Series 701 Wasp™ Cold Cathode Inverted Magnetron / Pirani Miniature Full Range Vacuum Gauge

Wide measurement range
- \(7.6 \times 10^{-10}\) to 760 Torr
- \(1 \times 10^{-6}\) to 1000 mbar
- \(1 \times 10^{-7}\) Pa to 101 kPa

Unique interchangeable dual chamber sensor design provides for virtually zero maintenance and easy sensor replacement

Patented ultra-low magnetic stray field expands applications suitability

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

Prolonged lifetime in harsh environments

Corrosion resistant feed through

Built-in Controller with digital input sensor control and log-linear analog output

Compact small footprint

Reliable fast sensor (anode) activation

WGM701 Wasp

The WGM701 Wasp™ vacuum gauge module combines Cold Cathode Inverted Magnetron technology with a pirani sensor to provide reliable and continuous pressure measurements from atmosphere to high vacuum.

The sensor assembly is constructed of a compact metal design resulting in a simple yet rugged sensor suitable for numerous industrial applications. Additionally a sensor activation aid mounted on the anode improves the time it takes to activate the cold cathode sensor.

The patented ultra-low magnetic stray field design expands the use of this technology beyond the traditional applications when using a cold cathode technology. i.e., the WGM701 can be used in combination with instruments sensitive to external magnetic fields generated by conventional vacuum gauges utilizing a cold cathode sensor. This novel magnetic field design also allows the gauge to be used in environments where strong magnetic fields are present.

The low current collector option is recommended for use in heavy gases such as Argon to prevent self-sputtering while the high current version is recommended for gases such as \(N_2\)/air.

A unique interchangeable dual chamber inside the sensor assembly avoids cleaning cycles and reduces maintenance, making the WGM701 the most robust and economical vacuum gauge of its kind.

The WGM701 provides the basic signal conditioning required to turn the sensor into a complete vacuum pressure measurement instrument. The built-in controller provides a log-linear analog output for the measured pressure as well as a sensor status output. The cold cathode sensor is automatically activated once the pressure measured by the pirani sensor has indicated a low enough pressure level of \(7.6 \times 10^{-3}\) Torr.

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

Specifications

<table>
<thead>
<tr>
<th>Measurement Range</th>
<th>(7.6 \times 10^{-10}) to 760 Torr / (1 \times 10^{-6}) to 1000 mbar / (1 \times 10^{-7}) Pa to 101 kPa</th>
</tr>
</thead>
</table>
| Accuracy - \(N_2\) (Typical) | \(7.6 \times 10^{-9}\) to \(7.6 \times 10^{-5}\) Torr: \(\pm 30\%\) of reading  
\(7.6 \times 10^{-3}\) to 75 Torr: \(\pm 15\%\) of reading  
75 to 760 Torr: \(\pm 50\%\) of reading |
| Repeatability (Typical) | \(7.6 \times 10^{-9}\) to 75 Torr: \(\pm 5\%\) of reading |
| Materials Exposed to Gases | pirani sensor: tungsten  
cold cathode anode: molybdenum  
others: Ni alloy, Al\(_2\)O\(_3\), stainless steel, glass |
| Internal Gauge Volume | 1.391 in\(^2\) (22.8 cm\(^2\)) |
| Admissible Pressure | 145 psi, 10 bar abs (limited to inert gases < 50 °C) |
| Temperature | operating: +5 to +55 °C  
storage: -40 to +70 °C |
| Humidity (30 days a year) | \(7.6 \times 10^{-8}\) ... \(7.6 \times 10^{-3}\) Torr  
0 to 95% relative humidity, non-condensing  
7.6\times10^{-9} ... 7.6\times10^{-3}\) Torr  
0 to 70% relative humidity, non-condensing |
bakeout temperature (at flange) 150 °C (sensor only - electronics removed)
weight 0.61 lb. (0.28 kg) with NW25 KF flange
housing (electronics) aluminum extrusion
mounting orientation any
analog output log-linear 0.5 to 7 Vdc, 0.5 V/decade
error signal analog output switches to ≥ 10 V
response time: p = 7.6 X 10^{-9} Torr
p > 7.6 X 10^{-7} Torr ~1 sec <100 msec
status output cold cathode sensor on/off status is determined by open collector transistor (ground emitter) rated at 30 V max. V_{CE}, 100 mA Ic max. Transistor off = Sensor off, Transistor on = Sensor on
input power 14.5 to 30 Vdc, 2 W protected against power reversal and transient over-voltages
supply voltage ripple ≤1 Vp-p
high voltage in measuring chamber operating voltage (anode): ≤3.3 KV
sensor activation voltage (anode): ≤4.5 KV
current in measuring chamber low current collector version: ≤ 100 µA
high current collector version: ≤ 500 µA
connector 9-pin D-sub male
CE compliance EMC (EN61000-6-2, EN61000-6-3, EN61010-1, EN61326-1)
environmental RoHS compliant

<table>
<thead>
<tr>
<th>Fitting</th>
<th>dimension A</th>
</tr>
</thead>
<tbody>
<tr>
<td>NW25KF</td>
<td>0.59 in. (15 mm)</td>
</tr>
<tr>
<td>NW40KF</td>
<td>0.67 in. (17 mm)</td>
</tr>
<tr>
<td>2 3/4 in. Conflat®</td>
<td>0.91 in. (23 mm)</td>
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</tbody>
</table>

Ordering Information

<table>
<thead>
<tr>
<th>Sensor Version</th>
<th>Collector</th>
<th>Fittings / Flanges</th>
<th>Electrical Connector</th>
</tr>
</thead>
<tbody>
<tr>
<td>S= Standard</td>
<td>H= High Current</td>
<td>C= NW25KF</td>
<td>A= 9-pin D-sub male</td>
</tr>
<tr>
<td></td>
<td>L= Low Current</td>
<td>D= NW40KF</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>F= 2 3/4 in. CF / NW40CF Conflat®</td>
<td></td>
</tr>
</tbody>
</table>

Example: WGM701S#HA (WGM701 with standard sensor, high current collector, NW40KF fitting, 9-pin D-Sub connector)

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