

A- GENERAL MATTERS

The building and/or facility must have a grounding system in accordance with the rules. Therefore, there is space at the base and around each building/facility.

area "main grounding conductor" and "protective conductor" and all other "outer conductor parts" (steel-framed structure, central heating and air conditioning systems, water and

Pipes of natural gas systems, base metal irons of structural reinforced concrete, functional grounding for devices, communication-external lightning-extreme

voltage protection systems and rail systems and the grounding of the antenna installation) must be connected to the main equipotential system (banding).

(TS HD 384.4.41 S2 page 7 / TS IEC 61024-1-1 and 2 page 10 / Grounding Regulation in Electrical Installations page: 37)

In order for the surge protection devices to work properly, they must be in accordance with the applicable regulations (DIN 57 800 Part 1/VDE 0800 Part 1/IEC).

62305) the existence of an established earthing potential equalization and the fact that the protected and unprotected lines are laid separately from each other.

they must be.

a. Protection systems will be arranged to protect three phases and a neutral-earth line.

b. Three-stage protection systems; It will be applied as B, C and D classes.

c. The systems to be applied will be against Lightning + Network peaks.

d. Connection of 1st stage (class B) protection products with NH fused switch-disconnector on ADP (main distribution panel) busbars after TRANSFORMER will be done. 2nd level (C class) protection products will be installed at the main switch output in secondary or sub distribution boards, 3rd level (D class) protection products will be used on the device supply sockets (as protection over the socket) or after the receiver fuse groups.

e. If there is no room in the LV panel for Class B products, the products can be mounted on a separate PVC or metal panel, and the distribution in the station with these panels. The connection between the units will be made by means of cables of appropriate cross-section and length.

f. Class B products, varistor, etc. "maintenance free" (maintenance free) designed with "Spark-Gap" technology, not containing discharge elements

feature and will have multicarbon/teflon technology; They will certainly be in a structure that will not emit gas, arc and flame during discharge.

g. There will be 2 separate connection terminals at the inputs and outputs of class B products, to provide protection against touching on the connection terminals.

will be insulated with PVC plugs. In addition, the places where the Phase-Neutral and Earth lines will be connected will be specified at the entrances of the products.

h. Protection products; Before and after the discharge, a voltage value above the protection values they have is applied to the following circuits.

will not pass.

i. Protection products will provide protection against sudden surges, not against continuous overvoltages.

j. The outputs of the protection products are connected to the ground potential in the shortest way with the yellow-green grounding cable in the section specified in the user manuals of the products.

shall be securely connected to the equalization busbar.

k. The ground cable to be connected shall be kept as far as possible from shielded supply or signal cables passing through the shielding products.

l. Protection products will be connected in parallel to the supply circuit as Three Phase+Neutral/One Phase+Neutral.

m. The sockets of the protection products will have 230/400 VAC continuous maximum operating voltages to be applied, They will have replaceable sockets with status indicators that show that they are working and that change from green to red in case of failure. Class D products (group socket structure) should be the type with LED light that changes from green to red at the time of failure. In panel type D class products, on the other hand, it burns when intact and goes out in case of failure. There will be green LEDs.

- n. Protection products will be based on the IEC 61643-1 standard and will comply with the E DIN VDE 0675 norm.
- o. Protection products will be in IP 20 protection class according to IEC 60 529/EN 60 529.
- p. Protection products will be rail mountable according to DIN EN 50 022.
- q. D-class protection products in the form of group sockets (3 or 5) will also be provided and installed for the devices/systems in the control monitoring center.
- r. Installation of protection products will be done in accordance with the manufacturer's catalog/brochure/assembly instructions. With the supply of all protection products assembly and connection works will be done by the "contractor company".

B- PRODUCTS TO BE USED

1. First Stage (Class B/Type 1/Class 1) Lightning Protection Surge Arresters (Facility/Building Front Protection Units)

- a. UC value; For LN/L-PE, 255 V AC, response time will be <100 ns between LN, <100 ns between N-PE.
- b. It will be able to discharge a minimum load of 50 kA/Phase between Phase-Neutral and a minimum load of 125 kA between Neutral-Ground in a 10/350 µsec curve.
- c. The protection level will be < 1.3 or 2 kV.
- d. It will work with Spark-Gap multicarbon + carbon technology.
- e. In order to ensure the continuity of the operation, it is protected from the aging of its internal insulation under normal operating conditions or during discharges. In order to prevent phase-neutral short-circuit faults that may occur because of the condition that they must be connected to the front (Transformer AG panel) as "pre-fuse" will be fulfilled according to the manufacturer's specifications.

