

Communication Service Equipment



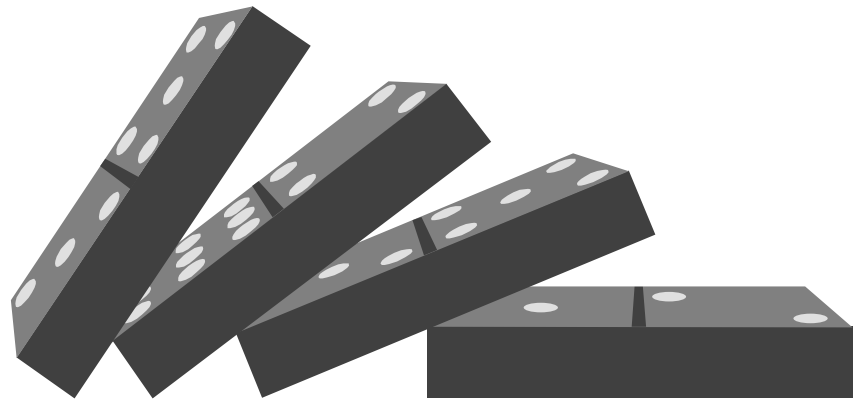
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Multimedia Systems

- Power source
- Cable feed
- Leakage protection
- Overvoltage protection
- NID operation



Category Control Number



- The UL Category Control Number (CCN) is **DUZO**
 - Subject 1697
 - Max. Operating Volts = 100Vrms
 - Power limits as defined in table 830-4
 - Provides listing for NID, NIU or SIU

Testing and Evaluation Objectives



- Wiring entering a premises
- Abnormal Voltage Protection to Premises
- Verify adequate protection from environment
- Ease of installation and equipment use
- Insure adequate installation information

Entering a premises (Wire)

- Input Limits - Table 830-4
- Is the system designed for disconnect
- Twisted pair operates within TNV limits
- Coax output at or below SELV limits



Abnormal Voltage Protection

- Voltage transients due to lightning
- Voltage transients due to induced AC
- Sustained power faults



Protection from Environment



- Indoor Vs Outdoor use
- Corrosion Protection
- UV and Water Exposure
- Grommet & Gasket Conditionings
- Mechanical Abuse

Ease of Installation and Use



- The system shall be installed in accordance with the NEC
- Identified for Outdoor and/or Indoor use
- Mounting Instructions required
- Wiring Instructions required

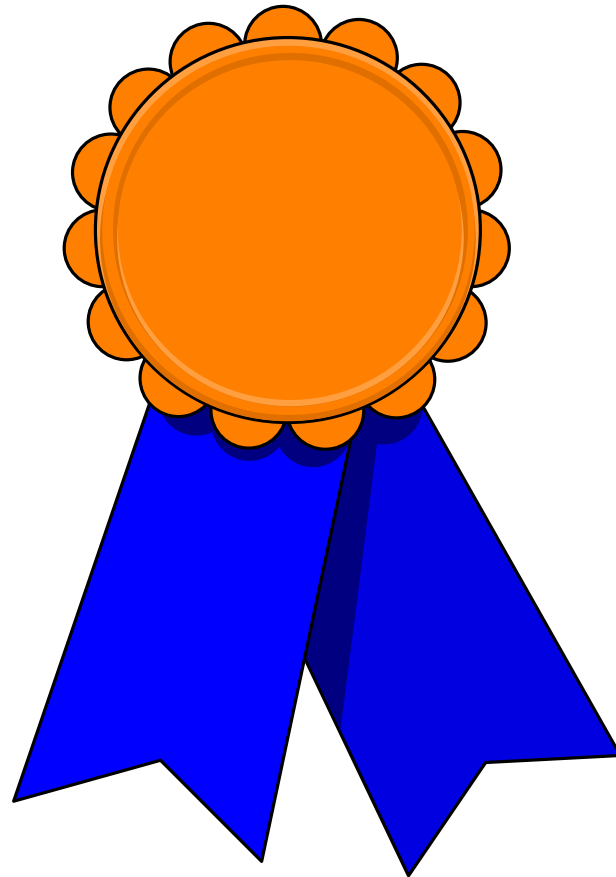
Adequate Information



- User informed of hazardous voltage on incoming Coax line to box
- Installer or Service personnel protected against unexpected Hazards
- Information conveyed by Markings on the unit and noted in the Installation Practice.
- Information entered into the UL report

