

Introduction



Welcome to Instruments Industries Pvt. Ltd., established by Mr. M. T Kulkarni, it is a family owned company. He is a Mechanical Engineer with over 42 years of experience of manufacturing process control instruments for measurement of Temperature, Pressure, Flow, Level & Instrumentation Valves.

We are the leaders in manufacturing various types of Thermowells for all types of Temperature Sensors and Gauges for Industrial applications like Sugar, Power, Oil, Gas, Petrochemical, Fertilizer and other process Industries.

The company has many sets of excellent mechanical processing equipments and modern inspection and testing equipments for our products.

Our Products have been supplied to the following Industries

- Bhabha Atomic And Research Center
- Oil & Gas Refineries & Petrochemical Industries
- Chemical, Process, Sugar Industries
- Thermal Power & Atomic Power Plants
- Fertilizers & Agro Chemicals
- Pharmaceuticals & Laboratories
- Steel & Metallurgical Plants
- Original Equipment Manufacturers
- EPC Contractors
- Water & Effluent Treatment Plants
- Pulp, Paper & Fibre Industries
- Defence
- And Many More

A-State-of-the-Art manufacturing facility, continuous Research & Development, innovative technology & stringent quality control at every stage have been some of the key factors in the manufacturing of our products.

We are not only the manufacturer but the solution providers.

We have built world class reputation of total understanding of customers requirements and needs, thus delivering excellent products and services at competitive prices.

For us, commitment and integrity are valued the most, which reflects in the philosophy of achieving total customer satisfaction. With our presence in major cities in India and a growing international network across all continents, we are in a position to reach clients all over the world.

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Bourdon Sensing Pressure Gauges

The Bourdon pressure gauge uses the principle that a flattened tube tends to straighten or regain its circular form in cross-section when pressurized. Although this change in cross-section may be hardly noticeable, and thus involving moderate stresses within the elastic range of easily workable materials, the strain of the material of the tube is magnified by forming the tube into a C shape or even a helix, such that the entire tube tends to straighten out or uncoil, elastically, as it is pressurized. This type of gauge is equipped to meet most of the Industrial applications.

Features

- Protection class IP-67
- \blacksquare Accuracy +/-1% FSD as Standard , \pm 0.5% on request
- 22mm A/F Socket
- Unit Of Measurement- mmWC, kg/cm², Bar, PSIG, Kpa mBar
- Range: (-) I to 1000 kg/cm²
- Compliance to latest EN-837 Standard
- Micrometer Pointer for Reset



Technical Specifications

Reference standard: EN-837

Dial : 100mm, 150mm, in aluminium white background

with black markings

Case : SS304 with Bayonet Bezel as a standard

SS316, Diecast Aluminium with screwed bezel,

epoxy painted black (on request)

Protection : Weatherproof to IP-67 (IS/IEC 60529:2001)

Bourdon Size : 63mm dia as a standard, I 10mm dia (on request)

Bourdon Material : SS316 as Standard, MONEL (on request)

: 22mm A/F in SS3 I 6 as Standard, SS3 I 6L,

Monel (on request)

Movement : SS304, SS316

Socket

Connection : 1/2" NPT (M) as standard (Any other on request)

Range : Minimum Span of 0.4Kg/cm²

upto maximum 1000 Kg/cm² (Ref Standard EN 837)

Accuracy : $\pm 1\%$ FSD (In accordance with EN 837)

Over range : 130% FSD

Temp Suitability : (-) 20 Deg C to 60 Deg C (Service Temperature)

Zero Adjustment : Micrometer Pointer
Blow Out Disc : Provided (Top Mounted)
Optional : 1) Glycerine Filled Case

2) IBR Certification3) Maxima Indicating Pointer

- 4) Snubber
- 5) NACE Certification
- 6) Adjustable Swivel Connection for better positioning and rotation of the Gauge
- 7) Pressure Gauge in Non Ferrous Materials
- 8) Restrictor in Stainless Steel



Chemical (Diaphragm) Seal Pressure Gauges

A Chemical (diaphragm) seal is a flexible membrane that seals and isolates an enclosure. The flexible nature of this seal allows pressure effects to cross the barrier but not the material being contained.

Common uses for chemical (diaphragm) PG seals are to protect pressure sensors from the fluid whose pressure is being measured.



