Series 355

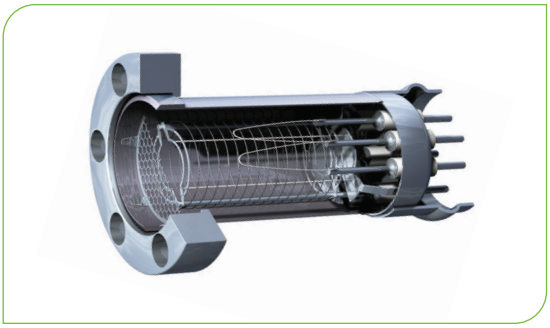
Micro-Ion® Hot Cathode Transducer

The Micro-Ion® Hot Cathode Transducer combines the world's smallest ionization gauge with control electronics to create a compact, convenient, reliable, and cost-saving solution for many high vacuum applications. The Micro-Ion gauge includes many features that provide much more accurate and repeatable measurement than traditional Bayard-Alpert gauges from 5 x 10^{-2} Torr to 10^{-9} Torr. The all-metal package is a rugged enclosure and providing a high level of immunity to electrical noise. High performance in a small volume is achieved though several enhancements including a patented dual ion collector design that optimizes electron motion and ion collection.

Transducers are available with analog output, RS485 or DeviceNet™ interfaces. The analog output and DeviceNet versions have a digital display option for convenient, point-of-use pressure readout.

Product Features

- Compact, convenient, reliable, cost-saving vacuum measurement
- Vacuum pressure measurement to 10^{-9} Torr (10^{-9} mbar, 10^{-7} Pa)
- Dual filaments increase equipment uptime
- Ultra-clean construction allows rapid response during pump down
- Rugged, all-metal, RF and noise-immune transducer
- Optional local display aids in setup and diagnostics
- RS485 and DeviceNet digital interfaces available
- Provides increased long-term stability over traditional designs



Cross section of the Micro-Ion® Vacuum Gauge

Wide Measurement Range: Allows vacuum system performance to be monitored continuously from 5 x 10^{-2} to 10^{-9} Torr (7 x 10^{-2} to 10^{-9} mbar, 7 to 10^{-7} Pa).

Dual Filaments: Dual, burn-out resistant yttria-coated iridium filaments provide long gauge life. Unscheduled downtime is avoided by using the second filament as a back-up until the gauge can be replaced during regular maintenance procedures.

Ultra-Clean Construction: Micro-Ion gauges are designed, constructed, and processed to minimize outgassing. All components are vacuum fired and assembled in a Class 100 cleanroom environment. This assures rapid, repeatable response during vacuum chamber pumpdown.

Cooler Operation: At only 8% of the power consumption of a glass or nude gauge, the Micro-Ion gauge generates much less heat, minimizing the disruption to a process or experiment.

Analog Output Version: The basic version provides an easy-to-use analog output signal that is linear with the logarithm of the pressure. An optional large green LED display provides point-of-use pressure indication.

Digital Interface Version: Transducers are available with an RS-485 or DeviceNet interface for easy compatibility with computer controlled processes. The digital interface versions have a set point relay allowing for control of other vacuum equipment or to provide a safety interlock.

All-Metal Package: Provides high level of immunity to RF noise.

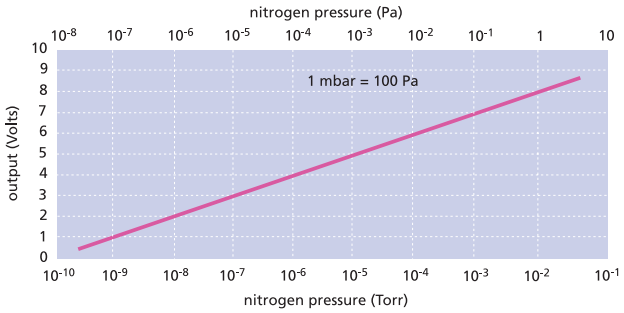
Replacement Gauge: Unique, no tools required detachable gauge.

Wide Selection of Vacuum Fittings: Simplifies installation on your vacuum system.

Long Term Stability: End caps which control ion flow, welding grid windings every 180°, and the all-metal housing provide repeatable measurements over time.

Micro-Ion® Hot Cathode Transducer

Replacement Gauge



Analog Output Signal

Specifications

Measurement Range for Air and N_2 See Notes (1), (2), (3)	
Torr	1×10^{-9} to 5×10^{-2}
mbar	1×10^{-9} to 7×10^{-2}
Pa	1×10^{-7} to 7
Emission Current	0.02 mA, 0.1 mA, or 4 mA
Degas	Electron bombardment, 3 W with 2-minute timer
Overpressure Protection	Transducer self protects by turning off filament power at upper pressure limit (adjustable)
Weight	370 gm (12 oz) with NW16KF flange
Power Required	24 VDC ±15%, 12 W max
Operating Temperature	0°C to 40°C ambient, non-condensing
Non-Operating Temperature	-40°C to 70°C
Case Material	Aluminum extrusion
Analog Output Version	1 Volt/decade, logarithmic, 0 to 9 V
Filament Control	Push button switch on top of transducer
Input Signals	Filament on/off, degas on/off and emission current are set by continuity to ground
Output Signals	Filament and degas on/off status are determined by an open collector transistor
Connector	9-pin D male
Display (option)	2 digits plus exponent, green LED
RS485 Interface Version	RS485 with one set point relay
Parameters Adjustable	Filament on/off, degas on/off, emission current select, filament select, set point (value, direction, and hysteresis)
Baud Rate	19200 Baud (default value)
Data Format	ASCII, 8 data bits, one stop-bit, no parity, no handshake (default values)
Relay Configuration	Single-pole, double-throw (SPDT)
Relay Contact Rating	1 A at 30 VDC resistive load, 0.5 A at 125 VAC non-inductive
Connector	9-pin D male
DeviceNet Interface Version	
Messaging	Polled I/O and explicit
Data Rates	125, 250 or 500 kbaud, switch selectable
Address	0 to 63, selected by using the Low and High address switches
Micro-Ion Gauge	
Sensitivity	20/Torr, 15/mbar, 0.15/Pa
X-ray Limit	$< 3 \times 10^{-10}$ Torr, $< 4 \times 10^{-10}$ mbar, $< 4 \times 10^{-10}$ Pa See Note (3)
Filament Materials	Yttria-coated iridium or tungsten See Note (4)
Other Materials Exposed to Gas	304 stainless steel, alumina, tantalum, tungsten, CuAg eutectic, Kovar®
Internal Gauge Volume	10.8 cm^3 (0.66 $in.^3$) to the port screen
Gauge Bakeout Temperature	200°C maximum (with electronics removed)
Compliance	CE, SEMI S2

