

## ATOMLAB™ 400 DOSE CALIBRATOR

Designed for Facilities Receiving Unit Doses Including PET and Beta



- Pre-programmed for 88 most commonly used radionuclides
- Large, easy-to-read backlit LCD
- Small footprint economizes workspace
- Ultra-fast response
- Automatic range selection; ranges up to 40 Curies of Tc-99m or 10 Curies of F-18
- Displays in Curies or Becquerels
- Remote Ionization Chamber
- Self-Diagnostic Software
- Desktop or wall mount display
- Two-year warranty
- RS-232 bi-directional serial communications port

New low pressure chamber. Atomlab Dose Calibrators are shipped air or ground as standard goods.

The Atomlab™ 400 provides fast, accurate radionuclide activity measurements with performance that easily complies with the most stringent regulatory requirements.

The unit is simple to operate. There is a routine list of ten pre-programmed isotopes plus another seven that are user selected from the library. The library contains 88 isotopes listed alphabetically, including Y-90 and Sr-89. Four isotopes are displayed at a time.

Activity is displayed on a LCD panel in either Curie or Becquerel units. Background correction is performed at the touch of a button. Range selection is automatic.

Activity measurements are performed by a microprocessor-controlled electrometer located within the detector assembly of the ionization chamber. The chamber is shielded with .25" (6.3 mm) lead. It can be located up to eight feet (2.4 m) away from the display unit. Chamber bias is generated within the display unit by an electronic high voltage supply, eliminating the need for expensive battery changes.

The RS-232 port enables the Atomlab™ 400 Dose Calibrator to communicate with most commercially available nuclear medicine management systems.

Item #	Description
993-000	Atomlab™ 400 Dose Calibrator
993-050	Dose Calibrator Shielding Rings, Interlocking, 2.25" Lead
993-052	Moly Assay Shield for Syringe, 0.3" Lead
993-054	Moly Assay Shield for Vial, 0.3" Lead
993-056	Lineator for Atomlab™ Dose Calibrators

### Item 993-000 Atomlab™ 400 Dose Calibrator Includes

- Smart Display
- Ionization Chamber
- RS-232 Port
- Vial/Syringe Dipper
- Well Insert

### Specifications

**Isotope Selection Keys:** Ten pre-programmed – Tc-99m, Tl-201, Co-57, Cs-137, I-131, In-111, Ga-67, Xe-133, I-123, and Mo-99; seven additional keys for user-set isotopes; two new isotope keys and a full alphabetical list of 88 isotopes.

**Activity Range:** 0.01  $\mu$ Ci to 40Ci (.001 MBq to 1500 GBq) of Tc-99m

**Energy Range:** 25 keV to 3 MeV photons

**Response Time:** One to two seconds for doses greater than 200 uCi; three seconds for doses greater than 20 uCi; 50-100 seconds below 20 uCi of Tc-99m with default threshold, threshold adjustable to reduce counting time

**Detector Linearity:**  $\pm 1\%$  or 0.2  $\mu$ Ci, whichever is greater

**Electrometer Linearity:**  $\pm 1\%$  or 0.2  $\mu$ Ci, whichever is greater

**Electrometer Accuracy:**  $\pm 1\%$  or 0.2  $\mu$ Ci, whichever is greater

**Overall Accuracy:**  $\pm 3\%$  or 0.3  $\mu$ Ci, whichever is greater; overall accuracy is affected by such factors as the accuracy of the specific source calibration, geometric variations due to sample volume or configuration, detector linearity, electrometer accuracy and readout accuracy

**Repeatability:**  $\pm 0.3\%$  above 1 mCi short term (24 hr); 1% long term (one yr); exclusive of background

**Digital Calibration Dial:** Four-digit LED dial display with increment/decrement keys to change the value; range is from 0.0 to 999.9

**Detector:** Well-type pressurized ionization chamber, with Argon fill gas; well opening 2.75" (7 cm), well depth 10.25" (26 cm)

**Chamber Gas Pressure:** 149KPa gauge (21.6 psig) at 20°C or 250KPa absolute (36.3 psia) at 20°C. IATA regulation 3.2.2.4 Exempts Gases of Division 2.2 from Dangerous Goods Regulations when transported at pressure less than 200KPa gauge (29 psig) at 20°C. Device is shipped standard goods.

**Detector Shielding:** .25" (6.3 mm) lead on all sides except top well opening; supplementary shielding available

**Chamber Bias:** 355  $\pm$ 5 volts

### Environmental Operating Conditions:

**Temperature:** 0-40°C

**Humidity:** 0-90% rh, non-condensing

**Power Requirements:** 100 to 240 VAC, 0.6 – 0.3 amps, auto switching; APS Power Supply (APS22ES-150160), for medical use.

**Line Frequency:** 50/60 Hz; detachable line cord; built-in EMI filter and transient suppression

**Detector and Interface Cables:** 8' (243 cm) long, six conductor cables (two carry power, two for chassis ground, two carry serial data for digital I/O)

### Display Unit:

**Dimensions:** 6.75" W x 6" depth x 5" H (17.1 x 15.3 x 12.7 cm)

**Weight:** 3.6 lb (1.64 kg); desktop or wall mountable

### Detector Unit:

**Dimensions:** 6" Dia x 15.5" H (15.24 x 39.37 cm)

**Well I.D.:** 2.75" Dia x 10.5" H (7 x 26.7 cm)

**Well I.D. with Liner:** 2.5" Dia x 10.25" H (6.35 x 26 cm)

**Lead Shielding:** .25" thick (6.3 mm)

**Weight:** 35 lb (16 kg)

**Approvals:** ETL to UL 60601-1 and cETL to CAN/CSA C22.2

No. 601-1-M90 IEC 60601-1, IEC 60601-1-4 and IEC 60601-1-2

**Warranty:** Two Year

Item #	Description
993-058	Syringe Reference Source Set for Atomlab™ Calibrators
993-060	Vial Reference Source Set for Atomlab™ Calibrators
993-062	Vial/Syringe Dipper, Replacement for Atomlab™ Calibrators
993-064	Well Insert, Replacement for Atomlab™ Calibrators

## ATOMLAB™ 500 DOSE CALIBRATOR



An extensive selection of quality assurance applications streamlines and simplifies hot lab administration requirements

- Easy to use, large color touch screen display with intuitive menus
- Automatic range selection; ranges up to 100 Curies of Tc-99m or 25 Curies of F-18
- Pre-programmed for 88 most commonly used radionuclides; any 12 can be conveniently touch selected
- Displays in Curies or Becquerels
- Small footprint economizes workspace
- Ultra-fast response
- Robust software and extensive functionality
- Remote Ionization Chamber
- Report and label printers available
- Self-diagnostic software
- Desktop or wall mount display
- Two-year warranty
- RS-232 bi-directional serial communications port

Standard APPs for Atomlab 500 include:

- Automated Quality Assurance APPs
  - Constancy and Expanded Constancy
  - Linearity and Auto Linearity
  - Accuracy
  - Geometry
- Nuclear Pharmacy APPs:
  - Future dose computation
  - Volume determination
  - Inventory control of 25 samples, correcting volume, activity and moly concentration
- Multiple Detector APPs:
  - Manages multiple ionization chambers
- Wipe Test Counter APPs:
  - Upgradeable at any time to include a wipe test counter

New low pressure chamber. Atomlab Dose Calibrators are shipped air or ground as standard goods.

The Atomlab™ 500 provides fast, accurate radionuclide activity measurements with performance that easily complies with the most stringent regulatory requirements. The system consists of a new low pressure ionization chamber with redesigned seal, electrometer with extraordinary linearity and an autoranging touch screen color display. Now one dose calibrator can be used for a wide variety of nuclear medicine, PET and radioimmunotherapy applications. Additionally, there are advanced, but easy-to-use programs for nuclear pharmacy, radiochemistry and radiochromatography.

Activity measurements are performed by the microprocessor controlled electrometer located within the chamber assembly. The chamber is shielded with .25" (6.3 mm) lead. It can be located up to eight feet (2.4m) away from the display unit. Chamber bias is generated by an electronic high voltage supply, eliminating the need for expensive battery changes.

Every element of the design and technical development will increase dose accuracy, department productivity and regulation compliance. The attractive and intuitive human interface guides the user through each operation. Software can easily be updated via the Biodex website or by using a convenient memory card. The touch-screen display can rest on a bench or mount on the wall of a hot lab, hot cell or laminar flow hood.

