



# TELEDYNE HASTINGS INSTRUMENTS

Everywhereyoulook™

## HVG-2020B Vacuum Gauge

### FEATURES

- Two Sensors in One Small Package
- Ranges 0.1 mTorr to 1000 Torr
- Excellent Accuracy<sup>1</sup>
  - 20 Torr - 1000 Torr:  $\pm(0.1\% \text{ of Reading} + 0.3 \text{ Torr})$
  - 1 mTorr - 20 Torr:  $\pm(5\% \text{ of Reading} + 0.25 \text{ mTorr})$
  - 0.2 mTorr - 1 mTorr:  $\pm(10\% \text{ of Reading} + 0.25 \text{ mTorr})$
- Touchscreen Display/Control Option
- Optional Remote Display and Power Supply
- 0-1 VDC, 0-5 VDC, 0-10 VDC Log & Linear
- 0-20 mA, 4-20 mA Log & Linear
- RS232 / RS485 & USB Connection
- Status and Vacuum LEDs
- Multiple Views
  - \* Pressure vs. Time Plot
  - \* Bar Graph
  - \* Set Point Status
- NIST Traceable Calibration
  - \* Certificate/Data Sheet Option

### APPLICATIONS

- Rough Vacuum Monitoring
- Vacuum Metallurgy
- Semiconductor
- Thin Film Coating
- Refrigeration & Air Conditioning
- Freeze Drying
- Oil Reprocessing

### BENEFITS

- High Accuracy
- Stable Performance
- Low Cost
- Flexible I/O
- Numerous System Connections
- Easy to Use

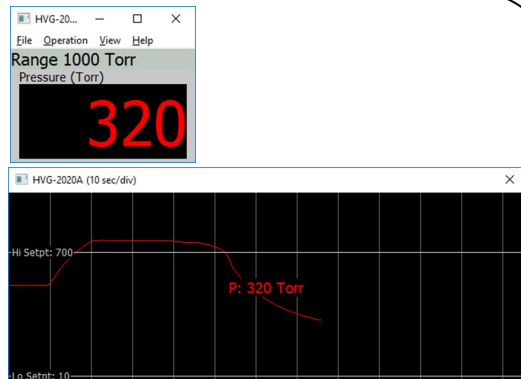
# Piezo-Pirani Vacuum Gauge



HVG - 2020B Vacuum Gauge with optional touchscreen display



Options for Local and/or Remote Display



Data Logging Software



# Description

## Dual Sensor

The HVG-2020B vacuum gauge from Teledyne Hastings Instruments features two sensors, a piezo-based transducer and a thermal-based Pirani sensor, in a single, small package. The piezo is used at higher pressures, above 20 Torr, to accurately measure pressures. This sensor is media-isolated and is also gas composition independent.

The Pirani sensor is a precision welded hot-wire thermal sensor that measures pressures below 1 Torr. An ambient thermal sensor enables the instrument to make adjustments for temperature which in turn enables better accuracy throughout the pressure range of the instrument (0.1 mTorr to 1000 Torr). Between 1 and 20 Torr, a weighted average between the two sensors is used to determine the pressure.

The HVG-2020B also features cross-calibration. In short, the low pressure Pirani is able to periodically zero the piezo sensor which gives the user superior accuracy performance.

## Display Modes

The HVG-2020B is easy to install, and the optional display provides the user with several different views, or modes of operation. The "Pressure versus Time" mode allows the user to monitor the pump-down (or vent) of their vacuum system. In this mode, it can be possible to identify problems early and save time. Rate-of-rise can be viewed and may help to identify the presence of a chamber leak.

For users who want another method to see system pressure changes, we provide the "Bar Graph" Mode. As the pressure changes, the user can view both the numeric value of the pressure in the system as well as the rate of change by viewing the position of the bar.

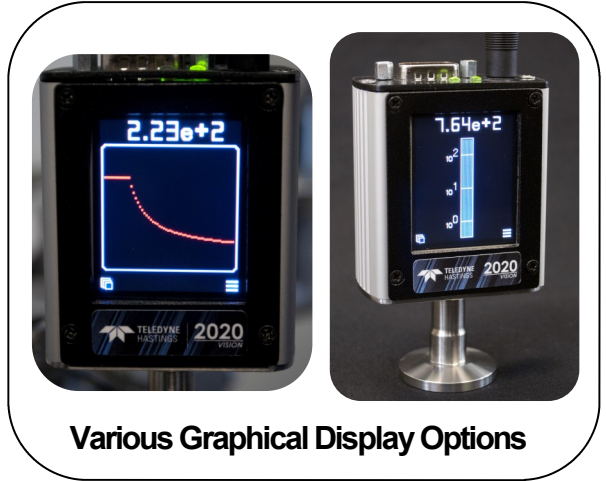
## Flexible

The HVG-2020B is very flexible and can provide both analog and digital output to easily integrate into process control. A wide variety of analog output signals may be selected (0-1 VDC, 0-5 VDC, 0-10 VDC, 0-20 mA, and 4-20 mA). This makes the HVG-2020B an excellent choice to replace more expensive capacitance manometers.

