



**LUDLUM**  
**MEASUREMENTS, INC.**

**HEALTH PHYSICS PRODUCT CATALOG**

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\*All instruments shown with default meter faces

# Ordering Info

## Placing an order with Ludlum

**Phone:** 800-622-0828 or 325-235-5494

**Fax:** 325-235-4672

**Web:** <https://ludlums.com>

**Email:** [sales@ludlums.com](mailto:sales@ludlums.com)

**Address:** 501 Oak Street  
Sweetwater, Texas, USA 79556

## Warranty

Ludlum Measurements, Inc. warrants the products it manufactures to be free of defects due to workmanship, material, and design for a period of twelve months (1 year) from the date of shipment to the purchaser (24 months from the date of shipment for our Model 4525 portal monitors). The calibration of a product is warranted to be within its specified accuracy limits at the time of shipment. In the event of instrument failure, notify Ludlum Measurements, Inc. to determine if repair, recalibration, or replacement is required. Ludlum will notify the customer of the closest repair facility to which the item may be returned. Return to repair facility shipping will be at customer cost. Shipping from the repair facility back to the customer will be at Ludlum's cost. This warranty excludes replacement of photomultiplier tubes, GM and proportional tubes, and scintillation crystals which are broken due to excessive physical abuse or used for purposes other than intended. There are no warranties, express or implied, including without limitation any implied warranty or merchantability or fitness, which extend beyond the description of the face thereof. If the product does not perform as warranted herein, the purchaser's sole remedy shall be repair or replacement, at the option of Ludlum Measurements, Inc. In no event will Ludlum Measurements be liable for damages, lost revenue, lost wages, or any other incidental or consequential damages arising from the purchase, use, or inability to use product.



*This catalog is a current representation of the Ludlum Measurements, Inc. product line at the time of print publication. The Ludlum product line is constantly improving and growing, warranting changes that may or may not be available in this catalog. We strongly encourage potential buyers and other interested parties to contact Ludlum Measurements, Inc. directly for assistance in ordering and for more detailed information.*

# Friskers

## Model 26 & 26-2



## Model 26 Series Dose Filter



## Model 26-1 & 26-3



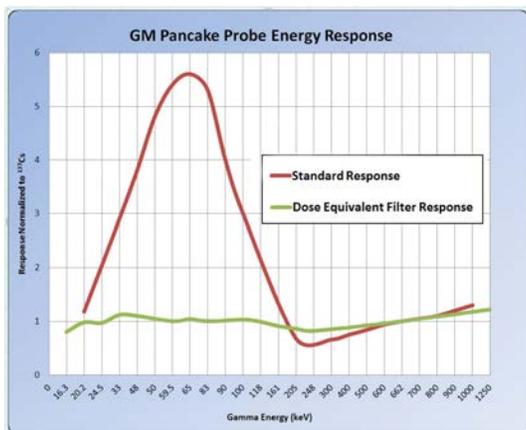
Integrated, Lightweight Design Simplifies Frisking • High-Impact Plastic with Water-Resistant Rubber Seals • Adjustable Alarms

| Model               | Detector                                       | Range   | Efficiency (4π)   | Measurement Type        | Battery Life | Alarms   |
|---------------------|--|---|---|-------------------------|--------------|--|
| 26<br>PN: 48-3885   | Pancake GM detector,<br>stainless steel screen | 0.1 cps to 1.99 kcps,<br>1 cpm to 99.9 kcpm   | <b>Alpha:</b><br>11% - <sup>239</sup> Pu;<br><b>Beta:</b><br>18% - <sup>99</sup> Tc<br>32% - <sup>32</sup> P<br>2% - <sup>14</sup> C;<br>22% - <sup>90</sup> Sr/ <sup>90</sup> Y<br>0.2% - <sup>125</sup> I<br><b>Gamma:</b><br><sup>137</sup> Cs: 5.5 cps per μSv/hr<br>(3300 cpm per mR/hr)<br><sup>99m</sup> Tc: ≤1% | Count rate              | 1000 hours   | Count rate and scaler alarms                   |
| 26-2<br>PN: 48-4044 |  |   |   |                         | 250 hours    | 3 red LEDs for 3 levels of alarm               |
| 26-1<br>PN: 48-3965 | Pancake GM detector,<br>stainless steel screen | 0.00 cps to 19.9 kcps<br>0 cpm to 999 kcpm<br>0.00 Bq to 19.9 kBq<br>0 dpm to 999 kdpm<br>0.00 to 1999 μSv/h<br>0.00 to 500 mR/h<br>(Model 26-3 goes up to<br>1,000 mR/h) | <b>Alpha:</b><br>11% - <sup>239</sup> Pu;<br><b>Beta:</b><br>18% - <sup>99</sup> Tc<br>32% - <sup>32</sup> P<br>2% - <sup>14</sup> C;<br>22% - <sup>90</sup> Sr/ <sup>90</sup> Y<br>0.2% - <sup>125</sup> I<br><b>Gamma:</b><br><sup>137</sup> Cs: 5.5 cps per μSv/hr<br>(3300 cpm per mR/hr)<br><sup>99m</sup> Tc: ≤1% | Count rate and exposure | 1000 hours   | Count rate, dose/exposure, and counting alarms |
| 26-3<br>PN: 48-4232 |  |   |   |                         |              |  |



PN: 2002-1050

## Ambient Dose Equivalent Filter



Ludlum offers an energy compensation filter that flattens the energy response of our popular **Model 44-9** GM pancake detector and **Model 26 Series** friskers to facilitate measuring Ambient Equivalent Dose (Sieverts) and exposure rate (Roentgens).

The venerable GM pancake has a significant over-response at lower energies between approximately 20 to 160 keV (red line in graph). Any dose measurements taken with an unfiltered GM pancake detector would thus have errors at these lower energies. This filter developed by Ludlum flattens the response to within  $\pm 20\%$  referenced to <sup>137</sup>Cs (662 keV) over an energy range of 20 keV to 1.2 MeV. (green line in graph).

# General Purpose - Digital

## Introduction

Ludlum's survey meters are world-renowned for their robustness, dependability, accuracy, and affordability. We have many models to choose from among our different lines to satisfy your technical and budgetary requirements. Visit our website to learn more about all specifications and available options.

### Model 3000



- Supports GM, Proportional, & Scintillation Detectors
- All-Digital Calibration
- USB Port
- Data Logging Options

### Model 3001



- Supports GM, Proportional, & Scintillation Detectors
- Stores Up to 4 Detector Setups
- All-Digital Calibration
- USB Port
- Data Logging Options

### Model 3002



- Supports Alpha-Beta Proportional & Scintillation Detectors
- All-Digital Calibration
- USB Port
- Data Logging Options

### Model 30 & 35



- Attaches to Detector Allowing One-Handed Operation
- Supports GM, Proportional, & Scintillation Detectors
- All-Digital Calibration
- USB Port

## Specifications

**Common Features:** High Voltage: 400 to 1500 Vdc (Except for Model 3002 at 400 to 2200 Vdc)

| Model                           | Threshold  | Controls                                    | Battery Life | Weight             |
|---------------------------------|--|---|--------------|--------------------|
| 3000<br>PN: 48-4035             | -4 to -100 mVdc                                  | on/off/ack, mode, audio, units              | 750 hours    | 0.9 kg<br>(2.0 lb) |
| 3001<br>PN: 48-4036             | -4 to -100 mVdc                                  | on/off/ack, mode, detector, units           | 500 hours    | 0.9 kg<br>(2.0 lb) |
| 3002<br>PN: 48-4037             | alpha: -2 to -500 mVdc<br>beta: -2 to -99.9 mVdc | on/off/ack, mode, audio, $\alpha$ - $\beta$ | 750 hours    | 0.9 kg<br>(2.0 lb) |
| 30<br>PN: 48-4108               | -2 to -120 mVdc                                  | on/off/ack, mode, units                     | 100 hours    | 174 g<br>(0.38 lb) |
| 35 Vehicle Mount<br>PN: 48-4112 | -2 to -120 mVdc                                  | on/off/ack, mode, units                     | 100 hours    | 174 g<br>(0.38 lb) |

For the latest, updated, detailed, correct product information, please visit our website ([www.ludlums.com](http://www.ludlums.com)) or contact a Ludlum Sales Representative (800-622-0828)

# General Purpose - Analog

**Model 3**



- 4-Range Analog Meter
- Supports GM & Scintillation Detectors

**Model 3A**



- 4-Range Analog Meter
- Supports GM & Scintillation Detectors
- Alarm

**Model 12**



- 4-Range Analog Meter
- Supports GM, Proportional, & Scintillation Detectors

**Model 14C**



- 5-Range Analog Meter
- Operates Two Detectors:  
Internal: GM Detector  
External: Supports GM & Scintillation Detectors
- Overload Protection

## Specifications

| Model               | High Voltage    | Threshold                     | Controls   | Battery Life | Weight          |
|---------------------|-----------------|-------------------------------|--|--------------|-----------------|
| 3<br>PN: 48-1605    | 400 to 1500 Vdc | Fixed at $-30 \pm 10$ mV      | rotary selector switch, response switch, reset button, audio switch, calibration controls                            | > 2000 hours | 1.6 kg (3.5 lb) |
| 3A<br>PN: 48-1408   | 400 to 1500 Vdc | Fixed at $-30 \pm 10$ mV      |  | > 2000 hours | 1.6 kg (3.5 lb) |
| 12<br>PN: 48-1609   | 400 to 2500 Vdc | Adjustable from -1 to -100 mV | rotary selector switch, response switch, reset button, audio switch, calibration controls, high voltage check button | > 2000 hours | 1.6 kg (3.5 lb) |
| 14C<br>PN: 48-1611  | 900 Vdc         | Fixed at $-40 \pm 10$ mV      | rotary selector switch, response switch, reset button, audio switch, battery push button                             | > 2000 hours | 1.6 g (3.5 lb)  |
| 16<br>PN: 48-1612   | 400 to 2500 Vdc | Adjustable from -2 to -60 mV  | off, battery check, range selector, audio, fast/slow, reset, HV check, window in-out                                 | 600 hours    | 1.6 kg (3.5 lb) |
| 18<br>PN: 48-1613   | 400 to 2500 Vdc | Adjustable from -2 to -60 mV  | off, battery check, range selector, audio, fast/slow, reset, HV check, window in-out, detector select                | 600 hours    | 1.6 kg (3.5 lb) |
| 2402<br>PN: 48-3087 | 550 to 900 Vdc  | $-35$ mV $\pm$ 10 mV          | on/off/audio, range selector, BATT check   | 250 hours    | 0.4 kg (0.9 lb) |
| 2403<br>PN: 48-3136 | 550 to 900 Vdc  | $-35$ mV $\pm$ 10 mV          | on/off/audio, range selector, BATT check   | 250 hours    | 0.4 g (0.9 lb)  |

# General Purpose - Analog

**Model 16**



- 4-Range Analog Meter
- Supports GM, Proportional, & Scintillation Detectors
- Adjustable Window for SCA (Single Channel Analyzer) Mode

**Model 18**



- 4-Range Analog Meter
- Supports GM, Proportional, & Scintillation Detectors
- Adjustable Window
- 3 Detector Setups

**Model 2402**



- 3-Range Analog Meter
- Supports GM & Scintillation Detectors
- Pocket-Size
- Audio & Visual Alarm

**Model 2403**



- 4-Range Analog Meter
- Supports GM & Scintillation Detectors
- Pocket-Size

**Model 3 & 14C Meter Face Selection Chart**

| Model #            | Meter Face # | Display                     | Detector: NaI Scintillator |                      |                    | Detector: GM       |                       |                 |                              |                      |
|--------------------|--------------|-----------------------------|----------------------------|----------------------|--------------------|--------------------|-----------------------|-----------------|------------------------------|----------------------|
|                    |              |                             | 44-2<br>1 x 1 in.          | 44-3<br>1 in. x 1 mm | 44-10<br>2 x 2 in. | 44-7<br>End Window | 44-38<br>Energy Comp. | 44-9<br>Pancake | 44-9Dose<br>Pancake w/filter | 44-89<br>Pancake x 4 |
| Both Model 3 & 14C | 202-627      | 0-2 mR/hr                   |                            |                      |                    |                    |                       | X               |                              |                      |
|                    | 202-085      | 0-2 mR/hr                   |                            |                      |                    | X                  |                       |                 |                              |                      |
|                    | 202-084      | 0-2 mR/hr                   |                            |                      |                    |                    | X                     |                 |                              |                      |
|                    | 202-330      | 0-4 kcpm; 0-2 mR/hr         |                            |                      |                    | X                  |                       |                 |                              |                      |
|                    | 202-608      | 0-6.6 kcpm; 0-2 mR/hr       |                            |                      |                    |                    |                       | X               | X                            |                      |
|                    | 202-241      | 0-2.4 kcpm; 0-2 mR/hr       |                            |                      |                    |                    | X                     |                 |                              |                      |
|                    | 202-379      | 0-20 $\mu$ Sv/h             |                            |                      |                    |                    | X                     |                 |                              |                      |
| Model 3            | 202-043      | 0-50 cps                    | X                          | X                    | X                  | X                  | X                     | X               | X                            | X                    |
|                    | 202-002      | 0-5 kcpm                    | X                          | X                    | X                  | X                  | X                     | X               | X                            | X                    |
|                    | 202-666      | 0-50 $\mu$ R/hr             | X                          |                      |                    |                    |                       |                 |                              |                      |
|                    | 202-654      | 0-50 $\mu$ R/hr; 0-8.5 kcpm | X                          |                      |                    |                    |                       | X               | X                            | X                    |
|                    | 202-514      | 0-25 $\mu$ R/hr             | X                          |                      |                    |                    |                       |                 |                              |                      |

**Note: This chart only includes the most common detectors. Consult with your Ludlum representative about other detectors or meter faces.**

# General Response Kits

**Model 3001-2RK**



- Adjustable Alarm Settings
- Adjustable Units
- Lightweight and Rugged Meter
- Also Considered a NORM Kit

**Model 2241-2RK**



- Auto-Ranging Digital Scaler/ Ratemeter
- Independent Detector Calibration for two Detectors

**Model 14C-RK**



- Traditional Analog Display

| Model                      | Display                               | Included in Kit  | Weight            |
|----------------------------|---------------------------------------|--|-------------------|
| 3001-2RK<br>PN: 48-4178    | Digital ratemeter/scaler/max          | Model 44-2<br>Model 44-9<br>Check source and holder<br>Cable<br>Batteries<br>Transport and storage case<br>(Depending on the kit chosen, either a Model 3001, Model 2241, Model 14C, or 3-IS will be included) | 5.9 kg<br>(13 lb) |
| 2241-2RK<br>PN: 48-2829    | Digital ratemeter/scaler              |  |                   |
| 14C-RK<br>PN: 48-2653      | 5-Range analog meter with internal GM |  |                   |
| 3-IS NORM<br>PN: 48-3581-1 | 4-Range analog meter                  |  |                   |

**Model 3001-3RK2**



PN: 48-4179

**Model 2241-3RK2**



PN: 48-4081

**Model 3-IS NORM**



PN: 48-3581-1

The two kits above include the same equipment as the -2RK versions, as well as a high-range GM detector (Model 133-6) that can measure up to 10 Sv/hr (1000 R/hr)

Intrinsically Safe Survey Meter

# Bluetooth LE<sup>®</sup> Option

The Model 3000 and Model 3001 can include a Bluetooth LE<sup>®</sup> Option

## Hardware Module

- Bluetooth 4.0 (BLE)<sup>®</sup> Module Wirelessly Streams Live Remote Display of Instrument Readings
- 120-Hour Battery Life
- Up to 30 m (98 ft.) Operating Distance

## Lumic Linker App

- For iOS & Android
- Integrated RadResponder Network Data Collection Provides "Reachback" Capability
- AES128 Encryption
- Location from Mobile Device GPS



PN: 4498-1024



Lumic Linker App

# Computerized

## Model 4404-16



- Single-Multi-Channel Analyzer
- GPS Receiver
- Data Logging Program
- Google Earth<sup>™</sup> Compatible Files

## Model 4404-16-4



- Single-Multi-Channel Analyzer
- Wireless Transceiver for Signal Output
- Data Logging Program
- Google Earth<sup>™</sup> Compatible Files
- Backpack Compatible

**Other options available:** Include a laptop PN: 2311792; Include GPS PN: 2312074

| Model                    | High Voltage  | Power                      | Detector  | Computer Battery Life | Weight              |
|--------------------------|---------------|----------------------------|---|-----------------------|---------------------|
| 4404-16<br>PN: 48-3730   | 0 to 2000 Vdc | 7.5 to 36 Vdc at 50 mA max | 5.1 x 10.2 x 40.6 cm<br>(2 x 4 x 16 in.) NaI scintillator | 9 hours               | 18.1 kg<br>(40 lb)  |
| 4404-16-4<br>PN: 48-3848 | 0 to 2000 Vdc | 7.5 to 36 Vdc at 50 mA max | 7.6 x 7.6 cm<br>(3 x 3 in.) NaI scintillator              | 9 hours               | 5.7 kg<br>(12.5 lb) |

## Features

- Available With 2 to 12 Channels
- PC Program Control & Logging
- Single Channel Analysis
- User-Adjustable Parameters

## Model 4600 Series



## Specifications

**WINDOW:** -5 to -3300 mV  
**HIGH VOLTAGE:** 0 to 1500 V  
**THRESHOLD:** -5 to -3300 mV  
**POWER:** 7.5 to 36 Vdc at 3 W maximum  
**AMPLIFIER RANGE:** 0 to 3 V

# Data Loggers

**Model  
3000/3001**



- Supports GM, Proportional, & Scintillation Detectors

**Model 3002**



- Supports Alpha-Beta Proportional & Scintillation Detectors

**Model 3005**



- Internal Energy-Compensated GM Detector

**Model 3019**



- Digital Meter
- Internal CsI Scintillation Detector
- Sigma Alarm
- Micro R Meter

