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Series 500
Cold Cathode Vacuum Gauge

The Series 500 Cold Cathode Gauge incorporates the latest technology with modern design techniques to provide highly reliable and long life vacuum measurement across a wide pressure range. The modular design integrates gauge and control electronics in one convenient package.

Cold cathode technology traditionally provides longer lifetime than hot cathode because there is no filament to burn out, but the tradeoff was reduced accuracy. The Series 500 Cold Cathode Gauge (CCG) defines a new accuracy standard based on innovative technology and time-tested calibration techniques. In addition, there has never been a good way to determine when a cold cathode gauge is worn to the point that its accuracy has significantly degraded. With a new patent-pending method of determining the pressure dosage over time and combining that with a user-selected environmental factor, the CCG Series 500 provides an indication of when the gauge needs to be serviced or replaced.

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Product Features

- Wide pressure measurement range from 10^{-10} to 10^{-2} Torr
- Individually calibrated gauges provide highest accuracy
- Display shows pressure and gauge status
- RS-485 communications interface and output signal with programmable off state, start point, and slope
- USB interface can be used to check gauge status and perform setup
- Includes 2 programmable set point relays



Key Benefits

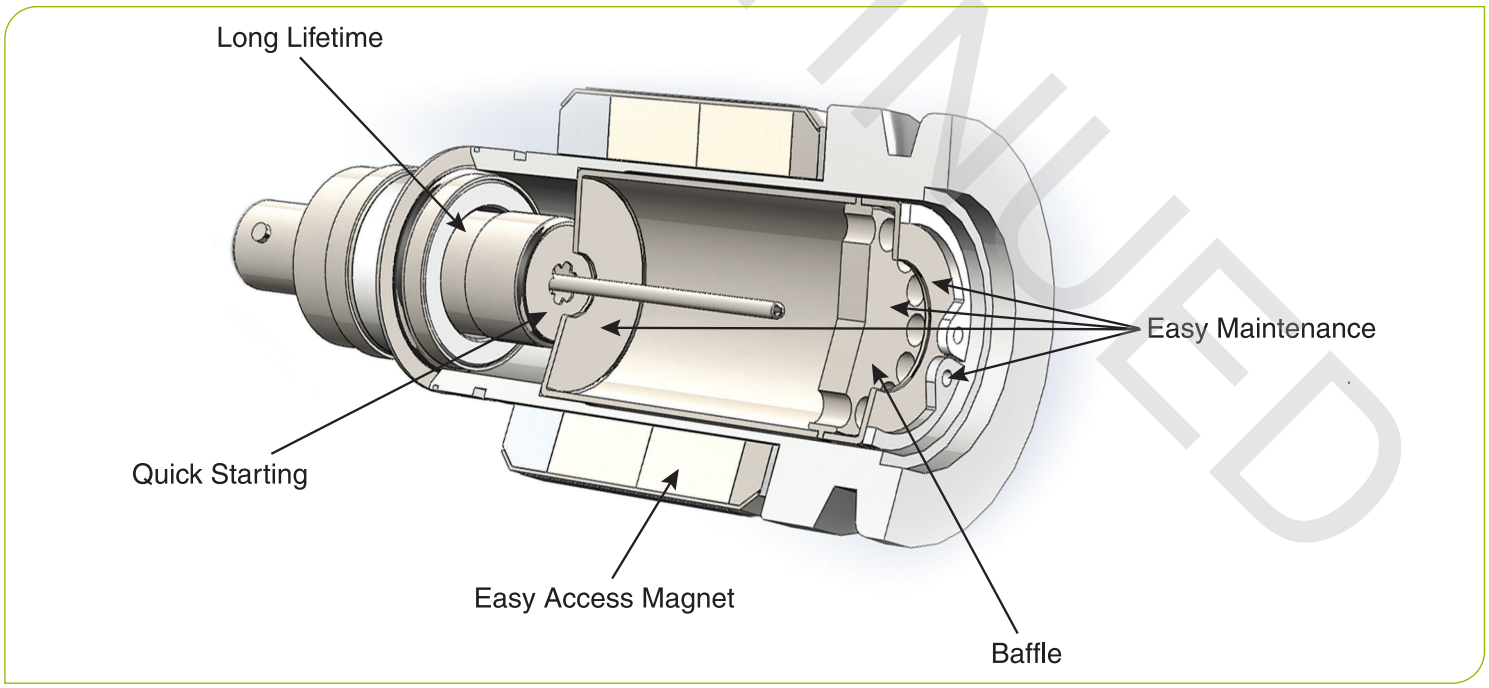
- Gauge design reduces contamination on critical parts increasing lifetime
- Lifetime indicator shows when the gauge needs maintenance
- Easily removable electronics and magnet assembly makes baking and installation easy