In addition to powerful self diagnostics, the Atomlab™ 500 includes an exclusive chamber monitoring technology to assure longer life and accuracy. Integrated pressure and temperature sensors feedback data so that the influence of gas pressure change will not effect an accurate reading.

### OPERATION

The system is easy to use. There are 12 isotope selection touch keys pre-programmed for the most commonly used radionuclides. Any of those keys can be reprogrammed by the user for a desired isotope. There are 88 isotope-specific dial values listed in the library. Dial values can easily be changed if required.

Activity is displayed on the touch screen color display in either curie or becquerel units. Background correction is performed at the touch of a button. Range selection is automatic, from .01 microcurie to 100 Curies of Tc-99m or 25 Curies of F-18.

### ACCURACY

Atomlab Dose Calibrators have consistently proven to be highly accurate. Biodex and chamber manufacturer Sun Nuclear Corporation have participated in the isotope program sponsored by National Institute of Standards and Technology. Each month a certified isotope is received from National Institute of Standards and Technology and is measured in the Atomlab™ Dose Calibrator, producing direct traceability to National Institute of Standards and Technology.

### QUALITY ASSURANCE

The Atomlab™ 500 has been designed to make life easier. The extensive selection of quality assurance applications streamlines and simplifies hot lab administration requirements. The system stores and decay corrects multiple reference sources and compares the measured activity to the calculated activity for the daily constancy test.

Linearity tests can be performed in the traditional manual method or by a fully automated program that allows for readings from a source to be taken, and automatically recorded at specified intervals. The system will graph the results.

The attenuation tube test for linearity can be performed using software that will guide the user through the procedure, store the values and make all calculations.

### COMMUNICATIONS

The RS-232 bi-directional serial port enables the Atomlab™ 500 Dose Calibrator to communicate in real time with most commercially available nuclear medicine management systems.

## COMMERCIAL NUCLEAR PHARMACY

The Atomlab™ 500 Dose Calibrator features a nuclear pharmacy “Dose Calculation Screen” to meet the needs of a commercial nuclear pharmacy. All the information needed to draw doses efficiently is readily available on one screen. The feature easily performs pre- and post-decay calculations, volume calculations for specific times and isotope changes all with minimal screen touches. No calculators needed! Atomlab Dose Calibrators can read up to 100 Curies of Tc-99m, thereby eliminating the need for an aliquot preparation, a significant time saver every time a generator is milked.

## INDUSTRIAL NUCLEAR PHARMACY

The Atomlab™ 500 provides inventory control for 25 samples, storing and correcting the volume, activity, and moly concentration. The system will perform both volume and future dose calculations. In addition to inventory management, the Atomlab™ 500 provides quality assurance and record keeping functions. The inkjet printer allows hard copy records to be produced for all functions. The label printer allows the user to print labels for the syringe or vial.

## RADIOCHROMATOGRAPHY

The radiopharmaceutical quality control program is exceptional. The Atomlab 500 performs all counting and calculations for paper chromatography tests, computing the percentages of free pertechnetate, hydrolyzed reduced Tc-99m and labeled radiopharmaceuticals.

## RADIOCHEMISTRY

Up to seven ionization chambers, or six ionization chambers and a well counter can be connected via daisy chain to a single display. The activity in each detector can be selected and viewed from the single display.

## DATA DOWNLOAD

The Atomlab™ Data Manager is available as an option. The Windows™ based utility allows wipe test and dose calibrator QA results to be downloaded using a USB/serial converter. The results can be viewed and printed from the data manager software as required. In addition, information stored in the data manager can be exported into Microsoft® Excel or to department management systems.

## Item 993-010 Atomlab™ 500 Dose Calibrator Includes

- Smart Display
- Ionization Chamber
- RS-232 Port
- Vial/Syringe Dipper
- Well Insert

## Specifications

**Display:** LCD Touch Panel 6.5" x 5" (16.5 cm x 12.7 cm), function keys are displayed for the operation being performed

**Connectors:** RJ-12 for well cable, USB for printer

**Power:** This system uses XP Power Supply for Medical Use, Model #PDM60US15

**Line Voltage:** 100 to 240 VAC, auto selectable by the power supply, 1.5-0.75 amps

**Line Frequency:** 50/60 Hz, detachable line cord, built-in EMI filter and transient suppression

**Auxiliary Port:** RS-232 connector, used for data export and firmware updates

Item #	Description
993-010	Atomlab™ 500 Dose Calibrator
993-030	Data Manager Software for Atomlab™ 500
993-032	Copper Dipper for Atomlab™ 500
993-034	Printer, Dot Matrix (Label) for Atomlab™ 500
993-036	Printer, Ink Jet (Report) for Atomlab™ 500
993-050	Dose Calibrator Shielding Rings, Interlocking, 2.25" Lead
993-052	Moly Assay Shield for Syringe, 0.3" Lead

**Memory: Stores:** Inventory and QA tests

**Isotope Selection Keys:** Twelve pre-programmed – Tc-99m, Tl-201, I-123, I-131, Cs-137, Co-57, Xe-133, Ga-67, In-111, F-18, Y-90, Mo-99; 25 user-defined isotopes and a full alphabetical list of 88 isotopes.

**Activity Range:** : 0.01 uCi to 100 Ci (.001 MBq to 3700 GBq) of Tc-99m or 25Ci of F-18

**Energy Range:** 25 keV to 3 MeV photons

**Response Time:** One to two seconds for doses greater than 200 uCi; three seconds for doses greater than 20 uCi; 50-100 seconds below 20 uCi of Tc-99m with default threshold; threshold adjustable to reduce counting time

**Detector Linearity:** ± 1% or 0.2 µCi, whichever is greater

**Electrometer Linearity:** ± 1% or 0.2 µCi, whichever is greater, up to 40 curies of Tc-99m, ± 1.5% up to 100 curies of Tc-99m

**Electrometer Accuracy:** ± 1% or 0.2 µCi, whichever is greater

**Overall Accuracy:** ± 3% or 0.3 µCi, whichever is greater; overall accuracy is affected by such factors as the accuracy of the specific source calibration, geometric variations due to sample volume or configuration, detector linearity, electrometer accuracy and readout accuracy

**Repeatability:** ± 0.3% above 1 mCi short term (24 hr); 1% long term (one yr)

**Digital Calibration Dial:** Four-digit dial with increment/decrement keys to change the value; range is from 0.0 to 999.9

**Detector:** Well-type pressurized ionization chamber, with Argon fill gas; well opening 2.75" (7 cm), well depth 10.25" (26 cm). Up to seven chambers can be serially connected to one display.

**Chamber Gas Pressure:** 149KPa gauge (21.6 psig) at 20°C or 250KPa absolute (36.3 psia) at 20°C. IATA regulation 3.2.2.4 Exempts Gases of Division 2.2 from Dangerous Goods Regulations when transported at pressure less than 200KPa gauge (29 psig) at 20°C. Device is shipped standard goods.

**Detector Shielding:** .25" (6.3 mm) lead on all sides except top well opening; supplementary shielding available

**Chamber Bias:** 355 ± 5 volts

**Environmental Operating Conditions:** Temperature: 0-40°C; Humidity: 0-90% rH, non-condensing

**Power Requirements:** 100 to 240 VAC, 0.38 – 0.15 amps, auto switching; XP Power Supply (PDM60US15), for medical use.

**Line Frequency:** 50/60 Hz; detachable line cord; built-in EMI filter and transient suppression

**Detector and Interface Cables:** 8' (243 cm) long, six conductor cables (two carry power; two chassis ground; two carry serial data for digital I/O)

**Display Unit:**

**Dimensions:** 9.5" W x 12" depth x 12" H (24.1 x 30.5 x 30.5 cm)

**Weight:** 6.3 lb (2.9 kg); desktop or wall mountable

**Detector Unit:**

**Dimensions:** 6" dia x 15.5" H (15.24 x 39.37 cm)

**Well I.D.:** 2.75" dia x 10.5" H (7 x 26.7 cm)

**Well I.D. with Liner:** 2.5" dia x 10.25" H (6.35 x 26 cm)

**Lead Shielding:** 0.25" lead (6.3 mm)

**Weight:** 35 lb (16 kg)

**Approvals:** ETL to UL 60601-1 and cETL to CAN/CSA C22.2No. 601-1-M90 IEC 60601-1, IEC 60601-1-4 and IEC 60601-1-2

**Warranty:** Two-year

Item #	Description
993-054	Moly Assay Shield for Vial, 0.3" Lead
993-056	Lineator for Atomlab™ Dose Calibrators
993-058	Syringe Reference Source Set for Atomlab™ Calibrators
993-060	Vial Reference Source Set for Atomlab™ Calibrators
993-062	Vial/Syringe Dipper, Replacement for Atomlab™ Calibrators
993-064	Well Insert, Replacement for Atomlab™ Calibrators

## ATOMLAB™ 500 PLUS - DOSE CALIBRATOR and Wipe Test Counter



The Atomlab™ 500Plus combines the Atomlab™ 500 Dose Calibrator and Atomlab™ Wipe Test Counter, bringing it all together – science, technology and application. It's a complete Hot Lab Management System.

