

Technical data GammaTRACER

Radiological Properties	GT-BASIC	GT-WIDE		GT-WIDE-XL		GT-HIGH
Type GM Tube 1	GM, 70003A/E	GM, 70003A/E		GM, 70031A/E		GM, ZP1301/1304
Number of pulses at 100 nSv/h in 10 min	150 pulses	150 pulses		1100 pulses		2 pulses
Type GM Tube 2	GM, 70003A/E	GM, ZP1301/1304		GM, ZP1301/1304		GM, ZP1301/1304
Number of pulses at 100 nSv/h in 10 min	150 pulses	2 pulses		2 pulses		2 pulses
Measurement range	10 nSv/h to 10 mSv/h (1 µR/h to 1 R/h)	10 nSv/h to 10 Sv/h (1 µR/h to 1000 R/h)		10 nSv/h to 10 Sv/h (1 µR/h to 1000 R/h)		1 mSv/h to 10 Sv/h (100 mR/h to 1000 R/h)
Energy range	45 bis 1350 keV (±30%)	45 bis 1350 keV (±30%)		45 bis 1350 keV (±30%)		45 bis 1350 keV (±30%)
Intrinsic effect	<10 nSv/h (elec. comp.)	<10 nSv/h (elec. comp.)		<10 nSv/h (elec. comp.)		
Calibration inaccuracy:	GM Tube 1 & 2	GM Tube 1	GM Tube 2	GM Tube 1	GM Tube 2	GM Tube 1 & 2
0 to 0,1 mSv/h (0 to 10 mR/h)	< 6%	< 6%	-	< 6%	-	-
0,1 mSv/h to 10 mSv/h (10 mR/h to 1 R/h)	< 15%	< 15%	< 15%	-	< 15%	< 15%
10 mSv/h to 100 mSv/h (1 R/h to 10 R/h)	-	-	< 15%	-	< 15%	< 15%
100 mSv/h to 10 Sv/h (10 R/h to 1000 R/h)	-	-	< 15%	-	< 15%	< 15%
Statistical error (1 Sigma) at 100 nSv/h (10µR/h), 60 min cycle	< 3%	< 4%	-	< 1,5%	-	-
Other Specifications (all types)						
Temperature range	-20°C...50°C (-4°F ... 140°F), opt. -40°C...60°C (-104°F ... +158°F)					
Protection class (Basic, Radio)	Hermetically sealed (Cable versions: IP67 – short-time plunging, max. 10 sec. up to 1 bar pressure)					
Mean time between failure (MTBF) at 200 nSv/h	> 1 000 000 h					
Data Storage						
Length of cycle	1, 2, 5, 10, 15, 30, 60, 120 min					
Storage capacity	12 800 values (4 ... 1 060 days - depending on measuring cycle)					
Data Transmission (Range)						
Infrared	up to 10 m					
RS232 interface	up to 10 m					
RS485 interface	up to 500 m (without a Repeater)					
Radio module	up to 100 km (60 miles)					
Power Supply						
Operating time at a measurement cycle of 60 min (at 200 nSv/h)	35 000 h, typically 5 years, guaranteed 3 years					
Mechanical Specifications						
Dimensions (diameter / length)	60mm * 665 mm, XL type incl. radio module: 60mm * 1120 mm					
Casing material	Aluminium, anodized, wall thickness of 1 mm					
Weight	950 g, XL type incl. radio module : ca. 1600 g					
Cable Interface	RS232			RS485		
Ext. power supply	--			12V / 500 mW		

Max. cable length	10 m	500 m (longer on request)
Galvanic isolation	1 000 V	1 000 V
Interface with GSM/ISDN/analog modem	via DataGATE	via DataGATE

Influencing factor	Nominal range of usage	Reference value of influencing unit	maximal change f_{\max}	Remarks
Photon energy and direction of incidence	for H*(10) 50 keV-1250 keV	662 KeV preferred direction	0,4	
Operating voltage with battery operation	5 - 8 VDC	7,5 VDC	0,05	
Operating voltage with ext. voltage supply	10 - 14 VDC	12,0 VDC	0,05	*)
Ambient temperature & rel. humidity	-20°C - 60°C (-40°C - 70°C) 0 - 100 % rH	20°C & 60 % rH	0,1	
Air pressure	85 kPa - 105 kPa	101,3 kPa	0,1	
Position of measuring probe	all positions	vertical position	0,0	
Electrical & magnetic interferences	see table	absence of interferences	0,1	
sunlight, intensity of radiation	0 - 1000 W/m ²	0 W/m ² (darkness)	0,1	

