



PROTK

SRM 502TM

Source Range Monitor (Start-up Channel)



Source range monitor used in combination with fission chamber for ex-core neutron flux monitoring in the start-up range.



FEATURES

- Qualified to perform category A functions according to IEC 61226 and KTA 3505 (for safety-related instrumentation)
- Seismic qualification (IEEE 344 and KTA 3505)
- Available with fission chambers of various sensitivities (see table)
- High longevity due to the robustness of fission chambers, LOCA proof fission chambers are available
- Large measurement range
- Signal filtering with adaptive time constant
- Calibration to neutron flux signal or reactor power (nv, %FP)
- Calculation of the relative flux change rate (reciprocal of the reactor period) or rate of change of reactor power (in decade/min)
- Linear and/or logarithmic analog outputs
- Generation of analog and binary outputs for the reactor protection system
- Built in test signal generators (remote activation possible)
- Optional: reactimeter

DESCRIPTION

The source range monitor SRM 502 forms part of the digital Neutron Flux Monitoring Systems (NFMS) product line proTKTM. It is used, in combination with fission chamber, for ex-core neutron flux monitoring in the start-up range.

The associated processing unit DAK 250-i has been designed and is qualified (in hardware and software) to meet category A requirements, applicable at the level of the reactor protection system.

Note: $1 \text{ nv} = 1 \text{ neutron} / (\text{cm}^2 \cdot \text{s})$

EX-CORE FISSION CHAMBERS

The ex-core fission chambers of the SRM 502 are designed to provide neutron flux information at low (thermal) neutron flux levels and can withstand harsh environmental conditions up to LOCA and post-LOCA conditions. Together with the DAK 250-i, these detectors operate in the pulse mode of the start-up range.

Reference (1)	Mode	Neutron Sensitivity (cps/nv)	Operating Range (nv)	Nominal Diameter (mm)	Detector Length (mm)		Integral Cable
					Nominal	Sensitive	
CFUG08 (2)	Pulse	4	2E-1 to 2E+5	80	419	220	6 mm coaxial
CFUL08 (2)	Pulse	1	1E+0 to 1E+6	48	384.5	211	6 mm coaxial
CFUM18	Pulse	1E-1	1E+1 to 1E+7	25.4	263	120	6 mm coaxial

Notes (please consult Mirion Technologies for details): (1) Other types of fission chambers are available, (2) Tested for LOCA

DETECTOR COMMON CHARACTERISTICS

- Maximum operating temperature: 250°C (482°F)
- Nominal operating voltage: 600 VDC
- Connector type: HN (male/female)
- Maximum fluence: 2E+19 nvt (neutrons/cm2)
- Maximum dose rate: 1E+4 Gy/h
- Maximum gamma exposure: 1E+9 Gy

PREAMPLIFIER (NV 320)

- Input impedance matched to impedance of detector cable (50 or 75 Ω)
- Power supply provided by the DAK 250-i
- Integrated test signal generator
- Max. distance to detector > 100 meters (330 ft)
- Max. distance to processing unit > 100 meters (330 ft)
- Dimensions: 268 mm x 155 mm x 53 mm

DIGITAL PROCESSING UNIT (DAK 250-i)

- Modular, multi-processor system
- Program code & configuration parameters, fixed in EPROM
- Non-volatile parameter memory (CMOS-RAM with integrated Li-battery)
- Data interface: up to two RS 232 and/or RS 485 (with optional built in firewall)
- Alphanumeric LCD: 2 x 16 characters (measurement values, status, diagnostic, parameters, thresholds...)
- Alarm and status LEDs on the front panel
- HV detector supply 0 ... 0.5/1/2/4 kV
- Dimensions: standard 19" x 3U rack (IEC60297)

ENVIRONMENTAL CHARACTERISTICS (For Electronics)

- Temperature (incl. pre-amplifier): 0°C to +70°C (+32°F to +158°F)
- Relative humidity: max. 75% RH

ELECTRICAL CHARACTERISTICS

- Power supply: 24 VDC or 115/230 VAC (50/60 Hz)
- Isolated analog outputs: 0/4-20 mA, 0/2-10 V
- Binary outputs (isolated relays): 60 V/0.5 A or 125 V/1 A

REFERENCE STANDARDS

- Safety classification: Category A, acc. IEC61226
- Software: IEC60880, KTA3503/3505
- Qualification: IEC60780, IEEE323, KTA3505
- Seismic: IEC60980, IEEE344, KTA3503/3505
- EMC/RF: IEC61000-6-2, IEC61000-6-4

VERSIONS

- 24 VDC or 115/230 VAC (50/60 Hz)
- Other fission chambers available
- Various lengths of integral detector cable
- Number and type of input and output modules adjustable

ACCESSORIES

- Seismic cabinet or wall-mounted cabinet
- Field cables at custom lengths

Featuring:

