BROOKS® INSTRUMENT

Beyond Measure

VersaTorr Series

BVT200/225 Wide Range High-Accuracy Vacuum Gauge

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

The VersaTorr BVT200/225 Series gauge establishes new standards with an all-in-one wide range measurement solution for a wide selection of vacuum applications. It differentiates from any other vacuum gauges by offering an overall cost-effective gas independent measurement from 3.75E-3 to 1000 Torr in combination with measurement down to 7.5E-7 Torr by use of the heat-loss principle.

In vacuum applications where the gas composition or type can change, traditional gas dependent Pirani gauges will result in measurement deviation from the actual pressure. To address this, BVT200 Series pairs a precision capacitance diaphragm gauge (CDG) and Piezo sensor to eliminate gas dependency, providing optimum process accuracy for mixed gas chemistries.

The integrated heat-loss MEMS Pirani sensor extends the measuring range down to 7.5E-7 Torr and provides a novel automatic zero adjustment of the capacitance manometer that eliminates the common needs for manual zero adjustment of traditional capacitance diaphragm gauges.

Features	Benefits
6 decades of gas independent measurement from 3.75E-3 to 1000 Torr	Ultra-wide measuring range of 9 decades
0-10 VDC programmable voltage output	Automatic zeroing of capacitance manometer
Digital RS-232 or RS-485 interface	Vacuum temperature sensor for diagnostics
RGB LED color pressure indicator	

Product Specifications

	BVT200	BVT225
Specifications		
Measuring range	7.5E-7 to 1000 Torr	
Measuring principle 7.5E-7 to 7.5E-4 mbar	MEMS Pirani thermal conductivity	
Measuring principle 7.5E-4 to 3.75E-3 mbar	Blended MEMS Pirani / piezo reading(1)	
Measuring principle 3.75E-3 to 3 mbar	Capacitance diaphragm gauge (CDG)	
Measuring principle 3 to 4.5 mbar	Blended MEMS Piezo / CDG (1)	
Measuring principle 4.5 to 1000 mbar	MEMS piezo resistive diaphragm	
Accuracy 7.5E-6 to 7.5E-5 mbar	25% of reading	
Accuracy 7.5E-5 to 7.5E-3 mbar	5% of reading	
Accuracy 7.5E-3 to 599 mbar	0.5% of reading	
Accuracy 600 to 824.9 mbar	0.25% of reading	
Accuracy 825 to 1000 mbar	0.5% reading	
Barometric measurement range	225 to 900 Torr	
Barometric accuracy	---	±0.38 Torr
Atmospheric referenced pressure output range	---	-1000 to +1000 mbar
Vacuum temperature sensor range	-20 to + 85°C	
Vacuum temperature sensor accuracy	+/- 1.5 °C	
Gauge temperature sensor range	---	-20 to + 85°C
Gauge temperature sensor accuracy	---	±1.5 °C
Analog output resolution	16 bit (150 µV)	
Analog output update rate	124 Hz	
Response time	<20 ms	
Temperature compensation	+10 to +50 °C	
Solid state relay set point range (absolute)	3.75E-6 to 1000 Torr	
Solid state relay set point range (atm. relative)	-770 to +375 Torr	
Solid state relay contact rating	50 V, 100 mArms / mADC	
Solid state relay contact endurance	Unlimited (no mechanical wear)	
Solid state relay approvals	UL Recognized: File E76270 CSA Certified: Certificate 1175739 EN/IEC 60950-1 Certified	

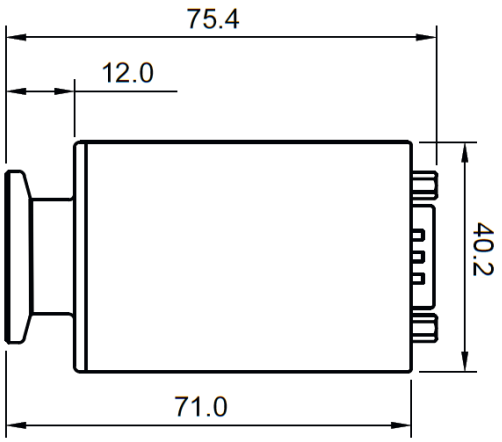
Product Specifications

	BVT200	BVT225
Environment Conditions		
Operating ambient temperature	-20 to +50 °C	
Media temperature	-20 to +50 °C	
Storage ambient temperature	-20 to +50 °C	
Bake-out temperature (non-operating)	+80 °C	
Maximum media pressure	58 psia	
Mounting position	Arbitrary	
Protection rating, EN 60529/A2:2013	IP40	
Humidity, IEC 68-2-38	98%, non-condensing	
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)	
Materials		
Enclosure	SS 1.4307 / AISI 304L / Aluminum 6061	
Vacuum Process flange (media wetted)	SS 1.4307 / AISI 304L	
Vacuum exposed materials (media wetted)	304 Stainless steel, Kovar, glass, silicon, nickel, aluminum, SiO_2, Si_3N_4, Al_2O_3, gold, Viton®, low out-gassing epoxy resin, solder, RO4305	
Process leak tightness (ISO 27895:2009)	< 7.5E-10 Torr l/s	
Approvals		
CE	EMC directive 2014/30/EU	
RoHS compliance	Directive EU 2015/863	

(1) Blending range can be changed and application adapted via the digital interface.

