DigiVac
Scientific Measurement & Control

BULLSEYE PRECISION GAUGE©

Operational Manual

YOU MUST READ THIS MANUAL BEFORE USE

July 2020

Table of Contents

 1020 Campus Drive, Morganville, NJ 07751 (732) 765-0900

Section 1: Overview

The Bullseye Precision Gauge® is a rugged, portable vacuum measurement instrument designed specifically for the demands of field use. It is a highly accurate digital vacuum gauge using field-proven thermocouple vacuum sensor technology. The Bullseye Precision Gauge offers several viewing options including numeric, bar graph, line graph and pump down graph display.

Portable

- Rugged design that offers a super-strong magnet for hands-free vacuum measurement
- Field-proven thermocouple vacuum sensing technology

Precise

- Bullseye accuracy available in 12 different measurement units (microns, millitorr, Torr, mm of Hg, mbar, bar, kPa, Pa, PSIA, inches of Hg, mm and inches of water)
- Field calibratable

Reliable

- 70 hour battery life
- Protective rubber boot
- Simple easy to use design

Features:

- Auto Off
- On/Off soft switch
- Battery level indication
- Good/Bad sensor (tube) indication
- Self test mode
- Field replaceable sensor
- 3 different graphical displays of vacuum pressure (pump-down, line, or bar
- graph)
- Vacuum analytics for leak, outgassing and pump-down
- Available with hard or soft protective travel cases (options)
- Bluetooth connectivity to smartphone (option)

 1020 Campus Drive, Morganville, NJ 07751 (732) 765-0900

Section 2 Quick Start: Bullseye Precision Gauge

Unpack and Confirm: verify you've received everything you ordered

The vacuum instrument contains the following components:

1. Vacuum gauge with amber backlight and blue rubber boot attached to 7' of coiled cable with Octal connector
2. Thermocouple Plus vacuum sensor, part number SEN-VGT500, or Agilent 531/536 sensor, depending on configuration
3. Quick Start guide or (this) User Manual

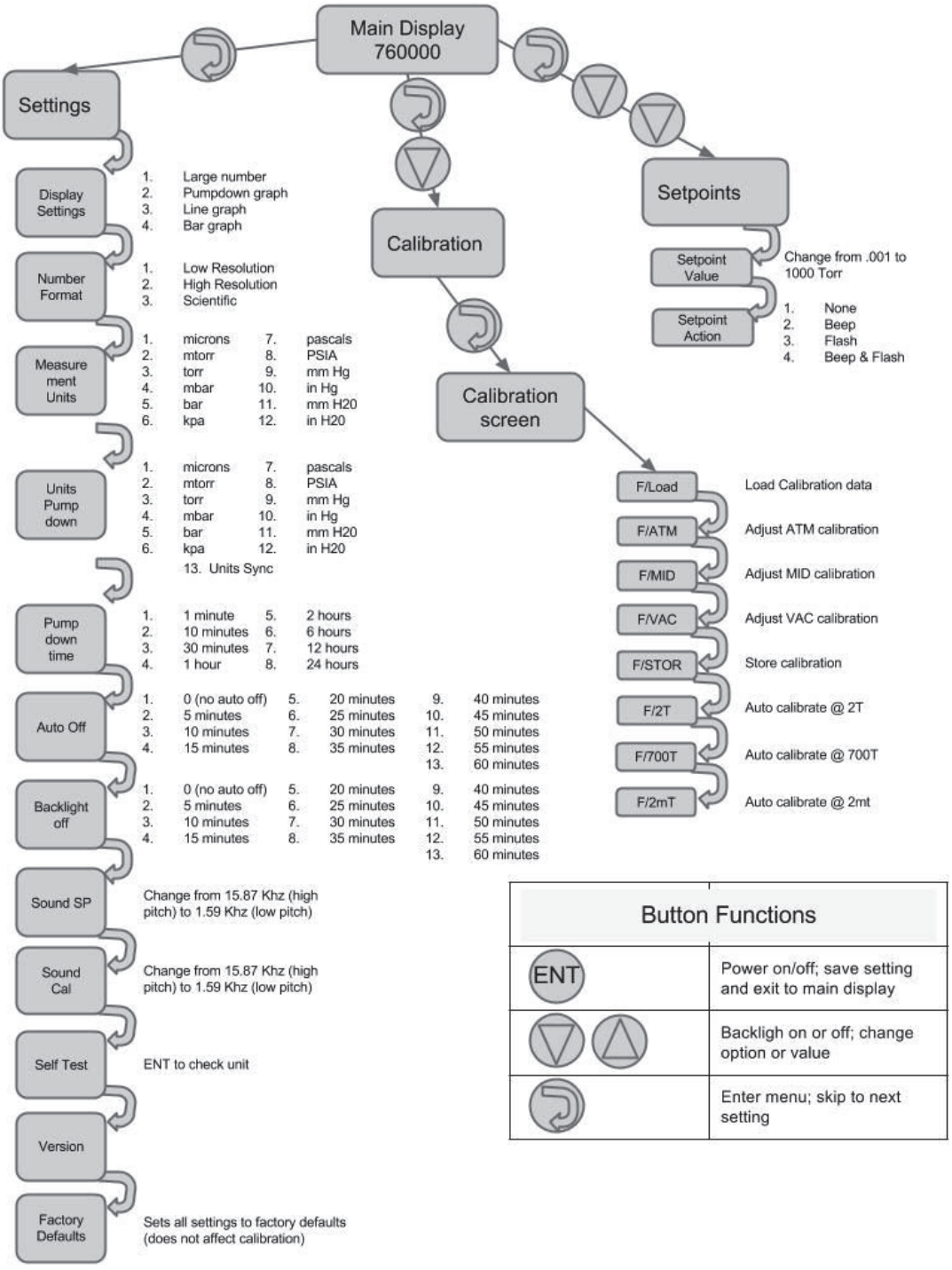
Easy to use steps:

1. Gauge comes with batteries already installed.
2. Plumb the thermocouple sensor into the system to be measured, taking care to keep the stem down.
3. Power on the device by pressing the "PWR" button. It will take about 5 seconds to turn on.
4. You may turn the backlight on or off with the arrow buttons. The backlight does not affect gauge reading or accuracy
5. Read vacuum!

Feel free to explore the latest copy of this manual at www.digivac.com for all the features that make this a truly useful vacuum measurement and system analysis tool.

 1020 Campus Drive, Morganville, NJ 07751 (732) 765-0900

Section 3: Menu Tree



 1020 Campus Drive, Morganville, NJ 07751 (732) 765-0900

Section 4: Modes of Display

The Bullseye Precision Gauge has four display modes: one numeric, and three graphical. The numeric display has three numeric formats: Low Resolution, High Resolution, and Scientific Notation. Display modes are selected from the settings menu “Display”, and numeric formats are selected from the Setting option “display”. The **SEL** button enters and traverses the Settings menu.

Display Large number

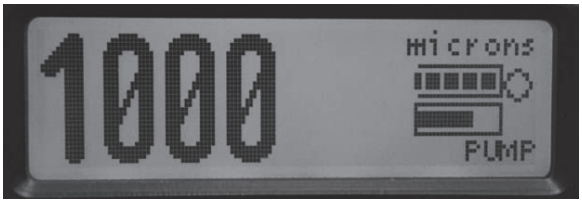
Numeric display with the “High Resolution” format

Large number display with the “scientific” format

The numeric display shows the currently configured units, in these examples the vacuum pressure units are “microns” or “torr”.

In any display mode, the **UP** and **DOWN** buttons turn the backlight on and off (respectively), the **SEL** button enters the configuration menu, and the **ENT** button turns the gauge on or off. The battery indicator shown at full strength

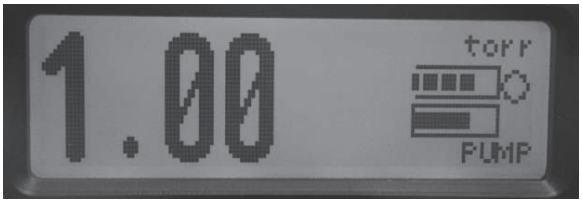
The battery indicator shown at full strength.



Vacuum Range Indicator

Bar Graph Level	Vacuum Range
Full bar	Greater than (>) 525 Torr
2/3 bar (pictured)	Between 525Torr - .0750 Torr
1/3 bar	Less than (<) .750 Torr or >_0.025 Torr
Empty box	< 0.025 Torr

In practice, this indicator changes based on the current level of pressure.

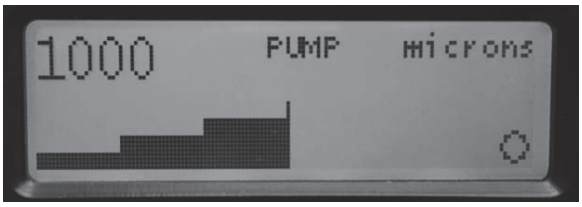


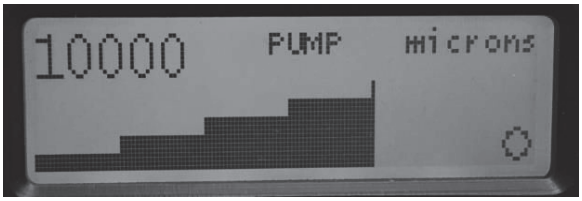
The numeric display shows when the **vacuum sensor tube** is disconnected, failed or when an over-range condition exists (pressure above 1000 Torr).

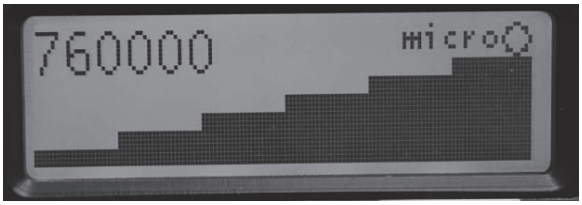
 1020 Campus Drive, Morganville, NJ 07751 (732) 765-0900

Display Bar Graph

The bar graph visualizes the current sensor reading with a 6-stage stepped bar.







