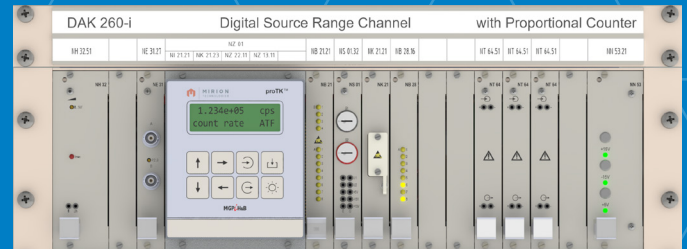




PROTK™ NEUTRON FLUX MONITORS

SRM 510™

Source Range Monitor



Neutron flux monitor for reactor start-up in the source range.

DESCRIPTION

At the heart of the SRM 510 source range monitor resides the DAK 260-i digital start-up signal processing unit that belongs to the Mirion proTK™/260 series of signal processing units for safety critical applications.

The DAK 260-i channel can be used with any type of neutron detector in the pulse mode and a matching pulse-preamplifier.

Hardware and software of the SRM 510 monitor are designed and qualified for use at the level of the reactor protection system.

With the SRM 510 monitor, Mirion provides the complete neutron monitoring system for the source range during reactor start-up from neutron detector to the safety signals for reactor protection and control.

FEATURES

- ✓ Modular design, highly customizable
- ✓ Operated with a B-10, BF₃, He-3 proportional counter or a fission counter
- ✓ Provides the count rate, calibrated neutron flux (nv) or reactor power (%FP, W, ...)
- ✓ Calculation of flux change rate (reciprocal of the reactor period)
- ✓ Signal filtering with adaptive filter parameters
- ✓ Generation of analog output signals with lin. or log. scaling
- ✓ Generation of binary alarm, trip and status indication signals
- ✓ Integrated test signal generators and simulation capabilities
- ✓ Secured serial interface
- ✓ Custom detector assemblies and mounting options, field cables and connectors available on request
- ✓ Qualified for Category A functions (Class 1 systems) acc. IEC 61226

SRM 510™ SOURCE RANGE MONITOR

| DETECTORS | | | | | | |
|-----------------------------------|--------------|----------------------|---------------------------|-------------------------|------------------------------------|----------------------------|
| Type | Product Code | Sensitivity (cps/nv) | Nominal Op. Voltage (VDC) | Neutron Flux Range (nv) | Dimensions (mm) ϕ , L (total) | Integral Cable, Connectors |
| B-10 Proportional Counters | PN 25 | 4.5 | 800 | 1.0e-1 ... 2.0e+5 | 25, 417 | 1 x HN |
| | PN 50-2/4/6 | 5 / 10 / 15 | 800 | 1.0e-1 ... \leq 3e+5 | 50, 379 / 559 / 739 | 1 x MI-cable + HN |
| BF₃ Counters | NY-10937 | 4.5 | 2,050 | 2.2e-1 ... 2.2e+4 | 25.4, 330 | 1 x HN |
| | WL-24425 | 25 | 3,500 | 1.0e-1 ... 7.0e+4 | 25.4, 595 | 1 x Type 237 (coax.) |
| Fission (U-235) Counters | WL-23110 | 0.18 | 300 | 6.0e-0 ... 6.0e+5 | 25.4, 305 | 1 x HN |
| | WL-6376A | 0.7 | 300 | 1.4e-0 ... 1.4e+5 | 50.8, 292 | 1 x HN |

The detectors are designed to withstands max. temperatures from 107 °C/225 °F (BF3 counters) to 357 °C/676 °F (Fission Counter WL-23110). For the full range of available detectors, for specific applications and for receiving further technical data, please contact Mirion.

| DIGITAL SIGNAL PROCESSING |
|---|
| Multi-processor system |
| Protected program memory |
| Non-volatile parameter memory |
| RS-232 and/or RS-485 serial interface for measurement data, status information and parameter settings |
| Internal LC-display: 2 x 16 characters |

| OUTPUT SIGNALS | |
|--|--|
| Log. count rate/neutron flux | 0.5 ... 5e+5 cps 0.1 ... 1e+5 nv |
| Linear count rate (DAK 260-i) | 0 ... 5e+5 cps |
| Relative flux change rate (log rate = 1/reactor period) | -3.33 ... 0 ... +33.3 %/s (equiv. period -30 ... ∞ ... +3 s) |
| Analog outputs | 0/4 ... 20 mA/600 Ω , isolated |
| Binary outputs (isolated relay changeovers) | 60 V/0.5 A or 125 V/1 A |

The shown scaling of the output signals are examples and can be configured according to the application requirements.

| ACCESSORIES | |
|---|---|
| Cabinet, incl. EMI/EMC and seismic testing | I&C cabinet or wall mounted housing (e.g. IEC 61000-6 2/4, IEEE 344) |
| Field cables (> 100 m) | Organic, low noise coaxial or triaxial field cables Halogen free, flame retardant (e.g. IEE 383, IEC 60754-1, IEC 60332-1-2) |

| PRE-AMPLIFIERS | |
|---|--|
| Pulse pre-amplifier NV 320 | Characteristic I/O impedance matched to cables (e.g. 50 or 75 Ω) |
| Integrated test signal generators (pulses or DC) | Activation via HMI or through serial interface. |

| ENVIRONMENTAL, ELECTRICAL, MECHANICAL CHARACTERISTICS (SIGNAL PROCESSING UNITS) | |
|---|---|
| AC/DC power supply 230 VAC or 115 VAC 18 ... 33 VDC | +10%/-15%, approx. 30 VA |
| High voltage supply HV module in DAK 260-i | Adjustable within max. range: 0 ... 0.5/1/2/4 kV |
| Operating temperature open rack recommended long-term op. | 0 ... 70 °C (32 ... 158 °F) 10 ... 40 °C (50 ... 104 °F) |
| Mechanical vibrations | max. 5 g, 5 ... 100 Hz (or acc. custom requirements) |
| Dimensions (mm/inch) Rack (W×H×D) Plug-in modules | 19" system acc. IEC 60297 483 × 133 × 280 / 19 x 5.2 x 11 100 × 160 / 3.9 x 6.3 |

| QUALIFICATION / DESIGN STANDARDS (SELECTION) | |
|--|--|
| Design Software Qualification | IEC 61513 / IEEE 603 IEC 60880 / IEEE 7.4.3.2 IEC/IEEE 60780-323 IEC/IEEE 60980-344 |

| RELATED PRODUCTS | |
|------------------------|---|
| DAK 260 | Digital signal processing unit for reactor start-up |
| IRM/PRM/WRM 510 | Intermediate/power/wide range monitor |



Copyright © 2024 Mirion Technologies, Inc. or its affiliates. All rights reserved. Mirion, the Mirion logo, and other trade names of Mirion products listed herein are registered trademarks or trademarks of Mirion Technologies, Inc. or its affiliates in the United States and other countries. Third party trademarks mentioned are the property of their respective owners.