



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.

Features & Benefits

- 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
- 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
- Includes 2 programmable set point relays

Pressure &

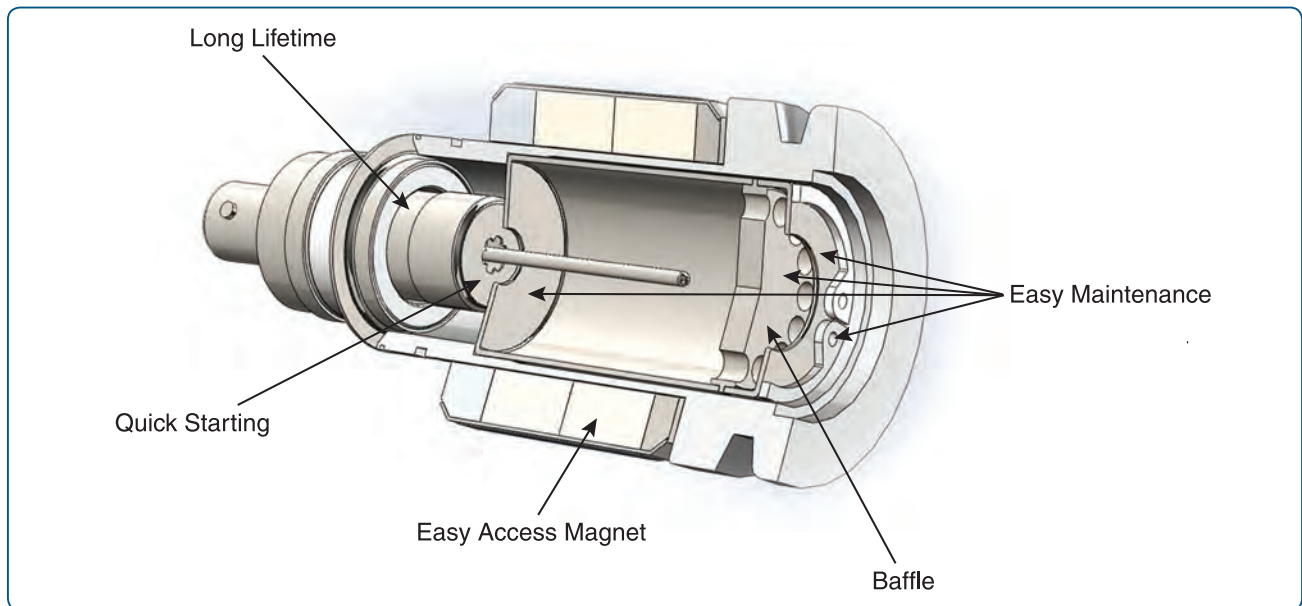
Vacuum Measurement Solutions

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Series 500 Description

- **Wide Measurement Range:** Allows vacuum system performance to be monitored continuously from 1×10^{-10} to 1×10^{-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 $\pm 10\%$ 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.