Display Pump-down graph

The pump-down graph plots time horizontally and logs pressure vertically. The horizontal time scale is selected using the configuration option "**Pump-down time**". The

vertical pressure scale is logarithmic, indicating order of magnitude from one micron to atmosphere.

The top left is the **current vacuum pressure** display figure. In the center of the first line is the Vacuum System Analysis, "**PUMP**", and to the right is one of either the **pump down rate** in units per minute, or the **data set window size** in hours, minutes and seconds. The "**STABLE**" case shows the data set window size.

Display Line graph

The **auto-scaling** (or, auto-ranging) **time graph** is a *microscope* into the pump down data.

NOTE: "1.05" ***(upper-left)*** refers to **Maximum & Minimum value** in measured range; "1.05" ***(upper right)*** refers to **Current or most recent pressure.**

In this mode, the **pump down graph** is shown with a **linear pressure scale** that is fit to the pressure range of the data set.

The height of the graph display is the pressure range of the data set in a ***linear scale*** (not log). The top left figure is the **maximum value in this range**, and the bottom left figure is the **minimum value in this range**. The top right figure is the **current or most recent value** in the Instrument.

Please Note: Sometimes this visualization is not useful, showing noise. This noise comes from the instrument's process of measurement, as well as the vacuum system

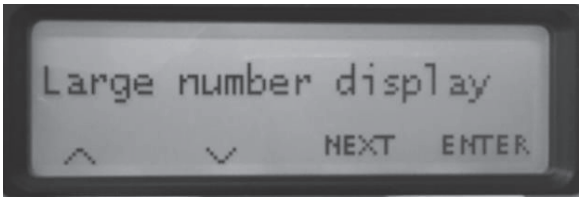
under measurement. The auto scaling graph is a data visualization microscope, in this sense.

Useful Quick Tip: This visualization can show a very small climbing or descending trend that the vacuum analysis algorithm has not declared as a leak or pumping.

Section 5: Menu of Settings

Display

Pressing the **SEL** button from the vacuum display screen will present three submenus: Settings, Calibration and Set-points.



The settings menu is a linear series of menu options that are stepped or skipped through using the **SEL** button.

Above each button is a utility hint to indicate specific button function. The **SKIP** hint is above the **SEL** button to indicate that the **SEL** button is used to step or skip to the next menu screen with no configuration change. The **ENTER** hint above the **ENT** button indicates that this button is used to enter the display mode as shown in the menu screen. Using the **UP** or **DOWN** buttons will change the option available on the menu screen.

In the example above, the configuration menu is ready to change the display to the Pumpdown Graph. In this state pressing the **ENTER** button will change the display to the Pumpdown Graph, or pressing the **SKIP** button will ignore the state of the menu screen and leave the display mode unchanged.

Number format

The number format setting defines the vacuum pressure number format throughout all modes of display.

The **UP** and **DOWN** buttons select a format type from “High Resolution”, “Scientific” and “Low Resolution”, and the **ENT** button saves the current choice.

High Resolution

The High Resolution format has three digits of precision. For example, an internal vacuum value of 1234 microns (µm Hg) would be displayed as 1.23 torr in the High Resolution format with torr units. Additionally, this format gives the raw vacuum measurement data which may be useful for trending, but could also result in a noisier reading.

Low Resolution

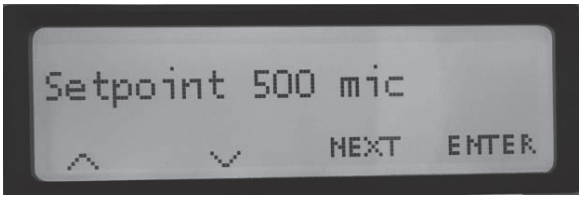
The Low Resolution format has two digits of precision. For example, an internal vacuum value of 1234 microns (µm Hg) would be displayed as 1.2 torr in the Low Resolution numeric format with torr units. This number format also gives a filtered number depending on the accuracy of the gauge in the pressure range of measurement. For example, it may count by 100 Torr increments around 400 Torr since the accuracy in this range is +/- 100 Torr, which results in a ‘quieter’ gauge. In this mode, the gauge will not change when ascending or descending between 500 Torr and 760 Torr. Most users will not require readings here, as thermocouple gauges are optimized for use from .001-5 Torr.

Scientific

The scientific format has two digits of precision with a base ten exponent following conventional usage. For example, an internal vacuum value of 1234 microns (µm Hg) would be displayed as 1.2 x 100 torr. ***For any resolution below 2 millitorr, the scientific format must be used.***

Set-point value

The Set Point Value is defined in terms of the current vacuum pressure units.



The Set Point indicates a pump down to configured pressure state according to the setting of the Set Point Action. See “Set Point Operation” for more detail.

Set-point action

The Set Point Action is defined as one of a set of choices, including: **None, Beep, Beep and Flash,** or **Flash.**

For details of operation, refer to the section “Set Point Operation”.

Pumpdown time

The pump-down time configuration option defines the width of the Pumpdown Graph and pumpdown rate window.

