



Features

- Measurement of the absorbed dose rate in six ranges: from 10 $\mu\text{Gy/h}$ to 1000 mGy/h and of the absorbed dose in five ranges: from 10 μGy to 100 mGy
- 515 cm^3 air ionization chamber with 7 mg/cm^2 tissue equivalent wall and 300 mg/cm^2 removable cap
- Uniform response from 8 keV to 2 MeV
- Produced under CEA (French Atomic Energy Commission) license
- CTHIR 005 qualification

BABYLINE 81

Portable Gamma and X-ray Doserate Meter/Dosimeter

Description

The BABYLINE 81 instrument is a linear response doserate meter/dosimeter for measuring the dose rate and the absorbed dose in human tissues (under 0.007 g/cm^2 or 0.3 g/cm^2) for an irradiation by incident or scattered photons in the 8 keV to 10 MeV energy range and, occasionally, by electrons.

The unit comes in a case containing the high-gain-current amplifier and the processing electronic circuits. The unit is provided with a handle that holds the rechargeable or non-rechargeable batteries; the ionization chamber and its 0.3 g/cm^2 removable cap are fixed on this case.

Several switches are provided to start the unit, to check the zero adjustment of the galvanometer and to select the measurement range (six dose rate ranges and five integrated dose ranges).

The large-sized needle indicator allows an easy reading of the absorbed dose rate. The presentation of the unit as a pistol facilitates its use.

The BABYLINE 81 instrument has become the reference doserate meter in laboratories and nuclear facilities all over the world.



Specifications

NUCLEAR

- UNIT – Produced under CEA (Atomic Energy Commission) license, CTHIR 005 qualification.
- DETECTOR – Air ionization chamber with a 515 ± 10 cm^3 internal sensitive volume (Silicagel drying agent capsule included).
 - 0.007 g/cm^2 wall thickness: made of light material and tissue equivalent allowing to evaluate the irradiation for the under layer of the epidermis, $D_t(0.07)$, $H'(0.07)$.
 - 0.3 g/cm^2 removable cap in tissue equivalent material (H 10%, C 61%, F 18%, Mg 11%) allowing to evaluate the irradiation of the soft tissues of the body $D_t(3)$.
 - Polyamide collector electrode.
 - Conductive deposits in graphite/tannin/magnesium fluoride 53/25/22.
- SENSITIVITY – 4.8 10^{-12} A per mGy/h; 0.6 $\mu\text{Gy/h}$ typical background (< 1 $\mu\text{Gy/h}$).
- ENERGY RESPONSE – Steady response from 8 keV to 2 MeV.
- ISOTROPY – The good isotropy of the unit allows accurate measurements of incident and scattered gamma and X-rays.
 - Uniform response in a cone of 130°: $\pm 5\%$ ^{60}Co (1.25 MeV), $\pm 30\%$ ^{241}Am (60 keV), $\pm 40\%$ ^{71}Ge (10 keV).

BABYLINE 81 Portable Gamma and X-ray Doserate Meter/Dosimeters

- **MEASUREMENT RANGES** –
 - Six dose rate ranges: 10 $\mu\text{Gy/h}$, 100 $\mu\text{Gy/h}$, 1000 $\mu\text{Gy/h}$ (1 $\mu\text{Gy/h} = 100 \mu\text{rad/h}$).
 - 10 mGy/h , 100 mGy/h , 1000 mGy/h (1 $\text{mGy/h} = 100 \text{mrad/h} = 0.1 \text{rad/h}$).
 - Five absorbed dose ranges: 10 μGy , 100 μGy , 1000 μGy , 10 mGy , 100 mGy .
- **INDICATOR** – Needle galvanometer, large and easy-to-read dial.
 - Overload breaker LED indicator, the needle remaining at the stop position.
- **RESPONSE TIME** – <20 s for 90% of the total deviation on the two lower ranges (10 $\mu\text{Gy/h}$ and 100 $\mu\text{Gy/h}$).
 - <5 s on the four upper ranges.
- **ACCURACY** – Better than 10% on the 10 $\mu\text{Gy/h}$ range (after the zero adjustment of the galva).
 - Better than 7% on the 100 $\mu\text{Gy/h}$ to 1000 mGy/h ranges.
 - Better than 10% on the integrated dose ranges from 10 μGy to 100 mGy .
 - A correction table according to the temperature and pressure conditions is provided.
 - Possible adjustment of dose rate and integrated dose calibrators.
- **SOURCE FOR TEST** – The radioactive source holder is housed under the unit; it is maintained in place (optional) by means of a small chain: 300 kBq $^{90}\text{Sr}+^{90}\text{Y}$ with two collimators, delivering 10 and 100 $\mu\text{Gy/h}$.
 - ($T_{1/2} = 28.15$ year, E_{β} max = 0.546 and 2.28 MeV).

ELECTRICAL

- **POWER SUPPLY** – Four alkaline batteries type R14-Type C (1.5 V); 60 h autonomy; voltage checking.
- Set of four rechargeable batteries and charger (option).

MECHANICAL

- **CASE** – Polycarbonate case with polyester, decontaminable painting.
- **CARRYING CASE** – For the BABYLINE unit, the four batteries, the charger and the power mains cord.
- **DIMENSIONS** – 236 x 290 x 115 mm (9.3 x 11.4 x 4.5 in.) (H x L x W).
- **WEIGHT** – 1.65 kg (3.6 lb).

ENVIRONMENTAL

- **TEMPERATURE RANGE** – -10 to +50 $^{\circ}\text{C}$ (+14 to +122 $^{\circ}\text{F}$) in operation; drift $<\pm 20\%$ (25% on the 10 $\mu\text{Gy/h}$ range) with zero adjustment at measurement temperature.
- **MOISTURE** – The unit is tight to jet; the drying agent capsule should be replaced when color changes.

ORDERING REFERENCES

- **BABYLINE 81 UNIT** – EM18316.

Options:

- **CARRYING CASE** – EM18318.
- **SET OF FOUR RECHARGEABLE BATTERIES** – EM18319.
- **BATTERY CHARGER** – EM18317.
- **RADIOACTIVE SOURCE FOR TEST** – EM18334.

