

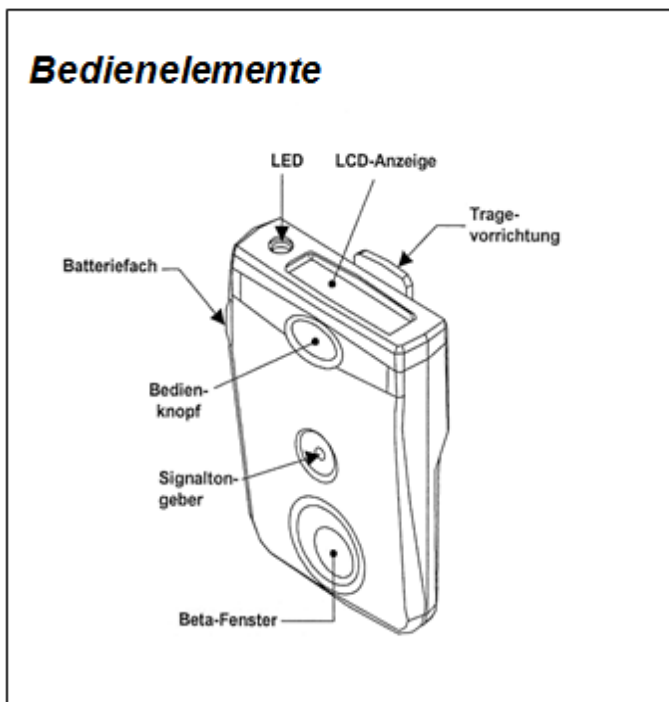
Guide on how to operate the electronic personal dosimeter EPD[®] Mk2

Measuring range

The dosimeter was approved by the Physikalisch-Technische Bundesanstalt for a dose range $H_p(10)$ of 10 μSv to 10 Sv at a dose rate of 50 nSv/h to 1 Sv/h in the energy range of 16 keV to 7 MeV and an angular range of $< \pm 60^\circ$.

Note: In the direct beam of pulsed radiation fields (X-ray, accelerator), the dose rate in the pulse can be much higher than 1 Sv/h. In this case, the dosimeter is not suitable for use because a significant dose underestimation may result. In the scattered beam and when worn under a lead apron, the dose rate values are generally within the permissible measurement range of the dosimeter. Please check your system for the possibility of using the dosimeter.

The EPD is equipped with the following operating elements:



Operating elements

LED

LCD display screen, i.e. function control panel

Clip assembly

Battery compartment

Operating button

Sounder

Beta window

LED and sounder for warning and fault signaling.

An **LCD display screen** with function control panel to indicate the dose values and settings.

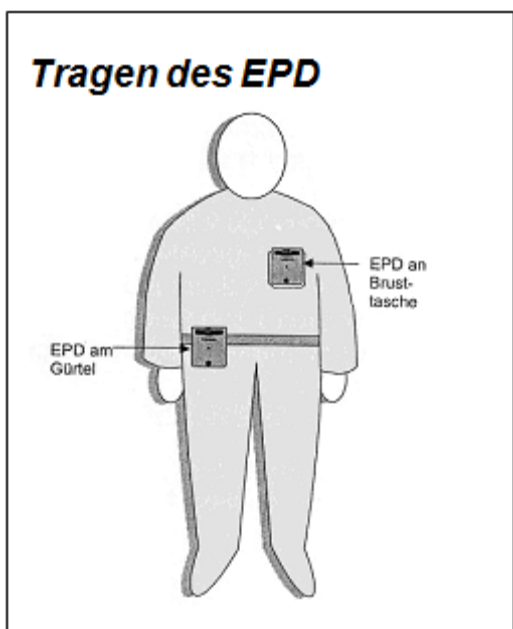
A **clip assembly** to fasten the EPD.

A **battery compartment** to replace the battery.

An **operating button** to adjust the settings on the unit.

A **beta window** to measure the personal surface dose $H_p(07)$.

