.) Dials may be for reading differential pressure, or reading flow directly, if ordered with a flow (square root) dial.

Product Features/Benefits:

- Over 30 Years of Input from Professional Testing Technicians
- Soft-Seated Brass Needle Valves (with replaceable valve seats)
- Test kit is protected with 90 micron filters to minimize plugging with scale, sand, etc. Filter elements can be cleaned or replaced
- Durable Molded Plastic Carrying Case with Removable lid
- Test Procedures are Laminated in Clear Plastic
- 5 Year Warranty

Specifications:

- Gauge Type: "Diaphragm" Differential Pressure
- Dial Size: 4-1/2"
- Range: 0-10" H2O thru 0-400" H2O ranges available
- Differential Pressure Accuracy:
  0-5" H2O thru 0-9.9" H2O ±5% Full Scale (Ascending)
  0-10" H2O thru 0-400" H2O ±3/2/3% Full Scale (Ascending)
- Working Pressure: 300 PSIG (Standard)
- Gauge Material: Engineered Plastic Body & 316 S.S. Internals
- Wetted Internals: Buna-N Seal & Diaphragm, Plastic, Aluminum & S.S., Brass
- Hoses & End Fittings: Nitrile Jacket and liner. Schrader 1/4" brass coupler **(Connects with 1/4" 37° Flare Male Fittings).**
- Valves: Soft-Seated Brass
- Tubing & Fittings: Nylon & Brass
- Hose Length: 10' long (3.0 meter)
- Filters: 90 Micron Brass **(Order Replacement Filter Kit No. 98008)**
- Approximate Shipping Wgt: 12 lbs / 5.5 kgs
- Case: Polyethylene
- Dimensional Data: 13.75" x 15.5" x 8.5"
- Temperature Limitations: Maximum 150°F/65°C
  Freezing Temperatures must be avoided

MODEL 831 TEST KIT
BASIC OPERATING INSTRUCTIONS

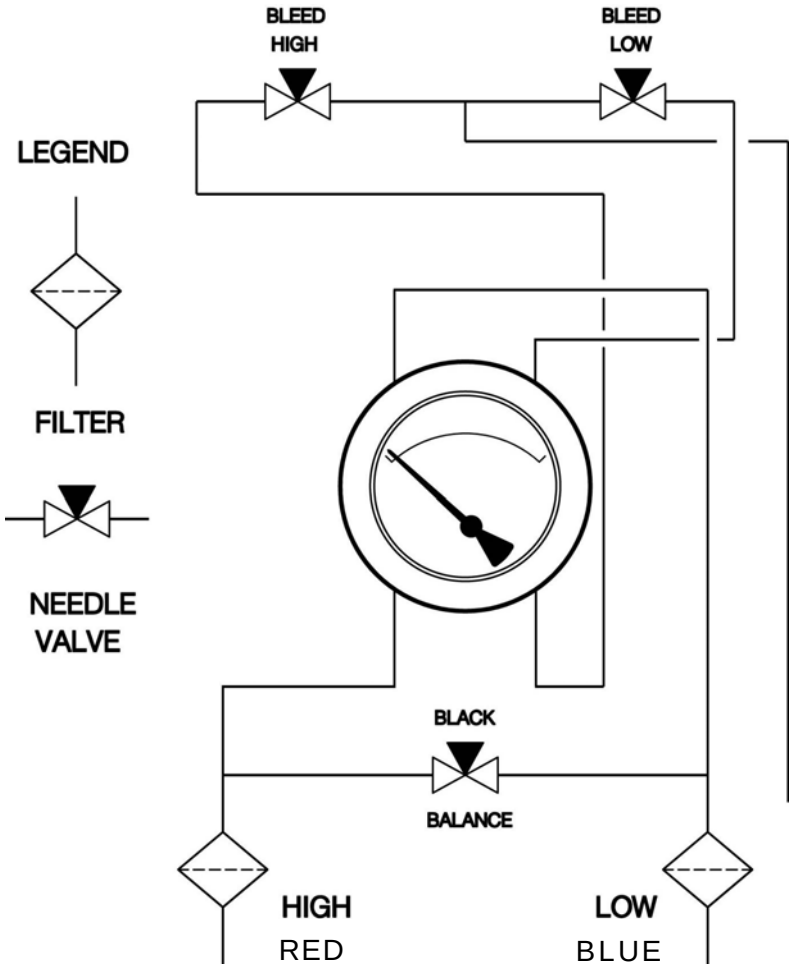
1. Connect hoses to test connections – red high pressure hose upstream, green low pressure hose downstream.
2. Open balance valve **(bottom of panel)**
3. Pull free end of clear plastic tubing from kit.
4. Open high and low bleed valves alternately to purge air from system. Bleed water discharges from convenient clear plastic flexible tubing.
5. When bleeding shows all air removed – close bleed valves, balance valve and read differential pressure.
6. When test is complete – open balance valve before disconnecting hoses from test connections.
7. Hoses are stored by coiling them around the test gauge panel.
8. Place clear plastic tubing inside case before closing lid.

For convenience I handling, the cover of the test kit is removable. Depress the pin spring of the top hinge, pull the hinge slightly apart and slide the cover off. To reinstall, reverse this procedure.

NOTE: The 831 Test Kit is equipped with in line filters near the ends of the hoses. If the gauges respond slowly to changes in the differential pressure the filter elements may be partially plugged.

To remedy this, unscrew the two halves of the filter housing and remove brass filter element. It may be cleaned by flushing with mild detergent and water. If, after reassembly this has not satisfactorily improved the response time a replacement filter element kit #98008 should be installed.

MODEL 831 TEST KIT SCHEMATIC DIAGRAM



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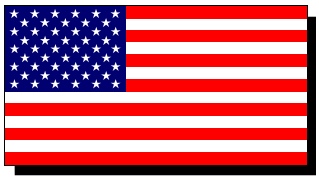
Bulletin No. 841/18
Supersedes Bulletin No. 841/14

Mid-West® Instrument

MODEL 841
PRECISION FLOW TEST KIT



Made In USA

Functions & Applications:

Rugged Medium Duty Portable Test Kit. This test kit is equipped with a diaphragm type differential pressure gauge. Popular applications include but are not limited to, measuring pressure drop across various types of equipment, filters, checking pump performance, balancing valves, checking equipment for excessive pressure drop, leakage, etc.

Product Features/Benefits:

- Over 30 Years of Input from Professional Testing Technicians
- Test kit is protected with 90 micron filters to minimize plugging with scale, sand, etc. Filter elements can be cleaned or replaced
- Durable Molded Plastic Carrying Case
- Test Procedures are Laminated in Clear Plastic
- 5 Year Warranty

Specifications:

- Gauge Type: “Diaphragm” Differential Pressure
- Dial Size: 2-1/2”
- Range: 0-50” H2O thru 0-100 PSID ranges available
- Differential Pressure Accuracy:
  0-50” thru 0-399.9” H2O ±5% Full Scale (Ascending)
  0-400” H2O thru 0-100 PSID ±3-2-3% Full Scale (Ascending)
- Working Pressure: 500 PSIG (Standard)
- Gauge Material: Aluminum Body & 316 S.S. Internals
- Wetted Internals: Buna-N Seal & Diaphragm, Aluminum & 316 Stainless Steel
- Hoses & End Fittings: Nitrile Jacket and liner. Schrader 1/4" brass coupler **(Connects with 1/4” 37° Flare Male Fittings).**
- Tubing & Fittings: Nylon & Brass
- Hose Length: 5' long (1.5 meter)
- Filters: 90 Micron Brass **(Order Replacement Filter Kit No. 98008)**
- Approximate Shipping Wgt: 8 lbs / 3.6 kgs
- Case: Polyethylene
- Dimensional Data: 12.25" x 6” x 7"
- Temperature Limitations: Maximum 150°F/65°C
  Freezing Temperatures must be avoided

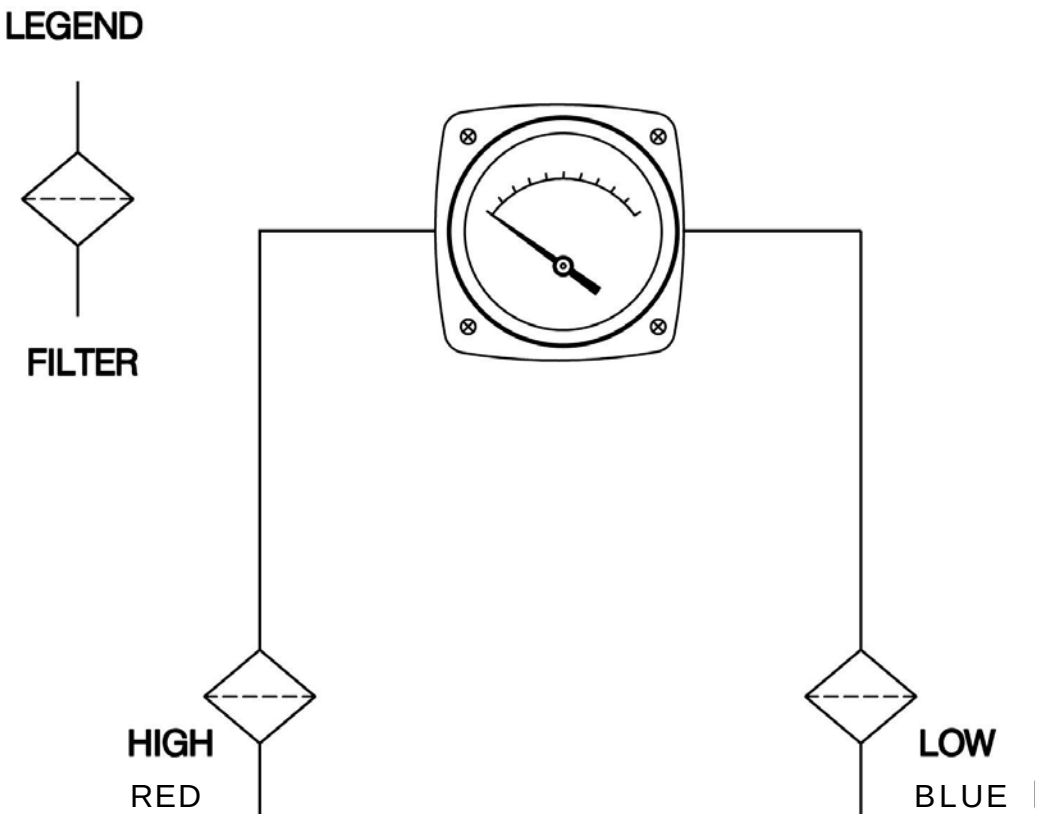
MODEL 841 TEST KIT
BASIC OPERATING INSTRUCTIONS

1. Connect hoses to test connections – red high pressure hose upstream and green low pressure hose downstream
2. Open valves on device being tested and read differential.
3. Upon completion of test close valves, disconnect hoses and store them in test kit case.

NOTE: The 841 Test Kit is equipped with in line filters near the ends of the hoses. If the gauges respond slowly to changes in the differential pressure the filter elements may be partially plugged.

To remedy this, unscrew the two halves of the filter housing and remove brass filter element. It may be cleaned by flushing with mild detergent and water. If, after reassembly this has not satisfactorily improved the response time a replacement filter element kit #98008 should be installed.

