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Dose Area Product Measuring Device

VacuDAP *compact*

REF 156 00 05

Application

The VacuDAP *compact* measuring device determines the following values simultaneously: Dose area product (DAP, cumulative) and Dose area product rate (DAP rate).

Because of the high digital resolution the measuring device can be used for pediatric and standard methods. The VacuDAP *compact* meets the requirements of the European Standard IEC 60580 for dose area product meter.

The VacuDAP *compact* consists of a transparent ionization chamber with integrated electronics and display. The bright 8-digit alpha-numeric LED display can indicate measuring values and status information. The measuring device is controlled with the control buttons RESET and TEST, while by PRINT a printer protocol output can be started.

With the aid of the guide rails, the measuring chamber is inserted into the accessory rails at the beam exit window of the beam limiting device and is therefore ideally suited for retrofitting. For the use of additional filters, various adapters are available. Due to the high light transparency of the ionization chamber, the function of the light beam diaphragm is not restricted.

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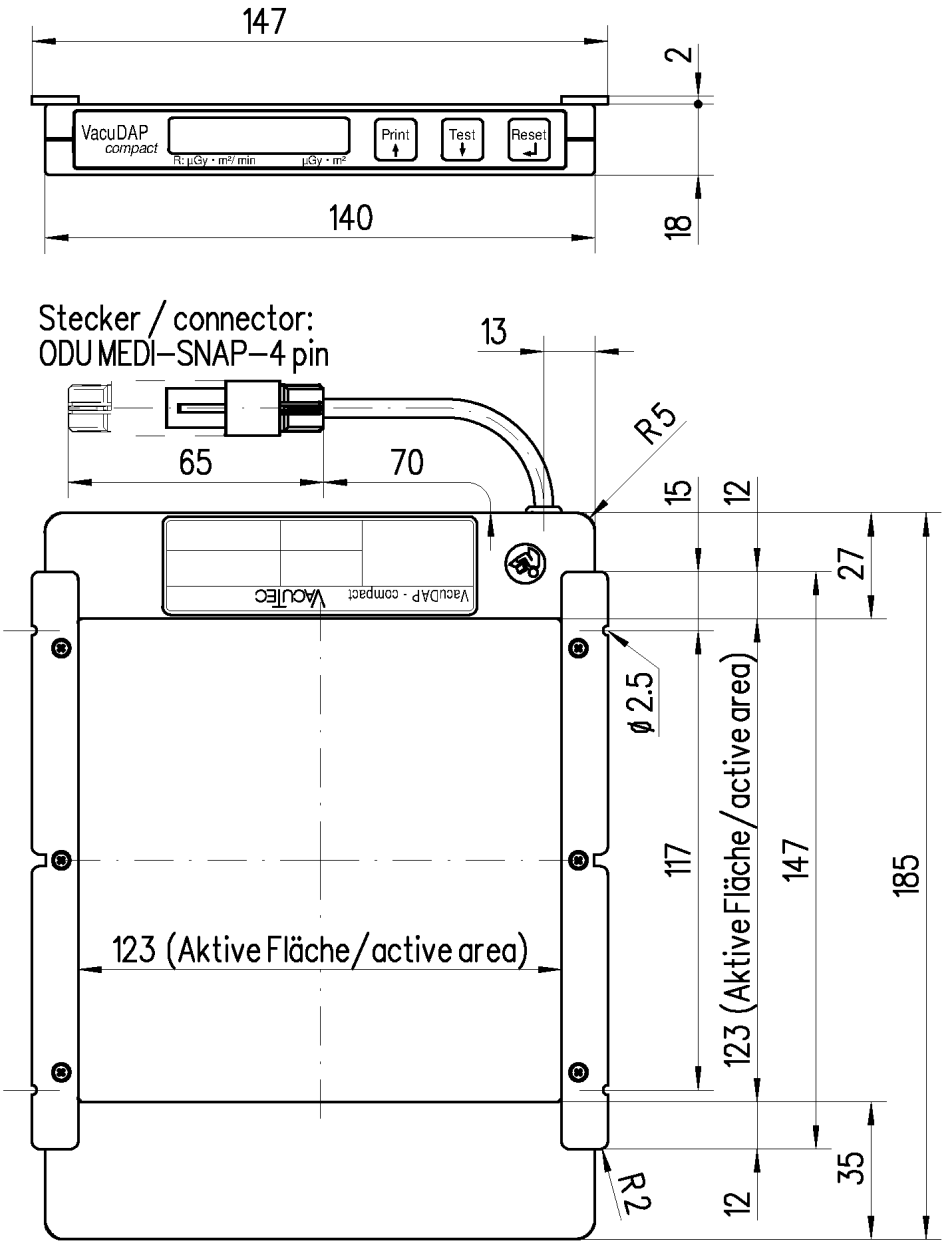
Mechanical data

dimensions in mm



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Technical data

All technical data are valid for the specified ambient conditions according to IEC 60580.

