

# Earthing Solution · Lightning Protection · Surge Protection

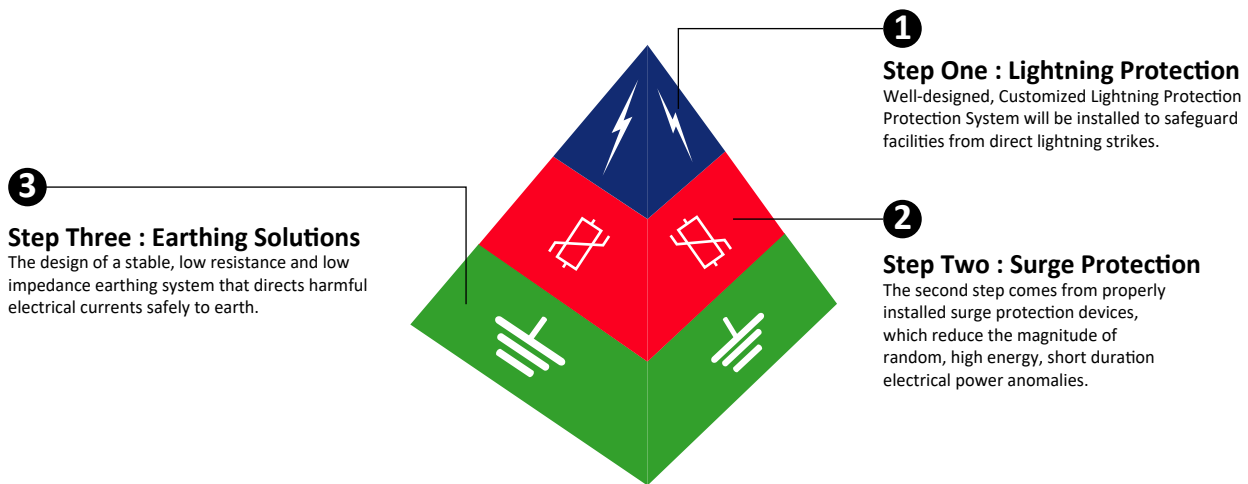
Complete Solution for Electrical System



**Superior Electric Ltd.** was established in the year 2014 with an aim to offer the best quality Electrical goods from almost every industrial segment. We introduced LED Light & Fixture under the brand name “Bright” in late 2015. Within few years, BRIGHT brand LED become popular among residential, commercial and industrial customers. We also engaged Busbar Trunking System (BBT) supply/indent from reputed European and Chinese manufacturer and install them for our valued customers. We so far installed a list of BBT in high-rise building, Garments, Textiles & Auto Brick Industry.

In the year 2018, we entered into Electrical Safety Products Business and offering Engineering Solutions in Maintenance Free Earthing, Lightning Protection System (E.S.E type & Conventional type) and Surge Protection System (SPD). We experienced working with Oil Refinery, Garments & Textiles, Real Estate & Construction, Solar Power Plant, Feed Mills & Rubber Industry etc. With a backing of experienced industrial expertise and knowledge, we are striving for continuous improvement. Hence we keep an eye on market development and latest technological advancement so as to be able to offer the best, latest and most innovative solution to our valued customers.

Our solution provides a three steps comprehensive facility approach for earthing, Surge Protection and Lightning Protection. The pyramid comes as close as humanly possible to protect both man and machine from lightning & non-lightning induced transient voltage damage. We are designing and manufacturing Conventional Lightning Protection System (LPS) under brand name Supelec.



We are proud to be the distributor of Schirtec AG, Austria for E.S.E Lightning Arresters, dealer of Phoenix Contact GmbH, Germany for SDP and Marconite for Earthing enhancing Chemical.

our Partners:



## Early Streamer Emission (ESE) Lightning Protection:

E.S.E. Lightning Conductor is a product that do not include radioactive materials but protect large fields from one point by becoming active with the lightning risk due to increasing atmospheric electrical field effect in lightning weathers. The head part of E.S.E Lightning Conductor is formed by Four main parts;

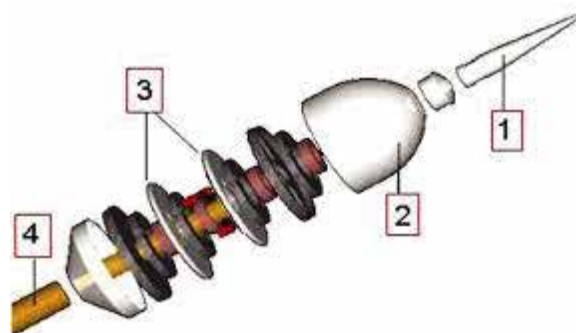


Fig. Details of SCHIRTEC-A E.S.E. Lightning Conductor

1. Air Terminal
2. Ion Generator
3. Accelerator and Atmospheric Electrodes
4. Grounding Connection Terminal

The Lightning Conductor is produced in the cross section and in the quality that can carry the biggest lightning observed. It is equipped with ion generator, induction coil and protective high impedance. This generator is placed in the special epoxy resin, so ion generator is protected against the negative effects of external environment. Accelerator and atmospheric electrodes are designed in a way that can be charged with different potentials and with this feature, it is aimed to make work the electrodes as both additional ionization producing resource and as accelerator.