MODEL 841 TEST KIT
SCHEMATIC DIAGRAM



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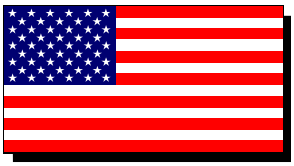
Bulletin No. 842/18
Supersedes Bulletin No. 842/14

Mid-West® Instrument

MODEL 842
PRECISION FLOW TEST KIT



Made In USA

Functions & Applications:

Rugged (2) gauge medium duty portable flow test kit. This kit is equipped with two differential pressure gauges (1) Diaphragm Type and (1) Piston Type gauge with complimentary dials ranges. Both gauges are protected against over-range to the maximum working pressure of the test kit. While primarily used for balancing HVAC systems it has numerous other applications which include but are not limited to: checking pump performance, checking pressure drop across filters, leakage, etc…

Product Features/Benefits:

- Over 30 Years of Input from Professional Testing Technicians
- Combination kit includes both 820 & 841 Flow test gauges
- Test kit is protected with 90 micron filters to minimize plugging with scale, sand, etc. Filter elements can be cleaned or replaced
- Durable Molded Plastic Carrying Case
- Test Procedures are Laminated in Clear Plastic
- 5 Year Warranty

Specifications:

- Gauge Type: **(1)** “Piston” & **(1)** “Diaphragm” Differential Pressure
- Dial Size: **(2)** 2-1/2”
- Range: 0-50” H2O thru 0-100 PSID ranges available
- Differential Pressure Accuracy:
  (841) 0-50" H2O to 0-400" H2O (±5%) 0-15 PSID to 0-100 PSID (±3/2/3%)
  (820) 0-5 PSID to 0-100 PSID (±3/2/3%)
- Working Pressure: 500 PSIG (Standard)
- Gauge Material: **(2)** Aluminum Body & 316 S.S. Internals
- Wetted Parts: Buna-N Seal & Diaphragm, Brass, Aluminum & 316 Stainless Steel
- Hoses & End Fittings: Nitrile Jacket and liner. Schrader 1/4" brass coupler
  (Connects with 1/4” 37° Flare Male Fittings).
- Tubing & Fittings: Nylon & Brass
- Hose Length: 5' long (1.5 meter)
- Filters: 90 Micron Brass **(Order Replacement Filter Kit No. 98008)**
- Approximate Shipping Wgt: 10 lbs / 4.5 kg
- Case: Polyethylene
- Dimensional Data: 12.25" x 6” x 7"
- Temperature Limitations: Maximum 150°F/65°C
  Freezing Temperatures must be avoided

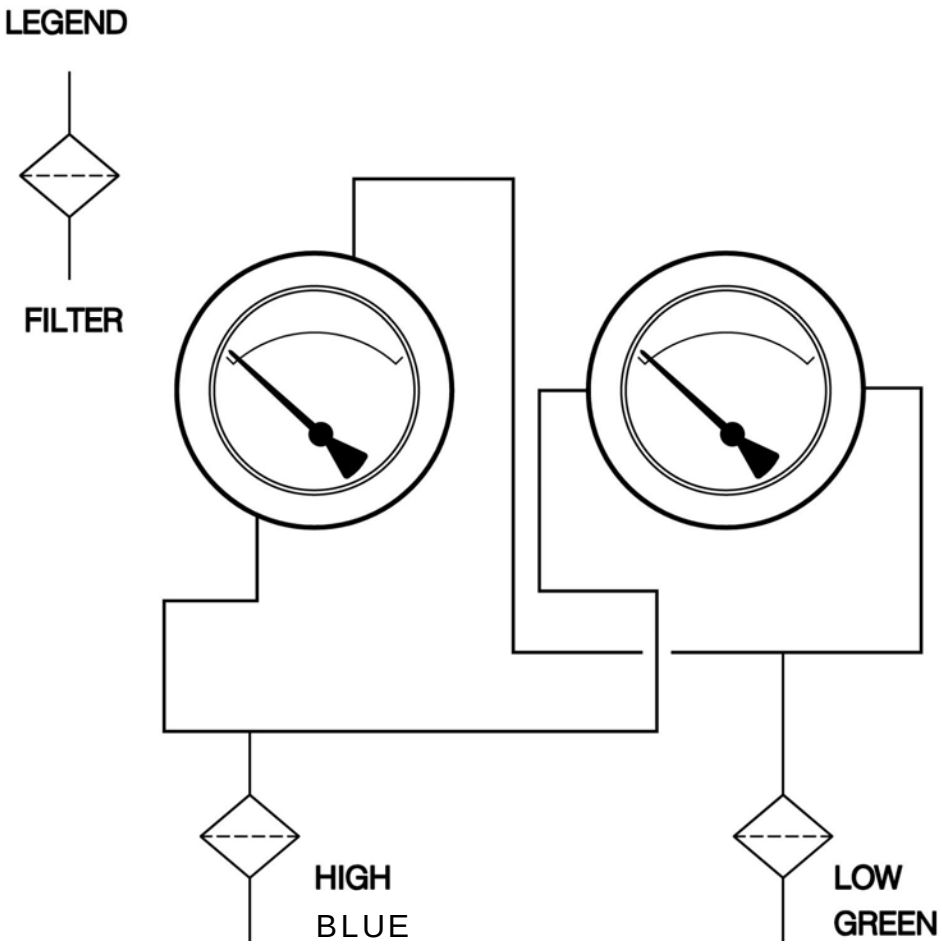
MODEL 842 TEST KIT
BASIC OPERATING INSTRUCTIONS

1. Connect hoses to test connections – red high pressure hose upstream and green low pressure hose downstream
2. Open valves on device being tested and read differential.
3. Upon completion of test close valves, disconnect hoses and store them in test kit case.

NOTE: The 842 Test Kit is equipped with in line filters near the ends of the hoses. If the gauges respond slowly to changes in the differential pressure the filter elements may be partially plugged.

To remedy this, unscrew the two halves of the filter housing and remove brass filter element. It may be cleaned by flushing with mild detergent and water. If, after reassembly this has not satisfactorily improved the response time a replacement filter element kit #98008 should be installed.

MODEL 842 TEST KIT
SCHEMATIC DIAGRAM



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Bulletin No. 843/18
Supersedes Bullen No. 843/14

Mid-West® Instrument

MODEL 843

PRECISION FLOW TEST KIT

Made In USA

Functions & Applications:

Rugged (2) gauge medium duty portable flow test kit. This kit is equipped with two Diaphragm Type differential pressure gauges with complimentary dials ranges, enabling it to cover a broad range of differential pressures. Both gauges are protected against over-range to the maximum working pressure of the test kit. While primarily used for balancing HVAC systems it has numerous other applications which include but are not limited to: checking pump performance, checking pressure drop across filters, leakage, etc…

Product Features/Benefits:

- Over 30 Years of Input from Professional Testing Technicians
- Combination kit includes both 831 & 841 Flow test gauges
- Test kit is protected with 90 micron filters to minimize plugging with scale, sand, etc. Filter elements can be cleaned or replaced.
- Durable Molded Plastic Carrying Case
- Test Procedures are Laminated in Clear Plastic
- 5 Year Warranty

Specifications:

- Gauge Type: **(2)** “Diaphragm” Differential Pressure
- Dial Size: **(2)** 4-1/2”
- Range: 0-5” H2O thru 0-100 PSID ranges available
- Differential Pressure Accuracy:
  (831) 0-5” H2O thru 0-9.9” H2O ±5% / 0-10” thru 0-400” H2O) ±3-2-3% Full Scale (Ascending)
  (841) 0-50” H2O thru 0-400” H2O ±5% / 0-15 PSID thru 0-100 PSID ±3-2-3% Full Scale (Ascending)
- Working Pressure: 300 PSIG (Standard)
- Gauge Material: **(1)** Engineered Plastic Body **(1)** Aluminum Body & 316 S.S. Internals
- Wetted Internals: Buna-N Seal & Diaphragm, Plastic, Aluminum & S.S., Brass
- Hoses & End Fittings: Nitrile Jacket and liner. Schrader 1/4" brass coupler
  (Connects with 1/4” 37° Flare Male Fittings).
- Tubing & Fittings: Nylon & Brass
- Hose Length: 5' long (1.5 meter)
- Filters: 90 Micron Brass **(Order Replacement Filter Kit No. 98008)**
- Approximate Shipping Weight: 12 lbs / 5.5 kgs
- Case: Polyethylene
- Dimensional Data: 16.5" x 7.25” x 9"
- Temperature Limitations: Maximum 150°F/65°C
  Freezing Temperatures must be avoided

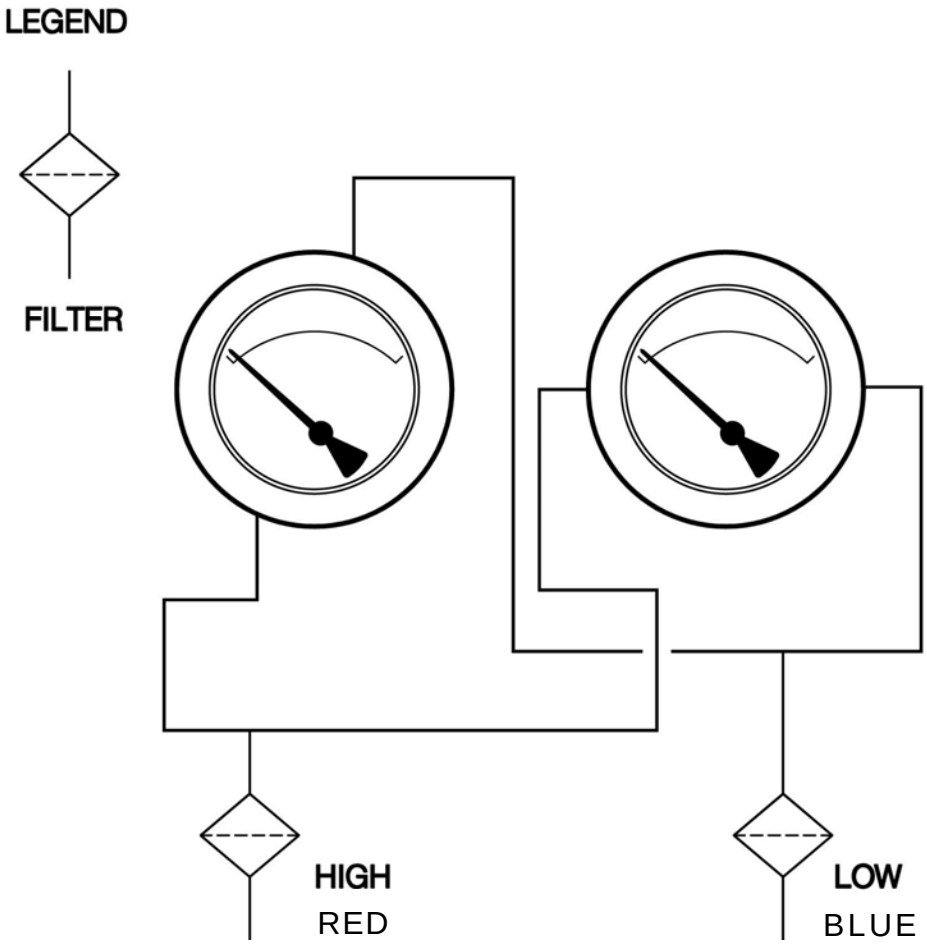
MODEL 843 TEST KIT
BASIC OPERATING INSTRUCTIONS

1. Connect hoses to test connections – red high pressure hose upstream and green low pressure hose downstream
2. Open valves on device being tested and read differential.
3. Upon completion of test close valves, disconnect hoses and store them in test kit case.

NOTE: The 843 Test Kit is equipped with in line filters near the ends of the hoses. If the gauges respond slowly to changes in the differential pressure the filter elements may be partially plugged.

To remedy this, unscrew the two halves of the filter housing and remove brass filter element. It may be cleaned by flushing with mild detergent and water. If, after reassembly this has not satisfactorily improved the response time a replacement filter element kit #98008 should be installed.

MODEL 843 TEST KIT
SCHEMATIC DIAGRAM



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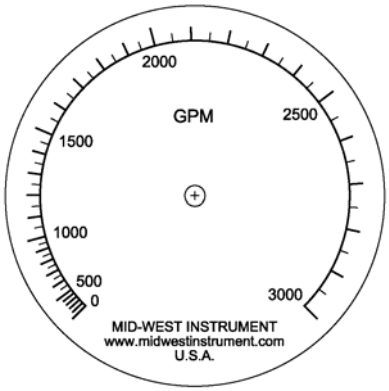
Flow Measurement Made Easy

Mid-West Instrument has the right Flow Scale for You.

- **From DP Gauge to Flow Measurement**
- **Easy to read dials**
- **Body materials of Aluminum, Brass, Stainless Steel, and more depending on model selected**
- **Models 105, 106, 109, 130, 140 & 142**
- **With or without switch / transmitter**
- **GPM, ACFM, SCFM, LBS/HR and more.**

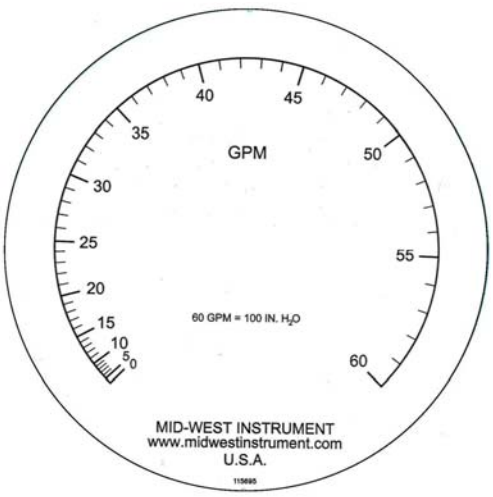


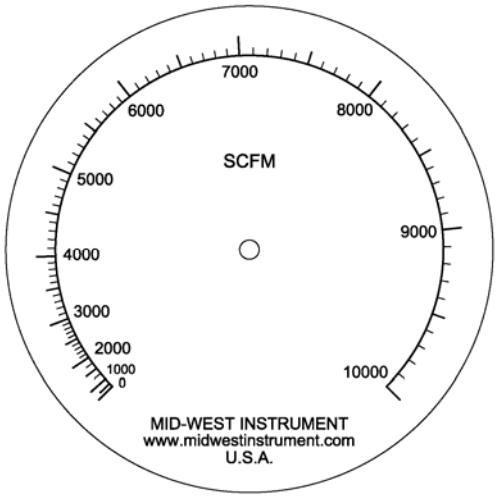
How we calibrate your flow scale.
Example:
DP Calibration Range = 200" H2O
200" H2O = Dial Scale of 0-3000 GPM

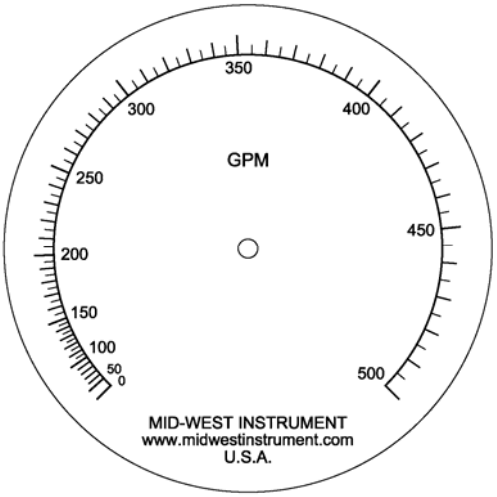
Flow measurement using Mid-West Instrument differential pressure gauge technology will provide accuracy and reliability you've come to know and trust. Our industrial quality differential pressure flow gauge uses modern materials and current technology to provide an easy to read flow scale.

