

WATER SUPPLIES DEPARTMENT
STANDARD SPECIFICATION E-82-11
LIGHTNING PROTECTION UNIT FOR ELECTRONIC EQUIPMENT

1. **GENERAL**

Lightning protection unit (LPU) shall be provided for the data or signal cablings specified so as to safeguard the connected instruments against the transient surges that are induced in the cablings by a nearby lightning discharge or high-level transients. Such instruments include transmitters, switches, process control devices, telemetry devices and power supply units etc. The design of the LPU shall meet the individual requirements for diverting the surge current to ground and prohibiting the unwanted voltage in entering the connected instruments, telecommunication networks or communication systems with the characteristics of rapid operation, accurate voltage control and automatic resetting once the over-voltage has ceased.

The lightning protection unit shall comply with the latest version of relevant IEC Standards as listed below or other international standards currently enforced on the date of tender invitation where applicable:

IEC 61643 Low voltage surge protective devices

2. **DESIGN**

The LPU shall have the following two levels of protection:

- (a) High current surge diversion
- (b) Voltage clamping

Fuse protection, where provided, shall only be used as a back-up to safeguard against malfunctions within the lightning protection unit. The use of circuit breaker, surge relay, air or carbon spark gaps connected between line and earth for lightning protection shall not be acceptable.

The LPU shall meet the following design requirements:

(a) **For Low Resistance Instrument Networks**

Discharge surge current : Not less than 10 kA pulse 8/20 μ s waveform

Response time : Less than 10 nanoseconds

Instrument network working : Suitable for 4 - 20mA
current

Instrument network working : Suitable for 24V d.c.
voltage

(b) For Telecommunication Networks

Discharge surge current : Not less than 10 kA pulse 8/20 μ s waveform

Response time : Less than 10 nanoseconds

Telecommunication network : Suitable for the type of telecommunication
working current and voltage networks (i.e. public switched telephone
network, remote terminal unit/telemetry
outstations etc.) to be protected as specified in the
Particular Specification

(c) For Communication Systems

Discharge surge current : Not less than 10 kA pulse 8/20 μ s waveform

Response time : Less than 10 nanoseconds

Communication system : Suitable for the type of communication systems
working current and voltage (i.e. RS232, RS422, RS485, fieldbus powered
systems, HART, PROFIBUS, EtherNet/IP,
BACnet, M-bus etc.) to be protected as specified
in the Particular Specification

3. CONSTRUCTION

The LPU shall intrinsically equip with a surge protective device. Except for the panel mounted type, all components and circuits of the surge protective device shall be housed in an industrial grade cabinet. For LPU mounted inside panel or cabinet, it shall normally be DIN rail type. The device and the enclosure shall be electrically earthed.

4. EQUIPMENT PARTICULARS

The contractor should refer to the Particular Specification for the following particulars of the equipment:-

(a) No. of channels per unit (with respect to earth)

(b) Type of instrument network, telecommunication network and/or communication system to be protected

- (c) Telecommunication network working current and voltage
- (d) Communication system working current and voltage

- End of this Specification -