ASHCROFT®

Duragauge® Pressure Gauge

NOW WITH PLUS! Performance

Plant Engineering PRODUCT of the YEAR 1998

ISO 9001 REGISTERED FIRM

DRESSER INSTRUMENT
a Halliburton company

BULLETIN DU-1

Features & Benefits

Ashcroft® Duragauge® Pressure Gauge

The Ashcroft® Duragauge® pressure gauge is the finest production gauge on the market for industrial use where precise indications are required. The product line offers a wide variety of case styles, Bourdon tubes and pressure ranges to meet your application needs .

With the component combinations available in the Duragauge gauge line, over ten million variations are possible to serve the needs of all types of industries, including process, power, nuclear, aerospace and cryogenics.

The Duragauge gauge offers the same outstanding quality and craftsmanship which have characterized all Ashcroft products since Edward Ashcroft introduced the Bourdon tube pressure gauge to American industry in 1852. It is built for long life and sustained accuracy under the most adverse operating conditions.

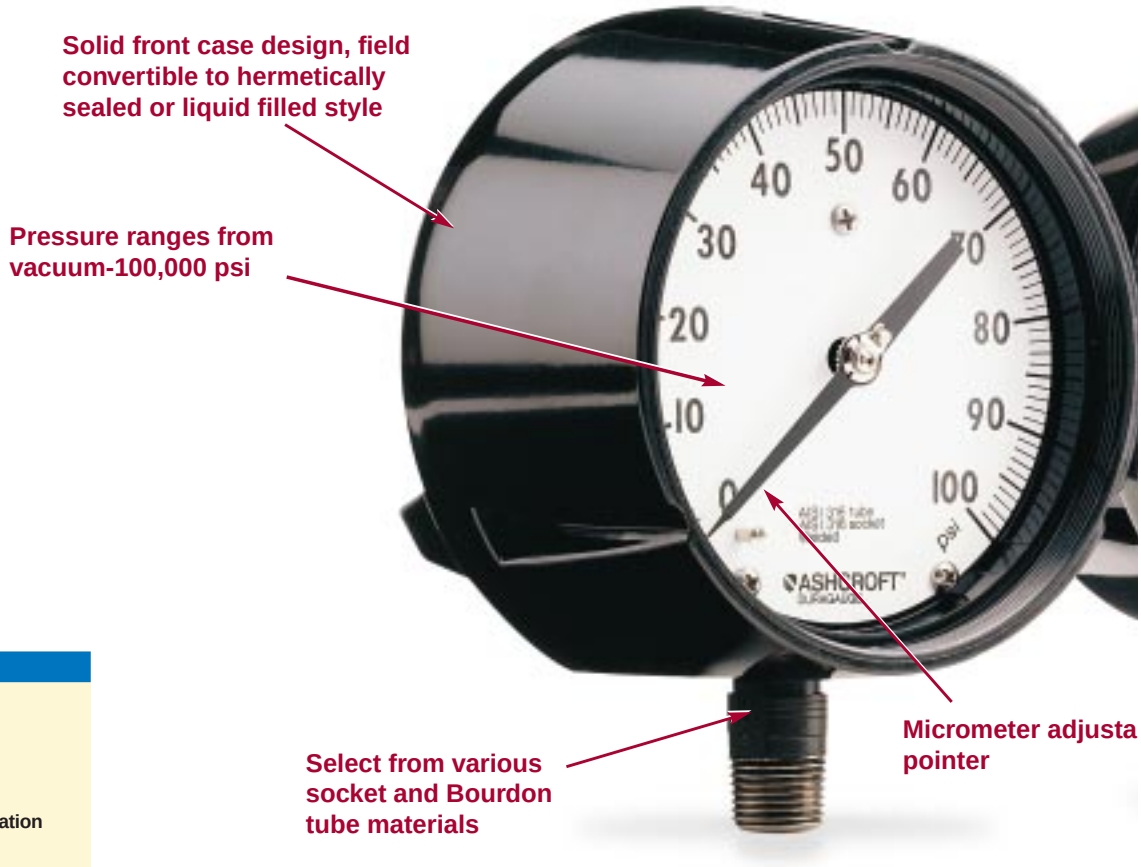
Uncompromising standards have been established for all incoming materials used in Ashcroft products, with dimensional details, material selection and design carefully scrutinized. Tubing used in manufacturing Bourdon tubes must meet stringent standards, more restrictive than ASTM material specifications. Throughout production, quality assurance procedures are adhered to, including assembly inspection, and critical laboratory examination.

Product integrity is assured through continual monitoring of pressure element quality. Every Bourdon tube system is subjected to a leak test at a pressure above the top of its range. Computer programs yield Bourdon tube designs with minimum stresses, assuring the long life and sustained accuracy demanded of Ashcroft products.

In the engineering breakdown lab, a variety of tests are run continually on Duragauge Bourdon tube systems, such as pulsation, burst, vibration, wear, and friction tests on movements.

Care and attention are given to every product from its inception to final assembly. The end result- thoroughly engineered instruments that assure the user a product that is precise, dependable and durable.

Ashcroft has pioneered the field of gauge manufacture in research and product integrity since the Bourdon tube was introduced to American industry. The list of Ashcroft “firsts” in pressure gauge development would fill several



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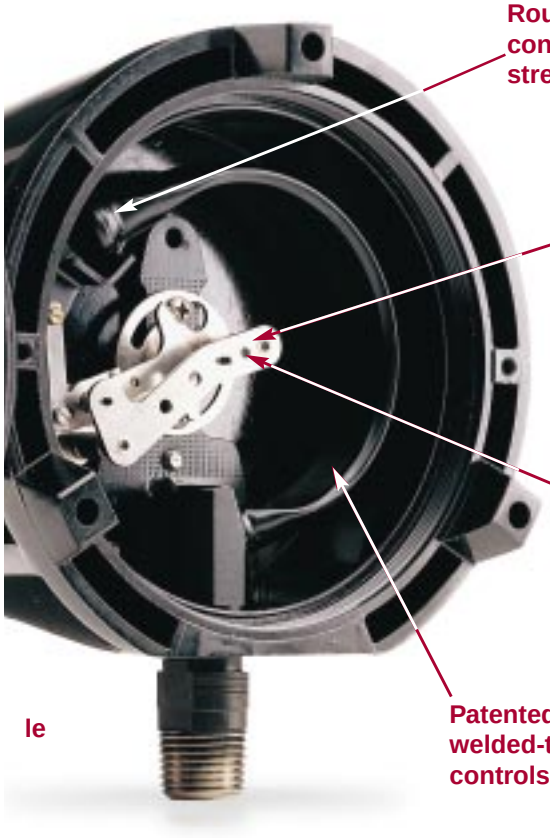
pages. They include the rotary geared stainless steel movement, the all 316 stainless steel pressure system, the phenolic turret case, numerous other improvements and most recently, the patent pending Duragauge® *PLUS!*.