**Model 2350-1**



- 5-Range Digital Meter
- Supports GM, Proportional, & Scintillation Detectors
- Stores 1000 Data Points

**Model 2360**



- 4-Range Analog Meter with Digital Scaler LCD
- Supports Alpha-Beta Proportional & Scintillation Detectors

| Model                 | High Voltage    | Threshold  | Response Times   | Controls  | Battery Life |
|-----------------------|-----------------|--|--|---|--------------|
| 3000*<br>PN: 48-4035  | 400 to 1500 Vdc | -4 to -100 mVdc                                  | User-selectable from 1 to 60 seconds, or Auto-Response Rate FAST or SLOW   | on/off/ack, mode, audio, units data logging handle*                                     | 750 hours    |
| 3001*<br>PN: 48-4036  |                 |  |  | on/off/ack, mode, detector, units, data logging handle*                                 | 500 hours    |
| 3002*<br>PN: 48-4037  | 400 to 2200 Vdc | Alpha: -2 to -350 mVdc<br>Beta: -2 to -99.9 mVdc |  | on/off/ack, mode, audio, $\alpha$ - $\beta$ , data logging handle*                      | 750 hours    |
| 3005*<br>PN: 48-4231  | 550 Vdc         | -4 to -100 mVdc                                  |  | on/off/ack, mode, audio, units, data logging handle*                                    | 750 hours    |
| 3019*<br>PN: 48-4091  | 400 to 1500 Vdc | -20 to -100 mVdc                                 |  | on/off/ack, mode, audio, units, data logging handle*                                    | 750 hours    |
| 2350-1<br>PN: 48-2751 | 400 to 2500 Vdc | Adjustable from -100 to -1000 mVdc               | Fixed response is adjustable from 1 to 127 seconds in one-second intervals | on/off, backlight, audio volume, audio divide-by, ack/scroll                            | 75 hours     |
| 2360<br>PN: 48-2872   | 200 to 2000 Vdc | Alpha: -40 to -700 mVdc<br>Beta: -2 to -15 mVdc  | 7 seconds on x1 range, 2 seconds on all others                             | reset/read HV, count type, audio volume, range selector, count time, logging pushbutton | 250 hours    |

**\*Full data logging capabilities only when you purchase the Lumic Datalogging Kit (PN: 4498-1019)**

# Specialized Meters

**Model 3-97**



- Gamma Survey
- Internal Na(Tl) Scintillator Detector
- External Energy-Compensated GM Gamma Detector (Model 44-38), Others Available

**Model 3-98**



- <sup>125</sup>I & Alpha-Beta-Gamma Survey
- Internal Pancake GM Detector
- External Low-Energy Gamma Detector (Model 44-3), Others Available

**Model 195 w/43-132**



- Alpha Survey
- External Model 43-132 Alpha Ion Chamber Detector

| Model                               | Indicated Use                         | Typical Sensitivity  | Display              |
|-------------------------------------|---------------------------------------|--|----------------------|
| 3-97<br>PN: 48-1410                 | Wide range gamma detection            | Internal NaI 2.5 x 2.5 cm (1 x 1 in.): 175 cpm per $\mu$ R/hr<br>External GM: 1200 cpm per mR/hr | 4-Range analog meter |
| 3-98<br>PN: 48-1135                 | Alpha-Beta-Gamma for nuclear medicine | External Model 44-3: 675 cpm per $\mu$ R/hr<br>Internal pancake GM: 3300 cpm per mR/hr           | 4-Range analog meter |
| 195 w/43-132<br>PN: 48-3233/47-3234 | High-range alpha detection            | Up to 900 Mdpm   | Digital meter        |

# Geiger Counters

**Model 3005**



- Auto-Ranging
- Internal Energy-Compensated GM Detector
- Data Logging Capabilities

**Model 5**



- 5-Range Analog Meter
- Two Internal Energy-Compensated GM Detectors

**Model 6**



- 3-Range Analog Meter
- Internal Energy-Compensated GM Detector

| Model               | Range  | Controls  | Indicated Use       | Battery Life |
|---------------------|--|---|---------------------|--------------|
| 3005<br>PN: 48-4231 | 1 $\mu$ Sv/h to 50 mSv/h (0.1 to 5000 mR/hr)<br>(other ranges available) | on/off/ack, mode, audio, units, data logging handle   | Gamma survey        | 750 hours    |
| 5<br>PN: 48-1607    | 0 to 20 mSv/h (0 to 2000 mR/hr)  | six-position switch (on/off, five-range positions), audio on/off switch, fast/slow, meter reset button, battery test button | Gamma survey        | 2000 hours   |
| 6<br>PN: 48-1676    | 0 to 10 mSv/h (0 to 1000 mR/hr)  | single five-position rotary knob for x1, x10, x100, battery test, instrument on/off   | Radiographer survey | 600 hours    |

# Intrinsically Safe

## Survey Meters

### Model 3-IS



- 4-Range Analog Meter
- Supports External GM & Scintillation Detectors (see qualifying list in table below)

### Model 3-IS-1



- 4-Range Analog Meter
- Internal Energy-Compensated GM Detector

## Personal Radiation Monitors

### Common Features:

- Sensitivity: 1800 cpm per mSv/h (18 cpm per mR/hr)
- Alarms
- Battery Life: 6000 hours

### Model 25-IS

PN: 48-3661



Measurement Range:  
0.01 mR/hr to 999 R/hr

### Model 25-IS-1

PN: 48-3686



Measurement Range:  
0.001 mSv/h to 9.99 Sv/h

| Model                                  | Typical Sensitivity ( <sup>137</sup> Cs)            | Measurement Range | Alarms | Battery Life |
|--|---|-------------------|--------|--------------|
| 3-IS<br>PN: 48-3581<br>(plus detector) | <u>Model No.</u> <u>Sensitivity</u> <u>Part No.</u> |                   |        |              |
|  | Model 44-9: 3300 cpm/mR/hr    47-1539               | 0 to 200 mR/hr    | No     | 2000 hours   |
|  | Model 44-2: 175 cpm/μR/hr    47-1532                | 0 to 5000 μR/hr   |        |              |
|  | Model 44-6: 1200 cpm/mR/hr    47-1535               | 0 to 200 mR/hr    |        |              |
|  | Model 44-38: 1200 cpm/mR/hr    47-1588              | 0 to 200 mR/hr    |        |              |
|  | Model 42-41L: 350 cpm/mrem/hr*    47-3309           | 0 to 1000 mrem    |        |              |
| Model 44-7: 2100 cpm/mR/hr    47-1536  | 0 to 200 mR/hr                                      |                   |        |              |
| 3-IS-1<br>PN: 48-3651                  | 100 cpm per mR/hr                                   | 0.1 to 1000 mR/hr | No     | 2000 hours   |

\* (40 cpm per μSv/h for <sup>241</sup>AmBe)

## CERTIFICATION

All the instruments on this page were designed and tested to the following USA & Canadian standards for intrinsic safety, permitting them to be used in potentially explosive atmospheres.

- UL 913 Class I, II & III Division 1 Groups A, B, C, D
- CSA 22.2 No. 157
- UL 61010-1 CSA C22.2 No. 61010-1

# Ion Chambers

## Model 9DP



- Color LCD Digital Meter
- Range: 0 to 50 mSv/h (0 to 5 R/hr)
- Chamber Pressure: 9 atm (122 psig)

## Model 9DP\*



- Range: 0 to 50 mSv/h (0 to 5 R/hr)
- Chamber Pressure: 9 atm (122 psig)
- Provides ICRU-Based Ambient Dose Measurements

## Model 9DP-1



- Range: 0 to 500 mSv/h (0 to 50 R/hr)
- Chamber Pressure: 2.5 atm (22 psig)
- Low-Pressure Chamber is Non-Hazmat

## Model 9-3



- Range: 0 to 500 mSv/h (0 to 50 R/h)
- Temperature Compensated
- Retractable Beta Shield
- Vented Ion Chamber
- Audio

## Model 9-4



- Range: 0 to 500 mSv/h (0 to 50 R/h)
- Temperature & Pressure Compensated
- Retractable Beta Shield
- Vented Ion Chamber
- RF Immune Version Available (PN: 48-4338)

| Model                | Chamber Volume/Pressure  | Energy Response                          | Range Multipliers    | Battery Life                      |
|----------------------|--|--|----------------------|-----------------------------------|
| 9DP<br>PN: 48-3742   | 230 cm <sup>3</sup> (14 in <sup>3</sup> )/122 psig   | ± 25% from 60 keV to 1.25 MeV            | Auto ranging         | 12-30 hours between charges       |
| 9DP*<br>PN:48-3942   | 230 cm <sup>3</sup> (14 in <sup>3</sup> )/122 psig   | ± 25% from 60 keV to 1.25 MeV            | Auto ranging         | 12-30 hours between charges       |
| 9DP-1<br>PN: 48-3899 | 220 cm <sup>3</sup> (13.4 in <sup>3</sup> )/22 psig  | ± 25% from 60 keV to 1.25 MeV            | Auto ranging         | 12-30 hours between charges       |
| 9-3<br>PN: 48-3633   | 220 cm <sup>3</sup> (13.4 in <sup>3</sup> )  | ± 20% of true value from 40 keV to 2 MeV | 5-Range Analog Meter | 1050-1500 hours (scale dependent) |
| 9-4<br>PN: 48-3739   | 220 cm <sup>3</sup> (13.4 in <sup>3</sup> )  | ± 20% of true value from 40 keV to 2 MeV | 5-Range Analog Meter | 400 hours                         |
| 9-4RF<br>PN: 48-4338 | <b>RF Immunity: Improved components and shielding to pass RF susceptibility tests at military levels up to 18 GHz, suggested replacement for the model 440RF/D</b> |  |                      |                                   |

## Model 9-7

PN: 48-3689



- Digital Meter
- Display Range: 0 to 19.99 kR/hr
- 3 Available Detectors
- Replacement for Eberline Model RO-7

| 9-7 Detector Model  | Range            | Volume                                    | Resolution                          | Part Number |
|---|------------------|---|-------------------------------------|-------------|
| 9-7-LD<br> | 0.001–1.99 R/hr  | 50 cm <sup>3</sup> (3.1 in <sup>3</sup> ) | 0.01 mSv/h (0.001 R/h or 1.0 mR/hr) | 47-3693     |
| 9-7-BM<br> | 0.1–199.9 R/hr   | 7 cm <sup>3</sup> (0.43 in <sup>3</sup> ) | 1 mSv/h (0.1 R/h or 100 mR/hr)      | 47-3694     |
| 9-7-BH<br> | 0.01–19.99 kR/hr | 7 cm <sup>3</sup> (0.43 in <sup>3</sup> ) | 100 mSv/h (0.01 kR/hr or 10 R/hr)   | 47-3696     |

### Model 9-7 Options:

Extension Cables: 15 ft (4.6 m): 8293-689-15, 30 ft (9.1 m): 8293-689-30, 60 ft (18.3 m): 8293-689-60  
 Rigid Detector Extension: 2 ft (61 cm): 4293-843, 5 ft (152 cm): 4293-844  
 Underwater Housing with 60 ft (18.3 m) cable: 4536-046

# Isotope Identifiers

**Model 702i**



- Internal Detector
- Quick Identification with High Accuracy
- Color LCD
- Self Calibrating

**Model 702e**



- Identifies Mixed Isotopes in one Second
- Externally Housed Detector
- Self Calibrating

**Model 703e**



- Identifies Mixed Isotopes in one Second
- Externally Housed Detector
- Self Calibrating

**Model 711i**



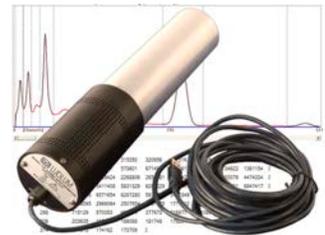
- Internally Housed LaBr Detector
- Identifies Mixed Isotopes in one Second
- Ethernet Connectivity
- LaBr has Better Resolution than NaI(Tl)

**Model 711e**



- Externally Housed LaBr Detector
- LaBr has Better Resolution than NaI

**Model 732 & 733**



- 1024 Channel MCA
- USB PC Interface
- 1k Multi-Channel Analyzer
- Retractable Beta Shield

| Model               | Detector(s)                           | Typical Gamma Sensitivity ( <sup>137</sup> Cs) | Weight             |
|---------------------|---------------------------------------|--|--------------------|
| 702i<br>PN: 48-3800 | NaI(Tl) 5.1 x 3.8 cm<br>(2 x 1.5 in.) | 775 cpm per μR/hr (1292 cps per mSv/h)         | 2.4 kg<br>(5.2 lb) |
| 702e<br>PN: 48-4064 | NaI(Tl), 5.1 x 5.1 cm<br>(2 x 2 in.)  | 900 cpm per μR/hr (1500 cps per mSv/h)         | 2.8 kg<br>(6.1 lb) |
| 703e<br>PN: 48-4075 | NaI(Tl), 7.6 x 7.6 cm<br>(3 x 3 in.)  | 2300 cpm per μR/hr (3800 cps per μSv/h)        | 3.4 kg<br>(7.4 lb) |
| 711i<br>PN: 48-3967 | LaBr, 3.8 x 3.8 cm<br>(1.5 x 1.5 in.) | 650 cpm per μR/hr                              | 2.2 kg<br>(4.8 lb) |
| 711e<br>PN: 48-4098 | LaBr, 3.8 x 3.8 cm<br>(1.5 x 1.5 in.) | 650 cpm per μR/hr                              | 2.6 kg<br>(5.7 lb) |
| 732<br>PN: 48-3834  | NaI(Tl), 5.1 x 5.1 cm<br>(2 x 2 in.)  | 900 cpm per μR/hr (1500 cps per mSv/h)         | 0.9 kg<br>(2.0 lb) |
| 733<br>PN: 48-3835  | NaI(Tl), 7.6 x 7.6 cm<br>(3 x 3 in.)  | 2300 cpm per μR/hr (3800 cps per μSv/h)        | 1.8 kg<br>(4.0 lb) |

# microR/microSv Meters

**Model 3019**



- Easy to Read Digital Display
- Internal Detector
- Lightweight, Splash Resistant, & Ruggedly Built
- Sigma Alarm - Red LED in Handle

**Model 19**



- Internal Detector
- 5 Selectable Ranges

**Model 19A**



- Logarithmic Meter
- 50  $\mu\text{R/hr}$  Alarm

**Model 192**



- Internal Detector
- Sigma Based & Fixed Alarm
- 4-Range Analog Meter

**Model 193**



- 4-Range Analog Meter
- Supports External Gamma Scintillation Detectors
- Sigma Based & Fixed Alarm

**Model 12S**



- 4-Range Analog Meter
- Internal Detector

**Model 12SA**



- 4-Range Analog Meter
- Internal Detector
- Adjustable Alarm

**Model 2401-S**



- 3-Range Analog Meter
- Sigma Based Alarm
- Internal Detector

**Common Features:** Audio Output • Battery Test

| Model                 | Detector  | Range                      | Battery Life | Typical Sensitivity          |
|-----------------------|---|----------------------------|--------------|------------------------------|
| 3019<br>PN: 48-4091   | 2.5 x 1.9 cm (1 x 0.75 in.) Internal CsI, rugged scintillator | 0 to 50 mR/hr              | 750 hours    | 175 cpm per $\mu\text{R/hr}$ |
| 19<br>PN: 48-1615     | 2.5 x 2.5 cm (1 x 1 in.) NaI(Tl) scintillator                 | 0 to 5000 $\mu\text{R/hr}$ | 2000 hours   | 175 cpm per $\mu\text{R/hr}$ |
| 19A<br>PN: 48-2117    | 2.5 x 2.5 cm (1 x 1 in.) NaI(Tl) scintillator                 | 0 to 5000 $\mu\text{R/hr}$ | 600 hours    | 175 cpm per $\mu\text{R/hr}$ |
| 192<br>PN: 48-2945    | 5.1 x 2.5 cm (2 x 1 in.) NaI(Tl) scintillator                 | 0 to 5000 $\mu\text{R/hr}$ | 600 hours    | 650 cpm per $\mu\text{R/hr}$ |
| 193<br>PN: 48-2959    | Can be used with a variety of gamma scintillator detectors    | 0 to 5000 $\mu\text{R/hr}$ | 600 hours    | Detector dependent           |
| 12S<br>PN: 48-1610    | 2.5 x 2.5 cm (1 x 1 in.) NaI(Tl) scintillator                 | 0 to 3000 $\mu\text{R/hr}$ | 600 hours    | 175 cpm per $\mu\text{R/hr}$ |
| 12SA<br>PN: 48-2621   | 2.5 x 2.5 cm (1 x 1 in.) NaI(Tl) scintillator                 | 0 to 3000 $\mu\text{R/hr}$ | 600 hours    | 175 cpm per $\mu\text{R/hr}$ |
| 2401-S<br>PN: 48-3117 | 18 mm dia (0.7 in.) CsI scintillator                          | 0 to 5000 $\mu\text{R/hr}$ | 250 hours    | 100 cpm per $\mu\text{R/hr}$ |

# Extended Reach microR/microSv Meters

**Model 3006**



- Digital Meter
- External Detector on Pole
- 4 Buttons for Easy Operation
- Sigma Alarm

**Model 193-6**



- External Detector on Pole
- 4-Range Analog Meter
- Sigma Based Alarm

**Model 30-6**



- Digital Meter
- External Detector on Pole with Ergonomic Handle
- Our Lightest Extended Reach Instrument
- Adjustable Length from 43.6 to 63.4 in.