The most important factor in E.S.E. Lightning Conductors is protection radius. It is dependent on protection diameter level calculation and the  $\Delta T$  value, which is found in the product's test results. Protection radius is calculated according to their protection levels with the formula below. The regulation is made with the number of the electrodes and ion generators' impedance, lets the different protection capacities in the SCHIRTEC E.S.E. Lightning Conductors.

$$R_p = \sqrt{h(2D-h) + \Delta L(2D + \Delta L)} \quad h \geq 5 \text{ meter}$$

D: Lightning advancement step or leaping interval of lightning along the way.

For this reason it is the protection level parameter.

For level I protection D=20 m

For level II protection D=30 m

For level III protection D=45 m

For level IV protection D=60 m

$$\Delta L \text{ (m)} = V \text{ (m}/\mu\text{s)} \cdot \Delta T \text{ (\mu s)}$$

V: is the speed of advancement of ions, which are formed on the conditions of lightning , around the air terminal, moving towards lightning. According to the standards  $V=1\text{m}/\mu\text{s}$ ,  $\Delta T$ : is early ionization time period.

$\Delta L$ : is the distance to catch the lightning in  $\Delta T$  period (in other words, the distance that ions travel towards the lightning). This parameter is variable according to the air terminal produced and it is set in the laboratory tests, according to the products' production types and characteristics.  $R_p$ : Protection Radius (m)

The Products of SCHIRTEC are in accordance to the new NFC 17-102:2011 and the UNE 21186:2011 Standards.

**A Sample Calculation for SCHIRTEC-A:**

If you calculate level-I according to appendix B of the NF C 17-102 For  $D=20$  m,  $h=6$  m from  $R_p=\sqrt{h(2D-h)+\Delta L(2D+\Delta L)}$ ...Eq.1 Protection radius is  $R_p=79$  m calculated.

If you calculate level-II according to appendix B of the NF C 17-102 For  $D=30$  m,  $\Delta L=60$  m  $h=6$  m From Eq.1,  $R_p=87$  m calculated

If you calculate level-III according to appendix B of the NF C 17-102 For  $D=45$  m,  $\Delta L=60$  m  $h=6$  m From Eq.1,  $R_p=97$  m calculated

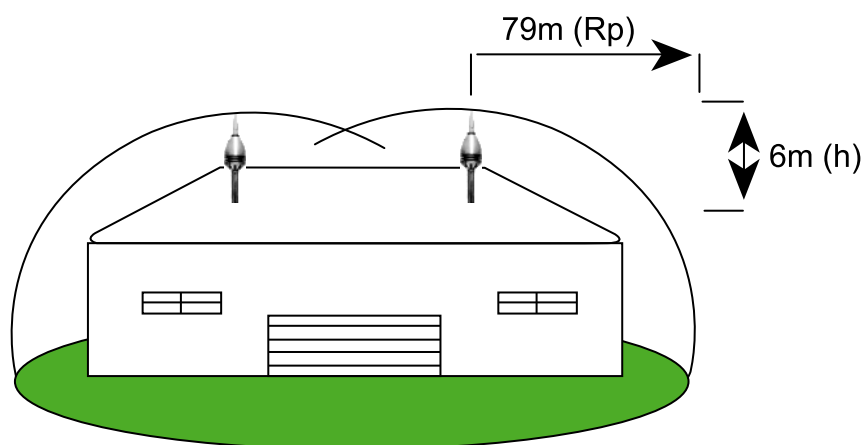
If you calculate level-IV according to appendix B of the NF C 17-102 For  $D=60$  m,  $\Delta L=60$  m  $h=6$  m From Eq.1,  $R_p=107$  m calculated

The Protection Radius For SCHIRTEC E.S.E Lightning Conductors ( According to NF C 17-102):



Radius of Protection $R_p(m)$	Schirtec-AS ( $\Delta T:30 \mu s$ )				Schirtec-A ( $\Delta T:60 \mu s$ )			
	I	II	III	IV	I	II	III	IV
2	19	22	25	28	31	35	39	43
4	38	44	51	57	63	69	78	85
5	48	55	63	71	79	86	97	107
6	48	55	64	72	79	87	97	107
8	49	56	65	73	79	87	98	108
10	49	57	66	75	79	88	99	109
20	50	59	71	81	80	89	102	113
30	50	60	73	85	80	90	104	116

**Example for S-A:**

Factory hall; 150 m x 50m, Protection Level 1




**E.S.E Schirtec Lightning Conductors:**

Model	Schirtec-AS		Schirtec-A	
Protection Radius	30 μs		60μs	
Tested Protection Radius ΔT (μs)	32 μs		65 μs	
Size (cm)	55 x 12		59 x 12	
Weight (Kg)	2.6		2.8	
Material	Stainless Steel			
Standards	NFC 17-102: 2011 and UNE 2118:2011			


**Lightning Strike Counter:**

The Lightning Strikes will be detected and recorded by SLSC-20. This device can also show the intact operation of the lightning system, resettable and does not require any external power supply.

Model	SLSC-20	
Peak Current (KA)	100KA	
Register Capacity	6	
Ingress Protection	IP67	
Dimensions	11x9x5.5	


**Solar Tester SRC-2T:**

The solar tester works remotely. The testing device stores energy to operate for 24 hours by an exposition of 5-7 hours of sun light daily.

