HAWK®
Since 1971

Solid Front Process Gauge

Safety Case

Measuring Instrument
ISO 9000
HAWK GAUGE CO.,LTD

45
HAWK

Catalog No:MKBP1B01A1-E

HAWK GAUGE CO LTD

Website : www.hawkgauge.com.tw Contact : sales@hawkgauge.com.tw

COMPANY PROFILE

HAWK GAUGE has developed, manufactured and marketed the instruments for the pressure ,temperature , level and flow measurements since 1971. From its foundation in 1971 , we quickly carved a niche in the highly competitive instrumentation market with its innovative designs and quality manufacturing.
Nowadays many millions of measuring devices made by us are used in a wide variety of applications worldwide. With our unremitting effort over 40 years, today we have been successful in becoming a major manufacturer on the world market for the instrumentation. we achieve high customer satisfaction through reliability, quick reaction times and quality.

Pressure

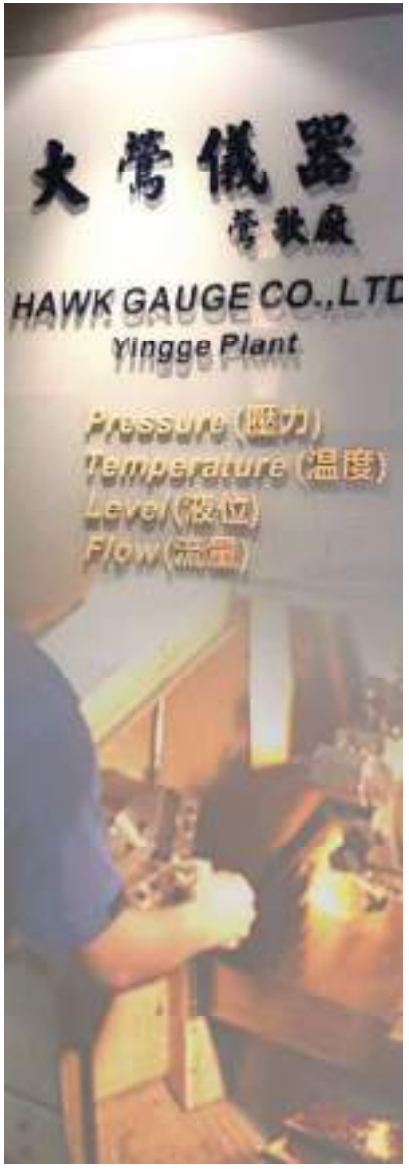
Temperature

Level

Flow

MANAGEMENT/QUALITY/PROCESS

The management system of HAWK GAUGE has been certified to ISO9001 . All applicable process descriptions, work instructions, form, etc. are summarized and standardized in our quality management guide and made accessible to all employees through our server. We use the smart enterprise resource planning(ERP) system integrated internal and external management information across an entire organization, embracing finance/accounting, manufacturing, sales and service, customer relationship management, etc. Through automated system, we can offer the most effective way to fulfill our world customers' business growth objectives.
In order to offer the best quality products to our customers, we are working continuously at improving the knowledge, skill and motivation of our employees and proficient processes.
Our engineers, technical staff and product marketing specialists can work with the customs to choice the right product to meet your goals.



Introduction

For fulfilling the requirements of high quality from various industries, HAWK GAUGE supplies all stainless steel pressure gauges. These gauges have all stainless steel material construction including case, ring, bourdon tube, movement, socket, screws and washers. HAWK all stainless steel gauges are in use on demanding applications where corrosion resistance and reliable operation are required. Typical applications include incinerators, chemical and petrochemical processing, food, and beverage processing, medical and pharmaceutical plants, powerplants, industria OEM equipments, hydraulic monitoring systems, power generating stations, offshore oil platforms, pulp and paper mills, pneumatic systems, level measurement, fertilizer plants and on shipboard.

PROCESS MEDIA

Since the measuring element of the pressure gauge may be directly exposed to measuring medium, you should obtain complete information about the medium and select the correct gauge materials that would not be affected by medium. The medium may be corrosive and HAWK all stainless steel gauge perform well to resist corrosion. The wetted parts of the pressure gauges can be in brass, 316stainless steel, and monel.

ENVIRONMENT

The ambient atmosphere in which the gauge is to be installed will have a direct on the use, serve life, and accuracy of the gauge. some airborne particles maybe corrosive to damage. This atmosphere may attack the Inner and outer parts and then damage its pressure system. HAWK process pressure gauges can offer with 304-stainless case and ring are seal weatherproof and durable. The 316SS case can be supplied as option.

DIAL SIZE

Selecting enough dial size may let users read easily. HAWK supplies varied selections of process gauge size including 3½"(90mm), 4½"(115mm) and 6" (150mm)

TEMPERATURE

Temperature need be considered when selecting a pressure gauge. All welded SS construction pressure gauge without filling liquid can withstand continuous ambient temperatures as high as 212°F (100°). The gauge combined with our cooling system can withstand fluid/air temperatures up to 750°F(400°C). Accuracy of measurement will be effected by the ambient temperature. This inaccuracy may be as much as 0.3 for 20°F(12°C) temperature Change.

CASE AND RING

HAWK process gauges are designed to provide the maximum safety for personnel monitor the gauge. These gauges are constructed with a solid wall between the sensing element and the window. In addition to protect users from fluid and particles in the event of failure, the back of these gauges are designed to blow out to release the pressure inside the case. Phenolic, aluminum and stainless steel case materials are offered for your applications.

ACCURACY

Selecting a gauge with sufficient accuracy to satisfy your requirements. Temperature change will reduce the accuracy of the gauges, check the individual specifications for available accuracy.

CONNECTION

HAWK pressure gauge are available in wide variety of connections. NPT threads are the standard configurations, BSP and JIS are available. If you have a requirement for a connection not listed, please contact with our offices/agnets/distributors.

MOUNTING

The gauge can be selected in stem, flush or surface mounting for the different installation requirements from the users. The surface mounting is usually in flange style. Regarding the flush mounting, HAWK offers the U-clamp and flange for choice.

LIQUID FILLED

HAWK supplies several types of liquid filled pressure gauges. The liquid filling may be glycerin or silicone. The liquid filled pressure gauges dampen Pulsation and the filling can lubricate gauge internals. Liquid filled gauge are also suited for rugged environment such as high vibration/pulsation/shock applications.

DIAPHRAGM SEAL

HAWK all pressure gauge is popular to used with the diaphragm seal. Diaphragm seals are used to isolate pressure measuring element of gauge from the media which may be corrosive, viscous, contaminated, hot or sedimentary. HAWK offers different diaphragm seal styles for the applications. For the detailed information, please refer to the HAWK diaphragm seal catalog.

Features

HAWK solid front process gauges are designed to provide the maximum safety for personnel monitoring the gauges in the event of the gauge failure. These gauges are constructed with a solid wall between pressure sensing element and the window. The different case materials are offered for your applications including stainless steel, aluminum and phenol.