**Common Features:** Sensitivity: 1500 cpm per  $\mu\text{R/hr}$  • High Voltage: 400-1500 Vdc

| Model                | Controls  | Battery Life | Range   | Weight             |
|----------------------|---|--------------|---|--------------------|
| 3006<br>PN: 48-4284  | on/off/ack, mode, audio, units  | 750 hours    | 0 to 20 $\mu\text{Sv/h}$<br>(0 to 2000 $\mu\text{R/hr}$ ) | 3.2 kg<br>(7.0 lb) |
| 193-6<br>PN: 48-3063 | five-position rotary knob for x1, x10, x100, x1000, battery test, instrument on/off | 600 hours    | 0 to 10 $\mu\text{Sv/h}$<br>(0 to 1000 $\mu\text{R/hr}$ ) | 3.9 kg<br>(8.5 lb) |
| 30-6<br>PN: 48-4195  | on/off/ack, mode, units   | 100 hours    | 0 to 10 $\mu\text{Sv/h}$<br>(0 to 1000 $\mu\text{R/hr}$ ) | 2.9 kg<br>(6.5 lb) |

# Personal Radiation Meters

## Model 25 Series



| Model                  | Display Range            | Typical Gamma Response | Intrinsically Safe |
|------------------------|--------------------------|------------------------|--------------------|
| 25<br>PN: 48-3584      | 0.01 mR/hr to 999 R/hr   | 18 cpm per mR/hr       | No                 |
| 25-1<br>PN: 48-3629    | 0.001 mSv/h to 9.99 Sv/h | 1800 cpm per mSv/h     | No                 |
| 25-IS<br>PN: 48-3661   | 0.01 mR/hr to 999 R/hr   | 18 cpm per mR/hr       | Yes                |
| 25-IS-1<br>PN: 48-3686 | 0.001 mSv/h to 9.99 Sv/h | 1800 cpm per mSv/h     | Yes                |

Water Resistant • 6000 Hour Battery Life • Audible & Visual Alerts and Alarms

## Model 25 Series Specifications

**DETECTOR:** Internal energy-compensated GM

**ENERGY RANGE:** 60 keV to 2 MeV

**ALERT & ALARMS:** Adjustable over entire display range

**ALARM INDICATIONS:** Distinct alerts and alarms for exposure and accumulated dose

**AUDIO:** Built-in speaker (typically 95 dB at 0.3 m [1.0 ft])

**LOW BATTERY INDICATION:** Provides 8 hours warning of low battery

**SELF-DIAGNOSTICS:** If no pulses are received from the detector in 60 minutes, instrument failure is indicated by an audible and visual alarm, and the display alternating between "0.0" and "F"

**CALIBRATION:** Requires no tools or software

**CALIBRATION RANGE:** Normally calibrated from 2 mR/hr (0.02 mSv/h) to 999 R/hr (9.99 Sv/h)

**POWER:** 2 each lithium coin cell batteries

**TEMPERATURE RANGE:** -40 to 65 °C (-40 to 150 °F)

**SIZE:** 7.6 x 5.4 x 1.7 cm (3.0 x 2.1 x 0.69 in.) (H x W x D)

**WEIGHT:** 144 g (5.1 oz) including batteries

**INTRINSICALLY SAFE CERTIFICATION (Models 25-IS, 25-IS-1):** Class I, Division 1, Groups A-D, Class II, III, Division 1, Groups E, F, and G, T6 (UL 610-1/CSA C22.2 No. 61010-1, UL 913, CSA C22.2 No. 157)

**WARNING (Models 25-IS, 25-IS-1):** Use only DL2450 (NEDA / ANSI / IEC / #5029LC) coin cell batteries. To reduce the risk of ignition of a flammable or explosive atmosphere, batteries must be changed only in a location known to be a non-hazardous area.

**WARNING (Models 25-IS, 25-IS-1):** When repairing this unit, substitution of components may impair intrinsic safety.

## Model 25 Series Accessories

**Arm Band**  
PN: 21-8974



**Model 25 Series Nylon Case**  
PN: 2311485



# Neutron Meters

**Model 30-7B**



- Digital Meter
- Moderator: 7.7 in. dia.
- Lighter Weight Design
- $^3\text{He}$  Proportional Detector

**Model 12-4-7**



- 4-Range Analog Meter
- Moderator: 7.7 in. dia.
- Lighter Weight Design
- $^3\text{He}$  Proportional Detector

**Model 30-4**



- Digital Meter
- Moderator: 9 in. dia.
- $^3\text{He}$  Proportional Detector

**Model 12-4**



- 4-Range Analog Meter
- Moderator: 9 in. dia.
- $^3\text{He}$  Proportional Detector

**Common Features:** Gamma Sensitivity: < 10 cpm at 10 R/hr

| Model                 | Measurement Range   | Typical Sensitivity                                  | Neutron Energy Response  | Weight              |
|-----------------------|---------------------|--|--|---------------------|
| 30-7B<br>PN: 48-4309  | 0 to 9.99 rem/hr    | 4.5 cpm per $\mu\text{Sv/h}$<br>(45 cpm per mrem/hr) | Provides approximate inverse RPG curve for neutrons from thermal through 7 MeV, provides response up to 12 MeV | 4.6 kg<br>(10.2 lb) |
| 12-4-7<br>PN: 48-4280 | 0 to 10,000 mrem/hr | 10 cpm per $\mu\text{Sv/h}$<br>(100 cpm per mrem/hr) |  | 5.4 kg<br>(12 lb)   |
| 30-4<br>PN: 48-4191   | 0 to 9.99 rem/hr    | 10 cpm per $\mu\text{Sv/h}$ (100 cpm per mrem/hr)    |  | 6.6 kg<br>(14.5 lb) |
| 12-4<br>PN: 48-1200   | 0 to 10,000 mrem/hr | 10 cpm per $\mu\text{Sv/h}$<br>(100 cpm per mrem/hr) |  | 8.3 kg<br>(18.3 lb) |

**Also Available: Model 30-7**

The Model 30-7 uses the same detector as the Model 30-7B, except the internal borated layer has a lower boron concentration. This instrument offers greater sensitivity, typically 10 cpm per  $\mu\text{Sv/h}$  (100 cpm per mrem/hr), but tends to overrespond in the 5 keV range.

# Neutron Meters

**Model 2241-4**



- Digital Scaler-Ratemeter
- Moderator: 9 in. dia.
- <sup>3</sup>He Proportional Detector

**Model 15**



- Analog + Digital Scaler-meter
- Neutron and Gamma Detection
- <sup>3</sup>He Proportional Detector
- Model 44-7 End Window GM Detector

**Model 2363 w/42-41L**



- 4-Range Analog Meter
- Neutron and Alpha-Beta-Gamma Detection
- PRESCILA Scintillator Detector
- Internal Energy-Compensated GM

| Model                         | Detector Range   | Typical Sensitivity  | Neutron Energy Response  | Weight  | Gamma Rejection                               |
|-------------------------------|--|--|--|---|---|
| 2241-4<br>PN: 48-2973         | 0 to 100 mSv/h<br>(0 to 10,000 mrem/hr)                              | 100 cpm per mrem/hr  | Thermal to 12 MeV,<br>Approximately follows<br>the inverse of the<br>radiation protection<br>guide curve for neutron<br>dose | 8.16 kg<br>(18 lb)  | < 10 cpm<br>through 10 R/hr                   |
| 15<br>PN: 48-1614             | 0 to 500,000 cpm   | <u>Neutron Detector:</u><br>55 cpm per mRem/hr<br>bare <sup>241</sup> AmBe<br><u>Gamma Detector:</u><br>2100 cpm per mR/hr<br>αβ Efficiencies:<br>2% for <sup>14</sup> C<br>7% for <sup>239</sup> Pu<br>10% for <sup>90</sup> Sr/ <sup>90</sup> Y<br>7% for <sup>99</sup> Tc | Not linear through<br>energy spectrum<br>(0.025 - 12 MeV)  | 3.7 kg<br>(8.1 lb)  | < 10 cpm<br>through 10 R/hr                   |
| 2363 w/ 42-41L<br>PN: 48-3514 | Neutron:<br>0.1 mrem/hr to 1 rem/hr<br>Gamma:<br>0.1 mR/hr to 1 R/hr | <u>Neutron:</u><br>350 mrem/hr<br><u>Gamma:</u><br>1000 cpm per mR/hr  | Thermal to 100 MeV   | with PRESCILA:<br>4.2 kg (9.2 lb)<br>without PRESCILA:<br>2.0 kg (4.5 lb) | ≈ 400 cpm @<br>100 mR/hr ( <sup>137</sup> Cs) |

# Pocket-Size Meters

**Model 2401 Series**



- Internal Detectors
- 3-Range Analog Meter
- Typically 250 Hours of Battery Life

**Model 2402**



- 3 Ranges
- Supports a Variety of Detectors
- Typically 250 Hours of Battery Life

**Model 2403**



- 4 Ranges
- Supports a Variety of GM Detectors
- Typically 250 Hours of Battery Life

| Model                    | Indicated Use                    | Detector  | Typical Sensitivity    | Energy Response                  | Range                                      | Alarms |
|--------------------------|----------------------------------|---|------------------------|----------------------------------|--|--------|
| 2401-EC<br>PN: 48-2824   | Gamma survey                     | Energy-compensated GM tube                        | 1050 cpm per mR/hr     | Reading within 20% of true value | 0 to 200 mR/hr<br>0 to 210,000 cpm         | No     |
| 2401-ECA<br>PN: 48-2996  |                                  |   |                        |                                  |  | Yes    |
| 2401-EC2<br>PN: 48-2885  | Gamma survey                     | Energy-compensated GM tube                        | 100 cpm per mR/hr      | Reading within 20% of true value | 0 to 200 $\mu$ Sv/h<br>0 to 2 R/hr         | No     |
| 2401-EC2A<br>PN: 48-2995 |                                  |   |                        |                                  |  | Yes    |
| 2401-EW<br>PN: 48-2874   | Alpha-Beta-Gamma survey          | 0.57 in. diameter end-window GM                   | 1050 cpm per mR/hr     | Energy dependent                 | 0 to 200 mR/hr<br>0 to 210,000 cpm         | No     |
| 2401-EWA<br>PN: 48-2997  |                                  |   |                        |                                  |  | Yes    |
| 2401-P<br>PN: 48-2875    | Alpha-Beta-Gamma survey          | Pancake GM with stainless steel protective screen | 3300 cpm per mR/hr     | Energy dependent                 | 0 to 200 mR/hr<br>0 to 660 kcpm            | No     |
| 2401-S<br>PN: 48-3117    | Low-level gamma and x-ray survey | 18 mm dia. (CsI) scintillation crystal            | 100 cpm per $\mu$ R/hr | Energy dependent                 | 0 to 50 $\mu$ Sv/h<br>0 to 5000 $\mu$ R/hr | Yes    |
| 2402<br>PN: 48-3087      | General purpose survey           | Externally mounted                                | Detector dependent     | Detector dependent               | Detector dependent                         | Yes    |
| 2403<br>PN: 48-3136      | General purpose survey           | Externally mounted                                | Detector dependent     | Detector dependent               | Detector dependent                         | No     |

## Pocket-Size Meter Accessories

**Hard Case**  
PN: 2311119



**Wrist Strap**  
PN: 4397-182



**Belt Clip**  
PN: 4397-176



**Nylon Case**  
PN: 2310517



**Handle**  
PN: 4397-165



# Scaler-Ratemeters

## Model 2241 Series



- Auto-Ranging Digital Meter
- Supports GM, Proportional, & Scintillation Detectors
- Battery Life: 200 Hours (Model 2241 Pictured)

## Model 2242



- Gamma Survey Digital Meter
- 2 Internal Energy-Compensated GM Detectors
- Battery Life: 200 Hours

| Model                    | Detector Setups   | Display Range  | Alarm |
|--------------------------|---|--|-------|
| 2241<br>PN: 48-2444      | 1<br>(Up to 6 setups using dip switch on the circuit board)                   | 0.0 $\mu$ R/hr to 9999 R/hr<br>0.000 $\mu$ Sv/h to 9999 Sv/h<br>0 cpm to 999 kcpm<br>0 cps to 100 kcps | Yes   |
| 2241-2<br>PN: 48-2731    | 2   |  | Yes   |
| 2241-2i<br>PN: 48-2960   | 1 Internal GM tube (up to 10 R/hr)<br>1 External                              |  | Yes   |
| 2241-2i/2<br>PN: 48-3100 | 1 Internal GM tube (up to 1 R/hr)<br>2 External                               |  | Yes   |
| 2241-3<br>PN: 48-2864    | 4   |  | Yes   |
| 2241-3i<br>PN: 48-3358   | 1 Internal tube (up to 10 R/hr)<br>3 External                                 |  | Yes   |
| 2242<br>PN: 48-3437      | 2 Internal GM tubes<br>(low range: up to 1 R/hr, high range: up to 1000 R/hr) | 0.1 mR/hr to 999.9 R/hr  | Yes   |
| 2221<br>PN: 48-2065      | 1   | Analog display is detector dependent<br>Digital display is up to 999999                                | No    |

## Model 2221



- 4-Range Analog Meter & Digital LCD
- Supports GM, Proportional, & Scintillation Detectors
- Battery Life: 250 Hours

## Model 2221 Controls

- Adjustable Count Times
- Fast/Slow Response Time Switch
- Meter Reset Button
- Count Button
- Count Hold Button
- Digital Display Switch
- Scaler Function, Window Function
- Audio Divide Switch
- Volume Control
- Lamp Function
- Test Buttons for Battery, High Voltage, Threshold, and Window
- Window In/Out Button

# Stretch Scopes

**Model 78**



**Model 78-1**



**Model 78-6**



- Stainless Steel Construction
- Analog + Digital Meter
- Extends to 3.6 m (12 ft)
- Gamma Survey
- No Alarms

**Model 79**



**Model 79/1**



**Model 79/2**



- Carbon-Fiber Construction
- Digital Meter
- Extends to 4.5 m (14.75 ft)
- Gamma Survey
- Our Lightest Stretch Scope
- Selectable Alarms

**Model 78-9**



- Analog + Digital Meter
- Stainless Steel Construction
- Extends to 3.6 m (12 ft)
- Beta-Gamma Survey
- No Alarms

| Model               | Detector   | Measurement Range                                   | Battery Life | Weight             |
|---------------------|--|---|--------------|--------------------|
| 78<br>PN: 48-2832   | 2 Energy-compensated GM tubes  | 0.1 mR/hr to 1000 R/hr<br>(no Sv)                   | 250 hours    | 2.9 kg<br>(6.4 lb) |
| 78-1<br>PN: 48-3743 | 2 Energy-compensated GM tubes  | 0.1 $\mu$ Sv/h to 9999 mSv/h<br>(no R)              | 250 hours    | 2.9 kg<br>(6.4 lb) |
| 78-6<br>PN: 48-3411 | Photomultiplier coupled to a<br>1 x 1 in. NaI(Tl) crystal mounted inside<br>the instrument housing | 1 to 5000 $\mu$ R/hr<br>(0.01 to 50 $\mu$ Sv/h)     | 1000 hours   | 2.9 kg<br>(6.4 lb) |
| 79<br>PN: 48-3966   | Energy-compensated GM tube   | 10 $\mu$ Sv/h to 10 Sv/h<br>(1 mR/hr to 1000 R/hr)  | 100 hours    | 1.4 kg<br>(3.0 lb) |
| 79/1<br>PN: 48-4241 | CsI(Tl) crystal scintillator   | 0.01 $\mu$ Sv to 0.5 mSv<br>(1 $\mu$ R to 50 mR/hr) | 100 hours    | 1.4 kg<br>(3.0 lb) |
| 79/2<br>PN: 48-4203 | Internal energy-compensated GM   | 0.001 mSv/h to 0.04 Sv/h<br>(0.1 mR/hr to 4 R/hr)   | 100 hours    | 1.4 kg<br>(3.0 lb) |
| 78-9<br>PN: 48-3808 | Halogen-quenched GM pancake  | 000.0 - 999.9 cps<br>(000.0 - 999.9 $\mu$ Sv/h)     | 250 hours    | 2.9 kg<br>(6.4 lb) |

# Benchtop Meters

**Model 3276**



- Digital Display
- Supports GM, Proportional, & Scintillation Detectors

**Model 177**



- 4-Range Linear Analog Meter
- Supports GM & Scintillation Detectors

**Model 177-50**



- 5-Range Logarithmic Analog Meter
- Supports GM, Proportional, & Scintillation Detectors

**Model 177-56**



- 4-Range Linear Analog Meter
- Operates with Two Detectors: Scintillation for Alpha, GM for Beta

**Model 177-61**



- 4-Range Linear Analog Meter
- Supports GM, Proportional, & Scintillation Detectors

**Model 177-84**



- Dual 3-Range Logarithmic Analog Meter
- Supports Alpha-Beta Proportional & Scintillation Detectors
- Other Configurations Available on our Website

**Model 4600 Series**



- 12-Detector, Single-Channel Analyzer
- Supports GM, Proportional, & Scintillation Detectors

**Common Features:** Battery life: 50 Hours (Except the Model 4600 Series, which has no batteries)

| Model                           | Controls  | Threshold                                    | High Voltage                               |
|---------------------------------|---|--|--|
| 3276<br>PN: 48-4160             | on/off/ack; mode alternates between normal, max, and count; audio on/off; units   | -4 to -100 mV                                | 400 to 1500 Vdc                            |
| 177<br>PN: 48-1632              | on/off switch, power-on and alarm lamps, volume control, audio speaker, range selector switch, ratemeter, reset, fast/slow response, battery, high voltage, alarm test, alarm set | -10 to -100 mV                               | 400 to 1500 Vdc                            |
| 177-50<br>PN: 48-1202           | on/off switch, power-on and alarm lamps, volume control, audio speaker, ratemeter, reset, battery, high voltage, alarm test, alarm set  | -2 to -100 mV                                | 400 to 2500 Vdc                            |
| 177-56<br>PN: 48-1323           | on/off switch, power-on lamp, volume control, audio speaker, range selector switch, ratemeter, reset, fast/slow response, battery and high-voltage test, alpha/beta               | Alpha: -10 to -100 mV<br>Beta: -10 to -25 mV | Alpha:<br>400 to 1500 Vdc<br>Beta: 900 Vdc |
| 177-61<br>PN: 48-1382           | on/off switch, power-on and alarm lamp, volume control, audio speaker, range selector switch, ratemeter, reset, fast/slow response, battery, high voltage, alarm test, alarm set  | -2 to -100 mV                                | 400 to 2500 Vdc                            |
| 177-84<br>PN: 48-2727           | ack/reset button, meter readout (high voltage, alarm, ratemeter), power on/off  | Alpha: -1 to -180 mV<br>Beta: -1 to -4 mV    | 200 to 2500 Vdc                            |
| 4600 Series<br>Inquire about PN | controls via software   | -5 to -3300 mV                               | 0 to 1500 Vdc or<br>0 to 2500 Vdc          |

