



BVT125

# VersaTorr Series

## BVT125 Load-Lock Vacuum Gauge

Ultra-wide range vacuum measurement from 1000 Torr to  $7.5 \times 10^{-7}$  with atmospheric switch

VersaTorr extends the performance of MEMS-based vacuum gauge measurement by combining advances in Micro-Pirani/Piezo sensor design with active temperature compensation and advanced digital signal processing to greatly enhance the accuracy and working range by up to 3 decades.

Optimized for load-lock control applications, the BVT125 provides 9 decades of vacuum measurement with precise gas independent measurement from 1.5 to 1000 Torr.

### Features & Benefits

- Ultra-wide vacuum measurement from atmosphere to  $7.5 \times 10^{-7}$  minimizes the need for multiple vacuum gauges and separate atmospheric switch for system simplification, space and cost savings.
- Accurate sensing relative to atmospheric pressure and extended absolute vacuum measurement to prevent system contamination from air/moisture.
- <20 ms, highly repeatable response enables load-lock cycle time optimization.
- Up to three independent, programmable solid-state relays to control system venting, vacuum transfer valve and load-lock door.
- User configurable analog output scaling to emulate competitive vacuum gauges for maximum flexibility and inventory reduction.
- Digital serial interface for diagnostics, predictive maintenance, data acquisition and gauge programming
- Drop-in upgrade for first generation competitive MEMS vacuum gauges

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Performance	
Measurement Range	7.5 × 10 <sup>-7</sup> to 1000 Torr
Sensor Measurement Ranges	7.5 × 10 <sup>-7</sup> to 1.125 Torr 1.125 to 1.5 Torr 1.5 to 1000 Torr
MEMS Pirani thermal conductivity	
Blended MEMS Pirani/Piezo	
MEMS Piezo resistive diaphragm	
Accuracy	±25% of reading ±5% of reading ±1% of reading ±0.5% of reading ±0.25% of reading ±0.5% of reading
7.5 × 10 <sup>-6</sup> to 7.49 × 10 <sup>-5</sup>	
7.5 × 10 <sup>-5</sup> to 7.49 Torr	
7.5 to 74.9 Torr	
75 to 599 Torr	
600 to 824 Torr	
825 to 1000 Torr	
Hysteresis	1% 0.1%
7.5 <sup>-4</sup> to 7.5 Torr	
7.5 to 900 Torr	
Barometric Sensor	-225 to 900 Torr ±0.375 Torr
Measurement Range	
Accuracy	
Atmospheric Referenced Pressure Output Range	-1000 to 1000 Torr
Vacuum Temperature Sensor	-20 to +85°C ±1.5°C
Range	
Accuracy	
Response Time	<20 ms
Temperature Compensation	10 to +50°C
Mechanical	
Materials Exposed to Vacuum	304 stainless steel, Kovar, glass, silicon, nickel, aluminum, SiO <sub>2</sub> , Si <sub>3</sub> N <sub>4</sub> , Gold, Viton, low out-gassing epoxy resin, solder, RO4305
Flange/Fitting	SS 1.4307/AISI 304L
Electrical	
Analog Output Signal (absolute pressure)	0.5 -9.5 Vdc (1V per decade) standard, other selectable/user programmable options <sup>1</sup>
Analog Output Resolution	16 bit (150 μV)
Analog Output Update Rate	124 Hz
Digital Communication	RS232 / RS485
Electrical Connector	15-pin HD D-sub
Solid State Relays	
Number of Relays	Up to 3
Set Point Range (absolute)	3.75×10 <sup>-6</sup> to 1000 Torr
Set Point Range (atm. relative)	-770 to +375 Torr
Contact Rating	50 V, 100 mArms / mADC
Approvals	UL Recognized: File E76270 CSA Certified: Certificate 1175739 EN/IEC 60950-1 Certified

<sup>1</sup>The analog output voltage scaling can be ordered preconfigured or user configured via the RS232 / RS485 or VersaTorr User Software

## ENVIRONMENTAL

Ambient Operating Temperature	-20 to +50°C
Bake-out Temperature (non-operating)	120°C
Humidity	98%, non-condensing
Over Pressure Limit	145 psia
Protection Rating, EN 60529 / A2:2013	IP40
Mounting Orientation	Any

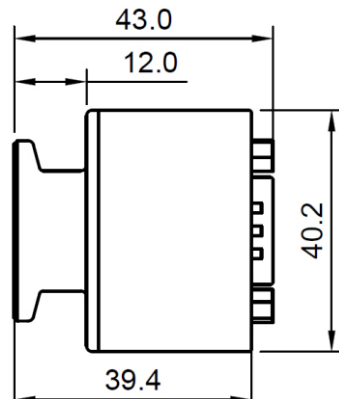
## CERTIFICATIONS

CE	EMC directive 2014/30/EU
RoHS	Directive EU 2015/863

## POWER SUPPLY

Supply Voltage	12-30 VDC
Power Consumption	350 mW (max)
Reverse Polarity Protection	Yes
Overvoltage Protection	Yes
Internal Fuse	100 mA (thermal recoverable)

### Dimensions (DN16KF flange with 15-pin HD D-sub)

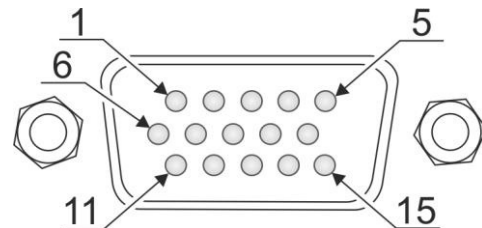


All dimensions in mm.

