

COMMON SAFETY STANDARD REFERENCE CHART

Standard/ Harmonized Standard	Testing Type	Dielectric Withstand			Ground Bond/Continuity			
		Test Voltage	Max I.	Test Time	Test Current	V Limit	Max. R	Test Time
IEC/UL 60601-1 3rd Edition Medical Electrical Equipment	Performance	500 – 4000 VAC or 707 – 5656 VDC	No Breakdown	60 s	10-25 A	≤ 6 V	≤ 0.1 Ω	5 s
	Production*	1000 – 3000 VAC		1 or 60 s	10-25 A	≤ 6 V	≤ 0.1 Ω	5 s
IEC 61730-2 UL 1703 Photovoltaic Modules & Panels	Performance	1000 VAC + 2 x rated V or 2000 VAC + 4 x rated V	50 uA	60 s	2.5 x Max Over Current Protection	≤ 12 V	≤ 0.1 Ω	120 s
	Production	1000 VAC + 2 x rated V or (1000 VDC + 2 x rated V) X 120%	50 uA	1 or 60 s	Continuity			
IEC 60335-1 Household Electrical Appliances	Performance	500 – 2400 VAC x rated V + 2400 VAC	No Breakdown	60 s	≥ 10 A	≤ 12 V	0.1 – 0.2 Ω	≤ 120 s
	Production	400 – 2500 VAC	5-30 mA	1 s	≥ 10 A	≤ 12 V	0.1 – 0.2 Ω	No time specified
UL 60335-1 Household Electrical Appliances	Performance	500V – 2400 VAC x rated V + 2400 VAC	No Breakdown	60 s	40 A	≤ 6.5 V	≤ 0.5 Ω	120 s
	Production	400 – 2500 VAC	5-30 mA	1 s	40 A	≤ 12 V	0.1 – 0.2 Ω	No time specified
IEC 60598-1 Luminaires	Performance	500 – 4 x rated V + 2000 VAC	No Breakdown	60 s	≥ 10 A	≤ 12 V	≤ 0.5 Ω	60 s
	Production	Not Specified – Responsibility of Manufacturer						
UL 1598 Luminaires	Performance	1000 VAC – 1000 VAC x 2 x rated V	No Breakdown	60 s	30 A	≤ 4 V	≤ 0.1 Ω	120 s
	Production	1200 VAC		1 s	Continuity		≤ 0.1 Ω	Continuity
IEC/UL 61010-1 & CSA 22.2 No. 61010-1 Laboratory Control Test & Measurement Equipment	Performance	840 – 11940 VAC or 1200 – 7500 VDC	No Breakdown	5 – 60 s	25 or 30 A	≤ 10 V or ≤ 12 V	≤ 0.1 Ω or < 4 V 0.133 Ω	60 or 120 s
	Production			5 s max ramp up 2 s dwell	Continuity			
EN 60204-1 Electrical Equipment of Machines	Performance	2 x rated V or 1000 VAC	No Breakdown	1 s	0.2 – 10 A	≤ 24 V	Refer to Section 18.2.2	No time specified
	Production	Not Specified – Responsibility of Manufacturer						
UL 2202 Electric Vehicle Charging System Equipment	Performance	500 VAC or 1000 VAC + 2 x rated V	No Breakdown	60 s	≤ 60 A	≤ 12 V	Continuity	120 – 240 s
	Production	1000 – 1700 VAC + 3.4 x rated V		60 or 1 s	Continuity			
IEC 61851-1 Electric Vehicle Conductive Charging System	Performance	1200 VAC + rated V or DC Equivalent	No Breakdown	60 s	Continuity			
	Production	Not Specified – Responsibility of Manufacturer						
UL 45A Portable Electrical Appliances	Performance	1000 VAC + 2 x rated V or DC equivalent	No Breakdown	60 s	Continuity			
	Production	1000 – 3000 VAC		1 s	Continuity			
EN 60950-1 EN 50116 Information Technology Equipment	Performance	1000 – 3000 VAC or 1414 – 4242 VDC	No Breakdown	120 s	30 A	≤ 12 V	≤ 0.1 Ω	60 s
	Production			1 – 4 s	25 A	≤ 12 V	≤ 0.1 Ω	1-4 s
UL 60950-1 CSA 22.2 No. 60950-1 Information Technology Equipment	Performance	1000 – 3000 VAC or 1414 – 4242 VDC	No Breakdown	60 s	≤ 40 A	≤ 12 V	≤ 0.1 Ω	60 s
	Production			1 – 6 s	Continuity			

*As a result of performing risk analysis, many medical device manufacturers are performing leakage tests as part of 100% production line testing.