 1020 Campus Drive, Morganville, NJ 07751 (732) 765-0900

The pumpdown rate is the difference between the start and end of the pressure data shown in the pumpdown graph. For example using a pump down time of ten minutes, a system pump down from atmospheric pressure to one torr in ten minutes has a pump down rate of 760 torr per ten minutes or 76 torr per minute.

Auto Off time

Use this setting to save battery power during periods of inactivity. The figure zero will disable the auto off battery saver feature. To see the specifics of this feature, look at the **Auto Off Operation** section. With a positive (non-zero) value, the unit will indicate the **Auto Off**.

Backlight time

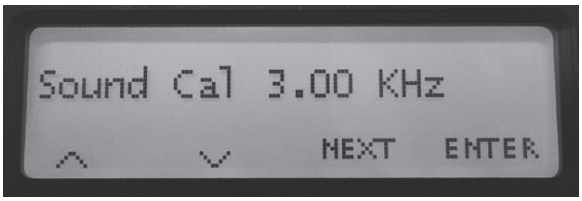
Use this setting to save battery power during periods of inactivity. The setting of “0” will never turn off the backlight. Set the Backlight time to a specific number of minutes to determine when the backlight will turn off, which can help conserve battery life.

Sound

The two sound configurations determine the audible Set Point Alarm and Calibration Storage Acknowledgement tones, named “Sound SP” and “Sound Cal” respectively.

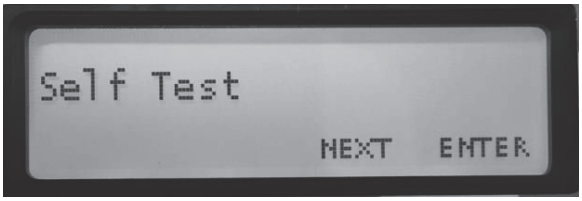
 1020 Campus Drive, Morganville, NJ 07751 (732) 765-0900

The **Set Point Alarm** sound is typically configured to a different value from the **Calibration Acknowledgement sound**.



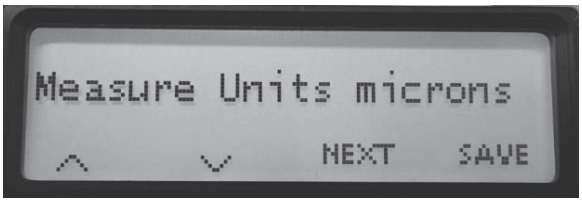
Self-Test

The self-test function reviews the Tube and Battery status, and resets the internal Elapsed Time Clock, Pump Down Data, and Auto Off subsystems. Enter the Self-Test sequence with this option. Refer to the section “Self-Test Operation” for more detail.



Measurement Units

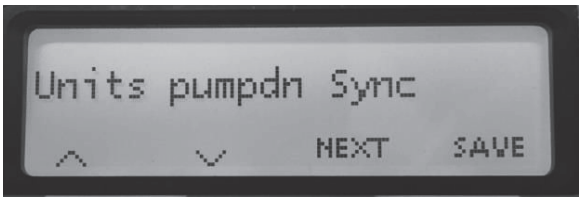
The units settings permits numeric vacuum values to be displayed in any one of a 12 available vacuum pressure units including microns, millitorr, millimeters of mercury, Torr, mbar, Bar, Pa, kPa, inches of mercury, mm of water, inches of water and PSIA. Note that inches of mercury and inches of water is zero referenced to 760 Torr absolute pressure.



NOTE: A negative number indicates vacuum, a positive number indicates pressure relative to sea level.

Units pumpdown rate

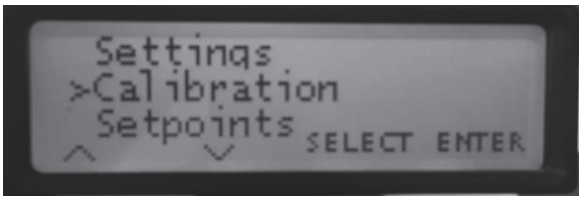
The **Units Pump-down** configuration option permits the pumpdown rate figure displayed in the Pumpdown Graph to employ identical or different units from the numeric vacuum units. Use this option to change the pumpdown rate units—allowing you to sync with your standard operating procedures for your particular vacuum system.



The "**Sync**" option, shown in this example (above), maintains the pumpdown rate units as identical to the primary vacuum units. **Note**: "**Sync**" is the recommended configuration— employing mixed units could be a source of misinterpretation.

Calibration

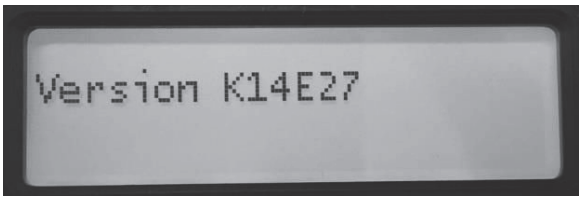
This configuration option is available from the main menu and will enter the field calibration mode.



Refer to the section "**Field Calibration**" for a complete description of the operation of the
Calibration function.

Version

The last step in the configuration menu reports the software version identifier.



