

# NT200

## Smear test instrument



**NUTRONIC** Gävle Sweden



## Main features

- Compact design with handy mechanism for two samples
- Permanently filled Ar-CO<sub>2</sub> proportional detector
- Fast measurements
- Automatic detection of alpha in beta mode (auto-alpha)
- Automatic background compensation with separate background detector
- Very easy to decontaminate
- Easy to change mode between smear sample and air sample

The NT200 is a small and user-friendly smear test instrument. The compact design and the relatively low weight makes it possible to place the instrument directly at the working area in a nuclear power plant. Measuring at locations with increased background radiation is no problem because the NT200 has a 50 mm lead shield and an automatic background compensation.

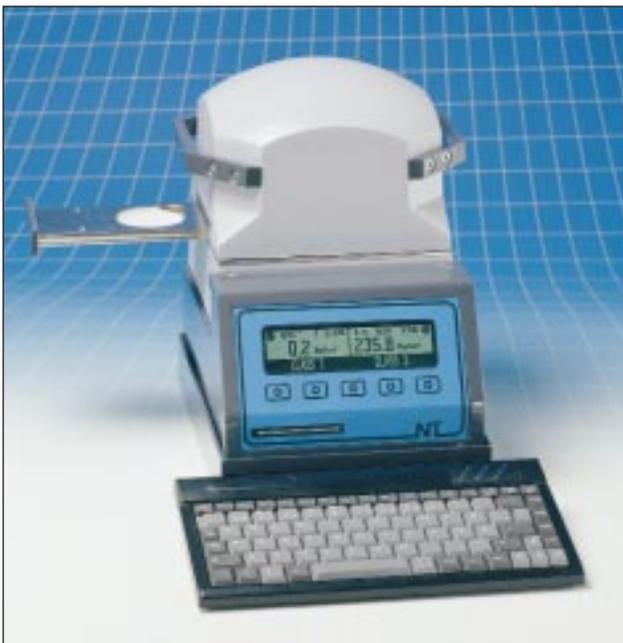
It is uncomplicated and fast to use the NT200. A pass-through slide acts as a combined sample holder and start button. Insert the sample, push the slide through the instrument and the measuring starts immediately. Meanwhile the next sample can be put at the other end of the slide. When the first sample is measured the result and the classification is shown on the display. Push the slide to the opposite position and the measuring of the second sample starts. Insert the next sample and push the slide (and so on) until the sample series is completed. Push a button on the front panel and the built-in printer prints the results, date and time.

The computer in the NT200 optimises the measuring process and measuring times to as low as four seconds are possible depending on the required accuracy.

The combination of a proportional detector with alpha and beta separation, a lead shield, computer control and a built-in printer makes it possible for the NT200 to replace permanently installed smear test instruments located at central departments. The NT200 can be placed directly at the working area in the plant where the operator can do the smear tests and measure them immediately without unnecessary waiting for transportation to a permanently installed instrument. The NT200 saves time and improves the workflow for both routine measurements and measurements during time critical plant maintenance.



*Insert a sample, push the slide and the measuring starts.*



*The optional external keyboard can be used to document the smear samples.*

The optional external keyboard and a removable PC-CARD memory makes the NT200 a complete system for documenting smear samples. The operator can make notes about the samples and store them together with the results. The data can be exported to any PC with a PC-CARD reader for further processing and storage.

## Detector

The NT200 has a proportional detector that can separate alpha and beta radiation. It has low sensitivity for gamma (background) radiation. The detector is permanently sealed and needs no gas supply.

The instrument is equipped with two equal detectors. One measures the sample and the other one records the background radiation.

## Measuring modes

The NT200 can be set to measure beta only, alpha and beta or beta with auto-alpha detection (auto-alpha is patented by Nutronic). This makes the instrument flexible and easy to adapt to different tasks.

In the beta mode the measuring is performed on the beta plateau only. In alpha and beta mode the instrument will first measure on the beta plateau. When the beta measurement is completed the detector bias voltage is lowered to the alpha plateau and a new measurement is started. The alpha and beta results are presented separately on the display and on the printer.

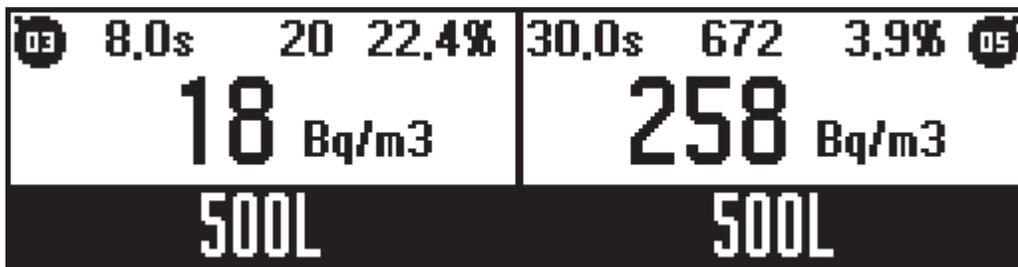
In auto-alpha mode the instrument will always start to measure in beta mode. During the measurement on the beta plateau the instrument monitors for pulses with high amplitude that are suspected alpha pulses. If high-amplitude pulses are found the NT200 will first complete the beta measurement and then lower the detector bias voltage to the alpha plateau and make an alpha measurement. Samples without alpha activity will only be measured in beta mode. In this way you are sure to detect alpha activity on the sample without increasing the measuring time (as in alpha and beta mode). The lower detector bias voltage on the alpha plateau ensures that only alpha radiation is registered.