Pass/Fail Criteria

- There shall be no degradation in safety systems when the unit remains operational.
- Protection against immediate risk of fire or shock.
- Casualty hazard?



UL Standards Used



- UL50; Cabinets and Boxes
- UL467; Grounding and Bonding Equipment
- UL497; Telephone Protectors
 - UL497A, B and/or C
- UL1419; Professional Video and Audio Equip.
- UL1950; Information Technology
- UL1459; Telephone Equipment ?

Non UL Standards used



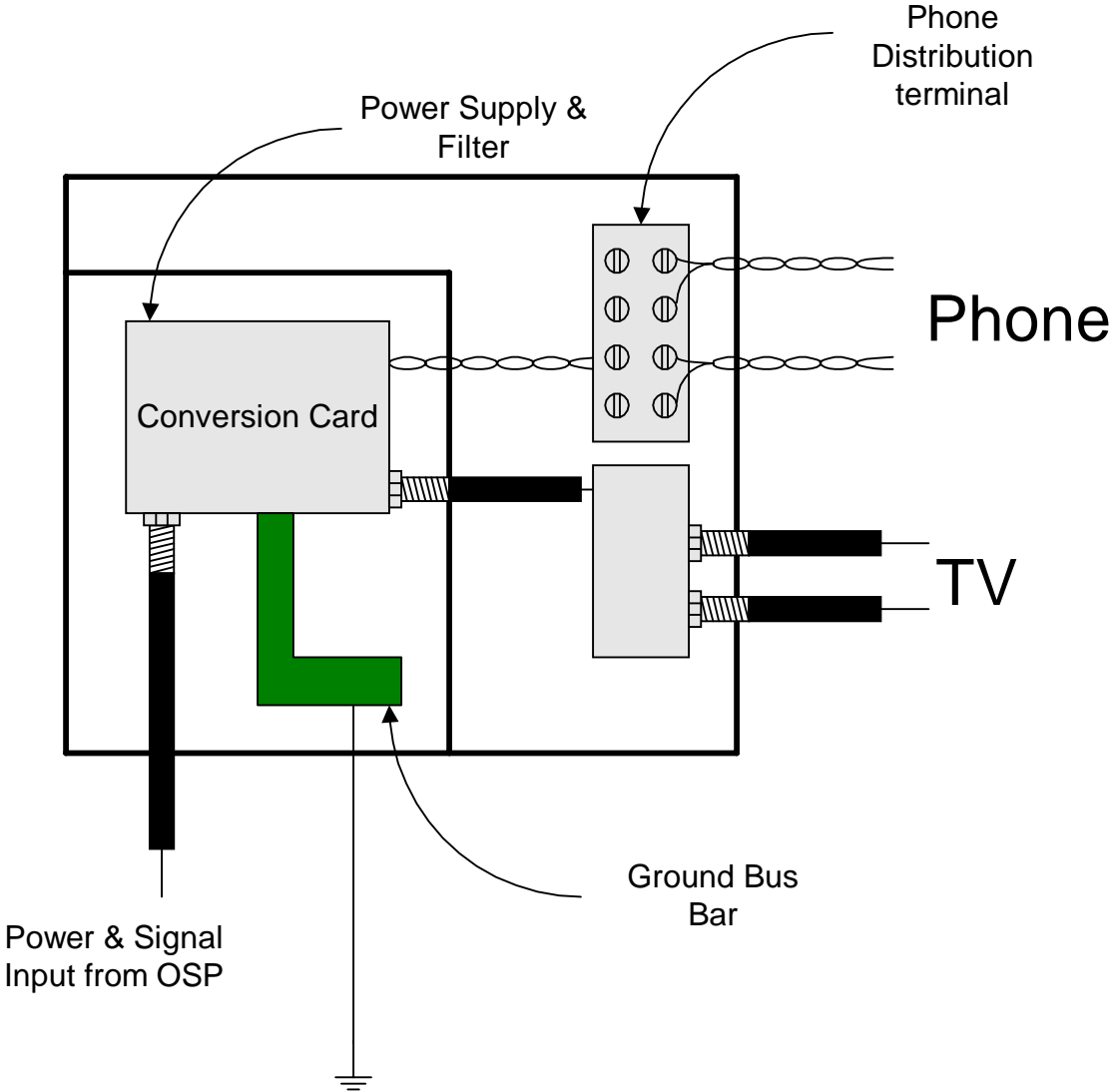
- National Electrical Code, NFPA70
 - **Article 800**
 - **Article 820**
 - **Article 830**
- National Electrical Safety Code, ANSI C2
- Telcordia's GR-63 (Bellcore)
- Telcordia's GR-1089 (Bellcore)