# Scalers/Counters

**Model 2200**



- Supports GM, Proportional, & Scintillation Detectors

**Model 2000**



- Supports GM, Proportional, & Scintillation Detectors

**Common Features:** High Voltage: Adjustable from 200 to 2500 Vdc • Scaler Range: 0 to 999,999 counts

| Model               | Indicated Use                            | Controls  | Thresholds                     |
|---------------------|--|---|--------------------------------|
| 2200<br>PN: 48-1651 | Single-channel analyzing, gross counting | Count button, count time multiplier, count time adjustment, high-voltage adjustment, analog display multiplier, display function knob, window adjustment, threshold adjustment, fast/slow, zero switch, discriminator adjustment, window on/off, power switch | Adjustable from 0.0 to -100 mV |
| 2000<br>PN: 48-1648 | Gross counting                           | Count button, count time multiplier, count time adjustment, high voltage/battery switch, threshold adjustment, high-voltage adjustment, power switch  | Adjustable from 0.0 to -100 mV |

# Pulsers

**Model 500**



**Model 500-1**



**Model 500-2**



Provides the functions required to calibrate scaler/ratemeter radiation detection instruments

**Common Features:** Digital Pulse Rate Display: 1 to 9,900,000 cpm • Pulse Amplitude Display: 0 mV to 5 V

| Model                | High Voltage   | Controls  |
|----------------------|--|---|
| 500<br>PN: 48-1677   | Analog HV meter: 0 to 2.5 kVdc<br>Analog pulse amplitude   | Pulse frequency multiplier, coarse and fine adjustment knobs, pulse amplitude range switch, pulse amplitude adjustment knob, negative/positive pulse switch, power switch |
| 500-1<br>PN: 48-1166 | Digital HV meter: 0 to 1999 Vdc<br>Analog pulse amplitude  |   |
| 500-2<br>PN: 48-1340 | Digital HV meter: 0 to 1999 Vdc<br>Digital pulse amplitude |   |

# Detectors

## Alpha

**Common Features:** Used for contamination survey • Typical Background (10 µR/hr) : 3 cpm

| Model  | Detector Type        | Window                 | Area (active/open)                           | Efficiency (4π)                                   | Operating Voltage (Vdc)               | Part No. |
|--|----------------------|------------------------|--|---|---------------------------------------|----------|
| 43-5<br>      | ZnS(Ag) scintillator | 0.8 mg/cm <sup>2</sup> | 76 cm <sup>2</sup> /<br>50 cm <sup>2</sup>   | 13% <sup>-239</sup> Pu                            | 500 to 1200                           | 47-1521  |
| 43-65*<br>    | ZnS(Ag) scintillator | 0.8 mg/cm <sup>2</sup> | 63 cm <sup>2</sup> /<br>50 cm <sup>2</sup>   | 17% <sup>-239</sup> Pu,<br>17% <sup>-230</sup> Th | 500 to 1200                           | 47-1441  |
| 43-90<br>     | ZnS(Ag) scintillator | 0.8 mg/cm <sup>2</sup> | 125 cm <sup>2</sup> /<br>100 cm <sup>2</sup> | 20% <sup>-239</sup> Pu                            | 500 to 1500                           | 47-2448  |
| 43-92<br>    | ZnS(Ag) scintillator | 0.8 mg/cm <sup>2</sup> | 100 cm <sup>2</sup> /<br>88 cm <sup>2</sup>  | 20% <sup>-239</sup> Pu                            | 500 to 1500                           | 47-2555  |
| 43-136<br>  | ZnS(Ag) scintillator | 0.8 mg/cm <sup>2</sup> | Active: 65.3 cm <sup>2</sup>                 | 20% <sup>-239</sup> Pu                            | 500 to 1500                           | 47-3829  |
| 43-1*<br>   | ZnS(Ag) scintillator | 0.8 mg/cm <sup>2</sup> | 83 cm <sup>2</sup> /<br>75 cm <sup>2</sup>   | 33% <sup>-239</sup> Pu                            | 500 to 1200                           | 47-1516  |
| 43-2*<br>   | ZnS(Ag) scintillator | 0.8 mg/cm <sup>2</sup> | 9.7 cm <sup>2</sup> /<br>9.7 cm <sup>2</sup> | 30% <sup>-239</sup> Pu,<br>30% <sup>-230</sup> Th | 500 to 1200                           | 47-1517  |
| 43-44<br>   | Air proportional     | 0.4 mg/cm <sup>2</sup> | 76 cm <sup>2</sup> /<br>50 cm <sup>2</sup>   | 8% <sup>-239</sup> Pu                             | Altitude<br>dependent<br>1875 to 2050 | 47-1169  |
| 43-44-1<br> | Air proportional     | 0.4 mg/cm <sup>2</sup> | 154 cm <sup>2</sup> /<br>100 cm <sup>2</sup> | 8% <sup>-239</sup> Pu                             | Altitude<br>dependent<br>1875 to 2050 | 47-2385  |

**\*Model 43-1, 43-2, and 43-65 are also available in an alpha-beta version.**

# Detectors

## Alpha-Beta

**Common Features:** Used for Contamination Survey

| Model   | Detector Type                                      | Window   | Area (Active/Open)                           | Efficiency (4 π)  | Typical Bkg (10 μR/hr)                          | Crosstalk                             | Operating Voltage (Vdc)                               | Part No. |
|---|--|--|--|---|---|---------------------------------------|---|----------|
| 43-89<br>      | ZnS(Ag) on 0.03 cm (0.01 in.) plastic scintillator | 1.2 mg/cm <sup>2</sup>   | 125 cm <sup>2</sup> /<br>100 cm <sup>2</sup> | 20%– <sup>239</sup> Pu<br>10%– <sup>99</sup> Tc<br>20%– <sup>90</sup> Sr/ <sup>90</sup> Y   | Alpha: ≤ 3<br>Beta: ≤ 300                       | Alpha-Beta: < 10%<br>Beta-Alpha: < 1% | 500 to 1500   | 47-2430  |
| 43-93<br>      | ZnS(Ag) on 0.03 cm (0.01 in.) plastic scintillator | 1.2 mg/cm <sup>2</sup>   | 100 cm <sup>2</sup> /<br>88 cm <sup>2</sup>  | 20%– <sup>239</sup> Pu<br>15%– <sup>99</sup> Tc<br>20%– <sup>90</sup> Sr/ <sup>90</sup> Y   | Alpha: ≤ 3 cpm<br>Beta: ≤ 300 cpm               | Alpha-Beta: < 10%<br>Beta-Alpha: < 1% | 500 to 1200   | 47-2556  |
| 43-147<br>     | ZnS(Ag) on 0.03 cm (0.01 in.) plastic scintillator | 1.2 mg/cm <sup>2</sup>   | 200 cm <sup>2</sup> /<br>176 cm <sup>2</sup> | 20%– <sup>239</sup> Pu<br>13%– <sup>99</sup> Tc<br>20%– <sup>90</sup> Sr/ <sup>90</sup> Y   | Alpha: ≤ 3 cpm<br>Beta: ≤ 400 cpm               | Alpha-Beta: < 10%<br>Beta-Alpha: < 1% | 500 to 1200   | 47-4092  |
| 43-68<br>      | Rechargeable gas proportional                      | 0.8 mg/cm <sup>2</sup>   | 126 cm <sup>2</sup> /<br>100 cm <sup>2</sup> | Gross counting:<br>20%– <sup>239</sup> Pu<br>15%– <sup>14</sup> C<br>30%– <sup>99</sup> Tc<br>20%– <sup>90</sup> Sr/ <sup>90</sup> Y<br>< 1% gamma<br>alpha-beta:<br>17.5%– <sup>239</sup> Pu<br>20%– <sup>99</sup> Tc<br>20%– <sup>90</sup> Sr/ <sup>90</sup> Y                | Alpha: ≤ 3 cpm<br>Beta-Gamma:<br>350 cpm        | Alpha-Beta: < 10%<br>Beta-Gamma: < 1% | Alpha:<br>1100 to 1400<br>Beta-Gamma:<br>1600 to 1800 | 47-2005  |
| 43-135-1<br> | Gas proportional (presurized gas chamber)          | Windowless   | 2300 cm <sup>2</sup>                         | 42%– <sup>239</sup> Pu<br>33%– <sup>230</sup> Th<br>55%– <sup>99</sup> Tc<br>37%– <sup>63</sup> Ni<br>55%– <sup>90</sup> Sr/ <sup>90</sup> Y  | Alpha: 0.06 cps<br>Beta: 30 cps                 | Alpha-Beta: < 10%<br>Beta-Gamma: < 1% | < 2500  | 47-4117  |
| 43-143-1<br> | Gas proportional (requires continuous gas flow)    | 0.8 mg/cm <sup>2</sup>   | 100 cm <sup>2</sup> /<br>70 cm <sup>2</sup>  | Gross counting:<br>20%– <sup>239</sup> Pu<br>20%– <sup>90</sup> Sr/ <sup>90</sup> Y<br>30%– <sup>99</sup> Tc<br>15%– <sup>14</sup> C<br>< 1% gamma<br>alpha-beta:<br>17.5%– <sup>239</sup> Pu<br>20%– <sup>90</sup> Sr/ <sup>90</sup> Y<br>20%– <sup>90</sup> Tc                | Alpha: ≤ 3 cpm<br>Beta-Gamma:<br>≤ 350 cpm      | Alpha-Beta: < 10%<br>Beta-Gamma: < 1% | Alpha:<br>1100 to 1400<br>Beta-Gamma:<br>1600 to 1800 | 47-4011  |
| 43-37-1<br>  | Large-area gas proportional                        | Alpha only:<br>0.8 mg/cm <sup>2</sup><br>Beta-Gamma:<br>3.4 mg/cm <sup>2</sup><br>Gamma: 11.8 mg/cm <sup>2</sup> | 821 cm <sup>2</sup> /<br>609 cm <sup>2</sup> | Gross Counting:<br>20%– <sup>239</sup> Pu (alpha only);<br>30%– <sup>99</sup> Tc (beta only)<br>30%– <sup>90</sup> Sr/ <sup>90</sup> Y<br>alpha-beta<br>< 1% gamma<br>17.5%– <sup>239</sup> Pu<br>20%– <sup>99</sup> Tc<br>20%– <sup>90</sup> Sr/ <sup>90</sup> Y<br>< 1% gamma | Alpha: < 10 cpm<br>Beta-Gamma:<br>1000-1800 cpm | Alpha-Beta: < 10%<br>Beta-Gamma: < 1% | Alpha:<br>1100 to 1400<br>Beta-Gamma:<br>1700 to 1800 | 47-2243  |

# Detectors

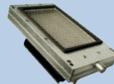
## Alpha-Beta-Gamma

**Common Features:** Operating Voltage: 900 Vdc

| Model  | Detector Type                       | Window                               | Area (Active/<br>Open)                         | Efficiency (4 π)   | Typical<br>Bkg<br>(10 μR/hr) | Typical<br>Sensitivity ( <sup>137</sup> Cs)<br>(cpm) | Part No. |
|--|-------------------------------------|--------------------------------------|--|--|------------------------------|--|----------|
| 44-7<br>      | GM, end window                      | 2.0 ± 0.3 mg/cm <sup>2</sup><br>mica | 6 cm <sup>2</sup> /<br>5 cm <sup>2</sup>       | 2%– <sup>14</sup> C<br>10%– <sup>90</sup> Sr/ <sup>90</sup> Y<br>7%– <sup>99</sup> Tc<br>7%– <sup>239</sup> Pu<br>0.1%– <sup>125</sup> I | 40 cpm                       | 2100 cpm per mR/hr<br>*energy dependent              | 47-1536  |
| 44-9<br>      | GM,<br>pancake                      | 1.7 ± 0.3 mg/cm <sup>2</sup><br>mica | 15.5 cm <sup>2</sup> /<br>12.3 cm <sup>2</sup> | 5%– <sup>14</sup> C<br>22%– <sup>90</sup> Sr/ <sup>90</sup> Y<br>19%– <sup>99</sup> Tc<br>32%– <sup>32</sup> P<br>15%– <sup>239</sup> Pu | 60 cpm                       | 3300 cpm per mR/hr<br>*energy dependent              | 47-1539  |
| 44-9 Dose<br> |                                     |                                      |  |  |                              | 3300 cpm per mR/hr<br>*energy compensated            | 47-3789  |
| 44-9-18<br>   | Telescoping GM,<br>pancake          | 1.7 ± 0.3 mg/cm <sup>2</sup><br>mica | 15.5 cm <sup>2</sup> /<br>12.3 cm <sup>2</sup> | 5%– <sup>14</sup> C<br>22%– <sup>90</sup> Sr/ <sup>90</sup> Y<br>19%– <sup>99</sup> Tc<br>32%– <sup>32</sup> P<br>15%– <sup>239</sup> Pu | 60 cpm                       | 3300 cpm per mR/hr<br>*energy dependent              | 47-2940  |
| 44-40<br>     | GM,<br>pancake with lead<br>housing | 1.7 ± 0.3 mg/cm <sup>2</sup><br>mica | 15.5 cm <sup>2</sup> /<br>12.3 cm <sup>2</sup> | 5%– <sup>14</sup> C<br>22%– <sup>90</sup> Sr/ <sup>90</sup> Y<br>19%– <sup>99</sup> Tc<br>32%– <sup>32</sup> P<br>15%– <sup>239</sup> Pu | 25 cpm                       | 3300 cpm per mR/hr<br>*energy dependent              | 47-1538  |
| 44-40-2<br> | GM,<br>pancake with lead<br>housing | 1.7 ± 0.3 mg/cm <sup>2</sup><br>mica | 15.5 cm <sup>2</sup> /<br>12.3 cm <sup>2</sup> | 5%– <sup>14</sup> C<br>22%– <sup>90</sup> Sr/ <sup>90</sup> Y<br>19%– <sup>99</sup> Tc<br>32%– <sup>32</sup> P<br>15%– <sup>239</sup> Pu | 25 cpm                       | 3300 cpm per mR/hr<br>*energy dependent              | 47-2758  |
| 44-88<br>   | Cylindrical GM,<br>pancake          | 1.7 ± 0.3 mg/cm <sup>2</sup><br>mica | 15 cm <sup>2</sup> /<br>12 cm <sup>2</sup>     | 5%– <sup>14</sup> C<br>22%– <sup>90</sup> Sr/ <sup>90</sup> Y<br>19%– <sup>99</sup> Tc<br>32%– <sup>32</sup> P<br>15%– <sup>239</sup> Pu | 60 cpm                       | 3300 cpm per mR/hr<br>*energy dependent              | 47-2356  |
| 44-89<br>   | GM,<br>pancake array                | 1.7 ± 0.3 mg/cm <sup>2</sup><br>mica | 62 cm <sup>2</sup> /<br>50 cm <sup>2</sup>     | 5%– <sup>14</sup> C<br>22%– <sup>90</sup> Sr/ <sup>90</sup> Y<br>19%– <sup>99</sup> Tc<br>32%– <sup>32</sup> P<br>15%– <sup>239</sup> Pu | 240 cpm                      | 13,200 cpm per mR/hr<br>*energy dependent            | 47-2357  |
| 44-94<br>   |                                     |                                      |  |  |                              |  | 47-2390  |
| 44-25<br>   | GM,<br>pancake array                | 1.7 ± 0.3 mg/cm <sup>2</sup><br>mica | 31 cm <sup>2</sup> /<br>18 cm <sup>2</sup>     | 5%– <sup>14</sup> C<br>22%– <sup>90</sup> Sr/ <sup>90</sup> Y<br>19%– <sup>99</sup> Tc<br>32%– <sup>32</sup> P<br>15%– <sup>239</sup> Pu | 120 cpm                      | 6600 cpm per mR/hr<br>*energy dependent              | 47-1508  |
| 44-26<br>   | GM,<br>pancake array                | 1.7 ± 0.3 mg/cm <sup>2</sup><br>mica | 46 cm <sup>2</sup> /<br>27 cm <sup>2</sup>     | 5%– <sup>14</sup> C<br>22%– <sup>90</sup> Sr/ <sup>90</sup> Y<br>19%– <sup>99</sup> Tc<br>32%– <sup>32</sup> P<br>15%– <sup>239</sup> Pu | 180 cpm                      | 9900 cpm per mR/hr<br>*energy dependent              | 47-1509  |