Digital output can include RS232 and RS485 via a small jack on the top of the instrument. A USB connection is also available which makes connection and operation very easy. Free data acquisition software for data logging is available for the HVG-2020B.

## Remote Display

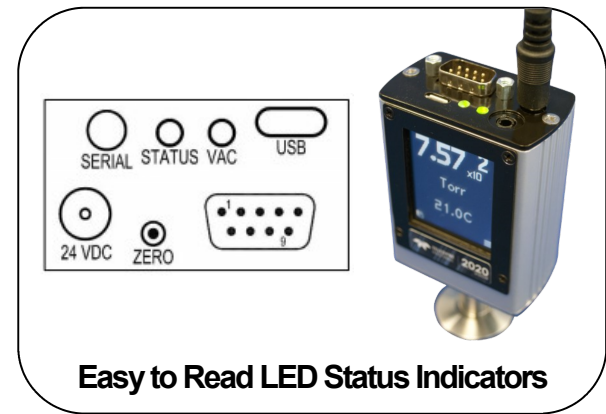
The THCD-101 and all of its advanced features, including its internal webserver, is now available for the HVG-2020B! The vacuum gauge will have the standard option for logarithmic output of 1V / Decade (2 - 9 VDC). The THCD-101-LOG powers the HVG-2020B and then receives the output signal proportional to the range of the HVG-2020B. Then the output is converted to a pressure reading on the screen in Scientific Notation with Torr units. It also has two built in relays that can be used to control the upper and lower limits of the vacuum level. The remote display is able to be panel mounted or placed on a benchtop while the HVG-2020B may be installed anywhere, including difficult to reach locations.



