

# Beam Profile Monitoring System System 5100



The system is especially designed for providing data on the intensity, profile and position of ion or electron beams.

It can be used with all forms of particle accelerators such as mass spectrometers, isotope separators, and V.d. Graaff accelerators.

The "heart" of the system is the probe unit, which can be supplied with sensor probes of different shapes to suit different applications.

The probe sweeps through the beam and intercepts part of it; the current, absorbed by the probe, is carried to an oscilloscope (optional), where the "X" deflection is controlled by the electronic driver unit. This process gives a picture on the oscilloscope of the intercepted current as a function of the probe's movement through the beam, furnishing information on the intensity, profile and position of the beam

## Application examples

### A. In an isotope separator

By mounting a probe (model 516, pin type) after the deflection magnet, a profile picture, recorded on the oscilloscope, gives immediate information on the relative positions on the isotopes and their relative abundance.

### B. In the beam line of a V.d. Graaff accelerator

By mounting a vane type probe in the beam line of a V.d. Graaff particle accelerator, the profile picture gives immediate information on intensity, profile and position of the beam in both x- and y-direction. This is particularly useful when it is of primary importance to control the location of the beam in relation to the centre-line. For this purpose, the probe is provided with position markers, giving exact indication of the centre position.

The above mentioned applications are just two examples of the various uses possible with the Danfysik beam monitoring system.

### Probe 516 pin with single pin probe

- for scanning in one axis, x or y
- scan frequency, 18 Hz
- scanner range, max. 150 mm
- probe capacity to ground, 15 pF
- probe noise pick-up, 10 pA<sub>rms</sub>
- drive signal, max. 25 V p-p



### Probe 516 vane with dual vane probe

- for simultaneous scanning in two axis, x and y
- scan frequency, 14 Hz
- scanner range, max.  $\pm 30^\circ$
- max  $\varnothing$ beam at  $\pm 20^\circ$ , 31.5 mm
- probe capacity to ground, 25 pF
- probe equivalent noise, 10 pA<sub>rms</sub>
- Drive signal, max 25V pp



### Position marker 571

- for installation with probe 516
- generates marker signals at two fixed positions for absolute check of beam tube centre and scanner range
- requires external power (supplied from 522)



### Probe unit housing 561

- beam tube (max. diam. 4") mounting flange optional
- suitable for 516 vane probes



### Probe electronics 522

- for operating two probes of type 516 pin/vane simultaneously
- provides gain control for preamplifiers 537/548



# Preamplifier 537/548

## Features

- Remote controlled sensitivity over 6 ranges
- Additional range (7) available for testing
- Bias Power supply (reversible) available on BNC socket-adjustable from 20-100 V



## Specifications

### Model 537

Input power	220/110 V AC 50/60 Hz Single phase (internal fuse 0.2 Amp)
Sensitivity	Most sensitive range: 5 V out for 10 nA input Least sensitive range: 5 V out for 1 mA input
Rise/fall times	0.6 and 0.2 msec. for 10nA and 100 nA ranges 50 µsec. for all other ranges
Range control	Via 12 pin DIN connector. Control 12 V/4 mA (via simple switches or open collector logic)
Current input	BNC
Voltage output	BNC

### Model 548

Identical to 537 but 10 times more sensitive i.e. most sensitive range 5 V out for 1 nA input.  
Least sensitive range 5 V out for 100 µA input.

## Electrical schematic