2. Second Stage (Class C/Type 1/Class 1) Surge Surge Protection Surge Arresters (Building/Sub/Sub Protection Units)

- a. UC value; 280 VAC for LN/L-PE, Response time < 25 ns between LN, < 25 ns between N-PE.
- b. per phase; It will be able to discharge minimum 20 kA/Phase, maximum 40 kA load in 8/20 µs curve.
- c. The protection level will be < 1.3 kV.
- d. The power will be in varistor structure.
- e. There will be color changing indicators on each socket at the contact output and at the end of life.

3. Third Stage (D class/Type 3/Class 3) Surge Surge Protection Surge Arresters (Device Protection Units)

(Plasma, monitors, recorders, etc. systems and will be mounted on surge arrester panels in the field)

- a. The products will be in different combinations of 3 Phase+Neutral/1 Phase+Neutral.
- b. Response time will be < 25 ns between LN and < 100 ns between N-PE.
- c. It will be able to discharge minimum 2.5 kA/Phase, maximum 7 kA load in 8/20 µs curve.
- d. The protection level will be < 1.1 kV.
- e. The power will be in the form of a varistor, suppressor diode or gas arrester or a combination of these.
- f. At the end of its life, there will be indicators that change color on each socket. Which changing indicator should be.

4. Video Signal Protection

- a. Video line protection devices for camera systems, combined with the camera and in the monitoring center, depending on the product type and place of use. or as a sensitive protection device.
- b. Combined protection devices in accordance with IEC 616343-21, lightning and overvoltage discharge in category D1 + C2 + C3 will consist of devices. They will provide lightning protection equipotential bonding between PE/shielding and data lines. On the other hand, excessive will reduce voltages to a level of protection that does not pose a hazard.
- c. Sensitive protection devices shall consist of surge arresters in category C2 + C3. Protection devices, direct data They should be in a structure that can be used by connecting between the lines and can be seamlessly integrated into existing communication systems.
- d. Video signal line protection device specifications for coaxial video systems:
 - It will be in an aluminum case.
 - It will have a BNC connector.
 - It will be easy to install thanks to the intermediate socket.
 - There will be two-stage protection circuit.
 - It will be suitable for the protection of video signals and can be used in camera or TV facilities.

e. Technical specifications of outdoor camera guards:

- U max AC Uc AC V 4.2
- U max DC Uc DC V 6.2
- LPZ 0→3
- Impulse current (10/350) Iimp kA 2,5
- Rated discharge current (8/20) In kA 15
- Transmission frequency f < 113 MHz
- Additional loss a/dB dB 0.2 at 10 MHz
- Series resistor R Ohm 4.7
- In C2 protection level (symmetrical) ≤ 12 V
- Protection level (asymmetric) at —In C2 ≤ 500 V
- 1 kV/μs at C3 protection level (asymmetric) ≤ 8 V
- Protection class IP 40
- Plug-in system coax socket

f. Monitoring center video signal guards specifications:

- U max AC Uc AC V 4.2
- U max DC Uc DC V 6.2
- LPZ 1→3
- Rated discharge current (8/20) In kA 10 / 0.5
- Transmission frequency f < 200 MHz
- Additional loss a/dB dB 0.2 at 10 MHz
- In C2 protection level (symmetrical) ≤ 12 V
- Protection level (asymmetric) at —In C2 ≤ 500 V
- 1 kV/μs at C3 protection level (asymmetric) ≤ 8 V
- Protection class IP 40
- Plug-in system coax socket

5. Camera Feed, Fiberoptic Converter Feed Line Guards

The AC/DC protection product, which will be connected to the feed line of the camera and fiberoptic translations, will protect the end devices against overvoltage surges. It will be installed as a Class D (Type 3) Surge Stopper/Sensitive Protection in accordance with DIN EN 61643-11. Gas surge arresters and

There will be an integrated protection circuit consisting of varistors. A function with LED light that can be kept under constant control by a thermal switch. It will have an indicator, it will show the fault status when the protection circuit is disabled. This protection product should be placed near the device to be protected. It can be mounted on the U profile rail. It will be suitable for use in direct and alternating current systems. (Features given below are It can be changed in accordance with the device in line with the customer's approval.)

