

# ISO 11929-1:2025-12 (E)

## Determination of the characteristic limits (decision threshold, detection limit and limits of the coverage interval) for measurements of ionizing radiation - Fundamentals and application - Part 1: Elementary applications

---

<b>Contents</b>		<b>Page</b>
Foreword .....		iv
Introduction .....		v
1	Scope .....	1
2	Normative references .....	2
3	Terms and definitions .....	2
4	Quantities and symbols .....	6
5	Summary of procedures for evaluating a measurement and calculating the characteristic limits .....	8
5.1	General aspects .....	8
5.2	Modelling the measurement .....	9
5.3	General considerations about the applicability of the ISO/IEC Guide 98-3 .....	9
5.4	Evaluating the input quantities, standard uncertainties and covariances, and the primary result and its associated standard uncertainty .....	10
5.5	Evaluating the standard uncertainty as a function of an assumed true value of the measurand .....	10
5.6	Calculating the decision threshold and decisions to be made .....	11
5.7	Calculating the detection limit and assessment of the measurement procedure .....	12
5.8	Calculating a coverage interval for the measurand .....	12
5.9	Calculating the best estimate of the measurand and its associated standard uncertainty ..	13
5.10	Reporting the results .....	14
6	Fundamentals and evaluation of the measurement .....	16
6.1	General aspects concerning the measurand .....	16
6.2	Model of evaluation .....	16
6.2.1	General model .....	16
6.2.2	Model in ionizing radiation counting measurements .....	17
6.3	Evaluation of the primary measurement result .....	18
6.4	Standard uncertainty associated with the primary measurement result .....	18
7	Standard uncertainty as a function of an assumed value of the measurand .....	19
8	Decision threshold, detection limit and assessments .....	21
8.1	Specifications .....	21
8.2	Decision threshold .....	21
8.3	Detection limit .....	21
8.4	Assessments .....	22
9	Limits of the coverage interval .....	23
9.1	General aspects .....	23
9.2	The probabilistically symmetric coverage interval .....	23
9.3	The shortest coverage interval .....	24
10	The best estimate and its associated standard uncertainty .....	24

11	Documentation .....	25
	Annex A (normative) Repeated counting measurements with random influences .....	27
	Annex B (normative) Measurements with ratemeters .....	32
	Annex C (informative) Calculation of the detection limit by iteration .....	34
	Annex D (informative) Calculations with a generalized net count rate .....	36
	Annex E (informative) Distribution function of the standardized normal distribution .....	39
	Bibliography .....	44