

Direct Reading Dosimeter - Low Range Models

The Direct-Reading dosimeter is a pocket-size, carbon fiber electroscope 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 can be immersed in water without effecting the instrument readings.	
Low Range Models include:	
Model	Range
138	0- 200mR
138-S	0- 2mSv
500	0- 500mR
500-S	0- 5mSv

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

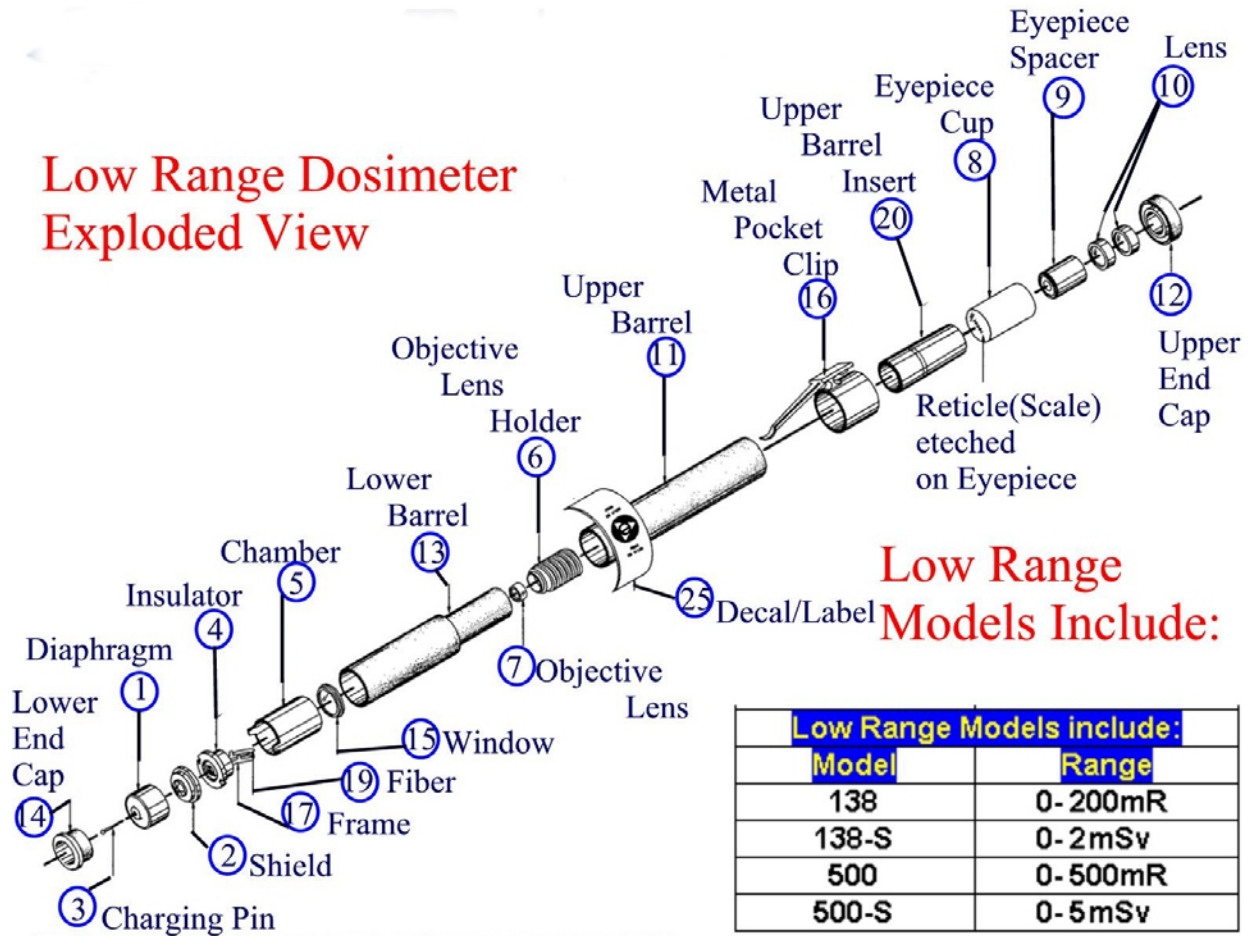
Radiation Detected:	Gamma and x-ray from 16 keV to 6 MeV
Ranges:	0 –200 mR, 0 – 500 mR, 0 – 2 mSv, 0 – 5 mSv
Detector:	Fiber electrometer mounted in an electrically conductive plastic ion chamber
Detector Housing:	Very low permeability plastics-hermetically sealed
Accuracy:	Within + or – 10% of true 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.

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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.

Low Range Dosimeter Exploded View



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
25	Decal/Label

Direct Reading Dosimeters Operation

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 (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.