The Atomlab™ 500 Dose Calibrator provides fast, accurate radionuclide activity measurements with performance that easily complies with the most stringent regulatory requirements.

- Easy-to-use, large, color touch-screen display with intuitive menus
- Automatic range selection; ranges up to 100 Curies of Tc-99m or 25 Curies of F-18
- Pre-programmed for 88 most commonly used radionuclides; any 12 can be conveniently touch selected
- Displays in Curies or Becquerels
- Small footprint economizes workspace
- Ultra-fast response
- Robust software and extensive functionality
- Remote Ionization Chamber
- One wipe counter and up to six ionization chambers can be connected
- Report and label printers available
- Self-diagnostic software Desktop or wall mount display
- Two-year warranty
- RS-232 bi-directional serial communications port

Standard APPs for Atomlab 500 include:

- Automated Quality Assurance APPs
  - Constancy and Expanded Constancy
  - Linearity and Auto Linearity
  - Accuracy
  - Geometry
- Nuclear Pharmacy APPs:
  - Future dose computation
  - Volume determination
  - Inventory control of 25 samples, correcting volume, activity and moly concentration
- Multiple Detector APPs:
  - Manages multiple ionization chambers
- Wipe Test Counter APPs:
  - Upgradeable at any time to include a wipe test counter

New low pressure chamber. Atomlab Dose Calibrators are shipped air or ground as standard goods.

The Atomlab™ Wipe Test Counter is easy to use, easy to understand, fast and dependable. A color touch-screen display, utilizing intuitive software, eliminates the tedium of wipe testing.

- Easy-to-use, large touch screen display with intuitive menus
- Meets NRC/State regulations
- 64 Channel MCA
- Adjustable wide window and individual isotopes
- 2x2 NaI drilled-well detector
- Remote shielded well
- Energy spectrums with individual ROI
- Ability to help identify isotopes causing contamination
- User-specific wipe locations and trigger levels
- Wipes that exceed trigger levels are immediately recognized: flashes on screen and prints in red
- Detailed wipe reports including cpm and dpm
- Wipe testing results stored
- Upgradeable at any time to a dose calibrator by adding an ionization chamber
- Optional printer for hard-copy archives
- Two-year warranty
- RS-232 bi-directional serial communications port

Standard APPs for Atomlab Wipe Test Counter include:

- Automated Quality Assurance APPs
  - Full Width at Half Max (FWHM)
  - Chi Square
  - Minimum Detectable Activity (MDA)

Combine the Atomlab 500™ Dose Calibrator with the Atomlab™ Wipe Test Counter and create a complete, efficient and cost effective radioactivity measurement system... the Atomlab™ 500Plus.

Consider the software that is supplied with the Atomlab™ 500Plus. It's comprehensive, easy-to-use and feature rich. The software mirrors the way you think and work. It guides when necessary, but does not burden the advanced user. The touch-screen and easy-to-follow on-screen prompts mean you won't need "cheat sheets."

When required, you can be confident that every operation is captured and documented. That documentation makes compliance a breeze.

Your Atomlab™ 500 Dose Calibrator is upgradeable. You can easily install software updates via the Biodex website or by using a convenient memory card.

### Item 993-015 Atomlab™ 500 Plus - Dose Calibrator and Wipe Test Counter Includes

- Smart Display
- Ionization Chamber
- Well Counter
- RS-232 Port
- Vial/Syringe Dipper
- Well Insert

## Specifications

**DISPLAY** (A single "Smart Display" controls both Dose Calibrator and Wipe applications)

**Display:** LCD Touch Panel 6.5" x 5", function keys are displayed for the operation being performed

**Display Unit:**

**Dimensions:** 9.5" W x 12" H x 12" depth (24.1 x 30.5 x 30.5 cm)

**Weight:** 4.2 lb (1.9 kg)

**Connectors:** RJ-12 for well cable, USB for printer

**Power:** This system uses XP Power Supply for Medical Use, Model #PDM60US15

**Line Voltage:** 100 to 240 VAC, auto selectable by the power supply, 1.5 – 0.75 amps

**Line Frequency:** 50/60 Hz, detachable line cord, built-in EMI filter and transient suppression

**Auxiliary Port:** RS-232 connector, used for data export and firmware updates

**Memory:** Stores for Wipe Test Counter: Calibration, background, high voltage, isotope specification, isotope efficiency, Chi-Square testing results, technologist list, wipe locations list and latest MDA calculation. Results can be displayed and printed.

**Memory:** Stores for Dose Calibrator: Inventory and QA tests

## ATOMLAB™ 500 DOSE CALIBRATOR

**Isotope Selection Keys:** Twelve pre-programmed – Tc-99m, Tl-201, I-123, I-131, Cs-137, Co-57, Xe-133, Ga-67, In-111, F-18, Y-90, Mo-99; 25 user-defined isotopes and a full alphabetical list of 88 isotopes.

**Activity Range:** : 0.01 uCi to 100 Ci (.001 MBq to 3700 GBq) of Tc-99m or 25Ci of F-18

**Energy Range:** 25 keV to 3 MeV photons

**Response Time:** One to two seconds for doses greater than 200 uCi; three seconds for doses greater than 20 uCi; 50-100 seconds below 20 uCi of Tc-99m with default threshold, threshold adjustable to reduce counting time

**Detector Linearity:** ± 1% or 0.2 µCi, whichever is greater

**Electrometer Linearity:** ± 1% or 0.2 µCi, whichever is greater, up to 40 curies of Tc-99m, ± 1.5% up to 100 curies of Tc-99m

**Electrometer Accuracy:** ± 1% or 0.2 µCi, whichever is greater

**Overall Accuracy:** ± 3% or 0.3 µCi, whichever is greater; overall accuracy is affected by such factors as the accuracy of the specific source calibration, geometric variations due to sample volume or configuration, detector linearity, electrometer accuracy and readout accuracy

**Repeatability:** ± 0.3% above 1 mCi short term (24 hr); 1% long term (one yr)

**Digital Calibration Dial:** Four-digit dial with increment/decrement keys to change the value; range is from 0.0 to 999.9

**Detector:** Well-type pressurized ionization chamber, with Argon fill gas; well opening 2.75" (7 cm), well depth 10.25" (26 cm). Up to seven chambers can be serially connected to one display.

**Chamber Gas Pressure:** 149KPa gauge (21.6 psig) at 20°C or 250KPa absolute (36.3 psia) at 20°C. IATA regulation 3.2.2.4 Exempts Gases of Division 2.2 from Dangerous Goods Regulations when transported at pressure less than 200KPa gauge (29 psig) at 20°C. Device is shipped standard goods.