# Detectors

## Beta

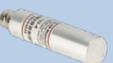
| Model   | Detector Type  | Window   | Area (Active/Open)                            | Efficiency (4 π)  | Typical Bkg (10 μR/hr) | Operating Voltage (Vdc) | Part No. |
|---|--|--|---|---|------------------------|-------------------------|----------|
| 44-1<br>     | 4.3 cm (1.7 in.) dia x 0.03 cm (0.01 in.) thick plastic scintillator | 1.2 mg/cm <sup>2</sup>   | 9.7 cm <sup>2</sup> /<br>9.7 cm <sup>2</sup>  | 7%– <sup>14</sup> C   | 100 cpm                | 500 to 1200             | 47-1531  |
| 43-65-1<br>  | 0.03 cm (0.01 in.) thick plastic scintillator                        | 0.8 mg/cm <sup>2</sup><br>(1.2 mg/cm <sup>2</sup> recommended for outdoor use) | 63 cm <sup>2</sup> /<br>50 cm <sup>2</sup>    | 15%– <sup>99</sup> Tc<br>20%– <sup>90</sup> Sr/ <sup>90</sup> Y<br>1%– <sup>14</sup> C  | ≤ 200 cpm              | 500 to 1200             | 47-2061  |
| 44-116<br>   | 0.03 cm (0.01 in.) thick plastic scintillator                        | 1.2 mg/cm <sup>2</sup>   | 125 cm <sup>2</sup> /<br>100 cm <sup>2</sup>  | 15%– <sup>99</sup> Tc<br>4%– <sup>14</sup> C<br>30%– <sup>90</sup> Sr/ <sup>90</sup> Y  | ≤ 300 cpm              | 500 to 1000             | 47-2696  |
| 44-142<br>   | 0.03 cm (0.01 in.) thick plastic scintillator                        | 1.2 mg/cm <sup>2</sup>   | 100 cm <sup>2</sup> /<br>88 cm <sup>2</sup>   | 15%– <sup>99</sup> Tc<br>4%– <sup>14</sup> C<br>30%– <sup>90</sup> Sr/ <sup>90</sup> Y  | ≤ 300 cpm              | 500 to 1200             | 47-3161  |
| 44-215<br>   | 5.1 cm (2.0 in.) dia x 0.03 cm (0.01 in.) thick plastic scintillator | 1.2 mg/cm <sup>2</sup>   | 20 cm <sup>2</sup> /<br>16.65 cm <sup>2</sup> | 33%– <sup>99</sup> Tc<br>10%– <sup>14</sup> C<br>33%– <sup>90</sup> Sr/ <sup>90</sup> Y | 100 cpm                | 500 to 1200             | 47-4143  |
| 44-110<br> | Gas flow proportional  | Windowless   | 126 cm <sup>2</sup> /<br>100 cm <sup>2</sup>  | 25%– <sup>3</sup> H   | 400 cpm                | 1700                    | 47-2585  |

## Beta-Gamma

| Model  | Detector Type  | Window                        | Area (Active/Open)                           | Efficiency (4 π)   | Typical Bkg (10 μR/hr) | Operating Voltage (Vdc) | Part No. |
|--|--|-------------------------------|--|--|------------------------|-------------------------|----------|
| 44-21<br> | 2.54 cm (1.0 in.) dia x 0.1 cm (0.04 in.) NaI(Tl) scintillator and 0.03 cm (0.01 in.) plastic scintillator | 3.4 mg/cm <sup>2</sup>        | 5.1 cm <sup>2</sup> /<br>5.1 cm <sup>2</sup> | 4%– <sup>14</sup> C<br>28%– <sup>32</sup> P<br>38%– <sup>125</sup> I<br>19%– <sup>129</sup> I  | 450 cpm                | 500 to 1200             | 47-1560  |
| 44-98<br> | Bismuth germanate (BGO) scintillator, 2.5 cm (1.0 in.) dia x 1 mm thick                                    | 1.2 mg/cm <sup>2</sup>        | 5 cm <sup>2</sup> /<br>5 cm <sup>2</sup>     | 3%– <sup>14</sup> C<br>15%– <sup>125</sup> I<br>8%– <sup>129</sup> I   | 650 cpm                | 500 to 1200             | 47-2465  |
| 44-92<br> | Sealed, xenon gas proportional   | 6 mg/cm <sup>2</sup> titanium | 169 cm <sup>2</sup> /<br>140 cm <sup>2</sup> | 10%– <sup>14</sup> C<br>13%– <sup>99</sup> Tc<br>24%– <sup>36</sup> Cl<br>26%– <sup>90</sup> Sr/ <sup>90</sup> Y<br>3%– <sup>129</sup> I<br>1.6%– <sup>57</sup> Co<br>1.2%– <sup>55</sup> Fe<br>10%– <sup>239</sup> Pu | < 1000 cpm             | 1600 to 1900            | 47-2362  |

# Detectors

## Gamma GM

| Model   | Detector Type                                | Linear Range Without Dead Time Correction               | Typical Sensitivity ( $^{137}\text{Cs}$ ) | Energy Response                           | Typical Bkg (10 $\mu\text{R/hr}$ ) | Typical Dead Time | Operating Voltage (Vdc) | Part No. |
|---|--|---|---|---|------------------------------------|-------------------|-------------------------|----------|
| 133-2<br>waterproof option available<br> | Energy-compensated GM                        | 1 $\mu\text{Sv/h}$ to 2 mSv/h (0.1 to 200 mR/hr)        | 1000 cpm per mR/hr                        | $\pm 25\%$                                | 12 cpm                             | 50 $\mu\text{s}$  | 550                     | 47-1717  |
| 133-4<br>waterproof option available<br> | Energy-compensated GM                        | 0.1 mSv/h to 20 mSv/h (1 mR/hr to 2 R/hr)               | 100 cpm per mR/hr                         | $\pm 15\%$                                | $\leq 1$ cpm                       | 50 $\mu\text{s}$  | 550                     | 47-1674  |
| 133-6<br>waterproof option available<br> | Energy-compensated GM                        | 40 $\mu\text{Sv/h}$ to 60 mSv/h (4 mR/hr to 6 R/hr)     | 18 cpm per mR/hr                          | $\pm 15\%$                                | $\leq 1$ cpm                       | 50 $\mu\text{s}$  | 550                     | 47-1718  |
| 133-7<br>waterproof option available<br> | Energy-compensated GM                        | 250 $\mu\text{Sv/h}$ to 300 mSv/h (25 mR/hr to 30 R/hr) | 4.2 cpm per mR/hr                         | $\pm 15\%$                                | $\leq 1$ cpm                       | 50 $\mu\text{s}$  | 460                     | 47-1216  |
| 44-6<br>                                | GM w/ Beta window                            | $\pm 10\%$ up to 50 mR/hr                               | 1200 cpm per mR/hr w/ window closed       | Energy dependent                          | Closed: 20 cpm<br>Open: 25 cpm     | 95 $\mu\text{s}$  | 900                     | 47-1535  |
| 44-38<br>                              | GM w/ Beta window                            | $\pm 10\%$ up to 50 mR/hr                               | 1200 cpm per mR/hr w/ window closed       | Within 20% of $^{137}\text{Cs}$ (662 keV) | Closed: 20 cpm<br>Open: 25 cpm     | 95 $\mu\text{s}$  | 900                     | 47-1588  |
| 44-150-1<br>                           | Energy-compensated GM                        | 1 to 500 $\mu\text{Sv/h}$ (0.1 to 50 mR/hr)             | 4000 cpm per mR/hr                        | Within 25% from 60 keV to 3 MeV           | 48 cpm                             | 50 $\mu\text{s}$  | 550                     | 47-3335  |
| 44-150-3<br>                           | Energy-compensated GM                        | 0.1 to 80 $\mu\text{Sv/h}$ (0.01 to 8 mR/hr)            | 13,500 cpm per mR/hr                      | Within 30% from 60 keV to 1.3 MeV         | 300 cpm                            | 50 $\mu\text{s}$  | 900                     | 47-4039  |
| 44-183<br>                             | Shielded, directional, energy-compensated GM | 10 to 20 mSv/h (1 mR/hr to 2 R/hr)                      | 100 cpm per mR/hr                         | $\pm 15\%$                                | $\leq 1$ cpm                       | 50 $\mu\text{s}$  | 550                     | 47-3758  |

## Gamma Scintillator

| Model   | Detector Type   | Efficiency (4 π)  | Typical Sensitivity   | Energy Response     | Typical Bkg (10 μR/hr) | Operating Voltage (Vdc) | Part No. |
|---|---|---|-----------------------|---------------------|------------------------|-------------------------|----------|
| 44-2<br>       | Nal(Tl) scintillator,<br>2.5 x 2.5 cm (1 x 1 in.)                     | 7%– <sup>125</sup> I<br>10%– <sup>57</sup> Co<br>3%– <sup>137</sup> Cs<br>3%– <sup>60</sup> Co  | 175 cpm per<br>μR/hr  | Energy<br>dependent | 1800 cpm               | 500 to 1200             | 47-1532  |
| 44-10<br>      | Nal(Tl) scintillator,<br>5.1 x 5.1 cm<br>(2 in. x 2 in.)              | 4%– <sup>125</sup> I<br>20%– <sup>57</sup> Co<br>9%– <sup>137</sup> Cs<br>15%– <sup>60</sup> Co | 900 cpm per<br>μR/hr  | Energy<br>dependent | 9750 cpm               | 500 to 1200             | 47-1540  |
| 44-62<br>      | Nal(Tl) scintillator,<br>1.3 x 2.5 cm (0.5 x 1 in.)                   | 3.8%– <sup>137</sup> Cs   | 49 cpm per<br>μR/hr   | Energy<br>dependent | 600 cpm                | 500 to 1200             | 47-1238  |
| 44-11<br>      | Nal(Tl) scintillator,<br>5.1 x 5.1 cm (2 x 2 in.)                     | 11.2%– <sup>137</sup> Cs  | 900 cpm per<br>μR/hr  | Energy<br>dependent | 9750 cpm               | 500 to 1200             | 47-1541  |
| 44-20<br>    | Nal(Tl) scintillator,<br>7.6 x 7.6 cm (3 x 3 in.)                     | 29%– <sup>125</sup> I   | 2300 cpm per<br>μR/hr | Energy<br>dependent | 23,000 cpm             | 500 to 1200             | 47-1104  |
| 44-159-1<br> | Csl (cesium iodide)<br>scintillator,<br>18 x 18 mm<br>(0.7 x 0.7 in.) | 14%– <sup>57</sup> Co<br>3%– <sup>137</sup> Cs<br>5%– <sup>60</sup> Co                          | 120 cpm per<br>μR/hr  | Energy<br>dependent | 750 cpm                | 700 to 1200             | 47-3820  |
| 44-132<br>   | EJ-212 plastic<br>scintillator,<br>14.6 x 2.5 cm<br>(5.75 x 1 in.)    | None  | 1500 cpm per<br>μR/hr | Energy<br>dependent | ≤ 10,000 cpm           | 700 to 1100             | 47-3074  |

# Detectors

## Low-Energy Gamma Scintillator

| Model  | Detector Type   | Window                  | Area (Active/Open)                             | Efficiency (4 π)   | Typical Bkg (cpm) (10 μR/hr) | Operating Voltage (Vdc) | Part No. |
|--|---|-------------------------|--|--|------------------------------|-------------------------|----------|
| 44-3<br>          | NaI(Tl) scintillator, 2.5 x 0.1 cm (1 x 0.04 in.)                         | 18.4 mg/cm <sup>2</sup> | 5 cm <sup>2</sup> /<br>5 cm <sup>2</sup>       | 33.5%– <sup>125</sup> I<br>18%– <sup>129</sup> I   | 300                          | 500 to 1200             | 47-1533  |
| 44-17<br>         | NaI(Tl) scintillator, 5.1 x 0.2 cm (2 x 0.08 in.)                         | 43 mg/cm <sup>2</sup>   | 17.8 cm <sup>2</sup> /<br>17.8 cm <sup>2</sup> | 41%– <sup>125</sup> I<br>22%– <sup>129</sup> I   | < 1500                       | 500 to 1200             | 47-1547  |
| 44-172<br>        | YSO (Yttrium Oxyorthosilicate) scintillator, 2.5 cm x 1 mm (1 x 0.04 in.) | 1.2 mg/cm <sup>2</sup>  | 5 cm <sup>2</sup> /<br>5 cm <sup>2</sup>       | 40%– <sup>125</sup> I<br>25%– <sup>129</sup> I<br>8%– <sup>14</sup> C<br>7%– <sup>55</sup> Fe<br>2.5%– <sup>137</sup> Cs<br>11.2%– <sup>241</sup> Am<br>7.4%– <sup>57</sup> Co | ≤ 250                        | 500 to 1200             | 47-3543  |
| 44-213 FIDLER<br> | CsI crystal scintillator, 12.7 cm x 1.2 mm (5 x 0.050 in.)                | 10.6 mg/cm <sup>2</sup> | 127 cm <sup>2</sup> /<br>127 cm <sup>2</sup>   | 13%– <sup>241</sup> Am<br>8%–U <sup>Nat</sup>  | ≤ 9000                       | 500 to 1200             | 47-4134  |

## Neutron

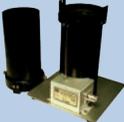
| Model   | Indicated Use  | Detector Type  | Moderator                                    | Energy Response   | Typical Sensitivity                        | Operating Voltage (Vdc) | Part No. |
|---|--|--|--|---|--|-------------------------|----------|
| 42-30H<br> | Wall mount area monitor  | 2 atm <sup>3</sup> He tube                                 | 10 in. dia polyethylene sphere               | Follows the RPG curve for neutron dose from thermal to 12 MeV | 200 cpm per mrem/hr                        | 1200                    | 47-3582  |
| 42-31H<br> | Survey and/or area monitoring                                    | 2 atm <sup>3</sup> He tube                                 | 9 in. dia cadmium-loaded polyethylene sphere | Follows RPG curve for neutron dose from thermal to 12 MeV     | 100 cpm per mrem/hr                        | 1200                    | 47-3583  |
| 42-5<br>   | Determining neutron fluences and dose throughout energy spectrum | <sup>6</sup> LiI Scintillator Crystal, 0.16 in. x 0.16 in. | Includes 6 high-density polyethylene spheres | Thermal to approximately 12 MeV                               | 45 cpm per mrem/hr (with 10 in. moderator) | 400 to 900              | 47-1505  |
| 42-41L<br> | Survey measurement   | PRESCILA proton recoil scintillator                        | N/A  | Follows RPG curve for neutron dose from thermal to 100 MeV    | 350 cpm per mrem/hr                        | 500 to 700              | 47-3309  |
| 42-38<br>  | Wide energy neutron detection instrument (WENDI-2)               | 2 atm <sup>3</sup> He tube                                 | Polyethylene cylinder                        | Follows RPG curve for neutron dose from 0.1 MeV to 5 GeV      | 450 cpm per mrem/hr                        | 1000 to 1200            | 47-3127  |

# Detectors

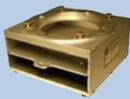
## Sample Counter Heads

| Model   | Type           | Detector                        | Window                 | Efficiency  | Typical Background (10 $\mu$ R/hr)                  | Voltage (Vdc) | Sample Size (dia.) | Part No. |
|---|----------------|---------------------------------|------------------------|---|---|---------------|--------------------|----------|
| 43-9<br>       | Alpha          | ZnS(Ag)                         | 0.4 mg/cm <sup>2</sup> | 30%– <sup>230</sup> Th  | ≤ 3 cpm   | 500 to 1200   | 2.5 cm (1 in.)     | 47-1525  |
| 43-10<br>      | Alpha          | ZnS(Ag)                         | Windowless             | 37%– <sup>230</sup> Th  | ≤ 3 cpm   | 500 to 1200   | 5.1 cm (2 in.)     | 47-1526  |
| 43-78<br>      | Alpha          | ZnS(Ag)                         | Windowless             | 37%– <sup>230</sup> Th<br>37%– <sup>239</sup> Pu  | ≤ 3 cpm   | 500 to 1200   | 12.7 cm (5 in.)    | 47-2180  |
| 43-10-1<br>   | Alpha/<br>Beta | ZnS(Ag) on plastic scintillator | 0.4 mg/cm <sup>2</sup> | 37%– <sup>239</sup> Pu<br>32%– <sup>230</sup> Th<br>39%– <sup>238</sup> U<br>5%– <sup>14</sup> C<br>27%– <sup>99</sup> Tc<br>26%– <sup>90</sup> Sr/ <sup>90</sup> Y<br>29%– <sup>137</sup> Cs | Alpha: ≤ 3 cpm<br>Beta: 80 cpm                      | 500 to 1200   | 5.1 cm (2 in.)     | 47-1305  |
| 43-10-10<br> | Alpha/<br>Beta | ZnS(Ag) on plastic scintillator | Windowless             | 40%– <sup>239</sup> Pu  | ≤ 1 cpm   | 500 to 1200   | 5.1 cm (2 in.)     | 47-4114  |
| 43-78-2<br>  | Alpha/<br>Beta | ZnS(Ag) on plastic scintillator | 0.4 mg/cm <sup>2</sup> | 37%– <sup>239</sup> Pu<br>37%– <sup>90</sup> Sr/ <sup>90</sup> Y  | Alpha: ≤ 7 cpm per 10 min count;<br>Beta: ≤ 100 cpm | 800 to 1200   | 7.6 cm (3 in.)     | 47-2620  |

