

3 D I N S T R U M E N T S



3D Instruments, Inc.
Direct Drive Difference

Member of
FCI
Fluid Controls Institute, Inc.

DIRECT DRIVE DIFFERENCE

3D Instruments

At 3D Instruments we believe that simple is beautiful. Replacing the antiquated C shape Bourdon tube in our pressure gauges is a unique helically wound Bourdon, The Direct Drive Difference. Our Bourdon coil is coupled directly to the shaft-pointer, the only moving part.

Fewer parts, fewer problems. Regular recalibration is eliminated because there are no complex, wear-prone parts. Linearity is built-in; no span adjustment is necessary- ever And 3D accuracy is maintained throughout the useful life of the gauge, many times longer than those old fashioned designs.

The 3D Direct Drive design gives instant response while resisting pointer pulsation. Overpressure? Even 150% of full scale will not affect the accuracy of most 3D gauges. And, it takes pressures of 500% greater than dial range to result in sensing coil rupture. Even when subject to abuse, 3D Direct Drive gauges last longer

All 3D gauges use the finest materials in construction. We construct our Bourdon tube of Inconel X-750. This is a highly elastic material with excellent corrosion resistance. All other wetted parts are in 316SS. All materials are selected to be compatible with your most challenging applications.



Features

- Helically Wound Bourdon Tube in Inconel X-750
- All Wetted Parts in 316SS or Inconel
- Precision Anti-Friction Sapphire Shaft Bearings
- High Impact Resistant Cyclocac Case
- Needle Edged Pointer
- Human Engineered Dial
- Adjustable Zero Set-Point
- One Moving Part

User Benefits

- No Recalibration Required
- Longer Field Service Life
- Greater Reading Accuracy
- Maintenance Free
- Safer Operation (UL Listed)*
- Corrosion Resistant

-UL Std #SA 6134(N) High Pressure Gas



3D Vs. Liquid Filled Gauges

In many severe applications C-shape pressure gauge cases are filled with silicone liquid to dampen their movements and increase service life. Beside adding cost to the gauge, the liquid fill causes other problems. These are associated with loss of liquid fill, discoloration, and added maintenance difficulties. (See ANSI B40.1 3.4.1.5)

3D applies a silicone dampener known as GAD directly to the outer layers of the coil. This GAD dampens the pointer movement in heavy vibration applications eliminating the need for liquid fill. GAD had been proven to perform better than liquid filling in tough applications.

In most instances a standard 3D TLG "Tough Little Gauge" can replace an old fashioned liquid filled gauge. Beside being less expensive, the 3D gauge will provide longer service life and much less field complications for your instrument personnel. Even against liquid fill, 3D gauges can last as much as ten times longer in severe services with pulsation or vibration. This has a dramatic effect on your cost of ownership. After all, 3D gauges are designed to work, and work for a long time no matter what the application.

SIX YEAR

Warranty

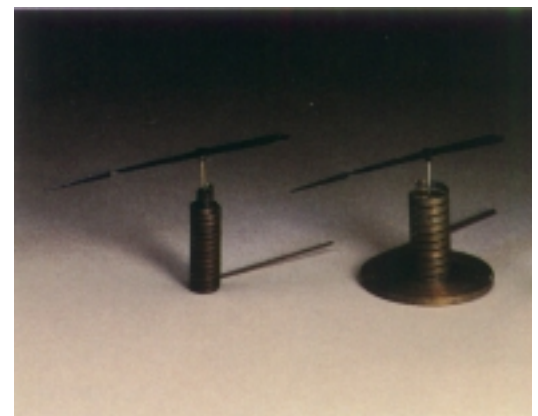
on the Direct Drive Difference

3D Instruments Inc. warrants to the original purchaser of any 3D Instruments Direct Drive pressure gauge that it will be free from defects in materials and workmanship for a period of six (6) years from the date of delivery to the purchaser. A copy of the full text of the 3D Instruments six year limited warranty is available by pressing here.

The 3D Helical Bourdon Tube

The heart of the 3D Pressure Gauge is the Helically wound Inconel X-750 Bourdon Tube. Inconel was chosen because of its excellent resistance to corrosion and its elasticity. There are two types of helical Bourdon tubes: one is specifically designed for higher pressures and the other is designed for lower pressures. Each pressure range dictates subtle differences in Bourdon tube design and manufacturing method.

To the user the benefits of this painstaking high technology process are longer field life with inherent accuracy and span. As an assembly in the 3D Test or Process gauge our coil provides lower cost of ownership and easier field use, simply because our gauges do not fail or require recalibration. In testing, some 3D Gauges have been cycled over a million times with no appreciable wear or effect on accuracy. Some 3D Gauges have been in constant use for more than 15 years, replacing old fashioned gauges which had failed in the same service within weeks.



