UL TEST REPORT AND PROCEDURE

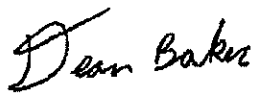
Standard:	UL 60950-1, 2nd Edition, 2007-03-27 (Information Technology Equipment - Safety - Part 1: General Requirements) CSA C22.2 No. 60950-1-07, 2nd Edition, 2007-03 (Information Technology Equipment - Safety - Part 1: General Requirements)
Certification Type:	Information Technology Equipment Including Electrical Business Equipment
CCN:	NWGQ, NWGQ7
Product:	IP Network Server
Model:	NSN2U, CG2100
Rating:	AC Units: 100-127/200-240Vac, 6/3 A, 50/60 Hz (Per each AC input) DC Units: -48Vdc to -60Vdc, 13 A (Per each DC input)
Applicant Name and Address:	KONTRON AMERICA INC 14118 STOWE DR POWAY CA 92064 UNITED STATES

This is to certify that representative samples of the products covered by this Test Report have been investigated in accordance with the above referenced Standards. The products have been found to comply with the requirements covering the category and the products are judged to be eligible for Follow-Up Service under the indicated Test Procedure. The manufacturer is authorized to use the UL Mark on such products which comply with this Test Report and any other applicable requirements of Underwriters Laboratories Inc. ('UL') in accordance with the Follow-Up Service Agreement. Only those products which properly bear the UL Mark are considered as being covered by UL's Follow-Up Service under the indicated Test Procedure.

The applicant is authorized to reproduce the referenced Test Report provided it is reproduced in its entirety.

Any information and documentation involving UL Mark services are provided on behalf of Underwriters Laboratories Inc. (UL) or any authorized licensee of UL.

Prepared by: Dean Baker
Underwriters Laboratories Inc.



Reviewed by: Lorinda Badalian
Underwriters Laboratories Inc.

Supporting Documentation

The following documents located at the beginning of this Procedure supplement the requirements of this Test Report:

A. Authorization - The Authorization page may include additional Factory Identification Code markings.

B. Generic Inspection Instructions -

i. Part AC details important information which may be applicable to products covered by this Procedure. Products described in this Test Report must comply with any applicable items listed unless otherwise stated in the body of this Test Report.

ii. Part AE details any requirements which may be applicable to all products covered by this Procedure. Products described in this Test Report must comply with any applicable items listed unless otherwise stated in the body of each Test Report.

iii. Part AF details the requirements for the UL Certification Mark which is not controlled by the technical standard used to investigate these products. Products are permitted to bear only the Certification Mark(s) corresponding to the countries for which it is certified, as indicated in each Test Report.

Product Description

The equipments under test are a IP Network Server for rack-mounting or desktop use (AC only). The equipment is provided with up to two PSUs (two DC supplies, two AC supplies or one DC supply and one AC supply), one DC/DC converter board (previously evaluated as backplane card in the PSU reports), one server motherboard, one server I/O board with network, USBs, fan connections, eight Hard Drives, one riser card with dual network card, I/O connectors.All circuits except power-supplies are SELV. Energy available in secondary circuits of power supplies, backplane card, and motherboard contains hazardous energy levels, all secondary outputs complies with LPS, no accessible energy hazards.The equipment can be provided in an AC configuration (AC unit), a DC configuration (DC unit) and in an AC/DC configuration (One AC PSU/One DC PSU). The only difference between these configurations is the PSU chassis and PSUs that are installed in the enclosure. The PSU chassis (AC, DC) are designed to accept two PSUs (a dual redundant configuration) either as AC/AC, DC/DC or AC/DC. When the equipment is provided with a single PSU a filler plate is provided for the second PSU slot. The PSU chassis and PSUs are both separately certified.

Model Differences

The Model CG2100 is the same as the Model NSN2U except the enclosure is smaller and there is no CD/DVD drive in the Model CG2100 (see critical components list).

Technical Considerations

- Equipment mobility : Stationary: Desktop (AC only) / Fixed (rack mounted)
- Connection to the mains : AC Units: pluggable A, DC units: via pluggable terminal block (provided as an element of the power supply)
- Operating condition : continuous
- Access location : AC Units: Operator Accessible; DC Units: Restricted Access Locations
- Over voltage category (OVC) : OVC II
- Mains supply tolerance (%) or absolute mains supply values : AC: +6%, -10%; DC: Client specified tolerance of -38 Vdc to -75 Vdc

