

# STEELE DIGITAL VACUUM GAUGE FAQ

## (Frequently Asked Questions)

### **What is an "absolute" vacuum gauge?**

Absolute gauges are referenced to vacuum and read out in Inches of Mercury Absolute (InHgA). They read zero at optimum (full) vacuum and atmospheric pressure if no vacuum is applied. So the gauge simply reads barometric pressure with the vacuum pump turned off. When the vacuum pump is turned on, the readings will decrease, and would reach zero if full vacuum could be achieved [generally 1.0 to 1.5 InHgA is the lowest possible on a typical system].

### **How do I know I have good vacuum?**

Many operators are used to a simple vacuum gauge that reads zero when exposed to atmosphere. An absolute gauge, on the other hand, would read zero if full vacuum could be achieved. So there may be an adjustment period while the operator determines what absolute vacuum reading (for example 1.5, 2.0, 2.5 InHgA) signifies acceptable vacuum for a particular product.

### **Are other engineering units available?**

Yes. The standard readout is in InHgA since this is the most common unit in the US for measuring vacuum. Gauges can also be special ordered that display Torr (mm Hg), millibar, or other units.

### **What are the power requirements?**

There is a stand-alone low voltage unit and a loop-powered unit for use with data systems or PLCs. The low voltage unit requires 8 to 24 VAC (50 or 60 Hz) or 9 to 32 VDC. The loop-powered unit is powered by the current loop and does not require a separate voltage source.



**NEMA 12  
EQUIVALENT\*  
GAUGE**



**NEMA 4X  
GAUGE**

### **Can I monitor a signal from the unit for recording vacuum data or setting a low vacuum alarm?**

Yes, the loop-powered unit outputs a 4-20 mA signal for this purpose.

### **What do the NEMA ratings mean?**

NEMA 4X enclosures provide protection against falling dirt, rain, sleet, snow, windblown dust, splashing water, hose-directed water, the external formation of ice on the enclosure, and protection against internal corrosion.

NEMA 12 equivalent\* enclosures provide protection against falling dirt; circulating dust, lint, fibers, and against dripping and light splashing of liquids.

\*Although they comply with NEMA 12 standards, we call these gauges "NEMA 12 equivalent" since they have not been certified at this time.



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## Which NEMA rating do I need?

The NEMA 12 equivalent is fine for panel mounting. Generally, the NEMA 4X is best for mounting on the machine or other locations where it can be exposed to more dust, dirt, and water spray.

## What are the buttons on the gauge face for?

Low-Voltage powered units:

The large center button is simply an on/off switch. There are also two potentiometers with black protective caps (nylon screws with sealing o-rings on the NEMA 4X model) labeled "Span" and "Zero". These should never be adjusted except by a qualified calibration technician (see question on calibration below).

Loop-powered units:

The large "TEST" button will output a test signal (factory setting is 15.0 InHgA) that is useful for troubleshooting if the gauge is connected to a controller or data system. In addition to "Span" and "Zero", there is a "Test" potentiometer for adjusting this signal, if desired.

## What about calibration?

All gauges are calibrated on equipment traceable to NIST before shipment. There is no need to calibrate the gauge before putting it in service. The following is a brief outline of re-calibration techniques. Detailed procedures are available on request.

Calibration intervals depend on operating conditions and quality standards. The most reliable way to recalibrate is to send the gauge to a metrology lab (J.C. Steele & Sons can make recommendations). Gauges can also be recalibrated on site if a full vacuum source and accurate barometric reading (such as a mercury manometer) are available.

Zero setting - With full vacuum applied to the gauge it should read 0.0 InHgA. If not, adjust the "Zero" potentiometer.

Span setting - With the gauge exposed to atmosphere it should read local atmospheric pressure. IMPORTANT: Do not use barometric pressure from a weather station or airport since these have been "corrected" to local elevation above sea level. Also keep in mind that atmospheric pressure can change quickly

depending on weather conditions. If an accurate atmospheric pressure is available, adjust the "Span" potentiometer to match it when the gauge is exposed to atmosphere.

All calibrations should be performed by a qualified calibration technician.

## I'm not sure I understand. Why would my gauge show a different pressure than the local weather report or airport barometer?

As noted, atmospheric pressure is affected by high and low pressure weather systems and how high the measuring station is above sea level. To standardize readings around the world, regardless of the local elevation, a weather barometer reading is "corrected" to sea level. As a rule of thumb, it's approximately 1" Hg added for every 1,000 feet above sea level.

## What accessories are available?

We offer a panel mount option (NEMA 12 equivalent gauge pre-mounted in black anodized aluminum plate, 4.1" by 4.1" with four mounting holes) and a 115VAC input / 12VDC output power supply. The panel mount option must be ordered with the gauge and cannot be retrofitted.

## Is it "Brickyard"?

The unit is very rugged and impervious to environmental factors. It has an operating range of -10°F to 185°F and stands up to dirty, dusty, and wet conditions (especially the NEMA 4X model). Drops of up to 6 feet will generally not damage the gauge.

## ORDERING INFORMATION

Panel Mounting - NEMA 12 Equivalent*	Ordering #
8-32 VDC/ 8 to 24 VAC 50/ 60Hz	PGH S 1010 CB
4-20 mA output, loop powered	PGH S 1012 CB
Mounting Panel Option - must be ordered with gauge)	PGH S 1019 CB

Machine Mounting - NEMA 4X	Ordering #
8-32 VDC/ 8 to 24 VAC 50/ 60Hz	PGH S 1014 CB
4-20 mA output, loop powered	PGH S 1016 CB
12VDC Power Supply (115 VAC input) - includes a 6 ft long, 2-conductor lead and a moisture resistant, no-wire-stripping connector	PGH S 1018 CB