Mid-West differential pressure flow gauges indicate such flow rates as liters per minute up to gallons per hour, even when used at high line pressures. Units can be supplied with reed switches or relays to initiate alarms, activate other equipment, or shut the system down. Two switches are available when high and low limits are required. 4-20 mA Transmitter also available on select models please contact a sales coordinator for more information.

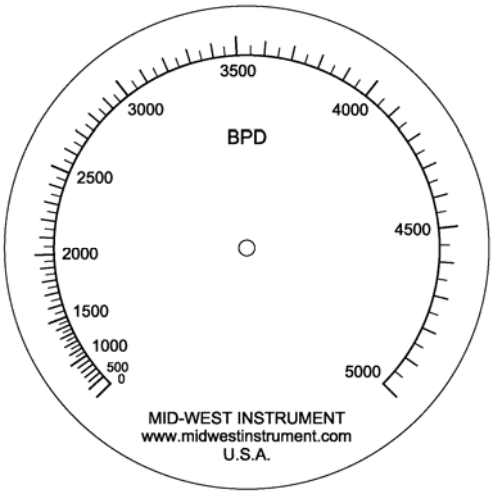
Here are some typical flow designators: ***GPM, BPD, ACFM, SCFM, NM3/HR, LBS/HR, L/MIN, L/SEC, KG/HR, TONS/HR***.

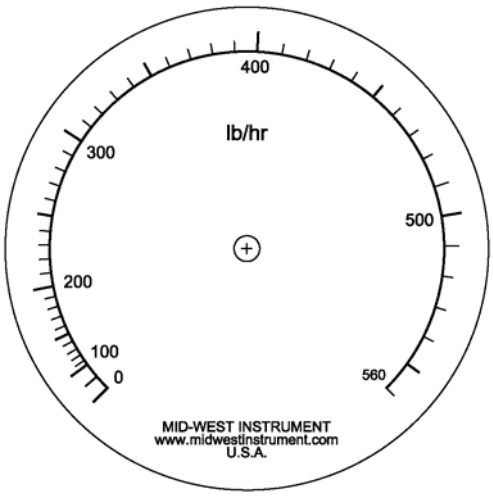


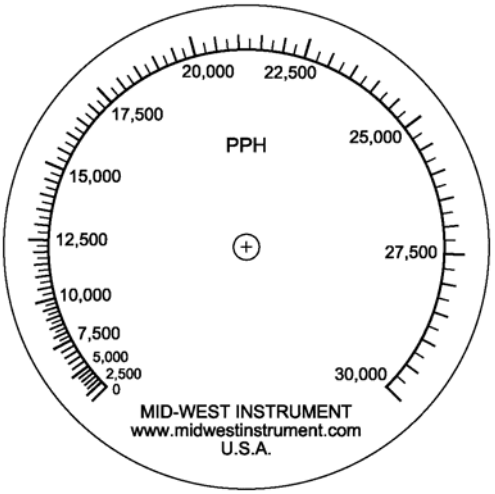




- **Model 105/106** Range: 0-10" H2O to 0-30 PSID (25 mbar to 2 bar)
- **Model 109** DP Range: 0-15 PSID (0-1.0 bar) to 0-6000 PSID (0-400 bar)
- ***± 1% Full Scale Accuracy***
- Dial Ranges are available in either LINEAR or SQUARE ROOT FLOW SCALES

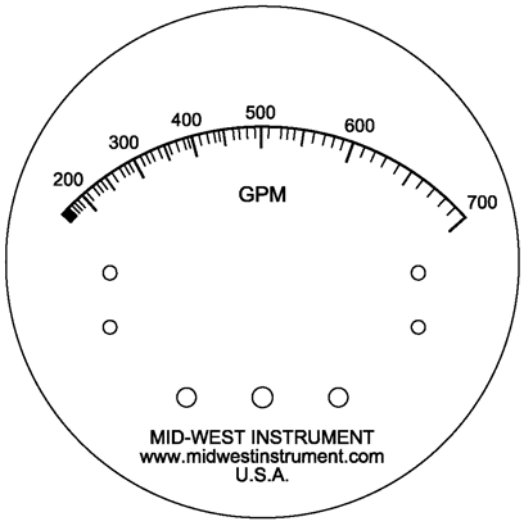






Available Flow Scales for Models: 105, 106, & 109

Uni-Directional Dial Ranges are available in either LINEAR or SQUARE ROOT FLOW SCALES with any appropriate legend (I.E. GPM, SCFM, USGPM, NM3/HR, L/MIN, ETC) at no extra charge		
0-0.5	0-30	0-300
0-1.0	0-35	0-400
0-1.6	0-40	0-500
0-2.0	0-50	0-600
0-3.0	0-60	0-700
0-4.0	0-70	0-800
0-5.0	0-75	0-900
0-6.0	0-80	0-1000
0-7.0	0-100	0-1500
0-8.0	0-135	0-1600
0-10	0-150	0-2000
0-15	0-160	0-3000
0-20	0-200	0-4000
0-25	0-250	0-5000
		0-6000



- **Model 130**
- **Range: 0-5" H2O to 0-400" H2O**

0-5" to 0-9.9" H2O
± 5% Full Scale Accuracy
0-10" to 0-400" H2O ± 3/2/3%
Full Scale Accuracy

- **Model 140**
- **Range: 0-50" H2O to 0-100 PSID**

0-50" H2O to 0-399" H2O
± 5% Full Scale Accuracy
0-15 PSID to 0-100 PSID
± 3/2/3% Full Scale Accuracy

- **Model 142**
- **Range: 0-20" H2O to 0-25 PSID**

± 3/2/3% Full Scale Accuracy

Dial Ranges are available in either
LINEAR or SQUARE ROOT FLOW SCALES

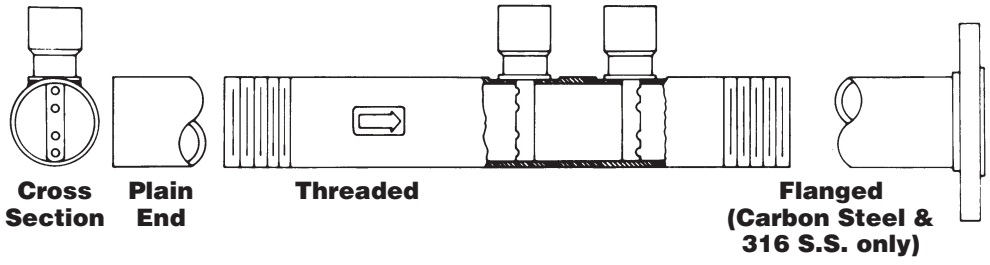
Available Flow Scales for Models: 130, 140, 142

Uni-Directional Dial Ranges are available in either LINEAR or SQUARE ROOT FLOW SCALES with any appropriate legend (I.E.GPM, SCFM, USGPM, NM3/HR, L/MIN, ETC) at no extra charge		
Model 130 Flow Dials		**Models 140/142 Flow Dials**
0-1.0		0-1.0
0-1.25		0-1.5
0-1.5		0-2.0
0-1.75		0-2.5
0-2.0		0-5.0
0-2.5		0-7.5
0-3.0		0-10.0
0-3.5		
0-4.0		
0-4.5		
0-5.0		
0-5.5		
0-6.0		
0-6.5		
0-7.0		
0-7.5		
0-8.0		
0-8.5		
0-9.0		
0-9.5		
0-10		
Available Multipliers for Flow Dials: X10, X100, X1000, and X10,000		
Note: Not all ranges available in all diaphragm materials		

Mid-West Instrument also offers Flow Test kits for your portable flow test applications.
See Flow Test Kit section for more information.

BULLETIN NO. 300/02
(Supersedes 300/00)

MODEL 300



Functions & Applications:

An inline flow element for measurement of flow in pipe lines from 1/2" (nominal) through 3" (nominal)

Specifications:

Materials		Carbon Steel (a)		316 Stainless Steel (b)		CPVC Solvent Welded
Pipe Size		1/2", 3/4", 1", 1 1/2", 2", 2 1/2", 3"				1/2", 3/4", 1", 1 1/2", 2", 2 1/2", 3" Schedule 80 only
End Connections		Threaded	Welded	Threaded	Welded	Threaded - Standard Plain End - Optional
Working Pressure (PSIG) Carbon Steel Based on -20 to 600°F 316 S.S. Based on -20 to 200°F CPVC (Water Service) Up to 73.4°F (23°C) For other media and/or temperatures, see Engineering Data.	**Pipe Size**	**Schedule 40**	**Schedule 40**	**Schedule 40**	**Schedule 40**	**Schedule 80**
	1/2	1320	2950	2080	4640	300
	3/4	1130	2400	1770	3770	240
	1	1020	2240	1600	3520	220
	1 1/2	830	1660	1310	2600	170
	2	740	1390	1170	2190	140
	2 1/2	750	1530	1180	2400	150
	3	690	1320	1080	2080	130
NOTES:		For flange applications, see ASME/ANSI B16.5 or Mid-West Bulletin No. ASDE/Latest. (a) Pressures & Temperatures are based on ASTM A53 Grade A Welded Schedule 40 Carbon Steel Pipe. (b) Pressures & Temperatures are based on ASTM A 312 TP 316 Welded Schedule 40 Stainless Steel Pipe. For additional System Pressure (PSIG) vs Temperature (°F) see Mid-West Bulletin No. ASDE/Latest.				
Instrument Connections		1/4" FNPT (Standard), 1/2" (Optional for C.S. or S.S. only)				

Special Features:

Utilizes two averaging flow elements of equal area to sense stagnation (RAM) and static differential pressure providing minimum permanent pressure loss.

Related Products Available:

Indicators & Switches	A broad selection of indicators, with or without switching, are available. For details, please refer to Mid-West Bulletins on Models 105 & 130.
Portable Indicators	A wide variety of portable indicators are also available. Please see Mid-West Bulletin 800/Latest.

Part Numbering System

3 0 0 - A A - 0 0 - A A

1 Basic Model Number

2 Material
A - Steel
B - 316 Stainless Steel
C - CPVC

3 Size
(Nominal Pipe Size)
A - 1/2"
B - 3/4"
C - 1"
D - 1 1/2"
E - 2"
F - 2 1/2"
G - 3"

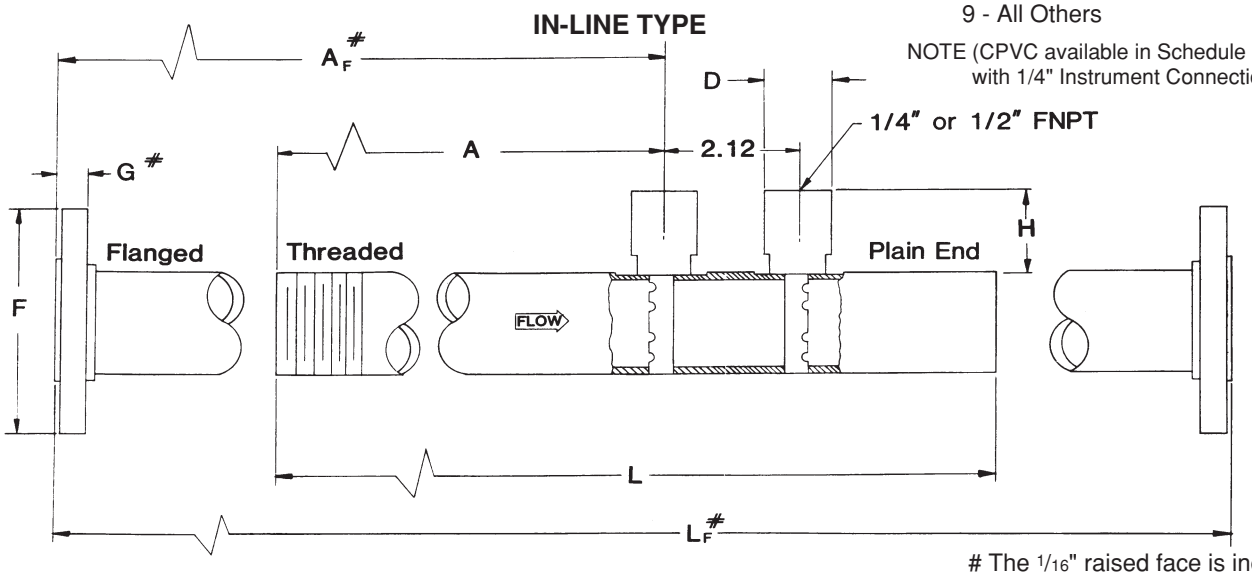
4 Pipe Schedule
0 - Schedule 40
1 - Schedule 80
9 - All Others

5 Construction
0 - Solvent Welded CPVC
1 - Welded (Steel & Stainless Steel)

6 Instrument Connections
A - 1/4" FNPT (Standard)
B - 1/2" FNPT (Optional)

7 End Configuration
A - Threaded
F - Flanged (150# RF)
P - Plain End
Z - All Others

NOTE (CPVC available in Schedule 80 only & with 1/4" Instrument Connections only)



The 1/16" raised face is included in thickness "G" and length A_F & L_F

Dimensional Data

Manufacturer reserves the right to change specifications without prior notice.