Product Dimensions

VersaTorr Series - Dimensions (DN16KF flange)



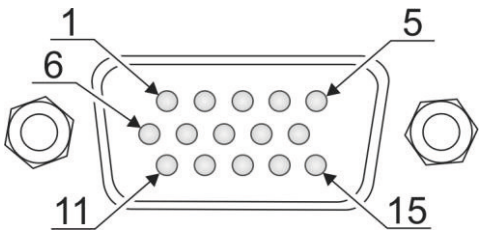
All dimensions in mm.

VersaTorr Series - 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) (1)
8	Relay 1 Common (1)
9	Relay 1 NC (normally closed contact) (1)
10	Relay 2 NC (normally closed contact) (1)
11	Relay 2 Common (1)
12	Relay 2 NO (normally open contact) (1)
13	Relay 3 NC (normally closed contact) (1)
14	Relay 3 Common (1)
15	Relay 3 NO (normally open contact) (1)

(1) Optional relay

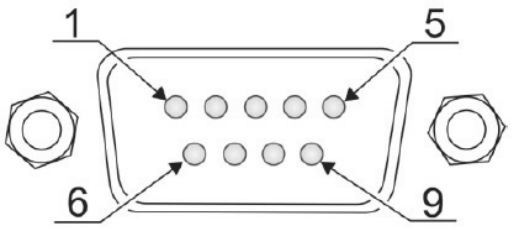


Product Dimensions

9 Pin D-sub RS-232 / RS-485

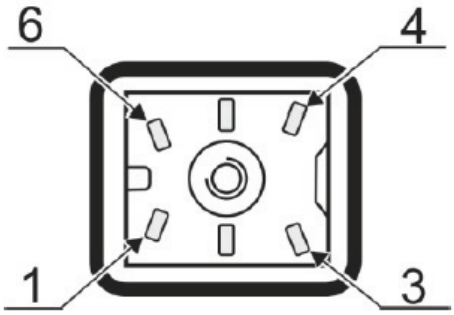
Pin	Description
1	Relay 1 NO (normally open contact) (1)
2	Relay 1 NC (normally closed contact) (1)
3	Supply voltage 12-30 VDC
4	Supply voltage – (return)
5	Analog voltage signal +
6	Relay 1 Common (1)
7	RS-232 Transmit / RS-485 (-)
8	Analog voltage signal – (return)
9	RS-232 Receive / RS-485 (+)

(1) Optional relay



6 Pin Hirschmann connector

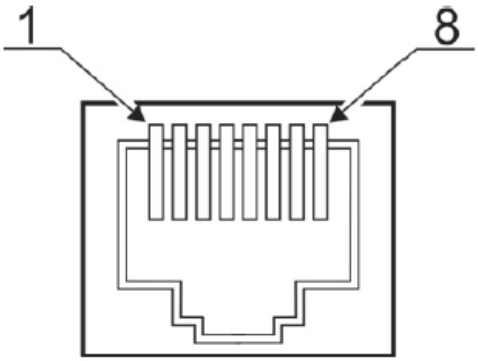
Pin	Description
1	Identification resistor (3K)
2	Analog voltage signal +
3	Analog voltage signal – (return)
4	Supply voltage 12-30 VDC
5	Supply voltage – (return)
6	Chassis



8 Pin RJ45 / 8P8C

Pin	Description
1	Supply voltage 12-30 VDC
2	Supply voltage – (return)
3	Analog pressure voltage signal +
4	Analog pressure voltage signal – (return)
5	Supply voltage – (return)
6	Relay 2 NO (normally open contact) (1)
7	Relay 1 NO (normally open contact) (1)
8	Relay COMMON

(1) Optional relay



Model Code

Code Description	Code Option	Option Description		
I. Base Model Code	BVT200	VersaTorr Tri-sensor Gauge		
	BVT225	VersaTorr Tri-sensor Gauge w/ Barometer		
II. Units	1	Torr		
	2	mbar		
	3	Pascal		
III. Setpoints	0	None		
	1	1x Solid State Relay		
	2	2x Solid State Relay		
	3	3x Solid State Relay		
IV. Vacuum Flange			BT200	BVT225
	1	DN16KF	X	X
	2	DN25KF	X	X
	3	NPT 1/8"	X	X
	4	VCR4	X	X
	5	DN16KF Extended	X	X
	6	DN16KF with Light Baffle	X	X
	7	DN16KF with Heavy Duty Baffle	X	X
	8	DN25KF with Light Baffle	X	X
	9	DN25KF with Heavy Duty Baffle	X	X
	A	VCR8F	X	X
V. Electrical Connector			BVT200	BVT225
	1	9 Pin D-sub male	X	X
	2	15 pin HD D-sub male	X	X
	3	15 pin HD D-Sub male / dual analog out	X	X
	4	6 pin Hirschmann, ID res 3K	X	
	5	6 pin Hirschmann, ID res 5.1K	X	
	6	6 pin Hirschmann, ID res 9.1K/11.1K	X	
	7	8 pin RJ45 / FCC68, ID Res 27K	X	
	8	8 pin RJ45 / FCC68, ID Res 36K	X	
	9	8 pin RJ45 / FCC68, ID Res 43K	X	
VI. Digital Interface			BVT200	BVT225
	1	RS-232 / BVT Communicator (9 or 15 Pin D only)	X	X
	2	RS-485 / BVT Communicator (9 or 15 Pin D only)	X	X
	3	BVT Communicator (Hirschmann or FCC68 only)	X	