EPD should be worn as shown below:



Wearing the EPD

EPD on the breast pocket

EPD at the waist belt

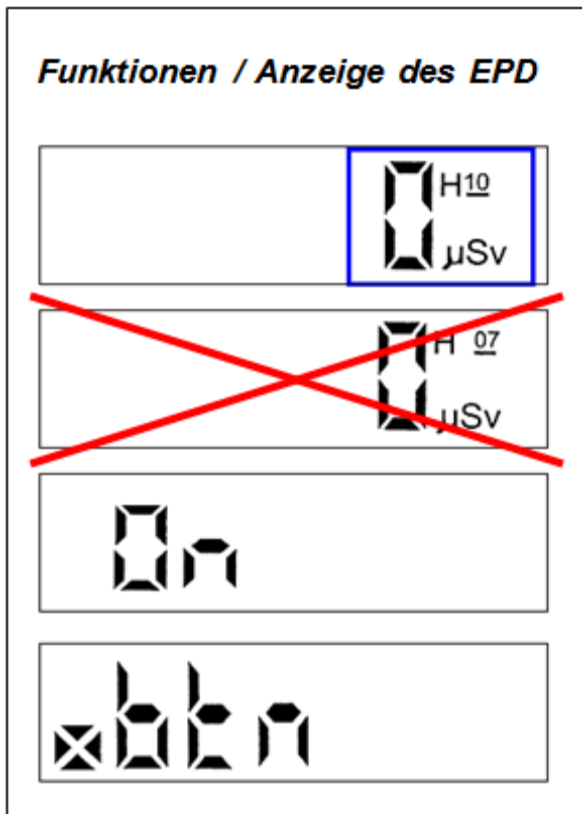
Using the clip, the EPD can be fastened onto the waist belt or the chest pocket.

The EPD should be worn according to the instructions of the Radiation Safety Officer.

If the EPD is used for the weekly measurement of the personal dose of pregnant women, it should be worn in the abdominal area.

Please note: the operating button **must** face out from the front of the body.

Single button operation:



Functions / Display screen of the EDP

The functions of the unit can be changed and selected by pressing the operating button in different ways.

Press and hold the operating button:

The unit cycles through the available functions (approx. once per second while the LCD display screen is changing)

- **H_p(10)** dose: default setting (blue rimmed)
- **H_p(07)** dose: (disabled)
- **ON**: status of the EPD (on/off)
- **Btn**: status button-signal (on/off)

Press the operating button twice shortly ("double click"):

The current function that is indicated on the display screen is activated. Activation is only possible with the functions **ON** and **btn**. For switching off the unit, another double click is required.

Switching function of the EPD

Switching the EPD on: (long press operating button 1 time)

The EPD is switched off before starting-up, the LCD display screen is therefore set to **OFF**.

To switch the unit on, the operating button must be pressed for two seconds, after which the display screen will reset to the $H_p(10)$ condition. The EPD is now ready to perform measurements.

After the first operational use, the displayed value must be $0 \mu\text{Sv}$, as the predose values are cleared prior to shipping. Please note that during continuous operation, the EPD measures the natural environmental dose simultaneously. The natural environmental dose is dependent on the location and is about $1 \mu\text{Sv}$ per 12 hours measurement time.

Now, if you continue to hold the operating button pressed, the unit switches every second between the available functions (see above). The display screen indicating the current status of the EPD has shifted to **ON**.

Switching the EPD off: (hold operating button until "ON" is displayed, short press 4 times)

To switch the unit off, the operating button must be kept pressed until **ON** appears on the display screen. Then, the button must be pressed twice briefly in order to activate the function (now, the display screen begins to flash and is set to **OFF**); press again twice to confirm the function (the display stops flashing while **OFF** is still being displayed). The unit is now disconnected and stops recording exposure.

Please note: The EPD must be switched off after every operational use because otherwise it continues to measure and record the accumulated dose values.

Switching the acknowledgment signal off: (hold operating button until „btn“ is displayed, short press twice)

To switch the acknowledgment signal on and off while actuating the operating button, the operating button must be pressed and held until the symbol **"btn"** appears on the display screen. Then, the button must be pressed twice briefly to activate / deactivate the function.

Display of the personal dose

Hp(10): (preset)

The indication of the personal dose equivalent $H_p(10)$ is the default setting of the EPD and will appear on the display screen automatically after switching the unit on. The dose is being continuously summed while the unit is in operational use. The dose value cannot be reset. Even after switching off the unit or changing the battery, the stored dose cannot be deleted.

If a different setting is selected by holding the operating button, the display screen will revert back to the default setting automatically after 10 seconds.

Note on the dose display:

The natural background radiation in Germany varies between 0.5 mSv and 2 mSv per year. Thus, doses between 1 and 2 µSv per working day correspond to the background due to natural environmental radiation.