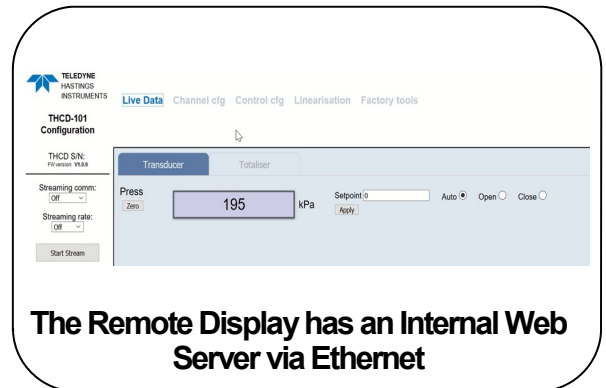
Various Graphical Display Options



USB - Easy to Connect



Easy to Read LED Status Indicators



The Remote Display has an Internal Web Server via Ethernet

Specifications



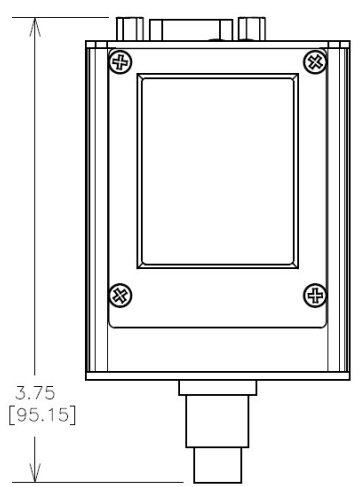
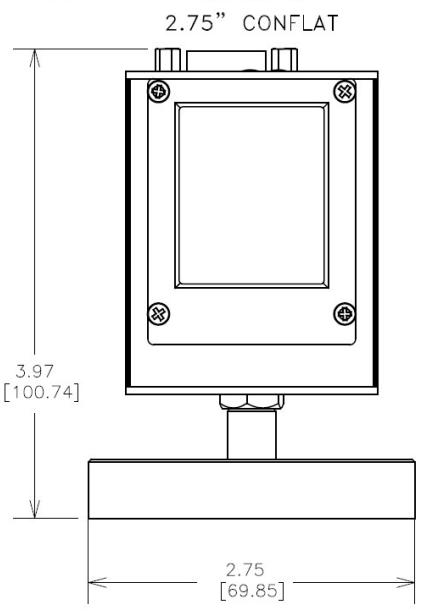
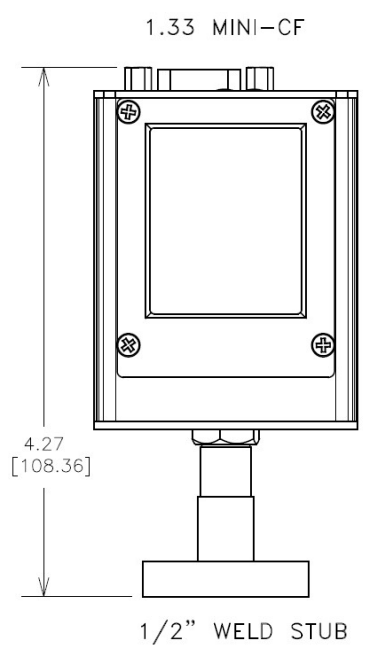
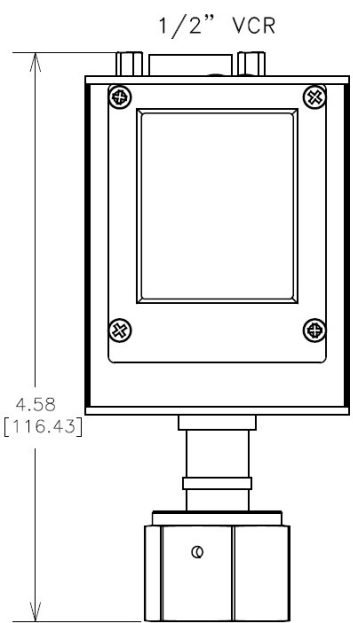
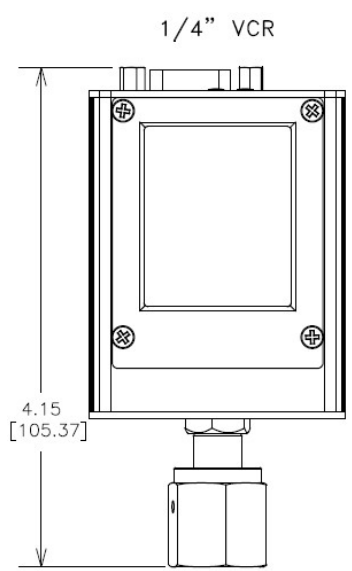
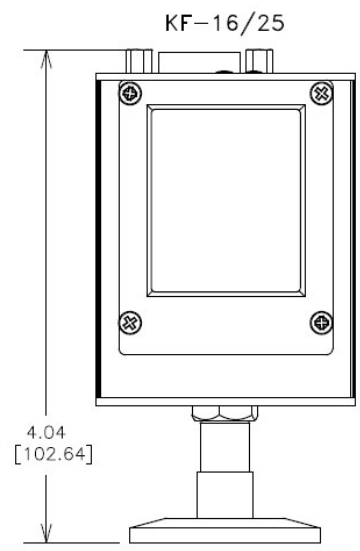
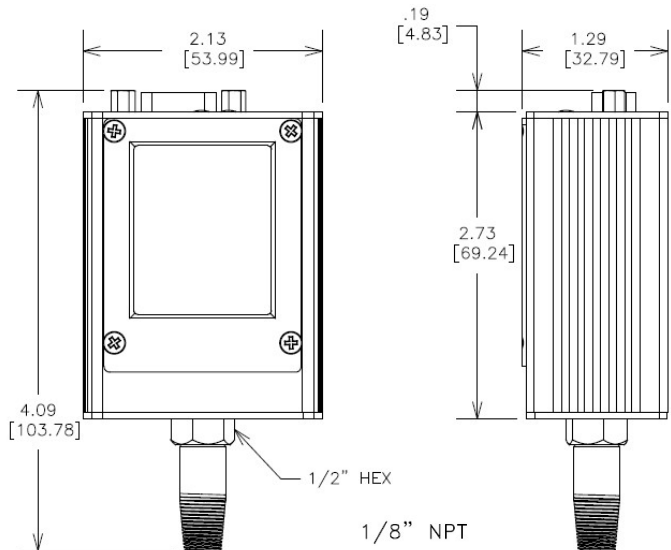
Specifications

