

## STANDARD INFORMATION

**Standard:** UL 61010-031 / CSA C22.2 No. 61010-031

**Standard ID:**

Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use - Part 031: Safety Requirements for Hand-held Probe Assemblies for Electrical Measurement and Test [UL 61010-031:2017 Ed.2+R:07Jan2020]

Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use - Part 031: Safety Requirements for Hand-Held Probe Assemblies for Electrical Measurement and Test [CSA C22.2#61010-031:2017 Ed.2+A1]

**Previous Standard ID:**

Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use - Part 031: Safety Requirements for Hand-held Probe Assemblies for Electrical Measurement and Test [UL 61010-031:2017 Ed.2]

Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use - Part 031: Safety Requirements for Hand-Held Probe Assemblies for Electrical Measurement and Test [CSA C22.2#61010-031:2017 Ed.2]

## EFFECTIVE DATE OF NEW/REVISED REQUIREMENTS

**Effective Date:** **January 1, 2023**

## IMPACT, OVERVIEW, AND ACTION REQUIRED

**Impact Statement:** Per our accreditation, Intertek is required to review reports against the standard revisions to confirm compliance. Once compliance is confirmed, the standard reference in the report is updated to show continued compliance to the technical requirements of the standard.

**Overview of Changes:**

- Addition of requirements for solid insulation
- Revision of requirements for probe wires

Specific details of new/revise requirements are found in table below.

***Current Listings Not Active? – Please immediately identify any current Listing Reports or products that are no longer active and should be removed from our records. We will do this at no charge as long as Intertek is notified in writing prior to the review of your reports.***



## STANDARD INFORMATION

CLAUSE	VERDICT	COMMENT
		<i>Additions to existing requirements are <u>underlined</u> and deletions are shown <del>lined out</del> below.</i>
6	Info	<b>Protection against electric shock</b>
6.5	Info	<b>Insulation requirements</b>
6.5.1	Info	<b>The nature of insulation</b> <i><b>New clause added;</b></i>
		<b>SOLID INSULATION</b>
		The term “solid insulation” is used to describe many different types of construction, including monolithic blocks of insulating material and insulation subsystems composed of multiple insulating materials, organized in layers or otherwise.
		The electric strength of a thickness of solid insulation is considerably greater than that of the same thickness of air. The insulating distances through solid insulation are therefore typically smaller than the distances through air. As a result, electric fields in solid insulation are typically higher, and often are less homogeneous.
6.5.1.3		Solid insulation material may contain gaps or voids. When a solid insulation system is constructed from layers of solid materials, there are also likely to be gaps or voids between layers. These voids will perturb the electric field so that a disproportionately large part of the electric field is located in the void, potentially causing ionization within the void, resulting in partial discharge. These partial discharges will influence the adjacent solid insulation and may reduce its service life.
		Solid insulation is not a renewable medium: damage is cumulative over the life of the equipment. Solid insulation is also subject to ageing and to degradation from repeated high voltage testing.
		Conformity is checked as specified in 6.5.2.5 and 6.5.2.6.
		<i><b>New Table added;</b></i>
Table 6		<b>CLEARANCES of probe assemblies RATED for MEASUREMENT CATEGORIES</b>
		See standard for table.



CLAUSE	VERDICT	COMMENT
		<b><i>New section added;</i></b>
		<b>Solid insulation of probe assemblies RATED for MEASUREMENT CATEGORIES</b>
6.5.2.5		Solid insulation of probe assemblies RATED for MEASUREMENT CATEGORIES shall withstand the electrical and mechanical stresses that may occur in NORMAL USE and in all RATED environmental conditions (see 1.4) during the intended life of the probe assembly. See standard for details.
		<b><i>New section added;</i></b>
		<b>Solid insulation for probe assemblies which are not RATED for MEASUREMENT CATEGORIES</b>
6.5.2.6		Solid insulation for probe assemblies which are not RATED for MEASUREMENT CATEGORIES shall withstand the electrical and mechanical stresses that may occur in normal use and in all RATED environmental conditions (see 1.4) during the intended life of the probe assembly. See standard for details.
6.7	Info	<b>Constructional requirements for protection against electric shock</b>
6.7.4	Info	<b>PROBE WIRE attachment</b>
		<b>General</b>
		The attachment of the PROBE WIRE to the probe body and to the equipment (or to the CONNECTORS if the attachment is not fixed) shall withstand forces likely to be encountered in NORMAL USE without damage which could cause a HAZARD. Solder alone, without mechanical gripping, shall not be used for strain relief. The insulation of the PROBE WIRE shall be mechanically secured to avoid retraction.
		Conformity is checked by inspection and by applying the tests of 6.7.4.2 to 6.7.4.4. After the tests,
6.7.4.1		<del>a) the security of wiring connections subject to mechanical stresses shall not depend on soldering;</del> <del>b) screws securing removable covers shall be captive if their length determines a SPACING between ACCESSIBLE conductive parts and HAZARDOUS LIVE parts;</del> <del>c) accidental loosening or freeing of the wiring, screws, etc., shall not cause ACCESSIBLE parts to become HAZARDOUS LIVE.</del>
		<u>a) the insulation of the PROBE WIRE shall not have been cut or torn, and shall not have moved more than 2 mm in the bushing;</u> <u>b) SPACINGS shall not have been reduced below the applicable values of i6.5.2.2 or 6.5.2.3 and 6.5.2.4;</u> <u>c) the PROBE WIRE shall pass the applicable test of i6.5.2.5.1.1 b) or 6.5.2.6 b);</u> <u>d) no more than 75 % of the copper strands of the PROBE WIRE shall be broken.</u>



CLAUSE	VERDICT	COMMENT
12	Info	<b>Components</b>
12.3	Info	<b>PROBE WIRE</b>
		Six lengths of insulated PROBE WIRE or insulated conductors removed from a jacketed wire are to be tested for each specimen of wire to be evaluated. Each sample is 600 mm in length. Three of the samples are to be tested in an unaged condition. The other three samples are to be tested after air oven conditioning.
12.3.4		<p>The test voltage is applied between the conductor of the test specimen and the metal mandrel. The a.c. voltage test of 6.6.5.1, or for PROBE WIRES stressed only by d.c., the d.c. voltage test of 6.6.5.2, with a duration of at least 1 min using the applicable test voltage of Table 4 for REINFORCED INSULATION is then performed without humidity preconditioning. After 1 min at the specified test voltage, the test voltage is increased at a rate not exceeding 500 V/s until dielectric breakdown occurs. <u>The applicable test of 6.5.2.5.1.1 b) or 6.5.2.6 b) for REINFORCED INSULATION (without humidity preconditioning) is then performed. The test voltage is applied between the conductor of the test specimen and the metal mandrel. After 1 min at the specified test voltage, the test voltage is increased at a rate not exceeding 500 V/s until dielectric breakdown occurs. If dielectric breakdown does not occur, breakdown voltage can be considered as twice the value in 6.5.2.5.1.2 or 6.5.2.6 b) (or 10 kV).</u> The dielectric breakdown voltage values are recorded separately for unaged specimens and oven-aged specimens. The average of the dielectric breakdown voltage values is calculated and recorded separately for unaged specimens and oven-aged specimens.</p>