Several important variables must be considered when selecting the type of case for the application. A gauge is subject to environmental and atmospheric conditions, and the gauge internals must be protected from these elements. To protect the gauge from environmental and atmospheric conditions, the 1279, 1377 and 1379 Duragauges are offered with a standard weatherproof type case. A 4½″ 1279 and 4½″ or 6″ 1379 Duragauge can be ordered dry, hermetically sealed, liquid filled or with *PLUS!* performance.

Exclusive Features!



Round-Cap-Tip construction lowers stresses for longer life

400 Series stainless steel movement wears better for longer life

Teflon-coated pinion for longer life

Patented Duratube™ with welded-tube construction controls stresses for longer life

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1279 Case style

The Ashcroft solid front phenolic case 1279 gauge can be converted to hermetically sealed or liquid filled using a conversion kit. Available in 4½″ dial size this gauge has a threaded reinforced polypropylene front ring for easy zero adjustment with a micrometer adjustable pointer.

1377 Case style

Designed particularly for flush mounting, the Ashcroft model 1377 is available in 4½″, 6″, and 8½″ dial sizes. The hinged steel black wrinkle enamel coated ring makes this gauge well suited for panel board applications.

1379 Case style

Available in 4½″ 6″ and 8½″ sizes. The Ashcroft model 1379 solid front gauge has a black epoxy coated aluminum case with a threaded reinforce polypropylene ring. This weather-proof gauge can be converted to liquid filled or hermetically sealed using a conversion kit.

2462 Case style

This high impact resistant polypropylene case gauge and bayonet lock black ring is available with a 6″ dial. This Duragauge can be stem, surface, or flush mounted and stands up well in most environments.

Warranty & Movement

Ashcroft® Duragauge® Pressure Gauge

Edward Ashcroft introduced the Bourdon tube pressure gauge to American Industry 140 years ago. Since that time, we have developed thousands of improvements and over a hundred patents furthering the development of Ashcroft pressure instruments. From the very beginning, we have maintained our reputation for quality, product performance, and technical innovation that is the envy of all others in the industry. We are confident of our manufacturing processes and the design of our pressure gauge systems. So confident, that we guarantee the Duragauge pressure system to be free of leaks for 10 years when installed and operated with the recommendations outlined in ASME B40.1 Of course our standard 1 year warranty on materials, workmanship, and all other parts, is still in effect.

Millions of Ashcroft Duragauge pressure gauges continue to deliver proven performance in critical process applications throughout the world. You can depend on our commitment to quality – just what you've come to expect from the leader in pressure technology – the people who design, produce, and sell Ashcroft products. For a copy of our warranty call or write:

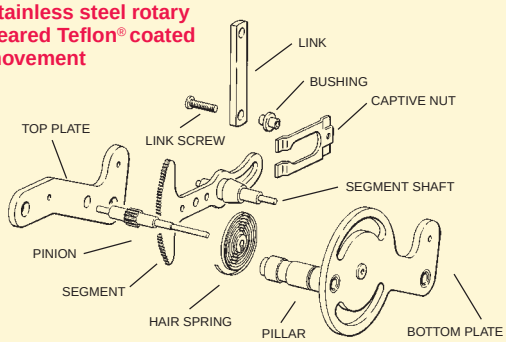
Dresser Instrument Division
250 East Main Street
Stratford, CT 06614-5145
203-378-8281
Ask for Customer Service.

The Ashcroft® Stainless Steel Rotary Geared Teflon® S Movement is another "first" in gauge manufacture. It is truly innovative with its thinner plates and segment, elimination of bushings, and low friction Teflon S coating on wearing parts. The shock resistance and stability of the Duragauge movement has been enhanced by staking the movement top and bottom plates.

A Teflon S coating is applied to the pinion gear, pinion shaft, link screws and segment shaft. These critical components translate the motion of the Bourdon tube tip into the rotating pointer motion. Minimal friction is essential for reduced wear. The coating also serves to protect wear surfaces from outside ambient conditions.

A specially formulated lubricant is applied to all wear points. Wear is further reduced because the moving parts are light weight. The curved tail segment provides easy calibration by minimizing the effect of the span adjustment on zero.

Stainless steel rotary geared Teflon® coated movement



Teflon® – DuPont Trademark

Other Duragauges

Ashcroft® Duragauge® Pressure Gauge

PLUS! Performance

PLUS!™ Performance Duragauge®

An exclusive, new, optional feature provides virtually liquid-filled performance in a dry gauge.

The Ashcroft *PLUS!*™ feature is a patent-pending design incorporated into the industry-standard Ashcroft pressure gauge. *PLUS!* is available in any Duragauge case style material or range.

Historically, pulsation and vibration have reduced gauge life and made gauges difficult to read.

Customers have had no alternative to liquid-filled gauges to solve vibration and pulsation problems, until now!

Advantages Versus Liquid-Filled Gauges

- Saves money
  - Lower purchase price versus liquid-filled gauges
  - Eliminates costly specialty fills
  - Allows easy standardization to reduce mis-applications
- Eliminates possibility of leaks
- Lighter weight . . . easier to handle
- Eliminates liquid-fill lines . . . easier to read
- Easy recalibration
- Wider ambient temperature range than glycerin
- Eliminates disposal and environmental issues

Advantages Versus Dry Gauges

- Steady pointer . . . same as liquid-filled gauges
- 100% longer life gauges . . . reduces gauge usage 50%!

Plant Engineering PRODUCT of the YEAR 1998

High Pressure Duragauge®

The Ashcroft high pressure Duragauge has a helical wound Inconel Bourdon tube which is capable of withstanding vibration without a zero shift or change in calibration. Because of the length of the helical tube, stresses are minimized and the tip travel increased; this permits the use of a low ratio movement, which decreases wear from friction and increases gauge life. For use on high pressure test applications, metal and concrete water cutting equipment, and other high pressure applications.

Features of the gauge include ASME B40.1, grade 2A, ½ of 1% full scale, 6″ dial, lower or back connection, solid front aluminum case for wall or flush mounting. Inconel 718 Bourdon tube and 316 stainless steel socket is standard. A hermetically sealed, field liquid-fillable case is standard. The Ashcroft high pressure Duragauge is available in ranges of 50,000 psi, 80,000 psi, and 100,000 psi with a standard ¼″ high pressure tubing connection.

Receiver Duragauge®

Used in conjunction with pneumatic transmitters, Ashcroft receiver gauges indicate pressure, temperature, flow, or any information that can be transmitted by proportional variations in air pressure.

For information concerning other receiver gauges offered, consult Customer Service, Stratford, Connecticut.

Liquid-Filled Duragauge®

Liquid-filled Duragauges have traditionally been used in applications where there is excessive vibration and pulsation. Vibration can cause rapid movement resulting in loss of accuracy and possibly complete destruction of the gearing. Pulsation can generate millions of pressure cycles causing Bourdon tube fatigue and reduced service life. The field conversion kit contains an Ashcroft patented elastomeric back which provides compensation for ambient temperature variation while providing all the features of a blow-out back.