All stainless steels have a high resistance to corrosion. Low alloyed grades resist corrosion in atmospheric conditions; highly alloyed grades can resist corrosion in most acids, alkaline solutions, and chloride bearing environments, even at elevated temperatures and pressures. The easy cleaning ability makes it the first choice for strict hygiene applications. It has a better fire and heat impact resistance.

The aluminum alloys is a light and high strength material. It has become one of the world's most widely used metal applications. Due to the appearance of aluminum excellent air stability and anodized rather severely applications.

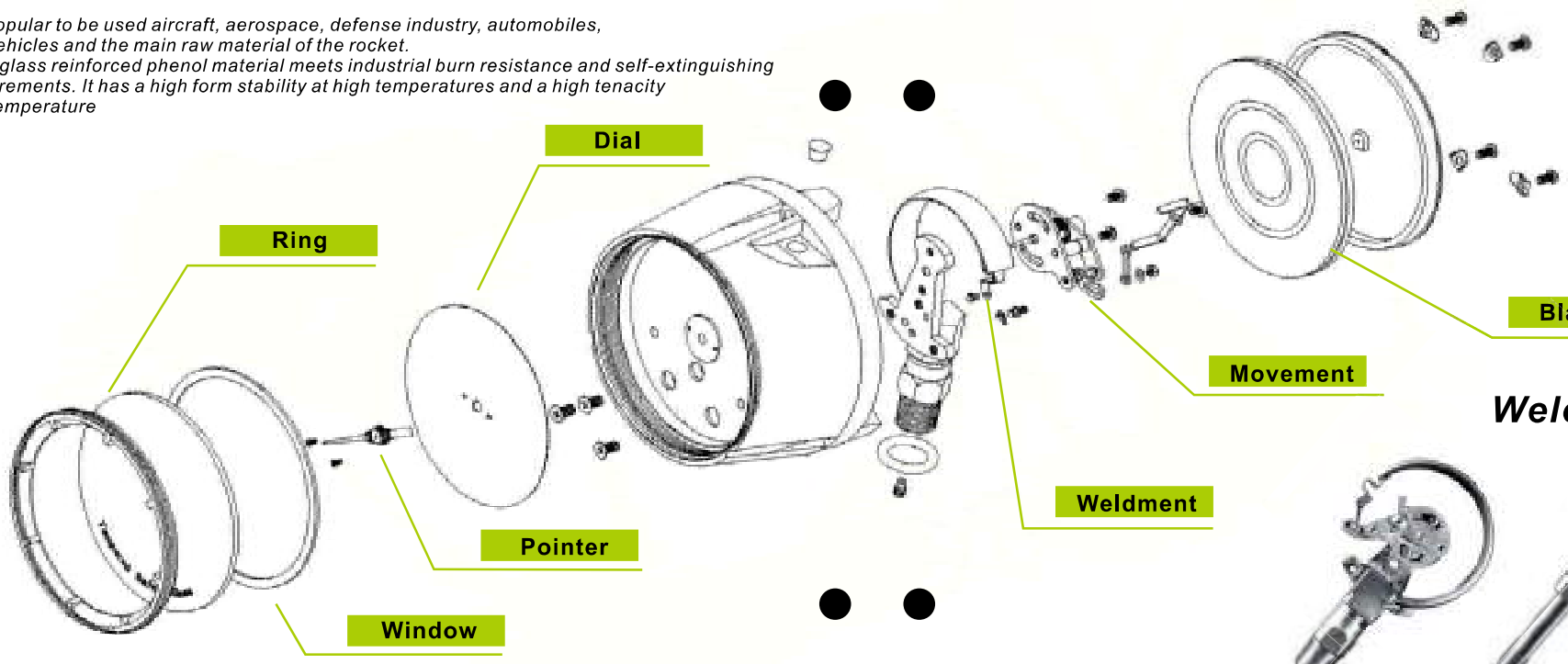
It's popular to be used aircraft, aerospace, defense industry, automobiles, rail vehicles and the main raw material of the rocket. Fiberglass reinforced phenol material meets industrial burn resistance and self-extinguishing requirements. It has a high form stability at high temperatures and a high tenacity low temperature

SS Case

Surface Mount Aluminum Case

Hinged Ring Aluminum Case

Phenol Case



Weledment

Specificatios





Models

Specifications		11 L	12 L	13 L	14 L	16 L
Accuracy		±0.5% of span	±0.5% of span	±0.5% of span	±0.5% of span	±0.5% of span
Socket to Case Seal		O-ring Style	O-ring Style	O-ring Style	Welded Style	O-ring Style
Case Material		Phenolic	Alminum	SS 304 (SS316 on option)	SS 304 (SS316 on option)	Aluminum
Dial Sizes		4.5"(115mm)	4.5"(115mm)	4.5"(115mm)	4.5"(115mm)	3.5"(90mm)
			6"(150mm)			4.5"(115mm)
						6"(150mm)
Dial Material		Aluminum	Aluminum	Aluminum	Aluminum	Aluminum
Ring Style		Removable Ring	Removable Ring	Polished Bayonet Ring	Polished Bayonet Ring	Removable Ring
Ring Material		Phenolic	Aluminum	SS 304	SS 304	Aluminum
Bourdon Tube Material		Brass, Monel, 316LSS	Brass, Monel,316LSS	Brass, Monel	316LSS	Brass, Monel,316LSS
Socket Material		Brass, Monel, 316SS, 316LSS	Brass, Monel, 316SS, 316LSS	Brass, Monel, 316LSS	316SS	Brass, Monel, 316SS, 316LSS
Connection Size		1/2"NPT, 1/4"NPT, others	1/2"NPT, 1/4"NPT, others	1/2"NPT, 1/4"NPT, others	1/2"NPT, 1/4"NPT, others	1/2"NPT, 1/4"NPT, others
Mounting		Stem or Surface	Stem	Stem	Stem	Stem or Surface
Movement		Brass, Stainless Steel	Brass, Stainless Steel	Brass, Stainless Steel	Brass, Stainless Steel	Brass, Stainless Steel
Range		Vac/20,000PSI	Vac/20,000PSI	Vac/20,000PSI	Vac/20,000PSI	Vac/20,000PSI
Pointer		Micro-adjustment	Micro-adjustment	Micro-adjustment	Micro-adjustment	Micro-adjustment
Window		Tempered Safety Glass	Tempered Safety Glass	Tempered Safety Glass	Tempered Safety Glass	Tempered Safety Glass
Weatherproof		NEMA 4/4X/IP65	NEMA 3/3X/IP54	NEMA 4/4X/IP65	NEMA 4/4X/IP65	NEMA 3/3X/IP54
Dry or Liquid Filling		Dry but liquid fillable	Dry type only	Dry or liquid filled	Dry but liquid fillable	Dry type only
Safety Style		Solid front and blow out back	Solid front and blow out back	Solid front and blow out back	Solid front and blow out back	Solid front and blow out back
Major Options						
Glycerin Filled	(G)	Available	N/A	Available	Available	N/A
Silicone Filled	(S)	Available	N/A	Available	Available	N/A
Dampened Movement	(M)	Available	Available	Available	Available	Available
Laminated Safety Glass	(L)	Available	Available	Available	Available	Available
Polycarbonate Lens (PC Lens)	(P)	Available	Available	Available	Available	Available
Nace Treatment	(N)	Available	Available	Available	Available	Available
Clean Oxygen Service	(X)	Available	Available	Available	Available	Available
Stop Pin on Zero	(0P)	Available	Available	Available	Available	Available
Hawk Factory Test Report	(C)	Available	Available	Available	Available	Available