*) only effects *GammaTRACER* with RS485-module

Table 1: Maximal admissible change of *GammaTRACER* susceptibility within its nominal range of usage

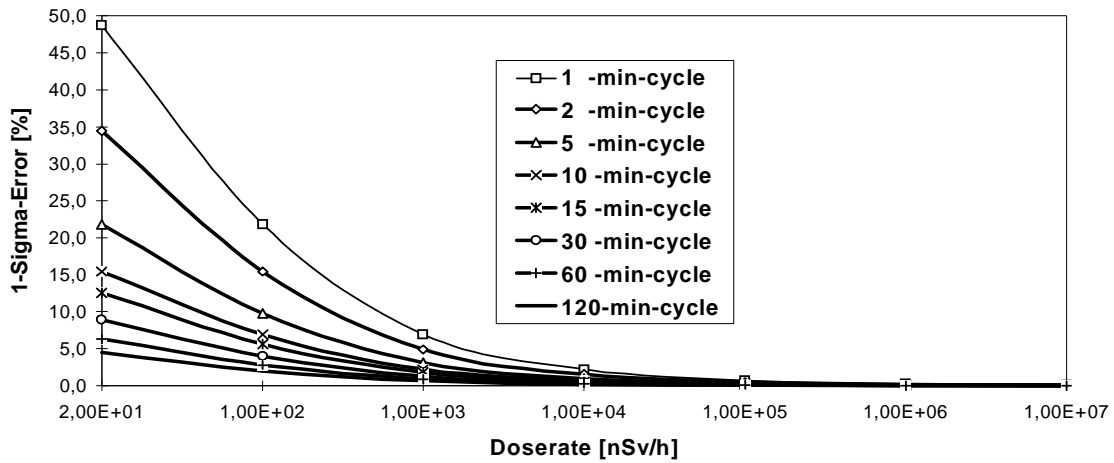


Fig. 1: Maximal value of the variation coefficient for ambient dose equivalent rate with GammaTRACER -Basic- (20 nSv/h - 10 mSv/h)

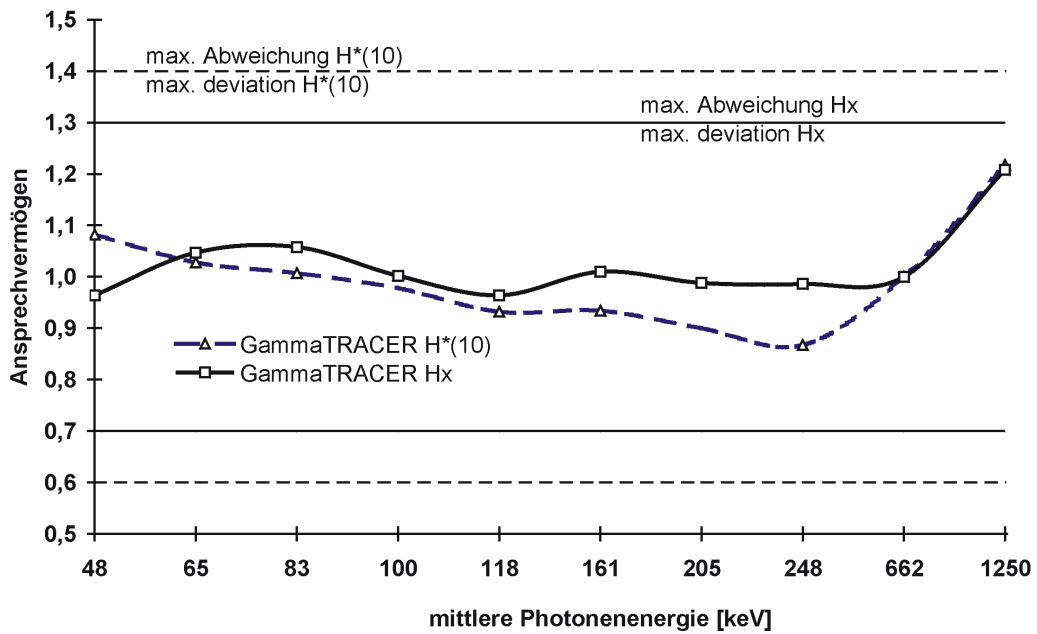


Fig. 2: Energy response (preferred direction) normalized to 662 keV (GammaTRACER -BASIC-)

