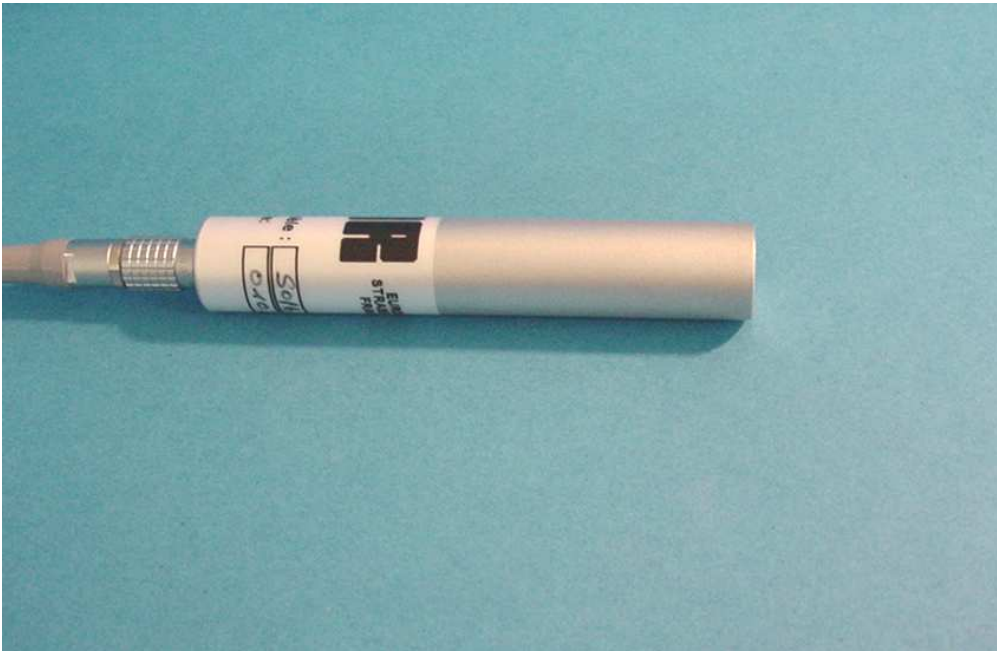


# GAMMA RAY DETECTION PROBE MODEL S016



## INSTRUCTION'S MANUAL

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## MAIN CHARACTERISTICS OF THE GAMMA RAY DETECTION PROBE

The SO16 probe was developed for using planar or hemispherical CdTe/CdZnTe as well as scintillator detector. It incorporates the detector and the charge sensitive preamplifier. The standard probe housing (Aluminium alloy) has a cylindrical shape of 16 mm diameter and a length of 92 mm as shown on Fig. 1.

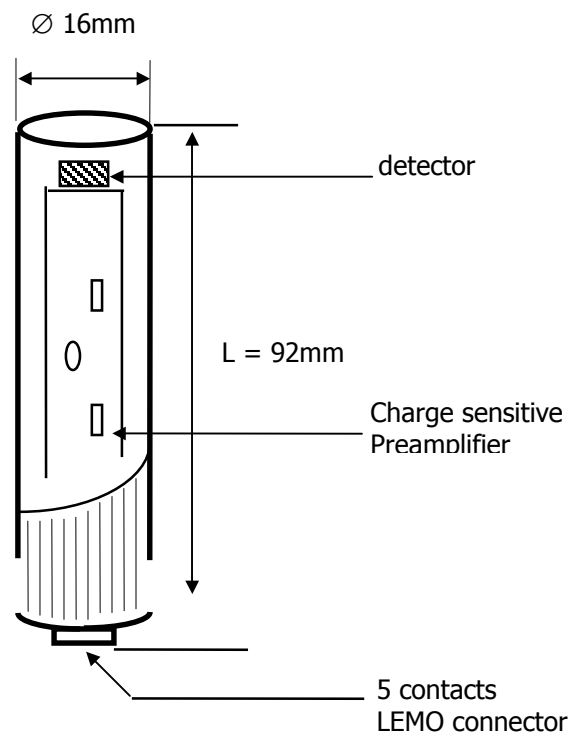


Fig. 1. Scheme of SO16 gamma-ray detection probe.

This small probe is recommended for general use in both counting and spectroscopic nuclear applications in the laboratory as well as in industry. The small weight, low bias voltages and low consumption make this probe practical.

The detector type, its size and quality are mounted in this probe on request. The standard probe contains the spectral quality CdTe planar detector of dimensions 5x5x2 mm<sup>3</sup>.