### Connector Pin Outs

#### 15 Pin HD D-sub RS-232/RS-485

Pin	Description
1	RS-232 Transmit / RS-485 (-)
2	RS-232 Receive / RS-485 (+)
3	Supply voltage 12-30 VDC
4	Supply voltage - (return)
5	Analog voltage signal +
6	Analog voltage signal - (return)
7	Relay 1 NO (normally open contact) <sup>(1)</sup>
8	Relay 1 Common <sup>(1)</sup>
9	Relay 1 NC (normally closed contact) <sup>(1)</sup>
10	Relay 2 NC (normally closed contact) <sup>(1)</sup>
11	Relay 2 Common <sup>(1)</sup>
12	Relay 2 NO (normally open contact) <sup>(1)</sup>
13	Relay 3 NC (normally closed contact) <sup>(1)</sup>
14	Relay 3 Common <sup>(1)</sup>
15	Relay 3 NO (normally open contact) <sup>(1)</sup>



(1) Optional relay

Code Description	Code Option	Option Description
I. Base Model	BVT125	VersaTorr MEMS Load-Lock Vacuum Gauge
II. Units	1	Torr
	2	mbar
	3	Pascal
III. Programable Relays	0	None
	1	1x Solid State Relay
	2	2x Solid State Relay
	3	3x Solid State Relay
IV. Vacuum Flange	1	DN16KF
	2	DN25KF
	3	NPT 1/8"
	4	VCR4F
	5	DN16KF Extended
	6	DN16KF with light baffle
	7	DN16KF with heavy duty baffle
V. Electrical Connector	2	15 pin HD D-sub male (up to 3 relays)
	3	15 pin HD D-Sub male / dual analog out (up to 3 relays)
VI Digital Interface	1	RS-232 / Brooks Vacuum Transducer Communicator
	2	RS-485 / Brooks Vacuum Transducer Communicator
VII. Analog Output	A	0.5 - 9.5 (1 V/dec)
	B	1.0-9 VDC 1 VDC/Dec (MKS 901P/925/910 emulation)
	C	0.375 to 5.659 VDC (MKS GP275 emulation)
	D	1.0-9 VDC (MKS 523 emulation)
	E	1.9-10 VDC (Inficon PSG55x, Leybold TTR91 emulation)
	F	1.5-8.5 VDC (Pfeiffer TPR260/27x/28x emulation)
	G	1.9-9.1 VDC (Edwards APG100XLC emulation)
	H	1.9-9.1 VDC (Edwards APG100XM emulation)
	J	0-10 VDC 0.1Torr FS (Capacitance manometer emulation)
	K	0-10 VDC 1 Torr FS (Capacitance manometer emulation)
	L	0-10 VDC 10 Torr FS (Capacitance manometer emulation)
	M	0-10 VDC 100 Torr (Capacitance manometer emulation)
	N	0-10 VDC 1000 Torr (Capacitance manometer emulation)
	VIII. Customer Special Request	XXXX

Part number	Description
BVT-XXX-(model number)	Accredited calibration certificate from DAkkS lab
<b>RS232 / RS485 USB-to-Serial converter for BVT125 transducers</b>	
BVT-RS2-15DS-01	RS232 communicator USB, 15p HD D-sub connector
BVT-RS4-15DS-01	RS485 communicator USB, 15p HD D-sub connector
<b>Cables</b>	
BVT-F15DSM15DS-003	15 p HD D-sub female to 15 p D-sub male with 3 m cable
BVT-F15DSM15DS-005	15 p HD D-sub female to 15 p D-sub male with 5 m cable
BVT-F15DSM15DS-010	15 p HD D-sub female to 15 p D-sub male with 10 m cable

## Service and Support

Brooks is committed to assuring all of our customers receive the ideal measurement solution for their application, along with outstanding service and support to back it up. We operate first class repair facilities located around the world to provide rapid response and support. Each location utilizes primary standard calibration equipment to ensure accuracy and reliability for repairs and recalibration and is certified by our local Weights and Measures Authorities and traceable to the relevant International Standards.

Visit [www.BrooksInstrument.com](http://www.BrooksInstrument.com) to locate the service location nearest to you.

### START-UP SERVICE AND IN-SITU CALIBRATION

Brooks Instrument can provide start-up service prior to operation when required. For some process applications, where ISO-9001 Quality Certification is important, it is mandatory to verify and/or (re)calibrate the products periodically. In many cases this service can be provided under in-situ conditions, and the results will be traceable to the relevant international quality standards.

### SEMINARS AND TRAINING

Brooks Instrument can provide seminars and dedicated training to engineers, end users, and maintenance persons. Please contact your nearest sales representative for more details. Due to Brooks Instrument’s commitment to continuous improvement of our products, all specifications are subject to change without notice.

#### TRADEMARKS

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### Global Headquarters

**Brooks Instrument**  
 407 West Vine Street  
 Hatfield, PA  
 19440-0903 USA

Toll-Free (USA): 888-554-FLOW  
 T: 215-362-3500

[BrooksAM@BrooksInstrument.com](mailto:BrooksAM@BrooksInstrument.com)

A list of all Brooks Instrument locations and contact details can be found at [www.BrooksInstrument.com](http://www.BrooksInstrument.com)

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