The sealed case completely excludes dusty or corrosive environmental conditions. Since vibration and pulsation frequently occur together, all liquid filled Duragauges are fitted with a throttle plug screwed into the socket. This can easily be removed or changed for viscous or particulate containing media. Seven sizes are available from .006 to .070 diameter.

Specification Matrix

Ashcroft® Duragauge® Pressure Gauges

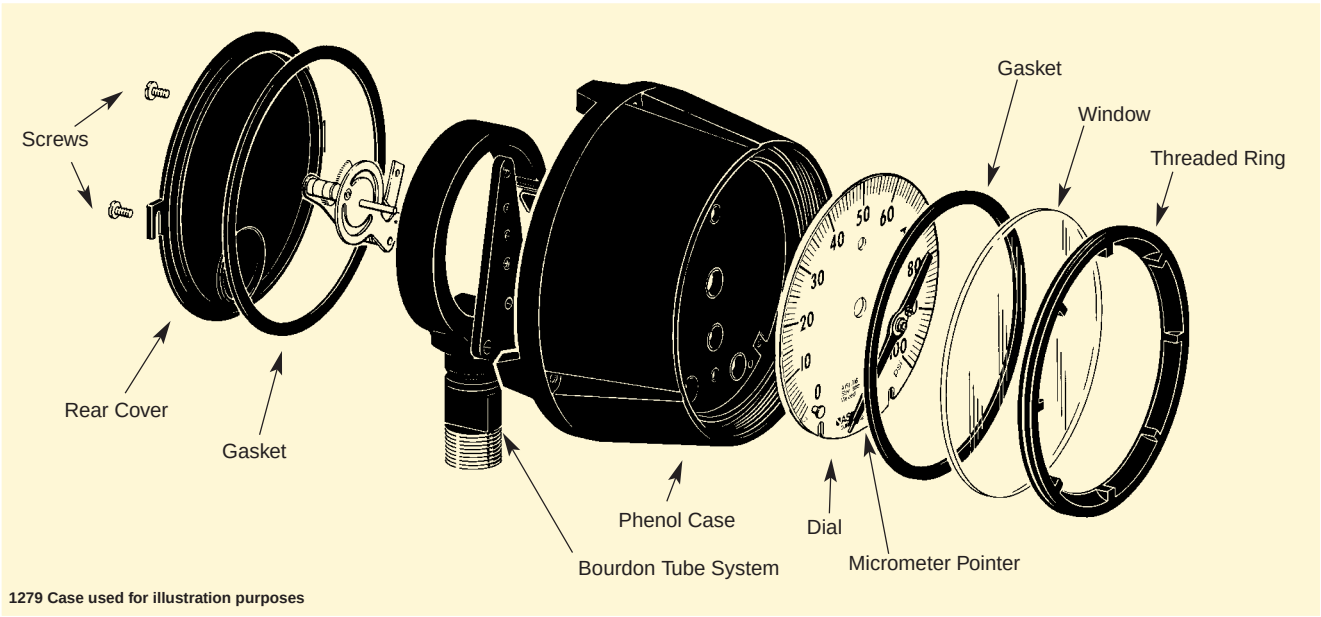
Specifications	Code	Type 1279	Type 1377
Accuracy (ASME B40.1, Grade 2A)		½% Full Scale	½% Full Scale
Case style	(S)	Solid front (S)	Solid front (S)
Case material		Black phenolic	Aluminum, black epoxy coated
Dial size	(45), (60), (85)	4½″ (45)	4½″ (45), 6″ (60), 8½″ (85)
Ring type		Threaded reinforced black polypropylene	Steel hinged, black enamel finish
Bourdon tube/Socket material (Code)		C510 Phos. bronze/Brass brazed (A) 316L stainless steel/steel (R) 316L stainless steel/316L stainless steel (S) K Monel/ Monel (P)	C510 Phos. bronze/Brass brazed (A) 316L stainless steel/steel (R) 316L stainless steel/316L stainless steel (S) K Monel/ Monel (P)
Range limits (psi)		Vacuum – 30,000	Vacuum – 30,000
Connection size (NPT)	(02), (04), (09)	¼ NPT (02 optional), ½ NPT (04 standard)	¼ NPT (02 optional), ½ NPT (04 standard)
Connection location	(L), (B)	Lower (L), back, (B)	Lower (L), back, (B)
Mounting		Stem, flush, surface	Stem, flush
Movement		Rotary, 400 st. st., Teflon® coated pinion gear and segment	Rotary, 400 st. st., Teflon® coated pinion gear and segment
Window		Glass	Glass
Pointer		Micrometer adjustable	Micrometer adjustable
Options			
***PLUS!* Performance**	(XLL)	Available	Available
Glycerin fill 0°F to +250°F –18°C to +120°C	(L)	Standard	N/A
Silicone fill –40°F to +250°F –40°C to +120°C	(XGV)	Available	N/A
Halocarbon fill –50°F to +250°F –45°C to +250°C	(XGX)	Available	N/A
Hermetically sealed	(H)	Available	N/A
Flush mounting ring	(X56)	Available	Standard
Surface mounting bracket	(XBF)	N/A	N/A
Flush mounting bracket	(XBQ)	N/A	N/A
Duragauge® receiver gauge	(XPR)	Available	Available
Shatterproof glass	(XSG)	Available	Available
Acrylic window	(XPD)	Available	Available
Set hand (red, single, fixed)	(XSH)	Available	Available
Maximum pointer (red)	(XEP)	Available	Available

Type 1379	Type 2462	Type 1379 High pressure
½% Full Scale	½ % Full Scale	½% Full Scale
Solid front (S)	Solid front (S)	Solid front (S)
Aluminum, black epoxy coated	Black polypropylene	Aluminum, black epoxy coated
4½,″ (45,) 6,″ (60), 8½,″(1) (85)	6,″ (60)	6,″ (60)
Threaded reinforced black polypropylene(2)	Bayonet lock black polypropylene	Threaded reinforced black polypropylene
C510 Phos. bronze/Brass brazed (A) 316L stainless steel/steel (R) 316L stainless steel/316L stainless steel (S) K Monel/ Monel (P)	C510 Phos. bronze/Brass brazed (A) 316L stainless steel/steel (R) 316L stainless steel/316L stainless steel (S) K Monel/ Monel (P)	Inconel 718 316 stainless steel (WW)
Vacuum – 30,000	Vacuum – 30,000	50,000, 80,000, 100,000
¼ NPT (02 optional), ½ NPT (04 standard)	¼ NPT (02 optional), ½ NPT (04 standard)	¼″ High pressure (09 standard)
Lower (L), back, (B)	Lower (L), back, (B)	Lower (L), back, (B)
Stem, flush, surface	Stem, flush, surface	Flush, surface
otary, 400 st. st., Teflon® coated pinion gear and segment	Rotary, 400 st. st., Teflon® coated pinion gear and segment	Rotary, 400 st. st., Teflon® coated pinion gear and segment
Glass	Glass	Acrylic
Micrometer adjustable	Micrometer adjustable	Micrometer adjustable
Available	Available	Available
Standard	N/A	Available
Available	N/A	Available
Available	N/A	Available
Available	N/A	Standard
Available	N/A	Available
Available	Available	N/A
N/A	Available	N/A
Available	Available	N/A
Available	Available	Available
Available	Available	Standard
Available	Available	Available
Available	Available	Available