	Earth Leakage		Insulation Resistance			Suggested Model	Testing Type	Standard/ Harmonized Standard
	Test Voltage	Max I.	Test Time	V Limit	Min. R	AR Instrument		
	110% x rated V	5-10 mA		N/A		8206, 8207, 8256, 8257 or MedTEST	Performance	IEC/UL 60601-1 3rd Edition Medical Electrical Equipment
	110% x rated V	5-10 mA		N/A		7804 or 7854	Production*	
	Max rated V	10 uA – 1 mA	10 uA – 1 mA	500 VDC or Max rated V	40-400 MΩ	3240, 8206, 8207, 8256, 8257 or MedTEST	Performance	IEC 61730-2 UL 1703 Photovoltaic Modules & Panels
	N/A			N/A		3240, 3870 or 7850	Production	
	1.06 x rated V	0.25 – 5.0 uA		N/A		8256 or 8257	Performance	IEC 60335-1 Household Electrical Appliances
	N/A			N/A		7804	Production	
	1.06 x rated V	0.25 – 5.0 uA		N/A		8256 or 8257	Performance	UL 60335-1 Household Electrical Appliances
	N/A			N/A		7804	Production	
	Rated V	0.5 – 10 mA	60 s	500 VDC	1-4 MΩ	8206, 8207, 8256 or 8257	Performance	IEC 60598-1 Luminaires
	Not Specified – Responsibility of Manufacturer					Hypot® or 7850	Production	
	N/A		No time specified	500 VDC	≥ 2 MΩ	7804 or 7854	Performance	UL 1598 Luminaires
	N/A			N/A		Hypot® or 7850	Production	
	< 300 V	0.5 mA		N/A		8256, 8257 or MedTEST	Performance	IEC/UL 61010-1 & CSA 22.2 No. 61010-1 Laboratory Control Test & Measurement Equipment
	N/A			N/A		3865 or 7850	Production	
	N/A		No time specified	500 V	≥ 1 MΩ	7804 or 7854	Performance	EN 60204-1 Electrical Equipment of Machines
	Not Specified – Responsibility of Manufacturer					Hypot® or 7850	Production	
	Rated V	0.5 – 0.75 mA or 5 mA		N/A		8206, 8207, 8256, 8257 or MedTEST	Performance	UL 2202 Electric Vehicle Charging System Equipment
	N/A			N/A		Hypot® or 7850	Production	
	Touch Current Only		60 s	500 V	≥ 1 MΩ or ≥ 7 MΩ	8206, 8207, 8256, 8257 or MedTEST	Performance	IEC 61851-1 Electric Vehicle Conductive Charging System
	Not Specified – Responsibility of Manufacturer					Hypot® or 7850	Production	
	< 300 V	0.5 – 3.5 mA	60 s	500 V	≥ 50 KΩ	8206, 8207, 8256, 8257 or MedTEST	Performance	UL 45A Portable Electrical Appliances
	N/A			N/A		Hypot® or 7850	Production	
	< 300 V	0.25 – 3.5 mA	60 s	500 V	≥ 2 MΩ	8206, 8207, 8256, 8257 or MedTEST	Performance	EN 60950-1 EN 50116 Information Technology Equipment
	N/A			N/A		7804 or 7854	Production	
	< 300 V	0.25 – 3.5 mA	60 s	500 V	≥ 2 MΩ	8206, 8207, 8256, 8257 or MedTEST	Performance	UL 60950-1 CSA 22.2 No. 60950-1 Information Technology Equipment
	N/A			N/A		Hypot® or 7850	Production	