Name	Description	Dimension (cm)	
SRC-2T	Tester for E.S.E	7x13.3x2.4 cm	

**E.S.E LA Tester:**

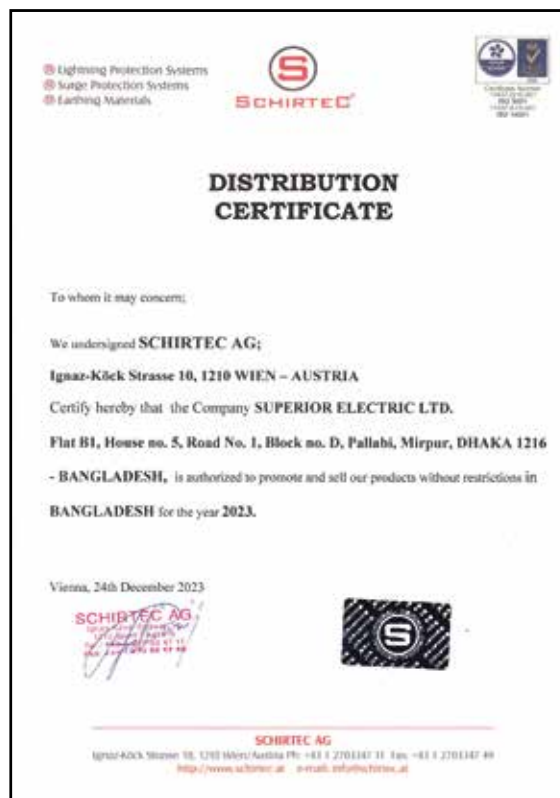
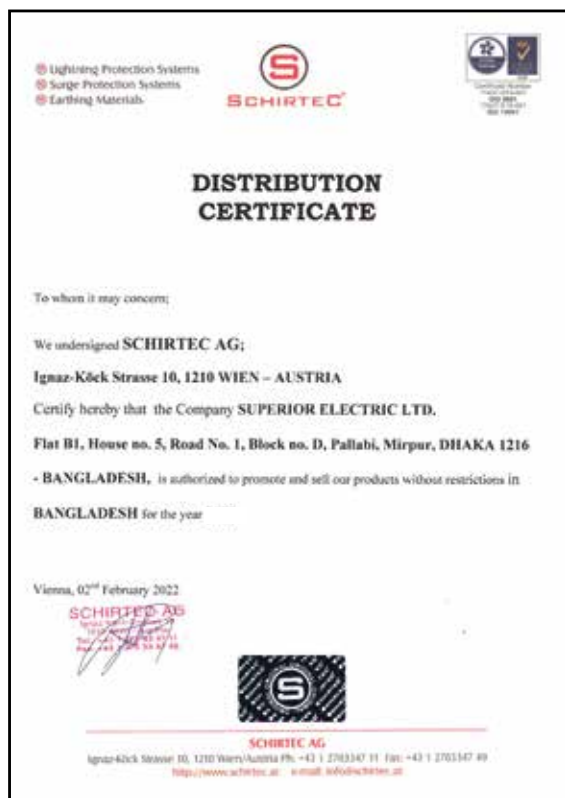
The cable of the tester is plugged to the lightning conductor, the green LED is showing that the lightning conductor is working.

Model	Sa-1t	
Weight (kg)	0.2	
Dimensions	10,5 x 7,5 x 2,8 cm	
Categories	Accessories	

**Standard Accessories with E.S.E Lightning Conductor:**

			
<b>Aviation Light</b>	<b>Air Clamp</b>	<b>Air Mast</b>	<b>Solar Panel</b>

**Schirtec Distribution Certificates:**



**Test & Certificates:**



## Conventional (LPS) Lightning Protection System:

A lightning protection system is designed to protect buildings, structures, and their occupants from the damaging effects of lightning strikes. Lightning is a powerful electrical discharge that can cause significant damage to buildings, electrical equipment, and other structures.

Compliance with national and international standard systems for lightning protection At Superior Electric Ltd., we maintain the international standards of lightning protection such as NFPA 780, BS EN/IEC 62305, IEEE, and NFC 17-102, etc. to make sure we offer our customers the safest experience with our lightning protection solution. We also follow our national standard BNBC (Bangladesh National Building Code)

### Protection against Lightning:

Lightning is one of nature's most powerful and destructive phenomena. Lightning strikes present a real and significant threat to life, to the structures in which we live and work, and to the electronic systems which support us in our daily lives.

The effects of a direct strike are obvious and immediately apparent - structures damaged personal injuries and even loss of life. However, the secondary effects of lightning - the surge over voltage's and lightning electromagnetic impulse (LEMP) can cause damage to electrical and electronic systems within structures.

A reliable lightning protection system must encompass external lightning protection, effective grounding and surge protection of electrical and electronic system as well as the LEMP protection measures. The protection against lightning according to IEC 62305 Series is essential.

**IEC 62305-1 (General Principals):** Describe the purpose of IEC 62305 Series and the connection between each part.

**IEC 62305-2 (Risk Management):** Determine the need for protection, the economic benefits of installing protection measures and the selection of adequate protection measures.