Technical Specifications

Dial : 100mm, 150mm in aluminium white background with

black markings

Case : SS304 / SS316 with Bayonet Bezel as a standard

Diecast Aluminium with screwed bezel, epoxy

painted black (on request)

Protection : Weatherproof to IP-67 (IS/IEC 60529:2001)
Bourdon Size : 63mm dia as a Standard, I I 0mm dia (on request)

Bourdon Material : SS316

Socket : 22mm A/F in SS3 | 6

Movement : SS304 / SS3 | 6

Connection to Seal : Screwed

Range : 0-2.5 Kg/cm² and above

Accuracy : $\pm 1\%$ FSD as Standard (In accordance with EN 837)

Over range : 130% FSD

Suitability : (-) 20 Deg C to 60 Deg C (Service Temperature)

Zero Adjustment : Micrometer Pointer
Blow Out Disc : Provided (Top Mounted)
Filled Fluid : Silicone Oil as a Standard
Seal Top Flange : CS / SS304 / SS316

Seal Bottom Flange : SS304 / SS316 / SS316L / SS316+PTFE

Chemical Seal (Diaphragm): SS316, SS316+PTFE, PTFE

Reference standard : EN-837

Optional : 1) Provision of Capillary in case of Remote Sensing Gauge

2) Bottom Flange equipped with Flushing Connection

3) Welded Diaphragm Construction

4) 'I' Section Type Chemical Seal Arrangement

5) Flanged, Jacketed, Weld in, Extended and Pancake type

Process Connection can be offered

Diaphragm Sensing Pressure Gauges

Such type of Gauges are mostly preferred, where pressures are low, thereby eliminating the use of the Bourdon type due to its insensitivity. In such a assembly, the sensing component is a diaphragm, which is connected to the movement assembly through a 'Ball & Socket' arrangement. The Pressure to be measured is transmitted through this Diaphragm to the transmission shaft.

The diaphragm offers dual advantage in such type of assembly. Along with increased sensitivity for low pressure measurement it also serves as an Isolation between the process medium and the pressure sensing element.



Technical Specifications

Reference standard: EN-837

Dial : 100mm, 150mm, in aluminium white background

with black markings

Case : SS304 with Bayonet Bezel as a Standard

SS316, Diecast Aluminium with screwed bezel,

epoxy painted black (On Request)

Protection : Weatherproof to IP-67 (IS/IEC 60529:2001)

Connection : 1/2" NPT (M) as Standard in SS304

or SS316 (Any other on request)

Range : Min: 0-400mmWC to Max: 0-6000mmWC

Accuracy : ±2% FSD

Over range : 130% FSD

Zero Adjustment : Micrometer Pointer

Top Flange : CS, SS304, SS316

Diaphragm : SS316, PTFE Lined SS316 (Any other on request)

Bottom Flange: SS304, SS316, SS316+PTFE Block,

PTFE lined SS3 I 6 (Any other on request)



Capsule Sensing Pressure Gauges

Such types of Pressure gauges are used for low pressure measurement, in NON corrosive process mediums. The sensing element is a capsule which is made up of dual SS316L laser welded diaphragms. Such type of gauges are preferred for their Accuracy in low pressure measurement. The unique compact design is highly suitable for use in many Industrial applications where space can be a major constraint.

Features

- Ingress Protection class IP-67
- Compact Design
- Lowest Span with Increased Accuracy
- All Internal Components in Stainless Steel.



Technical Specifications

Dial :100mm, 150mm, in aluminium white

background with black markings

Case : SS304 with Bayonet Bezel as a Standard

SS316, Diecast Aluminium with screwed bezel, epoxy painted black (on request)

Protection : Weatherproof to IP-67 (IS/IEC 60529:2001)

Pointer : Aluminium Capsule : SS316

Socket : SS316 / SS316L
Movement : Stainless Steel

 $\textbf{Connection} \hspace{1cm} : \frac{1}{2} \text{" NPT (M) as Standard in SS304 or SS316}$

(Any other on request)

Range : Min: 0-60mmWC to Max: 0-6000mmWC

(Some Ranges are restricted for 100mm Dial Size)

Accuracy: $\pm 2\%$ FSDOver range: 10% FSD

Zero Adjustment: Internal Micrometer Pointer



Solid Front (All Safety Pattern) Pressure Gauges

Such types of Pressure gauges are designed to be used in Process Industries where safety requirements are of prime importance. They are strategically designed with a solid front and a Blow out back which is detached from the assembly in case of the Bourdon Rupture, which can happen due to excess pressure developed in the system.

Features

- Ingress Protection class IP-67
- Safety Pattern (Solid Metallic Front)
- Micrometer Pointer
- All Components in Stainless Steel.



