

IRG080

Ion Reference Gauge - Passive

The INFICON Ion Reference Gauge IRG080 is a first-of-a-kind vacuum sensor developed for precise total pressure measurement in vacuum systems. This passive sensor is based on an innovative concept of ionization vacuum gauge, whereby a hot cathode emits electrons travelling on a straight path into a Faraday cup.

The IRG080 is suitable as reference standard in the range of 10^{-8} mbar (10^{-6} Pa) to 10^{-4} mbar (10^{-2} Pa). This gauge offers predictable gas sensitivity with a very small spread, very good short-term repeatability and reproducibility. The gauge can be used for calibration purposes of other vacuum gauges and quadrupole mass spectrometers. It is ideal for precise vacuum measurement in industrial applications pursuing no calibration or process readjustments after a gauge exchange. The IRG080 is connected and controlled by the IRC081 operating unit.



ADVANTAGES

- Developed for applications requiring high measurement accuracy in the high and ultra-high vacuum range
- True pressure for all gas species thanks to predictable relative gas sensitivity with small uncertainty
- Stable electron emission and lack of influence from ESD or X-ray effects
- Reproducible and easy to transport
- Bakeable to 165 °C (with temperature resistant cable) or up to 400 °C without connector unit
- Mu-metal intermediate piece available for magnetic shielding purposes

APPLICATIONS

- Metrology, transfer standards to national and calibration laboratories
- Advanced scientific and industrial applications requiring precise vacuum pressure measurement for quality assurance
- Calibration of other vacuum gauges and mass spectrometers, pump speed measurement

OPERATING UNITS

- Ion Reference gauge Controller IRC081

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ORDERING INFORMATION

Type	IRG080
Sensor, with BNC and multipin connector, DN 63 CF-R	399-874
Sensor, with BNC and multipin connector, DN 63 CF-F, with mu-metal intermediate piece	399-875

Accessories	IRG080
Replacement cathode	399-890
Mu-metal intermediate piece, DN 63 CF-F (incl. protection grid)	399-891
Protection grid for intermediate piece	399-892

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SPECIFICATIONS

Type	IRG080
Measurement system	hot cathode ionization
Electrode system configuration	according ISO TS 6737
Measurement range (N ₂) with IRC081 controller	1×10^{-8} ... $1 \times 10^{-4}</math> mbar1×10^{-6} ... 1 \times 10^{-2}</math> Pa$
Sensitivity (N ₂ , typical)	29 mbar ⁻¹
Accuracy (N ₂ , typical)	± 1% of reading
Repeatability (typical)	1% of reading
Mounting orientation	recommended aligned with magnetic field ¹⁾
with mu-metal int. piece (399-891)	any
Admissible temperature	
Ambient, in operation	+20 ... +80 °C
Bake-out	
max. flange with temp. resistant gauge head cable set	+165 °C
max. bake-out temp. without plug and connector plate unit	+400 °C
max. bake-out temp. without plug and connector plate unit with mu-metal int. piece (399-891)	+200 °C
Storage	+20 ... +50 °C
Relative humidity	≤ 85% (non-condensing)
Admissible external magnetic field	
in the plane normal to gauge axis, without shielding	≤ 50 μT
Use	indoors only
Standard operating characteristics with IRC081 controller	
Collector potential	0 V
Cathode potential	+50 V
Wehnelt potential	+34 V
Anode potential	+250 V
Deflector potential	45 V
Faraday cup potential	+280 V
Emission current range	10 ... 100 μA
Cathode heater current / voltage (typ.)	1.4 ... 1.8 A / 2 V
Flange connection	DN 63 CF-R
Gauge connections	
Ion collector	Bayonet (BNC)
Interface to Sensor (IS)	Push-pull self-latching, 7-pin
Materials exposed to vacuum	
Feedthrough pins	stainless steel (EN 1.4301)
Feedthrough caps	NiFeCo (EN 1.3981)
Feedthrough isolation	ceramic (Al ₂ O ₃)
Cathode	Ta, W, Kovar, Al ₂ O ₃
Anode	stainless steel (EN 1.4404, EN 1.4435)
Wehnelt cylinder	stainless steel (EN 1.4404, EN 1.4435)
Flange	stainless steel (EN 1.4335 ESU)
Internal volume	~385 cm ³
Weight	4.3 kg

¹⁾ Orientation should be such that magnetic field is not perpendicular to the electron trajectory

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DIMENSIONS

[mm]