**IEC 62305-3 (Physical Damage to Structures and Life Hazard):** Main protection measures in and around a structure against physical damage and injury to living beings due to touch and step voltages.

**IEC 62305-4 (Electrical and Electronics Systems within Structures):** Provides information on protection measures to reduce the risk of permanent failures of electrical and electronic systems within structures caused by the lightning electromagnetic impulse (LEMP).

## Air Terminal Network :

The Air Termination Network is a vital part of any structural Lightning Protection System.

The network is the part that arrests the lightning strike. An ATN can be designed through multiple methods:

- Mesh Method,
- Protective angle method
- Rolling sphere or a combination.

### An ATN may consist of:

- Vertical Air Terminals
- Conductors laid in a mesh over the structure
- A combination of the two (particularly useful when protecting roof mounted plant)

### Functionality of ATN System:

- The Air Termination Network - arresting the lightning strike
- The Down Conductor System - taking the lightning discharge to ground
- The Earth Termination/Network - safely dissipating the lightning discharge into the ground

Conductors are also an integral and important component of an earthing system, whether this is for a power station, sub-station, cell site, solar PV array etc.

We Offer Conventional LPS series of air terminal, roof/main conductors, down conductors, earth electrodes and fittings in accordance with National and International Standards like IEC, USA-NFPA-780 ,EN 62305-3, Australian-AS1768 and BNBC 2006.

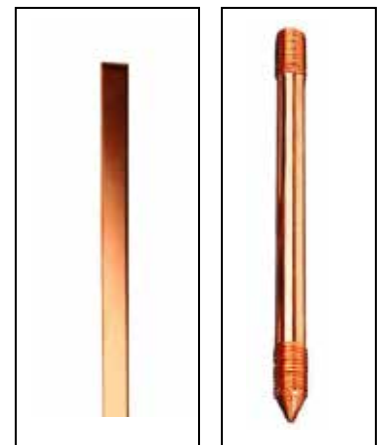
Features:

- Air terminal components and fittings are available in copper and aluminum.
- Multi-range of air terminal, bases, conductors, connectors and fasteners.
- Down conductors are available as standard or flat type construction.
- Based on conventional design principles rolling sphere, cone of protection and mesh as found in BNBC-2006, NFPA-780, EN 62305-3, Australian-AS1768.
- Ensure easy assemble and installation.

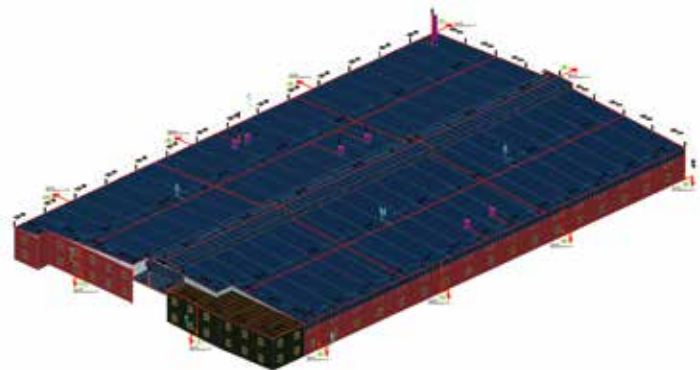
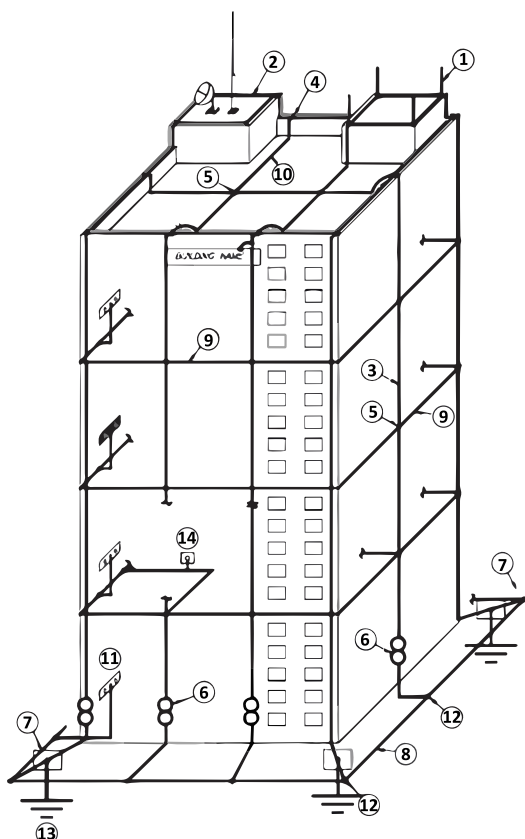


**Air Terminal & Tape (Cu/Al):**

Rod Diameter	Length	Material
9.5mm	600mm	Copper
12.7mm	600mm	Copper
12.7mm	600mm	Aluminium
15.9mm	600mm	Aluminium
Area (Actual)	Length	Material
10x3 mm	100 M	Copper
20x3 mm	100 M	Copper
30x2 mm	100 M	Copper
20x3 mm	100 M	Aluminium
25x4 mm	100 M	Aluminium



**Isometric View of Conventional LPS:**



**Description**

- |                            |                         |
|----------------------------|-------------------------|
| 1. Air Terminals           | 8. Ring Earth Electrode |
| 2. Conductors              | 9. Ring Conductor       |
| 3. Down Conductors         | 10. Fastener            |
| 4. Three Way Connection    | 11. Bonding Bar         |
| 5. Four Way Connection     | 12. Exothermic welding  |
| 6. Test Box                | 13. Ground Rod          |
| 7. Concrete Inspection Pit | 14. Earth Point         |



## Air Terminal:

Available in both copper and aluminium, Conventional Air Terminals offer a quick and easy solution for Air Terminals of 300mm, 600mm & required size in height. They are suitable for use with flat and circular conductors. Flat parapet, ridge saddle and wall-mounting bases are available.