- **Wide Measurement Range:** Allows vacuum system performance to be monitored continuously from $1x10^{-10}$ to $1x10^{-2}$ Torr.
- **Long Lifetime:** Cold Cathode Gauges do not require a filament, which simplifies gauge construction, increases reliability and lifetime, and lowers the cost of ownership. An internal guard ring reduces contamination on critical components and isolates leakage current from the measurement.
- **Quick Starting:** The field emission starter provides faster and more predictable start times.
- **Easy Access Magnet:** Tool-free magnet removal simplifies gauge installation and bakeout.
- **High Accuracy:** For applications requiring higher precision, an optional calibrated Series 500 CCG provides ±10% accuracy.
- **Digital Display:** Displays pressure, USB connectivity, RS-485 address, remaining lifetime, and self diagnostics status.
- **Status LEDs:** Indicate when power is applied to the module, when discharge is achieved, the state of the 2 set point relays, and if maintenance is suggested at the next PM or immediately.
- **Auto On/Off:** The gauge can be programmed to turn ON automatically based on an analog voltage input coming from a higher pressure (i.e. Pirani) gauge. The Series 500 CCG can also automatically turn the gauge OFF based on the analog input and/or the pressure reading from the CCG itself.
- **Easy Maintenance:** Internal components are easily replaced for quick maintenance.
- **Baffle:** Keeps sputtered material from entering your process chamber.
- **Lifetime Indicator:** To avoid guesswork, the Series 500 CCG displays the estimated remaining lifetime of the gauge – the point at which accuracy is compromised and gauge maintenance or replacement is recommended.



- **USB Interface:** The USB port provides connection to a PC together with an easy-to-use software program to setup, control, view diagnostics status, and display pressure trends. Communications over USB can occur while the gauge is ON without disrupting normal operation.

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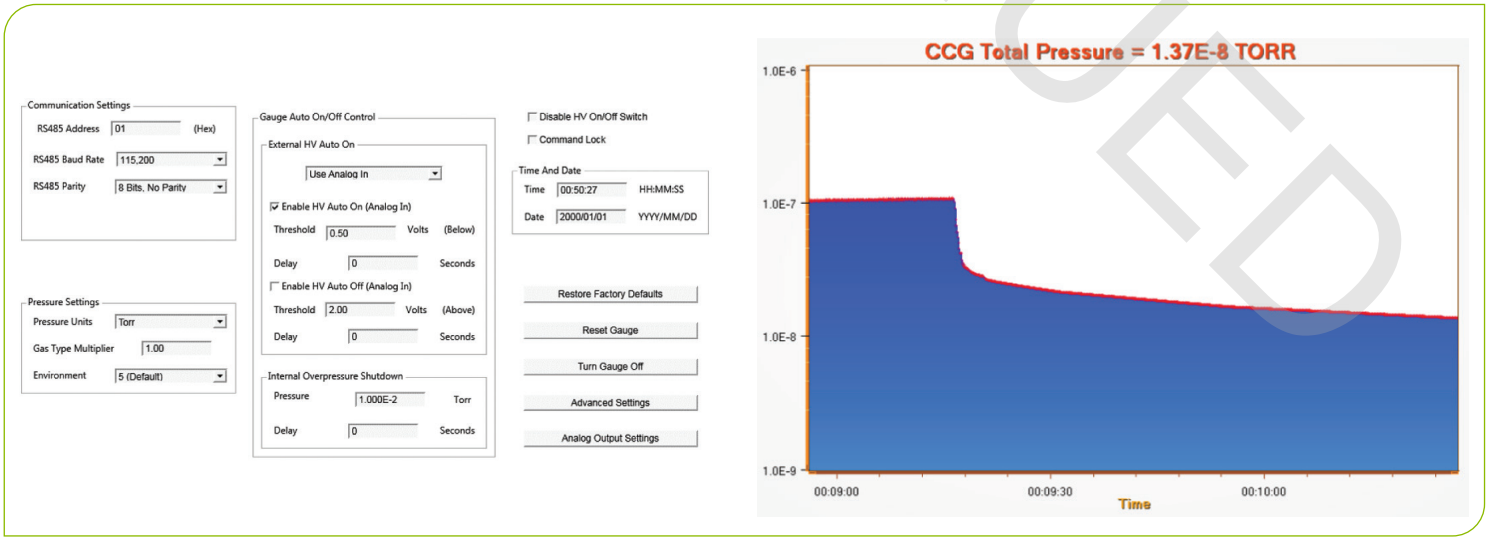