Specificatios

P1B



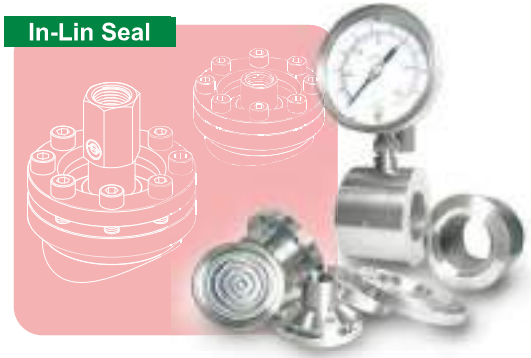


Models

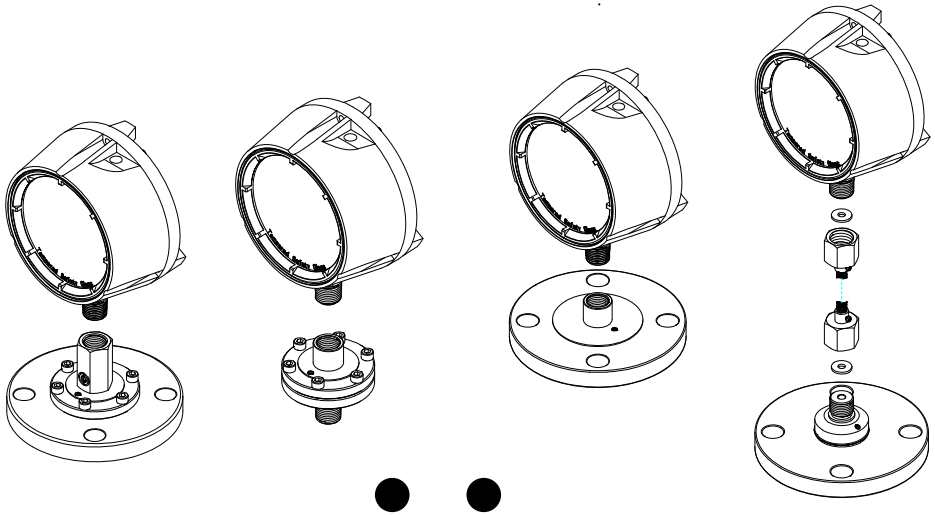
Specifications		11 B	12 B	13 B	14 B	16 B
Accuracy		±0.5% of span	±0.5% of span	±0.5% of span	±0.5% of span	±0.5% of span
Socket to Case Seal		O-ring Style	O-ring Style	O-ring Style	Welded Style	O-ring Style
Case Material		Phenolic	Alminum	SS 304 (SS316 on option)	SS 304 (SS316 on option)	Aluminum
Dial Sizes		4.5"(115mm)	4.5"(115mm)	4.5"(115mm)	4.5"(115mm)	3.5"(90mm)
			6"(150mm)			4.5"(115mm)
						6"(150mm)
Dial Material		Aluminum	Aluminum	Aluminum	Aluminum	Aluminum
Ring Style		Removable Ring	Removable Ring	Polished Bayonet Ring	Polished Bayonet Ring	Removable Ring
Ring Material		Phenolic	Aluminum	SS 304	SS 304	Aluminum
Bourdon Tube Material		Brass, Monel, 316LSS	Brass, Monel,316LSS	Brass, Monel	316LSS	Brass, Monel,316LSS
Socket Material		Brass, Monel, 316SS, 316LSS	Brass, Monel, 316SS, 316LSS	Brass, Monel	316SS,316LSS	Brass, Monel, 316SS, 316LSS
Connection Size		1/2"NPT, 1/4"NPT, other	1/2"NPT, 1/4"NPT, other	1/2"NPT, 1/4"NPT, other	1/2"NPT, 1/4"NPT, other	1/2"NPT, 1/4"NPT, other
Mounting		Stem	Stem or Panel	Stem or Panel	Stem or Panel	Stem
Movement		Brass, Stainless Steel	Brass, Stainless Steel	Brass, Stainless Steel	Brass, Stainless Steel	Brass, Stainless Steel
Range		Vac/20,000PSI	Vac/20,000PSI	Vac/20,000PSI	Vac/20,000PSI	Vac/20,000PSI
Pointer		Micro-adjustment	Micro-adjustment	Micro-adjustment	Micro-adjustment	Micro-adjustment
Window		Tempered Safety Glass	Tempered Safety Glass	Tempered Safety Glass	Tempered Safety Glass	Tempered Safety Glass
Weatherproof		NEMA 4/4X/IP65	NEMA 3/3X/IP54	NEMA 4/4X/IP65	NEMA 4/4X/IP65	NEMA 3/3X/IP54
Dry or Liquid Filling		Dry but liquid fillable	Dry type only	Dry or liquid filled	Dry but liquid fillable	Dry type only
Safety Style		Solid front and blow out back	Solid front and blow out back	Solid front and blow out back	Solid front and blow out back	Solid front and blow out back
Major Options						
Glycerin Filled	(G)	Available	N/A	Available	Available	N/A
Silicone Filled	(S)	Available	N/A	Available	Available	N/A
Dampened Movement	(M)	Available	Available	Available	Available	Available
Laminated Safety Glass	(L)	Available	Available	Available	Available	Available
Polycarbonate Lens (PC Lens)	(P)	Available	Available	Available	Available	Available
Nace Treatment	(N)	Available	Available	Available	Available	Available
Clean Oxygen Service	(X)	Available	Available	Available	Available	Available
Stop Pin on Zero	(0P)	Available	Available	Available	Available	Available
Hawk Factory Test Report	(C)	Available	Available	Available	Available	Available

Diaphragm Seal

In-Lin Seal



The in-line sealed type diaphragm seal is designed for flow-thru applications. The diaphragm seal forms an integral part of the process line. This avoids any obstructions in the system. This eliminates the disadvantage of the deal volume, because the in line seal is without corner, edges and dead spaces. They are particularly suitable which may damage or clog the process connection of the measuring instrument.