**Detector Shielding:** .25" (6.3 mm) lead on all sides except top well opening; supplementary shielding available

**Chamber Bias:** 355 ±5 volts

**Environmental Operating Conditions:** Temperature: 0-40°C;

Humidity: 0-90% rH, non-condensing

**Power Requirements:** 100 to 240 VAC, 0.38 – 0.15 amps, auto switching; XP Power Supply (PDM60US15), for medical use.

**Line Frequency:** 50/60Hz; detachable line cord; built-in EMI filter and transient suppression

**Detector and Interface Cables:** : 8' (243 cm) long, six conductor cables (two carry power; two chassis ground; two carry serial data for digital I/O)

**Detector Unit:**

**Dimensions:** 6" Dia x 15.5" H (15.24 x 39.37 cm)

**Well I.D.:** 2.75" Dia x 10.5" H (7 x 26.7 cm)

**Well I.D. with Liner:** 2.5" Dia x 10.25" H (6.35 x 26 cm)

**Lead Shielding:** 0.25" lead (6.3 mm)

**Weight:** 35 lb (16 kg)

**Approvals:** ETL to UL 60601-1 and cETL to CAN/CSA C22.2No. 601-1-M90

**Warranty:** Two-year

## ATOMLAB™ WIPE TEST COUNTER

**Detector Cable**

**Length:** Standard 8 ft. (2.43 cm); custom cable lengths available up to 20 meters

**Conductors:** Six total – 2 for power, two for chassis ground, two for serial data

**Connectors:** RJ-12

**Well Counter**

**Detector:** 2" x 2" NaI (TI) integral line scintillation detector with a 0.75" dia. x 1.44 " depth well (1.9 x 3.7 cm)

**Style:** Remote Detector

**Channels:** 64

**MCA:** Integral to Well Counter

**Spectral Resolution:** FWHM 10%

**Count Rate:** (Maximum) 30,000 cps

**Connectors:** RJ-12 for power and signal

**Lead Shielding:** 0.5" (1.2 cm) integral lead shield

**Optional Calibration Source:** 0.1 µCi Cs-137 Rod Source

**Optional Additional Shield:** 0.5" (1.2 cm) lead shield, slides over integral shield for total of 1.0" of shielding – includes cover

**Cover:** Fits optional additional lead shield, has 0.25" (.6 cm) lead shielding

**Physical Data**

**Display Unit**

**Size:** 9.5" W x 12" H x 12" D (24.1 x 30.5 x 30.5 cm)

**Weight:** 4.2 lb (1.9 kg)

**Well Counter**

**Size:** 6" D x 11" H (15.24 x 27.9 cm)

**Weight:** 29 lb (3.2 kg)

**Approvals:** ETL listed to UL 60601-1 and CAN/CSA C22.2 No. 601-1M90, IEC 60601-1, IEC 60601-1-4 and IEC 60601-1-2

Item #	Description
993-015	Atomlab™ 500 Plus - Dose Calibrator & Wipe Test Counter
993-030	Data Manager Software for Atomlab™ 500
993-032	Copper Dipper for Atomlab™ 500
993-034	Printer, Dot Matrix (Label) for Atomlab™ 500
993-036	Printer, Ink Jet (Report) for Atomlab™ 500
993-040	Rod Source, Cs-137, for AtomLab™ Wipe Test Counter
993-042	Wipe Test Kit for Atomlab™ 500 Plus Wipe Test Counter
993-050	Dose Calibrator Shielding Rings, Interlocking, 2.25" Lead

Item #	Description
993-052	Moly Assay Shield for Syringe, 0.3" Lead
993-054	Moly Assay Shield for Vial, 0.3" Lead
993-056	Lineator for Atomlab™ Dose Calibrators
993-058	Syringe Reference Source Set for Atomlab™ Calibrators
993-060	Vial Reference Source Set for Atomlab™ Calibrators
993-062	Vial/Syringe Dipper, Replacement for Atomlab™ Calibrators
993-064	Well Insert, Replacement for Atomlab™ Calibrators

## ATOMLAB™ WIPE TEST COUNTER



Eliminate the tedium of wipe testing with the Atomlab™ Wipe Test Counter

- Easy-to-use, large touch screen display with intuitive menus
- Meets NRC/State regulations
- 64 Channel MCA
- Adjustable wide window and individual isotopes
- 2x2 NaI drilled-well detector
- Remote shielded well
- Energy spectrums with individual ROI
- Ability to help identify isotopes causing contamination
- User-specific wipe locations and trigger levels
- Wipes that exceed trigger levels are immediately recognized: flashes on screen and prints in red
- Detailed wipe reports including cpm and dpm
- Wipe testing results stored
- Upgradable at any time to a dose calibrator by adding an ionization chamber
- Optional printer for hard-copy archives
- Two-year warranty
- RS-232 bi-directional serial communications port

Standard APPs for Atomlab Wipe Test Counter include:

- Automated Quality Assurance APPs
  - Full Width at Half Max (FWHM)
  - Chi Square
  - Minimum Detectable Activity (MDA)

Finally, a wipe test counter that's easy to use, easy to understand, fast and dependable. A color touch-screen display utilizing intuitive software eliminates the tedium of wipe testing. Simply perform a daily calibration and background count, then count the wipe for each predetermined location. Trigger levels can be set for any isotope at any location including 200 dpm for iodine. In seconds the system will determine if the location is above or below the user defined trigger level.

When performing a wipe test, the full spectrum is displayed. A wide window that includes the isotope energies expected in a particular department is set by the user. The efficiencies of the isotopes selected for the window can be either factory defaults or user determined using an integrated detector efficiency program. Individual isotope ROIs along with the wide window can be set. This feature helps identify the isotope(s) causing contamination.

Up to 50 wipe locations can be entered as a restricted area, unrestricted area, sealed source or package. The results are displayed in dpm, cpm,  $\mu\text{Ci}$  or kBq.

The system consists of a lead shielded 2" x 2" (5 x 5 cm) ( sodium iodide (NaI) well detector and a 64 channel multi-channel analyzer. The displayed energy range (spectrum) is 0-800 KeV, which is typically found in nuclear medicine departments.

The wipe counter is designed to meet or exceed all NRC (10 CFR 35.70, 10 CFR 20.1906 and 10 CFR 35.2067) and state wipe test requirements. There are automated programs for the quality assurance functions: calibration, FWHM, chi-square and minimum detectable activity (MDA).

Wipe test results and QA test data can be stored in memory and printed at any time.

### Item 993-020 Atomlab™ Wipe Test Counter Includes

- Smart Display
- RS-232 Port
- Well Counter

### Specifications

#### DISPLAY

**Display:** LCD Touch Panel 6.5" x 5" (16.5 x 12.7 cm), function keys are displayed for the operation being performed

**Connectors:** RJ-12 for well cable, USB for printer

**Power:** This system uses XP Power Supply for medical use, Model #PDM60US15

**Line Voltage:** 100 to 240 VAC, auto selectable by the power supply, 1.5 – 0.75 amps

**Line Frequency:** 50/60 Hz, detachable line cord, built-in EMI filter and transient suppression

**Auxiliary Port:** RS-232 connector, used for data export and firmware updates

**Memory:** Stores wipe, calibration, background, high voltage, isotope specification, isotope efficiency, Chi-Square testing results, technologist list, wipe locations list and latest MDA calculation. Results can be displayed and printed.

**Preset Radionuclides:** 27 including Tc-99m, Co-57, Cs-137, Ga-67, Tl-201, I-123, I-125, I-131, In-111, F-18

#### DETECTOR CABLE

**Length:** Standard 8 ft. (243 cm); custom cable lengths available up to 20 meters

**Conductors:** Six total – 2 for power, two for chassis ground, two for serial data

**Connectors:** RJ-12

#### WELL COUNTER

**Detector:** 2" x 2" (5 x 5 cm) NaI (TI) integral line scintillation detector with a 0.75" dia x 1.44 " depth well (1.9 x 3.7 cm)

**Style:** Remote Detector

**Channels:** 64

**MCA:** Integral to Well Counter

**Spectral Resolution:** FWHM 10%

**Count Rate:** (Maximum) 30,000 cps

**Connectors:** RJ-12 for power and signal

**Lead Shielding:** 0.5" (1.2 cm) integral lead shield

**Optional Calibration Source:** 0.1  $\mu\text{Ci}$  Cs-137 Rod Source

**Optional Lead Shield:** 0.5" (1.2 cm) lead shield, slides over integral shield for total of 1.0" of shielding - includes cover

**Optional Additional Shield:** 0.5" (1.2 cm) lead shield, slides over integral shield for total of 1.0" (2.5 cm) of shielding – includes cover

**Cover:** Fits optional additional lead shield, has 0.25" (.6 cm) lead shielding

#### PHYSICAL DATA

##### Display Unit

**Size:** 9.5" w x 12" h x 12" d (24.1 x 30.5 x 30.5 cm)

**Weight:** 4.2 lb (1.9 kg)

##### Well Counter

**Size:** 6" d x 11" h (15.24 x 27.9 cm)

**Weight:** 29 lb (3.2 kg)

**Approvals:** ETL listed to UL 60601-1 and CAN/CSA C22.2 No. 601-1M90, IEC 60601-1, IEC 60601-1-4 and IEC 60601-1-2 086-331

**Warranty:** Two Year

Item #	Description
993-020	Atomlab™ Wipe Test Counter
993-036	Printer, Ink Jet (Report) for Atomlab™ 500
993-040	Rod Source, Cs-137, for AtomLab™ Wipe Test Counter
993-042	Wipe Test Kit for Atomlab™ 500Plus Wipe Test Counter
993-044	Lead Shield for Wipe Test Chamber
993-046	Well Liners, Disposable, 100/Pkg

## COPPER SYRINGE DIPPER



- For use with I-123 and In-111
- Eliminate variations

Designed for use with I-123 and In-111, the Copper Dipper removes variation in readings caused by attenuation differences from different materials and thicknesses used in syringes and vials.