(1) Non-liquid fillable **(2)** Steel hinged, black enamel finish for 8½″ case

Product Selection Information

Ashcroft® Duragauge® Pressure Gauge



1279 Case used for illustration purposes

Consult ASME B40.1 for guidance in gauge selection

WARNING: To prevent misapplication, pressure gauges should be selected considering media and ambient operating conditions. Improper application can be detrimental to the gauge, causing failure and possible personal injury or property damage. The information contained in this catalog is offered as a guide to assist in making the proper selection of a pressure gauge. Additional information is available from Dresser Instrument Division.

Pressure Ranges:

As recommended by ASME B40.1, select a gauge with a full scale pressure range of approximately twice the normal operating pressure. The maximum operating pressure should not exceed approximately 75% of the full scale range. Failure to select a gauge range within these criteria may ultimately result in fatigue failure of the Bourdon tube.

Operating Conditions:

The operating conditions to which a gauge will be subjected must be considered. If the gauge will be subjected to severe vibrations or pressure pulsation, liquid-filling the gauge or the *PLUS!* option may be necessary to obtain normal product life. Other than discoloration of the dial and hardening of the gasketing that may occur as ambient temperatures exceed 150°F, non liquid-filled Type 1279 (phenolic case), 1377 and 1379 (aluminum case) Duragauges with standard glass windows, can withstand continuous operating temperatures up to 250°F. Liquid-filled gauges can withstand 200°F but glycerin fill and acrylic window will tend to yellow. Accuracy will be affected by approximately 1.5% per 100°F. Gauges with welded joints will withstand 750°F (450°F with silver brazed joints) for short times without rupture, although other parts of the gauge will be destroyed and calibration will be lost. Proper selection of the Bourdon system material is dependent on the process fluid to which the system will be subjected. If the correct material is not available, the use of a diaphragm seal may be necessary to protect the system from the process fluid. Liquid-filled gauges are recommended for the discharge side of positive displacement pumps.

Pressure Elements:

Available in a wide variety of materials, including: phosphor bronze, alloy steel, 316 stainless steel, K Monel and Inconel.

Cases:

Four solid front case types are offered. Solid front cases have a solid wall between the Bourdon tube and the window. The 1279 and 1379 Duragauge cases are field convertible by means of a kit. These gauges can be converted to hermetically sealed or liquid-filled. Buna-N seals at the front and rear of the case provide resistance to aggressive atmospheres.

Rings:

The ring, which retains the window, is threaded, bayonet (cam), or hinged, depending upon case type.

Movements:

Movements are designed and materials of construction selected to reduce friction and extend wear life. The Duragauge's stainless steel movement is a rotary geared design with Teflon coated wear parts.

Dials:

Dials are uniformly graduated and have highly legible black markings. A pointer dial stop pin at the 7:00 o'clock position is standard.

Windows:

The standard is glass on dry gauges and acrylic on liquid-filled gauges. Options are laminated safety glass, non-glare glass or acrylic.

Pointers:

Duragauge pressure gauges have balanced micrometer adjustable pointers which can be repositioned without removal from the pinion shaft.

Media Application Table

Ashcroft® Duragauge® Pressure Gauge

The media being measured must be compatible with the wetted parts of the pressure instrument. To use the chart below, locate the media whose pressure is to be measured and select a suitable material from those available. Diaphragm seal information is contained in Bulletin DS-1. This is a simplified chart and assumes the media temperature is below 200°F. *PLUS!* option, throttling devices and/or a liquid-filled instrument are recommended in applications with pulsation or vibration. These recommendations are only a guide, as service life is dependent on temperature, concentrations, catalysts that may be added, or other conditions beyond our control. Consult Stratford, CT customer service for specific applications and for any media not listed. More complete corrosion guide available on our website at ***www.dresserinstrument.com*** in the Application Data Section.

Media Application	Pressure Instrument Material				
	Brass or bronze	Steel	Stainless steel	Monel	Diaphragm seals*
Acetone	•		•	•	
Acetic Acid <40%			•		
Acetic Anhydride					•
Acetylene (Dry)		•	•		
Acrolein 100%					•
Air	•	•	•	•	
Alcohol, Ethyl	•		•	•	
Alum. Chloride >10%					•
Alum. Sulfate 10-50%					•
Ammonia Gas (Dry)		•	•		
Ammonium Chloride <40%					•
Ammonium Nitrate <50%			•		
Ammonium Sulfate <60%					•
Aniline>99%			•		
Argon	•	•	•	•	
Beer			•		
Benzidine >99%					•
Benzene <50%			•	•	
Benzoic Acid <70%					•
Boric Acid <25%			•		
Bromine (Dry)					•
Butane	•	•	•	•	
Butyric Acid <10%					•
Calcium Chloride <80%					•
Calcium Hydroxide <50%					•
Carbon Dioxide	•	•	•	•	
Carbon Monoxide >99%	•	•	•	•	
Chlorine (Dry)					•
Chlorine (Moist)					•
Chloroform (Dry)			•	•	
Chromic Acid					•
Citric Acid 10-50%			•		
Corn Oil			•		

Media Application	Pressure Instrument Material				
	Brass or bronze	Steel	Stainless steel	Monel	Diaphragm seals*
Crude Oil (Sour)				•	
Crude Oil (Sweet)			•	•	
Ethyl Acetate					•
Ethylene Oxide >99%	•		•	•	
Ferric Chloride <40%					•
Ferric Sulfate <10%			•		
Ferrous Chloride <30%					•
Ferrous Sulfate <50%					•
Fluorine Gas (Dry)				•	
Formaldehyde <95%				•	
Formic Acid					•
Freons		•	•		
Furfural <10%					•
Gasoline			•		
Glycerin >99%	•	•	•	•	
Hydrobromic Acid					•
Hydrochloric Acid					•
Hydrofluoric Acid					•
Hydrofluosilic Acid					•
Hydrogen ❶	•		•		
Hydrogen Peroxide <50%					•
Kerosene	•	•	•	•	
Lactic Acid <70%			•		
Magnesium Chloride <40%					•
Mercuric Chloride <60%					•
Mercury >99%			•		
Milk			•		
Naphtha >99%	•	•	•	•	
Naphthalene >99%			•	•	
Nickel Chloride >99%					•
Nitric Acid <95%			•		
Nitrogen	•	•	•	•	
Oleic Acid					•

