



Model HDR1000+ Brachytherapy Re-Entrant Well Chamber

The rapid increase in oncology centers providing high dose rate brachytherapy treatments has prompted an intense interest in calibration procedures for high dose rate ¹⁹²Ir sources.

Calibration of sources is necessary because some sources are delivered with ±10% specifications¹. One facility's experience has shown a variation of 15% in sources. Calibration with Farmer-type ion chambers requires a very time consuming procedure of 1 - 2 hours². For proper calibration, the jig and Farmer method requires multiple distance measurements which must be accurate to less than 1 mm. Scatter is produced by the jig apparatus which must be accounted for.

The HDR1000+ ion chamber, initially conceived by Professor Herb Attix, is designed specifically for use with high dose rate ¹⁹²Ir sources. A typical calibration time using the HDR1000+ ion chamber is 15 minutes. It eliminates any need for multiple distance measurements, therefore eliminating any chance of imprecision due to distance errors. All scatter is accounted for as part of its calibration factor. The HDR1000+ now offers a simple, reliable means to calibrate ¹⁹²Ir sources and to verify decay rates.

The HDR1000+ is supplied with a storage case.

¹ Calibration and Quality Assurance ¹, Ezell, Hicks, and DeWerd, International Brachytherapy, 1992

² Calibration of high-dose-rate afterloading systems, Goetsch et al: Medical Physics 18(3), 1991

Features:

- ▶ HDR and LDR Calibrations
- ▶ May be used with most any precision electrometer

Specifications

Active volume:	..... 245 cc
Nom. sensitivity:	..... HDR ¹⁹² Ir; 8.6 nA/Ci ¹²⁵ I; 5.4 nA/Ci
Axial response:	..... ±0.5% over 25 mm at center of axis
Accuracy:	..... ±1%
Stability:	..... 0.2% over 2 years
Ion collection efficiency:	..... 0.9996 @ >20 Ci
Leakage current:	..... <5 of A
Typical bias:	..... ±300 V
Cable:	..... 1 meter triaxial BNC (TNC optional)
Well opening:	..... 3.5 cm dia., 12.1 cm deep
Dimensions:	..... 10.2 cm dia. 15.6 cm high (4 x 6.1 in)
Weight:	..... 2.7 kg (6.1 lbs)

Accessories:

3BM-F10 10 m	..... triax extension cable, BNC male/female
70007	..... Wall-mount bracket for use with QA test tool insert
70008	..... QA Test Tool Insert
Calibration HDR:	..... ¹⁹² Ir
LDR:	..... ¹⁹² Ir, ¹⁰³ Pd, ¹³⁷ Cs

Source holders:

70003	..... Source holder with 7.1 mm dia. aluminum catheter for cobalt sources and ¹³⁷ Cs remote afterloading sources
70009	..... Source holder with 3 mm dia. acrylic coiled catheter for LDR ¹⁹² Ir ribbon seeds
70010	..... Source holder with 2.2 mm dia. aluminum catheter for HDR ¹⁹² Ir (this source holder is standard with HDR-1000+)
70016	..... Source holder with 1.2 mm dia. Teflon catheter for individual iodine or individual LDR seeds
70020	..... Source holder with 5 mm dia. aluminum catheter for ¹³⁷ Cs
70022	..... Source holder for LDR seed batch assay, up to 500 seeds and for iridium wire coil
70023	..... Source holder for RAPID Strand iodine seeds
70024	..... Source holder for MICK Cartridge
70026	..... Source holder for 5 and 10 cc Metastron syringes
70032	..... Source holder for Bard/Indigo Express cartridge