### Specifications

**Dimensions:** 10.25" H x 1.63" Dia (26 x 4.1 cm)

**Weight:** 0.75 lb (.34 kg)

Item #	Description
993-032	Copper Syringe Dipper

## ROD SOURCES



To calibrate well type scintillation crystals, Biodex offers a variety of Rod Sources to meet department needs. You can count on consistent accuracy. Rod Sources are calibrated as NIST traceable with an accuracy of  $\pm 5\%$  at the 95% confidence level.

### Specifications

**Dimensions:** 2.96" L x .47" dia (76 x 11.9 mm)

**Nominal Total Activity:** 0.1  $\mu\text{Ci}$

Item #	Description
993-040	Rod Source, Cs-137 for Atomlab™ Wipe Test Counter

## WIPE TEST KIT



Wipe Test Kits may be used to perform wipe tests as indicated in NRC and Agreement State Regulations. They provide an efficient, convenient means of sampling contaminated areas with radioactivity on either wet or dry surfaces.

Each box of wipes includes 500 record folders which may be used to

- identify each sample wipe
- prevent cross-contamination of smears
- transfer the wipe to the counting facility
- store the wipe until discarded

### Specifications

**Size:** 1.75" (4.4 cm) Dia.

**Quantity:** 500/Box

Item #	Description
993-042	Wipe Test Kit for Atomlab™ 500 Plus Wipe Test Counter

## DOSE CALIBRATOR SHIELDING RINGS Especially Suited for PET and Applications



The Dose Calibrator Shielding Rings offer an additional 2.25" (5.7 cm) of lead shielding around the remote chamber for working with 511 keV radionuclides, such as FDG F-18.

### Specifications

**Dimensions:** 10.6" dia x 14.9" h (27 cm x 37.9 cm)

**I.D.:** 6.1" dia (15.5 cm)

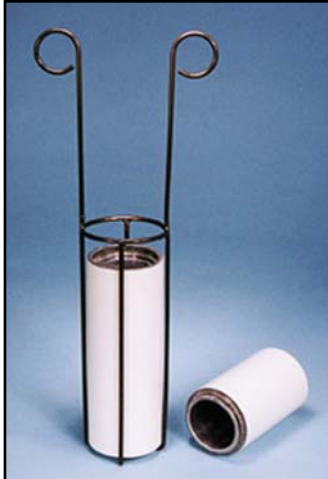
**Lead Shielding:** 2.25" thick (5.7 cm)

**Weight:** 359 lb (162.5 kg)

**Shipping Weight:** 388 lb (175.7 kg)

Item #	Description
993-050	Dose Calibrator Shielding Rings

## MOLY ASSAY SHIELD



Moly Assay Shields are a convenient method to a unit dose. Whether working with syringes or vials, either unit will fit into the well chamber of any Atomlab™ Dose Calibrator.

The leaded shields are cradled by a metal holder for easy handling to ensure proper placement inside the chamber.

### Specifications

#### Moly Assay Shield for Syringe, Item 993-052

**Dimensions:** 9.125" H x 2.125" Dia (23.2 x 5.4 cm)

**Lead Shielding:** .3" Thick (7.6 mm)

#### Moly Assay Shield for Vial, Item 993-054

**Dimensions:** 3.5" H x 2" Dia (8.9 x 5.1 cm)

**Lead Shielding:** .3" Thick (7.6 mm)

Item #	Description
993-052	Moly Assay Shield for Syringe
993-054	Moly Assay Shield for Vial

V

## LINEATOR



Simulates eight different source strengths - using only one source!

- Simplifies compliance with NRC and state requirements
- Checks linearity without sample decay or fractioning
- Covers diagnostic or therapeutic quantities in a single pass

The Lineator is a simple device to accurately and reliably verify the linearity of your dose calibrator. Test results are available in minutes, without waiting days for decay, making it feasible to perform a linearity test more often. Early identification can prevent problems before they occur.

The Lineator is a set of five tubes. Four tubes are used to perform the test and an interchangeable tube is used depending on the dynamic range needed to cover.

To perform a linearity test, insert a source of Tc-99m of the maximum activity to be measured into the central tube, then place the tube into the chamber of your dose calibrator and count. The remaining lead-lined tubes are placed, one at a time, concentrically over the central tube and counted individually or in combination. The readings are then normalized with predetermined factors, and the degree of linearity can be seen virtually at a glance.

Using only one source, the Lineator can simulate up to eight different source strengths. Each outer tube absorbs a portion of the source radiation and reduces the effective source activity seen by the dose calibrator.

Item #	Description	Weight
993-056	Lineator	6 lb (3 kg)

## SYRINGE REFERENCE SOURCE SET



The daily calibration of your dose calibrator is recommended to ensure accurate and reproducible instrument response. Calibration, using long-lived standards, should be performed in a manner that most closely represents how you use your dose calibrator. The Syringe Dose Calibrator Source was designed for imaging facilities that obtain their radiopharmaceuticals in unit dose syringes.

The sources are solid cast epoxy, 3 ml active volume in a 5 cc "mock" syringe. They are calibrated within  $\pm 5\%$  accuracy at 99% confidence level, NIST traceable.

Each source includes a certificate of calibration, leak test certificate, and radiation safety and handling sheet. The source is packaged in an individual lead shield that is color coded to the source. Syringe Dose Calibrator Sources are available individually or as an economical set.

Syringe Dose Calibrator Reference Sources:  
All sources calibrated to  $\pm 5\%$ .

### Item 993-058 Syringe Reference Source Set Includes

- Ba-133, 250  $\mu$ Ci
- Cs-137, 200  $\mu$ Ci
- Co-57, 5 mCi

**Note:** A photocopy of your NRC or Agreement State License must accompany orders for radioactive sources and must clearly indicate your authority to possess the source being ordered.

Item #	Description
993-058	Syringe Reference Source Set for Atomlab™ Calibrators

## VIAL REFERENCE SOURCE SET



The daily calibration of dose calibrators is recommended to ensure accurate and reproducible instrument response. Calibration is easily achieved and maintained by the use of long-lived reference sources.

These sources are solid cast epoxy, 20 ml active volume in the 27 ml Vial E. They are calibrated with  $\pm 5\%$  accuracy at the 99% confidence level, NIST traceable. Dose Calibrator Reference Sources are registered with the U.S. Food and Drug Administration Center for Devices and Radiological Health and the U.S. Nuclear Regulatory Commission.

Each source includes a certificate of calibration, a leak test certificate, and a radiation safety and handling sheet. The source is packaged in an individual lead shield that is color coded and vinyl covered to eliminate exposure to the lead. Dose Calibrator Reference Sources are available individually or as an economical set.

Vial Dose Calibrator Reference Sources:  
All sources calibrated to  $\pm 5\%$ .

### Item 993-058 Syringe Reference Source Set Includes

- Ba-133, 250  $\mu$ Ci
- Cs-137, 200  $\mu$ Ci
- Co-57, 5 mCi

**Note:** A photocopy of your NRC or Agreement State License must accompany orders for radioactive sources and must clearly indicate your authority to possess the source being ordered.

Item #	Description
993-060	Vial Reference Source Set for Atomlab™ Calibrators

## VIAL/SYRINGE DIPPER



This rugged, Vial/Syringe Dipper has a comfortable handle and it will hold 1 cc to 10 cc syringes or up to a 30 ml vial. Included with every Atomlab™ Dose Calibrator, the Vial/Syringe Dipper will also fit any well chamber with 2.5" x 10" interior dimension. The material used will not cause attenuation problems and is very resistant to breaking.

Item #	Description
993-062	Vial/Syringe Dipper, Replacement for Atomlab™ Calibrators

## WELL INSERT



The Well Insert is included with the purchase of any Atomlab™ Dose Calibrator. The durable, clear Plexiglas insert is designed to protect the chamber from contamination and can be easily removed for cleaning. The insert will fit any well chamber with 2.5" x 10" (6.35 x 25.4 cm) interior dimension.