Pipe Size (Nominal)	L	A	A_F	H	D		F	G	L_F
				(Max.)	1/4" FNPT	1/2" FNPT	Flanged Only*		
1/2"	6"	2 3/16"	2 7/16"	1.38			3.5	.44	6.62
3/4"	6"	2 3/16"	2 3/8"	1.38			3.88	.50	6.53
1"	8"	3 11/16"	3 7/8	1.38			4.25	.56	8.5
1 1/2"	8"	3 11/16"	3 15/16"	1.38	.75	1.12	5.0	.69	8.63
2"	10"	4 15/16"	5 1/4"	1.38			6.0	.75	10.75
2 1/2"	10"	4 15/16"	5 5/16"	1.38			7.0	.88	10.87
3"	12"	5 15/16"	6 5/16"	1.38			7.5	.94	13.0

*** Dimensions are for socket weld flanges (150 lb.). For other flange ratings consult factory.**

REPRESENTED BY

Mid-West®
Instrument

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BULLETIN NO. 126-127/18
(SUPERSEDES BULLETIN NO. 126-127/15)

Mid-West® Instrument

O.E.M "Piston Type"

Differential Pressure Gauges & Switches

Models 126 & 127

Common Applications

- Filter Monitoring
- Strainer Monitoring
- Water System Applications
- Refrigerant Filtration Systems

126/127 Specifications:

- (126) Differential Pressure Range 0-5 PSID (0-0.35 bar) to 0-20 PSID (0-1.4 bar)
- (127) Differential Pressure Range 0-25 PSID (0-1.7 bar) to 0-100 PSID (0-7 bar)
- Accuracy ±5% Full Scale Ascending
- Dial Size
  - Single 1-1/4" x 2-1/4" Oval (Std.)
  - Dual 1-1/4" x 2-1/4" Oval (Opt.)
- Working Pressure 3,000 PSIG (200 bar)
- Operating Temp. -40º F To +200º F (-40ºC to 93ºC)
- Body Material - Aluminum (Std.), 316/316L SS (Opt.)
- Internal Materials - 316 Stainless Steel
- Elastomers - Buna-N (Std), Viton®* , Neoprene, Ethylene-Propylene,
- Switch Option
  - SPDT 3W, 125 VAC/VDC, 0.25 Amp
  - SPST 60W, 240 VAC/VDC, 3 Amp
- Switch Mounting Clamp On, Stick On Flat Pack
- Process Connections 1/8" FNPT Bottom (Std) 1/8" FNPT End Conn. (Opt.)
- Dimensions 1.25H" x 1.62W" x 2.48L"
- Weight 0.5#

* Viton® is a Registered Trademark of DuPont Dow Elastomers

Model 126/127 Bottom Connections Shown

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Model "126" 3000 PSIG Working Pressure, S.S. Piston, Aluminum or S.S. Body & End Plug, Accuracy ±5% F.S. (Ascending), 1/8" FNPT Bottom Mount, Range**: 0-5 PSID thru 0-20 PSID**

Model "127" 3000 PSIG Working Pressure, S.S. Piston, Aluminum or S.S. Body & End Plug, Accuracy ±5% F.S. (Ascending), 1/8" FNPT Bottom Mount, Range:
0-25 PSID thru 0-100 PSID

Gauge Body and internal components are considered wetted parts.

Special Box Car Number will be assigned to all "OEM" Gauges

1	2	6	–	0	0	0	0

example

Range:_____ Dial Color PSI Break Points _____

2	Material
A	Aluminum Body / Stainless Steel Piston
S	316 S.S Body / Stainless Steel Piston
Z	Special ***(Un-coded Options)***
3	**Dial Size & Type**
W	One
X	Two
Z	Special ***(Un-coded Options)***
4	**Seal Materials**
0	Buna-N
1	Viton®-A Registered Trademark of Dupont
2	Neoprene
5	Ethylene Propylene
9	Special ***(Un-coded Options)***
5	**Process Connections**
0	1/8" FNPT Bottom Connections
2	1/8" FNPT End Connections
9	Special ***(Un-coded Options)***
6	**Options**
O	None
Z	Special ***(Un-coded Options)***
7	**Electrical Configuration**
A	(1) Switch (clamp-on) *(Switch adjustable range 10 to 100%)*
B	(2) Switches (clamp-on) *(Switch adjustable range 10 to 100%)*
C	(1) Switch (Flat Pack) *(Non-Adjustable)*
D	(1) Switches (Flat Pack) *(Non-Adjustable)*
E	(1) Switch (clamp-on) *(Switch adjustable range ±15%)*
F	(2) Switches (clamp-on) *(Switch adjustable range ±15%)*
Z	Special ***(Un-coded Options)***
8	**Electrical Specifications**
A	SPDT 3W .025 Amp 125 VAC/VDC (Flat-Pack)
C	SPST 60W 3.0 Amp 240 VAC/VDC (Clamp-On &Flat-Pack)
Z	Special ***(Un-coded Options)***

**** Special "OEM" Box car number will be assign upon order.***

****Gauges must be purchased in quantities of 25 units.***

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Mid-West® Instrument

O.E.M "Diaphragm Type"
Differential Pressure Gauge & Switch
Model 146

Common Applications

- Filter monitor for initiating backwash cycles
- Strainer Monitoring
- Water Systems applications
- Hydro applications
- Pump performance monitoring
- Refrigerant filtration systems
- Replacement indicating switch for competitor switches that do not offer local indication

Specifications:

- Differential Pressure 0-50" H2O (0-125 mbar) to 0-30 PSID (0-2.0 bar)
- Accuracy ±5% Full Scale Ascending
- Dial Size
  - Single 1-1/4" x 2-1/4" Oval (Std.)
  - Dual 1-1/4" x 2-1/4" Oval (Opt.)
- Working Pressure 1,000 PSIG
- Operating Temp. -40º F To +200º F (-40ºC to 93ºC)
- Body Material – Aluminum, Brass & 316L Stainless Steel
- Internal Materials - 316 Stainless Steel
- Elastomers - Buna-N (Std), Viton®* , Silicone, Neoprene (25 PSID & Below), Ethylene Propylene
- Switch Option
  - SPDT 3W, 125 VAC/VDC, 0.25 Amp
  - SPST 60W, 240 VAC/VDC, 3 Amp
- Process Connections 1/8" FNPT Bottom
- Dimensions 1.7H" x 2.5W" x 2.9L"
- Weight 2.5#

* Viton® is a Registered Trademark of DuPont Dow Elastomers

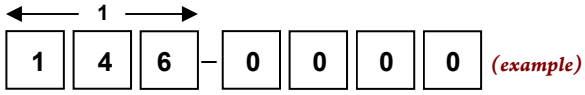
Operation: Differential pressure is sensed by flexible elastomer diaphragm and a calibrated spring. A magnetic coupling transmits the sensing element motion to an indicating pointer. This prohibits the possibility of fluid leaking into the gauge case, while assuring total isolation of the process fluid within the pressure capsule. The diaphragm assures total separation between high and low pressure signals. It is totally supported at full travel in either direction.

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.

Model "146" 1000 PSIG Working Pressure, Buna-N Diaphragm,
Aluminum, Brass or 316 Stainless Steel Body, 316 S.S. Internal Metal Parts
Accuracy ±5% F.S. (Ascending), 1/8" FNPT Bottom Mount
Range**: 0-50" H_2O thru 0-30 PSID**

Gauge Body and Internal components are considered wetted parts.

Special Box Car Number will be assigned to all "OEM" Gauges



(example)

Range:_____ Dial Color PSI Break Points _____

2	Material
A	Aluminum Body
B	Brass Body
S	316 Stainless Steel Body
Z	Special ***(Un-coded Options)***
3	**Dial Size & Type**
W	One
X	Two
Z	Special ***(Un-coded Options)***
4	**Seal Materials**
0	Buna-N
1	Viton®-A Registered Trademark of Dupont
2	Silicone
4	Neoprene *(25 PSID & below)*
5	Ethylene Propylene
9	Special ***(Un-coded Options)***
5	**Process Connections**
0	1/8" FNPT Bottom Connections
2	1/8" FNPT Back Connections
6	**Options**
O	None
Z	Special ***(Un-coded Options)***
7	**Electrical Configuration**
A	(1) Switch *(Non-Adjustable)*
B	(2) Switches *(Non-Adjustable)*
C	(1) Switch DIN Plug-In Connector *(Non-Adjustable)*
D	(1) Switch (Flat Pack) *(Non-Adjustable)*
E	(2) Switches (Flat Pack) *(Non-Adjustable)*
F	(1) Switch (Flat Pack) *(Switch Adjustable ±15%)*
G	(2) Switches (Flat Pack) *(Switch Adjustable ±15%)*
Z	Special ***(Un-coded Options)***
8	**Electrical Specifications**
A	SPDT 3W .025 Amp 125 VAC/VDC *(Flat-Pack)*
C	SPST 60W 3.0 Amp 240 VAC/VDC *(Clamp-On &Flat-Pack)*
Z	Special ***(Un-coded Options)***

****Product of switching voltage and current shall not exceed the power rating. Ratings are resistive loads.**

**** Special "OEM" Box car number will be assign upon order.***

****Gauges must be purchased in quantities of 25 units.***

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BULLETIN NO. 444/OEM/18
(Supersedes Bulletin NO. 444/11)

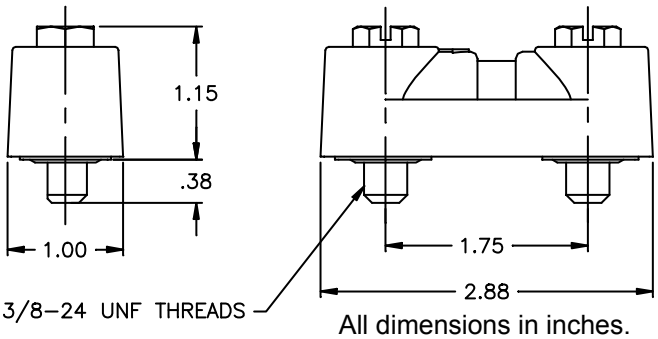
Mid-West® Instrument

O.E.M "Piston Type"

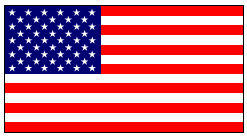
Differential Pressure Indicator

Model 444

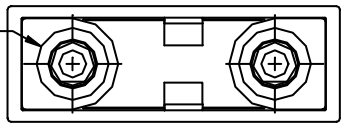
Model 444 Series differential pressure indicator offers a simple, yet functional design for use with filters, strainers, etc. This low cost indicator makes the perfect alternative to more costly differential pressure gauges where readability, small size and price are important considerations.



Made in the USA



FLAT AREA OF .625 DIA. MINIMUM REQUIRED ON MOUNTING SURFACE– FOR BOTH BOLTS



Model Number	DP Range	Transition Points	
		Piston Moves @	Indicator all Red @
444-05	0-5 PSID	3.75 PSI	5.25 PSI
444-10	0-10 PSID	7.75 PSI	10.5 PSI
444-15	0-15 PSID	11.75 PSI	15.5 PSI
444-25	0-25 PSID	18.75 PSI	27.0 PSI

Minimum Order Quantity
50 UNITS

OEM Applications Quoted
Please call with specifications.

SPECIFICATIONS:			Comments:
	Maximum Working Pressure	300 PSIG	
	Differential Pressure Ranges: **Contact factory for additonal ranges	0-5 thru 0-25 PSID**	
	Accuracy	± 5% of Rated Differential Pressure Range	Calibrated at Color Transitions
	Operating Temperature (Max.)	93°C (200°F)	
MATERIALS OF CONSTRUCTION:			
	Body Material	Glass Filled Nylon (GFN) 6/6 Body	
	Wetted Internals	Glass Filled Nylon & Stainless Steel	
	Elastomers	Buna-N	
	Lens	Clear Nylon	
INTERFACE:			
	Process Connection:	Slotted Hex Bolt 3/8-24 UNF Chamfered Bolts Ease Installation	Flow Direction Identified on Indicator Body. Arrow Points to Low Pressure Port.

