



Direct Reading Dosimeter - High Range Models

The Direct-Reading dosimeter is a pocket-size, carbon fiber electroscopie with a thin walled chamber for detecting exposure to gamma and x-ray.

The low energy feature has hospital applications including fluoroscopy, portable radiography and angiography.

This pocket size instrument is light weight and has a sturdy metal clip to attach to individual's pocket. The entire unit is waterproof.

High Range Models include:

| Model | Range |
|-------|----------|
| 715 | 0-1000mR |
| 720 | 0-2R |
| 725 | 0-5R |
| 730 | 0-20R |
| 740 | 0-100R |
| 742 | 0-200R |
| 746 | 0-600R |



All models are available with a protective hard (sapphire) window to prevent the lens from being scratched in a harsh environment. Arrow-Tech, Inc. is one of the few companies in the world that maintains the technology to manufacture the direct reading dosimeter.

Specifications

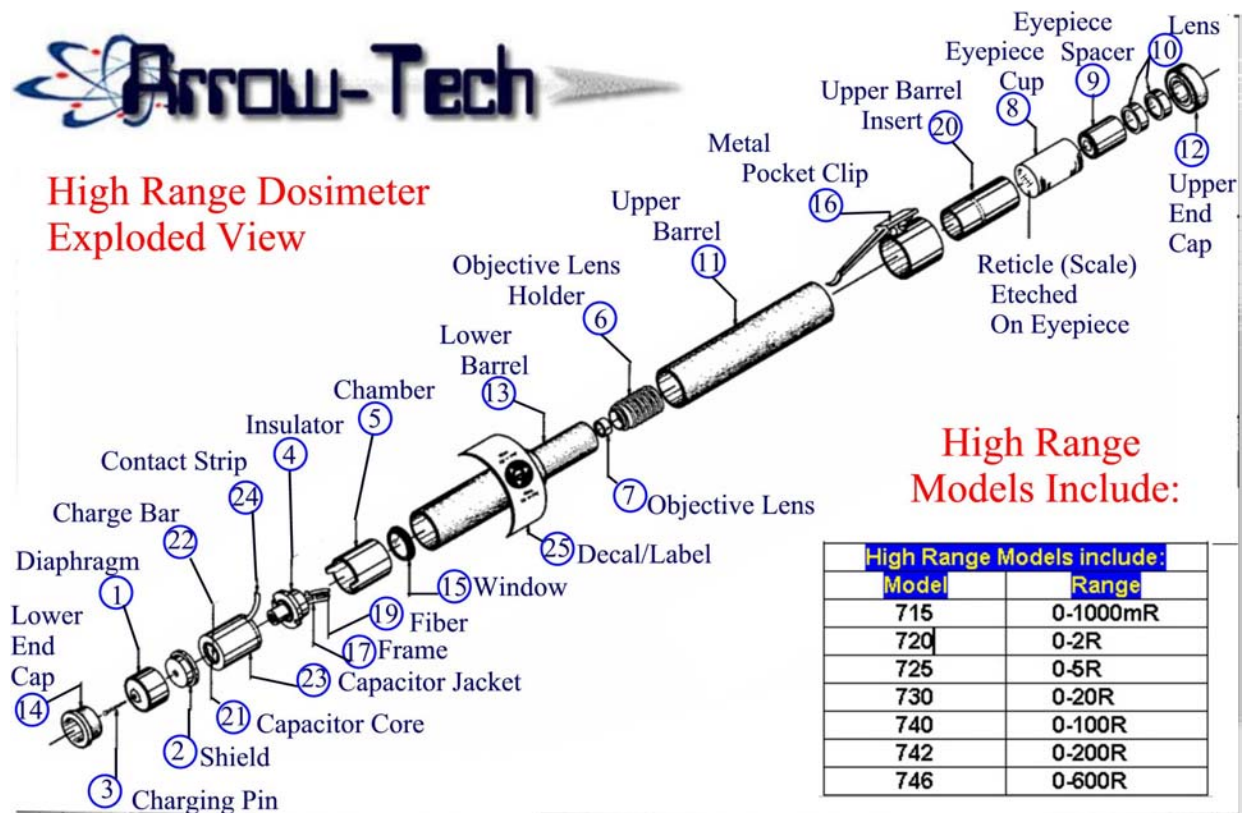
| | |
|---------------------|--|
| Radiation Detected: | Gamma and x-ray from 16 keV to 6 MeV |
| Ranges: | 0 –1000 mR to 0 – 600R |
| Detector: | Fiber electrometer mounted in an electrically conductive plastic ion chamber |
| Detector Housing: | Very low permeability plastics-hermetically sealed |
| Accuracy: | Within + or – 10% of true exposure |
| Rate Response: | Dose rate independent for gamma and x-ray |
| Electrical Leakage: | Less than 1.0% of full scale for 24 hours at 50 C |
| Temperature Range: | -20 degrees C to + 50 degrees C |
| Relative Humidity: | Up to 90% |
| Dimensions: | Length: 4.5" (12.4 cm) Diameter .6 " (1.5 cm) |
| Weight: | 1.0 oz (25 grams) |
| Finish: | Barrel and end caps are Natural matte black with metal clip |
| Warranty: | 2 year limited warranty |

