



7FCS Double Inverted Magnetron Quick-Start Cleanable Cold Cathode Vacuum Gauge

Part Number: **2-2146-05X**

Operating Specifications

Operating Range	1*10 ⁻¹¹ Torr to 1*10 ⁻² Torr
Analog Output	Controller-dependent
Supply Voltage	Controller-dependent
Mounting Orientation	Any
Calibration Medium	Dry air or nitrogen
Overpressure	150 PSI
Analog Output Resolution	Controller-dependent
Operating Temperature	0 °C to 50 °C
Storage Temperature	-20 °C to 70 °C
Bakeout Temperature	200 °C
Response Time	≤ 10 ms
Starting (Dormant) Time	≤ 5 s
Accuracy	
1*10 ⁻⁹ to 1*10 ⁻² Torr	±0.2 decade

Physical Characteristics

Electrical Connections	SHV5
Weight	944 g (2.08 lbs)
Dimensions	See dimensional drawings

Key Features and Benefits

- Cleanable design for extended use
- Resistant to inrushes of gas
- High bakeout temperature
- Improved sensitivity when compared to Penning Magnetrons
- Mountable in any orientation
- Minimal stray magnetic field
- Interchangeable with [7E](#), [7F](#), and [7FC](#)

Applications and Industries

- Medical particle accelerators
- National labs, research and development
- Semiconductor
- Thin film deposition

Ordering Information

Part Number	Description
2-2146-054	CF25/2.125" CF-F Stainless Steel
2-2146-053	CF40/2.75" CF-F Stainless Steel

Compatible Vacuum Controllers

Part Number	Description
2-7900-034	MX200 Vacuum Controller RS-232/RS-485/USB
2-7900-037	MX200 Vacuum Controller Ethernet/IP/USB
2-7900-038	MX200 Vacuum Controller PROFINET/USB

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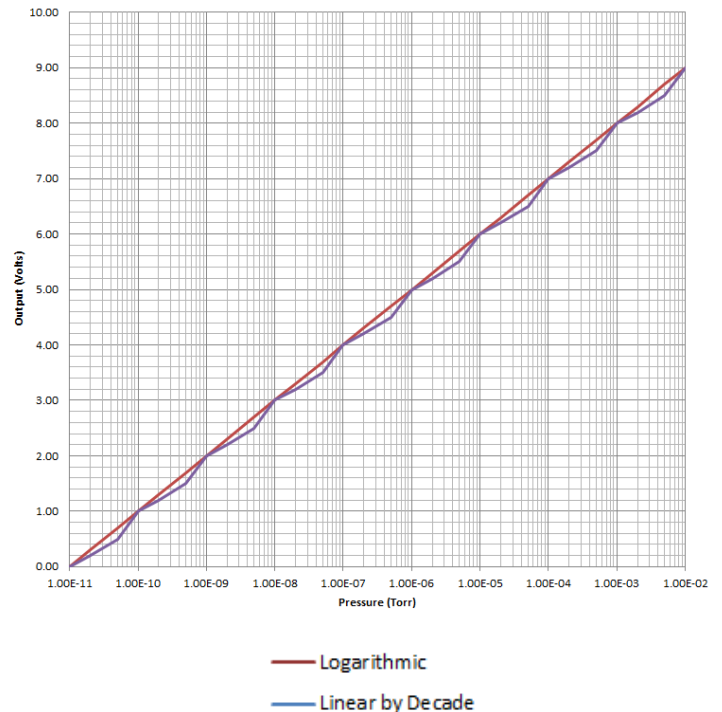
Description

The [7FCS Cold Cathode Passive Sensor](#) has a measurement range from 1*10⁻¹¹ Torr to 1*10⁻² Torr. It indirectly measures absolute pressure by ionizing gas in the presence of a magnetic field. Unlike hot filament sensors, the 7FCS is resistant to inrushes of gas. The design of this sensor allows for easy disassembly enabling quick cleaning and extended use.

In addition, the 7FCS sensor is specially designed for turn on at ultra-high vacuum (UHV). If your application requires ignition in the 10⁻⁸ Torr range or higher, turn on will occur in less than five seconds. The 7FCS utilizes Double Inverted Magnetron sensor technology combined with a thermionic emitter, which turns on automatically with the cold cathode for five seconds.