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BULLETIN NO. 555/OEM/18
(SUPERSEDES BULLETIN NO. 555/444/11)

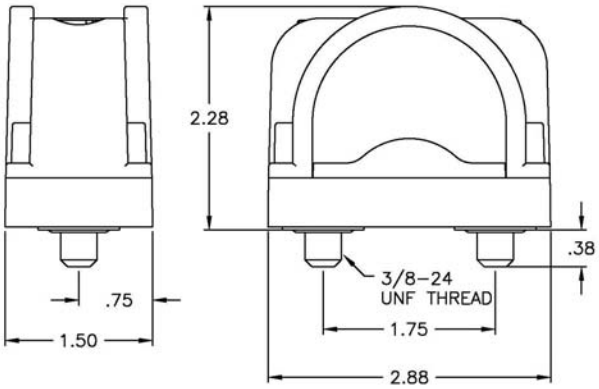
Mid-West® Instrument

O.E.M "Diaphragm Type"

Differential Pressure Indicator

Model 555

Colored bands allow you to quickly identify pressure drop across element.
Divided into three sections, each clearly marked for ease of understanding. Commonly used to indicate when to change or clean a filter. **Example:** 555-10.0 changes from green to yellow at 5 PSID and from yellow to red at 7.5 PSID. Accuracy is ±5% Full Scale



Model Number	DP Range	Transition Points		
		Green	Yellow	Red
555-3.5	0-3 PSID	0-2.0	2.0-2.5	2.5-3.5
555-5.0	0-5 PSID	0-3.0	3.0-4.5	4.5-5.0
555-10.0	0-10 PSID	0-5.0	5.0-7.5	7.5-10.0
555-12.0	0-12 PSID	0-6.0	6.0-9.0	9.0-12.0
555-15.0	0-15 PSID	0-7.5	7.5-12.0	12.0-15.0
555-25.0	0-25 PSID	0-11.0	11.0-18.5	18.5-25.0
555-30.0	0-30 PSID	0-13.0	13.0-20.0	20.0-30.0
555-43.0	0-43 PSID	0-19.5	19.5-29.5	29.5-43.0

50 Pieces per Shipment Minimum Order Quantity

OEM applications quoted. Please call with specifications.

SPECIFICATIONS:			Comments:
	Pressure (Ratings)		
	Maximum Working	300 PSIG	
	Maximum Differential	150 PSID	
	Accuracy	± 5% of Rated Differential Pressure Range	Calibrated at Color Transitions
	Operating Temperature (Max.)	93°C (200°F)	
	Materials of Construction		
	Body Material	Glass Filled Nylon (GFN)	
	Wetted Internals	Stainless Steel, Ceramic, & GFN	
	Elasto mers	Buna-N (std.) or Viton	
	Mo vement	Magnetic Piston and Follower Pointer	
	Dial	Plastic Lens with 3 Color Dial	
	INTERFACE:		
	Process Connection:	**¼" FNPT End Connections.** To switch HIGH and LOW pressure connections: Remove Indicator from base and rotate 180° - Retighten plastic bolts to 20-25 inch pounds.	Flow Direction Identified on Dial. Arrow Points to Low Pressure Port.

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BULLETIN NO. 522/OEM/18
(SUPERSEDES BULLETIN NO. 522/11)

Mid-West® Instrument

O.E.M "Diaphragm Type"

Differential Pressure Gauges & Switches

Model 522

RANGE: 0-5 P.S.I.D. TO 0- 50 P.S.I.D. (.3 bar to 3.4 bar)

Gauge Features:
- Safe Working Pressure: 1000 PSIG (69 bar).
- Aluminum or 316 / 316L SS Gauge Body.
- Wetted Parts: 316 SS, Ceramic, & Acetal components
- Seal & Diaphragm Material: Buna-N or Viton
- ¼" FNPT Process Connections (End Connected)
- Weather-resistant construction standard.
- Dial Accuracy ± 5% standard.
- Switch Only (No Dial) available
- Dial: 0.80" weatherproof multicolored
- 2-1/2" Optional Dial Size

Switch Options:
- Switches are optional.
- Hermetically Sealed Switch Outputs of 60W, 3 Amp for SPST and 3W, 0.25 Amp for SPDT electrical specification.
- SPST Switch Adjustable from 40% - 95% of Range * Up to 240 VAC/VDC voltage rating.
- SPDT Switch Adjustable from 20% - 70% of Range * Up to 125 VAC/VDC voltage rating.
- Available with Flat Pack case with Jacketed Flying Leads or with DIN IP65 / NEMA 4X Plug-in Connector.
- Optional Switch Set Feedback Decal
- Switch Location Top or Bottom
- CE Marking for the Low Voltage Directive and ROHS Compliance available upon request.

***Dependent on selected switch option.**

Operation: Differential pressure is sensed by flexible elastomer diaphragm and a calibrated spring. A magnetic coupling transmits the sensing element motion to an indicating pointer. This prohibits the possibility of fluid leaking into the gauge case, while assuring total isolation of the process fluid within the pressure capsule. The diaphragm assures total separation between high and low pressure signals. It is totally supported at full travel in either direction.

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: All Model 522 Series differential pressure 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. 250, EN-61010-1 UL Std. No. 50 & 508, CSA-C22.2 No. 14

Factory Preset of switches available at no charge (Specify switch setting on the order)
The use of diaphragm seals is not recommended.
Attempts to install such seals on this gauge will void the warranty

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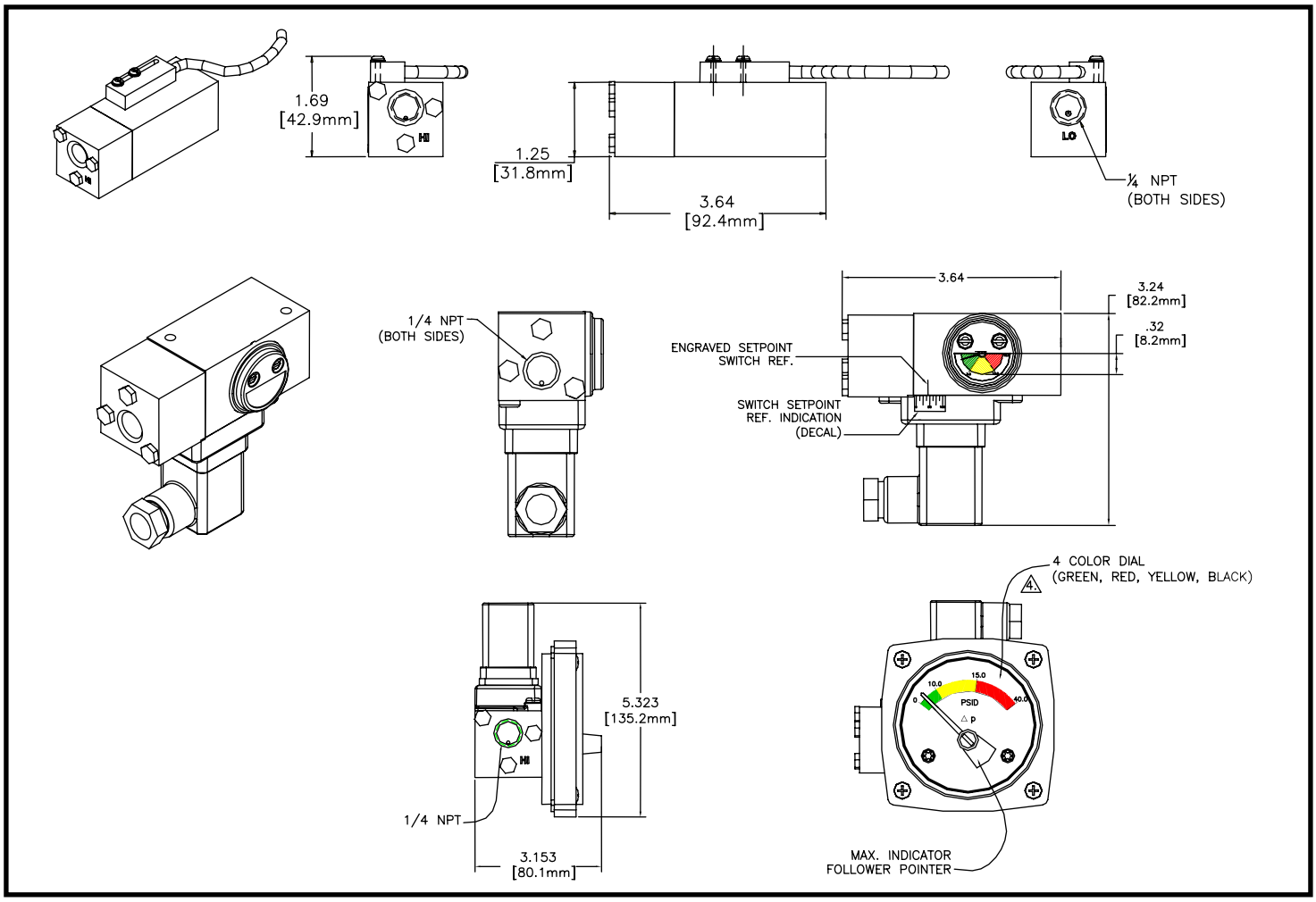
Ordering Information:

Contact factory for desired configuration options & pricing.

Dimensional:



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: All Model 522 Series differential pressure 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. 250
EN-61010-1	UL Std. No. 50 & 508
CSA-C22.2 No. 14	

Factory Preset of switches available at no charge (Specify Setting on the order)
The use of diaphragm seals is not recommended. Attempts to install such seals on this gauge will void the warranty

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Bulletin No. MFLD/18
Supersedes MFLD/11

Mid-West® Instrument

3 & 5 Valve

Differential Pressure Manifolds

#113343
3-Valve Mini- Manifold

#107469
5-Valve Manifold

#107470
3-Valve Manifold

#107467
Direct Mount 3-Valve Manifold
(Use with Model 105, 106, 115, and 116)

3 & 5 valve manifolds are designed for applications where direct mounting to an instrument is impractical or undesirable. The manifold is mounted to the lines from the instrument and signal rather than directly to instrument. Bubble tight shut-off, lightweight, super strong construction, compact designs that require less parts, chrome plated stems that prevent galling and stripping- these valves are built to perform under pressure.
MOC in accordance with NACE MR0175 is available upon request.

- **Pressure rating:** 6000 PSIG (413 bar) @ 212°F (100°C)
- **Material:** 316 Stainless Steel / 316L Stainless steel
- **Instrument Connections:**
- 3-Valve Mini #113343 = ¼" FNPT, 3-Valve #107470, 5-Valve #107469 = ½" FNPT
- 3-Valve #107467 = ¼" FNPT (Provided with optional Pressure Gauge Mount ¼" FNPT)
- **Process Connections:**
- 3-Valve Mini #113343 = ¼" FNPT, 3-Valve #107470 = ½" FNPT
- 3-Valve #107467 = ¼" FNPT, 5-Valve #107469 = ½" FNPT
- **Dust cap:** Protects spindle threads from dirt & dust.
- **Gland Nut & Lock Nut:** Adjusts the packing compression to provide leak free operation even on vacuum service.
- **Gland Packing:** PTFE / Graphite packing and metal seal ring ensures leak free operation.
- **Bonnet:** Precisely machined bonnet adds a high level of reliability at maximum pressure & temperature while increasing valve life and protecting stem threads from atmospheric corrosion.
- **Isolated Stem threads:** Adjustable packing below stem ensures leak proof long service life
- **Less Parts:** Less leak points and less fugitive emissions.
- **Test Ports:** ¼" FNPT ports which may be used as test connections (107467, 107469 & 107470) **(#113343 Mini -Manifold does not have test ports)**
- Integral (Body Material) Seat, and Stainless Steel Body

NOTE: All manifolds have the capability of being direct mounted dependent on Mid-West model gauge type. Please contact you sales coordinator for complete details. Manifolds are produced in INDIA to Mid-West exact requirements.

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Model Number	Description
113343	3-Valve 316 S.S. Single Block Mini-Manifold (1/4" FNPT Connections)
107470	3-Valve 316 S.S. Single Block Manifold (1/2" FNPT Connections)
107467	3-Valve 316 S.S. Direct Connect (1/4" FNPT Connections) ***for Model 105,106,115,116 only (58.8 MM Center Line to Center Line Instrument Connections)***
107469	5-Valve 316 S.S. Single Block Manifold (1/2" FNPT Connections)
107479	***3 or 5 Valve Manifold assembled directly to gauge body
Customer must provide process type, Gas or Liquid and preferred manifold mounting location	
Model Number	**Swivel Gauge Adapters**
171553	1/4" MNPT Instrument Connection X 1/4" MNPT Manifold Connection (68 MM OAL)
171554	1/4" MNPT Instrument Connection X 1/2" MNPT Manifold Connection (96 MM OAL)
172338	1/4" MNPT Instrument Connection X 1/4" MNPT Manifold Connection (116.6 MM OAL)
172336	1/4" MNPT Instrument Connection X 1/2" MNPT Manifold Connection (116.6 MM OAL)

Mid-West Models 130 and 140 not compatible with Swivel Gauge adapters due to Centerline to Centerline dimensions of process connections on gauge bodies.