TLG PROCESS GAUGES

Process Gauges

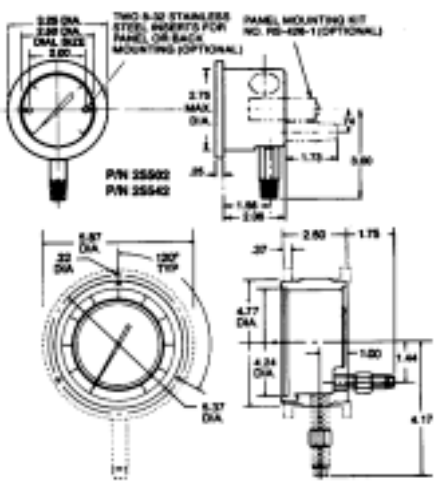
TLG "Tough Little Gauge"

3D Process Gauges are called TLG's for "Tough Little Gauge" Small wonder, our process gauges are designed specifically for the toughest conditions in your process. Typically a 3D TLG can last 4-10 times longer than a standard gauge, even if the standard gauge has been liquid filled. The "Tough Little Gauge" is available in diameters of: 2-1/2", 4-1/2", and 6". The 'Dyna-Mount' 4-1/2" TLG is standard with a special swivel fitting and moveable flange. The gauge can be changed to front or back flange and bottom or back mount (except 30 psi) in the field with no more than a screwdriver Standard accuracies are 0.5% mid-scale. Pressure ranges available are from vacuum to 20,000 psi.

The 3D TLG, one "Tough Little Gauge."

Process Dial Graduation Chart (± 0.5% of span @ MidScale, 1% Overall)			
Pressure Range (psia)	Major Figure Interval (psia)	Major Graduation (psia)	Minor Graduation (psia)
0 - 30	5	1	0.2
0 - 60	5	1	0.5
0 - 100	10	5	1.0
0 - 150	10	5	1.0
0 - 160	20	10	2.0
0 - 200	20	10	2.0
0 - 300	50	10	2.0
0 - 500	50	10	5.0
0 - 600	50	10	5.0
0 - 1000	100	50	10.0
0 - 1500	100	50	10.0
0 - 2000	200	100	20.0
0 - 3000	500	100	20.0
0 - 4000	500	100	50.0
0 - 5000	1000	500	50.0
0 - 6000	1000	500	50.0
0 - 8000	1000	500	100.0
0 - 10000	1000	500	100.0
0 - 15000	1500	500	100.0
0 - 20000	2000	1000	100.0
30" Hg - 0 Vac	5	5	0.5

Dimensions



Process & Test Gauge Specifications

Pressure Ranges:
0-30 psig to 0-20,000 psig equivalent ISO and Metric Scales

Compound Ranges:
30" Hg/0-30 psig to 30" Hg/0-300 psig

Receiver Gauges:
3-15 psig or 3-27 psig linear or square root scales

Proof Pressure without calibration shift:
150% of maximum rated pressure

Burst Pressure: 500% of Scale Pressure*

Operating Media:
Any media suitable for contact with stainless steel/Inconel.

Calibration: Vertical as standard.

Accuracy:
Process - ± 0.5% of span at mid-range, ± 1.0% overall

Test - + 0.25% or + 0.50% of span.
No tapping required ⊕, includes all friction, hysteresis, and linearity variations.

Response Time:
Approximately 100ms from 0 to full scale (gas service)

Ambient Temperature:
- 65°F to + 190°F (- 54°C to + 88°C)

Service Media Temperature:
- 65°F to + 400°F (- 54°C to + 204°C)

Higher temperatures allowable depending on installation.

Life:
250,000 cycles minimum to 1,000,000,*
80% of full scale.

Dial Sizes:
Process - 2-1/2" (64mm)
4-1/2" (114mm) 6" (152mm)
Test - 2-1/2" (64mm) 4-1/2" (114mm)
6" (152mm) 8-1/2" (216mm) 12" (305mm)

Repeatability: ± 0.025% full scale

Sensitivity: ± 0.025% full scale

Materials:
Case - ABS Plastic (std) SS (opt)
Dial, Capillary tube, fittings, screws, and rivets - Stainless Steel ⊕ ⊕
Sensing Element - Inconel X-750

Gauges conform to ANSI B40.1 1991 for "Gauges, Pressure and Vacuum. Dial Type, Elastic Element"
* Except on ultra high pressure (>10,000 psig)
* 2-1/2" Dial, Plastic
⊕ Except 30 PSI and Caisson Gauges
⊕ ⊕ 25% Accuracy Gauges are traceable to N.I.S.T.
Others available as an option.