## Sample Counter Heads

| Model   | Type                  | Detector   | Window                                | Efficiency   | Typical Background (10 $\mu$ R/hr)          | Voltage (Vdc)  | Sample Size (dia.)               | Part No. |
|---|-----------------------|--|---------------------------------------|--|---|--|----------------------------------|----------|
| 44-110-4<br> | Low energy Alpha/Beta | Gas flow proportional  | Windowless                            | 3%– <sup>3</sup> H<br>21%– <sup>14</sup> C<br>36%– <sup>63</sup> Ni<br>42%– <sup>239</sup> Pu          | Beta: 150 cpm<br>Alpha: $\leq$ 3 cpm        | 1600 to 1900   | 5.1 x 0.9 cm<br>(2 x 0.4 in.)    | 47-3929  |
| 120<br>      | Alpha/Beta/Gamma      | Gas flow proportional  | 0.4 mg/cm <sup>2</sup>                | 10%– <sup>14</sup> C<br>42%– <sup>90</sup> Sr/ <sup>90</sup> Y<br>35%– <sup>230</sup> Th<br>< 1%–gamma | Alpha: $\leq$ 3 cpm<br>Beta: $\leq$ 100 cpm | Alpha:<br>900 to 1300<br>Beta-Gamma:<br>1300 to 1700 | 5.1 cm<br>(2 in.)                | 47-1625  |
| 180-8<br>    | Alpha/Beta/Gamma      | End-window halogen-quenched GM                                 | 1.7 $\pm$ 0.3 mg/cm <sup>2</sup> mica | 2%– <sup>14</sup> C<br>10%– <sup>90</sup> Sr/ <sup>90</sup> Y<br>7%– <sup>239</sup> Pu                 | 14 cpm with end window GM                   | 900  | 5.1 cm<br>(2 in.)                | 47-1549  |
| 43-78-1<br> | Beta                  | Plastic scintillator   | Windowless                            | 40%– <sup>90</sup> Sr/ <sup>90</sup> Y<br>12%– <sup>14</sup> C<br>35%– <sup>99</sup> Tc                | $\leq$ 500 cpm                              | 500 to 1200  | 12.7 x 0.46 cm<br>(5 x 0.18 in.) | 47-2307  |
| 203<br>    | Gamma                 | Integral NaI(Tl) well scintillator, 2 in. dia. x 1.8 in. thick | N/A                                   | 65%– <sup>129</sup> I<br>33%– <sup>137</sup> Cs<br>43%– <sup>60</sup> Co                               | $\leq$ 500 cpm                              | 500 to 1200  | 1.7 x 3.9 cm<br>(0.7 x 1.6 in.)  | 47-1638  |
| 243<br>    | Gamma                 | Integral NaI(Tl) well scintillator, 1.8 in. dia. x 2 in. thick | N/A                                   | 80%– <sup>125</sup> I<br>90%– <sup>99m</sup> Tc<br>33%– <sup>137</sup> C<br>43%– <sup>60</sup> Co      | $\leq$ 1000 cpm                             | 500 to 1200  | 1.7 x 3.9 cm<br>(0.7 x 1.6 in.)  | 47-1621  |
| 182<br>    | Radon flask counter   | ZnS(Ag)  | N/A                                   | 40% using nickel-plated <sup>239</sup> Pu source on top of ZnS(Ag) coated light pipe                   | $\leq$ 2 cpm                                | 400 to 1500  | 6.1 x 12.7 cm<br>(2.4 x 5.0 in.) | 47-1633  |

## Sample Holders

| Model   | Sample Size (dia.)   | Construction  | Weight            | Compatible Detectors                                     | Part No. |
|---|----------------------|---|-------------------|--|----------|
| 180-1<br>    | 5.1 cm (2.0 in.) max | Anodized aluminum frame and sample tray                     | 0.5 kg (1.1 lb)   | 43-2<br>43-2-2<br>44-1<br>44-2<br>44-3<br>44-21<br>44-98 | 47-1675  |
| 180-1L<br>   | 5.1 cm (2.0 in.) max | Painted lead collimator with aluminum frame and sample tray | 1.4 kg (3 lb)     | Same as Model 180-1                                      | 47-2988  |
| 180-24<br>   | 5.1 cm (2.0 in.) max | Anodized aluminum frame and sample tray                     | 0.4 kg (0.8 lb)   | Same as Model 180-1                                      | 47-2631  |
| 180-7<br>   | 5.1 cm (2.0 in.) max | Anodized aluminum frame and sample tray                     | 0.5 kg (1.1 lb)   | 44-10<br>44-17   | 47-1582  |
| 180-16<br> | 10.2 cm (4 in.) max  | Anodized aluminum frame and sample tray                     | 1.2 kg (2.7 lb)   | 43-1<br>43-1-1   | 47-1132  |
| 180-4<br>  | 5.1 cm (2.0 in.) max | Anodized aluminum frame and sample tray                     | 0.35 kg (0.76 lb) | 44-7   | 47-1667  |
| 180-2<br>  | 5.1 cm (2.0 in.) max | Anodized aluminum frame and sample tray                     | 0.4 kg (0.9 lb)   | 44-9<br>44-9 W/DOSE<br>44-9-18                           | 47-1665  |

**Common Features:** Used for Repeatable Counting of Wipes, Filter Paper, or Slides

Tray Heights:

- 0.32 cm (0.125 in.)
- 0.64 cm (0.25 in.)
- 1.3 cm (0.5 in.)
- 2.5 cm (1.0 in.)
- 5.1 cm (2.0 in.)

# Detectors

## Sample Holders

| Model   | Indicated Use  | Sample Size (dia.)             | Tray Heights  | Construction   | Weight            | Compatible Detectors  | Part No. |
|---|--|--------------------------------|---|--|-------------------|---|----------|
| 180-15<br>   | Repeatable counting of wipes, filter paper, or slides                | 5.1 x 5.1 cm (2 x 0.6 in.)     | 0.2 cm (0.08 in.)   | Powder coated and anodized aluminum                              | 1.1 kg (2.3 lb)   | 44-40   | 47-1111  |
| 180-15-3<br> | Repeatable counting of wipes, filter paper, or slides                | 5.1 x 5.1 cm (2 x 0.6 in.)     | 0.2 cm (0.08 in.)   | Powder coated and anodized aluminum                              | 1.1 kg (2.3 lb)   | 43-92<br>43-93<br>44-142  | 47-3865  |
| 180-8<br>    | Low-background sample counting                                       | 5.1 cm (2.0 in.) max           | 0.32 cm (0.125 in.)<br>0.64 cm (0.25 in.)<br>1.3 cm (0.5 in.)<br>2.5 cm (1.0 in.)<br>5.1 cm (2.0 in.) | 3.8 cm (1.5 in.) thick lead housing with beige powder-coat paint | 107 kg (235 lb)   | Includes end window GM detector   | 47-1549  |
| 180-9<br>   | Low-background sample counting                                       | 5.1 cm (2.0 in.) max           | same as Model 180-8   | 3.8 cm (1.5 in.) thick lead housing with beige powder-coat paint | 118.1 kg (260 lb) | 43-2<br>43-2-2<br>44-1<br>44-2<br>44-3<br>44-10<br>44-11<br>44-17<br>44-21<br>44-98 | 47-1591  |
| 180-12<br> | Repeatable low-background counting of wipes, filter paper, or slides | 5.8 x 2.97 cm (2.3 x 1.17 in.) | 0.2 cm (0.08 in.)   | Powder-coated lead and aluminum                                  | 12.5 kg (27.5 lb) | 44-10<br>44-11<br>44-17   | 47-1562  |
| 180-28<br> | Repeatable counting of wipes, filter paper, or slides                | 5.1 cm (2.0 in.) max           | Same as Model 180-8   | Anodized aluminum frame and sample tray                          | 0.4 kg (0.9 lb)   | Model 26 series integrated friskers   | 47-3948  |

# Area Monitors

## Model 375 Series



- Digital Controller for Radiation Monitoring
- Photo Represents Models 375, 375/1, 375/2, and 375/4

## Model 375-Dual



- Digital Controller for Radiation Monitoring
- Dual Channel
- Supports GM, Proportional, Scintillator & Neutron Detectors

## Model 375-9



- Digital Controller for Ion Chamber
- Fast Response to Pulsed Fields
- 10 atm Aluminum Ion Chamber

## Model 375 Series Specifications

| Model                   | Detector Range  | Detector   |
|-------------------------|---|--|
| 375<br>PN: 48-2230      | Controller only, no detector included   | Supports GM, scintillator, and proportional detector types |
| 375-Dual<br>PN: 48-2369 |   |  |
| 375/1<br>PN: 48-3831    | 0.001 to 99.99 $\mu\text{Sv/h}$ (0.1 to 9999 $\mu\text{R/hr}$ )                 | Internal, 18 mm CsI scintillator                           |
| 375/2<br>PN: 48-2410    | 1 $\mu\text{Sv/h}$ to 10 mSv/h (0.1 mR/hr to 1.0 R/hr)                          | Internal, Energy-compensated GM                            |
| 375/4<br>PN: 48-2411    | 10 $\mu\text{Sv/h}$ to 100 mSv/h (1.0 mR/hr to 10 R/hr)                         | Internal, Energy-compensated GM                            |
| 375-9<br>PN: 48-3560    | Choose: 0.1 mR/hr to 1 R/hr,<br>1 mR/hr to 10 R/hr,<br>10 mR/hr to 100R/hr      | Internal, 10 atm chamber (Model 45-9)                      |
| 375-10<br>PN: 48-3443   | 0.1 $\mu\text{Sv/h}$ to 20 $\mu\text{Sv/h}$ (1.0 $\mu\text{R/hr}$ to 2.0 mR/hr) | Internal, NaI scintillator<br>5.1 x 5.1 cm (2.0 x 2.0 in.) |

**Common Features:** Adjustable Alarms • Dead Time Correction

## Model 3276 Series Specifications

| Model                 | Detector Range  |
|-----------------------|---|
| 3276<br>PN: 48-4160   | Controller only, no detector included                                 |
| 3276/1<br>PN: 48-4169 | 0.010 to 500 $\mu\text{Sv/h}$<br>(1.0 $\mu\text{R/hr}$ to 50.0 mR/hr) |
| 3276/2<br>PN: 48-4170 | 1.0 $\mu\text{Sv/h}$ to 10 mSv/h<br>(0.10 mR/hr to 1.00 R/hr)         |
| 3276/4<br>PN: 48-4171 | 10 $\mu\text{Sv/h}$ to 100 mSv/h<br>(1.0 mR/hr to 10.0 R/hr)          |
| 3276/6<br>PN: 48-4283 | 10 mSv/h to 9.9 Sv/h<br>(1 mR/hr to 1000 R/hr)                        |

## Model 3276 Series



- Auto-Ranging Digital Meter
- Functions as a Frisker or Area Monitor
- Supports GM, Proportional, Scintillation Detectors

# Area Monitors

## Model 375 Controller Specifications

**DISPLAY:** 4-digit LED display with 2 cm (0.8 in.) character height

**DISPLAY RANGE:** 000.0–9999 (Series one: 00.00–9999)

**DISPLAY UNITS:** Can be made to display in  $\mu\text{R/hr}$ ,  $\text{mR/hr}$ ,  $\text{R/hr}$ ,  $\mu\text{Sv/h}$ ,  $\text{mSv/h}$ ,  $\text{Sv/h}$ ,  $\mu\text{rem/hr}$ ,  $\text{mrem/hr}$ ,  $\text{rem/hr}$ ,  $\text{cpm}$ ,  $\text{cps}$ , and others

**LINEARITY:** Reading within 10% of true value

**RESPONSE TIME:** Typically three seconds from 10%–90% of final reading

### INDICATORS

- **STATUS:** Green light, instrument functioning properly
- **LOW ALARM:** Yellow light, 1 beep/second audible, selectable range: 0–9999
- **HIGH ALARM:** Red light, 4 beeps/second audible, selectable range: 0–9999
- **DETECTOR FAIL:** Red light, constant audible tone > 68 dB at 61 cm (2 ft)
- **LOW BAT:** Yellow light, indicates less than two hours of battery life remaining
- **OVERLOAD:** Senses detector saturation
- **OVER-RANGE:** Indicates radiation field being measured has exceeded counting range of instrument

**DATA OUTPUT:** Nine-pin connector providing five-range logarithmic output, RS-232 output, signal ground connection, FAIL, and alarm signals (current sink), and direct connection to battery and ground

**CALIBRATION CONTROLS:** Accessible from front of instrument (protective cover provided)

**POWER:** 95–135 Vac (178–240 Vac available), 50–60 Hz single phase. (includes 6-volt sealed lead-acid rechargeable battery)

**BATTERY LIFE:** Typically 48 hours in non-alarm condition; 12 hours in alarm condition

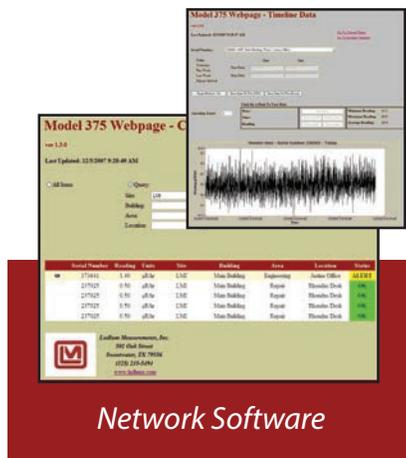
**BATTERY CHARGER:** Battery is continuously trickle charged when instrument is connected to line power and turned on

**SIZE:** 18.7 x 24.6 x 6.4 cm (7.4 x 9.7 x 2.5 in.) (H x W x D) \*controller only

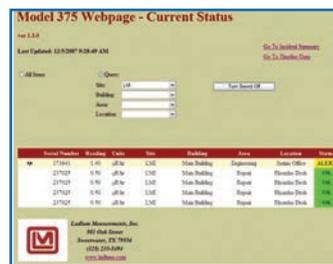
**WEIGHT:** 2.1 kg (4.7 lb) \*controller only

## Ethernet Connectivity with a Web Page Interface

Model 375 controllers equipped with the Ethernet option can be connected to a radiation network that collects and displays radiation levels and alarm status in real time from up to 50 area monitors. A standard web page browser with appropriate authorization can view all data across the network and audibly annunciate any alarms. The system can also be set up to send intelligent email alerts to responsible personnel and capture a picture of whatever triggered an alarm where optional Ethernet cameras are employed.



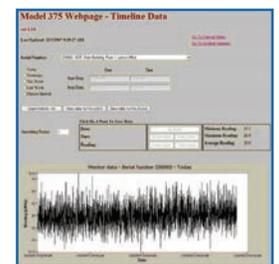
Part Number: 1370-077



Current Status



Incident Summary



Timeline Data

## Options

Various options are available for the Model 375 monitoring systems.

**Options include:** enclosures, remote displays, alarm annunciators, signal outputs, networking options, and software. A complete list of available options is listed on our website, [www.ludlums.com](http://www.ludlums.com).

# Portal Monitors

**Model 52**



- Beta-Gamma Portal Monitor
- Very Sensitive Beta Detection

**Model 52-1, 52-5,  
& 52-6 Series**



- Beta-Gamma Portal Monitor
- Very Sensitive Gamma Detection

**Model 52-8 Series**



- Can be Used to Monitor Vehicles as Well as Personnel
- Available in Two Sizes

| Model                  | Detectors  | Inside Width   | Detector Volume (Total)        |
|------------------------|--|----------------|--------------------------------|
| 52<br>PN: 48-2471      | 6 pancake GM detectors per side,<br>2 pancake GM detectors on top,<br>4 thin wall GM tubes on bottom | 81 cm (32 in.) | N/A                            |
| 52-1*<br>PN: 48-3172   | 4 plastic scintillators, 2 on each side  | 61 cm (24 in.) | 11 L (672 in <sup>3</sup> )    |
| 52-1-1*<br>PN: 48-3258 | 4 plastic scintillators, 2 on each side  | 81 cm (32 in.) | 11 L (672 in <sup>3</sup> )    |
| 52-5<br>PN: 48-3393    | 5 plastic scintillators, 2 on each side,<br>1 on the bottom  | 61 cm (24 in.) | 12.8 L (780 in <sup>3</sup> )  |
| 52-5-1<br>PN: 48-3571  | 5 plastic scintillators, 2 on each side,<br>1 on the bottom  | 81 cm (32 in.) | 12.8 L (780 in <sup>3</sup> )  |
| 52-6<br>PN: 48-3611    | 6 plastic scintillators, 2 on each side,<br>1 on the bottom, and 1 on top                            | 61 cm (24 in.) | 14.6 L (888 in <sup>3</sup> )  |
| 52-6-1*<br>PN: 48-3603 | 6 plastic scintillators, 2 on each side,<br>1 on the bottom, and 1 on top                            | 81 cm (32 in.) | 14.6 L (888 in <sup>3</sup> )  |
| 52-8/1<br>PN: 48-4251  | 2 plastic scintillators, 1 on each side  | Adjustable     | 15.7 L (960 in <sup>3</sup> )  |
| 52-8/2<br>PN: 48-4237  |  |                | 32.7 L (2000 in <sup>3</sup> ) |

\*Model 52-1, 52-1-1, and 52-6-1 also have a waterproof option

## Options

Various options are available for the Model 52-1, 52-5, and 52-6 series.

**Options include:** Vehicle conversion kit, stabilizer legs, remote electronics, extension cable, and a printer. A complete list of available options is listed on our website, [www.ludlums.com](http://www.ludlums.com).

# Monitoring Systems

**Model 375P-336**



\* For indoor use only, an outside waterproof version is available. (Model 375P-336-1, PN: 48-3535)

**Model 375P-1000**



**Model 375P-2000**



**Model 4525-7000**



**Applications:** Medical, Scrap Metal, or Landfill Monitoring • Detectors are in Waterproof Enclosures

| Model                    | Detectors  | Typical Sensitivity<br><sup>137</sup> Cs | Alarm Determination | Controller                |
|--------------------------|--|--|---------------------|---------------------------|
| 375P-336*<br>PN: 48-3285 | 2 ea. 2753 cm <sup>3</sup> (168 in <sup>3</sup> ) plastic scintillation detectors  | 200 cps per μR/hr per detector           | Sigma & sum         | Model 375P                |
| 375P-1000<br>PN: 48-3470 | 2 ea. 7866 cm <sup>3</sup> (480 in <sup>3</sup> ) plastic scintillation detectors with 0.32 cm (0.13 in.) lead shielding in weather-tight housings | 400 cps per μR/hr per detector           | Sigma & sum         | Model 375P                |
| 375P-2000<br>PN: 48-4236 | 4 ea. 7866 cm <sup>3</sup> (480 in <sup>3</sup> ) plastic scintillation detectors with 0.33 cm (0.13 in.) lead shielding in weather-tight housings | 400 cps per μR/hr per detector           | Sigma & sum         | Model 375P                |
| 4525-7000<br>PN: 48-3605 | 2 ea. detectors, with 57 L (3500 in <sup>3</sup> ) of EJ-200 plastic scintillator  | 3000 cps per μR/hr per detector          | Sigma, sum & gamma  | Model 4525 control system |

For the latest, updated, and detailed product information, please visit our website ([www.ludlums.com](http://www.ludlums.com)) or contact a Ludlum Sales Representative (800-622-0828)  
More information about our Model 4525 Series can be found in the metal recycling catalog

# Contamination Monitors



**239-1F Series**  
Floor Monitor

## Beta Gamma Floor Monitoring

The Model 239-1F Floor Monitor is a gas proportional floor monitor detector mounted on a roll-around cart. The instrument features a flow system, quick-connects, a gas bottle mount, and adjustable detector height for optimum performance. The detector is a 584 cm<sup>2</sup> gas proportional detector utilizing P-10 counting gas and measures 2.0 x 16.0 x 46.5 cm (0.8 x 6.3 x 18.3 in.) (H x W x L). The counting-gas bottle and gas regulator are not included. The basic system as shown here is equipped with the Model 2221 general purpose ratemeter. Ludlum also offers this floor monitor using other ratemeters equipped with scaler and data logging functionality (including: Models 12, 2221, 2360, and 2350-1).