## Roof Mesh Conductor Systems:

Our range includes solid circular, rectangular tape and stranded conductors, as well as copper and aluminium. Thus giving the designer the flexibility to blend the Lightning Protection network into the building facade. Conductors are an important element of a Lightning Protection System. They can be used by themselves in a mesh or in combination with Air Terminals. Conductors are also the main element in both down conductor (the path by which lightning is taken safely to the earth system) and earthing (the path by which the lightning current is discharged to earth). Given the importance of conductors (and their fittings) to the three elements of an effective lightning protection scheme, we have dedicated two sections to these products: conductors & fittings.

Conductors provide a low impedance path and they must be:

- Correctly sized for fault current
- Sufficiently robust to resist mechanical damage
- Able to resist the effects of corrosion

The most common cross-section areas for above mesh lightning protection copper conductors are 7mm & 9mm dia (29mm<sup>2</sup> - NFPA min) and 20 x 3mm (58mm<sup>2</sup>-NFPA MIN ) rectangular section.

## Product Series At a Glance: Copper & Aluminium Conductors & Fittings.



Copper

Aluminium

## Surge Protection Device:

A Surge Protection Device (SPD) is designed to protect electrical systems and equipment from surge events by limiting transient voltages and diverting surge currents. Surges can originate externally, most intensely by lightning, or internally by the switching of electrical loads. The sources of these internal surges, which account for 65% of all transients, can include loads turning on and off, relays and/or breakers operating, heating systems, motors and office equipment. Without the appropriate SPD, transient events can harm electronic equipment and cause costly downtime. The importance of these devices in electrical protection is undeniable.

### How SPD Works:

In the most basic sense, when a transient voltage occurs on the protected circuit, an SPD limits the transient voltage and diverts the current back to its source or ground. To work, there must be at least one non-linear component of the SPD, which under different conditions transitions between a high and low impedance state. At normal operating voltages, the SPDs are in a high-impedance state and do not affect the system. When a transient voltage occurs on the circuit, the SPD moves into a state of conduction (or low impedance) and diverts the surge current back to its source or ground. This limits or clamps the voltage to a safer level. After the transient is diverted, the SPD automatically resets back to its high impedance state.

Table: SPD Standard Definition

Description	Direct Lightning Stroke		Indirect Lightning Stroke	
	Class I test		Class II test	Class III test
IEC 61643-1	Class I test		Class II test	Class III test
IEC 61643-11/2011	Type 1 : <b>T1</b>		Type 2 : <b>T2</b>	Type 3 : <b>T3</b>
EN/IEC 61643-11	Type 1		Type 2	Type 3
Former VDE 0675v	B		C	D
Type of test wave	10/350		8/20	1.2/50 + 8/20

Note 1: There exist **T1** + **T2** SPD (or Type 1 + 2 SPD) combining protection of loads against direct and indirect lightning strokes.

Phoenix Contact, a Germany based company, is worldwide popular for SPD ranges of products. TRABTECH is the name of the range of surge protection devices from Phoenix Contact. Phoenix Contact split the SPD types into the following categories based on applications:

### Lightning Current Arrester (Flashtrab): Takes the fright out of lightning (TYPE 1/Class B - 10/350µs)

“Flashtrab” family with KEMA certification offer high-capacity surge arresters in a standardized, user-friendly installation design. It should be installed at main distribution panel.

#### Features

- Single high capacity spark gap arresters.
- Pluggability with status and remote indication facility.
- Free from line follow current and no need of fuse in series.



### Surge Voltage arrester (Valvetrab): Surge Protection for the control cabinet (Type II/Class C - 8/20µs)

VALVETRAB is for protection against switching surges. "Valvetrab" family with KEMA certification can fit into the small space requirements common with industrial, telecom and control cabinets and for the sub-distribution level power supply.

#### Features

- Pluggable with mechanical & remote indication.
- Thermal disconnect device.
- No need of fuse up to 315 A load current.

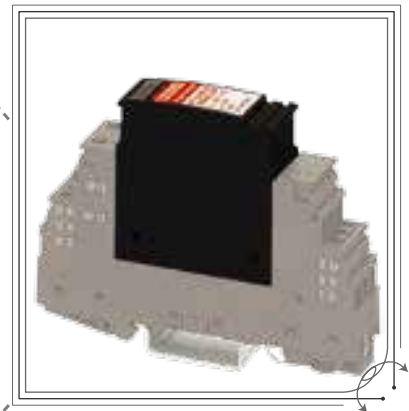


### Device Surge Arrester (Plugtrab): Device protection for all the applications (Type III/ Class D)

PLUGTRAB PTseries provides fine protection to the equipments. It provides protection to power supplies, PLCs, PCs, controllers and other electrical equipment. Available in voltage ranges from 24 V to 230 V. Plugtrab PT is the perfect solution for control cabinets.

