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ExVeritas Policy on Measurement Uncertainty and the Decision Rule

Purpose

ExVeritas applies defined decision rules in line with the requirements of ISO/IEC 17025:2017 and the guidance of IEC Guide 115 to ensure fair and consistent assessment of product compliance. This policy explains how measurement uncertainty is treated in testing and how it supports reliable conformity decisions.

General Policy

ExVeritas recognises that all measurements are subject to uncertainty. In practice, many electrotechnical safety standards—such as those in the IEC 60079 series—are written with sufficient safety margins such that small measurement uncertainties do not materially affect the compliance assessment.

Therefore, unless otherwise stated, measurement uncertainty is not applied to determine conformity. This approach aligns with the “simple acceptance” decision rule described in IEC Guide 115, where a measured value is taken at face value and compared directly to specification limits.

Use of Measurement Uncertainty

- Where required, ExVeritas evaluates measurement uncertainty using established methods (e.g. Type A or Type B evaluations).
- For input test parameters with specified tolerances, the measurement uncertainty of the instrument is maintained within half the tolerance range.
- For outputs, measurement uncertainty is generally not reported unless:
 - It exceeds acceptable limits (e.g. defined by internal policy or standard-specific requirements), or
 - A client requests its inclusion.

Shared Risk

In cases where a measured value is very close to a limit and uncertainty could affect the outcome, ExVeritas acknowledges that neither full compliance nor non-compliance can be guaranteed without doubt. In such cases, we adopt a “shared risk” model between the manufacturer and the end user.

Reporting

ExVeritas will include measurement uncertainty in reports when:

- Required by a specific test standard
- Requested by the client
- The measurement uncertainty exceeds agreed levels

Otherwise, the values are retained internally as part of our quality assurance process.

Uncertainty table by Measurand

Unless specified elsewhere for a specific test, the limits of uncertainty for tests by ExVeritas are:

Measurand	Range	Uncertainty
Capacitance	1–10 pF	±15%
	>10 pF–1000 µF	±2.0%
Current 40–60 Hz	<20 A	±1.5%
	>20 A	±2.5%
Current DC	<20 A	±1.5%
	>20 A	±2.5%
Explosion pressure	2–100 BAR	±4.0%
	<2 BAR	±0.8BAR
Force	<10 N	±0.2 N
	≥10 N	±2.0%
Frequency	ALL	±0.2%
Humidity	30–95% RH	±8% Absolute
Inductance	0.01–0.1 mH	±15%
	>0.1–1000 mH	±20 mH
Linear dimension	<25 mm	±0.05 mm
	≥25 mm	±0.25%
Mass	<1 g	±0.05 g
	1 g–10 g	±0.1 g
	>10 g–100 g	±1.0%
	>100 g	±2.0%
Optical power	ALL	±10%
Oxygen concentration	0–21%	±0.2% Absolute
Power	<1 W	±1.0% ±5 mW
	1 W–3 kW	±1.5%
	>3 kW	±5%
Pressure	0–1 BARG	±50 mBar
	>1 BARG	±2%
Resistance	<20 Ω	±2.5%
	20 Ω–20 MΩ	±1.0%
	>20 MΩ	±10%
Temperature non-contact	0–450°C	±10%
Temperature (contact)	<100°C	±2.0°C
	≥100°C	±2.0%
Time	<5 seconds	±0.5 seconds
	>5 seconds	±1.0%
Torque	<1 Nm	±0.1 Nm
	≥1 Nm	±10%
Vacuum	0 to –1 BARG	±50 mBar
Voltage transient	<1 V	±5.0%
	≥1 V	±10%
Voltage 40–60 Hz	<1 V	±1.5% ±1 mV
	1–1000 V	±1.5%
	>1000 V	±2.5%
Voltage DC	<1 V	±1.5% ±1 mV
	1–1000 V	±1.5%
	>1000 V	±2.5%
Impact energy	0–20 J	+0.2J -0%
Flow	<10 L/min	±0.5 L/min
	ALL	±5.0%