Data Sheet

CFUR64

Fission chamber for in-core use wide dynamic range

Application

- Detection of thermal neutrons in a flux range of 10^7 to 10^{14} $n.cm^{-2}.s^{-1}$

Features

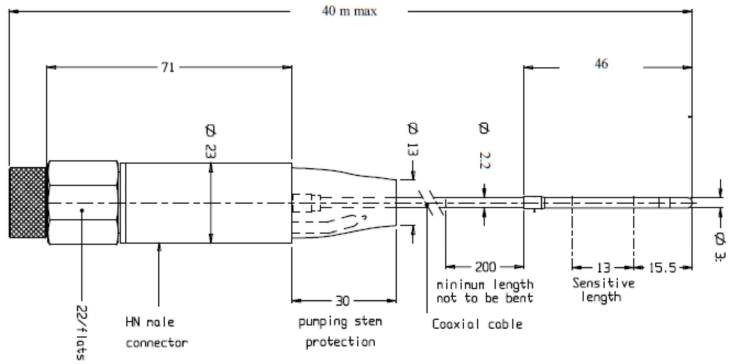
- Watertight stainless steel structure
- Integral, mineral insulated cable

Nuclear characteristic			
Sensitivity to thermal neutrons [1]	Pulse mode	$8x10^{-6}$	$c.s^{-1}/n.cm^{-2}.s^{-1}$
	Fluctuation mode	$2.9x10^{-32}$	$A^2.Hz^{-1}/n.cm^{-2}.s^{-1}$
	Current mode	$9.2x10^{-19}$	$A/n.cm^{-2}.s^{-1}$
Neutron flux ranges	Pulse mode [2]	$10^7 – 3x10^{11}$	$n.cm^{-2}.s^{-1}$
	Fluctuation mode	$10^6 – 10^{14}$	$n.cm^{-2}.s^{-1}$
	Current mode [3]	$10^{12} – 10^{14}$	$n.cm^{-2}.s^{-1}$
Gamma sensitivity		$2.5x10^{-12}$	$A/Gy.h^{-1}$
Exposure limits	Thermal neutrons [4]	max $1.5x10^{20}$	$n.cm^{-2}$
	Gamma exposure	max 10^{19}	Gy
	Gamma dose rate	max 10^7	$Gy.h^{-1}$

Electrical characteristics			
Insulating resistance at 250 VDC [5]	at 20°C	min 10^{12}	Ohm
	at 300°C	min 10^8	Ohm
Operating voltage	Nominal up to 300°C	250	VDC
	Maximum at 20°C	300	VDC
	Limit with no radiation	500	VDC
Cable capacitance		120	pF/m
Cable characteristic impedance		50	Ohm

Mechanical and physical characteristics		
Detector	Case, electrodes	Stainless steel (Co<0.05%)
	Insulators	Al_2O_3
	Sensitive layer	U > 90% enriched in ^{235}U
	Filling gas	Ar + 4% N_2 at 500 kPa
Cable	Type	Coaxial
	Insulator	SiO_2
	Curvature radius [6]	min 30 mm
Connector	Type [7]	Watertight HN
	Insulator	Al_2O_3

Outline



Notes.

[1] Values depending on the characteristics and the calibration of the measurement equipment. The pulse sensitivity is calculated from the (alpha-neutron) discrimination curve for a discriminating threshold corresponding to a alpha counting rate of 0.01 $c.s^{-1}$.

[2] Pulse mode operating range for a measurement equipment with a resolution shorter than the collection time of the detector.

[3] Current mode operating range: the lower limit of the current mode operating range depends on the electronics (specially on the input amplifier) and on the signal / parasitic current ratio (parasitic current = leakage current + gamma current + alpha current). The upper limit is depending both on the detector and the elctronics (loss of linearity).

[4] Flux corresponding to a 10 % sensitivity loss of the detector.

[5] The insulating resistance measurement includes the alpha current.

[6] This is the smallest irreversible curvature radius.

[7] In order to avoid humidity penetration during storage, the connector is closed with a cap to be removed just before use. As a general rule, prevent any humidity penetration at the connection level (refer to "Instructions for use and handling» in the package). Other connector types are possible. To be required when ordering.

Max operating temperature of detector and cable: 300 °C

Unless otherwise stated, all characteristics are given at 20°C and dimensions in mm.

2017-08-17

PHOTONIS Nuclear