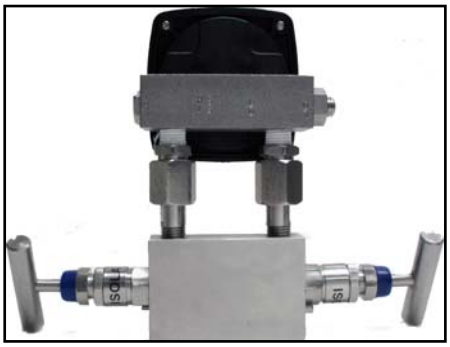
Examples of 3 & 5 Valve Bottom Mounted Manifold Installations

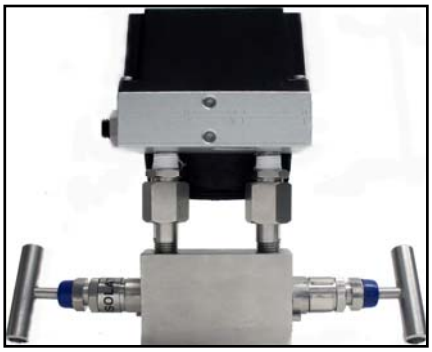
Model 114
6" Dial & #113343 3 Valve Manifold
With optional Standoff
& Pressure Gauge

Model 114
6" Dial with Direct Mount
#107469 5 Valve Manifold

Model 120
2-1/2" Dial with Direct Mount
#113343 3 Valve Mini-Manifold

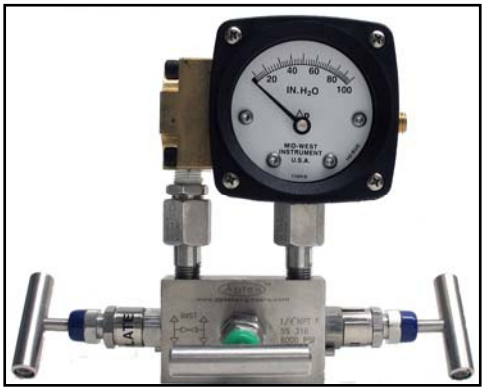
Model 121
2-1/2" Dial with Direct Mount
#113343 3 Valve Mini-Manifold

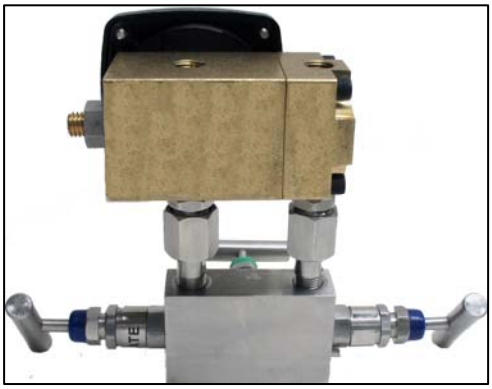




Model 122
4-1/2" Dial, End Connections
Tube Mounted #107470
3 Valve Mini-Manifold

Model 130 S.S
4-1/2” Dial with Tube Mounted
#107470 3 Valve Manifold





Model 142, 2-1/2” Dial with Direct Mount
#11334 3 Valve Manifold

Model 120, 4-1/2” Dial with Direct Mount
#107470 3 Valve Mini Manifold

Model 140 S.S
3-1/2” Dial with Tube Mounted
#107470 3 Valve Manifold

Model 106 S.S., 6” Dial with Direct Mount
#107470 3 Valve Manifold

Mid-West Instrument has a manifold/gauge combination to meet all your Differential Pressure requirements.

Swivel Gauge Adapters

Dimensional Information

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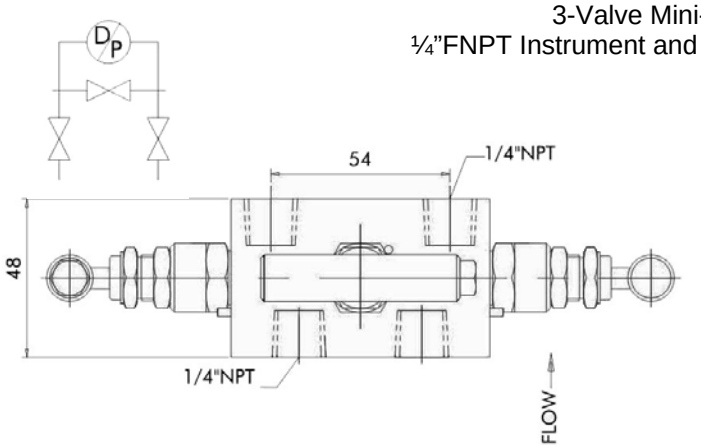
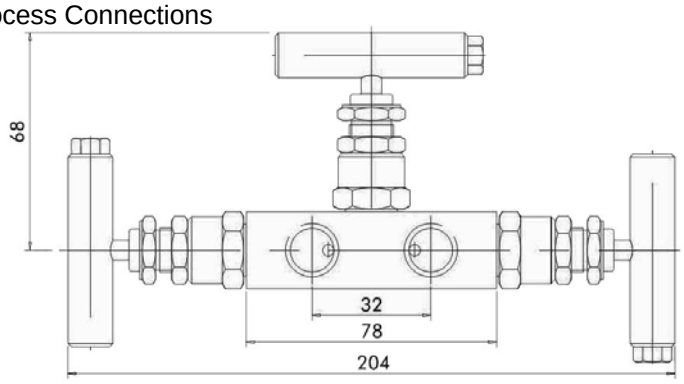
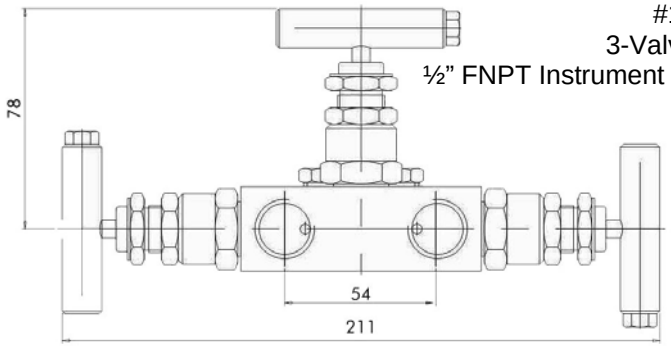
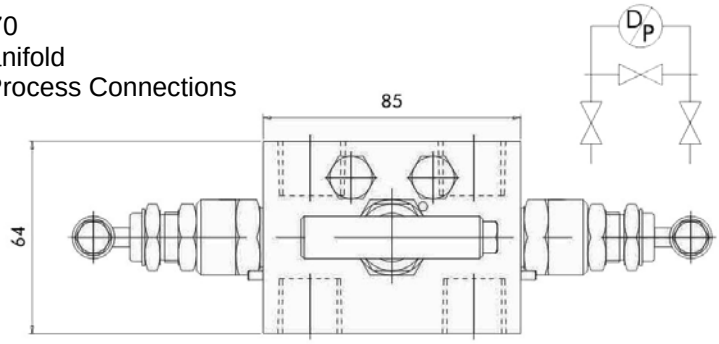
#113343
3-Valve Mini- Manifold
¼”FNPT Instrument and Process Connections



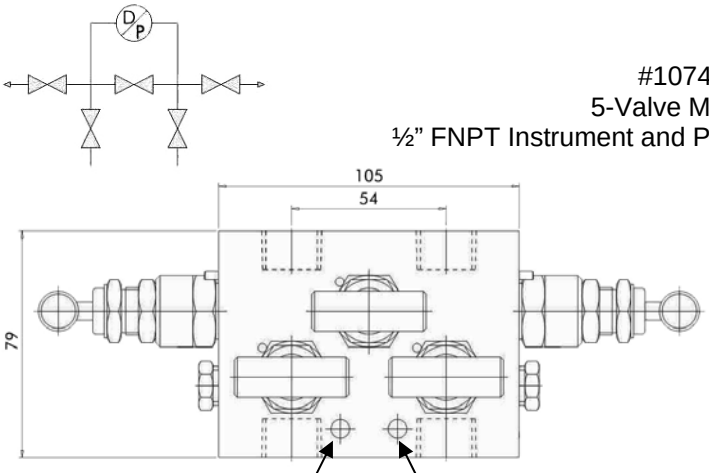


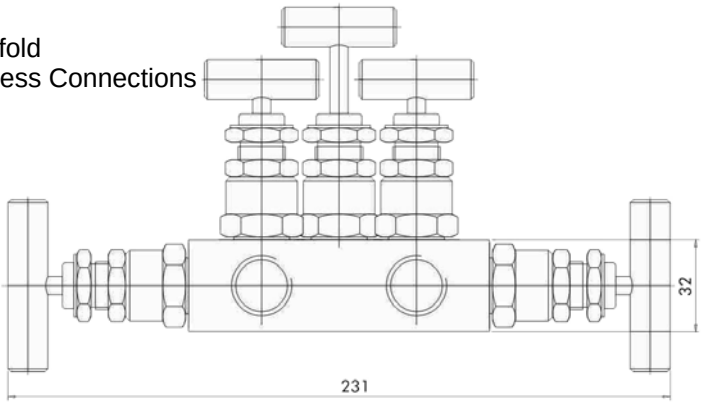
#107470
3-Valve Manifold
½” FNPT Instrument and Process Connections



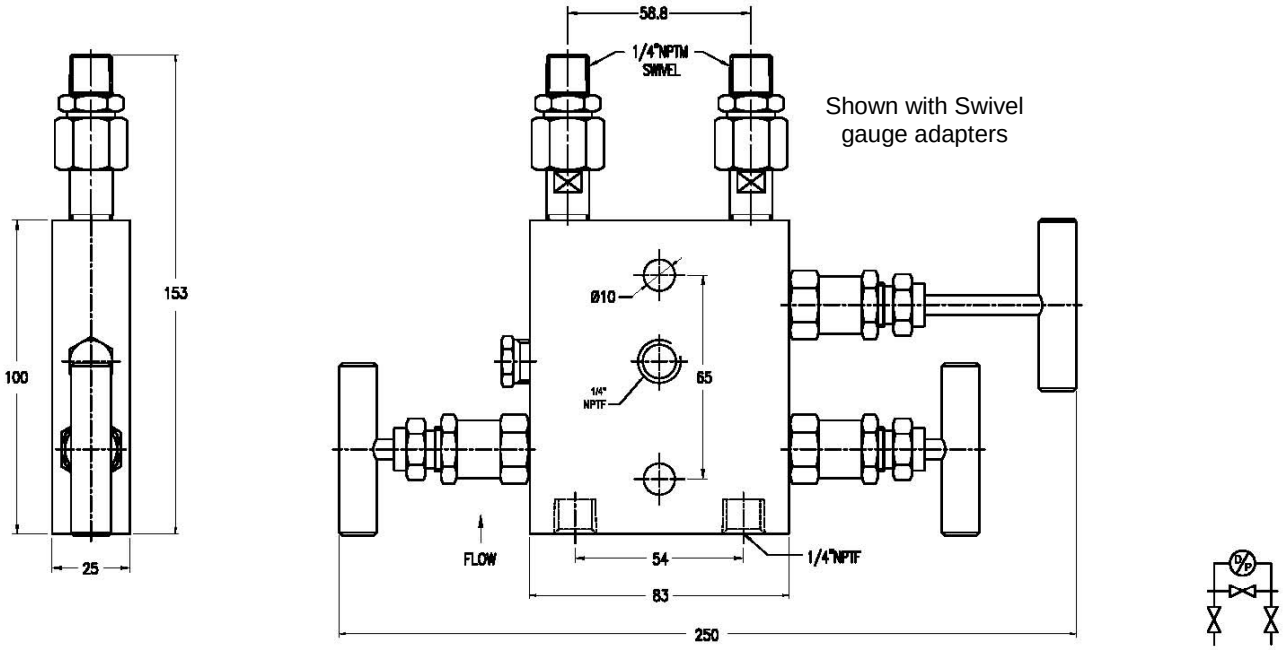


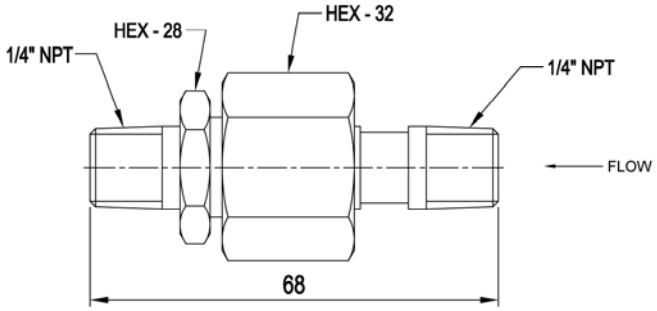
#107469
5-Valve Manifold
½” FNPT Instrument and Process Connections



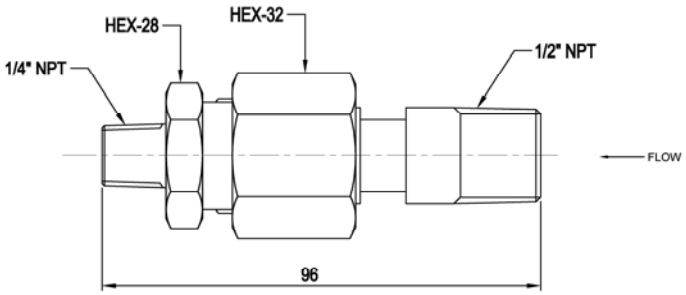


#107467 3-Valve Direct Mount Manifold
58.8 MM C/C Instrument connection for Model 116 only
54 MM Process connections

