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SCO Test: Hipot and Ground Continuity – Oracle Directed Instrument Setting for Routine Electrical Safety Testing in Production

Document Number and Revision: 923-7024076 Rev 06

Overview

This document defines the mandatory parameters to be used for electrical safety testing of Oracle hardware products in production sites. Safety agencies provide guidelines that have sometimes resulted in inconsistent settings across supply chains delivering Oracle products.

Audience

This document is intended for Operations Product Engineers, Test Engineers, Supplier Engineers, their counterparts in manufacturing supply partners, and Compliance Engineering.

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Introduction

The Oracle Product Safety Engineering Team provides safety test (Hipot) parameters for all supply partners, rather than relying solely on agency guidelines. Agency guidelines do not specify certain trip current levels and rise times, which has led to occasional erroneous test failures.

This document determines a correct level of electric strength (Hipot) and earthing (grounding) for the manufacturing partners to use for both alternating current (AC) and direct current (DC) input styles.

Test equipment functionality must be verified at the beginning and end of each production shift.

In this document, "Power Shelf" refers to the DC-powered rack-level power distribution unit. Unlike traditional AC PDUs, Power Shelves provide DC power to shelf-level components and serve as part of the rack grounding path.

Production Line Electric Strength (Hipot) Test

The goal of the electric strength (Hipot) test is to assure personal safety while identifying defective insulation, typically in the primary side, and any potential shock hazard. Dielectric strength (Hipot) tests must be conducted between the primary pins of the attachment plug cap (AC-inlet) or DC input pins (for DC-input equipment) and accessible metal parts (chassis) of the product.

For Hipot testing on FRUs (Field Replaceable Units) or components without known ratings, consult the Oracle Product Safety Engineering department via the Oracle Operations Program Manager for test specifications and parameters.

Appliance Voltage Rating	*Test Potential (Vrms)*	*Test Potential (Vdc)*	*Time Durations/Dwell (Seconds)*	*Trip Current Level (mA)*
Rated less than or equal to 130Vrms (184Vdc)	1000	1400	(1-60) 1 minimum 60 maximum	< 5 10 maximum (Rack Level)
Rated more than 130Vrms (184Vdc) and less than or equal to 600Vrms (849Vdc)	1590	2250	(1-60) 1 minimum 60 maximum	< 5 10 maximum (Rack Level)

Production Line Earthing (Grounding) Test

A 25A test current device must be used to determine compliance with the Earthing Test requirements. Commercial earth testers that pass current through the earthing path may be used to verify compliance.

Earthing tests must be conducted between the earthing conductor of the attachment plug cap (AC-inlet) and/or the main protective earthing point (DC ground stud) of the product, using the test equipment described below.

For Shelf level components (Servers, Switches….)

Test Points	*Test Current (A)*	*Time Duration/Dwell (Seconds)*	*Conformance Limit (mOhm)*
AC-inlet → chassis	25	(1-5) 1 minimum 5 maximum	<100
DC ground stud → chassis	25	(1-5) 1 minimum 5 maximum	<100

For Rack Integrated system (L11)

Test Points	*Test Current (A)*	*Time Duration/Dwell (Seconds)*	*Conformance Limit (mOhm)*
Rack Protective Earth (PE) reference point → Rack Frame (Top/bottom/Front/Rear)	25	(1-5) 1 minimum 5 maximum	<100
Rack PE reference point → Representative Rack door/panel (e.g., 1 front, 1 side)	25	(1-5) 1 minimum 5 maximum	<100
Rack PE reference point → Busbar Assembly (Mounting brackets, enclosure) (if applicable)	25	(1-5) 1 minimum 5 maximum	<100
Rack PE reference point → Server Chassis	25	(1-5) 1 minimum 5 maximum	<100
Rack PE reference point → Power Shelf chassis (if applicable)	25	(1-5) 1 minimum 5 maximum	<100
Rack PE reference point → Liquid Cooling Manifolds (metallic & bonded only) (if applicable)	25	(1-5) 1 minimum 5 maximum	<100

Scope of the Document

These guidelines apply to all products and sites unless superseded by a stand-alone requirement approved by the Product Team and Oracle Product Safety Engineering. For any deviations from these guidelines, consult the Oracle Product Safety Engineering Manager via the Oracle Operations Program Manager.

Reference Information

Reference Documents and Records

Document Title [1]	*Number*	*ESO Controlled*	
		Yes	*No*
WWOPS Product Lifecycle and Technology: Supplier Requirements Advanced Quality Planning (AQP) Matrix	913-3592-xx	X	
Information Technology Equipment - Routine Electrical Safety Testing in Production, EN50116	N/A		X

Document History and Approvals

REV	DATE	DESCRIPTION OF CHANGE	ORIGINATOR
02	05 Sep 2014	Update from Sun to Oracle and removed Webdocs references and links.	N/A
03	24 Sep 2015	Allow tolerances for different factory test setups. Eliminate non-critical test parameters. Added verification of test equipment to Introduction. In the Production Line Electric Strength (Hipot) Test table - defined minimum and maximum amounts for Time/Durations/Dwell and Trip Current Level. Removed Rise Time and Ramp Down Time columns. In the Production Line Earthing (Grounding) Test – defined minimum and maximum for Time Duration/Dwell amounts. Added process for deviations to guidelines in Scope of the Document section.	N/A
04	11 Feb 2019	In the Production Line Electric Strength (Hipot) Test table – Added Trip Current Level for Rack Level configurations.	N/A
05	20 Dec 2024	Change both rows in the "Trip Current Level" column from "3 minimum/5 maximum" to " < 5mA "	N/A

		In the last row, change the values in the "Test Potential" columns from "1500" and "2121" to "1590" and "2250"	
06	12 Sept 2025	Updated test title. Updated wording on Overview, Audience, Introduction, Production line hipot test, Production line grounding test and scope of the document. Added test duration (1-5) production line earthing test Added new test points to Ground Continuity test to support rack level testing, added new table For Rack Integrated system (L11)	N/A

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