

When Lives Are On The Line...



OEM Solutions



When does a firefighter realize the value of an engineer?

In the middle of a 1,400°F inferno

When does an airplane pilot realize the value of an engineer?

10,000 feet in the air

When does a HAZMAT crewman realize the value of an engineer?

When cleaning toxic contaminants

If you have to develop self-contained breathing apparatus (SCBA) equipment that will allow a firefighter to take a breath in a raging inferno or craft a landing gear system on a passenger jet, then you know what it's like to develop equipment for the nastiest and most dangerous possible scenarios. And at 3D Instruments, we know what it takes to help make your designs and equipment successful even in the most extreme situations.

We have provided early warning signs for the worst pressure applications since 1970. That's when we developed a groundbreaking Bourdon tube technology called "direct drive" for the demanding needs of the aerospace industry. Today, we provide rugged and reliable pressure measurement solutions that withstand extreme environments for industries ranging from SCBA and life support to Aerospace, control panels and military applications.



What Direct Drive Technology Means For You

Over Pressure Protection

Because of a single sensing element, direct drive gauges retain accuracy even at 150% over-pressure. The elastic helical Bourdon tube absorbs the over pressure and automatically returns to its original setting.

Burst Protection

Direct drive technology prevents early failure by incorporating a standard burst pressure of up to five times full scale.

Wear Protection

Direct drive gauges work with a single moving part to maximize lifespan and accuracy. There are no springs, gears, sectors or linkages that wear out, requiring you to recalibrate or cause loss of accuracy.

Design Flexibility

We can wind helical Bourdon tubes for a multitude of pressure ranges from full vacuum (30" Hg) to extremely high-pressure (20,000 psi).

Reduced Cost

Direct drive gauges do not need to be replaced nearly as often as standard duty gauges and require less recalibration than standard gauges, reducing purchasing and maintenance expenses and overall total cost of ownership.

Six-Year Warranty

We offer guarantees up to six-years (depending on products) to bring you peace of mind. If one of our gauges fails in an application for which it has been recommended, then we will repair or replace it without charge.



3D Instruments conducts a variety of tests on gauge characteristics such as overpressure protection, burst protection, wear protection, and calibration.

We can offer you a complete system of pressure measurement with gauges and hoses that are customized to your exact requirements

With both gauges and hoses, we will work with you to select materials to fit your specifications. And, that's our approach for all your system needs: **We'll do what you need to meet spec.**

- With no gears or linkage, gauges can be made as light and as compact as you need**
- Rugged and reliable gauges withstand extreme environments**
- No wear-prone parts means accuracy over years of use**
- Custom design gauges with more visibility, such as glow-in-the-dark faceplate**
- Private labeling or a custom dial design**
- Burst point above 15,000 psi**
- Flexible to 1 1/2" bend radius for users in cramped spaces**
- Pliable, armored hoses built to withstand harsh environments**

Breathe Anywhere

A 5% loss in gauge accuracy equals **1:42** less air at normal breathing rates

You need accuracy from your gauges because first responders are dealing with increasingly hostile environments.

● Firefighters may only have 15 minutes of air with their personal protection equipment.

● About three-fourths of fires in the U.S. occur in residential structures, and the recent building designs and construction materials used in these structures have made the fire atmosphere more aggressive.¹

● There are more than 800,000 shipments of hazardous materials in the United States every day.²

¹Source: NFPA

²Source: The Department of Transportation



“The equipment we get has to be better than bulletproof, it has to be fireman proof.”

Gary Wirf, Firefighter EMT



Before firefighters can save a life, they must suit up in their protective gear. The key component of this gear is the SCBA equipment that gives firefighters the ability to breathe.

“We bet our lives on it every time we go in.”

Fire Chief David Hall
Springfield, MO

“Springfield fire chief is asking for funds to replace aging, damaged life saving equipment,” kspr.com, May 11, 2012.



You want to make your equipment lighter, more convenient and more portable. Because our gauges have no movements inside, we can make them lighter and smaller than standard gauges. We can custom design gauges with more visibility, such as a glow-in-the-dark faceplate or other application specific designs. You even have the option of private labeling and creating a custom dial design.

Tested And Proven For SCBA

You can rely on 3D Instruments for accuracy because our gauges have been tested to NIOSH and NFPA standards.

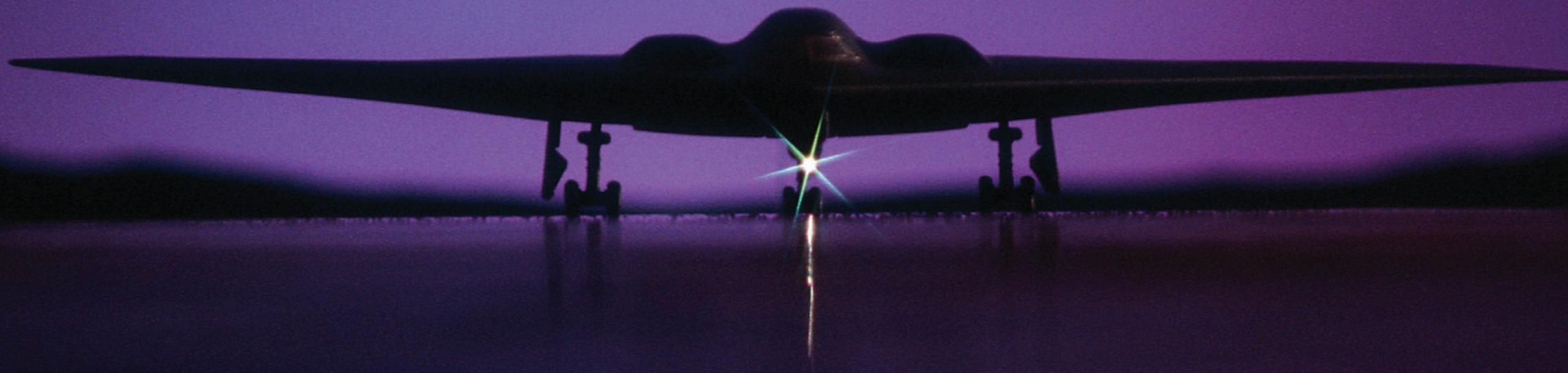
Leak Proof – 3D Instruments conducts Helium leak tests on its gauges to ensure no unwanted particles get in—or air get out. These leak tests are the most advanced in the industry, helping ensure that SCBA users can rely on their equipment to be ready and reliable when they need it.

