Previous model number: 2104

Fork Detectors

B2104 Series

Introduction

ANTECH B2104 Series Fork Detectors are routinely used as inspection tools, for safeguards purposes, and to conduct non-destructive measurements to determine the radiation from reactor pond fuel rod assemblies while stored underwater.

Fork Detectors are used to measure neutron and gamma radiation activity from spent fuel assemblies. They are supplied in two different configurations:

- BWR used to measure Boiling Water Reactor fuel rods
- PWR used to measure Pressurised Water Reactor fuel rods

The difference between the different types of unit is the inner distance between the tines of the detector head; the PWR option has a larger detector head and the BWR has a smaller detector head. All other components are identical. The detectors are designed to be portable and easy to assemble to facilitate transportation between sites and quick set-up.

B2104 Series Fork Detectors are manufactured to meet EURATOM's requirements. Each unit consists of a detector head with integral electronics, a set of connection pipes with associated interconnect clamps, O-ring seals, interconnect cables, a system status indicator unit, and a mechanism for attaching the detector assembly to the pond gantry side rails. There are three output signals: two from the neutron detectors which are combined as a single output from the two fission chambers in each tine of the detector head, and one from the two ion chambers which is combined as a single output. These three output signals are fed into the counting electronics, such as a MiniGrand or MicroMesskanal.

The status indicator box - also known as a Top Junction Box – is fitted with Health status LED's to indicate the presence of power to the detector head, and two further LED's to show when pulses are being received from each Fission Chamber channel, to provide the user with a visual indication that the system is counting. Each detector can be supplied tested with nuclear sources (optional) and are delivered with full documentation and test records including a leak test report, Certificate of Conformance and manufacturers test records for preamplifier and ^{3}He tubes.

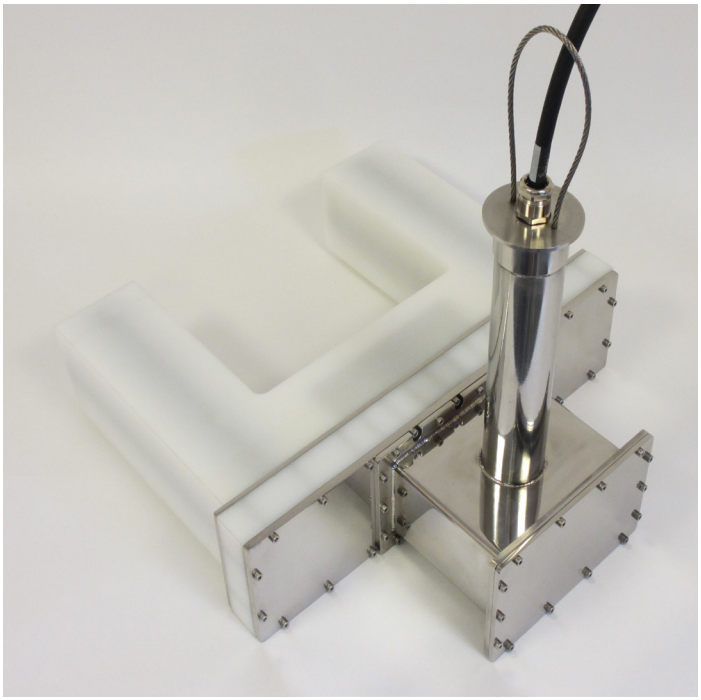
The Top Junction Box (TJB) mounts onto the lifting pipe. It regulates and transmits the 12V or 5Vdc supply - dependent on the nucleonics specified - from the system nucleonics to drive the A111A pre-amplifiers. It also drives a series of LEDs facing the user.

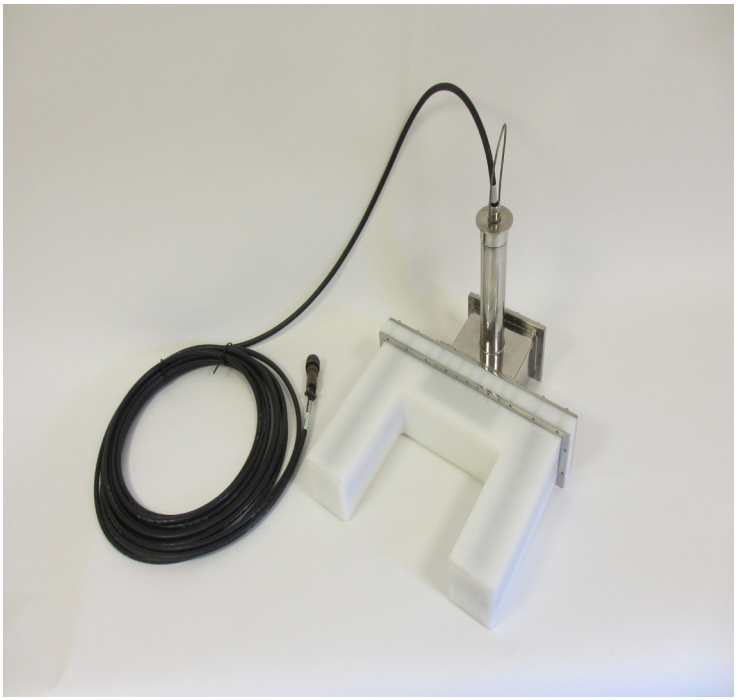
Features

- High density polyethylene detector head - PWR fuel configuration or BWR configuration - to be specified by customer
- All external components manufactured from polished stainless steel and polyethylene
- Rugged cable construction with extra strain relief for connectors
- Water tight detector head and pipe assemblies (IP68)
- Supplied with 11000 mm (433.07 in) of extension pipes, connecting flanges, clamps and 'O' ring seals
- Mounting bracket for securing to gantry surrounding fuel pond
- Reusable and decontaminable shipping containers for the detector body, pipe sections and other components
- An essential spares and maintenance kit

Benefits

- Can be supplied as a system with all commercially available neutron counting shift registers
- Designed for ease of decontamination
- Easily assembled and dismantled for transportation between facilities
- Highly reliable detector electronics
- Components leak tested prior to delivery
- Detector head and extension pipes supplied in reusable type transportation containers
- IAEA or EURATOM configuration (Photographs depict IAEA variant)
- BWR and PWR detector components to a common design, apart from polyethylene detector head, enabling substitution of detector head geometries





Specification

	Model B2104-BWR	Model 2104-PWR
Configuration	BWR	PWR
Dimensions between tines (mm) W x D	165 x 195	235 x 245
Neutron detectors	4 x Model FC167 Fission Chambers with 127 mm (5 in) active length (or equivalent)	
Gamma detector	2 x LND Model 52110 Ion Chambers with 86 mm (3.4 in) active length	
Preamplifier	PDT 210A (or equivalent)	
Extension pipes	5 x 2000 mm (78.7 in); 1 x 1000 mm (39.37 in) length, 1 x lifting pipe	
Cables	RG174 (or equivalent) multicore cable assemblies under a single common cover	
Nucleonics	Fully compatible with MicroMessKanal counting electronics	