The 7FCS can be operated by the Televac® [MX200 Vacuum Controller](#). This controller automatically operates the cold cathode to provide a full range vacuum measurement solution when the [7FCS](#) is used in conjunction with rough vacuum sensors like the [2A Thermocouple](#) or [4A Convection](#).

Analog Output Behavior



Ratings and Compliance

- RoHS compliant

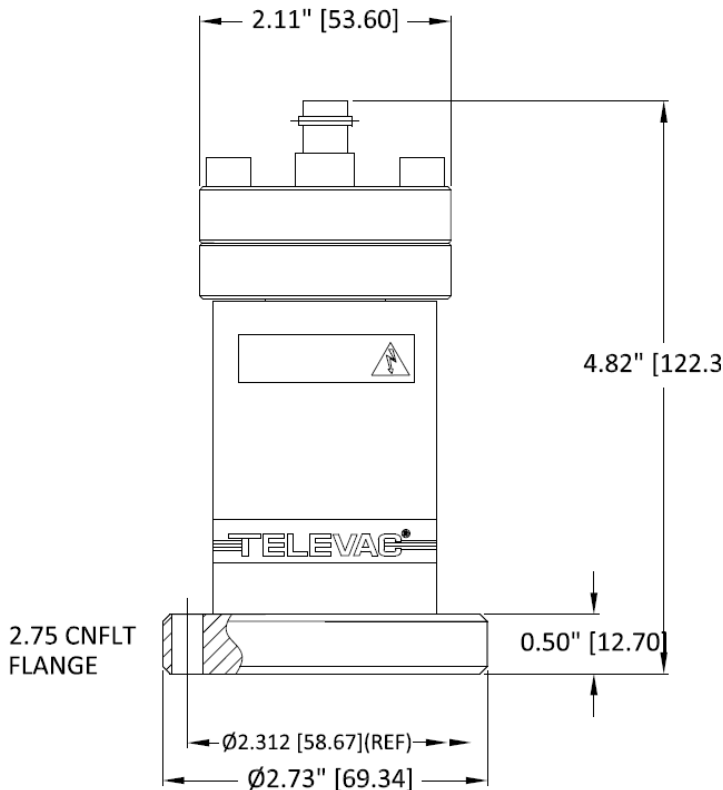


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Materials Exposed to Vacuum

Stainless Steel
Ceramic
Copper
Tungsten
Glass
Aluminum

Dimensional Drawing



Company Information

Specialty manufacturing services that promise precision - Since 1935, Fredericks has specialized exclusively in tilt and vacuum measurement products. Today, our precise manufacturing processes produce the most accurate and advanced products on the market, ensuring perfection every time. A true specialty service provider, we are willing and eager to put our experience and capabilities to good use, helping OEMs achieve even the most complex designs.

High performance products designed and manufactured with pride - Fredericks is a global provider and U.S. manufacturer and designer of high-performance tilt and vacuum measurement products. Built to last, our products are made with state-of-the-art sensing technology, proven processes, and an intrinsic passion for the trade. Offering simple integration and quality and safety benchmarks, our customers benefit not just from standard-setting reliability, but from our commitment to competitive pricing and performance.

A partnership that prioritizes uptime, lead time, and service - Fredericks guarantees customer satisfaction and our 'not too big, not too small' operation is what enables us to offer a true partnership experience. Our dedicated representatives and engineers offer exceptionally responsive service and some of the fastest lead times in the industry, knowing that uptime is the key to your success. With anytime-access to our leadership team and solutions that enhance your products, you will feel the Fredericks difference.

Vacuum measurement tools built for the toughest jobs - Fredericks' world-class vacuum sensors, gauges, and control instrumentation are engineered for the most demanding applications and environments. Our patented Televac® and ETI vacuum brands feature cold-cathode technology, thermocouple and convection gauges, and precision-manufactured hot ionization gauges. Dedicated solely to vacuum gauging and calibration services, we provide industrial heating, national laboratories, cryogenics, and industrial gas applications, among many others, with fast lead times and industry-leading performance. Covering the entire practical vacuum range, our products deliver rapid response vacuum readings and sensitivity.

Additional Documentation

AN3004	Cleaning the 7FC and 7FCS Cold Cathode Gauges
AN3010	Torr Scientific/Torr Decimal/mTorr/Micron Conversions
AN3015	Recommended Practices for Vacuum Calibration
AN3020	Vacuum Terminology Reference
Article	Case Study: Argonne National Laboratory
Video	7FC and 7FCS Disassembly Video
Resource	Televac® Tolerances

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