

Lerdn Lightning Protection

◆ Quality policy, environmental guideline

LERDN carried out operation strictly in accordance with the ISO9001 and ISO14001 management system, and be strict self-discipline in the full process of development, manufacturing and after service, LERDN consciously reduce and constantly improve the activity regarding environment pollution and security threat, so as to seek harmonious intergrowth with environment.

◆ Design basis

According to GB 50343-2004 <<Technical code for lightning protection of building electronic information sytem>> chapter 5: design for lightning protection;GB 50057-94(2000 edition) <<Code for design of lightning protection of building>>chapter 6: Prevention of Lightning Electromagnetic Pulse;section 4,from item 6.4.1 to item 6.4.12,Requirement for spd in LPZ1.and YD/T 5098-2001 <<code for design of lightning overtage protection engineering of communication bureau (station)>> section 5: selection of SPD;item 5.3: SPD for signal line;item 5.5: requirment of SPD for network data line of computer,control terminal,monitoring system, reference to IEC 61643-3 <<SPD for low voltage power system>> section 3 <<application of SPD in telecommunication>> and IEC 61644-1 1997 <<SPD for communication>> standard requirement, for the protection of communication line, we use signal SPD of 8/20 μ s waveform and current capacity 3KA at the incoming cable of device to limit inductive overvoltage of several KV to the equipment allowed value.

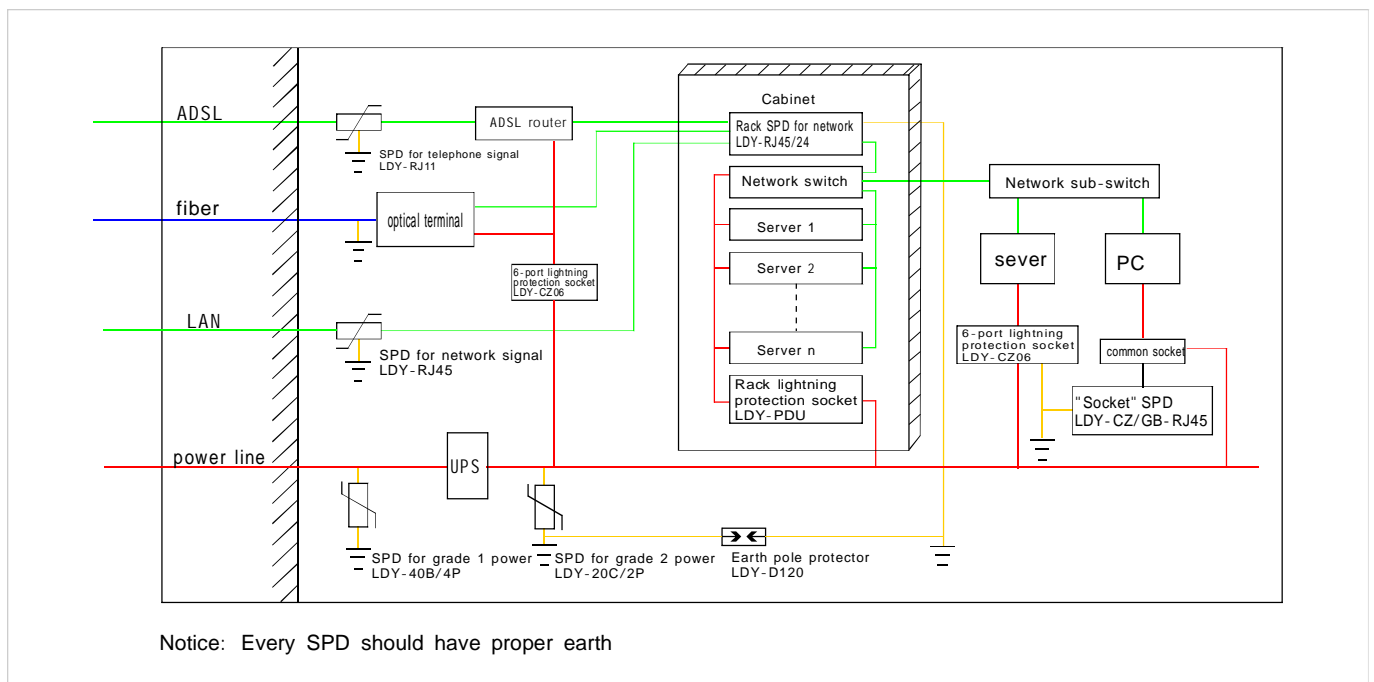
According to GB 50057-94 (2000 edition) <<Code for design of lightning protection of building>> chapter 6:Prevention of Lightning Electromagnetic Pulse, section 3,the requirement for shielding, grounding and equipotential bonding the requirement of item 6.3.4: all the external conductive matter into the building should be equipotential bonding at the interface between LPZOA or LPZOB and LPZ1,the equipotential bonding grid should be established among various mental components of information system,such as boxes, shells,frames,etc. which should connect to the common earthing system of the building.

According to chapter 14: grounding and security: GJ/T16-92 <<Civil Architectural Electrical Design Code>> chapter 14: earthing and security,requirement of item 14.7.5.3 When the computer room and earthing system share the earthing, the earthing resistance should be less than 1 Ω . So the earthing of monitoring room and communication room should share the same earthing device with the lightning protection ground of building, the earthing resistance should be less than 1 Ω

◆ System introduction

There are all high integrated electronic equipment inside the computer room,such as server,UPS, switch, sophisticated electronics,etc. there are a mass of integrated circuit module inside the advanced equipment,which are very sensitive to the inductive lightning current and pulsed electromagnetic field arising from lightning strike, as the characteristics of low working voltage and little working current,they have fatal weaknesses of poor abilities of immunity,overvoltage resistance and overcurrent resistance.American research report point out that when the magnetic induction reach 0.07GS,the misoperation of computer occurs, when the magnetic induction reach 2.4GS,the computer will be permanently damaged. So, it is very importance to do the full synthesis lightning protection.