*More information on the available configurations located on our website*



**53**  
Personal Portal Monitor



## Gamma Personnel Portal Monitor

The Model 53 Gamma Personnel Portal detects gamma radiation in or on personnel passing through the portal from either direction. This highly sensitive portal uses eight large plastic scintillation detectors. Shielding is accomplished with either the standard 2.5 cm (1 in.) or optional 5.1 cm (2 in.) thickness of lead. A user-friendly interface guides personnel through the portal monitor via automated voice prompts, and is accompanied with 22.9 cm (9 in.) color LCD articulating screens, presenting the instrument readiness and status at the ingress and egress. Alarms are manifested both audibly and visually, and can be silenced and acknowledged via control buttons located on either side of the instrument. Three statistical counting modes are available to maximize throughput, maximize sensitivity, or fix the count time. Fast alarm and clean options provide the ability to quickly determine if personnel are contaminated or clean before the entire count cycle has ended. Accessible USB ports facilitate connecting a keyboard to implement changes, input user ID, or upload revised software. The system also includes an Ethernet link. Ludlum's optional Universal network software (PN 1370-093) can be used to log instrument status, user activity, and other information from one or more portals.

PN: 48-3784

*Also available in Beta-Gamma version: Model 53B (PN: 48-3925)*

# Contamination Monitors

## Alpha Beta Array Floor Monitoring

The Model 240 Alpha-Beta Array allows a user to quickly survey large areas for alpha-beta contamination. Compatible with either gas-proportional or scintillation detectors, the Model 240 cart comes in a floor-style only version, or a version that supports both floor and wall monitoring. Detector-to-surface spacing is adjustable and detectors are positioned for no “dead” zones when scanning. Gas proportional models come with a gas regulator, flowmeters, and gas lines, but a P-10 gas bottle is not included. The cart also provides two holders for spare detectors, to provide for replacement if a detector becomes damaged.

Utilizing an array of detectors instead of a single detector provides several advantages: 1) smaller detectors have lower backgrounds and thus lower minimum detectable activity (MDA); 2) smaller detectors allow the user to pinpoint the contamination; and 3) smaller detectors make it easier to maintain and replace fragile metallized polyester windows necessary for alpha detection.



**240 Series**  
Floor Monitor

# Small Article Monitoring

## Small Article Contamination Checking

The Model 54 and 54A small article monitors feature true  $4\pi$  counting to provide a more uniform response throughout the large 130.3 L (4.6 ft<sup>3</sup>) volume of the Model 54 and the smaller 45 L (1.6 ft<sup>3</sup>) volume of the Model 54A. Both models utilize a stainless steel liner. The user interface is via a color touch-screen LCD. Ludlum's counting technology delivers consistent and accurate results in the shortest time. These systems are available in either four or six detector versions, and with either 2.5 or 5.1 cm (1.0 or 2.0 in.) lead shielding.



**54 Series**  
Small Article Monitors

| Number of Detectors | Shielding        | Model 54 Part No. | Model 54A Part No. |
|---------------------|------------------|-------------------|--------------------|
| 4                   | 2.5 cm (1.0 in.) | 48-3728           | 48-3803            |
| 4                   | 5.1 cm (2.0 in.) | 48-3727           | 48-3802            |
| 6                   | 2.5 cm (1.0 in.) | 48-3726           | 48-3793            |
| 6                   | 5.1 cm (2.0 in.) | 48-3263           | 48-3792            |

## Retrofit Option for Small Article Monitor

Small article monitors tend to be large, cumbersome instruments with multiple sensitive plastic scintillator detectors, case-mounted electronics, and heavy lead shielding. These characteristics tend to make them difficult to update when upgraded performance is desired or the monitor is no longer supported by the original manufacturer. However, Ludlum Measurements offers an option to update a small article monitor with comparative ease. The Model 54R Series is a set of electronics designed to retrofit existing small article monitors, giving them the same operational performance and features as the Ludlum Model 54 small article monitor.



**54R Series**  
Retrofit Option

# Air Monitors

**Model 334A**



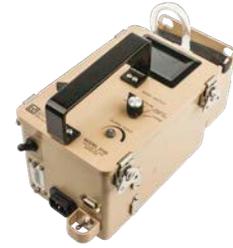
- Integrated LCD & Touch-Screen Display
- Non-SI or SI Units of Measurement
- Acute and Chronic Dose Modes

**Model 334AB**



- Integrated LCD & Touch-Screen Display
- Non-SI or SI Units of Measurement
- Portable Workplace Monitor or Portable CAM for Emergency Response Assessments
- Radon Compensation
- Built-In Gamma Guard Detector

**Model 3100**



- No Zero Adjust Control Needed
- Temperature and Altitude Compensation
- Passed USA Military Testing
- MDA: 0.074 MBq/m<sup>3</sup> (2 μCi/m<sup>3</sup>)
- See More Specifications on Page 46

| Model                   | Indicated Use      | Detector   | Detector Range  |
|-------------------------|--------------------|--|---|
| 334A*<br>PN: 48-3859    | Alpha monitor      | Solid-state silicon<br>(450 mm <sup>2</sup> active area)                                 | Typical sensitivity of 1.0 DAC-h (chronic)<br>and 30 DAC-h (acute)  |
| 334AB*<br>PN: 48-3864-G | Alpha-Beta monitor | Solid-state ion-implanted silicon<br>(450 mm <sup>2</sup> active area, 300 μm depletion) | MDC is less than 2 x 10 <sup>-9</sup> μCi/cc for Cs-137<br>using a 30 minute chronic analysis time in a<br>10 μR/h gamma background |
| 3100**<br>PN: 48-4282-1 | Tritium monitor    | Dual ion chambers  | 0.074 MBq/m <sup>3</sup> to 740 MBq/m <sup>3</sup><br>(2 μCi/m <sup>3</sup> to 20,000 μCi/m <sup>3</sup> )                          |

\*Sensitivity is dependent on several factors including radon background, filter type, flow rate, acute and chronic window settings, and the energy of the isotope of interest

\*\*See more specifications on page 46

# Hand & Foot Monitors

**Model 215**



- Alpha Only
- Can be Used as Both a Stationary Detector and Mobile Frisker
- No Batteries, Cables, or Gas Required

**Model 4901P**



- Employs a Total of 22 Pancake GM Detectors
- Automatic Background Subtract

**Model 3276 H&F**



- Consists of the Model 3276, Model 25, and Model 26
- Optional Model 43-93 or Model 44-9 for Frisking
- Includes Stand

**Model L-177 H&F**



- Consists of a Model 177, Model 44-25, and Model 44-26

| Model                     | Indicated Use                          | Detector(s)  |
|---------------------------|--|--|
| 215<br>PN: 48-3695        | Alpha frisker and hand monitor         | Alpha air proportional probe with integrated electronics |
| 4901P<br>PN: 48-3009      | Beta-Gamma hand and foot monitor       | 22 Pancake-type, halogen-quenched GM                     |
| 3276 H&F<br>PN: 48-4160-2 | Alpha-Beta-Gamma hand and foot monitor | 5 Pancake-type, halogen-quenched GM detectors            |
| L-177 H&F<br>PN: 48-2213  | Alpha-Beta-Gamma hand and foot monitor | 5 Pancake-type, halogen-quenched GM detectors            |



**4906 Series**  
Hand & Foot Monitor

## Hand & Foot Contamination Monitoring

The Model 4906 Series are low-cost, industrial duty, alpha and alpha/beta contamination monitoring systems for checking hands and feet of personnel. A large, color touch-screen LCD presents users with the system status and points out any potential contamination. The system employs six detectors with counting activated by optical switches.

Alarms are annunciated locally and can be augmented with optional relays and/or a light stack. The built-in Ethernet interface supports connection to a network for gathering all count cycles and remote monitoring of the status. All maintenance can be performed from the front of the instrument. Detector access for quick replacement or repair is facilitated by hinged top covers.

| Model  | Detection        | Detector Type         | Part Number |
|--------|------------------|-----------------------|-------------|
| 4906A  | Alpha            | Air proportional      | 48-3687     |
| 4906AB | Alpha-Beta       | Gas flow proportional | 48-3688     |
| 4906P  | Alpha-Beta-Gamma | GM pancake            | 48-3919     |

# Sample Counting Systems

## Model 3030P



- PC Interface
- Units: cpm, dpm
- Optional Detector Shield

## Model 3030 & 3030-2



- PC Interface
- Model 3030 units: cpm, dpm
- Model 3030-2 units: cps, cpm, Bq

## Model 3030E w/43-10-1



- PC Interface
- Units: cpm, dpm
- 3030E-2 Units: cps, cpm, Bq
- The Model 3030E can be purchased separately or with other detectors listed on our website

### Common Features: Used for Alpha-Beta Sample Counting

| Model                             | Detector                                       | Window                 | 4 $\pi$ Efficiency   | Typical Background (10 $\mu$ R/hr)     | Weight             |
|-----------------------------------|--|------------------------|--|--|--------------------|
| 3030P<br>PN: 48-3509              | Internal Solid-state PIPS™ silicon             | None                   | Alpha:<br>35%– <sup>239</sup> Pu<br>Beta:<br>15%– <sup>99</sup> Tc<br>23%– <sup>137</sup> Cs<br>34%– <sup>90</sup> Sr/ <sup>90</sup> Y   | Alpha: 0.3 cpm<br>Beta: 30 cpm         | 3.9 kg<br>(8.5 lb) |
| 3030 & 3030-2<br>PN: 48-3204/3992 | Internal ZnS(Ag) on plastic scintillation disk | 0.4 mg/cm <sup>2</sup> | Alpha:<br>37%– <sup>239</sup> Pu<br>32%– <sup>230</sup> Th<br>39%– <sup>238</sup> U<br>Beta:<br>8%– <sup>14</sup> C<br>27%– <sup>99</sup> Tc<br>29%– <sup>137</sup> Cs<br>26%– <sup>90</sup> Sr/ <sup>90</sup> Y | Alpha: ≤ 3 cpm<br>Beta-Gamma: ≤ 50 cpm | 13.2 kg<br>(29 lb) |
| 3030E w/43-10-1<br>PN: 48-3456    | External ZnS(Ag) on plastic scintillation disk | 0.4 mg/cm <sup>2</sup> | Alpha:<br>37%– <sup>239</sup> Pu<br>32%– <sup>230</sup> Th<br>39%– <sup>238</sup> U<br>Beta:<br>5%– <sup>14</sup> C<br>27%– <sup>99</sup> Tc<br>29%– <sup>137</sup> Cs<br>26%– <sup>90</sup> Sr/ <sup>90</sup> Y | Alpha: ≤ 3 cpm<br>Beta-Gamma: ≤ 80 cpm | 4.5 kg<br>(10 lb)  |

### Stainless & Aluminum Planchets



| Material                   | Part No.    |
|----------------------------|-------------|
| Aluminum (Qty: 500)        | 7525-371    |
| Stainless Steel (Qty: 500) | 7525-371-01 |

# Sample Counting Systems

**Model 2100**



- Automated Gamma Sample Counter
- Conveyor

**Model 2100-1**



- Gamma Sample Counter
- Sliding Sample Drawer

**Simulated <sup>60</sup>Co Source**



Calibrated 0.1 Bq/g (10 Bq) simulated <sup>60</sup>Co radiation source for use with the Model 2100 Sample Counter.  
PN: 2433-504.

**Common Features:** Designed to Measure Steel Slug Samples for Radiation • Alarms at 0.1 Bq/g (6-60)

| Model                 | Detector                                     | Chamber Size                           | Typical Background (10 µR/hr) |
|-----------------------|--|--|-------------------------------|
| 2100<br>PN: 48-3780   | Nal scintillator<br>5.1 x 5.1 cm (2 x 2 in.) | 1.3 x 5 x 7 cm<br>(0.5 x 2 x 2.75 in.) | 1200 cpm<br>(sum channel)     |
| 2100-1<br>PN: 48-3781 | Nal scintillator<br>5.1 x 5.1 cm (2 x 2 in.) | 7 x 1.3 cm<br>(2.75 x 0.5 in.)         | 1200 cpm<br>(sum channel)     |



## Alpha-Beta Counting Systems

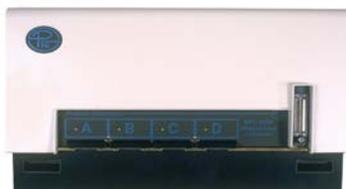
A division of Ludlum Measurements, Protean Instrument is a leading manufacturer of high performance sample counting systems for measuring alpha and beta activity at very low environmental levels. View more information about their products at [proteaninstrument.com](http://proteaninstrument.com)

**ASC-950-DP-G**



- Automatic Sample Changer
- Dual Phosphor Scintillation Detector (Gasless)

**MPC-9604**



- Manual Sample Changer
- Four 5.7 cm (2.25 in.) dia. Pancake Gas Flow Detectors

**WPC-1050**



- Automatic Sample Changer
- 5.7 cm (2.25 in.) dia. Pancake Gas Flow Detector

# Tritium Monitoring

## Specifications

**EFFECTIVE RANGE OF MEASUREMENT:** displays up to 740 MBq/m<sup>3</sup> (20,000 μCi/m<sup>3</sup>)

**MINIMUM DETECTABLE ACTIVITY (MDA):** 0.074 MBq/m<sup>3</sup> (2 μCi/m<sup>3</sup>)

**GAMMA COMPENSATION:** allows for tritium monitoring in gamma fields up to 0.05 mSv/h (5 mR/hr)

**LCD DISPLAY:** 6.9 cm (2.7 in.) diagonal transfective backlit LCD housed inside the electronics case

**BACKLIGHT:** rotary control adjusts backlight intensity for maximum contrast

**MODE SWITCH:** rotates between CHECK, MEASURE, SAMPLE (PUMP ON), and PURGE modes

**ALARM POINT:** adjusts the tritium alarm threshold anywhere from OFF to 740 MBq/m<sup>3</sup> (20,000 μCi/m<sup>3</sup>)

**RESPONSE TIME:** less than 60 seconds

**ZERO STABILITY:** 60-second countdown on power-up to 1 μCi/m<sup>3</sup> or less

**AUDIO:** 75 ± 5 dB at a frequency of 2500 Hz on alarm or failure conditions

**TEMPERATURE RANGE:** 0 to 50 °C (32 to 122 °F)

**PUMP:** maintenance-free diaphragm pump, typical airflow 1.5 L/min

**OUTPUT:** sealed 9-pin D connector provides potential-free relay contacts for energized and activated pump status, also provides data-out for streaming measurements

**POWER:** 110 - 240 Vac, 50/60 Hz input with 1.5A circuit breaker, or 8 NiMH AA cell batteries. Typical continuous battery life is 16 hours.

**CONSTRUCTION:** rugged, gasketed waterproof aluminum case

**AIR FILTER:** external user-replaceable 0.2 μm PTFE air filter

**DIMENSIONS:** Instrument: 20 x 16 x 30 cm (7.9 x 6.3 x 11.8 in.) (H x W x L); Case: 20 x 40 x 51 cm (7.9 x 15.5 x 19.9 in.) (H x W x L)

**WEIGHT:** Instrument: 4 kg (9 lb) with attached cables and tubing; Case: 9.5 kg (21 lb) with instrument, hose, power cord, and manual

### SOFTWARE:

- PN 4520-169-02: Includes calibration software and RS-232 USB cable.
- PN 4293-676-01: Includes calibration software, pressure calibration kit, and RS-232 USB cable.

**TESTING:** Passed USA Military Tests Including: MIL-STD-810G, MIL-STD-461G, MIL-STD-901D, MIL-STD-1399

## Model 3100 Portable Tritium in Air Monitor



PN: 48-4282-1



- No Zero Adjust Control Needed
- Easily Calibrated with <sup>137</sup>Cs Gamma Range
- Internal Heater Element Purge Mode to Dry Ion Chamber

## Also Available:

The Model 44-110 and Model 44-110-4 for tritium monitoring with appropriate electronics.



Model 44-110  
PN: 47-2585

**DETECTOR TYPE:** Gas flow

proportional

**WINDOW:** Windowless

**WINDOW AREA:**

Active: 126 cm<sup>2</sup> (19.5 in<sup>2</sup>)

Open: 100 cm<sup>2</sup> (15.5 in<sup>2</sup>)

**EFFICIENCY:** <sup>3</sup>H - 25%



Model 44-110-4  
PN: 47-3929

**DETECTOR TYPE:** Windowless  
gas flow proportional

**GAS FLOW:** Typically 0.1 L/min.,  
detector equipped with 3.2 mm  
(0.125 in) hose fittings and two  
position switch flow valve

**EFFICIENCY:**

3% - <sup>3</sup>H

21% - <sup>14</sup>C

36% - <sup>63</sup>Ni

42% - <sup>239</sup>Pu

# Dosimeters

## Model 23 (mrem)

PN: 51-2958



## Electronic Personal Dosimeters

The Ludlum Model 23 mrem Electronic Personal Dosimeter (EPD) is a compact and lightweight (55.9 g / 2.1 oz) pen-type personal dosimeter. It is ideal for the measurement and general monitoring of gamma and X-ray radiation in medical and laboratory environments, as well as any controlled or restricted area where personal radiation monitoring is required or desired. The unit is sensitive to a wide range of energies from 35 keV to 3 MeV. Dose, dose equivalent rate, and alarm values are easily seen on the four-digit LCD screen. An audible alarm is activated if the dose or dose rate exceeds the preset value of the dosimeter. The alarm set points are adjustable from the face of the unit.

