



Product Guide

The Complete Guide to Selecting Pressure Gauges

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Six Factors to Consider When Selecting Pressure Gauges

Ashcroft, a leader in pressure and temperature instrumentation, understands that you need accurate and reliable pressure gauges to keep your operation running efficiently. We also know finding the best solution to meet your unique specifications can be overwhelming. This guide can help. Let's start with the questions you need to answer before making your selection.

1 Safety Requirements *Does your pressure gauge meet your application's safety requirements?*

Protecting your people and process is a top priority, especially in potentially hazardous conditions. For instance, if you use specialized equipment to handle ultra-high pressure, a rupture in the process could hurt the operator, damage your equipment and disrupt your process.

In this case, choosing a high-pressure, solid-front pressure gauge that meets ASME safety standards will help protect the operator from rupture blowback and keep your operation running.

2 Media Compatibility *Are the pressure gauge materials compatible with the process media?*

The wetted material you choose must be compatible with your process media. If you are using the wrong materials, you may encounter instrument damage or failure. The [Ashcroft Material Selection & Corrosion Guide](#) can help ensure that you choose the proper instrumentation for your application's media.

3 Material Traceability *What are your material traceability requirements?*

Material traceability provides a documented record of the origin and composition of the pressure instrument's materials. This traceability is crucial for ensuring that the wetted materials used in the instruments are suitable for the specific application's conditions, such as high pressures, extreme temperatures or corrosive environments. It also enables easier identification of any issues or recalls and simplifies bulk replacements.

4 Application Requirements *Do you have the right instrumentation for your application?*

Your application has specific requirements for pressure range, temperature and other factors. Ensuring your instruments meet those specific demands is critical. For instance:

Temperature Range:

Pressure gauges are rated for use in a specific temperature range. Using gauges in temperatures outside of their range can lead to damage, depending on their design and construction.

Pressure Range:

Ashcroft recommends using ASME guidelines for selecting a mechanical pressure gauge with a full-scale range that allows the operating pressure to fall within the middle half (25% - 75%) of the scale. The full-scale range of a mechanical gauge should be about twice the desired operating pressure.



5 **Product Standards and Approvals**

Do you know which product standards and/or approvals you need?

Whatever your required safety standards and regulations, Ashcroft has the necessary product approvals to validate our instruments have undergone rigorous testing and comply with industry-specific requirements. This will give you confidence in the instruments' reliability and suitability for their intended applications.

Product Standards

- ASME B40.100
- EN 837-1
- CE
- RoHS
- Ingress Protection (IP65, 66 or 67, NEMA 4X)

Product Approvals

- 3-A
- CRN
- Hazardous Location Approvals (ATEX/FM/CSA)
- Natural Gas (NGV3.1/R110)
- NSF
- UL (252A, 404, 61010-1)

6 **Cost**

What cost factors should you be considering?

The cost of a pressure gauge that measures air in a tank will be vastly different than a pressure gauge used in a power plant or processing facility. Common cost factors will include:

Gauge Type:

Depending on whether you need a commercial, industrial, critical process or test gauge, the cost could be anywhere from \$10 - \$1,000.

Features:

Accuracy, dial size and pressure range requirements are also factors in gauge cost. Typically, more accurate pressure gauges, larger dials and certain pressure ranges, including vacuum and compound ranges, can be more expensive.

Options and Accessories:

Certain applications, especially those that involve hazardous conditions, may require options like a solid-front design, approvals, certificates and more that will add to the cost.



Helpful Information for Pressure Gauges



Accuracy

Accuracy describes how closely a measurement aligns with the true value, indicating its correctness. In other words, it is the difference between the measured value and the actual value being measured. An instrument with high accuracy delivers measurements with minimal error.

Pressure Gauge Accuracy is typically expressed as a percentage of the instrument span. The accuracy of your pressure gauge should align with your application requirements and ASME B40.100 or EN837-1 best practices.