Schematic diagram of lightning protection solution for network computer room



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◆ lightning protection for computer network system

1. lightning protection for WAN

Generally speaking, the WAN network are out of damage of direct lightning, if 1mm² copper line is attacked by the lightning of 10KA, they are fused automatically. So, the WAN network is mainly threatened by the inductive lightning hazard. ADSL router line are introduced from telephone line of telecommunication office, under this situation, they can easily generate the strong inductive lightning current, which can damage the ADSL router, seriously speaking the lightning current invade into the indoor, and damage important equipment, such as server and switch, etc, more serious speaking, they may cause the fire in the computer room. So, we must add telephone signal SPD, LDY-RJ11 at the front of ADSL router to protect the ADSL signal line.

2. lightning protection for LAN

LAN is inside the computer room, so we should do the lightning protection for power system and signal system. The 2-steps measures of lightning protection should be carried out for the power system of LAN. If we don't consider whether the front-end have the measures of lightning protection, install one set of grade 1 power SPD, LDY-40B/4P or lightning protection box, LDY-40/Y5C, at the main incoming line, install one set of grade 2 power SPD, LDY-20C/4P (three phase) or LDY-20C/2P (single phase) at the incoming line of UPS, install lightning protection socket, LDY-CZ06 or "socket" SPD, LDY-CZ/GB

The emphases of lightning protection of the LAN signal system is the shield of the network line, meanwhile, enhance the lightning protection of the LAN port of terminal equipment. Usually, the LAN transmits the data by the twisted pair, which is without shielding protection and the routing is not quite standard, except for the inductive lightning strike, the network system is also exposed to the interference of AC circuit. Install the lightning arrester on both sides of LAN, which is efficiently to prevent the device from damage of lightning current and various overvoltage. The net mouth of LAN should introduce the measures of lightning protection. Computer network lightning arrester, LDY-RJ45 or LDY-RJ45/24 (24 port), should be added to the port of personal computer, server, network switch, hub, etc. Telephone signal lightning arrester, LDY-RJ11 should be added to the port of telephone, telephone switch, etc.

3. Generic cabling

From the aspect of lightning protection, the routing must be definitely stated.

1. Don't install the power line and the network line in the same channel, keep the the data socket and the power socket in certain distance.
2. Don't install the WAN cable and LAN cable in the same channel.
3. Keep the network line from the wall as long as possible when the disposition of network line along the wall.
4. Shielding slot have requirement of certain thickness and need 2-point grounding.

4. Earthing of computer room and equipotential bonding

The computer room discharge the lightning current through the steel bar of the building. Due to the skin effect of lightning discharge, the discharge current of the outer steel bar of building is several times more than that of the inner steel bar of building. The computer room usually cross regions of outer and inner steel bar, so the great voltage difference exist between the different steel bar column when the lightning current discharge, which is much harmful to the precision and valuable device, so the ring conductor must be fitted to balance the voltage between different steel bars. Besides, the metal shell and cabinet of the devices, such as server, switch, etc. in the computer room is induced high voltage, which should be equipotential earthing. the earthing of computer room should share the same earthing system with signal earthing, DC earthing, working earthing, etc, the earthing resistance should be less than 1Ω

◆ Implementation method

★ Install one set of power grade 1 lightning protection module, LDY-40B/4P or lightning protection box, LDY-40B/Y5C at the incoming line of power distribution cabinet in the computer room, install one set of power grade 2 lightning protection module, LDY-20C/4P (three phase) or LDY-20C/2P (single phase) at the incoming line of UPS, and install one lightning protection socket LDY-CZ06 at the terminal devices, such as network switch, telephone switch, hub, etc. which is used to provide protection against lightning for the power supply system in the computer room.

★ Install one set of telephone signal SPD, LDY-RJ11 at the incoming line of ADSL router to protect ADSL router.

★ Install one set of network signal SPD, LDY-RJ45 at the incoming line of LAN to protect the LAN circuit. Install one set

of rack network signal SPD, LDY-RJ45/24 before the LAN circuit into the network switch to protect the network switch

★ Install one set of "socket" SPD, LDY-CZ/GB-RJ45 at the terminal device of server, person computer, etc to protect the terminal device ("socket" SPD owning lightning protection of power grade 3 and synthesis lightning protection of signal system)

★ The fibre used in the transmission between the networks don't need to be protected, but the metal stiffener of the fibre should be earthing.

★ Equipotential bonding: Usually, lay a ring of the nonclosed equipotential copper strip along the wall in the computer room, adopt the 30×3mm band copper as materials, braced by the φ8 insulator; install a piece of equipotential omnibus bar at the angular position near to the pillar in each computer room respectively, specification is 30×30mm band copper plate, 30cm length, excavate the main steel bar pillar of the building in each computer room, the copper iron connector connection with omnibus bar after welding with column bar, slot joint of all signal shielding line in each computer room and then joint with equipotential omnibus bar or equipotential band copper. Otherwise, connection of conductive metal object, such as power PE line, device shell of computer room, rack, etc and nearby omnibus bar or band copper, the connection line use 25mm² Copper conductive wire. The lightning protection earthing share the same earthing system with signal earthing, DC earthing and working earthing, etc. The earthing resistance should be less than 1Ω, If the lightning protection earthing can't share the same earthing grid with other earthing system, and they can't keep a certain distance from other earthing system, a earth pole protector, LDY-D120, should be fitted between the lightning protection earthing and other earthing.