Notes:

(1) Measurements will change with different gases and mixtures. Correction parameters for common gases are provided in the instruction manual.

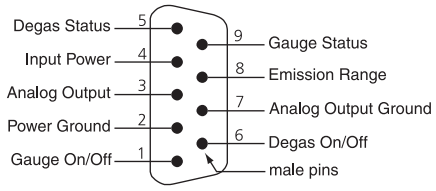
(2) Micro-Ion Gauges are not intended for use with flammable or explosive gases.

(3) The X-ray limit is the absolute lowest indication from the gauge. It is not practical to make repeatable measurements near the X-ray limit.

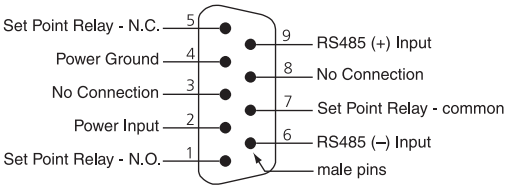
(4) Tungsten filaments are for applications involving gases containing fluorine, chlorine, or other gas species that poison yttria-coated iridium filaments. Tungsten filaments are not recommended for general vacuum applications because they may burn out when exposed to high pressures including, but not limited to, H_2O.

Ordering Information

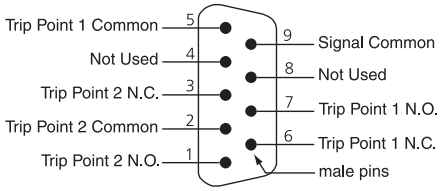
Analog Output Version, No Set Points



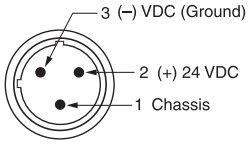
RS485 Interface Version, One Set Point



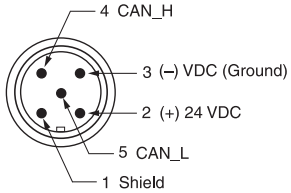
DeviceNet Interface Version, 9-Pin Trip Point Connector



3-Pin Power Connector



5-Pin Power Connector

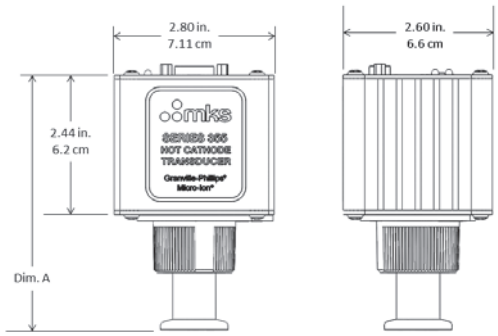


Electrical Connectors

Analog, RS485 and DeviceNet Interface Versions

Ordering Code Example: 355410-1-YD-T	Code	Configuration
Series 355 Micro-Ion Transducer	355	355
Display		
Without display	4	4
With display (Analog and DeviceNet only)	6	
Interface		
Analog	00	10
RS485 (No Display Option, Torr Units Only)	10	
DeviceNet	20	
Relay Set Points		
No Relay Set Points (Analog only)	0	1
1 Relay Set Point (RS485 only)	1	
2 Relay Set Points (DeviceNet only)	2	
Filaments		
Yttria-coated iridium	Y	Y
Tungsten	T	
Flange/Fitting		
NW16KF	D	D
NW25KF	E	
NW40KF	K	
1.33 inch (NW16CF) ConFlat®-type	F	
2.75 inch (NW35CF) ConFlat®-type	G	
1/2 inch VCR-type male	H	
Measurement Units		
Torr	T	T
mbar	M	
Pa	P	

Replacement Gauge Ordering Code Example: 355001-YE	Code	Configuration
Series 355 Micro-Ion Transducer	355001	355001
Filaments		
Yttria-coated iridium	Y	Y
Tungsten	T	
Flange/Fitting		
NW16KF	D	E
NW25KF	E	
NW40KF	K	
1.33 inch (NW16CF) ConFlat®-type	F	
2.75 inch (NW35CF) ConFlat®-type	G	
1/2 inch VCR-type male	H	



Fitting/Flange	Dimension A	
	Total Height (in)	Total Height (cm)
NW16 KF	4.46	11.33
NW25 KF	4.46	11.33
NW40 KF	4.46	11.33
1.33 in (NW16 CF)	4.45	11.31
2.75 in (NW35 CF)	4.45	11.31
½ in VCR type, male	5.23	13.29

Dimensional Drawing

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

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