All dosimeters are tested for compliance with ANSI specifications, and customer specification requirements. All test equipment is calibrated, with documentation of traceability to NIST standards. All dosimeters are identified as to model number, range, manufacturer's name, and unique serial number.

Accumulated radiation is read directly on an internal calibrated scale. A Dosimeter charger is required in order to return the dosimeter to zero after each exposure or when desired.



High Range Dosimeter Exploded View



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Direct Reading Dosimeter Operation

| Item | Description |
|------|-----------------------|
| 1 | Diaphragm Switch |
| 2 | Electrostatic Shield |
| 3 | Charging Pin |
| 4 | Electrometer |
| 5 | Ionization Chamber |
| 6 | Objective Lens Holder |
| 7 | Objective Lens |
| 8 | Eye Piece/Reticle |
| 9 | Eyepiece Spacer |
| 10 | Eyepiece Lens - 2 |
| 11 | Upper Barrel |
| 12 | Upper End Cap |
| 13 | Lower Barrel |
| 14 | Lower End Cap |
| 15 | Window |
| 16 | Metal/Pocket Clip |
| 17 | Frame |
| 19 | Conductive Fiber |
| 20 | Upper Barrel Insert |
| 21 | Capacitor Core |
| 22 | Charge bar |
| 23 | Capacitor Jacket |
| 24 | Contact Strip |
| 25 | Decal/Label |

A conductive fiber dosimeter is a rugged precision instrument consisting of an ionization chamber (5) sensitive to radiation. A conductive fiber electrometer (4) which measures the charge: and a microscope to read the shadow of the fiber on a reticle(scale) (8).

The electrometer embodies two electrodes, one of which is a moveable conductive fiber. When the electrometer is charged to a predetermined voltage, the electrodes assume a calibrated separation.

As the dosimeter is exposed to radiation, ionization occurs in the surrounding chamber decreasing the charge on the electrodes in proportions to the exposure. The deflection of the moveable conductive fiber electrodes is projected, by a light source, through an objective lens(7) to the calibrated reticle and read through a microscope eyepiece (8,9,10).

Illumination for the optical system is obtained by pointing the dosimeter at any convenient light source. Light passes through the clear plastic electrostatic shield (2) to illuminate the reticle.

The bottom is sealed by the clear plastic diaphragm switch (1) containing an insulated charge pin (3). When charging, the charging pin moves up to contact the electrometer closing the circuit. Sufficient voltage is applied to recharge the system.

The entire system is encased in a liquid crystal polymer (LCP) barrel (11 & 13) with all joints hermetically sealed with epoxy.