- Tested for IT power systems : No
- IT testing, phase-phase voltage (V) : N/A
- Class of equipment : AC: Class I (earthed); DC: Special Application: TNV-2
- Considered current rating (A) : Refer to Ratings section at the beginning of this report.
- Pollution degree (PD) : 2
- IP protection class : IP X0
- Altitude of operation (m) : < 2000
- Altitude of test laboratory (m) : < 2000
- Mass of equipment (kg) : Model NSN2U: 22.6kg / Model CG2100: 17.4kg
- DC Mains input was evaluated as a TNV-2 source for applying insulation requirements only in accordance with US/CAN National Difference 1.6.1.2 (power supply provides Basic Insulation between input and output - evaluated under a separate investigation)
- The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer's specification of: 35°C
- The means of connection to the mains supply is: AC unit is Pluggable A or B DC unit is permanent connection AC/DC unit is either Pluggable A or B and permanently connected
- The product is intended for use on the following power systems: TN or DC mains supply
- The equipment disconnect device is considered to be: AC: Appliance inlet, DC: Provided as an element of the building installation (see Inspection Criteria for installation manual requirement)
- The following are available from the Applicant upon request: Installation (Safety) Instructions / Manual

Additional Information

All user accessible connectors that extend from the unit's enclosure are protected from current overload by PTC devices. The devices have been evaluated as a part of the UL Recognized or UL Listed Accessory boards.

The operator is only intended to replace pluggable type devices (peripheral drives) from the outside of the equipment, and is not intended to access the interior of the equipment for any operator servicing. All internal servicing is to be performed by technically qualified service personnel.

The DC supplied units are for Restricted Access Locations (RAL) only.

This test report was based on the CB Report by Nemko CB Certificate Numbers NO52484 and

NO52484/A1/M1, dated 2009-05-18 and 2010-01-29, submitted via the CB Scheme. The test results and clause verdicts of the above noted report were reviewed and found to comply with the applicable Standard UL60950-1, 2nd Edition (2007). As a result the clause verdicts and test results for the report were noted as N/A (except for few sub-clauses) and have been referred to the Nemko CB Report for details.	
Markings and instructions	
Clause Title	Marking or Instruction Details
1.7.9 Marking - Multiple Power Sources	AC units: "CAUTION: This unit has more than one power supply cord. To reduce the risk of electrical shock, disconnect (2) power supply cords before servicing." DC units: "CAUTION: This unit has more than one DC voltage input wire. To reduce the risk of electrical shock, remove all (4) four wires from the DC input terminal block before servicing." or equivalent.
1.7.14 Installation Manual - RAL	DC: The installation instructions indicate use in a Restricted Access Location only.
Installation Manual - DC Earthing	The installation manual shall specify a minimum 14 AWG earth conductor to be secured to earth terminals of DC Configuration in UL Listed two-hole crimp terminal sized for minimum AWG employed.
2.7.1 Installation Manual - Short Circuit/Overcurrent Protection - DC Mains	Installation instructions indicate UL Listed circuit breaker, rated minimum 10 A, 75 Vdc per feed to be provided as an element of the host rack equipment.
1.7.1 Power rating - Ratings	Ratings (voltage, frequency/dc, current)
1.7.1 Power rating - Company identification	Listee's or Recognized company's name, Trade Name, Trademark or File Number
1.7.1 Power rating - Model	Model Number
1.7 Safety Instructions - Rack Mount	"Rack Mount Instructions - The following or similar rack-mount instructions are included with the installation instructions: A) Elevated Operating Ambient - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment

	in an environment compatible with the maximum ambient temperature (Tma) specified by the manufacturer. B) Reduced Air Flow - Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised. C) Mechanical Loading - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading. D) Circuit Overloading - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern. E) Reliable Earthing - Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips)."
1.7.2 Disconnect device - Permanently connected equipment	Statement indicating that a readily accessible disconnect device shall be incorporated in the building installation wiring. (Instruction)
1.7.8.3 Symbols - Stand-by switch	"Stand-by" to be indicated by
1.7.13 Replaceable batteries	"CAUTION: Risk of Explosion if Battery is replaced by an Incorrect Type. Dispose of Used Batteries According to the Instructions."
Special Instructions to UL Representative N/A	

Production-Line Testing Requirements

Electric Strength Test Special Constructions - Refer to Generic Inspection Instructions, Part AC for further information.