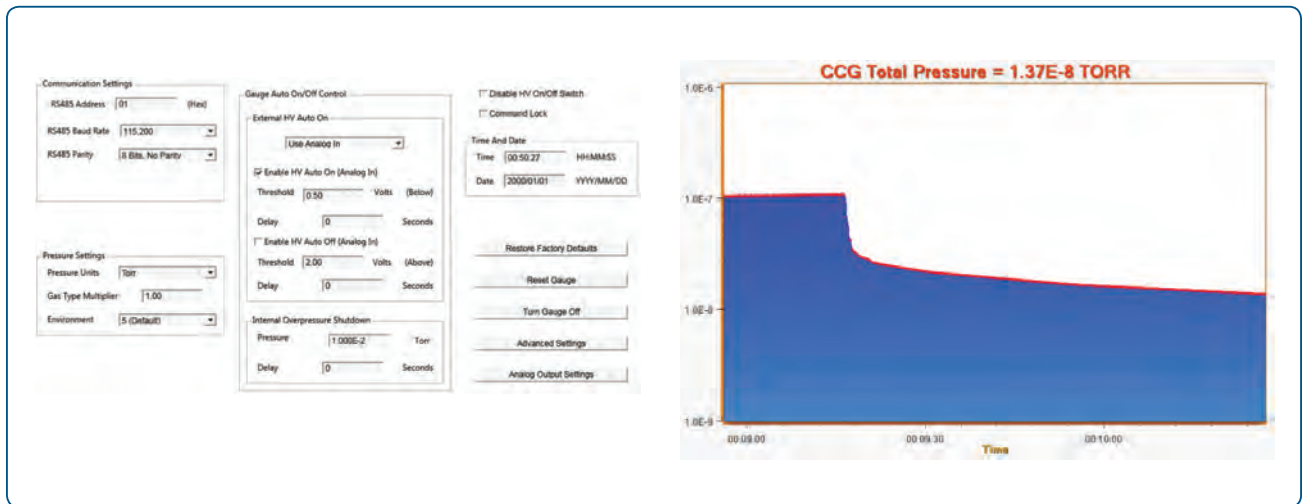


Cold Cathode Gauge Illustration



Specifications

Parameter	Conditions	Spec Limits
Total Pressure Measurement Range		1e-10 to 1e-2 Torr
Accuracy – Standard (typical)	1e-8 to 1e-4 Torr	±30%
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)	0 – 11 Vdc
	Min. output impedance	200 Ohm
	Min. load impedance	10k Ohm
	Min. update rate	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	



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.

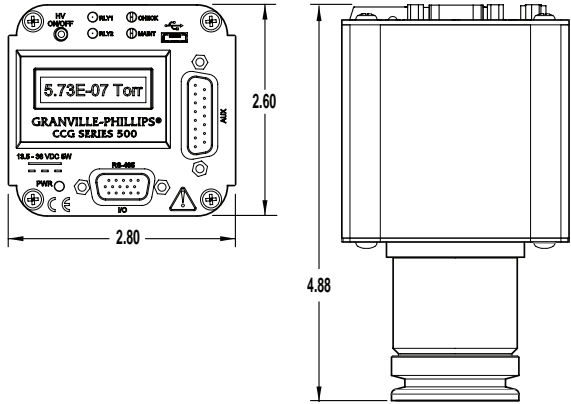


Ordering Information

Model Number Matrix

Module and Gauge Assembly

Module with Analog output, No Display	500100 - ## - ### - #
Module with Analog Output, Digital Display	500101 - ## - ### - #
Set Point Relay:	
Two	2
Calibration:	
Calibrated (Higher Accuracy)	C
Standard	S
Interface:	
RS-485	R4
Vacuum Connection:	
NW25KF	E
NW40KF	K
NW35CF (2.75 inch Conflat® type)	G
Measurement Units:	
Torr	T
mBar	M
Pascal	P

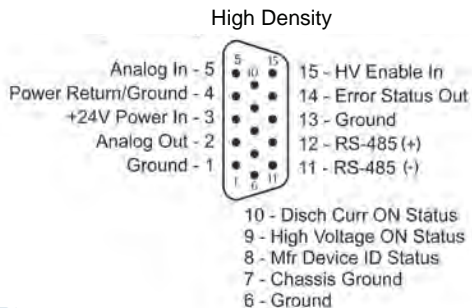
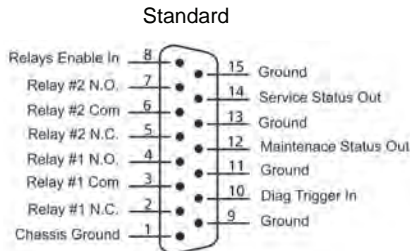


Dimensional Drawing —

Note: Unless otherwise specified, dimensions are nominal values in inches.

Replacement Gauge Sensor

Gauge Sensor	500200 - ##
Calibration:	
Calibrated (Higher Accuracy)	C
Standard	S
Vacuum Connection:	
NW25KF	E
NW40KF	K
NW35CF (2.75-inch Conflat®-type)	G



I/O Pinouts —

15-pin D-sub Connector

Maintenance Kit

Gauge Maintenance Kit	500600 - K
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