Sanitary Seal

The sanitary diaphragm face design enables deep cleaning of the surface. The quick-connection enables frequent removal from the process when cleaned in place (CIP) or steamed in place (SIP). These diaphragm seals are popular for hygienic process media applications. The connection can be in Tri-Clamp, APC, IDF, SMS, RJT, Cherry-Tank Spud and so on.

Thread Seal

The threaded type diaphragm seal connection is directly attached to the process by means of a male or female. The process connection is available in NPT, BSP or BSPT thread. It's a easy way to install into the process for the customers.

A diaphragm seal utilizes a elastic thin diaphragm as a protective device which is used to isolate pressure measuring element from the pressure medium. The volume between the diaphragm and the instrument's sensing element is completely filled with a compatible fluid. The process fluid pressure is transmitted to a gauge, transmitter, transducer, switch, or any other instrument by the movement of diaphragm and the replacement of the liquid filled in the pressure element. Used in a variety of process applications, diaphragm seals are intended for use where :

- The process medium might freeze or solidify in the pressure connection sensing element due to changes in ambient temperature.
- The measuring medium would corrode or attack the material of pressure sensing element.
- The pressure medium contains suspended solid or is highly viscous to clog the pressure sensing element.
- When changing process medium, the system requires flushing to prevent contamination.
- The process medium or ambient at measuring point has a very high temperature and the temperature of measuring instrument world rise to am undesirable degree.
- For hygienic reason absolutely no dead space is allowed.
- The mounting and reading possibilities at the measuring point are very difficult.

Flange Seal

The flange connection is directly attached to the process by means of a ANSI, DIN, JIS or HG flanges. The flange design is the most popular and common for the diaphragm seal.

Max/Min registering pointer

The max/min registering pointer can be installed on most HAWK pressure gauges and temperature gauges. This accessory allows the user to know what the highest or lowest pressure or temperature has been in your process. This device includes a pointer, an acrylic lens and a knob. The user can reset the pointer manually through the external knob.

Pulsation Dampener

The pulsation dampeners are designed to reduce the effect of pressure fluctuation and sudden pressure changes. The needle-type dampener features an adjustable needle valve to adjust the conditions of operation. The porous-type dampener is made using a porous metal disc as the flow restrict. The discs having a wide range of porosity are available and usually made of stainless steel. These dampeners make easier taken an accurate reading and help to increase life of the instruments at rugged conditions such as pulsations and shock found in compressors, pumps, hydraulic machines, fluid power system and chemical installations etc.

Over-pressure Protector

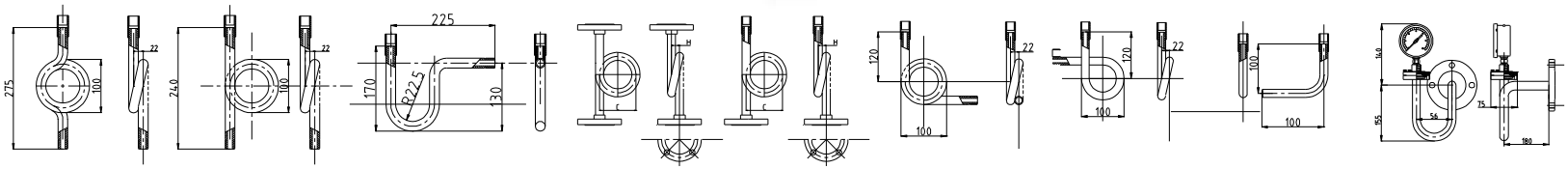
The over-pressure protectors are designed to protect the pressure instrument against short pressure peaks which may exceed the max operating pressure range.

Needle Valve

The needle-type valves are designed for multiple applications in pressure and flow instruments, including transmitters, gauges and switches where throttling or shut-off is required. These compact valves can used to isolate the instruments from the pressure medium and are rugged in construction to withstand high pressure and temperature. The valves are rated for pressure as high as 400 bar.

Siphon

In order to reduce the effect of high temperature steam and effect of rapid pressure surges, instrument siphons are supplied to prevent live steam directly entering a pressure gauge, pressure transmitter/ transducer and pressure switch sensing element. A siphon filled with water or any other suitable separating liquid should be installed between the instrument and instrument line. The siphon can be attached to the process by means of a thread or flange connection. When a instrument is to be used for steam pressures, a siphon is recommend for your applications.



Tranmitter/Tranducer

The analog indicating pressure transmitter/transducer is developed by using a bourdon tube pressure gauge and a ceramic cell pressure transmitters. It is ideal for all industrial applications when a local pressure reading and a remote signal transmission to a programmable logic controller or other computer-based system are required.

Three functions including local read out, voltage or current signal output and 2 switching points(option) in one instrument can reduce the cost by eliminating many of parts and labor associated with conventional in-house assemblies. The pressure gauge can continue to monitor your system even if an electrical power cut.

Hivis Dials

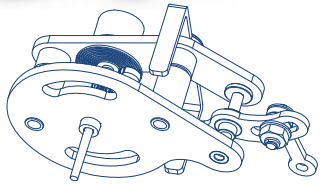
Hawk Hivis yellow dials for increase the visibility in low light.

Weldment

The weldment includes the bourdon tube and socket. It's the heart of the gauge which effect the performance. We supply heavy duty bourdons for different application of industries.

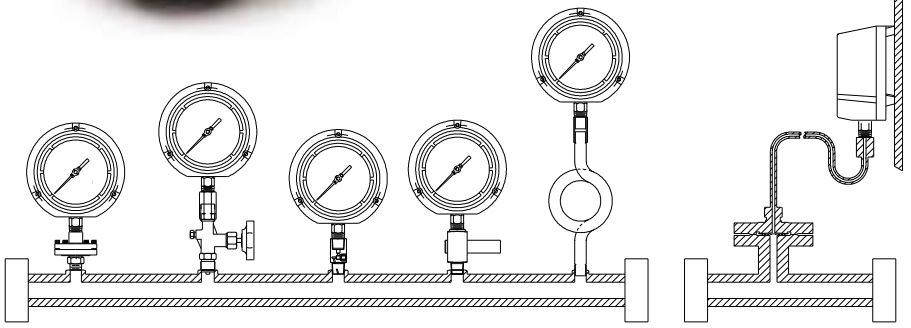
Stabilizer Movement

HAWK dampened movement is a good ideal for pressure gauge which is used in heavy vibration and pulsation applications. This device can eliminate the flutter of the pointer so the user needn't to do liquid filling for the pressure gauges.
This mechanism also supplies the higher operation temperature than the liquid filled pressure gauge.



Max/Min Registering Pointer

The red set hand can be used to indicate a specific operating or a desired predetermined reference point. It is attached to the dial with a grommet and can be adjusted manually through removing the ring and window of the gauge.