### **PLANAR DETECTOR**

Detector type: CdTe or CdZnTe

Size: 5x5x2 mm<sup>3</sup> (standard)

The probe including planar detector allows gamma ray detection with a good spectral resolution of 5-7 % for <sup>57</sup>Co. It allows frontal detection in the energy range of 20 to 200 keV.

### **HEMISPHERICAL DETECTOR**

Detector type: CdTe or CdZnTe

Sensitive volume: from 55 to 65 mm<sup>3</sup>

The probe with hemispherical detector mounted inside offers nearly uniform 360° solid angle detection sensitivity. It operates without collimator and is the best suited for inspection tasks, where the direction of irradiation cannot be foreseen. The hemispherical geometry of detector ensures a good energy resolution and peak to valley ratio in a gamma energy range from 80 keV up to 1000 keV.

### **CSI(TL) COUPLED TO SILICON PHOTODIODE**

The CsI(Tl) scintillator coupled to a Si diode allows to obtain good spectroscopic quality performances in the high energy range. This type of detector requires low polarisation voltage.

# PROBE SYNOPTIC

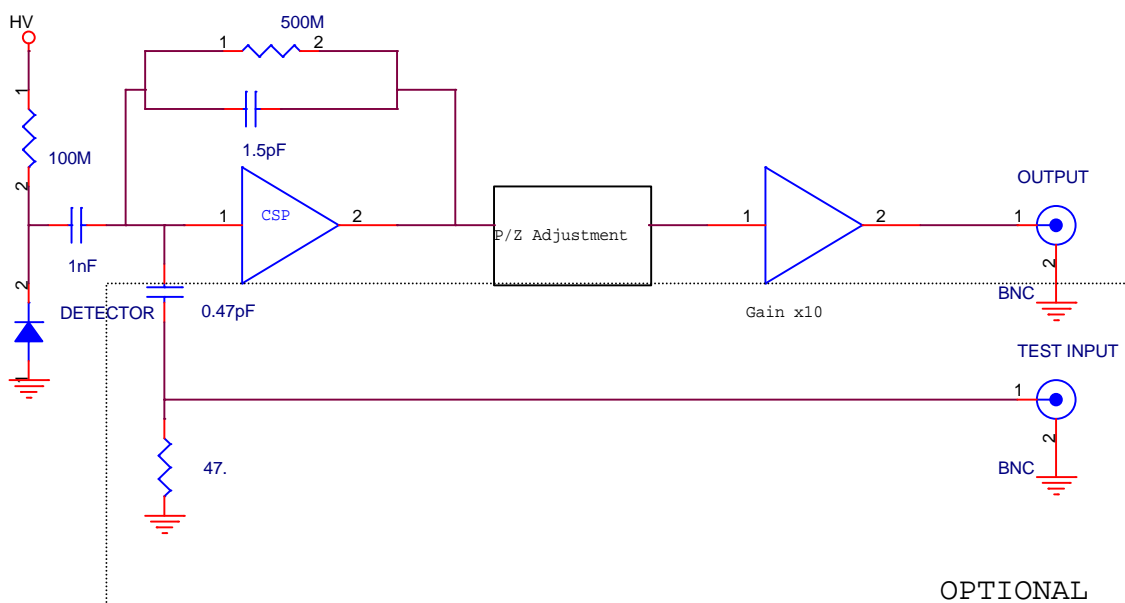


Fig. 2. Synoptic scheme of SO16 probe.

## TECHNICAL SPECIFICATIONS

**TYPE :** SO16

**DETECTOR:**

Type : CdTe detector hemispheric planar or CsI coupled to a Si photodiode

Volume : from 1mm<sup>3</sup> to 80mm<sup>3</sup>

**PREAMPLIFIER:**

Type: PRS16 SMD technology charge sensitive preamplifier

Noise: 1.4keV (CdTe, 0pF)

Sensitivity: 250mV/MeV Si

Risetime: 70ns (0pF)

Fall time: 200μs

Feedback network: 500MΩ / 1.5pF

Output resistance: 50 Ω

Supply voltage: ±12 V, ±20%

Supply consumption I<sub>cc+</sub>=13 mA I<sub>cc-</sub>=9 mA

Test input: 47Ω/0.47pF, Optional

## CABLE & CONNECTOR

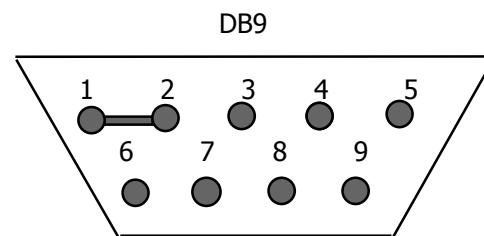
### SUPPLY VOLTAGES

Amphenol 9 contacts (DB9), male

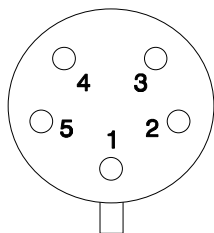
Detector BIAS voltage: high voltage BNC connector, female