Media Application	Pressure Instrument Material				
	Brass or bronze	Steel	Stainless steel	Monel	Diaphragm seals*
Oxalic Acid					•
Oxygen (Gas)❷			•	•	
Palmitic Acid >99%			•		
Phosphoric Acid <80%			•		
Picric Acid <10%			•		
Propane (Dry)		•	•	•	
Sea Water (Flowing)				•	
Silver Nitrate <70%					•
Sodium Bicarbonate <20%			•	•	
Sodium Bisulfate <30%					•
Sodium Carbonate <40%			•	•	
Sodium Chromate <60%	•	•	•	•	
Sodium Cyanide		•	•		
Sodium Hydroxide < 40%				•	
Sodium Hypochlorite <25%					•
Sodium Phosphate, Tri <60%		•	•	•	
Sodium Silicate <50%		•	•	•	
Sodium Sulfide <50%					•
Stannous Chloride <10%					•
Steam (Use siphon)	•	•	•	•	
Stearic Acid			•		
Sulfur Dioxide (Dry) >99%					•
Sulfur Trioxide (Dry) >99%					•
Sulfuric Acid					•
Tannic Acid <80%		•	•	•	
Tartaric Acid <50%			•	•	
Tin Chloride (ous) <10%					•
Toluene >99%	•	•	•	•	
Turpentine >98%	•	•	•	•	
Water (Tap)	•		•	•	
Whiskey			•		
Zinc Chloride <25%					•
Zinc Sulphate <40%					•

❶ Over 1000 psi – entire system must be 316 stainless steel. Applicable only to hydrogen.

❷ Monel and 316 stainless steel are acceptable for oxygen service, provided the instrument has been cleaned for oxygen service and is free from oil.

* Any standard Bourdon tube material may be used in conjunction with a diaphragm seal, but the gauge selection should take into consideration the corrosive environment in which it is to operate. For diaphragm seals see Bulletin DS-1.

Range Tables

Ashcroft® Duragauge® Pressure Gauge

Standard Ranges

Pressure – psi		
Range	**Figure interval**	**Minor graduation**
0/15	1	0.1
0/30	5	0.2
0/60	5	0.5
0/100	10	1
0/160	20	2
0/200	20	2
0/300	50	2
0/400	50	5
0/600	50	5
0/800	100	10
0/1000	100	10
0/1500	200	20
0/2000	200	20
0/3000	500	20
0/5000	500	50
0/6000	500	50
0/10,000	1000	100
0/20,000	2000	200
0/30,000	5000	200
0/50,000	5000	500
0/80,000	10,000	1000
0/100,000	10,000	1000

Compound				
Range	**Figure interval**		**Minor graduation**	
	in Hg	**psi**	**in Hg**	**psi**
30″ Hg/15 psi	5	3	0.5	0.2
30″ Hg/30 psi	10	5	1	0.5
30″ Hg/60 psi	10	10	1	1
30″ Hg/100 psi	10	10	2	1
30″ Hg/150 psi	10	20	5	2
30″ Hg/200 psi	30	20	5	2
30″ Hg/300 psi	30	50	5	2
30″ Hg/400 psi	30	50	5	5
30″ Hg/500 psi	30	50	5	5
30″ Hg/600 psi	30	50	10	5

Combination					
Range		**Figure interval**		**Minor graduation**	
inner–psi	**outer–ft H_2O**	**psi**	**ft H_2O**	**psi**	**ft H_2O**
0/15	0/34	3	5	0.5	0.5
0/30	0/70	5	10	0.5	1
0/60	0/140	5	20	0.5	5
0/100	0/230	10	20	1	2
0/160	0/370	20	50	2	5
0/200	0/460	20	50	5	5
0/300	0/690	25	100	5	10

Vacuum		
Range	**Figure interval**	**Minor graduation**
30/0 in. Hg	5 in	0.2 in
34/0 ft H_2O	5 ft	0.5 ft

Retard		
Range	**Figure interval**	**Minor graduation**
0/15 psi retard to 30 psi	1 psi-30 psi	0.25 psi-5 psi
0/30 psi retard to 60 psi	2 psi-60 psi	0.2 psi-10 psi
0/60 psi retard to 100 psi	2 psi-100 psi	0.5 psi-10 psi
30″ Hg vac/75 psi retard to 150 psi	5″ Hg/15 psi-150 psi	1″ Hg/1 psi-5psi
10″ Hg vac/5 psi retard to 30″ Hg vac	2″ Hg/1 psi 30″ Hg	0.2″ Hg/0.1 psi 5″ Hg
retard to 30 psi	30 psi	5 psi

Metric Ranges

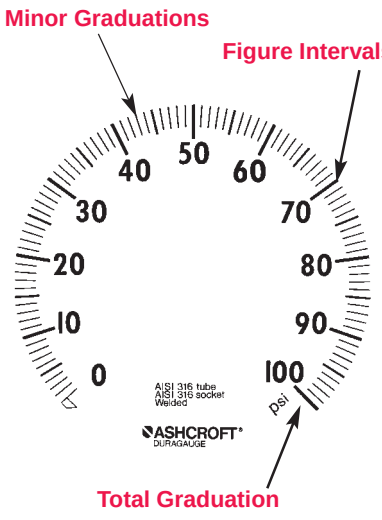
Pressure – kg/cm² and bar			
Range	**Figure interval**	**Minor graduation**	**Outer scale in psi**
0/1	0.1	0.01	0/14
0/1.6	0.2	0.02	0/22
0/2.5	0.5	0.02	0/35
0/4	0.5	0.05	0/55
0/6	0.5	0.05	0/85
0/10	1	0.1	0/140
0/16	2	0.2	0/220
0/25	5	0.2	0/350
0/40	5	0.5	0/550
0/60	5	0.5	0/850
0/100	10	1	0/1400
0/160	20	2	0/2200
0/250	50	2	0/3500
0/400	50	5	0/5500
0/600	50	5	0/8500
0/1000	100	10	0/14,000
0/1600	200	20	0/22,000
0/2500	500	20	0/35,000
0/4000	500	50	0/55,000
0/6000	1000	50	0/85,000

Compound – kg/cm² and bar			
Range	**Figure interval**	**Minor graduation**	**Outer scale in psi**
–1/0/1.5	0.2	0.02	30″ Hg/20
–1/0/3	0.5	0.05	30″ Hg/40
–1/0/5	0.5	0.05	30″ Hg/70
–1/0/9	1	0.01	30″ Hg/125
–1/0/15	2	0.02	30″ Hg/215
–1/0/24	5	0.02	30″ Hg/340

Vacuum – kg/cm² and bar			
Range	**Figure interval**	**Minor graduation**	**Outer scale**
–1/0	0.1	0.01	30″ Hg

Graduations and figure intervals

All Ashcroft dials have various total graduation marks, figure intervals and minor graduations. Standard dual scale metric ranges have a dominant metric inner scale. The outer scale is specified in psi. Some examples are shown. Duragauge gauges are made in accordance with ASME B40.1 entitled, "Gauges, Pressure, Indicating Dial Type – Elastic Element," Accuracy grade 2A (±0.5% of span). The accuracy of a retard range gauge applies only to the expanded portion of the scale. The error in the compressed portion is –10% to +20% of the span. Maximum pressure at which a gauge is continually operated should not exceed 75% of full scale range. Consult customer service in Stratford, CT for non-standard dials.



