CIC1H Ion Chamber Detector

Safety Grade 1E Qualified

Harsh Environments, High TID

The APANTEC, LLC. Model CIC1H Ion Chamber Detector is a High Range ionization chamber detector designed to provide accurate measurement of high intensity radiation fields in harsh environments. The CIC1H is 1E Qualified and will perform in conditions that may occur during and after nuclear accidents.

The CIC1H has been qualified for nuclear safety related applications under 10CFR50, Appendix B and ASME NQA-1. The detector has been tested and qualified for operation during a Loss of Coolant Accident (LOCA), Main Steam-Line Break (MSLB), and/or seismic events.

The CIC1H measures radiation over a seven decades (1 to 10^{+7} Rad/hr) range. The coverage is linear throughout the range and is within ±10% of the true dose rate.

The CIC1H is a Parallel Plate Ionization Chamber (PPIC) housed in a welded Stainless Steel cylindrical enclosure sealed against steam, pressure, condensation, and post-accident spray-down chemicals. The chamber consists of alternating anode and cathode plates electrically isolated using hardware constructed from PEEK, a radiation tolerant material. Two connectors are provided for biasing High Voltage and current signal output.

The CIC1H is optimized to perform with the Apantec RM Series Ratemeter and Apantec CIC1FH current to frequency converter. The CIC1FH converts the CIC1H output current into TTL level pulses suitable for counting by the RM Series Ratemeter. Apantec CIC and RM electronics have been adopted by accelerator facilities and Nuclear Power plants for continuous and burst (<1µs) radiation fields.

CIC1H with Type N connectors.

Specifications

GENERAL

Detector Type:	Parallel Plate Ionization Chamber (PPIC)
Housing:	Sealed 304/304L/316/316L SS Cylindrical Enclosure
Fill Gas:	N_2
Fill Pressure:	1.0 to 5 atm (760 to 3800 Torr)
Connector, HV:	HN (SHV, BNC options available)
Connector, Signal:	HN (SHV, BNC options available)

OPERATIONAL

Activity Range:	1 Rad/hr to 10^{+7} Rad/hr (7 decades)
Energy Range:	80 keV to 3 MeV
Energy Response:	±20% from 80 keV to 3.0 MeV referenced
Sensitivity:	5.2×10^{-11} A / (Rad/hr)
Accuracy:	±10%
Linearity:	±5%
Response Time:	<1 µs
Leakage Current:	<1 pA

ENVIRONMENTAL

Operating Temperature:	-10 to +60 °C
Operating Humidity:	<95% Relative Humidity, Non-condensing
Operating Voltage:	-250 to -2000 V, -1000 V nominal
Dimensions:	3.5 in ⌀ x 10.4 in LG
Weight:	4 lb (1.8 kg) nominal