TEST GAUGES

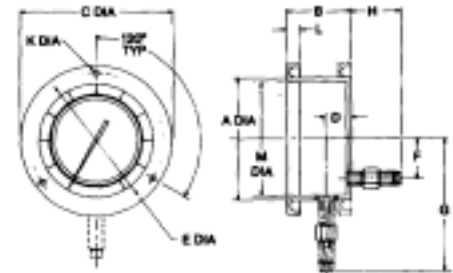
Test Gauges

The 3D Test Gauge series gives you a choice of two different degrees of accuracy to match your application. All 3D accuracy figures are real: they include all friction, error, hysteresis, and linearity variations. And 3D gauges maintain their rated accuracy over the entire life of the gauge. With no gears or wear points there is no need for recalibration.

Every dial is clearly marked for fast, accurate reading with calibrations covering a 270° arc. Parallax is corrected on the test gauges by a neutral glare-free face and a corrosion resistant stainless steel dial, incorporating a polished mirror band. Our test gauges are easy to zero with a front mounted zero adjust screw, virtually the only adjustment necessary over the life of the gauge. 3D test gauges are ideal for field calibrations where rough service conditions cause the need for frequent recalibrations in lesser gauge technologies. 3D Test Gauges are available in; 2-1/2", 4-1/2", 6", 8-1/2", and 12" diameters. Accuracies available are 0.5% and 0.25% of span'. A variety of case configurations and colors is provided so that you can match the exact pressure calibration instrument required for your service.

Test Dial Graduation Chart (± 0.25% and ± 0.5% of span Accuracy)					
Pressure Range (psia)	Major Figure Interval (psia)	Minor Figure Interval (psia)	Major Graduation (psia)	Inter. Graduation (psia)	Minor Graduation (psia)
0 - 30	5	1	5	1	0.1
0 - 60	10	1	10	1	0.2
0 - 100	10	1	10	1	0.5
0 - 150	10	2	10	1	0.5
0 - 200	10	2	10	2	1.0
0 - 300	50	5	50	5	1.0
0 - 500	100	10	100	10	2.0
0 - 600	100	10	100	10	2.0
0 - 1000	100	20	100	10	5.0
0 - 1500	100	20	100	10	5.0
0 - 2000	100	20	100	20	10.0
0 - 3000	500	50	500	50	10.0
0 - 4000	1000	100	500	100	20.0
0 - 5000	1000	100	1000	100	20.0
0 - 8000	1000	200	1000	50	50.0
0 - 10000	1000	200	1000	100	50.0
0 - 15000	1000	200	1000	100	50.0
0 - 20000	1000	500	1000	100	100.0
30" Hg - 0 Vac	10	1	10	1	0.2

Dimensions



Test Gauge Basic Dimensions in Inches (millimeters)												
Model No.	A	B	C	D	E	F	G	H	K	L	M	Panel
255*4	4.83 (122.7)	2.50 (63.5)	6.00 (152.4)	1.00 (25.4)	5.37 (136.4)	1.54 (39.1)	4.99 (126.7)	1.65 (41.9)	0.24 (5.6)	0.50 (12.7)	4.50 (114.3)	5.00 (127.0)
255*5	6.31 (160.3)	2.50 (63.5)	7.63 (193.8)	1.00 (25.4)	7.00 (177.8)	2.13 (177.8)	5.72 (145.3)	1.65 (41.9)	0.28 (7.1)	0.50 (12.7)	6.00 (152.4)	6.50 (165.1)
255*6	8.81 (233.8)	2.50 (63.5)	10.20 (259.1)	1.00 (25.4)	9.63 (244.60)	2.13 (177.8)	6.97 (177.0)	1.65 (41.9)	0.28 (7.1)	0.50 (12.7)	8.50 (215.9)	9.00 (228.8)
255*7	12.50 (317.50)	2.50 (63.5)	14.13 (358.9)	1.00 (25.4)	13.50 (342.9)	2.13 (177.8)	8.82 (224.0)	1.65 (41.9)	0.28 (7.1)	0.50 (12.7)	12.00 (304.8)	12.75 (323.9)

HOW TO ORDER

How To Order:

To obtain your part number for the type of gauge you need, select one variation under each section heading. Place a check mark immediately below the part number for each variation. When complete, write the part numbers above each check. The resulting number is your part number. (Note: The first two numbers are always 25 as indicated.)
Example: 25544-311313.

D-M Connector



D-M Snap-On Mounting Flange



ISO and Metric Scale	
Type	Suffix
Kilopascals / Megapascals *	ISO
BAR	ISB
Kg/cm ²	ISK
Note: for dual scale ass "D" to suffix. I.e; PSI & bar = ISBD. PSI typically on outer arc	

* above 1000 PSI