#### Features

- Function display on the device and as remote indication.
- High nominal current, up to 26 Amps.
- Complete function test with CHECKMASTER.



### Signal line Surge arrester

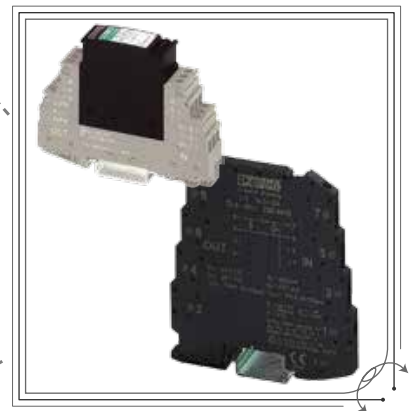
PLUGTRAB PT pluggable solution for analog & digital circuit protection.

#### LINETRAB

The LINETRAB product range offers surge protection for signal circuits of the MCR technology up to 4 signal wires can be protected over a design width of just 6.2 mm. KEMA/CCOE/ATEX certified and SIL 2 complied.

#### Features

- Both of the above are Compatible with HART and foundation field bus application.



### SURGETRAB: Transmitter protection

SURGETRAB is a surge protection device that are especially intended for installation on measuring heads/TRANSMITTER to protect against current loops or simi-lar standard signals. Two, three and four condutor transmitter can be protected. It has KEMA/CCOE/ATEX approval.

#### Features

- The direct installation in the measuring sensor saves space and costs in comparison to the conventional installation of surge protection devices in a separately mounted installation box.
- Compatible with HART and foundation field bus application.



### DATATRAB: Surge Protection for IT and communication

DATATRAB generation protects high speed networks reliably against damage caused by surge voltages. DATATRAB combines high transmission speeds and different data protocols like those of ethernet, Power over Ethernet (PoE), ISDN, token ring, RS 485, RS 232, MODBUS application.

#### Features

- The device can be usable as an adaptor and rail-mountable device.

COAXTRAB: Coaxial Surge Arrester

Protection of UHF, VHF, Antenna, Video, GSM signals and it comes in different variants with BNC, N, F connectors etc.



### Residual Current Monitor and Device circuit breaker

Protection against fault current. It provides information about fault without disconnection. It is available for Alternating & Direct currents.

Device Circuit breaker: Protection against overload / Short circuiting / Attenuation available for 0.1 Amp to 40 Amp DC load current.



### Standard and Certificates



## Earthing System

Earthing, also known as grounding, is a system used in electrical installations to protect people and equipment from electric shock and damage caused by electrical faults. An earthing system is designed to provide a low impedance path for the fault current to flow into the earth, which allows the protective devices in the electrical circuit to detect and isolate the fault.

Earthing is essential in all electrical installations, but is particularly important in high voltage and industrial applications. A properly designed and installed earthing system can prevent electrical accidents and equipment damage, and ensure that the electrical installation operates safely and reliably.

### **An earthing system is necessary in electrical installations for several reasons:**

**Protection against electric shock:** In case of a fault in an electrical system, such as a short circuit, current can flow through unintended pathways, including human bodies. This can result in serious injury or even death. Earthing system provides a low impedance path for the fault current to flow into the ground, which reduces the risk of electric shock to humans.

**Protection of equipment:** Electrical equipment, particularly electronic devices, can be damaged by voltage spikes or surges. Earthing system provides a path for the excess electrical energy to dissipate safely into the earth, which can prevent damage to equipment.

**Safety of electrical supply:** In the absence of an earthing system, the insulation of electrical equipment can fail due to overvoltage, leading to electrical fires or damage to the equipment. An earthing system can ensure that the electrical supply remains stable and safe.

**Compliance with regulations:** Earthing systems are required by electrical safety regulations and standards, such as the International Electrotechnical Commission (IEC) and the National Electrical Code (NEC). Bangladesh National Building Code (BNBC) Compliance with these regulations is mandatory to ensure the safety and reliability of electrical installations

Overall, the earthing system is an essential safety measure in electrical installations to protect human lives, equipment, and ensure the safe and reliable operation of electrical systems.

### **IEC-International Standards:**

According to IEC 60364, which is the international standard for electrical installations in buildings, there are several types of earthing systems that can be used, including:

**TN-S:** In this system, the neutral and protective conductors are separated throughout the installation, and the earth is connected to the ground at a single point, typically at the main switchboard.

**TN-C-S:** In this system, the neutral and protective conductors are combined at the source of the supply, but are separated throughout the rest of the installation. The earth is connected to the ground at a single point, typically at the main switchboard

**TT:** In this system, each piece of equipment is connected to the ground via its own separate earth electrode. There is no connection between the neutral and the earth at any point in the installation.

**IT:** In this system, the neutral is isolated from the ground, and each piece of equipment is connected to the ground via an impedance, such as a resistor or a reactor. This system is typically used in high-voltage applications.