The technical specifications of the camera and fiberoptic converter feed line protections will be as follows:

- U max AC Uc V 13.5
 - U max DC Uc V 18
 - Demand class Type 3 in accordance with EN 61643-11
 - Demand class Class III according to IEC 61643-1
 - LPZ 2→3
 - Rated discharge current (8/20) In kA 0.7
 - Maximum discharge current I_{max} kA 2
 - Rated load current IL A 20
 - Activation time t_A ns < 25
 - Temperature range: -40 to +80 °C
 - Protection level core/vessel V < 110
 - Protection level core/earth V < 1200
 - Width: 17.5 mm
 - Connection cross section, fixed mm² 0.14 - 2.5
 - Connection cross section, stranded mm² 0.14 - 2.5
 - Connection cross section, flexible mm² 0.14 - 2.5
- Plug-in system coax package

6. Motion Camera Data Line Guards

Against capacitive and inductive overlaps that will occur on the data cable where the signals of the controlled motion cameras are carried to the monitoring center,

The protection products that will be used both in the monitoring center and in the camera data entries will have the following features:

- Will be able to perform basic, medium and sensitive protection.
- It will have a "two-stage" protection circuit with a high lightning current discharge capacity.
- It will work in accordance with the high transmission frequency of maximum 100 MHz.
- It will support all Bus systems for general purpose.
- It will be suitable for bus connection with easy-to-assemble, screwless connection terminals.
- Space-saving width of 17.5 mm.
- Application: On 35 mm U profile rail in every standard type distributor box
- Rated voltage UN V: 5
- U max AC Uc AC V: 4.2
- U max DC Uc DC V: 6
- LPZ 0→3
- Transmission frequency f 0-100 MHz
- Impulse current (10/350) Iimp kA : 6
- Rated discharge current (8/20) In kA: 20
- Rated load current IL A: 0.45
- Protection level vessel/vessel V < 18
- Protection level core/earth V < 500
- Series resistor R Ohm 2.2
- Activation time tA ns < 1
- Temperature range: -40 to +80 °C
- Protection class IP 20
- Horizontal spacing TE (17.5 mm) 1
- Connection cross section, fixed mm² 0.14 - 2.5
- Connection cross section, stranded mm² 0.14 - 2.5
- Connection cross section, flexible mm² 0.14 - 2.

7. B+C Class Protection Set

It will be formed by the combination of Spark-Gap technology and varistor technology. 50 kA per phase, 100-125 kA between Neutral/Ground, 100 in total

The set providing kA protection will be mounted on the main sub-panels inside the building, which will be used for the electricity supply of the uninterruptible power supply.

The product shall have the following features:

- There will be B+C Class (Type 1+2) and 3+NPE (3 phase, neutral-earth) connections. (This set will be considered as 1 piece)
- Highest continuous voltage UC : 255-275 V AC
- Demand class according to EN 61643-11: Type 1+2
- Demand class according to IEC 61643-1: Class I+II
- LPZ: 0→2
- Impulse current: (10/350) Iimp 100 kA
- Protection level: Up ≤ 1.3 kV
- Activation time: tA ≤ 25 ns
- Secondary current extinguishing capacity: Ipeak Ifi peak 25 kA
- Secondary current extinguishing capacity: Ieff Ifi eff 12,5 kA
- Short circuit endurance Ipeak: 25 kA
- Maximum front fuse: 125 A
- Temperature range: -40 to +85 °C
- Connection cross section, fixed: 10 - 50 mm²
- Connection cross section, stranded: 10 or 16 - 35 mm²
- Connection cross section, flexible: 10 - 25 mm²

8. B+C Class Protection with Power Varistor Connected Between Three Phases+Neutral/Ground (Combined Lightning and Overcurrent Discharge Device)

Switched automatic equipment located in the distribution boards of the uninterruptible power supplies feeding the camera system and not having the appropriate amperage.fuses and residual current relays will be replaced with ones of suitable amperage, B+C type protection to the supply input before the uninterruptible power supply products will be installed. The protection products to be used will have the following features:

- There will be B+C Class (Type 1+2) and 3+NPE (3 phase, neutral-earth) connections. (This set will be considered as 1 piece)
 - Highest continuous voltage UC : 275-280 V AC
 - Demand class according to EN 61643-11: Type 1+2
 - Demand class according to IEC 61643-1: Class I+II
 - LPZ: 0→2
 - Impulse current: (10/350) Iimp 25 kA
 - Rated discharge current: (8/20) In 90 kA
 - Maximum discharge current Imax: 150 kA
 - Protection level: Up < 0.9 kV
 - Activation time: tA ≤ 25 ns
 - Maximum front fuse: 160 A
 - Protection class: IP 20
 - Temperature range: -40 to +80 °C
 - Connection cross section, fixed: 2.5 – 35 mm²
 - Connection cross section, stranded: 2.5 – 35 mm²
 - Connection cross section, flexible: 2.5 – 25 mm²
- Plug-in system coax package