UL Foreword - Paragraph D



- A product employing materials or having forms of construction different from those in the requirements of this standard may be examined and tested according to the intent of the requirement and, if found to be substantially equivalent, may be judged to comply with the standard.

DUZO Box



UV & Water Exposure



- Five Samples are to be exposed
- No visible signs of:
 - Cracking
 - Warping
 - Tensile Strength
- 720 Hour exposure
 - 612 hours UV light only
 - 108 hours UV light & water
 - 60C ambient

Corrosion Conditioning



■ Indoor Corrosion

■ H₂S, 0.1%

■ CO₂-SO₂, 1.0 & 0.5%

■ Outdoor Corrosion

■ H₂S, 1.0%

■ CO₂-SO₂, 1.0 & 1.0%

■ NaCl, 5%

Bonding & Grounding Requirements



- Enclosures
- Metal parts
- Coax cable
- Secondary circuits
- Twisted Pair circuits

Enclosure Test



- Distortion test
- Flame test
- UV and Water test
- Low Temperature test
- Impact test

Cable Strain Relief



- Low Power Cables - 10Kg for 1 Min.
- Medium Power Cables - 10 Kg for 1 Min.
- Safety Strap - 300 lb.. weight dropped 4 feet

Gaskets (Environmental Considerations)



- Ability to Seal (Unseal)
- Maintains its properties over expected life
- Shall not degrade after Ozone exposure
- Shall not degrade after UV and Water exposure
- Ability of an adhesive to secure a gasket

Twisted Pair Terminations



- **CCITT Surge, 10x700 @ 5Kv**
 - **1000 volts if Primary Protector is not provided**
 - **Max voltage of specified Protector other than carbon**
 - **Isc = Test Voltage / 15**
- **Connected to Service Drop <= 500 feet**
 - **Surge = 10x700 @ 1.5Kv**
 - **Max voltage of specified Protector**
 - **Isc = Test voltage / 40**

Coaxial Cable Connections



- Four discharges from a 0.01 mfd. Capacitor, 10Kv
- CCITT Surge, 10x700 @ 5Kv
 - 10 repetitions
 - Specified protector may be employed
 - 333A short Ckt between center conductor & shield
 - 50A surge between input & output

Power Cross



- Power Cross Test - 25A @ 120 & 277 V - 15Min.
- Power Cross Test - 60 A @ 600V - 5 seconds
- Long Term Fault Induction
 - **100 to 600 Volts**
 - **0 to 2.2 Amps**
 - **30 minutes minimum**

Electrical Separation



- Hazardous Secondary and Coax entering premises
- Grounded hazardous secondary & grounded SELV
- Hazardous Secondary & Ungrounded SELV or ungrounded parts
- Hazardous Secondary and grounded dead metal parts