Range Tables

Ashcroft® Duragauge® Pressure Gauge

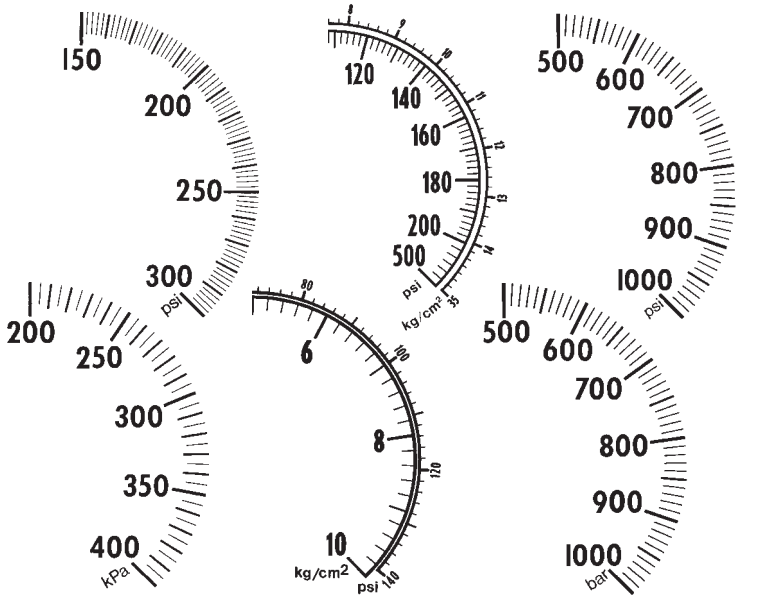
Metric Ranges

Pressure – (kPa) kilopascal			
Range	**Figure interval**	**Minor graduation**	**Outer scale in psi**
0/100	10	1	0/14
0/160	20	2	0/22
0/250	50	2	0/35
0/400	50	5	0/55
0/600	50	5	0/85
0/1000	100	10	0/140
0/1600	200	20	0/220
0/2500	500	20	0/350
0/4000	500	50	0/550
0/6000	500	50	0/850
0/10,000	1000	100	0/1400
0/16,000	2000	200	0/2200
0/25,000	5000	200	0/3500
0/40,000	5000	500	0/5500
0/60,000	5000	500	0/8500
0/100,000	10,000	1000	0/14,000
0/160,000	20,000	2000	0/22,000
0/250,000	50,000	2000	0/35,000*
0/400,000	50,000	5000	0/55,000*

Compound – (kPa) kilopascal			
Range	**Figure interval**	**Minor graduation**	**Outer scale in psi**
–100/0/150	50	5	30˝ Hg/20
–100/0/300	50	5	30˝ Hg/40
–100/0/500	50	10	30˝ Hg/70
–100/0/900	100	10	30˝ Hg/125
–100/0/1500	200	20	30˝ Hg/215
–100/0/2400	500	20	30˝ Hg/340

Vacuum – (kPa) kilopascal			
Range	**Figure interval**	**Minor graduation**	**Outer scale**
–100/0	10	1	30˝ Hg

* 200° Arc



Receiver gauge

These ranges apply to any unit of pressure, temperature, liquid level, flow, or other value specified. Units in psi pressure will be denoted on the dial unless specified. Available with input ranges of 3-15 psi or 3-27 psi.

Receiver Gauge Ranges			
0/1	0/75	30/80	100/600
0/2	0/80	5/110	200/700
0/3	0/85	20/120	100/800
0/4	0/90	40/120	200/800
0/5	0/95	20/150	300/800
0/6	0/100	30/150	400/800
0/7	0/120	40/150	450/800
0/8	0/140	50/150	500/800
0/9	0/160	30/180	650/800
0/10	0/180	130/180	200/900
0/11	0/200	100/200	400/900
0/12	0/250	20/220	700/900
0/14	0/300	40/220	200/1000
0/15	0/350	30/240	400/1000
0/16	0/400	100/240	500/1000
0/17	0/500	30/250	600/1000
0/18	0/600	50/250	800/1000
0/19	0/700	100/250	200/1100
0/20	0/760	30/300	400/1200
0/21	0/800	50/300	500/1200
0/25	0/900	80/300	600/1200
0/26	0/1000	100/300	1000/1500
0/28	0/1500	50/350	300/1600
0/30	0/2000	80/350	1000/1600
0/35	0/3000	150/350	600/1800
0/40	0/4000	100/400	900/1800
0/45	0/5000	150/400	1200/1800
0/50	0/10,000	50/500	700/2000
0/55	0/15,000	100/500	1000/2500
0/60	0/20,000	200/500	1500/2500
0/65	0/30,000	300/500	900/3000
0/70	0/50,000	200/700	1500/3000

Square Root Ranges			
0/5	0/70	0/300	0/1500
0/10	0/80	0/350	0/2000
0/15	0/90	0/400	0/3000
0/20	0/100	0/500	0/4000
0/25	0/125	0/600	0/5000
0/30	0/150	0/700	0/10,000
0/40	0/175	0/800	
0/50	0/200	0/900	
0/60	0/250	0/1000	

Compound Ranges
30˝ Hg/0/15 psi
30" Hg/0/30 psi
30" Hg/0/60 psi
30" Hg/0/100 psi
30" Hg/0/150 psi
30" Hg/0/500 psi
30" Hg/0/800 psi