Ionization chamber

Response	
without additional absorber	800 pC / µGy·m²
with additional absorber (0.5 mm Al)	920 pC / µGy·m²
Leakage current	≤ 0.1 pA
Response versus radiation quality	- 6% / + 0% (50 kV …150 kV, acc. to IEC 60580)
Quality equivalent filtration (70 kV)	0.2 mm Al
Transparency	> 70%
Useful field	(1 ... 140) cm²
Chamber voltage	300 V
Distance of the electrodes	6 mm
Stabilization time	5 min

Measuring device

Combined standard uncertainty (acc. IEC 60580) ±25 %

Measured quantity	Dose area product		Dose area product rate	
Mode	High Resolution	High Rate	High Resolution	High Rate
Unit of measure	[µGy·m²]	[µGy·m²]	[µGy·m²/min]	[µGy·m²/min]
Digital resolution	0.01	0.1	0.6	6
Measuring range	0.1 ... 99.999.999	1 ... 99 999 999	6.0 ... 280 000	60 ... 2 200 000

Rated range of use

Radiation quality	(40 ... 150) kV
Dose area product rate (High Res. Mode)	(0.6 ... $2.8 \cdot 10^5$) µGy·m²/min
Dose area product rate (High Rate Mode)	(6.0 ... $2.2 \cdot 10^6$) µGy·m²/min
Air kerma rate	(6.0 ... $1.7 \cdot 10^5$) mGy/min (at the position of the chamber)
Air pressure	(80.0 ... 106.0) kPa
Temperature	(+10 ... +40) °C
Air humidity	(10 ... 80) % rel. humidity (max. 20 g/m³)

The maximum dose area product rate must not be exceeded.
The ionization chamber must frame the radiation field at all times!

Serial interface	RS-485; half-duplex
Supply voltage ($+U_S$)	(+ 10 ... + 30) V DC
with *Battery for VacuDAP* (REF 950 00 64)	(+ 6.5 ... + 8.4) V DC
Power consumption	max. 3 W
Weight without guide rails	210 g

Only values given with tolerance ranges, or limits are guaranteed. All other values are for information only. Subject to change.

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Interface

Data cable with 4-pin male cable connector (ODU: MediSnap) and the following pin assignment:

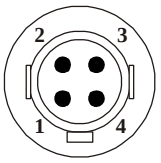
Pin	Signal	Notes	Plug MEDI-SNAP View at connector pins
1	$+U_S$	Supply voltage	
2	GND	Reference potential, ground	
3	RS485-B	RxD/TxD-N (-)	
4	RS485-A	RxD/TxD-P (+)	

Table 1: Pin assignment

Response correction

The response of the ionization chamber is affected by the radiation quality and the air density. Graphs 1 and 2 show the respective correction factors.

The VacuDAP *compact* features an automatic function for tube voltage correction. For using this function change the parameter `KV VALUE` at the display unit (see *Instructions for Use*). The temperature dependence of the air density is corrected automatically.

If the measuring chamber is used at altitudes above 300 m the systematic error caused by the change of air density depending on the altitude must be corrected by recalibration under installation conditions!

After installation the calibration should be tested at installation conditions (see *Instructions for use*). The calibration factor determined in this way includes the altitude correction. If a calibration check under installation conditions is not possible, then the calibration factor can be corrected with the help of the corresponding correction factor k2 from *Graph 2*.