- $\leq \pm 0.25\%$ of span - for high-accuracy test and measurement applications.
- $\pm 0.5\%$ to $\pm 1.0\%$ of span - for high to mid-accuracy process applications.
- $\pm 1.6\%$ to $\pm 2.5\%$ of span - for mid-accuracy industrial applications.
- $\geq \pm 3.0\%$ of span - lower accuracy for general-purpose applications.

When verifying the accuracy of a pressure gauge, ASME recommends that the standard to which the tested gauge is being compared is at least four times more accurate. For example, a 0-100 psi gauge with $\pm 1\%$ of full span accuracy (tolerance of ± 1.0 psi) should be verified with a pressure standard capable of measuring within ± 0.25 psi or less.



Temperature Effects

Pressure gauges are often exposed to extreme temperatures that may damage them or impact their accuracy. To minimize the effects of temperature on our instrumentation and protect your pressure gauges from damage there are a few strategies you can try:

Temperature Dissipation: The Ashcroft® Microtube™ Siphon and Capillary are designed to dissipate elevated temperatures by reducing the volume and allowing the ambient temperature to cool down the process. Capillaries can also help by removing an instrument away from elevated ambient temperatures. For processes that may cause clogging, a Diaphragm Seal should be used in conjunction with the dissipator to protect the instrument.

Steam Service: Siphons, often referred to as coil siphons or pig tails, are industry solutions to protect instruments from the high temperatures of steam service. Using a condensate barrier, the siphon isolates the instrument with an air pocket. Another solution is the Finned Siphon which has a more compact design using an internal chamber and fins that help radiate the elevated temperature.

A Liquid-filled Gauge: These gauges can withstand 200 °F (93 °C) but glycerin fill and acrylic windows will tend to yellow. Gauges with welded joints will withstand 750 °F (400 °C), 450 °F (232 °C) with silver brazed joints for short times without rupture, but other parts of the gauge can be destroyed and calibration lost.

View [ASME B40.100-2013](#) for more guidance on sealed gauge cases and temperature error.





Customizing Your Dial

Ashcroft custom-designed dials enhance a pressure gauge or dial thermometer by providing clear and specific application information, greater visual appeal and brand visibility. We offer the following options for creating custom pressure gauge dials:

Branding: Personalizes gauge dial with your brand colors and features your company logo.

Colors: Prints the closest CMYK equivalent to named PMS spot inks.

Multiple Scales: Simultaneously displays multiple-scale pressure readings.

Alternate Scales: Relates pressure to scales that better serve your application.

Zone Indicators: Allows quick identification and process pressure measurement in safe, cautious or dangerous states.

Tag Numbers: Provides operators with technical information for easy installation and replacement.

To order a custom dial, follow these three steps:

1. Contact Ashcroft

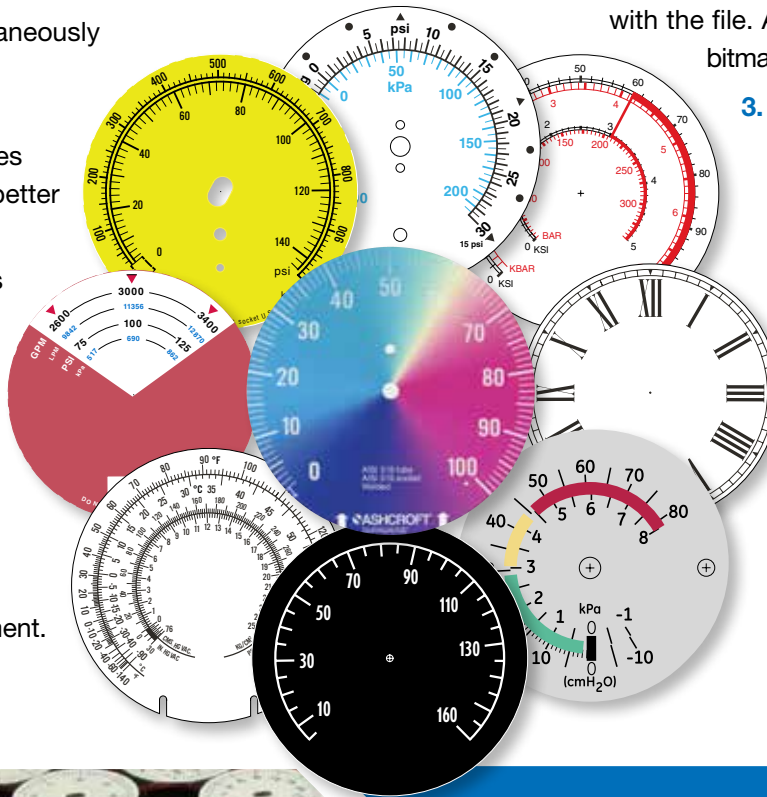
Go to Ashcroft.com to connect with us online or talk to your territory manager or authorized distributor.

