MODEL S GAUGE WITH RECORDER

Industrial Nucleonics

PRODUCT INFORMATION 3-10-54

MODEL "S" EQUIPMENT

To meet the demand for a beta gauge to serve processes where economics do not justify an expenditure for AccuRay (Series R) equipment, Industrial Nucleonics is introducing to industry a new gauge to be known as the Model S. The Model S features a measuring circuit that has been field proved over a three-year period in special gauges made by Industrial Nucleonics.

It shall be emphasized that the Model S meets the same high standards of quality for which Industrial Nucleonics has become known in the nuclear gauging field. Although the Model S does not possess all the plus features of standard AccuRay equipment, it is not a "cheap gauge" in any sense of the word. Its basic measuring system is far superior to the so-called deluxe models of our competitors.

The basic Model S system includes a control unit and source-detector unit. The control unit houses a meter to indicate measurement, measuring and standardizing circuits and power supplies. The source-detector unit has a 24-inch throat depth. The basic price of the Model S gauge does not include a source, this is to accommodate a policy new to Industrial Nucleonics of offering an option to purchase the source outright or rent it for an annual fee.

Unlike the Model R line of gauges, the Model S is produced in quantity and is offered for sale as designed, no modifications can be made. Additional features available at extra cost are: traversing slide to allow manual traversing of the source-detector unit, repeat recorder to give permanent record of measurements, provision for 115 volt, 25 or 50 cycle operation; sample holder, chart viewer, and meter and recorder scales. Using the basic gauge plus the additional features listed above, an accurate, low priced, continuous measurement is now available.

Points of importance to be remembered about the Model S gauge are:

- Low cost to customer
- Field tested circuitry
- High quality components
- Source protective device
- Calibrations, installations, and applications extra
- Standard meter or recorder scales (not custom made for customer)
- No modifications or "specials"
- Manual standardization
- Manual traversing, traversing slide extra

SPECIFICATIONS

The following specifications apply to the new Model S beta gauges. They provide information to be used in applying the gauge to various processes. These

specifications should be carefully studied to assure that the gauge is applicable to the process under consideration since no modifications other than these listed can be made. The Model S is a packaged unit, produced in quantity, and as such does not lend itself to "specials".

A. Console

Maximum Size:	19" W x 15½" H x 13½" D.
Construction:	Heavy gauge steel - Standard Bristol Recorder Case.
Inner Door:	1/8" thick aluminum panel with components attached thereto is easy to swing open for maintenance.

Panel contains the following:

1. Power switch with positions OFF-STANDBY - ON
2. Standardization switch with positions MEASURE - CHECK 1 - CHECK 2
3. Knob for adjusting CHECK 1
4. Knob for adjusting CHECK 2
5. Rectangular meter with 4-1/2" face, and a standard 10-0-10 scale.
6. Dial calibrated in units of 1 to 1000 specification to read in the center of the meter scale.
7. Dial calibrated in units of 1 to 1000 for adjusting the span of the instrument.
8. Panel mounting in opening 18-9/16" W x 14-9/16" H.

B. Source Detector Unit

Maximum Size:	36" L x 10-3/4" W x 24½" H.
Construction:	Fabricated steel.
Finish:	Baked synthetic enamel.
Measuring Gap:	1-1/2"
Pass Line:	Maximum 8½" from mounting surface.
Mounting:	Mounting to be supplied by the customer.
Throat:	24" from center of radiation pattern to end of detector.
Source:	Hermetically sealed radioisotope enclosed in heavy metal block for protection against mill accidents. Source is rented unless customer can qualify with AEC for ownership of radioactive material.
Protective Devices:	The source is shielded by a printed circuit window which automatically releases a solenoid operated shutter and closes a pair of contacts suitable for actuating an alarm when the window is pierced. The shutter is also released whenever the gauge is turned off or the power fails. The shutter is opened again when gauge is turned on. The source is locked inside its protective housing with a tumbler type lock.

Industrial Nucleonics

PRODUCT INFORMATION 3-10-54

C. Power

Maximum of 2 amperes at 115 ± 15 volts and 60 cycles. Reference voltages supplied by batteries whose life is at least six months.

D. Radiation Levels

Maximum stray radiation: 7 mr. at 10½" in the on-sheet direction at angle of approximately 30° from the horizontal.

Maximum horizontal radiation: 7 mr. at 14".

Allowable time of exposure at 7 mr: 66 hr/wk.(per AEC standards).

E. Performance Characteristics

1. Maximum weight/unit area which can be measured - 600 mg./cm.^{2}
2. Minimum weight/unit area which can be presented full scale when measuring very light material - 6 mg./cm.^{2}
3. Measured area - 2-1/2" diameter circle (approximately)
4. Temperature effect - approximately .01 mg./cm.^{2}/degrees F at 100°F
5. Humidity effect - approximately .001 mg./cm.^{2} percent RH at 100°F
6. Pressure effect - approximately .22 mg./cm.^{2}/inch of Hg at 100°F
7. Tolerable flutter - ±1/8", at weights greater than 5 mg./cm.^{2}
8. Instrument response - 1/2 second for 63% response
   1 second for 90% response
   2 seconds for 99.9% response

F. Optional Features (at additional cost)

Traversing: A manual traversing mechanism can be provided to permit moving the measuring position or withdrawing from sheet. The maximum traversing distance is 30" and the detector may be secured at any point along its travel. The addition of a traversing mechanism will increase the pass line to mounting surface dimension by 9½" for a total of 18".

Averaging: Can be provided by changing the input time constant. Time constants available from .5 to 10 seconds for 63% response. Changes in the time constant will have an inverse effect on statistics.

Recorder: A self-balancing wide strip chart recorder can be provided as an external indicator.

Units to operate at frequencies other than 60 cycles.
Calibration of instrument to customer's particular process.
Power and interconnecting cables.
Installation in customer's plant.