A measurement in auto-alpha mode with the NT200. In the right windows alpha activity has been registered. The display clearly indicates this and shows the alpha and beta results separately.

## Air samples

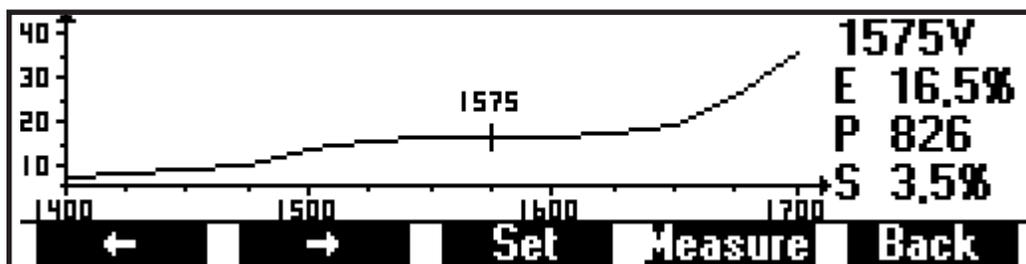
The NT200 can also measure air samples (50 mm paper filters). The supervisor can pre-set three air volumes that the operator can choose from. The result is displayed in Bq/cm<sup>3</sup>.



The NT200 can also measure air samples.

## Calibration

Calibration is simplified by an automated procedure. The activity on the reference source, the measuring time and the step voltage must be selected. The NT200 automatically selects the start and stop voltage. The scan is presented in a chart on the display and is printed on the printer.



Example on beta plateau from a Co-60 source. The arrow keys are used to step up and down in the plateau to select a suitable detector bias voltage.

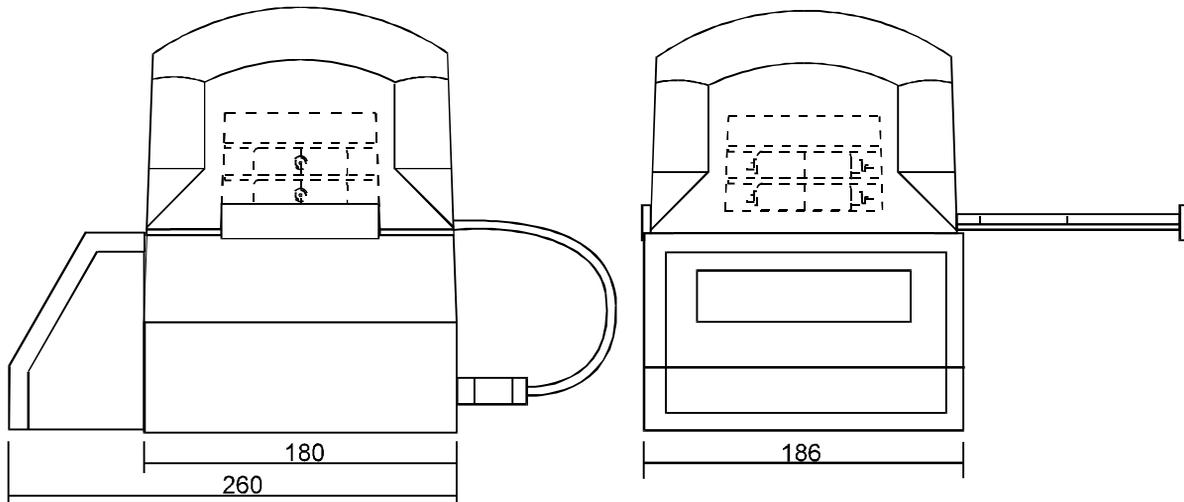
## Specifications

### Size and weight (All measures in mm)

Width 186, depth 260, height 260.  
Vial size for samples 52x6.

Lead shield approx. 50 mm thick.

Weight complete with computer and lead 56kg (6+20+30).



### Detector

Permanently filled and sealed proportional detector (Ar, CO<sub>2</sub>).

Window diameter 49 mm.

Working voltage approx. 1600v, plateau approx. 100v.

Life length at working voltage approx. 10E11 pulses, storage life almost unlimited.

Efficiency Co-60 16%, Am-241 15%.

Background 0,5 cps at 0,1µSv/h, 2 cps at 100 µSv/h.

### Computer

PC-104 form factor with 40MHz 80386 microprocessor.

PC-CARD slot (PCMCIA) for program updates and data transport.

2 serial ports (RS-232).

Keyboard port.

### Display

Resolution 256x64 pixels.

Viewing angle approx. 180 degrees.

Background light of CFL-type with white light.

Screensaver increases the life of the CFL tube.

### Printer

Thermo printer with 58mm paper.

### Mechanics

The slide mechanics is made of stainless steel.

The slide slot is coated with low friction PTFE for smooth action.

The slide can easily be removed and decontaminated.

The box is made of stainless steel coated with durable paint.

### Power

85-264 VAC, 50-60 Hz.

The NT200 complies with the CE standard.

#### Address

NUTRONIC AB  
Utjordsvägen 9N  
S-802 91 Gävle  
Sweden

#### Telephone

+46 26 658850

#### Telefax

+46 26 658851

#### E-mail

info@nutronic.se

#### Homepage

<http://www.nutronic.se>

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