Cold Cathode Gauge Cross Section

Specifications

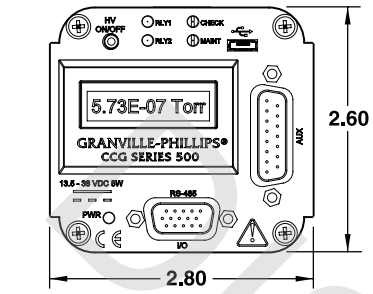
Parameter	Conditions	Spec Limits
Total Pressure Measurement Range	—	1e-10 to 1e-2 Torr
Accuracy – Calibrated Gauge	1e-8 to 1e-4 Torr	±10%
Repeatability – (typical)	1e-8 to 1e-4 Torr	±5%
Electronics Storage Temperature	—	-40°C to 70°C
Electronics Operating Temperature	—	0 – 50°C
Bake-Out Temperature	Magnets removed	250°C
Mounting Orientation	Any	—
Analog Output Signal	Output voltage (log) Min. output impedance Min. load impedance Min. update rate	0 – 11 Vdc 200 Ohm 10k Ohm 40 Hz
Analog Input Signal	Input voltage	0 - 11 VDC
Power Required	—	13.5 - 36 VDC, <2 Watts
RS-485 Baud Rate	—	1200-115, 200 Baud
USB Interface	—	Micro-AB
Overpressure Protection	Controlled by an external gauge and/or measured pressure	
Materials Exposed to Vacuum	304 Stainless Steel, 17-7 stainless steel, ceramic, Cu brazing material, alumina, and molybdenum	
Set Point Relays	Max 1A@30 VDC; Min 5 mA at 5 VDC, maximum ripple 1Vpp	
Weight	652 grams	
Compliance	CE	

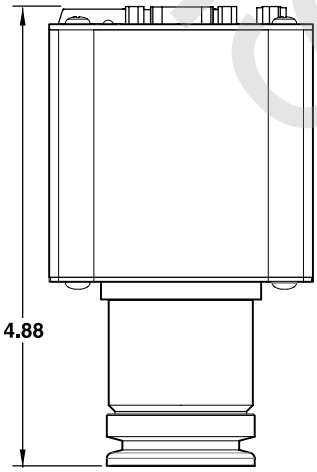
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The GP Connect software makes it easy to setup and monitor the Cold Cathode Gauge through a graphical user interface. GP Connect is a free application that provides two screens for setting up the gauge RS-485 parameters, auto on/off settings, relay set points, analog output curve, and gas type multiplier. In addition, status of all inputs and outputs can be monitored along with pressure trends, dosage, remaining lifetime, and operational info such as how long the gauge has operated in each pressure range.

Ordering Information





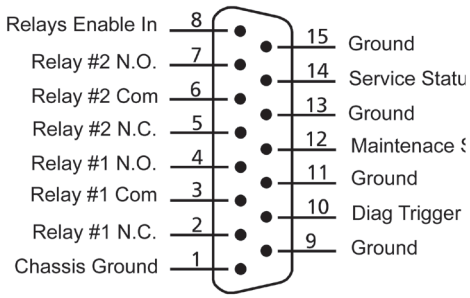
Dimensional Drawing
Note: Unless otherwise specified, dimensions are nominal values in centimeters (inches referenced).

Ordering Code Example: 500100-2-C-R4-K-T	Code	Configuration
Module		
Module with Analog Output, No Display Module with Analog Output, Digital Display	500100 500101	500100
Set Point Relay		
Two	2	2
Calibration		
Calibrated (Higher Accuracy)	C	C
Interface		
RS485	R4	R4
Vacuum Connection		
NW40KF NW35CF (2.75 inch Conflat® type)	K G	K
Measurement Units		
Torr mbar Pa	T M P	T

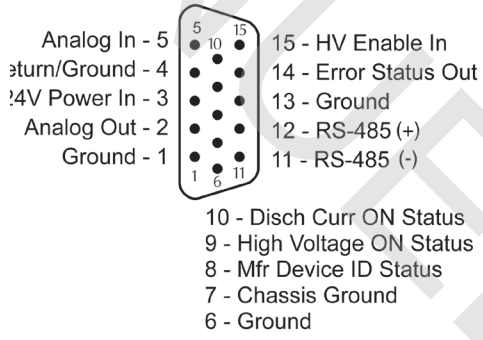
Ordering Code Example: 500200-C-K	Code	Configuration
Replacement		
Gauge Sensor	500200	500200
Calibration		
Calibrated (Higher Accuracy)	C	C
Vacuum Connection		
NW40KF NW35CF (2.75 inch Conflat® type)	K G	K

Ordering Code Example: 500600-K	Code	Configuration
Maintenance Kit		
Gauge Maintenance Kit	500600-K	500600-K

Standard



High Density



I/O Pinouts
15-pin D-sub Connector

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