HVG-2020B

Range	0.1 mTorr to 1000 Torr
Accuracy <sup>1</sup>	20 Torr - 1000 Torr: ±(0.1% of Reading + 0.3 Torr) 1 mTorr - 20 Torr: ±(5% of Reading + 0.25 mTorr) 0.2 mTorr - 1 mTorr: ±(10% of Reading + 0.25 mTorr)
Maximum Overpressure	2000 Torr
Proof Pressure	25 psig <sup>2</sup>
Burst Pressure	45 psig
Operating Temperature	-20 - 70°C
Warm up time <sup>3</sup>	30 min (typical)
Warm up time <sup>4</sup>	2 hr (typical)
Analog Output (voltage)	0-1 VDC, 0-5 VDC, 0-10 VDC Log & Lin.
Analog Output (current)	0-20 mA, 4-20 mA Log & Linear
Wetted Materials	304 and 316L SS, glass, Ni, Au
Analog Connector	9 Pin D-sub
Digital Connector	Bayonet, 4 - conductor TRRS 3.5 mm
Input Voltage	12 - 36 VDC
Process Control Setpoints	Dual TTL (High & Low)
Power (With Display)	2.0 W (Max) @ 36VDC < 1.5 W (Typ) @ 24 VDC
Power (No Display)	1.8 W (Max) @ 36VDC < 1.3 W (Typ) @ 24 VDC
CE Mark	EN55011; EN61326; EN61010
RoHS Compliant	YES
Note 1:	Includes non-linearity, hysteresis, repeatability at ambient operating temperature after 2 hours warm up followed by zero adjustment.
Note 2:	The max pressure that can be applied without changing performance.
Note 3:	Warm-up time to within rated accuracy at atmosphere
Note 4:	Warm-up time for zero adjustment



Outline Drawings HVG-2020B Series



# Selection Chart - HVG-2020B Series

<b>Model Number</b>	<b>Analog Output</b>	<b>System Connection</b>	<b>Units</b>	<b>Digital Comm</b>	<b>Display</b>
HVG-2020B					

Analog Output (Linear)	
01	0 - 1 VDC
02	0 - 5 VDC
03	0 - 10 VDC
04	4 - 20 mA
05	0 - 20 mA
Analog Output (Log)	
06	1 V/decade (1-8 VDC)
07	1 V/decade (1.6249 -8.6249 VDC)
08	1 V/decade (2-9 VDC) DEFAULT
09	1.286 V/decade (1.16 - 10.162 VDC)
10	2.0 mA/decade (4-20 mA)
11	2.5 mA/decade (0 - 20 mA)

System Connection	
01	1/8" NPT
02	1/4" VCR <sup>®</sup>
03	1.33" Mini-CF
04	2.75" CF
05	KF-16
06	KF-25
07	1/2" Weld Stub
08	1/2" VCR <sup>®</sup>

Units	
01	Torr
02	mbar
03	kPa
04	psia
05	Bar
06	Pa
07	Atm

Digital Communication	
02	RS232 & USB
03	RS485 & USB

Display	
01	Display
02	No Display

Calibration Option	
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V-OPT-NIST

NIST Traceable Certificate with Data

# Power Supplies & Cables



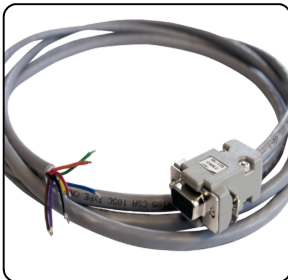
<b>External Power Supply and Remote Display</b>	
<b>THCD - 101 - LOG</b>	Capable of powering the HVG-2020B and displaying its logarithmic output <b>(24 VDC Power supply needed)</b>



<b>24 VDC Switching Power Supply</b>	
<b>12 - 01 - 169</b>	For use with HVG-2020, THCD-101, or 300 Vue <b>(Please specify AC Input Clip)</b>



<b>AC Input Clips</b>	
<b>12 - 01 - 160</b>	United States
<b>12 - 01 - 165</b>	United Kingdom
<b>12 - 01 - 164</b>	Europe



<b>HVG-2020 Cables (9-pin)</b>	
<b>CB - AF - XXX - HVG9M</b>	9-pin connection to bare-leads <b>Custom Length Cable</b>
<b>CB - AF - 8 - HVG9M</b>	8' Cable (~2.4m) 9-pin connection to THCD-101 <b>Other lengths available upon request</b>



<b>Serial Communication Cables</b>	
<b>CB - RS232 - TRRS</b>	RS232 Cable (9-pin "D" Female to Male TRRS) 6' Cable (~1.8 m)