Technical Specifications

Reference Standard: EN 837

Dial : 100mm, 150mm, in aluminium white background

with black markings

Case : SS304 with Bayonet Bezel as a Standard

SS316 (on request)

: Weatherproof to IP-67 (IS/IEC 60529:2001) Protection **Bourdon Size** : 63mm dia as a standard, 110mm dia (on request)

Bourdon Material : SS316

Socket Material : 22mm A/F in SS316 as Standard, SS316L,

Monel (on request)

: SS304, SS316 Movement

: As per EN 837, minimum Span of 0.4Kg/cm² Range

upto maximum 1000 Kg/cm²

Accuracy : ±1% FSD Over range : 130% FSD

: (-) 20 Deg C to 60 Deg C (Service Temperature) Suitability

Zero Adjustment : Micrometer Pointer : 1) Glycerine Filled Case Optional

2) NACE Certification



Some Special Purpose Pressure Gauges

Receiver Gauges

High quality gauge designed to work with a pneumatic transmitter or controller

Stainless Steel wetted parts. Range of 3-15 Psi or 0.2 to 1 Kg/m² as Standard, any other on request. Reliable indication of changes in pressure, temperature, flow, level, or other measured variables

Dial : 100mm, 150mm,

Case : SS304 as a Standard Aluminium, SS316 (on request)

Mounting: Local, Surface or Panel Mounted

Entry: Bottom, Back

Note: Linear Dial Marking offered as Standard (Square Root on request)



Vacuum / Compound Gauges

A compound gauge is a device that can display both positive and negative (vacuum) pressures. A compound gauge is used when measuring a system that is exerting both positive and negative pressure on the gauge.

Vacuum gauges, measure pressure in units of inches of mercury (in Hg).

The needle in a compound gauge will move clockwise when measuring positive pressure and counterclockwise when measuring negative pressure.

Dial : 100 mm, 150 mm

Case : SS304 as a standard Aluminium, SS316 (on request)

Mounting: Local, Surface or Panel Mounted

Entry: Bottom, Back

Note: Lowest Range: (-) | Kg/cm² to 0 or 0-760mm Hg Vac or (-)5000mm WC

to (+)5000mmWC. (Any other on request)



Oxygen/Acetylene Gauges

We exercise extreme care in the manufacture and testing of this gauge, and in the subsequent cleaning and handling of oxygen / Acetylene gauges and their connections, so that they are kept absolutely free of oil and grease. Bourdon Sensing Pressure Gauges are offered in such type

Dial : 100 mm, 150 mm



Ammonia Gauges

Ammonia gauges requirements for the agricultural, industrial, OEM, and refrigeration markets are increasing day by day. We have intensified our focus on the ammonia pressure gauge market to bring our knowledge and customer service to an industry based on quality and service. Ammonia pressure gauges are designed for rugged performance in the measurement of vacuum and pressure for any system or piece of equipment that is charged with ammonia.

Dial : 100 mm, 150 mm



Hygiene Gauges

These types of Gauges are Specifically designed to be crevice free with flush diaphragms for all hygienic applications. They contain no filling fluid which would contaminate the process, should a failure of the unit occur. Complying with the most stringent of hygiene regulations, it is available with a full range of connections and operating pressures.



Technical Specifications

Reference Standard: EN 837

Dial : 100mm, 150mm, in aluminium white background

with black markings

Case : SS304 with Bayonet Bezel as a standard

SS316 (on request)

Protection : Weatherproof to IP - 67 (IS/IEC 60529:2001)

Bourdon Size : 63mm dia as a standard, 110mm dia (on request)

Bourdon Material : SS316

Socket Material : 22mm A/F in SS316 as Standard, SS316L, Monel (on request)

Movement : \$\$304, \$\$316

Range : As per EN 837, minimum Span of 0.4Kg/cm² upto maximum

1000 Kg/cm²

Accuracy: $\pm 1\%$ FSDOver range: 130% FSD

Suitability : (-)20 Deg C to 60 Deg C (Service Temperature)

Zero Adjustment: Micrometer Pointer

Optional : 1) Glycerine Filled Case

2) NACE Certification



Indicating Pressure Switch

A Indicating Pressure Switch is a form of switch that closes an electrical contact when a certain set pressure has been reached on its input. It offers a dual advantage of Indication and Switching. The switch may be designed to make contact either on pressure rise or on pressure fall. Because of their robust design, they are suitable for harsh environment and most corrosive media and meet stringent demands to bring the advantages of high accuracy, long term stability and protection against water jets and dust on their moving parts.