Direct actuated diaphragm seal | Needle valve | Pulsation dampener | Over-pressure protector | Siphon | Removing actuated diaphragm seal

Electrical Warning Contact

The Limit-value electrical warning contacts are designed for opening or closing electric and pneumatic circuits in relation to the position of the pointer on the instrument. These electrical contact devices are usually combined with the measuring instruments(pressure gauges and dial thermometers) for a continuous reading. We recommend strongly the use of control relay for your system in order to increase the working life of contacts. For intrinsic safety applications , an appropriate barrier must be used for your system.

Corrosion Table

APPLICATION \ MATERIAL	bronze or brass	steel	316-stainless steel	monel	diaphragm seals
Acetone	★		★★		
Acetic Acid			★		
Acetic Anhydride					★
Acety lene		★	★★		
Acrolein					★
Air	★	★	★★		
Alcohols	★		★★		
Alkali cleaners			★★		
Alum Chloride					★
Alum Hydroxide					★
Alum Sulfate			★		
Ammonia Gas		★	★		
Ammonium Chloride					★
Ammonium Nitrate			★		
Ammonium Sulfate					★
Aniline			★		
Argon	★	★	★★		
Beer			★		
Bauxite	★		★★		
Benzidene					★
Benzene			★★		
Benzoic Acid					★
Benzol	★	★	★		
Black Liquor			★		★
Boric Acid	★		★★	★	★
Brines			★★	★	★
Bromide					★
Bromine					★
Butane	★	★	★★		
Butyl Alcohol	★		★★		
Butyric Acid					★
Calcium Chloride			★★		
Calcium Hydroxide					★
Carbolic Acid			★		
Carbon Dioxide	★	★	★★	★	
Carbon Monoxide		★	★★		
Carbon Tet			★★		
Carbonated Water			★		
Caustic Soda					★
Caustic Phosphate			★		★
Cement Slurry					★
Chlorine Dioxide					★
Chlorine , Dry					★
Chlorine , Moist					★
Chloroform			★★		
Chromic Acid					★

APPLICATION \ MATERIAL	bronze or brass	steel	316-stainless steel	monel	diaphragm seals
Cider	★		★★		
Citric Acid			★		
Coffee			★★		
Corn O oil			★		
Crude Oil(Sour)				★	
Crude Oil(Sweet)			★★		
Detergents			★★		
Ethanol	★		★★		
Ethyl Acid	★		★★		
Ethylene Oxide	★		★★		
Fatty Acid					★
Ferric Chloride					
Ferrous Sulfate			★		
Ferrous Chloride					★
Ferrous Sulfate					★
Fluorine Gas			★★	★	
Formaldehyde			★★		
Formic Acid					★
Freons			★		
Furfural					★
Gasoline			★		
Glycerine	★	★	★★		
Hydrobromic Acid					★
Hydrochloric Acid					★
Hydrofluoric Acid					★
Hydrofluosilic Acid					★
Hydrogen	★		★		
Hydrogen Peroxide			★		
Hydrogen Sulfate					★
Hydrogen Sulfite					★
Hydroxy Acetic Acid			★		
Kerosene	★	★	★★		
Lacquers	★		★★		
Lactic Acid			★		
Linseed Oil		★	★★		
Lime Water			★		
Magnesium Chloride					★
Mercuric Chloride					★
Mercury		★	★		
Methylene Chloride			★		
Milk			★		
Naptha		★	★		
Naphthalence			★		
Nickel Chloride					★
Nitric Acid			★		
Nitrogrn	★	★	★★		

APPLICATION \ MATERIAL	bronze or brass	steel	316-stainless steel	monel	diaphragm seals
Oleic Acid			★		★
Oleum					★
Oxalic Acid					★
Oxygen	★		★★	★	
Palimitic Acid			★		
Perchloric Acid					
Phosphoric Acid			★		
Photographic Bleach			★		
Picric Acid			★		
Propane	★	★	★★	★	
Quinine			★		★
Rochelle Salt					★
Sea water				★	
Silicate Solution			★		★
Silver Nitrate					★
Soaps			★★	★	
Sodium Bicarbonate			★★		
Sodium Bisulfate					★
Sodium Carbonate			★		★
Sodium Chloride					★
Sodium Chromate			★		★
Sodium Cyanide			★		
Sodium Hydroxide				★	
Sodium Hypochlorite					★
Sodium Phosphate			★		
Sodium Silicate		★	★★		
Sodium Sulfide					★
Sour Oils					★
Steam	★	★	★		
Stearic Acid			★		
Sulfur Chloride					★
Sulfur Dioxide					★
Sulfur Trioxide					★
Sulfuric Acid					★
Sulfurous Acid					★
Tallow Oil					★
Tannic Acid	★	★	★★		
Tartaric Acid			★	★	
Tin Chloride					★
Toluene	★	★	★★		
Tritium Gas			★		
Turpentine			★	★	
Varnish		★	★	★	
Water	★		★	★	
Whisky			★		
Zine Chloride					★

P1B How to order

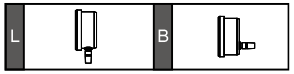
Example: **P - 1B - 11 L 45 S 2 P41 H- GL**

HAWK Model

Hawk Process Gauge **11 to 16**

Type No

Lower(Bottom) Connection	L
Center or Lower Back Connection	B



Dial Sizes

3" (75mm)	03
3 ½" (90mm)	35
4" (100mm)	04
4 1/2" (115mm)	45
6" (150mm)	06

Wetted Parts

SS316/SS316L	S
Monel	M
Brass	B
SS316L	W

Process Connection

1" NPT	1	R1/4	B
3/4" NPT	5	R1/8	C
1/2" NPT	2	M20*1.5	J
3/8" NPT	3	M14*1.0	K
1/4"NPT	4	7/16"-20UNF	7
1/8"NPT	8	9/16"-18UNF	9
G1/2	D	3/8"MPF-Autoclave	13
G3/8	H	1/4"HPF-Autoclave	24
G1/4	E	9/16"MPM-Autoclave	39
G1/8	F	9/16"HPM-Autoclave	49
R1/2	A	Others	L
R3/8	G		

Pressure Range

Please refer to the range table (From Page 22 to 23) XXX

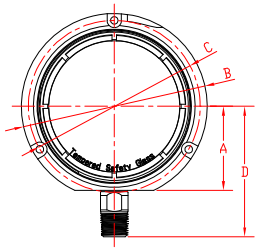
Option (Please fill in the option in order.)