Particle Free – 3D Instruments cleans its gauges and hoses to ensure they are hydrocarbon-free. A low tolerance for hydrocarbons (no more than 5 milligrams per cubic meter of air) underscores the importance of avoiding mixture with oxygen even in very small amounts.

Shock Resistant – With fewer moving parts in the direct drive system, 3D Instruments gauges are less susceptible to shock and jolts. The ability to withstand G-Forces or even sustained vibrations provides SCBA manufacturers the most flexibility—and end users with the most reliability.

Heat Tested – 3D Instruments’s Cyclocac® ABS cases withstand very high temperatures to ensure the gauge operates properly in even the toughest environments. The gauges will also self-extinguish within 15 seconds or less when coming into contact with direct flames—even at temperatures up to 194°F degrees.

3D Instruments conducts a variety of tests on gauge characteristics such as overpressure protection, burst protection, wear protection, and calibration. Cyclocac is a registered trademark of Sabic IP



The Speed Of Change In Aerospace

The aerospace industry is rapidly changing. Large aerospace manufacturers are transforming themselves into systems integrators that outsource many aspects of airplane production such as engineering and manufacturing. Meanwhile, they have to worry about nascent competitors in countries such as China and Russia. And, aerospace manufacturers now require that new aircraft structures and engines be lighter and more environmentally friendly. For suppliers, all these changes have coalesced into one overarching challenge: deliver maximum performance for minimum cost.

We help you provide superior execution because our gauges can withstand all aircraft environments, including cabin- pressurized systems and external airframe mounting and usage. We ensure our products can pass the extremely rigorous testing requirements of aerospace manufacturers, including the ability to withstand extremely low or high temperatures, environmental conditions such as salt and fog, and severe vibrations and shock. With the attention to safety required, our testing routines are often designed to be more severe than that actual service experience.



3D gauges can withstand aircraft environments such as pressurized cabin systems and external airframe mounting.



Because aircraft are weight conscious, our aerospace OEM customers often specify a maximum weight for a pressure gauge. Without gears and a linkage, our direct drive gauges are as lightweight as your specs require.

Matching Your Need For Lightweight

Our direct drive gauges require no movement, so we can make them as compact as needed to fit within the limited space in an airplane. You can order our gauges with a diameter as small as 1/2" while still maintaining the full application advantages of our direct drive design.

Regardless of whether you are designing an airborne breathing system, or a hydraulics or pneumatic system, we understand that you need a quick turnaround from us. We will work with you to ensure we pass your testing

and acceptance criteria in as little time as possible. The lightweight, compact 3D Instruments Direct Drive gauge design allows the possibility of having personnel-mounted systems that provide local pressure readings as well as standby cabin systems. The small volume and proven failsafe design of 3D Instruments gauges means that our gauges will not leak and will maintain their accuracy even after long-term storage. We can also supply special application gauges with a large selection of mounting types and sizes.

Beyond the Gauge: Completing a Durable SCBA System with Flexible Hoses

Armored hoses to endure the beating of harsh environments, ensuring strength and flexibility for SCBA systems.

The design provides a burst point well above 15,000 psi, while remaining flexible to a 1-1/2" bend radius for SCBA users that have to work in cramped spaces.

Each hose is tested to ensure it will withstand forces, both in pressure and shock-resistance, in extreme environments. 3D Instruments hoses can be chrome- or stainless steel-plated, with solid brass fittings, and can be calibrated to fit your specific design needs.

Give a "Boost" to SCBA Systems

With the shift of first responders to smaller SCBAs to reduce the overall weight of equipment, air cylinders require higher pressure to maintain the same air usage time. Traditional compressors may not be able to fill high-pressure SCBAs, leaving users vulnerable as their tanks provide less air and usage time. An air booster from 3D Instruments ensures complete fills up to 4500 PSI, helping facilities avoid the costly addition of high-flow air compressors.

Rescue Vehicles

- Maximize the use of breathing air in storage cylinders and increase the number of complete SCBA fills per storage cylinder
- Reduce fill times by eliminating the need to cascade air storage cylinders.
- Eliminate the possibility of contaminated air at fire incidents when used in conjunction with an air storage system versus the use of mobile compressors

Fire Stations

- Enhance the capability of existing low-pressure compressors and avoid the cost of a new compressor (e.g., if your current 3000 psi compressor cannot fill your new 4500 psi air packs, then an air booster is less costly than purchasing a new compressor)
- Extend the service life of existing compressors by operating at lower pressures

Hazmat

- Comply with government safety regulations on the use of high-pressure compressors at hazardous material manufacturing locations
- Using a cascade system in conjunction with a booster, and replenish the air supply from a local fire department or welding supply shop, to maximize the use of air from the cascade system and minimize the costs of stored air and government compliance





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