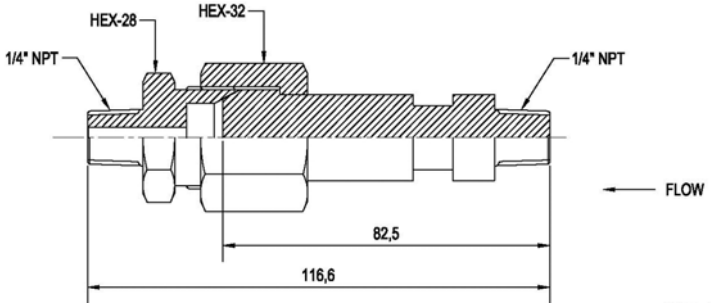




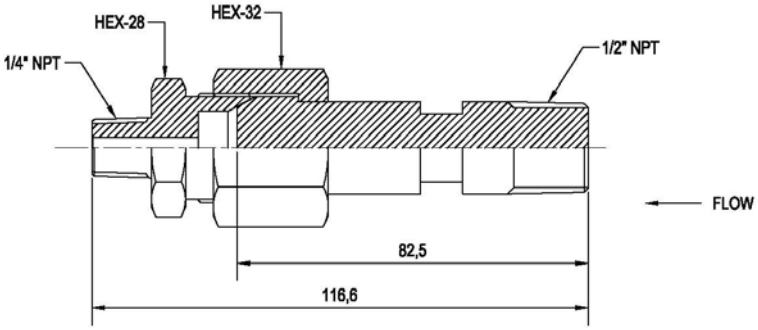
#171553 Swivel Gauge Adapter



#171554 Swivel Gauge Adapter



#172338 Swivel Gauge Adapter



#172336 Swivel Gauge Adapter

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Mid-West® Instrument

Product Notes:

BULLETIN NO. 150/18
(Supersedes Bulletin NO. 150/11)

Mid-West® Instrument

Model 150 "VARI-DAMP"
ADJUSTABLE PULSATION DAMPENER
and NON- ADJUSTABLE SNUBBERS

Made in the USA

Adjustable Pulsation Dampeners

Non-Adjustable Snubbers

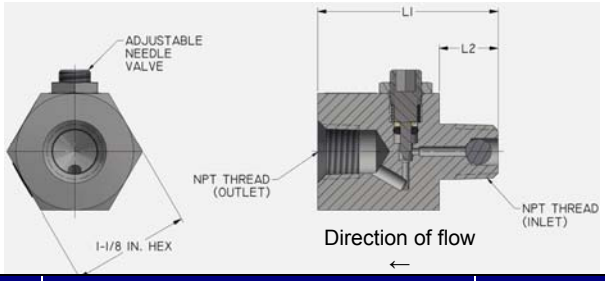
- Model 150 provides infinitely adjustable dampening • Both models protect against surges and pressure shocks
- Use with all types of pressure gauges including differential pressure and compound gauges

The Model 150 "Vari-Damp" all purpose pulsation dampener features both a fine thread adjustable needle valve for dampening characteristics and a precision ball check to block line surges, shock waves or fluid hammer. The Model 150 provides outstanding protection for applications where low displacement devices such as bourdon tube gauges or electronic transmitters are used or in high displacement devices where diaphragm, piston or bellows operated gauges, recorders or controllers are required. Double-ported instruments should be installed with a Model 150 on each input pressure line.

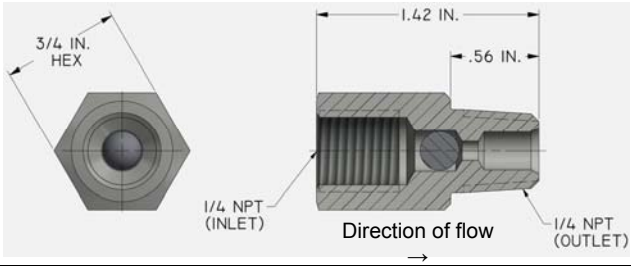
The Model 150 needle valve provides adjustable dampening characteristics by simply loosening the lock-nut on the adjusting screw and making a slight re-adjustment to the needle valve setting. Use of the Model 150 is preferred over other commercially available designs that feature several piston diameters or porous metal discs requiring removal and/or disassembly to re-adjust. The Model 150 adjustable needle valve can be used as a complete shutoff to facilitate changing out of a gauge or instrument. This method is not intended to replace instrument block valves as continual over-torqueing could damage the valve seat.

The *Model 150 Adjustable Pulsation Dampener* and the *Non-Adjustable Snubber* ball check offers protection surge and/or pressure spikes. The 316 stainless steel ball is driven on seat by the pressure surge and held on seat as long as the differential pressure exists across the ball, while metering pressure to the instrument through a calibrated, groove across the ball seating area.

Model 150



Non-Adjustable Snubbers



Model	Description	Thread Size	Body Material	L_1 OAL Length (INCH)	L_2 Thread Length (INCH)	MAX. W.P. PSIG (bar)	Weight OZ
150-BO	Male X Female NPT	1/4" NPT	Brass	1.73	0.56	3,000 (204)	6
150-BH	Male X Female NPT	1/2" NPT	Brass	2.31	0.75	5,000 (340)	8
150-SO	Male X Female NPT	1/4" NPT	316 S.S.	1.73	0.56	5,000 (340)	6
150-SH	Male X Female NPT	1/2" NPT	316 S.S.	2.31	0.75	10,000 (680)	8
110371	Non-Adjustable, Male X Female NPT	1/4" NPT	Brass	1.42	0.56	3,000 (204)	6
110370	Non-Adjustable, Male X Female NPT	1/4" NPT	316 S.S.	1.42	0.56	5,000 (340)	8

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Adjustable snubber

Standard Model Specification: 150-BO-00

3000 PSIG Working Pressure, Brass Body Material
¼" FNPT X ¼" MNPT Connections, Buna-N & Teflon Seals

Mid-West Instrument
1-800-648-5778

1			2	3	4	5
1	5	0				

Basic Model

Adjustable Pulsation Dampeners

Non-Adjustable Snubbers

2	Material (Body)
B	Brass
S	316 Stainless Steel
Z	Special ***(Un-coded Options)***
3	**Size**
O	1/4" FNPT X 1/4" MNPT
H	1/2" FNPT X 1/2" MNPT
Z	Special ***(Un-coded Options)***
4	**Seal Materials / Temperature Range (Deg. F)**
0	Buna-N & Teflon -30° to +250°
1	Viton & Teflon -15° to +400°
2	Neoprene & Teflon -45° to +300°
5	Ethylene & Teflon -70° to +250°
9	Special ***(Un-coded Options)***
5	**Options**
0	NONE
9	Special ***(Un-coded Options)***

Brass & Stainless Steel Non-Adjustable Snubbers	
110371	1/4" FNPT x 1/4" MNPT BRASS Non-ADJUSTABLE SNUMBBER
110370	1/4" FNPT x 1/4" MNPT STAINLESS STEEL Non-ADJUSTABLE SNUMBBER

INSTALLATION: Model 150 pulsation dampener can be installed directly on the instrument to be protected. The Model 150 features a built-in shutoff to allow instrument protection or removal. A shutoff valve in the line is not required. Avoid excessive force when closing to prevent seat galling.
NOTE: CAUTION TO BE EXERCISED WHEN ADJUSTING NEEDLE VALVE. DO NOT ADJUST MORE THAN TWO TURNS FROM CLOSED POSITION, LEAKAGE CAN ACCUR.
MAINTENANCE: The Model 150 can be cleaned by removing the needle adjusting screw, "O" Ring and Teflon backup ring. Metal parts should be cleaned in a commercial solvent.

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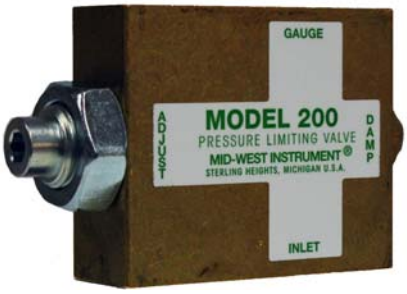
Mid-West® Instrument

Model 200 "GAUGE MINDER"

PRESSURE LIMITING VALVE

Aluminum
Model 200



Brass
Model 200

- **Pressure limiting valve prevents instrument over-range**
- **Adjustable needle valve dampens pulsation**
- **Use with all types of instruments and pressure gauges**
- **Can be mounted in any position**
- **Available in Aluminum, Brass, and 316 S.S.**

Model 200 "Gauge Minder" features a pressure limiting valve that blocks off excess pressure to the instrument, preventing calibration failure, internal damage, and "blow-out" from over-ranging - a principal cause of instrument failure.

Model 200 is supplied with a set of range springs designed to set the shutoff pressure point at any pressure from 50 to 5000 PSI. The automatic shutoff valve is positive on closing and is non-chattering. Once closed, pressure need only be reduced approximately 10% of set pressure to re-open the valve. The accuracy of the instrument used with the Model 200 is in no way affected up to the set point of the pressure shutoff.

Model 200 also features an adjustable needle valve designed to dampen system pulsation reducing instrument oscillation, improving readability, and extending instrument life without the addition of a snubber. Instrument reliability is improved and the cost to repair, re-calibrate, or replace the instrument is lowered. Operating safety is also enhanced.

Model 200 is available in Aluminum, Brass, or 316 Stainless Steel with 1/4" FNPT connections for 5000 PSI working pressure and in Brass or 316 Stainless Steel with 1/2" FNPT connections for 10,000 PSI working pressure. Buna N O-rings and Teflon backup rings are standard. Optional seal materials include Viton, Neoprene, and Ethylene Propylene.

The range springs are identified by color, as follows:

Color of Spring	**Shut-off Range, PSI**
Silver	50 to 120 PSI
Black	100 to 1100 PSI
Gold	1000 to 5000 PSI

Model	Process Connections	Thread Size	Body Material	Valve Shut-Off Pressure Range	MAX. W.P. PSIG (bar)	Approx. Weight
200-AO	Female x Female NPT	1/4" FNPT	Aluminum	50 to 5000 PSIG	5,000 (340)	.80 oz
200-BO	Female x Female NPT	1/4" FNPT	Brass	50 to 5000 PSIG	5,000 (340)	2.2 Lbs
200-BH	Female x Female NPT	1/2" FNPT	Brass	50 to 5000 PSIG	10,000 (680)	2.2 Lbs
200-SO	Female x Female NPT	1/4" FNPT	316 S.S.	50 to 5000 PSIG	5,000 (340)	1.25 Lbs
200-SH	Female x Female NPT	1/2" FNPT	316 S.S.	50 to 5000 PSIG	10,000 (680)	1.25 Lbs

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Model 200 “GAUGE MINDER”
PRESSURE LIMITING VALVE

INSTALLATION AND MAINTENANCE INSTRUCTIONS:

Model 200 “Gauge Minder” is mounted in-line with the instrument to be protected and may be mounted in any position. The automatic shutoff set point is adjusted by loosening the lock nut marked “adjust” and turning the adjustment screw. Turning “clock-wise” increases the shutoff pressure and turning “counter clock-wise” reduces the shutoff pressure. The Model 200 is shipped with a 50 to 120 PSI range spring installed, unless otherwise requested. Two additional springs for higher ranges are included as separate parts. The range spring can be changed by removing the adjustment screw.

The range springs are identified by color, as follows:

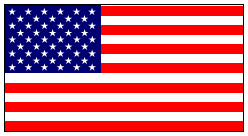
Spring Color of	**Range, PSI Shut-off**
Silver	50 to 120 PSI
Black	100 to 1100 PSI
Gold	1000 to 5000 PSI

The operating limits of the instrument to be protected must be considered when determining the point to set the Model 200 shutoff pressure. Commonly, a setting of 110% of full scale of the instrument is used. Instruments with full scale ranges above 1000 PSI generally have a lower safety factor. It is necessary in this instance to set the shutoff point to 100% of full scale of the instrument to prevent calibration failure. After adjustment of the shut-off pressure of the Model 200 is completed the instrument should be over-pressured for several minutes to verify operation. If indicated instrument pressure falls with the shut-off valve closed, there is a connection leak from the Model 200 to the instrument which must be corrected. If indicated instrument pressure rises beyond the shut-off point, the Model 200 is defective and should be returned if new or repaired by cleaning or installing new seals if previously used.

CAUTION: Do not adjust the set point with system pressurized and in the shutoff mode. Reduce system pressure until shutoff valve is open, then make set point adjustment.

Model 200 can be shut off manually with the needle valve marked “damp”. The lock nut must be loosened. The valve screw is turned “clock-wise” to close. Turning the valve screw “counter clock-wise” one turn from closed position gives a range of pulsation dampening. Adjust the amount of dampening necessary to stop pointer oscillation on the instrument.

NOTE: Caution must be exercised when adjusting needle valve. Do not adjust more than two turns from closed position. Leakage can occur.