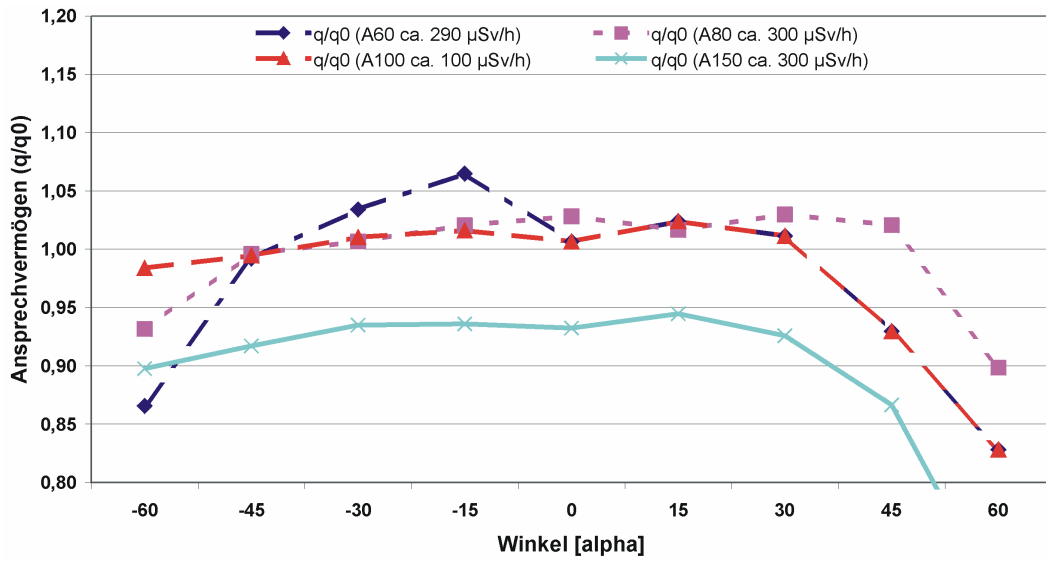


Fig. 3: Angle response GammaTRACER -BASIC- (unit $H^*(10)$) – axis of rotation vertical to probe axis –

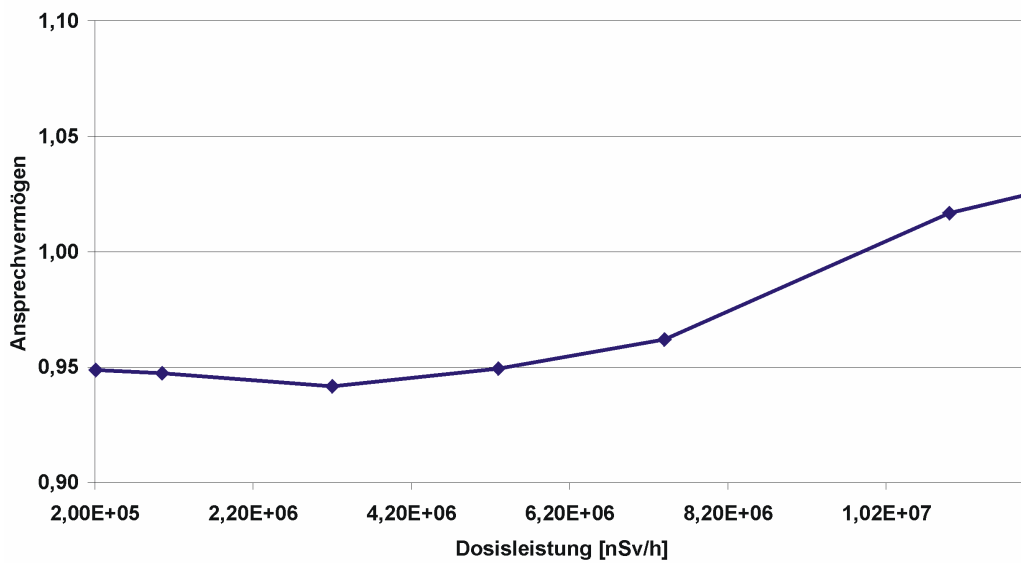


Fig. 4: Dose rate response (GammaTRACER -BASIC-, unit $H^*(10)$)