TIP: This software version identifier is useful for communicating with the factory or distributor support.

Factory Defaults

The last step in the settings screen will return all the settings to factory defaults. **This does not affect calibration.** Tap the "**reset**" button to restore factory defaults.

Auto Off Operation

The auto off feature will engage only in the unattended mode of operation. The Bullseye Precision Gauge will not turn itself off when:

- connected to a system under vacuum (less than 100 Torr, pump down feature set)
- any button activity on instrument will reset "auto-off" time elapse
- in calibration mode

Set Point Operation

A Set Point can be enabled to alert the user when a specific vacuum level is reached. Enter the menu option "**Setpoints**". Adjust to the desired setpoint using the Up and Down arrows. Then press Next and use the **Up** and **Down** arrows to choose the desired **alert**; **Beep**, **Flash**, or **Beep/Flash**. The unit will alert the user when the defined vacuum level is reached. ***Press any button to silence the alert.***

Section 6: Vacuum System Analysis

The result of the Vacuum System Analysis is one of "**PUMP**", "**LEAK**", "**OUTGAS**" or "**STABLE**" and is shown in some display modes.

Internally, one data set serves the **Pump down** and **Time Auto line graphs** as well as the Vacuum System Analysis. The data is visualized in the Pump down and Time Auto line graphs. The data set is maintained continuously in every mode of operation.

Data set size

The width of the data set in time is configured with the option "**Pumpdown time**". This figure is employed to determine the time slices that are accumulated at a rate of roughly three updates per second. A small difference will accrue depending on the actual data set span in hours, minutes, and seconds. The Pump down graph with a "**STABLE**" case (under 100 torr) will display the actual time window size in hours, minutes and seconds.

Differential Analysis

The Vacuum System Analysis looks at the last quarter of the pump down data set to determine the state of the system under test. The whole analysis is recomputed approximately three times per second.

- The "**LEAK**" result indicates pressure increasing toward Atmosphere with rates that are not typically indicative of outgassing alone.
- The "**PUMP**" result indicates a strong pressure descent to vacuum as for a system under vacuum pump down.
- The "**OUTGAS**" result indicates evidence of outgassing. Evidence of outgassing is a pressure trend that is ascending at a rate that is decreasing. Eventually the rate of ascent decreases until the pressure stabilizes.
- The "**STABLE**" result indicates no particular evidence of venting (**LEAK**) or **outgassing**, and is shown for slow pump down rates.

Reset Historical Data

The pump down data set is cleared in power-off states: turned off, or dead or missing batteries.

Section 7: Self-Test Operation

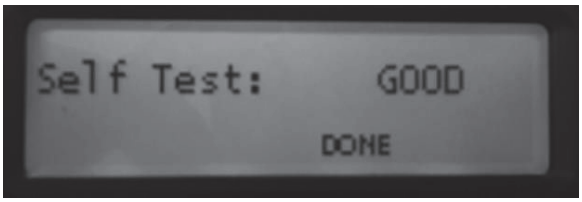
The Self-Test feature is available from the Configuration option "**Self-Test**", pictured below.

From this Configuration option, press the **ENT** button to enter the "**Self-Test**" sequence. The Self-Test sequence will then start after you press any other button.

Step 1: Performs tests of the Battery level and Tube connection

Step 2: Pressing any button will initiate the second step, shown below. The second step reviews the detailed results of the tests performed in the preceding step. Pressing any button will proceed to the third step.

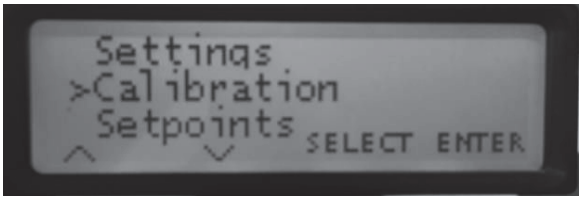
Step 3: Reports the overall condition as **GOOD** or **NOT GOOD**, based on the results reviewed in the previous step. Pressing any button will exit the Self-Test and reset the Elapsed Time Clock and dependent subsystems including the Pump Down Data Set—as occurs on any power off state (turned off or batteries dead or missing).



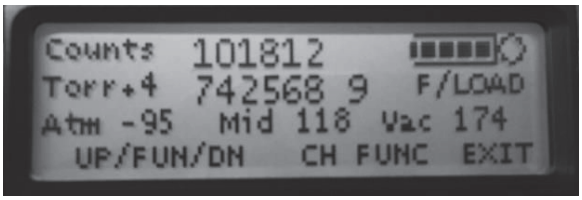
Section 8: Field Calibration

Disclaimer: You need a clean, leak-free vacuum system that can achieve and hold pressures of 1 Torr, 700 Torr and 5 millitorr, plus another gauge whose readings you trust. If this is not possible, the gauge should be remitted to DigiVac for factory calibration.

From the Settings view, choose "**Calibration**", pictured below, press the **ENT** button to enter the field calibration mode.



The field calibration mode, shown below, shows digital signal counts and torr pressure multiplied by 10,000 (“Torr x 10+4”). For example, one micron (or millitorr) is “10” in the “Torr x 10+4” scale.