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Standard Model Specification: 200-AO-00

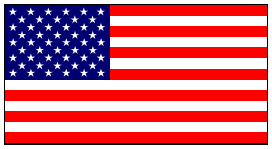
5000 PSIG Working Pressure, Aluminum Body Material
¼" FNPT X ¼" MNPT Connections, Buna-N & Teflon Seals

Mid-West Instrument
1-800-648-5778

1			2	3	4	5
2	0	0				

Basic Model

2	**Material (Body)**
A	Aluminum
B	Brass
S	316 Stainless Steel
Z	Special ***(Un-coded Options)***
3	**Size**
O	1/4" FNPT X 1/4" FNPT
H	1/2" FNPT X 1/2" FNPT **(Not available on Aluminum Body Material)**
Z	Special ***(Un-coded Options)***
4	**Seal Materials / Temperature Range (Deg. F)**
0	Buna-N & Teflon -30° to +250°
1	Viton & Teflon -15° to +400°
2	Neoprene & Teflon -45° to +300°
5	Ethylene & Teflon -70° to +250°
9	Special ***(Un-coded Options)***
5	**Options**
0	NONE
7	Factory Preset Shutoff Point **(Above 1500 PSIG)**
8	Factory Preset Shutoff Point **(Up to 1500 PSIG)**
9	Special ***(Un-coded Options)***



Made in the USA

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Mid-West® Instrument

Product Notes:

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Diaphragm / Chemical Seals

Diaphragm Seals *(or Chemical Seals) use a flexible barrier, or diaphragm, to isolate a pressure sensor (gauge, switch, transmitter, or transducer) from adverse effects of the process fluid.*

HOW IT WORKS:
A diaphragm seal, when properly mounted to its sensor and filled will accurately transmit process pressure to the instrument. Pressure exerted on the flexible diaphragm is transmitted hydraulically to the instrument through the fill fluid, which fills the void between the diaphragm and the instrument, (including the bourdon tube, in the case of a pressure gauge.)

APPLICATION CONSIDERATIONS:
The following should be considered when choosing a diaphragm seal:

1. Process Characteristics: Pressure, temperature, (see tables, this page) chemical compatibility and viscosity.
2. Seal Mounting: Connection to process (threaded, flanged, clamped, in-line) Connection to instrument (usually NPT).
3. Ambient Characteristics: Temperature, corrosive atmosphere, etc.
4. Instrument Considerations: Sufficient fluid displacement is required to drive instrument through its full range (this means, for example, you can't put a large gauge on a small seal); remote instrument placement requires a capillary connecting instrument to seal.
5. Vacuum Considerations: High vacuums (over 25" Hg vac.) or vacuums with high temperatures require special fill selection, preparation, and procedures, as well as careful diaphragm selection.
NOTE: Improper selection may result in system failure and possible damage or injury. *Mid-West* can provide application assistance, but final compatibility is the responsibility of the buyer. Proper selection of seal can reduce or eliminate any additional system error caused by adding a Diaphragm Seal to your instrument.

SEAL TYPES:
Standard Seals (pages 2&3) include Threaded off-line, threaded in-line, and flanged off-line types in many materials for a variety of applications:

Maximum Temperature	Diaphragm Material	Lower Housing
650°F	Welded Metal	Metal
450°F	Teflon	Metal
300°F	Viton	Metal
140°F	n/a	Nonmetal

SPECIAL DESIGNS: Mid-West is ready to work with you on any high-performance diaphragm seal application, (that might exceed the stated limit below) such as high vacuum, high temperature, high sterility, custom design or high static pressure with a low differential span, or high vacuum with high temperature.

	PSI	Lower Housing	
Maximum working pressure	1,500	Metal, w/S.S. Bolting	(at 100°F)
	2,500	Metal,w/Std. Bolting	(at 100°F)
	5,000	Metal, w/Hi-Press. Bolting	(at 100°F)
	Per flange rating	ASA Flange	(Per Flange Spec)
	300	Non-Metalic	(at 140°F)

	Diaphragm	Size 5 Seal	Size 6 Seal
Min. working pressure	Metal	25 PSI	10 PSI
	Teflon	20 PSI	8" WC
	Viton	5" WC	N/A
Vacuum Limits	Metal	-21" hg	-24" hg
	Teflon	-23" hg	-26" hg
	Viton	-29" hg	N/A

MATERIALS:
Lower housings: 316 S.S. is standard with a large selection to suit a wide variety of applications **(see table 1, page 3)**
Diaphragms: Standard metal diaphragms are convoluted and made of 316 S.S. Many other materials are available for corrosion resistance or extra sensitivity. **(see table 6, page 3)**
Gaskets: Standard gaskets are Teflon on the process side of diaphragm (Grafoil for hi temp.), and Viton on the fill side. Other materials are available.

DIAPHRAGM SEALS

HOW TO ORDER

TABLE 1 Seal Series	TABLE 2 Seal Size	TABLE 3 Configuration	TABLE 4 Instrument Connection	TABLE 5 Process Connection	TABLE 6 Diaphragm Material	TABLE 7 Lower (process) Housing Material	TABLE 8 Upper (instrument) Housing Material
EXAMPLE:							
W	5	15	4	2	S	S	C

TABLE 1 Seal Series

- W - Welded metal diaphragm
- T - Teflon diaphragm (high sensitivity, chemical resistance)
- V - Viton diaphragm - (most sensitive, for low pressures)

TABLE 2 Seal Size

- 5 - Standard size Seal dia. = 3.25" in threaded models Diaphragm dia. = 2.25"
- 6 - Large size - (Preferred for low pressure, hi displacement, or hi sensitivity.) Seal dia. = 4" in threaded models Diaphragm dia. = 3"
- 7 - Large size Seal diameter; 5.2" Diaphragm dia. = 4.1"

TABLE 4 Instrument Connection

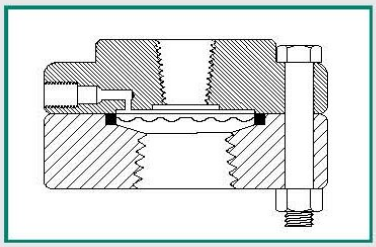
- 4 - 1/4" NPTF
- 2 - 1/2" NPTF

TABLE 5 Process Connection

- 4 - 1/4" NPTF
- 2 - 1/2" NPTF
- 3 - 3/4" NPTF
- 1 - 1" NPTF
- F - Flanged - specify flange size and pressure rating (e.g. 1 1/2", 150 lb) or insert "V" codes from Table A see p. 24 (e.g. V41=1 1/2" 150#)

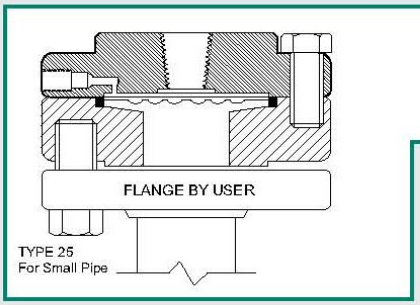
TABLE 3 - Configuration

Threaded, Off-Line

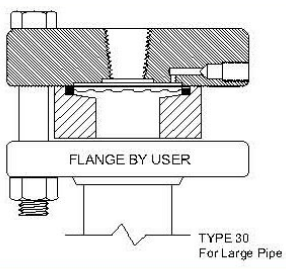


- 10 - Replaceable diaphragm - non cleanout (not available with series "W")
- 11 - Same as 10, with flush port
- 15 - Cleanout style - lower housing can be removed without losing fill. (Available with Series W, T, V)
- 16 - Same as 15, with flush port

Flanged, Off-Line - with cleanout

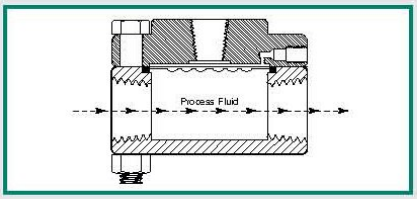


- 25 - for 1/2", 3/4" pipe size (1" in size 6)
- 26 - Same as 25, with flush port



- 30 - for 1 1/2" pipe to 3" pipe size (1" in size 5)
- 31 - Same as 31, with flush port

In-Line, Flow-Thru - with cleanout



- 35 - Threaded (shown) - for 1/4" to 1" pipe
- 40 - Socket Weld - for 1/4" to 1" pipe
- 45 - Saddle Weld - for 1" to 8" pipe
- 50 - Butt Weld - for 1" to 12" pipe

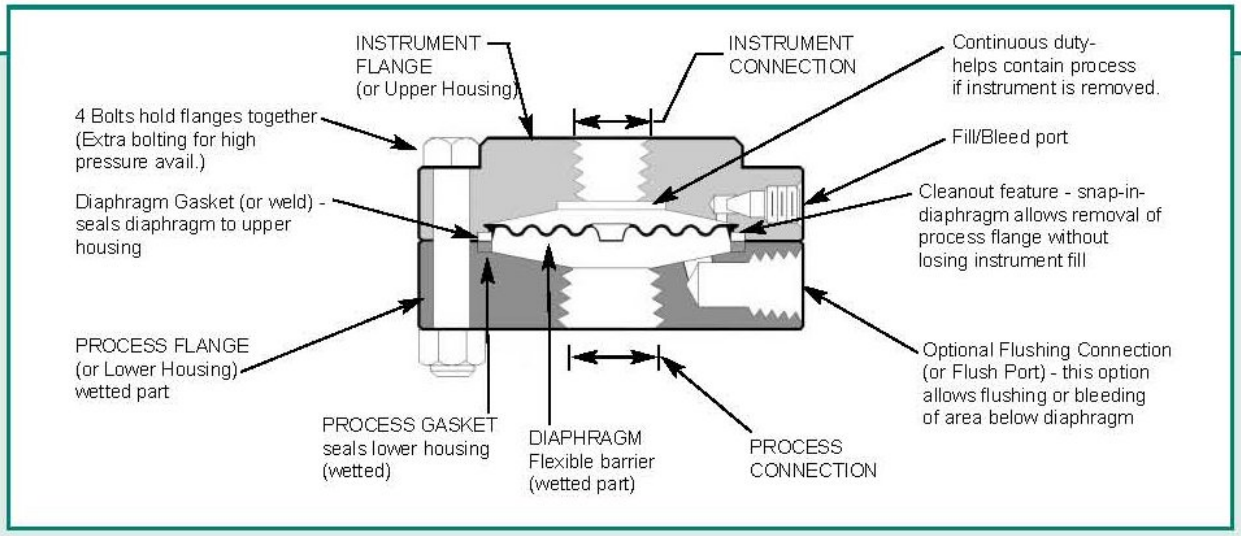


TABLE 6
Diaphragm Material (wetted)

MOST COMMON
- S - 316 S.S.
- T - Teflon
- *V - Viton
- D - Carpenter 20
- *F - 304 S.S.
- G - Hastelloy B
- H - Hastelloy C
- J - Titanium
- L - 316LSS, teflon coated
- M - Monel
- N - Nickel
- U - Tantalum
- X - Gold Plated Diaphragm
- *Y - Inconel

Size 5 only.

TABLE 7
Lower Housing Material (wetted)

MOST COMMON
- S - 316 S.S.
- T - Teflon
- *L - Teflon lined
- Z - PVC
- B - Brass
- C - Steel
- D - Carpenter 20
- F - 304 S.S.
- G - Hastelloy B
- H - Hastelloy C-276
- J - Titanium
- K - Kynar
- M - Monel
- N - Nickel
- P - Polypropylene
- U - Tantalum
- UL - Tantalum Lined
- W - CPVC
- Y - Inconel

Available only on types 25 & 30, 1" and larger.

TABLE 8
Upper Housing Material (including bolts)

- C - Carbon Steel (standard)
- S - 316 Stainless
- F - 304 Stainless

OPTIONS:

- Hi Pressure bolting
- Non-Stick Teflon coating on metal diaphragm
- Socket weld connections
- High temp. gasketing
- Stainless steel bolting (reduces pressure rating up to 50%)
- Capillary Lines

Fill Fluids

Fill Fluids should be chosen with care. The fluid must be compatible with the process medium in case the diaphragm is ruptured. Compatibility of fill fluid with process is the user's responsibility.

FLUID	TEMPERATURE LIMITS	VISCOSITY, CS. 77° F	NOTES
Silicone, DC 200	-50 to 450° F	20	our standard fill
Silicone, DC 704	+50 to 600° F	44	Hi-temp fill
Silicone, DC 710	+30 to 700° F	500	Hi-temp fill
Neobee M-20	-4 to 320° F	10	food grade
Glycerin	+30 to 300° F	1110	for food; not recomm. for capillary
Halocarbon	-40 to 400° F	6	inert, for use with oxidizers (must not contact Al, Mg)

not to be used with strong oxidizers, such as chlorine, oxygen, etc

Other fills available: consult factory.

Credits: Viton, Teflon, Kynar, TM DuPont, Inc.; Carpenter 20 - TM Carpenter Steel Co.; Inconel, Monel - TM Huntington Alloys, Inc.; Hastelloy - TM Cabot Corp.; Halocarbon - TM Halocarbon Corp.

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Diaphragm Seal Worksheet

Customer Information:

- Company Name:_____
- Address_____
- Contact:_____
- Phone number: _____
- Email address: _____
- Date: _____

Process Information:

- Process Temperature Range: _____
- Ambient Temperature Range: _____
- Process Fluid/Media: _____
- Current Pipe/Tank Material: _____
- Maximum Pressure on Seal: _____
- Differential Pressure Range: _____
- Working Pressure on Seal: _____
- Other (vibration, pulsation, etc.): _____

Seal Information:

- Mounting - Direct or Remote: _____
- (if remote) Capillary Length: _____
- Process Connection: _____
- Required date for completed seal assembly?_____

Midwest Differential Gauge Information:

Model number used in application:_____
Quantity of differential gauges used in application:_____

Additional Notes:

_____
_____
_____
_____
_____
_____

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