MIRION TECHNOLOGIES

PROTK

PDM 502™

Power Distribution Monitor
(In-Core Neutron Flux Instrumentation)

Power distribution monitor used with SPN detectors for in-core neutron flux distribution monitoring in the power range.

FEATURES

- Up to six in-core SPND per DLK 250
- Compatible with in-core SPND of various sensitivities and response times
- High reliability of SPND for severe environmental conditions (temperature, pressure...)
- Differential current amplifier for dynamic signal compensation
- Signal filtering with adaptive time constant
- Neutron flux signal for each detector
- Digital calibration and offset compensation for each detector signal
- Calculation of the mean value and generation of a substitute signal for a faulty detector
- Linear analog outputs
- Generation of analog and binary outputs for the reactor protection system
- Built in test signal generators (remote activation possible)
- Option: integrated transmitter for fuel temperature monitoring
- Option: fast isolated outputs for noise analysis

DESCRIPTION

The power distribution monitor PDM 502 forms part of the digital Neutron Flux Monitoring Systems (NFMS) product line proTK™. It is used, in combination with Self Powered Neutron Detectors (SPND), for in-core neutron flux distribution monitoring in the power range.

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

SELF POWERED NEUTRON DETECTORS (SPND)

SPND are designed for the detection of thermal neutrons within the core of the reactor. These detectors generate a current proportional to the neutron flux density without applying any external voltage source.

Typically, the detector current is caused by the emission of beta radiation (electrons) from the target material which gets activated by the neutrons. Different types of emitter material (Rhodium, Vanadium, Cobalt...) can be used and adapted to meet customer's requirements.

For in-core applications, during power operations, the SPND are used in current mode. They are designed to withstand severe environmental conditions and are extremely radiation resistant.

TYPICAL CHARACTERISTICS OF MIRION SPND

- Measurement range: up to 1E+15 nv
- Maximum operating temperature: 400°C (752°F)
- Diameter of the integrated mineral cable: 1.6 mm
- Connector type: BNC
- Diameter of the detector: 1.6 mm
- Different sensitivities and response times of detection are available (1)

(1) Please consult Mirion Technologies for complementary information

DIGITAL PROCESSING UNIT (DSK 250)

- 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
- Up to six SPND per DLK 250
- Detector current range, selectable by jumper, Full Scale: 0.1 µA / 0.3 µA / 1 µA
- Dimensions: standard 19" x 3U rack (IEC60297)

ENVIRONMENTAL CHARACTERISTICS (For Electronics)

- Temperature: 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

- Qualification: IEC 60780, IEEE 323, KTA 3505
- EMC/RF: IEC 61000-6-2, IEC 61000-6-4

VERSIONS

- 24 VDC or 115/230 VAC (50/60 Hz)
- Various SPND and cable lengths
- Number and type of input and output modules adjustable

ACCESSORIES

- Seismic cabinet or wall-mounted cabinet
- Field cables (length on customer's specification)

Featuring:

MGPi H&B

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