Polycarbonate Window	P	Certificate of Accuracy	C	Oxygen Cleaning(Use No Oil)	X
Back Flange	B	Front Flange	F	Upgrade Accuracy	1
NACE Treatment	N	Max Registering Pointers	J	U-Clamp	U
Rubber Cover	V	Stainless Steel Tag Plate	Y	Glycerine Filled	G
Disc Blow Out Back	Y	Laminated Glass Lens	L	Silicone Filled	S
316SS Case	3	Tempered Safety Lens	T	Red/Green Set	K

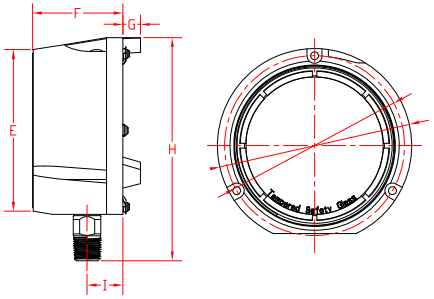
Dimensions

Type 11 Normal size

Bottom connection



Back connection

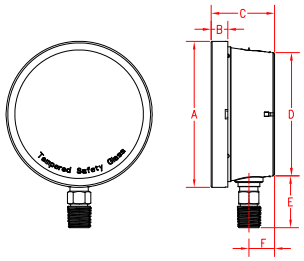


Dimensions in mm.

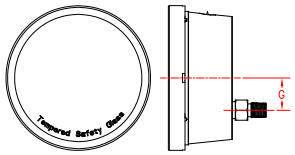
Size	A	B	C	D	E	F	G	H	I	J	K	L
4.5"(115)	67	148	137	104	128.9	72	14	178	28.5	34.5	36.6	141

Type 13 & 14 Normal size

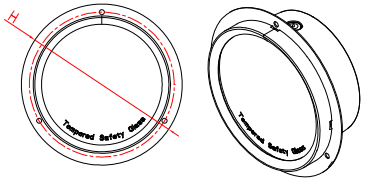
Bottom connection



Back connection



Front flange panel mounting

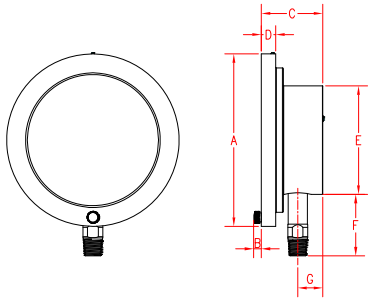


Dimensions in mm.

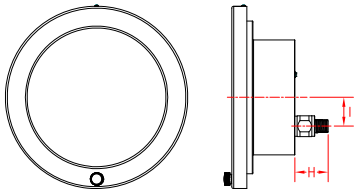
Size	A	B	C	D	E	F	G	H
4.5"(115)	136.5	15.7	59.3	115.2	48.4	24	30.4	160

Type 12 & 15 Normal size

Bottom connection



Back connection

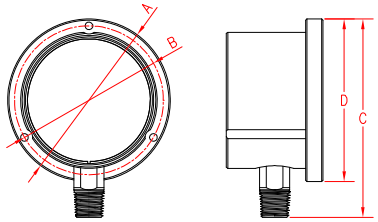


Dimensions in mm.

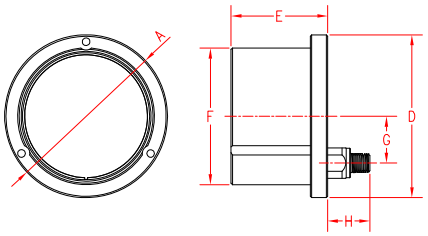
Size	A	B	C	D	E	F	G	H	I
4.5"(115)	156.5	10	57.7	14.7	121	50.4	24.9	38	30.4
6"(150)	192	8.5	66.5	16	121	68.5	27.9	35	30.4

Type 16 Normal size

Bottom connection



Back connection



Dimensions in mm.

Size	A	B	C	D	E	F	G	H
3.5"(90)	118	108	144	118	70	99	33.9	30.5
4.5"(115)	150	136	186	150	70	125	30.4	31.1
6"(150)	193	179	225.5	193	70	164.5	30.4	31.8

Range table

Pressure Ranges

SINGLE SCALE								DUAL SCALE					
PSI		Bar		KPa		Kg/cm2		Bar & PSI		Kpa & PSI		Kg/cm2 & PSI	
Code	Range	Code	Range	Code	Range	Code	Range	Code	Range	Code	Range	Code	Range
P29	6	R1	0.4	K29	40	G1	0.4	X9	0.4 Bar/PSI	Y16	40 kPa/PSI	W9	0.4 Kg/cm2/PSI
P30	8	R2	0.6	K31	60	G2	0.6	X11	0.6 Bar/PSI	Y18	60 kPa/PSI	W11	0.6 Kg/cm2/PSI
P32	15	R3	1	K33	100	G3	1	X12	1 Bar/PSI	Y22	100 kPa/PSI	W12	1 Kg/cm2/PSI
P33	20	R4	1.6	K34	160	G4	1.6	X13	1.6 Bar/PSI	Y25	160 kPa/PSI	W13	1.6 Kg/cm2/PSI
P35	30	R5	2	K35	200	G5	2	X14	2 Bar/PSI	Y26	200 kPa/PSI	W14	2 Kg/cm2/PSI
P37	40	R6	2.5	K36	250	G6	2.5	X15	2.5 Bar/PSI	Y27	250 kPa/PSI	W15	2.5 Kg/cm2/PSI
P38	50	R7	3	K37	300	G7	3	X16	3 Bar/PSI	Y28	280 kPa/PSI	W16	3 Kg/cm2/PSI
P39	60	R8	4	K38	400	G9	4	X18	4 Bar/PSI	Y31	400 kPa/PSI	W18	4 Kg/cm2/PSI
P40	80	R9	5	K39	500	G10	5	X19	5 Bar/PSI	Y32	500 kPa/PSI	W19	5 Kg/cm2/PSI
P40A	85	R11	6	K40	600	G11	6	X20	6 Bar/PSI	Y33	600 kPa/PSI	W20	6 Kg/cm2/PSI
P41	100	R12	7	K41	700	G12	7	X21	7 Bar/PSI	Y34	700 kPa/PSI	W21	7 Kg/cm2/PSI
P42	150	R13	10	K42	1000	G13	10	X22	10 Bar/PSI	Y36	1000 kPa/PSI	W22	10 Kg/cm2/PSI
P43	160	R13A	11	K42A	1100	G13A	11	X23	11 Bar/PSI	Y36A	1100 kPa/PSI	W23	11 Kg/cm2/PSI
P43A	180	R13B	14	K42B	1400	G13C	14	X24	14 Bar/PSI	Y37	1400 kPa/PSI	W24	14 Kg/cm2/PSI
P44	200	R13C	15	K42C	1500	G13B	15	X25	15 Bar/PSI	Y38	1500 kPa/PSI	W25	15 Kg/cm2/PSI
P45	250	R14	16	K43	1600	G14	16	X26	16 Bar/PSI	Y39	1600 kPa/PSI	W26	16 Kg/cm2/PSI
P46	300	R15	20	K44	2000	G15	20	X28	20 Bar/PSI	Y40	2000 kPa/PSI	W28	20 Kg/cm2/PSI
P47	350	R16	25	K45	2500	G16	25	X29	25 Bar/PSI	Y41	2500 kPa/PSI	W29	25 Kg/cm2/PSI
P48	400	R16B	28	K55A	2800	G16A	28	X30	28 Bar/PSI	Y42	2800 kPa/PSI	W30	28 Kg/cm2/PSI
P48A	450	R17	30	K46	3000	G17	30	X31	30 Bar/PSI	Y43	3000 kPa/PSI	W31	30 Kg/cm2/PSI
P49	500	R18	35	K47	3500	G18	35	X32	35 Bar/PSI	Y44	3500 kPa/PSI	W32	35 Kg/cm2/PSI
P50	600	R19	40	K48	4000	G19	40	X33	40 Bar/PSI	Y45	4000 kPa/PSI	W33	40 Kg/cm2/PSI
P51	800	R20	50	K49	5000	G20	50	X34	50 Bar/PSI	Y46	5000 kPa/PSI	W34	50 Kg/cm2/PSI
P51A	850	R21	60	K50	6000	G21	60	X35	60 Bar/PSI	Y47	6000 kPa/PSI	W35	60 Kg/cm2/PSI
P52	1,000	R22	70	K51	7000	G22	70	X36	70 Bar/PSI	Y48	7000 kPa/PSI	W36	70 Kg/cm2/PSI
P53	1,500	R23	100	K52	10000	G23	100	X39	100 Bar/PSI	Y50	10000 kPa/PSI	W39	100 Kg/cm2/PSI
P53A	1,600	R23A	140	K52B	14000	G23A	140	X40	140 Bar/PSI	Y51	14000 kPa/PSI	W40	140 Kg/cm2/PSI
P54	2,000	R24	160	K53	16000	G24	160	X42	160 Bar/PSI	Y53	16000 kPa/PSI	W42	160 Kg/cm2/PSI
P56	3,000	R25	200	K54	20000	G25	200	X43	200 Bar/PSI	Y54	20000 kPa/PSI	W43	200 Kg/cm2/PSI
P57	3,500	R26	250	K55	25000	G26	250	X44	250 Bar/PSI	Y55	25000 kPa/PSI	W44	250 Kg/cm2/PSI
P58	4,000	R26A	280	K55A	28000	G26A	280	X44A	280 Bar/PSI	Y56	28000 kPa/PSI	W44A	280 Kg/cm2/PSI
P58A	4,250	R27	300	K56	30000	G27	300	X45	300 Bar/PSI	Y57	30000 kPa/PSI	W45	300 Kg/cm2/PSI
P59	5,000	R28	350	K56A	35000	G28	350	X46	350 Bar/PSI	Y58	35000 kPa/PSI	W46	350 Kg/cm2/PSI
P60	6,000	R29	400	K57	40000	G29	400	X47	400 Bar/PSI	Y59	40000 kPa/PSI	W47	400 Kg/cm2/PSI
P60B	7,000	R30	500	K58	50000	G30	500	X48	500 Bar/PSI	Y60	50000 kPa/PSI	W48	500 Kg/cm2/PSI
P61	8,000	R31	600	K59	60000	G31	600	X49	600 Bar/PSI	Y61	60000 kPa/PSI	W49	600 Kg/cm2/PSI
P62	10,000	R33	700	K60	70000	G32	700	X50	700 Bar/PSI	Y62	70000 kPa/PSI	W50	700 Kg/cm2/PSI
P63	15,000	R33	1000	K61	100000	G33	1000	X52	1000 Bar/PSI	Y64	100000 kPa/PSI	W52	1000 Kg/cm2/PSI
P64	20,000	R33A	1400	K61A	140000	G33A	1400	X53	1400 Bar/PSI	Y65	140000 kPa/PSI	W53	1400 Kg/cm2/PSI
P65	25,000	R34	1600	K62	160000	G344	1600	X55	1600 Bar/PSI	Y67	160000 kPa/PSI	W55	1600 Kg/cm2/PSI

Vacuum Ranges

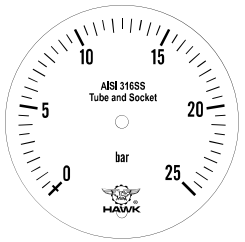
SINGLE SCALE								DUAL SCALE					
InHg		Bar		kPa		Kg/cm²		Bar & PSI		kPa & PSI		Kg/cm² & PSI	
Code	Range	Code	Range	Code	Range	Code	Range	Code	Range	Code	Range	Code	Range
PV1	-30/0	RV1	-1/0	KV1	-0.04	GV1	-1/0	XV1	-1 Bar/PSI	YV1	-100 kPa/PSI	WV1	-76 cmHg/inHg

1. The other scales and ranges not listed are available in request.
2. Not all listed ranges and scales are in stock, consult your distributors for the detailed information