Keep in mind that this procedure must be performed with:

• A leak-free vacuum system capable of achieving pressures of 1 Torr, 700 Torr and 5 millitorr, and capable of holding vacuum and remaining stable at those pressures for around a minute.

• Another vacuum gauge whose readings you trust.

Resetting Calibration Offsets Before Field Calibration

First, you must make sure the calibration offsets shown in the menu (the negative or positive numbers next to ATM, MID, and VAC) are reset to zero before performing the field calibration.

• Turn on the gauge using the rightmost PWR/Ent button, wait for unit to boot up. Press circular arrow button to access menu, press the down key, then Enter to access calibration screen.

• Use the circular arrow button to scroll through options until text on right-hand side of screen below battery indicator reads F/ATM.

• Press the two leftmost buttons (the two arrows) at the same time. The number next to the ATM option will become zero.

• Press the circular arrow button once so the text on right-hand side of screen below battery indicator reads F/MID.

• Press the two leftmost buttons (the two arrows) at the same time. The number next to the MID option will become zero.

• Press the circular arrow button once so the text on right-hand side of screen below battery indicator reads F/VAC.

• Press the two leftmost buttons (the two arrows) at the same time. The number next to the MID option will become zero.

• Press the circular arrow button once so the text on right-hand side of screen below battery indicator reads F/STOR. Press the two leftmost buttons at the same time. This will save your adjustments. Gauge should beep and screen should flash black and then back to orange. **Changes will not be stored without saving!**

Field Calibration

Pump your vacuum system down to 1 Torr and hold it, allowing gauge to settle for about 30 seconds. Use the circular arrow button to scroll through option until text on right-hand side of screen below battery indicator reads F/1T. Then press the two leftmost buttons at the same time. The number next to the MID option will change, and the vacuum reading in the center should read at or very near 1.0000 Torr.

Pressurize vacuum system to 700 Torr and hold it, allowing gauge to settle for about 30 seconds. Press circular arrow button once so text below battery indicator reads F/700T. Process here is identical to the above – press leftmost two buttons simultaneously, and the number next to the ATM option will change and the vacuum reading will read at or very near 700.0000.

Pump vacuum system down to 5 millitorr and hold it, allowing gauge to settle for about 30 seconds. Press circular arrow button so text below battery indicator reads F/5mT. Process here is identical to the above – press leftmost two buttons simultaneously, and the number next to the VAC option will change and the vacuum reading will read at or very near 1.0 x 10 -3.

Press circular arrow button several times until text under battery indicator reads F/STOR. Press two leftmost buttons simultaneously to save your changes. Gauge should beep and screen should flash black and then back to orange. Exit using rightmost button, then check your calibration from hard vacuum up to atmosphere. Remember **Changes will not be stored without saving!**

 1020 Campus Drive, Morganville, NJ 07751 (732) 765-0900

Section 9: Servicing and Maintenance

GAUGE TUBE SERVICING

In many cases, a gauge tube may become fouled with oil or other foreign matter. Regular cleaning of sensors is safe and recommended. We recommend acetone for fully-welded stainless steel sensors such as the Agilent 531/536, and isopropyl alcohol for the VGT-500.

After cleaning with solvents, the gauge tube should be completely dried, either under vacuum or in ambient air, prior to reinstalling it. ***Do not attempt to dry the sensor with a cotton swab or compressed air.***

Maintenance

Your vacuum instrument should give you many years of trouble-free service. There are no regularly scheduled maintenance intervals. If consistent accuracy is required, it is recommended that the gauge, tube, cable and power supply be returned for a yearly calibration check.

NOTES ON CALIBRATION

The instrument is calibrated in nitrogen, which has thermal properties virtually identical to air. Other gasses will affect the readings by an amount proportional to the thermal conductivity of the gases. In most cases, the gases present in a vacuum system will be air, nitrogen, or oxygen, and no appreciable errors will occur.

Certain other gases, however, have thermal conductivity significantly greater than air and will cause the instrument to read higher than the actual amount of pressure.

Examples of such gases are water vapor, fluorocarbon refrigerants, and acetone. Conversely, other gasses have thermal conductivity significantly lower than air and will cause the instrument to read lower than actual pressure. Examples of such gases include helium, oxygen and to a lesser extent, CO2.

When interpreting readings using gasses other than air, it should be borne in mind that the Bullseye Precision Gauge reads absolute pressure—that is the opposite of vacuum. Thus, a lower numerical reading actually is a higher level of vacuum. For more information, refer to section 8.0.