Keep a spare on hand for use while the other insert is being decontaminated.

Item #	Description
993-064	Well Insert, Replacement for Atomlab™ Calibrators

## CRC®-15BT BRACHYTHERAPY DOSE CALIBRATOR

For HDR or LDR Brachytherapy



ADCL Calibration is available with the CRC®-15BT to ensure maximum accuracy. Calibrated with the specific brachytherapy source(s) utilized in your department, activity can be measured precisely in either Curies (Ci) or Air Kerma strength (U).

The CRC®-15BT software is a menu driven design that will allow the user to move rapidly through all of the system functions. The Daily QC protocol will perform zero adjust, background subtraction, system test, accuracy (with a deviation percentage) and constancy. The nuclide library is programmed with more than 80 nuclides and half-lives, plus available space for 10 additional nuclides. The system memory can also support up to 20 brachytherapy sources with isotope name, calibration number, Air Kerma strength and ADCL factor.

Overall the CRC®-15BT is quick, reliable and cost effective. With optional features such as the RS-232 computer interface port, a selection of printers or the CRC-AD15 auxiliary display you can configure a system that is right for your department.

For those customers who require a more portable measurement solution, the BT is also available as a stand alone chamber, which can be connected directly to your department's electrometer.



### Specifications

**Ionization Chamber:** Thin wall, deep well, Argon gas [16.3cm (6.4") deep x 6.1cm (2.4") dia. opening]

**Chamber Shielding:** 1/8" (3.2mm) mechanically reinforced lead

**Measurement Range:** Autoranging, up to 12 Ci

**Resolution:** 0.001 MBq (0.01 µCi)

**Electrometer Accuracy:** Better than ±2%

**Linearity:** Within ±2%

**Response Time:** Within 2 seconds, 4 to 16 sec. for very low activity (user selectable)

**Nuclide Keys:** 14 user defined

**Calibration Key:** Over 200 Nuclides

**Printer Interface:** Provided for serial printer

**System Memory:** Over 80 Nuclides (w/ half-life),

Ability to add 10 nuclides and 20 brachytherapy sources (w/cal #, U and ADCL factor)

**Interconnecting Cable:** 2.4m (8')

**Metal cable connectors with thumb screws**

**No battery required**

**Power Requirements:** 100-240 VAC 0.1A or 50/60 Hz 120mA

**Display External Dimensions:** 4.75" x 10" x 10.5" (12.1 x 25.4 x 26.7 cm)

**Weight:** 4 lb (2 kg)

**Chamber Unit Dimensions:** 12.3" H x 6.7" dia (31.3 x 17 cm)

**Weight:** 26.8 lb (12.2 kg)

Source holders can be found on the following page.

- Sealed, gas filled ionization chamber (no temperature or pressure corrections required)
- Auto ranging
- Max activity up to 12 Ci
- Remote ionization chamber with 8' cable (2.4 m) longer lengths are available
- Microprocessor controlled
- Large LCD display with nuclide name, activity (in Ci or Bq) and calibration number
- Daily QC functions, including zero adjust, background subtraction, system test, accuracy (with deviation percentage) and constancy
- Library of over 80 nuclides and half-life with room for 10 additional nuclides
- Menu driven programming for easy navigation

Accurate high activity brachytherapy measurements present new challenges in Radiation Therapy, the CRC®-15BT easily overcomes these challenges.

Both HDR and LDR brachytherapy sources are quickly and precisely measured by the CRC®-15BT.

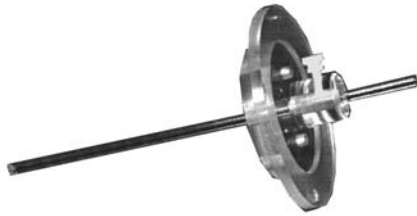
The console of the CRC®-15BT is designed for ease and efficiency. There are 14 nuclide keys that can be programmed to meet the users needs. The unit has a large LCD display that will show the isotope name, activity (in Ci or U) and calibration number. A custom alphanumeric keyboard drives all of the menus and functions.

The chamber of the CRC®-15BT has 1/8" (3.2 mm) mechanically reinforced lead shielding. The chamber is a sealed thin wall, deep well design with 2.5 atmospheres of Argon gas and a 500 V bias in order to achieve optimal response time (within 2 seconds) without temperature or pressure corrections.

Item #	Description
344-030	CRC®-15BT Dose Calibrator
344-031	CRC®-15BT RS-232-R Serial Port
344-032	CRC®-15BT Stand Alone Chamber
344-033	CRC®-AD15 Auxiliary Display for CRC®-15BT
344-042	Liner for CRC®-15BT
344-043	Dipper for CRC®-15BT

Call for Printer Options

## SOURCE HOLDERS FOR CRC-15BT BRACHYTHERAPY DOSE CALIBRATOR

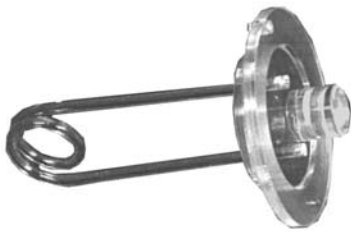


**Item 344-035** Cs-137 Brachytherapy Seed Holder Set is specially designed to fit Capintec dose calibrators. The set positions Cs-137 seeds in the ionization chamber for accurate assays of activity.

The tube has centimeter markings that allow convenient positioning and determination of source length. The centrally positioned tube is easily adjusted with a thumb screw.

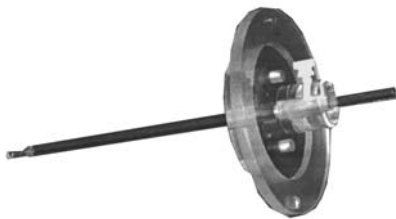
**Item 344-036** Tube only for Cs-137 seed holder.

Item #	Description
344-035	Cs-137 Seed Holder Set
344-036	Cs-137 Seed Holder, Tube Only



**Item 344-037** Ir-192 Ribbon Holder positions Ir-192 seeds in the ionization chamber for accurate assays of activity. The coil holds up to 12 Ir-192 seeds with 1 cm spacing and no overlap.

Item #	Description
344-037	Ir-192 Ribbon Holder



**Item 344-038** I-125 Brachytherapy Seed Holder Set features a tube with a thin-walled section (1 cm L x 1.5 mm dia.) for counting I-125 source seeds.

**Item 344-039** Tube only for I-125 seed holder. This tube will also fit in the Cs-137 holder.

Item #	Description
344-038	I-125 Seed Holder Set
344-039	I-125 Seed Holder, Tube Only



**Item 344-040** Mick-Bard Source Holder is specifically designed to hold seed cartridges. This device allows cartridges to be properly placed in any Capintec standard length Dose Calibrator chamber for the most accurate and reproducible measurement available.

**Item 344-041** Mick Cartridge Holder is designed to allow the Mick Cartridge to be properly placed in the CRC-series dose calibrator chamber for the most accurate and reproducible measurement.

Item #	Description
344-040	Mick-Bard Source Holder for Standard Chamber
344-041	Mick Cartridge Holder

V

## HDR 1000 PLUS WELL CHAMBER



- HDR and LDR calibrations
- May be used with any precision electrometer
- Performance validated in over 50 scientific presentations and is used by Primary and Secondary Radiation Standards Laboratories throughout the world
- Precise and accurate calibration of HDR and LDR Iridium, Iodine, Palladium, Cesium, and Strontium brachytherapy source activities- Calibrates individual and multiple isotopes
- Outstanding versatility, use one chamber for many isotopes
- Source holders available for most existing isotopes

AAPM TG 56, TG 40, TRS 398, and many manufacturers of brachytherapy seeds recommend independent verification of their source strengths. Centers in the U.S. may also be forgoing reimbursement income by not performing independent verifications. CPT code 77370 provides reimbursement for on-site calibration of brachytherapy seeds. To receive the reimbursement a facility is required to have a NIST traceable calibration for instruments like the HDR 1000 Plus for on-site calibrations. The HDR 1000 Plus Well Chamber is an air-communicating chamber, so there is no inaccuracy due to an undetected gas leak as in a pressurized chamber. The HDR 1000 Plus is ideal for low dose rate and high dose rate brachytherapy. Source holders are available for most existing isotopes.