The choice of earthing system depends on various factors, such as the type of electrical equipment being used, the location of the installation, and the level of fault protection required. It is important to follow the appropriate IC standards to ensure the safety and reliability of electrical installations.

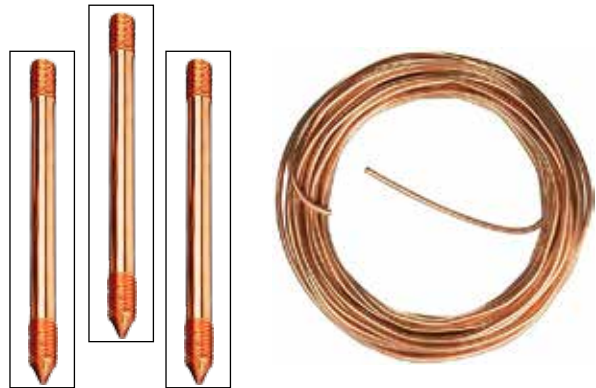
### Reasons of Earthing System:

1. Lightning Damage
2. Electrical leakages
3. Short circuits between phases and phase to Neutral
4. Surges in Supply line

### Specifications of Solid Copper Earth Rod/Wire:

Copper earth rods are designed for use where extremely high corrosion resistance and exceptionally long life are required. Solid copper earth rods are produced from solid copper bar with a 99.9 % pure copper and are internally threaded for jointing. When deep driving a solid copper earth rod the usual practice is to insert the rod into a bore hole and backfill with either Low-Resistance Earthing Compound.

Outer Dia (actual)	Length
7 mm	100 m
8 mm	100 m
9 mm	100 m
10 mm	100 m
12.7 mm	1500 m
12.7 mm	3000 m
16 mm	1500 m
16 mm	300 m
20 mm	300 m
25 mm	300 m



### Maintenance Free Earthing:

Wallis Low Res provides a permanent simple solution to substantially lower the resistance of an earthing system. It is a high performance low-resistance earthing compound which when mixed with cement and water forms a high strength electrically conductive concrete to last for the life of the system.

Low Res is supplied in a fine granular form available in 25 kg and convenient 10kg bags suitable for health and safety lifting regulations. It is widely used in earthing and grounding applications where permanent low resistance and high compressive strength solutions are required.

By mixing Low Res with cement at a ratio of 2:1 the resulting concrete is electrically conductive whilst offering a solid electrical connection between the earthing system and the ground.

Low Res is a non leaching, maintenance free stable earthing compound ideal for use in ground conditions where conductivity is very poor such as rock or shale.

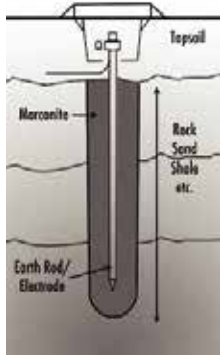
Low Res provides a permanent path for excellent conduction of current instead of attempting to employ large diameter difficult to drive earth rods.

Low Res applications include static control for aircraft aprons and fuel tankers, RF and microwave screening and earthing for a wide variety of applications in Oil and Gas installations, Telecommunications industry, Defence Establishments, Rail and Underground installations, Electricity and Water Companies.

### Benefits of Maintenance Free Earthing:

- ✓ Eco friendly chemicals are used for longer life.
- ✓ Maintenance Free
- ✓ More Surface area conduction
- ✓ Highly reliable for safety to human life
- ✓ Adequate galvanization and highly conductive
- ✓ Design to handle high peak current & maximum fault current dissipation instantly
- ✓ Controls Radio frequency emission & electromagnetic interferences
- ✓ Provides stable reference potentials for instrument accuracy
- ✓ Discharges short circuit currents
- ✓ Corrosion Free and Maintains low resistance for a very long period having minimum fluctuation

**Key Features of Chemical Compound:**

<p><b>Stable Resistance</b> Permanent &amp; consistent low resistance of 0.001 Ωm</p>	
<p><b>Corrosion Free</b> Does not corrode hence gives consistent resistance values</p>	
<p><b>Best Performance</b> Engineered Substance –works most effectively in the Toughest Soil Conditions</p>	
<p><b>Zero Leaching</b> Does not pollute groundwater table</p>	
<p><b>High Strength</b> Becomes compact in a few hours once installed</p>	
<p><b>Lowest Life Cycle Cost</b> Chemical Earthing has lowest life cycle cost when compared to Conventional Earthing</p>	
<p><b>Sustainable Solution</b> Maintenance-Free for 50 Years. Does not require water &amp; charcoal to replenish earthing pit as in the case of chemical earthing</p>	
<p><b>Versatile Applications</b> Industrial, Commercial Building, Residential Buildings, Lightning Protection, etc.</p>	
<p><b>According to BNBC 2020 (1.3.33.8-b)</b> The total resistance of an electrode for a Lightning Protection System (LPS) must not exceed 10 ohms for buildings up to 10 stored and 2 ohms for high rise buildings.</p>	
<p><b>Complies IEC 62561-7:2011</b></p>	



**Earth Rod Inspection Pits:**

The concrete inspection pit is suitable for most types of earthing and lightning protection installations. It protects the Earth Rod connection and makes it available for inspection.