Section 10: Accuracy

Instrument Repeatable Accuracy

Range	Accuracy
1-99 millitorr	**+/- 2 millitorr or 20 %**
100-2000 millitorr	**+/- 10%**
2-6 Torr	**+/- 25%**
6-760 Torr	**Continuous and monotonic**

Instrument Accuracy with Random Tube

This assumes the replacement Tube is the same type from the same manufacturer, **MID** and **VAC** set to zero, **ATM** rough calibrated to 760 when tube exposed to **ATM**

Range	Accuracy
.001 to .099 Torr	**+/- .015 Torr**
.100 to 2 Torr	**+/- 30% of reading**
2 to 6 Torr	**In range (1, 300 Torr), increasing pressure results in increasing value**
6 Torr to 760 Torr	**+/- 30% of reading**

Section 11: Specifications

Time to resolve	2 seconds to decade, 20 seconds to full accuracy
Input Voltage	4 AA Alkaline or Micro-B USB 
Maintenance Interval	1-10 years depending on use

 1020 Campus Drive, Morganville, NJ 07751 (732) 765-0900

Overall Dimensions, front panel	6.0 in high, 3.5 in wide, 1.25 inches deep
Ambient Operating range	-14°F to 120°F
Battery Life	60 Hours running
Measurement Media	Clean Dry Air or Nitrogen
Certifications, controller display	CE + RoHS with 536 sensor tube

Section 12: Understanding Torr

This instrument and many similar instruments are calibrated in microns or "milliTorr." It is appropriate to discuss what microns are and to relate microns to other measures of pressure and vacuum. Microns are not really a measure of vacuum at all, but rather of absolute pressure.

The pressure of the atmosphere is 14.696 or approximately 14.7 pounds per square inch at sea level. One TORR is an absolute pressure of one millimeter of mercury. A milliTorr is equal to one thousandth of a TORR. A MICRON is the same as a milliTorr.

This pressure is due to the weight of all of the air in the earth's atmosphere above any particular square inch. This 14.696 PSI is equivalent to the pressure produced by a mercury column of approximately 29.92 inches high or .76 meters (~ 3/4 of a yard) or 760 millimeters of mercury.

Atmospheric pressure varies greatly with altitude. It decreases approximately 1 inch of mercury per thousand feet of altitude. It also varies widely with local weather conditions. (Variations of one half inch in a single day are common.) The word "**vacuum**" means pressure lower than atmosphere or "**suction**." However, in describing negative pressure, the atmosphere is only a satisfactory reference if we are dealing with values of vacuum down to about 27 inches of mercury. Below that, it is much more useful to talk in terms of **absolute pressure**, starting from absolute zero. The Bullseye Precision Gauge and all similar instruments do just this.

Section 13: Options

Product	Part Number	Interface	CE/ RoHS	Features/Benefits
Bullseye Precision Gauge with Bluetooth	BPGBT	1/8" NPT	N	Includes Bluetooth display and logging to Apple, Android phone, or tablet via Vacuum Gauge app
Bullseye Precision Gauge(R), 531 Tube	BPG-531	1/8" NPT	N	BPG with upgrade to an all metal 531 sensor
Bullseye Precision	BPGBT-	1/8" NPT	N	BPG with all metal 531 sensor and Bluetooth

 1020 Campus Drive, Morganville, NJ 07751 (732) 765-0900

Gauge(R), with Bluetooth 531 tube	531			display and logging to Apple and Android
Bullseye Precision Gauge(R), 536 tube	BPG-CE	1/8" NPT	Y	BPG with stainless steel 536 sensor with baffle
Bullseye Precision Gauge(R), with Bluetooth 536 tube	BPGBT-CE	1/8" NPT	Y	BPG with stainless steel 536 sensor with baffle, and Bluetooth display and logging to Apple and Android
Bullseye Precision Gauge(R), with Bluetooth 536 tube, KF16	BPGBT-KF16	KF16	Y	BPG with stainless steel KF16 536 sensor with baffle, and Bluetooth display and logging to Apple and Android
Bullseye Precision Gauge(R), with Bluetooth 536 tube, KF25	BPGBT-KF25	KF25	Y	BPG with stainless steel KF25 536 sensor with baffle, and Bluetooth display and logging to Apple and Android
Weatherproof Bullseye	BPGBT-WP	1/8" NPT	Y	Weatherproof BPG with Bluetooth, ruggedized sensor cord, stainless steel sensor & external power supply meant for outdoor installation
Bullseye Precision Gauge(R) HVAC kit	BPG-R	1/4" Flare	N	Bullseye, Refrigeration version
Bullseye Precision Gauge(R) HVAC kit with Bluetooth	BPG-R-BT	1/4" Flare	N	Bullseye, Refrigeration version with Bluetooth display and logging to Apple and Android phone or tablet
Bullseye Hard Case	CAS-HARD-BPG	Hard case with die cut foam for secure storage		
Bullseye Soft Case	CAS-SOFT-BPG	High quality custom protective soft case with shoulder strap		
BE-fitting-kit	BE-fitting-ki			BE-fitting kit for hooking up a Bullseye to many common interfaces, including: 1/8" NPT, KF16, KF25, 1/4" I.D. hose, 3/4" I.D. hose and a modified rubber stopper for testing vacuum pump

 1020 Campus Drive, Morganville, NJ 07751 (732) 765-0900

Section 14: Bluetooth Connectivity

Bluetooth

- Versatile digital vacuum gauge that you can monitor right from your phone or tablet (Apple ios and android)
- Enables remote monitoring and troubleshooting
- Set low and high alarm from your phone
- Email vacuum data to document leaks, baseline pressure or pump-downs