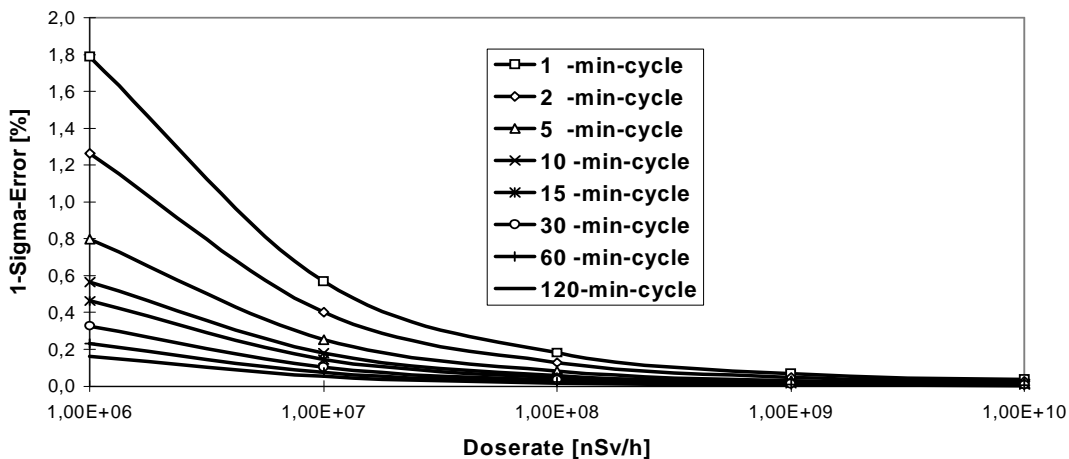


Fig. 5: Maximal value of the variation coefficient for ambient dose equivalent rate with GammaTRACER -HIGH- (1 mSv/h - 10 Sv/h)

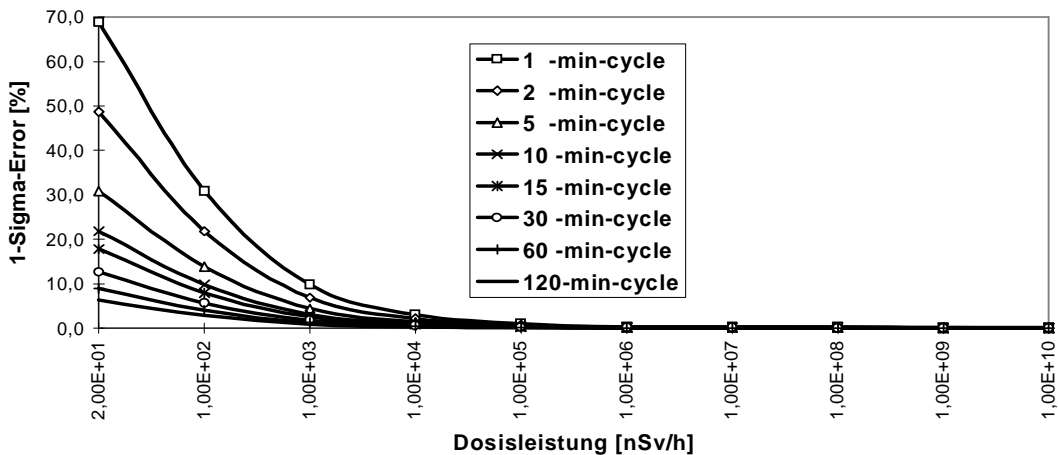


Fig. 6: Maximal value of the variation coefficient for ambient dose equivalent rate with GammaTRACER -WIDE- (20 nSv/h - 10 Sv/h)

Influencing factor	Minimum nominal usage range	According to norm
Discharge, statistic electricity, [voltage]	0 - 8 keV	ICE1000-4-2
Sweep radiation, electromagnetic field	80 MHz - 1 GHz 10 V/m	ICE1000-4-3
Fast transient interfering factors (burst) [voltage]	0 - 1 keV	ICE1000-4-4
Shock potentials rise time	0 -500 V 1 μ s	ICE1000-4-5
wired interferences	150 kHz - 80 MHz	ICE1000-4-6
Sweep radiation, magnetic field	50 Hz 0 - 60 A/m	ICE1000-4-8
Interruption external voltage supply	0 - 0,5 periods	ICE1000-4-11

Tab. 1: Individual tests to test the influence of electric and magnetic interference (GammaTRACER with RS485-Interface)

The probe with RS485 or RS232 adapter has been tested according to the specifications of EN61326 (Industrial Environment) and fulfills all requirements. Probes without cable connection (BASIC or RADIO) are completely insusceptible to magnetic interference because of their completely insulated mounting.