Output : BNC connector male

TEST : BNC connector male (Optional)



1-2: GND	6 :
3 :	7 :
4 : +12V	8 :
5 :	9 : -12V



- Probe connector: Lemo 5 contacts, male
 

1:	Bias
2:	-12V
3:	Output
4:	+12V
5:	Test Input (Optional)

The standard length cable is 3 m (maximum 25m (on request)).

## MECHANICAL CHARACTERISTICS

Size: cylindrical shape,  $L = 92 \pm 1\text{mm}$ ,  $\varnothing = 16\text{mm}$   
Material of housing : Aluminium alloy  
Entrance window Aluminium with  $500\mu\text{m}$  thickness

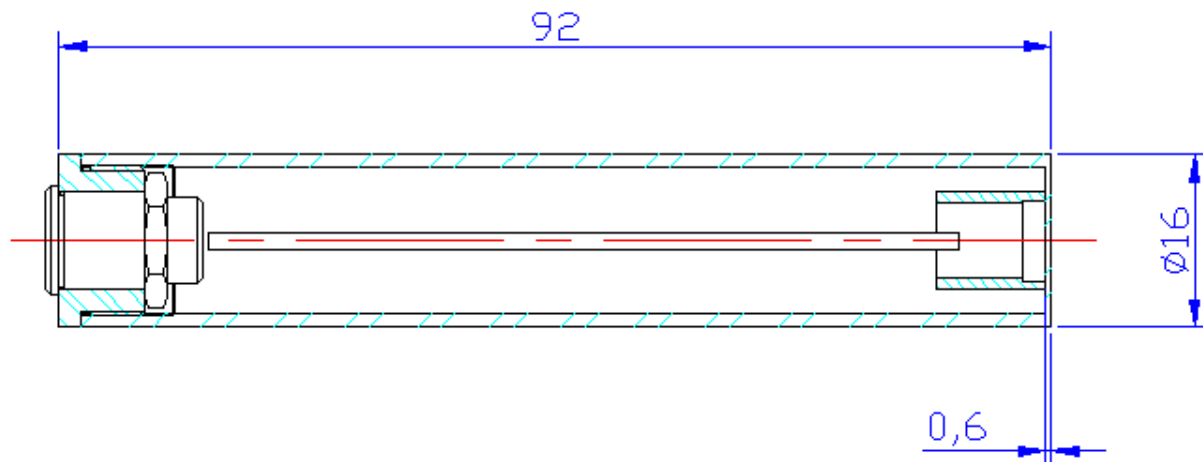


Fig. 3. Technical plan of SO16 probe.