Audible warnings:

The EPD delivers an audible warning (beep) on two occasions:

- as an acknowledgment signal when the operating button is pressed
- as a warning signal

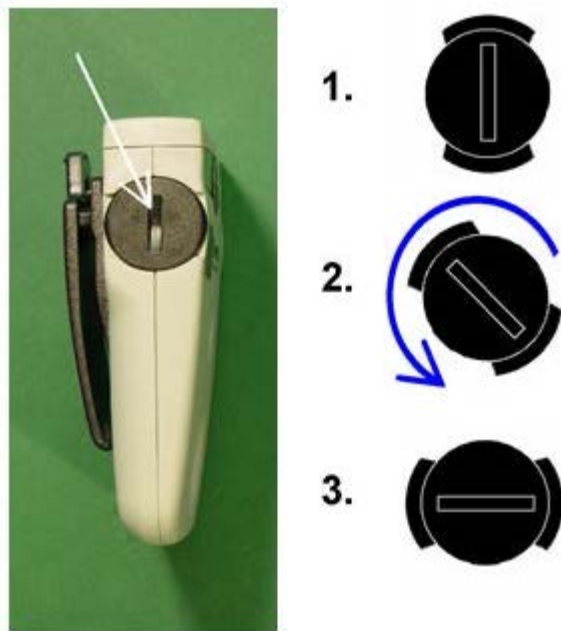
Confirm warning signals: (hold for 2 seconds)

The EPD responds to certain events by delivering different warning signals, which can be confirmed and muted with a long keystroke. During the warning, the reason for the warning signals is indicated in the display screen and the LED signal (on the right side of the display screen) is active. Both display screen and LED are blinking every second.

Standard configuration (surveillance of pregnant women):

Warning type	Display screen	Significance
Dose	10 (HP10-Alarm)	The total dose has exceeded 0,5 mSv (alarm1) or 1 mSv (alarm2)
Dose rate	10 / h	The dose rate has risen above mSv/h The warning stops when the dose rate falls below 0,9 mSv/h
Error	Fxxx	An error has occurred in the unit "Xxx" stands for the error code
Misuse	Everything is blinking	Occurs when mechanical vibrations are being continuously recorded for 15 seconds

Changing the battery



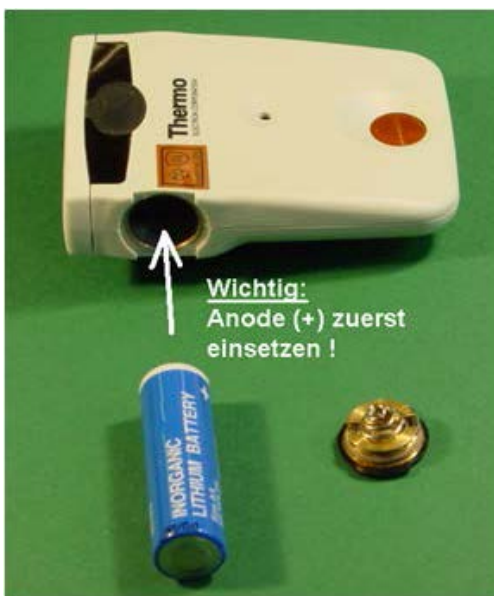
Battery warning

When the battery symbol appears on the display screen, the battery must be replaced.

Opening the battery cap

The battery cap is located on the side of the unit and has a slot that helps open the cap with a coin (best suited for this purpose is a 10 cent coin, for example). A screwdriver may not be used for this purpose because the battery cap may be damaged.

By using the coin, turn the battery cap 90 degrees to the left (do not overwind!). To avoid the risk of damage to the unit, do not use screwdrivers! The battery cap can now be removed by gently pulling. Important: insert the anode side (+) first!



Inserting the battery

After removing the old battery, the anode side (+ charge) of the new one must be first inserted into the battery compartment of the unit.

Replacement batteries can be ordered through our customer service department. Temporarily, the use of a standard 1.5V battery AA/LR6 is also possible.

After inserting the new battery, the battery cap is now gently pressed against the opening until the latches on the cap have snapped into place, and then reverted back into the original position by using the coin.

At that point, the EPD carries out a 10 second self-test (beeping and flashing of the display screen and the LED).

Returning the batteries

Please also return the exchanged batteries to the monitoring service. We will arrange for proper and environmentally friendly disposal. This service is free of charge.