2. Submit Your Artwork

Submit logo artwork as an Adobe Illustrator line art file only (.ai or .eps) from either a Mac or PC. Include named PMS ink(s) required to reproduce your logo artwork. Convert all fonts to outline or include fonts with the file. Avoid linked or embedded bitmap images. Call for approval.

3. Review and Approve Your Proof

When your proof arrives, make sure everything is correct. We will assign a code to your part number, which is a unique identifier that can only be sold to you in the future. It won't be shared with other customers.



If you have additional questions about pressure gauges or would like to discuss your unique requirements with one of our experts, please contact us today!

1.800.328.8258 | ashcroft.com

Accessories for Your Pressure Gauge

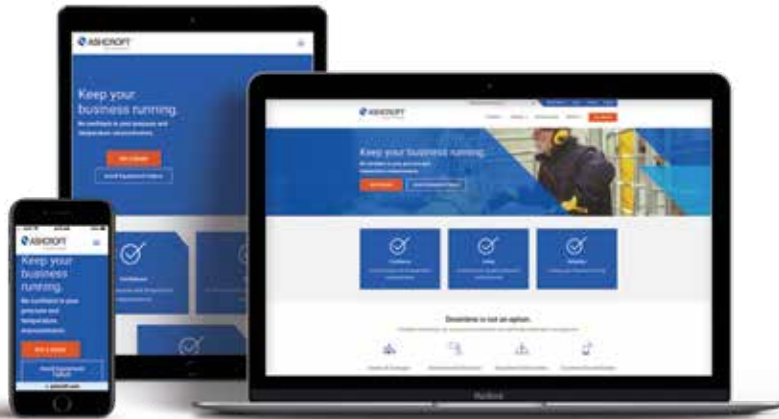
Harsh Conditions	Action Required	Accessory Solutions
 Pulsation	Flow Restriction	Pulsation Dampeners 
 Vibration	Dampening	PLUS! ™ Performance & Liquid-Filled Gauges 
 Over Pressure	Protection	Pressure Limiting Valves 
 Clogging	Isolation	Isolation Rings & Seals 
 Corrosion	Integration & Protection	Diaphragm Seals 
 Extreme Temperatures	Dissipation	MicroTube™ Siphon & Capillary Lines 
 Extreme Temperatures	Steam Service Dissipation	Finned & Coiled Siphons 