Model	Component	Removable Parts	Test probe location	V rms	V dc	Test Time, s
N/A						

Earthing Continuity Test Exemptions - This test is not required for the following models:

Electric Strength Test Exemptions - This test is not required for the following models:

Electric Strength Test Component Exemptions - The following solid-state components may be disconnected from the remainder of the circuitry during the performance of this test:

Sample and Test Specifics for Follow-Up Tests at UL

Model	Component	Material	Test	Sample(s)	Test Specifics
N/A					

TABLE: List of Critical Components

Object/part No.	Manufacturer/ trademark	type/model	technical data	CCN	Marks of Conformity
Enclosure - for Model NSN2U only	--	--	Metal, minimum 1.5 mm thick. Overall dimensions 43.2 cm by 60.9 cm by 8.9 cm.	--	--
Enclosure - for Model CG2100 only	--	--	Metal, minimum 1.5 mm thick. Overall dimensions 43.2 cm by 53.0 cm by 8.9 cm.	--	--
Filler Panels	Various	Metal	Provided for empty slots.	--	--
Mini Front Bezel, CPU Fan Duct, PCI Fan Holder, PCI Card Support Bracket	SABIC Innovative Plastics	C2800	Minimum V-0, 1.5 mm thick	QMFZ2	UL
Internal Plastics	Various	Various	Minimum V-2 at minimum thickness.	QMFZ2	UL
Power Supply Unit (AC)	Delta	DPS-600TB XX	Up to two provided. (Input: 100-127/200-240 Vac, 8.9/4.5 A, 50-60 Hz; Output: +12Vdc, 49 A; -12Vdc, 0.5A; +5Vsb, 3.0 A. Output power 600W max.)	QQGQ2	UL
Power Supply Unit (DC)	Delta	DPS-600TB-1 XX	Up to two provided. (Input: -48 to -60 Vdc, 20.5 A; Output: +12Vdc, 49 A; -12Vdc, 0.5A; +5Vsb, 2.5 A. Output power 600 W max.)	QQGQ2	UL
Power Supply Unit Backplane Card	Delta	AC-077 XX	(Input: +12V, 49A; -12V, 0.5A; +5Vsb, 2.5A. Output: +3.3V, 20A; +5V, 26A; -12V, 0.5A; +5Vsb, 2.5A, +12V1, 16A; +12V2, 16A; +12V3, 16A; +12V4, 18A. Max. output power of 3.3V and 5V should not exceed 150W. Total output power should not exceed 580W max.)	Tested with power supply units noted above.	--
Server I/O board	Intel	"D" series	SELV (Lithium battery protection and I/O current limiting provided per UL R/C)	NWGQ2	UL
Server I/O board - Alternate	Intel	Various	SELV (Provided with the following CofA: Lithium battery protection and I/O current limiting provided per UL R/C)	NWGQ2	UL
Server Mainboard	Intel	"S" series	SELV (Lithium battery protection and I/O current limiting provided per UL R/C)	NWGQ2	UL

Object/part No.	Manufacturer/ trademark	type/model	technical data	CCN	Marks of Conformity
Server Mainboard - Alternate	Intel	Various	SELV (Provided with the following CofA: Lithium battery protection and I/O current limiting provided per UL R/C)	NWGQ2	UL
I/O Fans (2 provided)	Nidec	V60E12BS1B5-07A01	12 Vdc, 1.6 A (62 CFM)	GPWV2	UL
I/O Fans (2 provided) - Alternate	Various	Various	12 Vdc, 1.6 A, minimum 62 CFM, minimum V-2.	GPWV2	UL
CPU Fans (2 provided)	Nidec	V80E12BS2A5-07A01	12 Vdc, 1.95 A (109 CFM)	GPWV2	UL
CPU Fans (2 provided) - Alternate	Various	Various	12 Vdc, 1.95 A, minimum 109 CFM, minimum V-2.	GPWV2	UL
PCI Riser Card	Various	Various	Rated minimum V-1, 105°C	ZPMV2	UL
Hard Drive (Up to 8 provided)	Various	Various	SELV. Rated 5 V, 1.0 A; 12 V, 1.2 A	NWGQ2	UL
CD/DVD Drive - for Model NSN2U only	Various	Various	SELV. Rated 5V or 12V. Class I source.	NWGQ2	UL
Printed Wiring Board	Various	Various	Rated minimum V-1, 105°C	ZPMV2	UL
Connectors (SELV)	Various	Various	R/C or copper alloy pins housed in bodies of R/C (QMFZ2), V-2 minimum.	RTRT2 or ECBT2	UL
Label	Various	Various	Suitable for use on surface applied.	PGDQ2 or PGJI2	UL
Battery Pack (Optional)	LSI Corporation	25127	Supplied by SELV	NWGQ - Accessory	UL

Enclosures

Type	Supplement Id	Description
Photographs	3-01	External - Top/Front/Right View
Photographs	3-02	External - Front Panel
Photographs	3-03	External - Rear View
Photographs	3-04	Internal View
Photographs	3-05	Internal View With Cover Removed
Diagrams		
Schematics + PWB		
Manuals		
Miscellaneous	7-01	Label Artwork