Concrete earth inspection pit

Type Description	Dimension	Weight	Materials
SUPELEC INSPIT	300 x 300 x 300	12.5 kg	Concrete
SUPELEC INSPIT	450 x 450 x 450	62 kg	Concrete

**Accessories and Fittings:**

					
Earth Bar	Air Rod Base	Rod to Tape	Cable	C Connector	Cross Run Clamp
					
DC Clip	Joint Clamp	Earth Test Box	Tape Clip	Terminal Adapter	Rod Bracket
					
Copper Rod Clamp	Earth Rod Coupler	Earth Mat	Copper Plate	Copper Lugs	Earth Pit



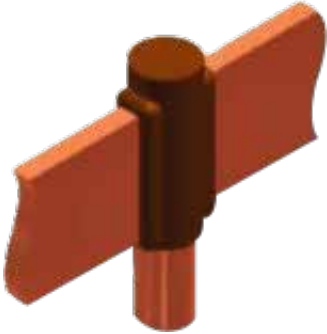


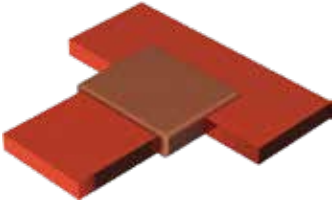


**Exothermic Bonding:**

**Exothermic welding:**

Exothermic welding is a simple, economical method of making permanent, very high quality electrical connections. The process uses the high temperature reaction of copper oxide and aluminum, within a semi-permanent graphite mould, to form electrical connections mainly between copper to copper or copper to steel.

**Features & Benefits:**

- Superior electrical conductivity
- Maintenance free connection
- Does not corrode oxide or degrade with time
- Time & Cost effective
- Completely portable
- Light weight for field use
- Higher mechanical and squeezing resistance

		
<p><b>Type Tape to Rod</b></p>	<p><b>Type Rod to Rod</b></p>	<p><b>Cable to Rod</b></p>
		
<p><b>Type Busbar to Busbar</b></p>	<p><b>Powder</b></p>	<p><b>Exothermic Welding</b></p>

## Inspection and Testing:

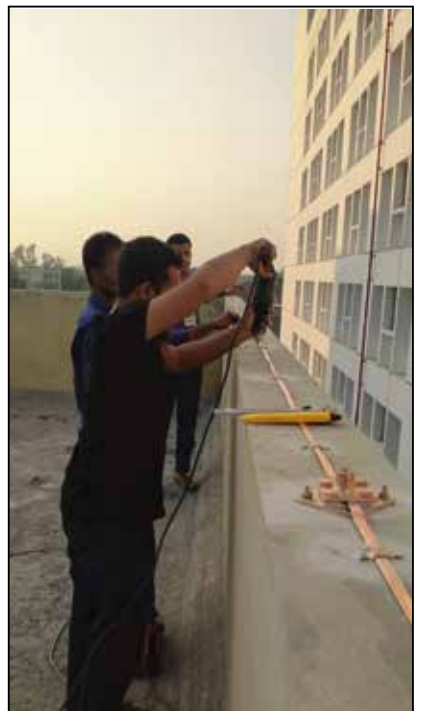
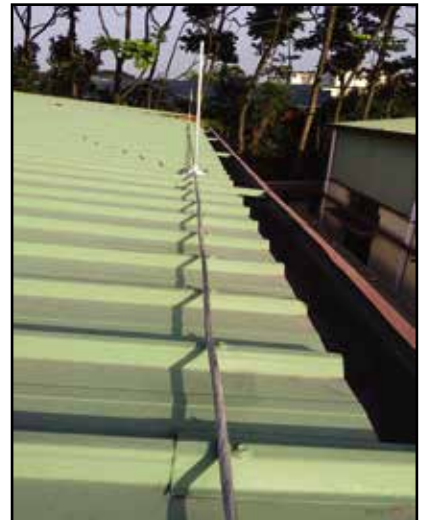
Earth resistance measurements significantly differ from other measurements performed to assess the protection against electric shock. They require the knowledge about construction of the earthing system, the phenomena occurring during the measurements and methods for managing difficult field conditions. Persons performing tests and measurements of ground systems must have appropriate knowledge and measuring equipment able to support such complicated task.

	
<p>Earth Tester</p>	<p>Soil Resistance Tester</p>

## Machine & Tools:

			
<p>Hydraulic Puncher</p>	<p>Cable Cutter</p>	<p>Welding Machine</p>	<p>Multi meter</p>
			
<p>Hammer Drill Machine</p>	<p>Grinding Machine</p>	<p>Heat Gun</p>	<p>Hand Tools</p>

## Work References:



**Valued Clients:**

		 <p>Continental Garments Industries (pvt) Ltd.</p>	
		 <p>DEBONAIR GROUP</p>	
			
		 <p>National Board of Revenue, Bangladesh জাতীয় রাজস্ব বোর্ড, বাংলাদেশ</p>	
			
			
			

# Superior Electric Ltd.

Superior Electric Ltd. is also Distributor/Agent/Authorized for:

- MAX Electric (China) Brand Busbar Trunking System (BBT),
- BRIGHT Brand LED Lighting products from China
- ABB/Schneider/ChiNT/ ranges LV products including Switch, Socket, Circuit Breaker & DBs



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