## SIGNAL PROCESSING

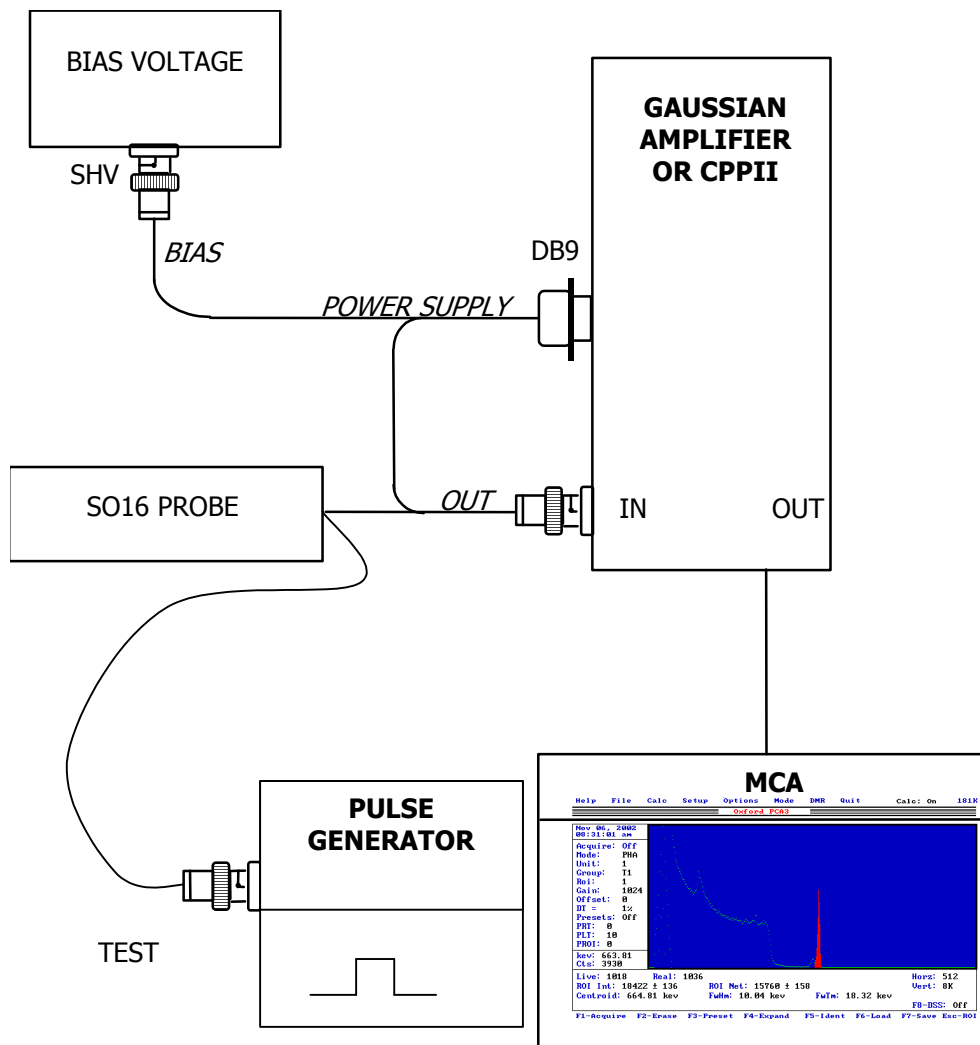
Common spectroscopic amplifier with gaussian / triangular shaping.

Hemispherical detector: gaussian or triangular shaping amplifier

Planar detector: gaussian or EURORAD model CPP (Compact Pulse Processor) or EURORAD model  
EUROSPECTRUM ENHANCER

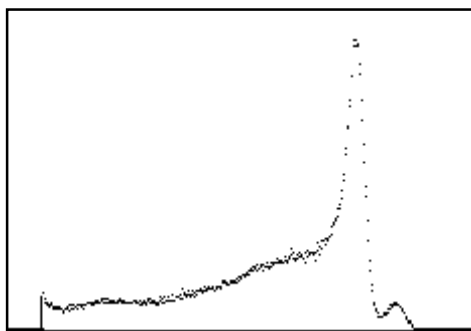
# CONNECTION DIAGRAM

## NIM amplifier or CPPII

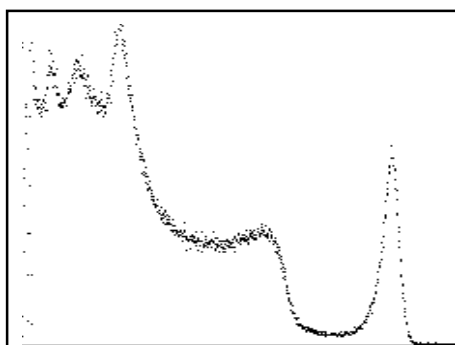


**TYPICAL SPECTRA WITH CDTE DETECTOR**

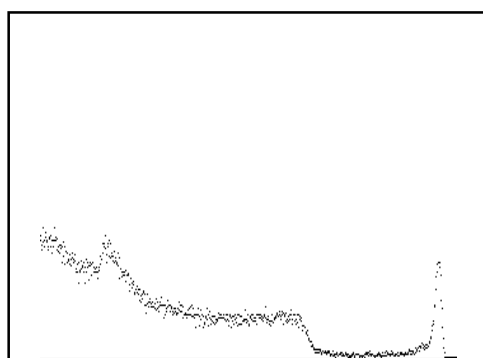
**PLANAR DETECTOR <sup>57</sup>CO**



**HEMISPHERIC DETECTOR <sup>137</sup>CS**



**PLANAR DETECTOR AND CPP OR SELECTOR <sup>137</sup>CS**



**NOTICE OF INFORMATION**

(please complete in case of problem with a system)

**NAME :**

.....

**ADDRESS :**

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.....

**TEL :** ..... **FAX :** .....

**PROBLEM ENCOUNTERED :**

.....  
.....  
.....  
.....  
.....

**Please send this notice back to :**

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