Code Description	Code Option	Option Description
VII. Analog Output	A	0.5 - 9.5 (1 V/dec)
	B	1.0-9 VDC 1 VDC/Dec (MKS 901P/925/910)
	C	0.375 to 5.659 VDC (MKS GP275)
	D	1.0-9 VDC (MKS 523)
	E	1.9-10 VDC (Inficon PSG55x, Leybold TTR91)
	F	1.5-8.5 VDC (Pfeiffer TPR260/27x/28x)
	G	1.9-9.1 VDC (Edwards APG100XLC)
	H	1.9-9.1 VDC (Edwards APG100XM)
	J	0-10 VDC 0.1Torr FS (Capacitance manometer)
	K	0-10 VDC 1 Torr FS (Capacitance manometer)
	L	0-10 VDC 10 Torr FS (Capacitance manometer)
	M	0-10 VDC 100 Torr (Capacitance manometer)
	N	0-10 VDC 1000 Torr (Capacitance manometer)

VIII. Customer Special Request	XXXX	Customer Special Request (Optional)

Note: If a CSR affects any product description held within the PDC, the affected description character within that field will be replaced with an 'X' to denote the area of customization. If none of the product description character fields are affected by the CSR, no 'X' shall be denoted in the string, and the CSR number alone will define the special requirements.

Accessories

Part Number	Description	BVT200	BVT225
BVT-XXX-(model number)	Accredited calibration certificate from DAkkS lab	X	X
Brooks Vacuum Gauge USB programmer			
BVT-S4-15DS-01	Brooks Vacuum Gauge Communicator programmer USB, 15p HD D-sub connector	X	X
BVT-S4-9DS-01	Brooks Vacuum Gauge Communicator programmer USB, 9p D-sub connector	X	X
BVT-S4-RJ45-01	Brooks Vacuum Gauge Communicator programmer USB, 8p FCC68/RJ45	X	
BVT-S4-HM-01	Brooks Vacuum Gauge Communicator programmer USB, 6p Hirschmann	X	
RS232 / RS485 USB-to-Serial converter			
BVT-RS2-15DS-01	RS232 communicator USB, 15p HD D-sub connector	X	X
BVT-RS2-9DS-01	RS232 communicator USB, 9p D-sub connector	X	X
RS232 / RS485 Programmer with Wall Plug Power Supply			
BVT-WPRS2-9DS-01	RS-232 to USB, 9 pin HD D-sub, Power supply (90-230VAC)	X	X
BVT-WPRS4-9DS-01	RS-485 to USB, 9 pin HD D-sub, Power supply (90-230VAC)	X	X
BVT-WPRS2-15DS-01	RS-232 to USB, 15 pin HD D-sub, Power supply (90-230VAC)	X	X
BVT-WPRS4-15DS-01	RS-485 to USB, 15 pin HD D-sub, Power supply (90-230VAC)	X	X
Cables			
BVT-F15DSM15DS-003	15 p HD D-sub female to 15 p D-sub male with 3 m cable	X	X
BVT-F15DSM15DS-005	15 p HD D-sub female to 15 p D-sub male with 5 m cable	X	X
BVT-F15DSM15DS-010	15 p HD D-sub female to 15 p D-sub male with 10 m cable	X	X
BVT-F9DSM15DS-003	9 p D-sub female to 15 p D-sub male with 3 m cable	X	X
BVT-F9DSM15DS-005	9 p D-sub female to 15 p D-sub male with 5 m cable	X	X
BVT-F9DSM15DS-010	9 p D-sub female to 15 p D-sub male with 10 m cable	X	X

Service and Support

Brooks is committed to assuring all of our customers receive the ideal flow 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 andreliability 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 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.

CUSTOMER SEMINARS AND TRAINING

Brooks Instrument can provide customer 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.

PATENTS
Advanced Digital Architecture: 6,910,381; 7,010,983; 7,490,518
Digital Temperature Control: 6,701,790; 7,729,628
Improved Sensitivity to Temperature and Humidity: 6,734,659
Mark IV Sensor: 4,823,603

Data-Sheet-BVT200-225-EN/2024-03

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

A list of all Brooks Instrument locations and contact details can be found at www.BrooksInstrument.com

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