\*Licensed from WARF, University of Wisconsin, Madison Wisconsin.

†Dewerd, Jursinic, Kitchen, Thomadsen: "A new daily quality assurance tool for HDR systems." Med. Phys. April 1995.

†Thomadsen, Rowad, Paliwal: "A comparison of several techniques to determine the correct length on a high dose-rate, remote afterloader." Med. Phys., June 1996.

### Specifications

- Overall Size:** 4" dia. x 6.1" H (10.2 dia. x 15.6 cm)  
**Insert Size:** 1.4" dia. x 4.8" H (3.5 dia. x 12.1 cm)  
**Active Volume:** 245 cm<sup>3</sup>  
**ADCL Calibrations:** HDR <sup>192</sup>Ir and/or LDR radionuclides as requested  
**Connector:** BNC Two lug, triaxial (standard)  
 TNC, Type M, or BNC + Banana (optional)  
**Range:** 10 U to 80 MU, 0.01 mCi to 20 Ci  
**Cable:** 3' (1 m)  
**Bias Voltage Applied:** ±300 volts, typical  
**Leakage:** Less than 50 fA  
**Stability:** 0.2% (Reproducibility over 2 years)  
**Response:** ±0.5% over 25 mm at center of axis  
**A<sub>ion</sub>:** 0.9996, typical  
**Case:** Wooden carrying case included  
**Product Standards:** CE<sub>0413</sub>, Externally certified IEC 60601-1, IEC 60601-1-2  
**Weight:** 6.1 lb (2.7 kg)

### SENSITIVITY

Source	Current to Apparent Activity	Current to Air Kerma Strength U=1uGym <sup>2</sup> /h
HDR Iridium	8.6 nA/Ci	2.1 pA/U
Cesium	5.6 nA/Ci	2.0 pA/U
LDR Iridium	9.1 nA/Ci	2.3 pA/U
Iodine	5.4 nA/Ci	4.3 pA/U
Palladium	2.4 nA/Ci	2.1 pA/U



Item #	Description
344-050	HDR-1000 Plus Well Chamber
344-051	Calibration

## SOURCE HOLDERS FOR HDR 1000 PLUS WELL CHAMBER



**Item 70003 Source Holder for Cesium Remote Afterloading:** Has a 7.1 mm diameter opening. This source holder is used with LDR remote afterloading treatment systems. There is no spacer because the afterloading system positions the sources. This insert can also be used with cobalt sources used in some LDR remote afterloading treatment systems.



**Item 70004 10 Meter Cable:** With tri-axial BNC connectors and protective caps connected by chains



**Item 70007 Wall Mounted Bracket:** Secures the HDR 1000 Plus next to your afterloader for periodic quality assurance checks for verification of source presence, source strength, calibration accuracy, and timer consistency.



**Item 70008 HDR <sup>192</sup>Ir QA Test Tool:** Performs crucial tests of <sup>192</sup>Ir sources including source positioning within 0.3 mm, timer accuracy, and consistency of source activity. Tests can be completed in as little as 15 minutes and require no films or development procedures.



**Item 70009 Source Holder for LDR Iridium Sources:** Has a 3 mm diameter acrylic tube which extends from the top of the insert to the most active area of the chamber. It makes one loop at the active area and extends back to the top of the insert. A collective calibration of the entire ribbon of seeds is obtained. Fourteen iridium seeds spaced one centimeter center to center can fit into the active area.



**Item 70010 Source Holder for HDR Iridium:** Has a 2.2 mm opening for the catheter. A rubber o-ring secures the catheter with a uniform constricting pressure to prevent any movement of the catheter. The calibration procedure is easy and uncomplicated. The time required for calibration is only a fraction of that required for thimble ion chamber techniques.



**Item 70016 Source Holder for Single LDR Seed Sources:** The single LDR seed source holder features a 1.2 mm inner diameter tube which positions an individual iodine, palladium, iridium or gold seed at the most sensitive area of the well chamber. The smooth tube allows easy removal of the seed. This source holder can be calibrated for several iodine and palladium isotopes. Only one source holder needs to be purchased for multiple calibrations.



**Item 70022 Seed Batch Assay Tool:** Designed to provide multiple seed measurements for up to 500 of the iodine or palladium seeds typically used for prostate cancer treatment. Source holder positions seeds at the most sensitive area of the HDR 1000 Plus Well Chamber.



**Item 70024 Source Holder for Mick® Cartridge:** The Mick® Cartridge source holder provides a consistency QA check of the activity of seeds loaded into a Mick® cartridge. Source holder positions the cartridge for a quick, reproducible measurement. Spring loaded clamp attachment quickly grips cartridge to minimize finger dose. (Mick® Cartridge source holder) can also be used with the Oncura Sterile Convenience Pack.



**Item 70026 Syringe Holder:** The syringe holder provides a quick and convenient QA measurement of METASTRON® 89Sr, 153Sm, and 131I vials and most liquids in a 5 cc or 10 cc syringe. Syringe Holder Item 70026 includes one 5 cc syringe and one 10 cc syringe.



**Item 70031 Leipzig Applicator Source Holder:**

- Quickly provide the required output of Leipzig Applicators prior to clinical use.

The Leipzig Applicator Source Holder, when used with the Standard Imaging HDR 1000 Plus Well Chamber and an HDR Iridium Source Holder with an ADCL calibration, creates a complete calibration system for measuring the output of the six Leipzig Applicators prior to clinical use. No additional equipment is needed to verify output measurements with published correlation factors.



**Item 70020 Source Holder for Cesium:** Has a 5.0 mm diameter opening and is commonly used with manually loaded cesium sources. A spacer within the source holder positions the cesium insert at the most active area of the chamber. The spacer for positioning the cesium source is removable so that the insert can also be used with longer cesium sources and larger HDR <sup>192</sup>Ir catheters.



**Item 70023 Source Holder for Rapid Strand™ I-125 Seeds:** The RAPID Strand® iodine seed source holder provides a fast and convenient method to perform a quality assurance measurement of the I-125 RAPID Strand® under sterile conditions. The source holder for the HDR 1000 Plus Well Chamber is constructed to simultaneously measure 5 seeds at a time. A correction factor has been determined to calculate the activity.

RAPID Strand® is a registered trademark of Oncura.



**Item 70025 1" (2.54 cm) Lead Shielding Ring:** This Shielding Ring is made of 1" thick (2.54 cm) lead to surround the HDR 1000 Plus Well Chamber. It is constructed of 4 interlocking rings to shield the user during measurement.



**Item 70030 Source Holder for Nucletron SelectSeed™ Sources:** Source holder connects to the Nucletron seedSelectron® to center a source in the active area of the HDR 1000 Plus Well Chamber for measurement.



**Item 70032 Source Holder for Bard® EXPRESS™ Seeding Cartridge:** The Bard® Source Holder positions loaded cartridges at the most sensitive position of the HDR 1000 Plus Well Chamber, providing a check of the relative activity of the seed held within the cartridge. The source holder accommodates Bard® EXPRESS Seeding Cartridges with 2 to 6 seeds and can be gas or steam sterilized.

Bard is a registered trademark of C.R. Bard, Inc.

Item #	Description
70003	HDR 1000 Plus Source Holder for Cesium Remote Afterloading
70004	HDR 1000 Plus 10 Meter Cable with Tri-axial BNC Connectors
70007	HDR 1000 Plus Wall Mount Bracket
70008	HDR 1000 Plus HDR Ir-192 QA Test Tool
70009	HDR 1000 Plus Source Holder for LDR Iridium Sources
70010	HDR 1000 Plus Source Holder for HDR Iridium
70016	HDR 1000 Plus Source Holder for Single LDR Seed Sources
70020	HDR 1000 Plus Source Holder for Cesium, 5mm Opening

Item #	Description
70022	HDR 1000 Plus Seed Batch Assay Tool
70023	HDR 1000 Plus Source Holder for Rapid Strand I-125 Seeds
70024	HDR 1000 Plus Source Holder for Mick™ Cartridge
70025	1" (2.54 cm) Lead Shielding Ring to Surround HDR 1000 Plus
70026	HDR 1000 Plus Syringe Holder
70030	HDR 1000 Plus Source Holder for Nucletron SelectSeed™ Sources
70031	HDR 1000 Plus Leipzig Applicator Source Holder
70032	HDR 1000 Plus Source Holder for BARD® EXPRESS™ Seeding Cartridge