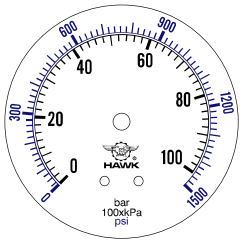
Compound Ranges

SINGLE SCALE								DUAL SCALE					
PSI		Bar		KPa		Kg/cm2		Bar & PSI		Kpa & PSI		Kg/cm2 & PSI	
Code	Range	Code	Range	Code	Range	Code	Range	Code	Range	Code	Range	Code	Range
PCA1	VAC/8.5	RCA	-1/0.6	KOQ	-100/60	GCA	-1/0.6	XCA	-1/0.6 Bar/PSI	YCA	-100/60 kPa/PSI	WCA	-1/0.6 Kg/cm2/PSI
PCA	VAC/15	RCB	-1/1	KOR	-100/100	GCB	-1/1	XCB	-1/1 Bar/PSI	YCB	-100/100 kPa/PSI	WCB	-1/1 Kg/cm2/PSI
		RCC	-1/1.5	KOS	-100/150	GCC	-1/1.5	XCC	-1/1.5 Bar/PSI	YCC	-100/150 kPa/PSI	WCC	-1/1.5 Kg/cm2/PSI
PCB	VAC/30	RCD	-1/2	KOS1	-100/200	GCD	-1/2	XCD	-1/2 Bar/PSI	YCD	-100/200 kPa/PSI	WCD	-1/2 Kg/cm2/PSI
		RCE	-1/2.5	KOS2	-100/250	GCE	-1/2.5	XCE	-1/2.5 Bar/PSI	YCE	-100/250 kPa/PSI	WCE	-1/2.5 Kg/cm2/PSI
		RCF	-1/3	KOT	-100/300	GCF	-1/3	XCF	-1/3 Bar/PSI	YCF	-100/300 kPa/PSI	WCF	-1/3 Kg/cm2/PSI
PCC	VAC/60	RCG	-1/4	KOT2	-100/400	GCG	-1/4	XCG	-1/4 Bar/PSI	YCG	-100/400 kPa/PSI	WCG	-1/4 Kg/cm2/PSI
		RCH	-1/5	KOU	-100/500	GCH	-1/5	XCH	-1/5 Bar/PSI	YCH	-100/500 kPa/PSI	WCH	-1/5 Kg/cm2/PSI
PCD	VAC/100	RCJ	-1/7	KOU2	-100/700	GCJ	-1/7	XCJ	-1/7 Bar/PSI	YCJ	-100/700 kPa/PSI	WCJ	-1/7 Kg/cm2/PSI
		RCK	-1/9	KOV	-100/900	GCK	-1/9	XCK	-1/9 Bar/PSI	YCK	-100/900 kPa/PSI	WCK	-1/9 Kg/cm2/PSI
PCE	VAC/150	RCL	-1/10	KOV1	-100/1000	GCL	-1/10	XCL	-1/10 Bar/PSI	YCL	-100/1000 kPa/PSI	WCL	-1/10 Kg/cm2/PSI
PCF	VAC/160	RCM	-1/11	KOV2	-100/1100	GCM	-1/11	XCM	-1/11 Bar/PSII	YCM	-100/1100 kPa/PSI	WCM	-1/11 Kg/cm2/PSI
PCG	VAC/200	RCO	-1/14	KOV4	-100/1400	GCO	-1/14	XCO	-1/14 Bar/PSI	YCO	-100/1400 kPa/PSI	WCO	-1/14 Kg/cm2/PSI
		RCP	-1/15	KOW	-100/1500	GCP	-1/15	XCP	-1/15 Bar/PSI	YCP	-100/1500 kPa/PSI	WCP	-1/15 Kg/cm2/PSI
		RCR	-1/19	KOW2	-100/1900	GCR	-1/19	XCR	-1/19 Bar/PSI	YCR	-100/1900 kPa/PSI	WCR	-1/19 Kg/cm2/PSI
PCH	VAC/300	RCS	-1/20	KOW3	-100/2000	GCS	-1/20	XCS	-1/20 Bar/PSI	YCS	-100/2000 kPa/PSI	WCS	-1/20 Kg/cm2/PSI
		RCT	-1/24	KOX	-100/2400	GCT	-1/24	XCT	-1/24 Bar/PSI	YCT	-100/2400 kPa/PSI	WCT	-1/24 Kg/cm2/PSI
		RCU	-1/25	KOX1	-100/2500	GCU	-1/25	XCU	-1/25 Bar/PSI	YCU	-100/2500 kPa/PSI	WCU	-1/25 Kg/cm2/PSI
PCI	VAC/400	RCV	-1/27	KOX2	-100/2700	GCV	-1/27	XCV	-1/27 Bar/PSI	YCV	-100/2700 kPa/PSI	WCV	-1/27 Kg/cm2/PSI
		RCW	-1/30	KOY	-100/3000	GCW	-1/30	XCW	-1/30 Bar/PSI	YCW	-100/3000 kPa/PSI	WCW	-1/30 Kg/cm2/PSI
PCJ	VAC/500	RCW1	-1/35	KOZ	-100/3500	GCW1	-1/35	XCX	-1/35 Bar/PSI	YCX	-100/3500 kPa/PSI	WCX	-1/35 Kg/cm2/PSI
PCK	VAC/600	RCX	-1/40	KOZ1	-100/4000	GCX	-1/40	XCY	-1/40 Bar/PSI	YCY	-100/4000 kPa/PSI	WCY	-1/40 Kg/cm2/PSI
		RCY	-1/50	KOZ2	-100/5000	GCY	-1/50	XCZ	-1/50 Bar/PSI	YCZ	-100/5000 kPa/PSI	WCZ	-1/50 Kg/cm2/PSI
		RCZ	-1/60	KOZ3	-100/6000	GCZ	-1/60	XC1	-1/60 Bar/PSI	YC1	-100/6000 kPa/PSI	WC1	-1/60 Kg/cm2/PSI
		RC0	-1/100	KOZ7	-100/10000	GC0	-1/100	XC2	-1/100 Bar/PSI	YC2	-100/10000 kPa/PSI	WC2	-1/100 Kg/cm2/PSI

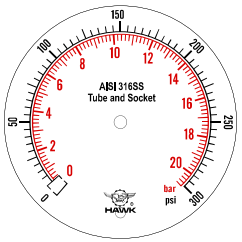
Single Scale



Triple Scale



Dual Scale



Triple Pressure Ranges

Bar & kPa & PSI											
Code	Range	Code	Range	Code	Range	Code	Range	Code	Range	Code	Range
ZV1	-1 Bar/kPa/PSI	ZCI	-1/6 Bar/kPa/PSI	ZCT	-1/24 Bar/kPa/PSI	Z20	6 Bar/kPa/PSI	Z31	30 Bar/kPa/PSI	Z43	200 Bar/kPa/PSI
ZCA	-1/0.6 Bar/kPa/PSI	ZCJ	-1/7 Bar/kPa/PSI	Z11	0.6 Bar/kPa/PSI	Z21	7 Bar/kPa/PSI	Z33	40 Bar/kPa/PSI	Z44	250 Bar/kPa/PSI
ZCB	-1/1 Bar/kPa/PSI	ZCK	-1/9 Bar/kPa/PSI	Z12	1 Bar/kPa/PSI	Z22	10 Bar/kPa/PSI	Z34	50 Bar/kPa/PSI	Z44A	280 Bar/kPa/PSI
ZCC	-1/1.5 Bar/kPa/PSI	ZCL	-1/10 Bar/kPa/PSI	Z13	1.6 Bar/kPa/PSI	Z23	11 Bar/kPa/PSI	Z35	60 Bar/kPa/PSI	Z45	300 Bar/kPa/PSI
ZCD	-1/2 Bar/kPa/PSI	ZCM	-1/11 Bar/kPa/PSI	Z14	2 Bar/kPa/PSI	Z24	14 Bar/kPa/PSI	Z36	70 Bar/kPa/PSI	Z47	400 Bar/kPa/PSI
ZCE	-1/2.5 Bar/kPa/PSI	ZCO	-1/14 Bar/kPa/PSI	Z15	2.5 Bar/kPa/PSI	Z26	16 Bar/kPa/PSI	Z39	100 Bar/kPa/PSI	Z48	500 Bar/kPa/PSI
ZCF	-1/3 Bar/kPa/PSI	ZCP	-1/15 Bar/kPa/PSI	Z16	3 Bar/kPa/PSI	Z28	20 Bar/kPa/PSI	Z39A	110 Bar/kPa/PSI	Z49	600 Bar/kPa/PSI
ZCG	-1/4 Bar/kPa/PSI	ZCR	-1/19 Bar/kPa/PSI	Z18	4 Bar/kPa/PSI	Z29	25 Bar/kPa/PSI	Z40	140 Bar/kPa/PSI	Z50	700 Bar/kPa/PSI
ZCH	-1/5 Bar/kPa/PSI	ZCS	-1/20 Bar/kPa/PSI	Z19	5 Bar/kPa/PSI	Z30	28 Bar/kPa/PSI	Z42	160 Bar/kPa/PSI	Z52	1000 Bar/kPa/PSI