Features

- Reliable and accurate multi-stage Pressure Switches
- Dual Performance of Indication and Switch
- Low Hysterisis
- Flameproof or Weatherproof Housing

Technical Specifications

Dial : 100mm, 150mm, in aluminium white background with

black markings

Case : SS304 with Bayonet Bezel as a standard

SS3 I 6, Diecast Aluminium with screwed bezel, epoxy painted

black (on request)

Protection : Weatherproof to IP-67 (IS/IEC 60529:2001), Flameproof to IIA IIB

Bourdon Size : 63mm dia as a Standard, 110mm dia (on request)

Bourdon Material : SS3 | 6 as Standard, Monel on request Socket Material : SS3 | 6 as Standard, Monel on request

Movement: SS304 / SPDT Microswitch movement (Imported from Germany)

as per the type of switch required

Range : (-)1 to 600 kg/cm²

Accuracy : \pm I % FSD for Indication and \pm 2% FSD for Switching

Over range : 130% FSD Blow Out Disc : Provided

Contacts for Switching: a) I SPST, Single, Open Normally, Closes on rise in Pressure or

Vice Versa rated 30VA@230VAC

b) 2 SPST, Dual Contacts, Individually adjustable, one closed one open, both open, both closed rated 30VA@230VAC

c) I SPDT, Single Microswitch, adjustable over entire span rated 5A@230VAC

d) 2 SPDT, Dual Microswitch, adjustable over entire span rated 5A@230VAC

Accessories

Snubber

A pressure gauge snubber is installed in the line that leads to the pressure gauge. The purpose of the snubber is to dampen the oscillations and thus provide a steady reading and protection for the gauge

MOC: CS, SS304, SS316, Monel (Any other on request)

Connection: ½"NPT(F)x1/2"NPT(M) as a Standard. (Any other on request)



Gauge Saver



The gauge saver is a piston valve designed to protect pressure gauges against over pressure. The high rate of gauge repairs indicates over pressure at many measuring points which exceed not only the normal operating pressure by far but also the measuring range of the pressure gauge. Such pressure peaks destroy the measuring system of the pressure gauge. Expenses for disassembly of the damaged instrument, reassembly of a new gauge and repair of the damaged one are the consequences. This can be avoided by using dependably working gauge savers

MOC: CS, SS304, SS316, Monel (Any other on request)

Connection: ½"NPT as a standard. (Any other on request)

Syphon

A pressure gauge syphon is a simple device used to protect a pressure sensor from high-temperature media, such as steam. It can also be used to reduce the potentially damaging effects of rapid pressure changes. These low-cost devices allow system builders to use a pressure sensor with a much lower temperature range in high-temperature applications. Can be offered with IBR Certification if required

MOC: CS, SS304, SS316, Monel (Any other on request)

Connection: ½"NPT(F) x I/2"NPT(M) as a Standard. (Any other on request)



Two Way Isolation Valve



These are needle type valves used for Isolation of the process and the Pressure Gauge.

MOC: CS, SS304, SS316, Monel (Any other on request)

Connection: ½"NPT(F) x I /2"NPT(M) as a Standard. (Any other on request)

Three Way Isolation Valve

These valves are also used for Isolation of the process and the Pressure Gauge. These type have Drainage Facility

MOC: CS, SS304, SS316, Monel (Any other on request)



Gauge Union

It is used for positive sealing while the pressure gauge may be directed into any direction MOC: CS, SS304, SS316, Monel (Any other on request)

Connection: 1/2"NPT(M) as a Standard. (Any other on request)

In-House Testing facilities for Pressure Gauges

For the manufacturing & testing of Pressure gauges, we follow EN: 837 standard.

Following tests are carried out to ensure the quality of Pressure gauges. We have facilities to carry out following tests in-house at our manufacturing plant.