## IVB 1000 WELL CHAMBER



### Specifications

**Chamber Size:** 4.0" dia. x 10.2" H (10.2 cm dia. x 25.9 cm H)

**Insert Size:** 1.4" dia. x 8.8" H (3.5 cm dia. x 22.4 cm H)

**Active Volume:** 475 cm<sup>3</sup>

**Connector:** BNC Two lug, triaxial (standard)  
TNC, Type M, or BNC + Banana (optional)

**Range:** 10 U to 80 MU, 0.01 mCi to 20 Ci

**Cable:** 3' (1 m)

**Bias Voltage Applied:** ± 300 volts, typical

**Leakage:** Less than 50 fA

**Stability:** 0.2% (Reproducibility over 2 years)

**Response:** ± 0.3% over 100 mm at center of axis, typical

**A<sub>ion</sub>:** 1.000

**Case:** Wooden carrying case included

**Product Standards:** CE<sub>0413</sub>, Externally certified IEC 60601-1,  
IEC 60601-1-2

**Weight:** 8.0 lb (3.6 kg)

- An exceptionally long 100 mm sweet spot, unmatched in other chambers, accommodates long source trains and wires
- Satisfies NRC requirements and TG-60 quality assurance requirements for IVB source strength verification
- Precise and accurate calibration of HDR and LDR Iridium, Iodine, Palladium, Cesium, and Strontium brachytherapy source activities
- Calibrates individual and multiple isotopes
- Outstanding versatility, use one chamber for many isotopes
- Source holders available for most existing isotopes

AAPM TG 56, TG 40, TRS 398, and many manufacturers of brachytherapy seeds recommend independent verification of their source strengths. Centers in the U.S. may also be forgoing reimbursement income by not performing independent verifications. CPT code 77370 provides reimbursement for on-site calibration of brachytherapy seeds. To receive the reimbursement a facility is required to have a NIST traceable calibration for instruments like the HDR 1000 Plus or IVB 1000 Well Chambers for on-site calibrations.

The IVB 1000 Well Chamber can be used for intravascular, HDR and LDR brachytherapy. It is similar to the HDR 1000 Plus but has an active length which is four times longer, making it ideal for long source trains.

Customer must specify the calibration needed.

### SENSITIVITY

Source	Current to Apparent Activity	Current to Air Kerma Strength U=1uGym <sup>2</sup> /h
HDR Iridium	9.0 nA/Ci	2.2 pA/U
Cesium	5.9 nA/Ci	2.1 pA/U
LDR Iridium	9.5 nA/Ci	2.4 pA/U
Iodine	5.5 nA/Ci	4.3 pA/U
Palladium	2.6 nA/Ci	2.3 pA/U



Item #	Description
996-700	IVB 1000 Well Chamber
996-701	Carrying Case

## SOURCE HOLDERS FOR IVB 1000 WELL CHAMBER



**Item 996-734 (70034) Source Holder for LDR Iridium Sources:** Centers a source train in the active area of the IVB 1000 Well Chamber for measurement. Source holder collar is adjusted to accommodate the number of seeds in the source to be measured. Collar is adjustable to measure 6, 10, 14 18 or 22 seeds.



**Item 996-736 (70036) Source Holder for Novoste™ <sup>90</sup>Sr/<sup>90</sup>Y IVB Sources:** centers the source in the active area of the IVB 1000 Well Chamber for measurement. The collar is adjustable for sources of 30, 40 and 60 mm lengths. Source holder accommodates both 3.5 and 5.0 mm French catheters.



**Item 996-742 (70042) X-Ray Contamination Test Tool:** Is designed for use with <sup>90</sup>Sr/<sup>90</sup>Y sources only. It consists of a 7 mm thick wall of Delrin that absorbs nearly all of the beta particles. It allows only the bremsstrahlung radiation to pass through the source holder for measurement.



**Item 996-743 (70043) Source Holder for Single LDR Seeds:** features a 1.2 mm inner diameter tube which positions an individual iodine, palladium, iridium or gold seed at the most sensitive area of the well chamber. The smooth tube allows easy removal of the seed. This source holder can be calibrated for several iodine and palladium isotopes. Only one source holder needs to be purchased for multiple calibrations.

# CALIBRATORS



**Item 996-744 (70044) Source Holder for HDR Iridium:** Is designed for high dose rate iridium measurements. It has a 2.2 mm diameter opening for the catheter. A rubber o-ring secures the catheter with a uniform constricting pressure to prevent movement of the catheter.



**Item 996-745 (70045) Source Holder for Cesium:** Commonly used with manually loaded cesium sources, this source holder has a 5.0 mm diameter opening. A spacer within the source holder positions the cesium insert at the most active area of the chamber. The spacer for positioning the cesium source is removable so the insert can also be used with longer cesium sources and larger HDR <sup>192</sup>Ir catheters.



**Item 996-746 (70046) Source Holder for Cesium Remote Afterloading:** Designed for use with LDR remote after-loading treatment systems, this source holder has a 7.1 mm diameter opening. There is no spacer because the after-loading system positions the source. This insert can also be used with cobalt sources used in some LDR remote after-loading treatment systems.



**Item 996-747 (70047) Source Holder for MICK® Cartridges:** Provides a consistency QA check of the activity of seeds loaded into a Mick® cartridge. The source holder positions the cartridge for a quick, reproducible measurement. Spring loaded clamp attachment quickly grips cartridge to minimize finger dose. Mick® Cartridge source holder can also be used with the Oncura Sterile Convenience Pack.



**Item 996-748 (70048) Source Holder for RAPID Strand™ Iodine Seeds:** Provides a fast and convenient method to perform a quality assurance measurement of the 1-125 RAPID Strand™ under sterile conditions. This source holder is constructed to simultaneously measure the ten 6711 seeds in the strand. A correction factor has been determined to calculate the activity.



**Item 996-749 (70049) Source Holder for IBt InterStrand®:** Is designed for QA measurements of International Brachytherapy InterStrand® source trains. The train consists of ten InterSource® 103Pd seeds or ten InterSource® 125I seeds, with an absorbable suture contained within the open annulus of each seed. The InterStrand® stainless steel shielding container connects to the top of the source holder for easy transfer of the InterStrand® to the source holder for measurement.



**Item 996-751 (70051) Source Holder for Preloaded Needles:** Allows calibration and visual verification of a sterilized needle filled with seeds and spacers. A universal luer lock mates to the needle through an adjustable needle hub to needle opening interface offering seamless integration from seeds to the needle. Source trains of one to ten seeds may be verified and calibrated while maintaining sterility.

Item #	Description
996-734	IVB 1000 Source Holder for LDR Iridium Sources
996-736	IVB 1000 Novoste™ Source Holder for <sup>90</sup> Sr/ <sup>90</sup> Y IVB Sources
996-742	IVB 1000 X-Ray Contamination Test Tool
996-743	IVB 1000 Source Holder for Single LDR Seeds
996-744	IVB 1000 Source Holder for HDR Iridium
996-745	IVB 1000 Source Holder for Cesium

Item #	Description
996-746	IVB 1000 Source Holder for Cesium Remote Afterloading
996-747	IVB 1000 Source Holder for MICK® Cartridges
996-748	IVB 1000 Source Holder for RAPID Strand™ Iodine Seeds
996-749	IVB 1000 Source Holder for IBt InterStrand®
996-751	IVB 1000 Source Holder for Preloaded Needles

**Additional Shielding - 1" thick (2.54 cm) lead rings to surround the well chamber are available. Call RPD for more information.**

V

## INTERLOCKING LEAD RING SET



The 2" thick (5.08 cm) lead rings provide additional shielding around a dose calibrator chamber thereby giving maximum protection when working with 511 keV radionuclides.

The interlocking ring set consists of eight (8) interlocking lead rings that stack on top of a 2" thick (5.08 cm) lead base block which is surrounded by one interlocking ring.

The 2" thick (5.08 cm) lead rings offer three interlocks: two where the ring halves connect and another on top of the ring to fit into the bottom of the next ring.

### Specifications

**Lead Shielding:** 2" thick (5.08 cm)

**Overall Height:** 18" (45.7 cm)

**Inside Height:** 16" (40.6 cm)

**Outer Diameter:** 11" Dia. (27.9 cm)

**Inner Diameter:** 7" (17.8 cm)

**Weight:** 450 lb (205 kg)

**Ships via Truck**

Item #	Description
344-100	Interlocking Lead Rings