Common Options

PRESSURE GAUGE TYPES																									
CODE	DESCRIPTION	PROCESS GAUGES				STAINLESS STEEL CASE & INDUSTRIAL GAUGES				SANITARY GAUGES			DIFFERENTIAL GAUGES			DIGITAL GAUGES				TEST GAUGES		COMMERCIAL GAUGES			
		1188	1259	1279	T6500	1008S	1009 (2½, 3½)	1009 (4½, 6)	8008S/8009S	1032	1032 Fractional	2030	113 Series	114 Series	F5504	2074/2174/2274	2080 Series	2030	DG25	A4A	1082	1001T	105H/106P/106S	1008A	8008A
XLL	PLUS!™ Performance		•	•	•	•	•	•		•															
XSF	FlutterGuard™																					•	•	•	•
XNP	Nickel plated socket																					•	•	•	
XBF	Wall mounting bracket							•					•												
XFW	Back flange				•	•	•		STD(2)																
XFF	Front flange				•	•	•	•	STD(2)	•			•			•		•				•		•	
XUC	U-clamp					•	•	•	STD(2)	•												•	•	•	•
XLJ	Dry liquid-fillable gauge		•		•	•	•	•		•														•	
XOS	Overload stop		•	•	•	STD(1)	STD	•												STD					
XVS	Underload stop		•	•	•	STD(1)	STD	•												STD					
XTS	Throttle screw	•	•	•		•	•	•																	
XTU	Throttle plug				•	•	•	•	STD														•	•	•
XT4	Throttle plug																					•	•	•	•
XT5	Throttle plug																					•	•	STD	STD
XT7	Throttle plug																					•	•	•	•
XT9	Throttle plug																					•	•	•	•
XS4	Slotted link movement (decrease)			•	•			•																	
XRJ	Slotted link (increase)			•	•			•																	
XAP	Adjustable pointer																					•	•	•	•
XMP	Micrometer pointer	STD	STD	STD	•		•	STD																	
XSH	Red set hand stationary	•	•	•	•		•	•																	
XEO	Red set hand adjustable	•		•	•		•	•					•	•											
XEP	Maximum pointer	•	•	•	•			•					•	•	•					•		•	•	•	•
XEQ	Minimum pointer	•	•	•	•			•							•						•				
XAR	Adjustable red indicator + min/max pointer								•													•			
XPD	Plastic window	•	•	•	•	STD(1)	STD	•	STD(2)	•	•		•	•	•					•	•	STD	STD	STD	STD
XSG	Safety glass	•	•	•			•	•	STD(2)	•	•		•	•	STD					•	•				•
XS3	Solid front case	STD	STD	STD	STD				•											STD	STD				
XDA	Dial marking	•	•	•	•	•	•	•		•	•				•						•	•	•	•	•
XNN	Paper tag	•		•		•	•	•	•	•	•									•	•				
XNH	Stainless steel tag	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•				
XAB	Absolute pressure	•	•	•	•		•	•		•							•				•				
XAJ	½% Optional accuracy		STD	STD	•			•																	
XAN	1% Optional accuracy	•			STD		STD	STD	STD(2)																
XRA	Retard scale		•	•	•			•															•		
XBD	Black dial	•	•	•	•	•	•	•		•													•	•	
X6B	Oxygen-cleaned gauges (gaseous)	•	•	•	•	•	•	•		•	•				•					•	•				
XTB	Tip bleed			•																STD					
XED	High and low electric contacts			•	•			•																	
XEE	Double high-electric contacts			•	•			•																	
XEF	Double low-electric contacts			•	•			•																	
XEG	Electric contacts off at low/high/in-between			•	•			•																	
XGV	Silicone-filled gauge		•	•	•	•	•	•	STD(2)	•			•											•	•
XGX	Halocarbon®-filled gauge		•	•	•	•	•	•																	
XCF	Halocarbon®-filled system									•	•														
XCZ	Food grade silicone-filled system									•															
XFJ	Distilled water-filled system									•	•														
XMO	Mineral oil-filled gauge									•															
XMY	Mineral oil-filled system									•															
XNM	Neobee® M-20-filled system									•	•														
XCH	Carrying handle																								
XC4	Calibration chart	•	•	•	•	•	•	•		•	•		•	•	•	•	•	•	•	STD	•				
8N	NGV3.1 Approval on dial								•																
8R	R110 Approval on dial								•																

NOTES: The options listed above are only a partial listing. For other options on these or other pressure instruments please call the factory for availability. Not all variations available for each size, connection, range in a specific gauge, model/type. Minimums may also apply. STD means the option comes standard with the product. (1) Option is standard for 40 mm and 50 mm. (2) Standard option in part number.

Learn more about Ashcroft instrumentation
by visiting our website:



[ashcroft.com](https://www.ashcroft.com)



**Keep your critical equipment and processes
running with confidence.**

Process, industrial and manufacturing companies need quality pressure and temperature measurements to keep their critical equipment and processes running. Understanding that your business can't stop, Ashcroft designs and manufactures reliable instrumentation to meet the most challenging applications worldwide so you can confidently run your business.

For more information about pressure and temperature measurement solutions, please contact us to discuss your specific requirements.