9. B+C Class Protection with Power Varistor Connected Between 1 Phase+Neutral/Ground (Combined Lightning and Overcurrent Discharge Device)

It will be mounted (in the field) before the power input of the external cameras with uninterruptible power supply output. The product has the following features will carry:

- There will be B+C Class (Type 1+2) and 1+NPE (1 phase, neutral-earth) connections. (This set will be considered as 1 piece)
- Highest continuous voltage UC: 275-280 V AC
- Demand class according to EN 61643-11: Type 1+2
- Demand class according to IEC 61643-1: Class I+II
- LPZ: 0→2
- Impulse current: (10/350) Iimp 7 kA
- Rated discharge current: (8/20) In 30 kA
- Maximum discharge current Imax: 50 kA
- Protection level: Up < 0.9 kV
- Activation time: tA ≤ 25 ns
- Maximum front fuse: 160 A
- Protection class: IP 20
- Temperature range: -40 to + 80°C
- Connection cross section, fixed: 2.5 – 35 mm²
- Connection cross section, stranded: 2.5 – 35 mm²
- Connection cross section, flexible: 2.5 – 25 mm²

Protection products suitable for the D class system will be used for the protection of cameras and fiber optic converters in the field. (Contractor within the scope of this work All these materials will be provided and installed by the company.)

10. Phone Line Sensitive Protections

Telephone line guards will be mounted on cut-off type regulators inside the flame-proof surface-mounted special telephone distribution box. The protection products to be used will have the following features:

- Highest continuous voltage Uc: 180 V
- LPZ: 0-2
- Impulse Current (10/350): 1 kA
- Rated Discharge Current (8/20): 5 kA
- Maximum Discharge Current: 10 kA
- Protection Level: < 0.7 kV
- Temperature Range: -40 to +80 °C

C- SAFETY AND SECURITY ON THE WORK SITE

1. During the continuation of the work (until the provisional acceptance), the contractor may cause accidents to the workers, the facility and the surrounding people due to the work to be done at the workplace. They are obliged to take all kinds of security measures to prevent them from being harmed. Adequate safety measures at or around the work site. The contractor is responsible for the payment of damages and damages that may arise from the failure to receive it. The contractor; accidents, damage and loss must take all necessary precautions and comply with the instructions given by the control organization. In addition, the contractor have to teach the employees the methods and precautions to be protected from the accidents that may be caused by the tools, equipment and machines used in the workplace. All of the expenses related to the security and protection measures implemented by the contractor voluntarily belong to the contractor himself. Contractor's reason In case a complaint is received by the facility administration about the damage and loss caused by the facility or if it is determined by the control organization, the The cost of material damage will be deducted from the progress payment.

2. The Contractor shall provide security to be obtained from the Public Prosecutor's Office for each personnel to be employed for more than 15 (fifteen) days during the continuation of the work. will present the documents related to the investigation and the photocopies of the identity card to the customer at the latest 3 (three) days before. He will need to enter the facility during the continuation of the work. License copies of all kinds of vehicles will be delivered to the facility administration at the latest 3 (three) days in advance. All personnel employed by the contractor firm Persons who will be insured, uninsured and illegal to work (under the age of 18) will not be allowed into the application area.

D- CONTROL AND INSPECTION METHODS

1. The control and inspection of the production subject to the tender will be made in accordance with the Construction Works Inspection and Acceptance Regulation of the Public Procurement Law No. 4734.

2. Quality, control and inspection expenses belong to the contractor company.

3. All kinds of personnel, materials and test equipment that may be required during quality, control and inspection will be provided by the contractor company.

4. The contractor company will be responsible for all kinds of accidents and damages that may occur due to manufacturing errors during the inspection.

5. The contractor firm; In case of disagreement with the temporary or final acceptance, the deficiencies identified by the administration will be deemed to have been accepted and the objection will be made. will not be found.

6. Before and after production, all stages will be photographed; At the end of the work, it will be delivered to the facility administration in album form (on CD).

7. The construction work in question will be started in line with the work program to be approved by the administration and will be completed within the time specified in the administrative specification.

Plug-in system coax package