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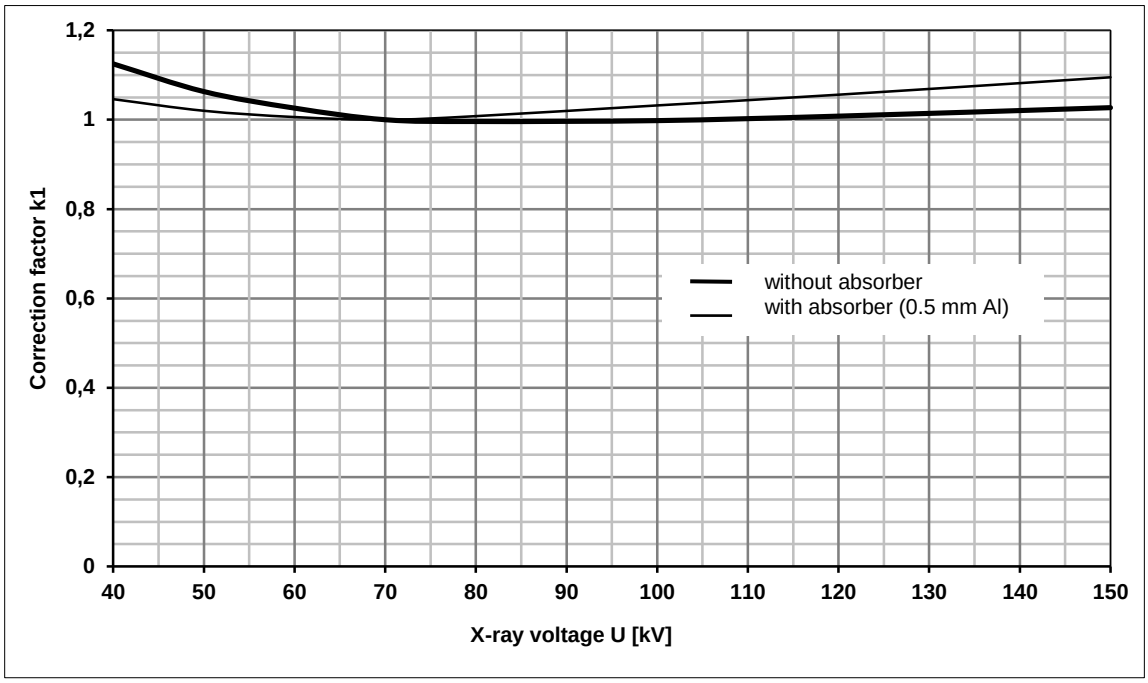
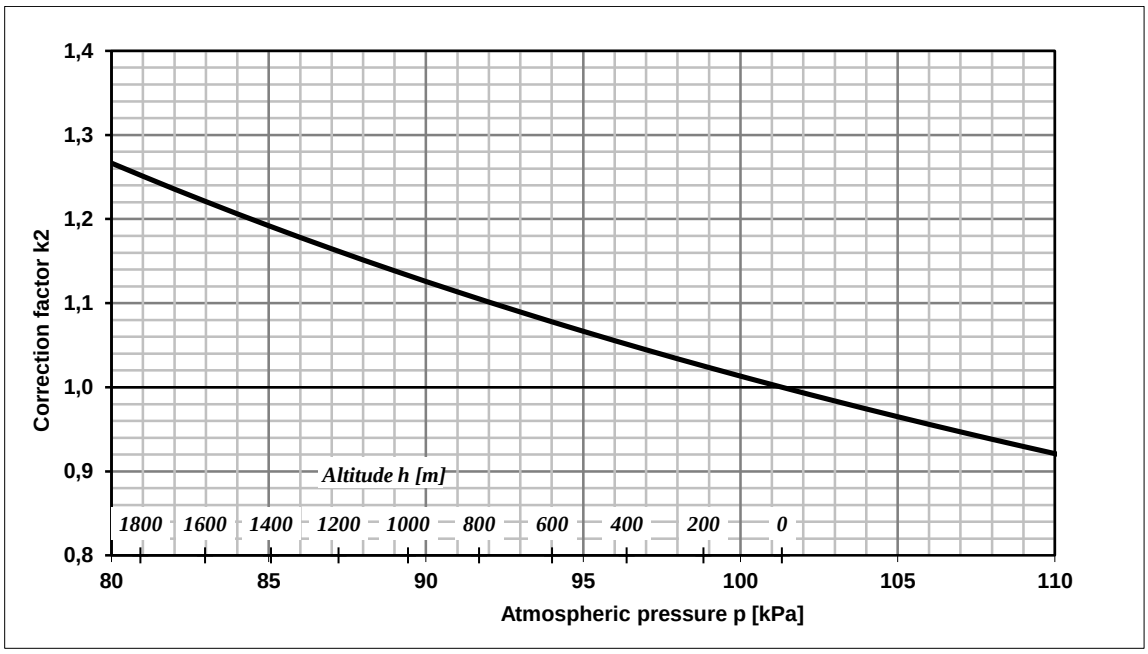


Graph 1: Response correction versus radiation quality



Graph 2: Response correction versus air density