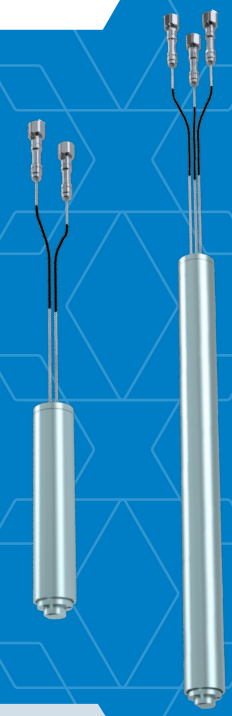
MIRION
TECHNOLOGIES

PROTK™

KNK/KNU 50 ACH™

γ-Compensated/Uncompensated



Neutron flux detectors for the intermediate and power range

DESCRIPTION

The neutron ionization chambers of type KNK 50 ACH and KNU 50 ACH are designed for measuring the neutron flux outside the reactor core during reactor start-up and power operation, respectively.

The detector signal consists of a current that is proportional to the thermal neutron flux at the detector position. The electrical current is generated by the lithium nuclei and the α particles resulting from the B 10 (n, α) Li 7 reactions inside the homogeneously distributed B 10 layer. Either of the two positively charged nuclei is entering the gas-filling of the chamber causing secondary ionizations that are collected at the electrodes with the help of the applied bias voltage. The resulting DC signal can be measured through an external electronic circuit.

FEATURES

- Wide thermal neutron flux range from 10^{2} to 10^{10} nv
- Robust design, uniform sensitivity
- Detector available with sensitivity from (0.7 to 4.4) × 10^{-14} A/nv
- No organic materials and therefore suitable for long-term operation in high radiation environment
- Saturation proof over entire neutron flux range
- Intrinsic gamma compensation (KNK 50 ACH)
- Integral MI cable with or w/o PEEK layer for mechanical protection and electrical insulation
- Variant with transition/splice to organic cable available (KNU/KNK 50 ASH)
- Accident/LOCA proof (KNK 50 ACH/ASH)

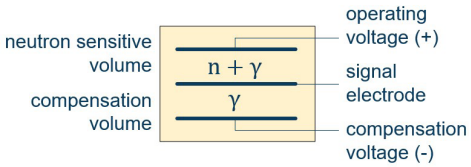
KNK/KNU 50 ACH™ NEUTRON IONIZATION CHAMBERS

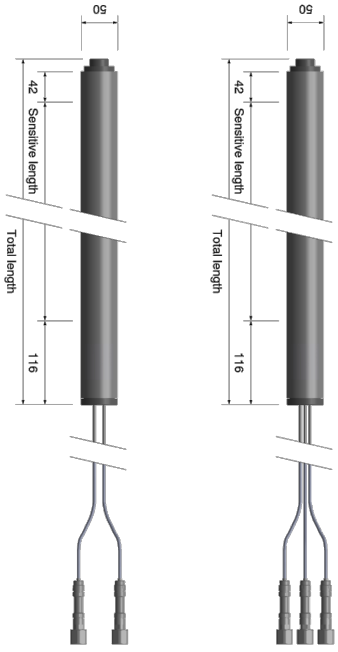
SPECIFICATIONS AND PERFORMANCE

Type	Product Code	Sensitivity (A/nv) x 10^{-14}	Operation/ Compensation Voltage (V DC)	Neutron Flux Range (nv)	Total/Sensitive Length (mm)	Integral Cables /HN Connectors
γ-compensated (CIC) **γ-compensated (CIC)**	KNK 50-1 ACH KNK 50-6 ACH	0.7 ... 4.4	+800/0 to -500 (CIC)	10^2 to 10^{10}	255/80 ... 705/530	3 MI cables + HN (male) connectors
Uncompensated (UIC)	KNU 50-1 ACH KNU 50-6 ACH					2 MI cables + HN (male) connectors

For specific applications and for receiving further technical data related to these and more detectors, please contact Mirion.

MATERIALS	
Filling gas/pressure	N^2/1 bar
Detector housing and HV electrodes	Al
Detector/cable isolators	Al_2O_3/MgO
Integral cable outer sheath	Stainless steel, OD = 4 mm
Optional cable protection and electrical isolation	PEEK, OD = 4.7 mm





KNU 50-x ACH KNK 50-x ACH

proTK™ SIGNAL PROCESSING UNITS AND MONITORS

Suitable signal processing units for KNK/KNU 50 ACH neutron ionization chambers:

DAK 260-g + NV 102

DGK 260-g

Mirion can provide the complete neutron flux monitoring system for reactor start-up and power operation.

Digital start-up signal processing unit for the intermediate range DAK 260-g with current-to-frequency converter NV 102 for use with a KNK 50 ACH.

See also corresponding intermediate range neutron flux monitor IRM 510.

Digital signal processing unit for the power range for use with up to two (2) KNU 50 ACH.

See also corresponding neutron flux monitor for the power range PRM 510.

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