Options

Ashcroft® Duragauge® Pressure Gauge

Case and ring options	Code	Comments
Hermetically Sealed Case	H	Available on types 4½˝ 1279 and 4½˝, 6˝ 1379 models only.
Gauge Heater	HD	Used for outdoor applications or other services where ambient temperatures are –50°F. Available on 4½˝ 1379 model only.
Flush Mounting Ring - Steel, Black Epoxy	56	Available on 4½˝ 1279 and 4½˝, 6˝ 1379 models only (also called 1278 flush mounting ring).
Flush Mounting Ring - Stainless Steel, Polished	57	Available on 4½˝ 1279 and 4½˝, 6˝ 1379 models only (also called 1278 flush mounting ring).
Bourdon tube and system assembly options		
AND10050-4 (¼˝ Tubing Conn.)	AM	
¼˝ High Pressure Tubing Conn.	09	Standard on ranges 30,000 psi and up.
Overload Stop	OS	Used to protect the gauge against extreme pressures.
Underload Stop	VS	Used to protect low pressure gauges against vacuum.
Throttle Screws – Brass, stainless steel and Monel	TS	0.031˝ Standard. Other sizes: .006, .0135, .020, .040, .050 and .070 (Monel .040 only).
Capillary Bleeder	BG	Available in model 1379, 4½˝ Lower conn. only with stainless steel system. Max. pressure 1000 psi.
Tip Bleeder	TB	Available in bronze, St. St. or Monel Bourdon tube gauges only. Max. pressure 15,000 psi.
Cleaning for Gaseous Oxygen	6B	Not available with steel or bronze and *PLUS!* option Bourdon tubes. If Gauge is liquid-filled specify Halocarbon as the fill.
Cleaning for Liquid Oxygen Service	6D	
Free from Mercury Contamination	MF	Provided with free from mercury contamination certification (CD-2).
Link options		
Slotted Link for Sudden Pressure Increase	RJ	Unless specified, slotted link set for pressure increase. Accuracy 1% F.S. with slotted link.
Slotted Link for Sudden Pressure Decrease	S4	
Liquid-filling options		
Silicone Fill	GV	
Halocarbon Fill	GX	For oxidixing media. Examples: chlorine, oxygen, nitric acid and sulfuric acid.
Pointer options		
Red Set Hand (Single)	SH	Single stationary set hand used to indicate a specific pressure.
Red Set Hand (Double)	SJ	Double stationary set hand used to indicate 2 specific pressures.
Red Set Hand (Adjustable)	EO	Internally adjustable.
Maximum Pointer	EP	Externally reset by a knob on outside of an acrylic window.
Minimum Pointer	EQ	Externally reset by a knob on outside of an acrylic window.
Window options		
Acrylic Window	PD	Ambient temperature limits –50/180°F.
Laminated Safety Glass	SG	Ambient temperature limits –50/200°F.
Non Glare Glass	NG	Ambient temperature limits –50/350°F.
Marking and tagging options		
Dial Marking	DA	Service marking printed on dial.
Paper Tagging of Carton and Gauge	NN	Tag is bonded to gauge case and carton.
Stainless Steel Tagging of Gauge Case	NH	300 series stainless steel tag is wired to gauge case.
Calibration options		
Calibrate to Absolute Pressure	AB	
Test and certificate options		
Mass Spectrometer Leak Test	ML	
Special Certificate of Conformance	CD-1A	Non standard certificate of conformance.
Certificate of Conformance	CD-1	Conformance to specifications and/or drawings.
Free From Mercury Contamination	CD-2	Conformance to specifications and/or drawings and free from mercury contamination.
Individual Certified Calibration Chart	CD-4	

Table A – Case selection & mounting

Dial Size (in)	Ordering Code	Case Type	Case: Material Finish	Ring: Style Material Finish	Mounting/Connection
4½	(45)	1279(1)	Phenolic (Black)	Threaded Reinforced Polypropylene (Black)	Stem– Lower or back Surface– Lower or back Flush– Back: Specify X56
4½, 6, 8½	(45)(60)(85)	1377	Aluminum Black epoxy coating	Hinged Steel Black wrinkle enamel coat	Flush– Back Stem– Lower or back
4½, 6, 8½	(45)(60)(85)	1379(1)	Aluminum Black epoxy coating	4½˝, 6˝ Threaded reinforced polypropylene 8½˝ Hinged steel, black wrinkle enamel coat	Stem– Lower or back Surface– Lower or back Flush– Back, specify X56 8½˝ standard
6	(45)	2462	Polypropylene (fiberglass reinforced) (Black)	Bayonet lock Polypropylene (Black)	Stem– Lower or back Surface– Lower or back, specify XBF Flush– Back, specify XBQ
6	(60)	1379(1) (high pressure)	Aluminum Black epoxy coating	6˝ Threaded reinforced polypropylene	Flush– Lower or back Surface– Lower or back

Table B – System, connection & location

Bourdon Tube & Tip Material (2) (all joints TIG welded except code "A")	Socket Material(2)	Tube & Socket Code	Case Style Code	NPT Conn. & Code	Conn. Location & Code	Range Selection Limits (psi)
C510 Grade A Phosphor Bronze Tube Brass Tip, Silver Brazed	Brass	(A)	(S) Solid Front	(04) ½		Vac./1000
4130 alloy steel	1018 steel	(B)	(S) Solid Front	(STD)	Lower (L)	Vac./5000
316 stainless steel	1018 steel	(R)	(S) Solid Front	(02) ¼		Vac./20,000
316 stainless steel	316 stainless steel	(S)	(S) Solid Front	(OPT)	Back (B)	Vac./20,000
K 500 Monel®(3)	Monel 400	(P)	(S) Solid Front			Vac./30,000
Inconel 718®	316 stainless steel	(WW)	(SH) Solid Front Herm. Sealed	(09) ¼ High Pres.		50,000/80,000/100,000

NOTES:

(1) Liquid-fillable or hermetically sealed when kit 101A202-01 (lower) or kit 101A203-01 (back) is ordered.

(2) For selection of the correct Bourdon system material, see the media application table on page 9.

(3) Use on applications where NACE MR-01-75 is specified for selection of the correct Bourdon system material.

GAUGE ACCURACY

Duragauge gauges are made in accordance with ANSI B40.1 (Gauges, pressure and vacuum, indicating dial type – elastic element), Accuracy Grade 2A (±0.5% of span). Because of hysteresis, the downscale accuracy of a 20,000 psi gauge (S) or (R) code is 1.2%. Maximum pressure at which a gauge is continually operated should not exceed 75% of full scale range.

To order a Duragauge (sample coding shown)

Select:	45	1279	RS*	04L	XXX	0/2,000 psi

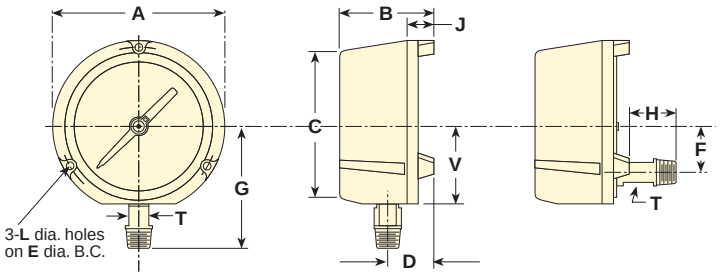
1. Dial size–4½˝
2. Case type–1279
3. Bourdon tube and socket code
4. Connection–¼ NPT (02), ½ NPT (04), Lower (L), Back (B)
5. Optional features
6. Pressure range (see range tables on pages 10 & 11)

