



**InstruTech®**

**Series 501 Hornet™ Cold Cathode Miniature-Ionization Vacuum Gauge**

**Wide measurement range**  
1 x 10<sup>-9</sup> to 1 x 10<sup>-2</sup> Torr  
1.3 x 10<sup>-9</sup> to 1.3 x 10<sup>-2</sup> mbar  
1.3 x 10<sup>-7</sup> to 1.3 Pa

**Double-Inverted Magnetron improves sensor sensitivity and performance**

**Built-in digital display, set-point relay, log-linear analog output and RS485 serial communication, are all standard features of the Hornet™**

**Double-Inverted Magnetron Cold Cathode sensor, rugged and compact metal construction**

**Improved sensor signal to noise ratio provides stable and optimal performance throughout the measurement range**

**Bright digital OLED graphical display provides for a wide viewing angle**



**CCM501 sensor**

The CCM501 Hornet™ Cold Cathode ionization gauge sensor assembly is constructed of a compact metal design resulting in a simple yet rugged sensor suitable for numerous industrial applications.

The Double-Inverted magnetron design places two opposing magnetic fields over the anode (sensor) to enhance the generations of ions. This nearly doubles the electron currents, maximizing the generation of ions and improving sensitivity and signal-to-noise ratio.

The sensor assembly can be easily disassembled and cleaned allowing long term use with minimal down time.

**CCM501 Built-in Controller & Display**

The CCM501 Hornet ionization vacuum gauge module provides the basic signal conditioning required to turn the sensor into a complete vacuum pressure measurement instrument.

The built-in controller is offered with a standard bright OLED display providing full programmability and a convenient user interface for setup and operation of the vacuum gauge.

The standard CCM501 model also provides one analog output with two different scaling selections, one setpoint relay and RS485 serial communications. This provides great flexibility for various process control schemes.

**Lower cost without sacrificing quality or functionality**

InstruTech has made numerous design enhancements to reduce cost and improve performance. The electrometer auto zeroes to ensure that the readings are not subject to temperature drift. This eliminates the need for unnecessary and expensive circuitry which further reduces the cost.

Service screens allow monitoring of sensor operation. Error messages will be displayed for all fault conditions.

Setpoint relay can be manually toggled to test for correct external circuit wiring.

Anode voltage and ion current can be monitored in real time on the research screen. Sensitivity may be adjusted by the user.

The display enables the user to select from 16 commonly used gases eliminating the need to apply correction factors to the displayed pressure readings.

The combination of superior sensor design and enhanced signal processing provides optimal and stable pressure readings over the entire measurement range from low to high vacuum.

## Specifications

measurement range	$1 \times 10^{-9}$ to $1 \times 10^{-2}$ Torr / $1.3 \times 10^{-9}$ to $1.3 \times 10^{-2}$ mbar / $1.3 \times 10^{-7}$ to 1.3 Pa
accuracy - N <sub>2</sub> (typical)	$1 \times 10^{-8}$ to $1 \times 10^{-2}$ Torr; $\pm 30\%$ of reading
repeatability - (typical)	$\pm 5\%$ of reading
display	bright OLED display, 2 digits plus 1 digit exponent, user-selectable Torr, mbar, or Pa
materials exposed to gases	304 stainless steel, ceramic, Viton® O-ring
sensitivity	factory preset to 10 Torr <sup>-1</sup> (also user adjustable between 2 to 99)
overpressure protection	gauge turns off at factory default setting of $1 \times 10^2$ Torr
internal gauge volume	1.965 in <sup>3</sup> (32.2 cm <sup>3</sup> )
temperature	operating; 0 to +40 °C storage; -40 to +70 °C
bakeout temperature	150 °C (sensor only - electronics removed), limit to 5 hours with magnets installed
humidity	0 to 95% relative humidity, non-condensing
weight	1.7 lb. (0.77 kg) with NW25 KF flange
housing (electronics)	aluminum extrusion
mounting orientation	any
serial communications	RS485 - ASCII protocol; minimum command interval: 50 ms
analog output	user selectable scaling; log-linear 0 to 8 Vdc, 1 V/decade or 1.8 to 8.7 Vdc, 0.8 V/decade
setpoint relay	one single-pole, double-throw (SPDT), 1 A at 30 Vdc resistive, or ac non-inductive
status outputs	sensor on/off status is determined by display messages, via open collector transistor or RS485 serial communications
input signal	sensor enable (anode voltage turned on) is set by continuity to ground using digital input, RS485 commands or manually using front panel programming soft-keys
input power	20 to 28 Vdc, 7.2 W protected against power reversal and transient over-voltages
connectors	9-pin D-sub male for analog and 15-pin D-sub male for RS485
CE compliance	EMC Directive 2004/108/EC, EN61326-1, EN55011 Low Voltage Directive 2006/95/EC, EN61010-1
environmental	RoHS compliant

Fitting	dimension A
1 in. Tube	2.56 in. (65 mm)
NW16KF	2.63 in. (67 mm)
NW25KF	2.63 in. (67 mm)
NW40KF	2.82 in. (72 mm)
1 1/3 in. Mini-CF	2.11 in. (54 mm)
2 3/4 in. Conflat®	2.63 in. (67 mm)



## Ordering Information

## Part Numbers

CCM501 Fittings / Flanges	Cold Cathode Module	Replacement / Spare Sensor
1 in. Tube (1 in. O.D. O-ring compression)	CCM501TD	CC5T
NW16KF	CCM501BD	CC5B
NW25KF	CCM501CD	CC5C
NW40KF	CCM501DD	CC5D
1 1/3 in. Mini-CF/NW16CF Mini-Conflat®	CCM501ED	CC5E
2 3/4 in. CF / NW35CF Conflat®	CCM501FD	CC5F

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Conflat® is a registered trademark of Varian, Inc. / Agilent Technologies, Lexington, MA.



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