Portable and Precise

- Rugged thermocouple vacuum gauge ideal for understanding: Leaks, Pump Downs, Outgassing or Stable Systems
- Includes a powerful magnet and kickstand to enable hands-free operation
- Long battery life and versatility with 12 different measuring units (micron, Torr, Inches of Hg, kPa, Inches of H20, millitorr, mbar, Pa, PSIA, mm of Hg, bar, and mm of H2O)
- Calibrated under actual vacuum against a NIST standard

Graphing and Analysis

- Patent Pending vacuum graphing displays vacuum and time data
- Visual graphing right on the display that identifies current system status
- Vacuum Analytics to quickly identify vacuum pressure trends
- Graphical display for quick determination of vacuum level

Android: Links via Bluetooth Low Energy to Bullseye Precision Gauge with Bluetooth to view, alarm, log readings and email data for graphing pump down curves. Ideal for vacuum pump test or finding leaks. For the medium vacuum range with typical measurements in the micron or millitorr range.

Apple: Links via Bluetooth Low Energy to Bullseye Precision Gauge with Bluetooth to view, alarm, log readings and email data for graphing pump down curves. **Compatibility**: Requires iOS 7.0 or later. Compatible with iPhone, iPad, and iPod touch.

Section 15: Terms of Use, Limited Warranty, and Liability Waiver

THE DIGIVAC COMPANY ("DIGIVAC") offers all of its products with the following terms and conditions and notices as follows. By accepting and/or using a DIGIVAC product, you hereby acknowledge and agree to the following terms and conditions, and acceptance of these terms and conditions are a condition precedent to any purchase/sale agreement between you and DIGIVAC.

Exclusive Obligation: The DIGIVAC product you are purchasing has been designed for a specific use within a set of suitable operating conditions, as set forth in its User Manual, or as indicated otherwise by DIGIVAC. Any use of the DIGIVAC Product for any purpose or under any conditions, other than those specified, shall render any limited warranty void, and shall expressly invalidate any liability of DIGIVAC for damages as a result of such misuse. **User limitation:** You may not modify, copy, distribute, transmit, display, perform, reproduce, publish, license, create derivative works from, transfer, or sell, any information, software, products or services obtained from or created by DIGIVAC to any third party, without the express written consent of DIGIVAC to do otherwise. Any violation of this provision shall give rise to an indemnification of DIGIVAC by you, for any third party claims arising out of such violation. **THIRTY (30) DAY LIMITED Warranty**: All DIGIVAC products are warranted against any manufactured defect for a period of thirty (30) days from date of purchase, unless such product is a custom-work for you and not a standard DIGIVAC product. Any product qualifying as a custom-work shall not be warranted against any defects for any purpose, and your acceptance of such custom-work shall relieve DIGIVAC of any liability for any purpose. WITH THE EXCEPTION OF THE LIMITED WARRANTY ABOVE, YOU AGREE ANY DIGIVAC PRODUCT IS PROVIDED AS IS, EXCLUSIVE OF ANY WARRANTY, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, NON-INFRINGEMENT, OR ANY OTHER WARRANTY, EXPRESSED OR IMPLIED. **Limitation Of Liability:** You agree and acknowledge, DIGIVAC shall have no liability to you whatsoever for any direct, indirect, punitive, incidental, special consequential damages arising out of or connected with the use or misuse of its products. In particular, given the nature of DIGIVAC products, you agree and acknowledge, under no circumstances whatsoever shall DIGIVAC be liable to you for any consequential damages for damage to any non-DIGIVAC product or service, arising from the failure, use or misuse of a DIGIVAC product, including, but not limited to, any vacuum system, engine, vehicle, factory, or the like. In the event, a court of law with proper jurisdiction finds DIGIVAC liable to you for any purpose, you agree and acknowledge DIGIVAC's maximum liability shall not exceed the purchase price of one unit of product giving rise to such liability, or $250.00, whichever is greater. **Entire Obligation:** These terms and conditions express the entire obligation of DIGIVAC with respect to its products. If any part of these terms and conditions are deemed void, invalid, unenforceable or illegal, including, but not limited to, the warranty disclaimers, liability disclaimers and liability limitations set forth above, then the unenforceable clause or sentence may be disregarded with the remainder of these terms and conditions valid and enforced. In the event the unenforceable clause or sentence leaves a void in these terms and conditions, a provision closely matching the intent of the unenforceable provision should be deemed inherent within these terms and conditions, slightly modified to render such provision valid and enforceable. General: These terms and conditions are governed by the laws of the State of New Jersey, USA. You hereby consent to the exclusive jurisdiction and venue of

the Courts of New Jersey, in all disputes arising out of or relating to the use of this product. Use of this product is unauthorized in any jurisdiction that does not give effect to all provisions of these terms and conditions.
Modification of Terms and Conditions: DIGIVAC reserves the right to change the terms, conditions, and notices under which their products are offered.

 1020 Campus Drive, Morganville, NJ 07751 (732) 765-0900