(*) "S" denotes solid front case design

Dimensions

Ashcroft® Duragauge® Pressure Gauge

Case Type 1279

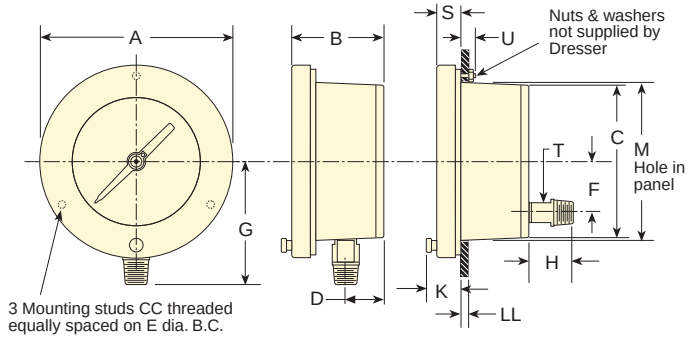


4½″ Lower Connection

4½″ Back Connection

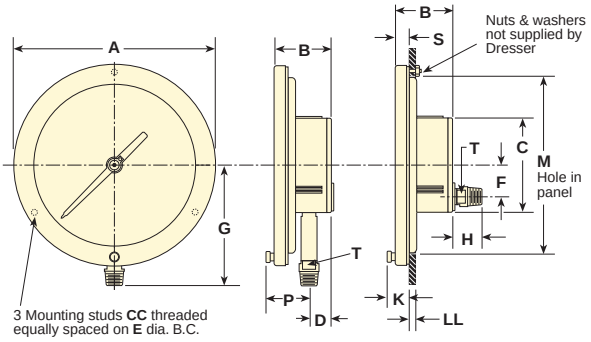
Dial Size Inches	A	B	C	D	E	F	G	H	J	L	T	V	Weight (lbs)
4½	5 13/16 (148)	3⅜ (86)	5 1/16 (129)	1⅝ (41)	5⅜ (137)	1⅝ (41)	3 15/16 (100)	¾ (20)	1 (25)	.218 (6)	⅝ (16)	2⅝ (67)	2½

Case Type 1377



4½″ & 6″ Lower Connection

4½″ & 6″ Back Connection



8½″ Lower Connection

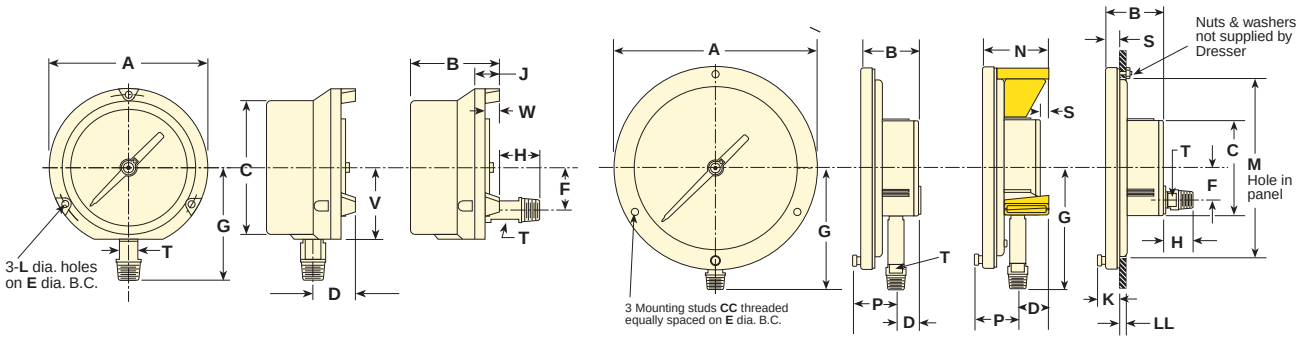
8½″ Back Connection

Dial Size Inches	A	B	C	D	E	F	G	H	K	M	P	S	T	U	CC	LL	Weight (lbs)
4½	6 3/32 (148)	2⅞ (73)	4¾ (121)	1 1/16 (27)	5⅜ (137)	1⅝ (41)	3 15/16 (100)	1⅜ (35)	1 1/16 (27)	4⅞ (124)	2⅛ (54)	⅝ (16)	⅝ (16)	¾ (19)	#10-24	⅛–½ (3)(13)	2½
6	7 9/16 (192)				7 (178)		4½ (114)			6½ (165)					¼-20		3
8½	10 1/16 (257)				9⅝ (244)		6 (152)			9 (229)					¼-20		4½

Dimensions

Ashcroft® Duragauge® Pressure Gauge

Case Type 1379

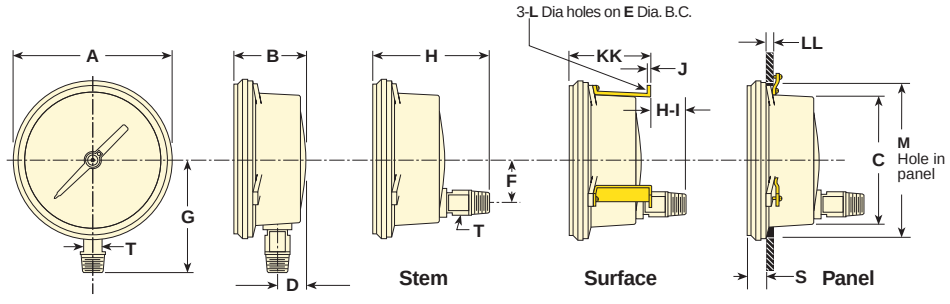


4½″ & 6″ Lower Connection | 4½″ & 6″ Back Connection | 8½″ Lower Conn. | 8½″ Wall Conn. | 8½″ Back Conn.

Dial Size Inches	A	B	C	D	E	F	G	H	J	K
4½	5 13/16 (148)	3 13/32 (86)	4 7/8 (124)	1 5/8 (41)	5 3/8 (137)	1 1/8 (42)	3 15/16 (100)	7/8 (20)	1 1/16 (27)	—
6	7 9/16 (192)	3 1/2 (89)	6 5/8 (162)	1 5/8 (41)	7 (178)	1 1/2 (42)	4 1/2 (114)			
8½	10 1/16 (256)	2 7/8 (73)	4 3/4 (121)	1 1/16 (27)	9 5/8 (244)	1 5/8 (41)	6 (152)	1 3/8 (35)	—	1 1/16 (27)

Dial Size Inches	L	M	N	P	S	T	V	CC	LL	Wgt. (lbs)
4½	.218 (6)	—	—	2 1/8 (54)	—	5/8 (16)	2 5/8 (67)	—	1/8-1/2 (3)(13)	2½
6										3⅛
8½		9 (228)	3 9/32 (83)	—	1 1/16 (17)	—	—	#10-24		4½

Case Type 2462



6″ Lower Connection | 6″ Back Connection

Dial Size Inches	A	B	C	D	E	F	G	H	H-1	J	KK	L	LL Min.	LL Max.	M	S	T	Wgt. (lbs)
6	6 3/8 (163)	2 7/16 (62)	4 3/4 (120)	7/8 (22)	5 3/8 (137)	1 5/8 (42)	3 15/16 (100)	4 9/16 (116)	4 9/32 (109)	5/64 (2)	2 11/16 (69)	.218 (6)	1/16 (2)	1/2 (13)	6 (152)	1 1/16 (17)	5/8 (16)	6

Note: Dimensions in brackets ( ) are millimeters.

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