- 1) Visual Inspection
- 2) Dimensional Check
- 3) Hysteresis Test
- 4) Accuracy Test
- 5) Degree of Protection Test
- 6) Leak Test
- 7) Mechanical Vibration Suitability Test
- 8) Mounting Position Test

- 9) Steady Pressure Endurance Test
- 10) Over Pressure Endurance Test
- Test Set Up for Endurance, Pulsation and Stress Relieving (Test Facility Under Commissioning)
- 12) Helium Leak Test for High Reliability and Safety Requirement
- 13) Hydraulic Dead Weight Test-Model No-CPB5800 (DH-Budenberg Make)



Some of our Valued Customers

Saint-Gobain Seva Engineering	Jindal Steel & Power Ltd.
Tata Chemicals Ltd.	Allied Furnaces Pvt. Ltd.
Hindustan Chemicals Company	Govind Poy Oxygen Ltd.
India Oil Tanking Ltd.	Paradeep Phosphates Limited
Meghmani Finechem Limited	Rama Newsprint And Papers Ltd.
Endress+Hauser (india) Pvt. Ltd.	P. T. Indo-Bharat Rayon
Solaris Chemtech	Eco Cane Sugar Energy Ltd.
S. S. Engineers	Advance Ventilation Pvt. Ltd.
Yokogawa India Ltd.	Chambal Fertilisers and Chemicals Ltd.
Shanti Gears Ltd.	Clique Solar
United Industries	Jasubhai Engg. Pvt. Ltd.
Monnet Ispat & Energy Ltd.	E & C Projects Pvt. Ltd.
Kalyani Gerdau Steels	Gharda Chemicals
Shriram Epc Ltd.	Greenesol Power Systems Pvt. Ltd.
Veesons Energy	Indian Rare Earths Ltd.
Multi Organics Pvt Ltd.	Clique Developments Ltd.
Prolific Systems And Technologies	Facor Power Ltd
Pvt. Ltd.	Del Controls Ltd.
Southern Petrochemicals	Essar Power Gujarat Ltd.
SRF Limited	Cetex Petrochemicals Ltd.
Hindalco Industries	Bhel-Bangladesh
Bilt Graphic Paper Products Ltd.	Bhushan Power & Steel Ltd.
Indian Acrylics Ltd.	Manali Petrochemicals Ltd.
Tamilnadu Petro Products Ltd.	Indian Additives Ltd.
Veesons Energy	Vadinar Power Company Ltd.
Micromax Systems Pvt. Ltd.	Indo Rama Synthetics Ltd.
Abb Ltd-Bangalore	Inox Air Products Ltd.
KG Denim Limited	Chennai Petroleum Corporation Ltd.
Chemplast Sanmar Ltd.	Coromandel International Ltd.
Styrolution ABS (india) Ltd.	Grasim Industries Ltd.
Essar Power Gujarat Ltd.	India Glycols Ltd.
Rainbow Papers Ltd.	ISGEC Heavy Engineering Ltd.
Industrial Instruments	Jubilant Lifesciences
Shriram Non Conventional Energy Ltd.	Konstelec Engineers Pvt Ltd.
Atul Ltd.	S. S. Company
Gail Pata	

Pressure Conversion Chart

То	psi	mbar	bar	atm	ра	kPa	MPa	mmH ₂ O	in.H ₂ O	mmHg	in.Hg	kg/cm²
From												
psi	I	68.95	0.0689	0.0681	6895	6.895	0.006895	703.8	27.71	51.715	2.036	0.0704
mbar	0.0145	I	0.001	0.000967	100	0.100	0.0001	10.21	0.402	0.75	0.0295	0.00102
bar	14.504	1000	I	0.987	100000	100	0.1	10210	4019	750.1	29.53	1.02
atm	14.7	1013.25	1.01325	I	101325	101.325	0.1013	10343	407.2	760.0	29.92	1.033
ра	0.000145	0.01	0.00001	0.00001	I	0.001	0.000001	0.102	0.00402	0.0075	0.000295	0.00001
kPa	0.14504	10.0	0.01	0.00987	1000	I	0.001	102.07	4.019	7.5	0.295	0.0102
МРа	145.04	10000	10	9.87	1000000	1000	I	101971.6	4014.6	7500.6	295.3	10.2
mmH ₂ O	0.001421	0.098	0.000098	0.000097	9.8	0.0098	0.0000098	T	0.0394	0.0735	0.00289	0.0001
in.H ₂ O	0.0361	2.488	0.002488	0.00246	248.8	0.2488	0.00025	25.4	ı	1.866	0.0735	0.00254
mmHg	0.01934	1.333	0.001333	0.001316	133.3	0.1333	0.00013	13.61	0.536	1	0.0394	0.00136
in.Hg	0.4912	33.86	0.03386	0.03342	3386	3.386	0.00386	345.7	13.61	25.4	1	0.0345
kg/cm²	14.22	960.7	0.9807	0.965	98067	98.067	0.0981	10010	394.1	735.6	28.96	T



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