## Model 23-1 (mSv)

PN: 51-2961

For users with multiple EPD units, the optional Model 23 Electronic Personal Dosimeter Reader/Software Kit can be used to quickly take data directly from the EPD via infrared communication to the user's PC. The software also allows the user to set or change alarm set points quickly.

An infrared reader that connects to the Model 23 and Model 23-1 dosimeters and the software required to communicate data may be purchased separately. PN: 51-2959

## Model AT Series



## Direct Reading Pencil Dosimeters

These direct reading dosimeters are rugged instruments that measure accumulated quantities of gamma and X-ray radiation. Applications include personal and environmental monitoring. The low-energy feature has hospital applications including fluoroscopy, portable radiography, and angiography. This pocket-size instrument is lightweight and has a sturdy clip to attach to an individual's pocket.

| Model   | Dose Range  | Part Number |
|---------|-------------|-------------|
| AT-138  | 0 to 200 mR | 51-2936     |
| AT-138S | 0 to 5 mSv  | 51-2937     |
| AT-725  | 0 to 5 R    | 51-2939     |

## Model AT Series Charger Options

### Model AT-909



The Model AT-909 is a compact, lightweight instrument designed to charge direct-reading pocket dosimeters. This unit requires batteries.

PN: 51-2938

### The Charger



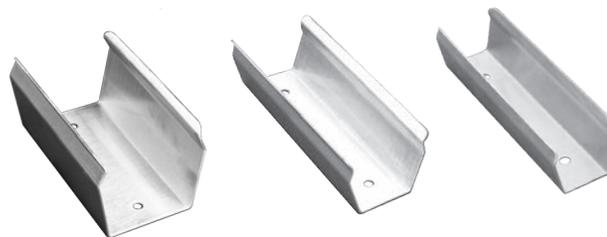
The Charger can zero a variety of quartz and carbon fiber dosimeters by squeezing the lever of a piezoelectric generator. This unit does not require batteries.

PN: 51-2940

# Accessories

## Detector Clips

| Detector Model No.                           | Clip Part Number |
|--|------------------|
| 43-5   | 4002-115         |
| 43-92<br>43-93                               | 4085-759         |
| 44-1<br>44-2<br>44-3                         | 4002-026-01      |
| 44-6<br>44-9<br>44-38                        | 4010-008-01      |
| 44-7   | 4010-007-01      |
| 44-10<br>44-17                               | 4002-020-08      |
| 44-40  | 4283-013         |
| 44-88  | 4002-304         |
| 44-142                                       | 4085-759         |
| 133 Series<br>(25 mm (1 in.) dia.)           | 4285-018         |
| 133 Series<br>(22 mm (0.875 in.) dia.)       | 4285-049         |
| L-8390-344 Barcode Scanner<br>for Model 2360 | 4002-020-08      |



These simple clips offer great convenience and gripping capability to attach detectors to the instrument. They are made from durable stainless steel to last a long time.

### Features:

- Brushed Stainless Steel
- Holds Detector Conveniently
- Helps Protect Detector
- Simplifies Transporting Meter & Detector in the Field
- Allows One-Handed Carrying of Instrument and Detector(s)
- Attaches to Carrying Handle or the Case of the Meter



## Detector Collimators

Ludlum offers a number of collimators for its gamma series detectors to accommodate a wide variety of applications. All collimators are constructed from lead (99% Lead & 1% Antimony) and are coated with beige powder-coat paint.

| Detector Model          | External Dimensions (D x L) (in.) | ID (in.) | Active Opening (in.) | Shielding (in.) | Weight (lbs) | Part Number |
|-------------------------|-----------------------------------|----------|----------------------|-----------------|--------------|-------------|
| 44-2                    | 2.135 x 2.0                       | 1.9      | 1.9                  | 0.118           | 1.5          | 7002-107    |
| 44-2                    | 2.63 x 1.875                      | 1.9      | 1.0                  | 0.365           | 6.6          | 4002-084-08 |
| 44-2<br>44-2-5<br>44-3  | 2.37 x 3.0                        | 1.91     | 1.91                 | 0.23            | 2.3          | 4002-227    |
| 44-10<br>44-17<br>44-22 | 3.125 x 2.5                       | 2.665    | 2.0                  | 0.23            | 2.0          | 4260-076    |
| 44-10<br>44-17<br>44-22 | 3.125 x 6.0                       | 2.665    | 2.0                  | 0.23            | 5.1          | 4260-079    |
| 44-11                   | 2.182 x 2.5                       | 2.332    | 2.0                  | 0.24            | 2.0          | 4260-120    |
| 44-20                   | 3.782 x 4.0                       | 3.29     | 3.29                 | 0.25            | 4.5          | 7032-051    |

## Fiberglass Extension Poles

| Part Number | Items Included              | Extension Length             | Instrument Variation |
|-------------|-----------------------------|------------------------------|----------------------|
| 4085-184*   | Detector clamp only         | 1 to 2.4 m<br>(4 to 8 ft)    | Any                  |
| 4498-865    | Detector clamp and Model 30 | 1 to 2.4 m<br>(4 to 8 ft)    | Model 30 only        |
| 4085-185*   | Detector clamp only         | 1.8 to 3.7 m<br>(6 to 12 ft) | Any                  |
| 4498-865-1  | Detector clamp and Model 30 | 1.8 to 3.7 m<br>(6 to 12 ft) | Model 30 only        |

**NOTE: The above poles do not include detectors.**  
**\*Does not include instrument/meter**

Clamp will fit detector diameters from 1.3 to 6.7 cm (0.5 to 2.625 in.)  
 (The picture below features the Model 43-92. Various detectors can be used with the fiberglass extension pole. Inquire about other options.)



## Additional Poles & Shoulder Straps



**Model 44-9-18**  
**PN: 47-2940**

A variant of the Model 44-9 alpha-beta-gamma pancake detector with a 0.9 m (36 in.) extension handle.



**Model 26 with Extension Pole**  
**PN: 4519-077**

0.6 to 1.5 m (23.6 to 59 in.) extension pole for the Model 26.



**Shoulder Straps**  
**PN: 4363-413**

This kit supplies an adjustable nylon strap and two replacement latches that attaches to most Ludlum meters.



**Model 3000 Series Shoulder Straps**  
**PN: 4498-868**

The Model 3000 series shoulder strap supports the meter over-the-shoulder allowing a detector pole to be held with both hands. Requires instrument case modification.

# Accessories

## Instrument Handles

Ludlum offers a variety of metal handles to go with our line of portable survey meters. The two basic handle types are rolled and flat. The flat handle is designed to accommodate a detector clip for convenient placement of the instrument detector.

Instruments equipped with a scaler function receive a rolled handle with an integrated scaler start button. When a detector clip is also desired, a flat handle with a control button is supplied.



Standard Rolled Handle  
PN: 7363-139



Flat Handle  
PN: 7363-203



Rolled Handle with Scaler Control  
PN: 4408-178



Flat Handle with Scaler Control  
PN: 4408-179

## Optional Lighted Handle

This handle incorporates a LED to illuminate the instrument display while in dark ambient conditions.

The 3-position rocker switch is conveniently located along the handle top allowing the operator to either turn the light on momentarily (while pressure is applied), turn it on indefinitely, or shut off the light. Two attachment points are additionally included along the top side to facilitate mounting a detector clip if desired. Power is supplied from a single AA size battery located within the handle that will allow over 500 hours of operation.



Lighted Handle  
PN: 4464-154

# Audio

## Headphone Jack

This modification for survey meters adds a headphone jack to the instrument body so headphones can be used to monitor click-per-event audio and audio alarms. Headphones are helpful when the instrument is being used in areas with high ambient noise levels or in areas where the audio would be distracting to others, such as in a medical or office environment.

| Detector Type                     | Part Number |
|-----------------------------------|-------------|
| Cast Aluminum Housing Instruments | 4464-464    |
| Model 9DP Series                  | 4293-891    |
| Model 26 Series                   | 4498-538    |
| Model 30 Series                   | 4498-697    |
| Model 3000 Series                 | 4498-555    |



## Headset

Comfortably reduces ambient sounds while working in a crowded or noisy area. This headset plugs into any Ludlum survey meter equipped with an audio output jack. The headphone cord comes with a 3.5 mm plug and a snap-on 1/4 inch adapter, and is attached to the earpiece with a reinforced connection. Dual volume control is available on the ear cups.  
PN: 22-9313

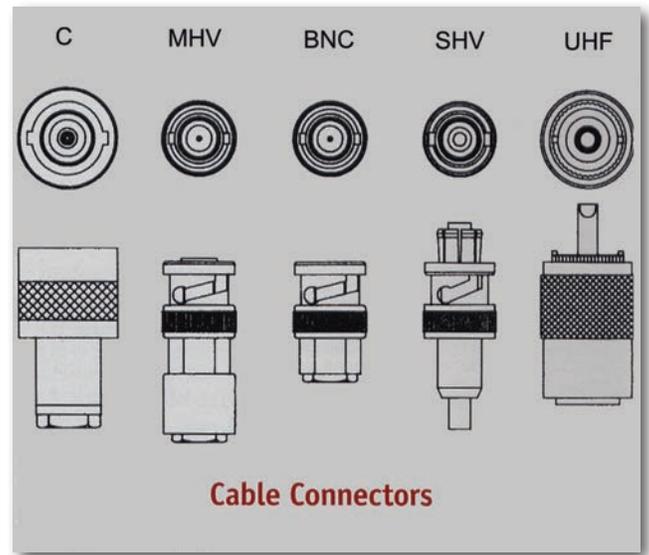


# Cables & Connectors

## Detector Cables

Ludlum offers straight cables with either type C, BNC, SHV, MHV, or UHF connectors. (SHV and UHF connectors are available for an additional charge). Unless specified otherwise, Ludlum survey meters and detectors come equipped with "C" type connectors. When a meter and accompanying detector are ordered as a matched set, Ludlum automatically includes a 99 cm (39 in.) straight type cable with "C" connectors at no additional charge.

| Cable Type   | Length |        | Part Number |
|--------------|--------|--------|-------------|
| C Straight   | 99 cm  | 39 in. | 40-1004     |
| C Straight   | 152 cm | 5 ft   | 40-1004-5   |
| BNC Straight | 99 cm  | 39 in. | 40-1008     |
| BNC Straight | 152 cm | 5 ft   | 40-1008-5   |
| SHV Straight | 99 cm  | 39 in. | 8303-134    |
| SHV Straight | 152 cm | 5 ft   | 8303-134-5  |
| MHV Straight | 99 cm  | 39 in. | 40-1011     |
| MHV Straight | 152 cm | 5 ft   | 40-1011-5   |
| UHF Straight | 99 cm  | 39 in. | 8303-263    |
| UHF Straight | 152 cm | 5 ft   | 8303-263-5  |



## Connectors & Adapters

| Item                     | Part Number |
|--------------------------|-------------|
| Series C Tee Connector   | 13-7788     |
| Series BNC Tee Connector | 13-7769     |
| Series C - BNC Adapter   | 13-7759     |
| Series BNC - C Adapter   | 13-7768     |

# Signal Converter Boxes



**Model 296  
Signal Switch Box**  
PN: 47-1101

The Model 296 switches between 2 input signals for a single output



**Model 296-1  
Signal Switch Box**  
PN: 47-1180

The Model 296-1 switches between 3 input signals for a single output



**Model 297  
Signal Splitter**  
PN: 47-1578

Separates HV and counting signal

- Input connector: type "C"
- HV output connector: MHV
- Signal output connector: BNC



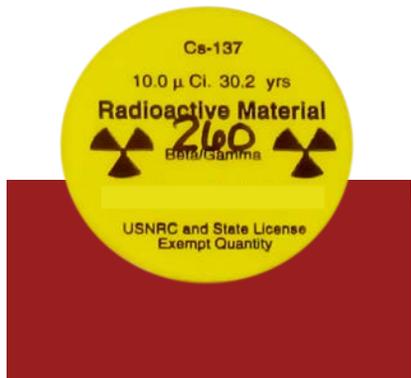
**Model T-1016  
HV Divider Box**  
PN: 48-2147

For use with a digital voltmeter to measure the HV up to 3000 V

- Detector connector: type "C"
- DMV connector: binding posts
- Impedance: 2.5 Gigohm

# Check Sources

## Plastic Disk Check Source



| Source                               | Size (diameter x thickness)       | Part Number |
|--------------------------------------|-----------------------------------|-------------|
| 0.25 $\mu\text{Ci } ^{137}\text{Cs}$ | 2.5 cm x 4.8 mm (1.0 x 0.125 in.) | 01-5723     |
| 0.50 $\mu\text{Ci } ^{137}\text{Cs}$ | 2.5 cm x 4.8 mm (1.0 x 0.125 in.) | 01-5203     |
| 1.0 $\mu\text{Ci } ^{137}\text{Cs}$  | 2.5 cm x 4.8 mm (1.0 x 0.125 in.) | 01-5196     |
| 5.0 $\mu\text{Ci } ^{137}\text{Cs}$  | 2.5 cm x 4.8 mm (1.0 x 0.125 in.) | 01-5186     |
| 10 $\mu\text{Ci } ^{137}\text{Cs}$   | 2.5 cm x 4.8 mm (1.0 x 0.125 in.) | 01-5231     |
| 1.0 $\mu\text{Ci } ^{133}\text{Ba}$  | 2.5 cm x 4.8 mm (1.0 x 0.125 in.) | 01-5818     |

### Mechanical Check Source Holder



Ludlum's traditional mechanical type check source holder is screwed on to the instrument can and has a nice swing-away door that exposes the source whenever needed. (Only for instruments with cast aluminum housing).  
PN: 4062-166.

## Check Sources with Stick-On Holder

These sources include a very thin (0.15 mm/0.006 in.) plastic laminate source and an industrial strength adhesive holder for attaching directly to an instrument. The adhesive type holder is the only one approved for use on any Ludlum intrinsically safe instrument.

The table below presents two of the more common sources including the stick-on holder. Other source activities and isotopes are available upon request.



Laminate Sources/Holder

| Source/Holder                        | Size (diameter x thickness)        | Part Number |
|--------------------------------------|------------------------------------|-------------|
| 0.25 $\mu\text{Ci } ^{137}\text{Cs}$ | 2.5 cm x 0.15 mm (1.0 x 0.006 in.) | 4464-473-02 |
| 1.0 $\mu\text{Ci } ^{137}\text{Cs}$  | 2.5 cm x 0.15 mm (1.0 x 0.006 in.) | 4464-473-01 |

# Instrument Cases

## General Purpose Instrument Cases

Ludlum offers carrying cases to facilitate equipment protection, transportation, or storage. These cases come in varying sizes to best accommodate each particular need.

The carrying cases have a hard durable shell and foam inserts that offer excellent protection for the contents, and are designed to be air- and water-tight. These cases are an excellent choice whenever shipping equipment via common carriers and are ideal for shipping GM pancake-style detectors or other fragile detectors.



| Type        | Interior Size (H x W x L)                     | Part No. |
|-------------|---|----------|
| Small Case  | 37.1 x 26.6 x 15.3 cm (14.6 x 10.5 x 6.0 in.) | 2311062  |
| Medium Case | 44.4 x 30.1 x 15.9 cm (17.5 x 11.9 x 6.3 in.) | 2311063  |
| Large Case  | 55.7 x 43.1 x 21.3 cm (21.9 x 17.0 x 8.4 in.) | 2311064  |

## Instrument Specific Cases

### Model 78 & 79 Series



Model 78 PN: 4272-444  
Model 79 PN: 2312979

### Model 193-6



PN: 2312562

### REM Ball Neutron Meter Case



PN: 2310377

\*Fits the Model 12-4, Model 12-4-7, Model 30-4, and Model 2241-4

### Model 3000 Series



PN: 2312958

# Support Services



## Repair

Ludlum Measurements offers a full-service repair and calibration department. We not only repair and calibrate our instruments, but most other manufacturers' instruments as well. Repair estimates are offered at no cost, and repair and modification charges are based on material cost plus labor. Labor rates are billed for actual time at the currently published rate. We also have a second location, Protean Instrument in Knoxville, Tennessee, that is able to repair most instruments.

Visit our website to view the current rates.

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## Calibration



We have two calibration locations, our headquarters in Sweetwater, Texas and our sister office, Protean Instrument in Knoxville, Tennessee. Both locations have been accredited by A2LA (American Association for Laboratory Accreditation) in accordance with the ISO/IEC 17025:2017 standard, as well as the ANSI/NCSL Z540-1-1994 standard. Calibrations are performed on Ludlum instruments as well as many instruments from other manufacturers.

Consistent with our commitment to excellent customer service, this accreditation affirms the quality and reliability of our calibration service for both newly manufactured instruments and instruments sent in for calibration.

Visit our website to view the current rates.

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## Training



We offer an intensive two day training course that involves calibration, repair, and maintenance on Ludlum manufactured instruments. This course is intended for customers interested in performing their own calibrations and minor repairs. It is generally not intended for first responders or survey technicians since it does not cover the health physics aspects of radiation surveying.

The course is held at Ludlum's main facility in Sweetwater, TX and Protean Instrument in Knoxville, TN. It is offered at no charge; however, attendees are responsible for accommodation and meals. Training is usually scheduled around middle of the month, but other times can be arranged for groups of four or more. This course has been granted 32 continuing education credits by AAHP (American Academy of Health Physics). Course ID 2019-04-001, valid through 2023.

If you are interested, contact Ludlum Measurements, Inc. at 800-622-0825 (toll free) or 325-235-5494. You may also email [training@ludlums.com](mailto:training@ludlums.com).

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