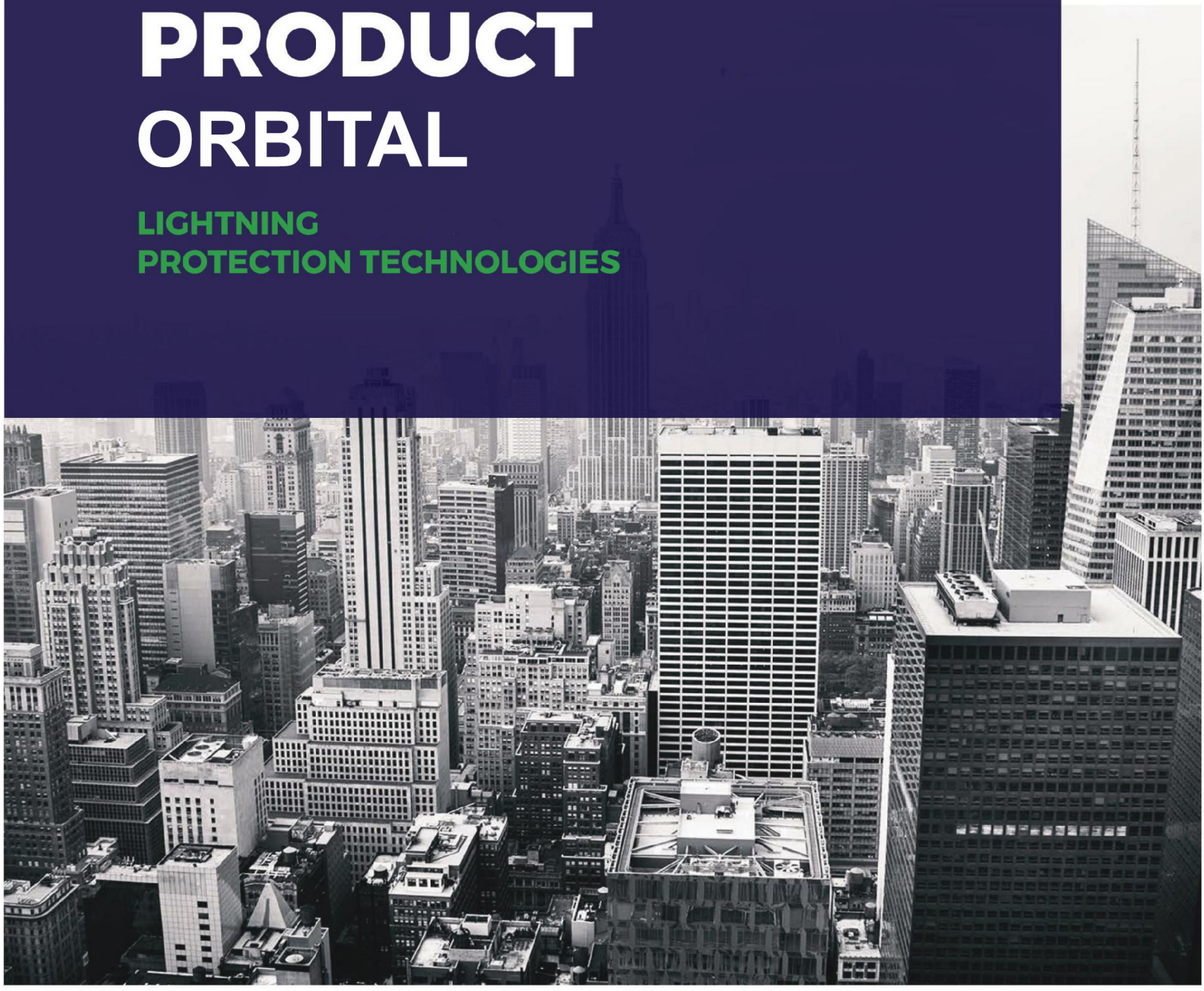
Summary Brochure

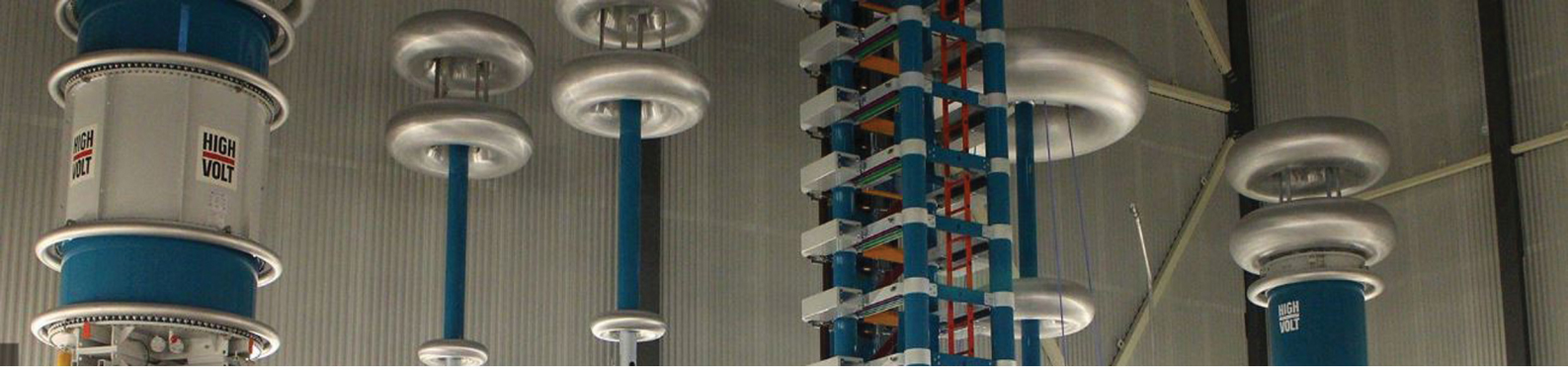
PRODUCT ORBITAL

LIGHTNING PROTECTION TECHNOLOGIES



ORBITAL

Advance Through Technics®



ABOUT ORBITAL

ORBITAL Lightning Protection Technologies is a fully compatible and competitive manufacturer and supplier of external direct strike lightning instruments,grounding/bonding equipments under ORBTech® brand, surge protection devices(SPDs) and all kinds of Lightning protection side products. For long successfull years, ORBITAL has been providing expertise for lightning protection insights to its customers in some of the most lightning prone areas of the world. Each of our personnel have extensive experience in risk management, system designings, training, installation, certification, qualifications, production and commissioning of all systems in a wide variety of industry groups like manufacturing, transportation, security and military zones.

ORBITAL also maintains a third party Quality Management System to AS/NZS ISO 9001:2015, ISO 14001:2015, ISO 29001:2010, OHSAS 9001:2007 and CE European Conformity certificates. ORBITAL 's most range of products and services are exported from its head Office, manufacture and research facility in Izmir, Turkey and via regional/local offices and branches worldwide in 4 continents.

Our company has been recognised in Turkey in a very respectful aspect by Ministry of Industry, Exporters Agencies and Trade Chambers. ORBITAL's fascinating production and export successes has been awarded by government and export agencies with many prestigious awards.

ORBITAL TECHS
LIGHTNING PROTECTION

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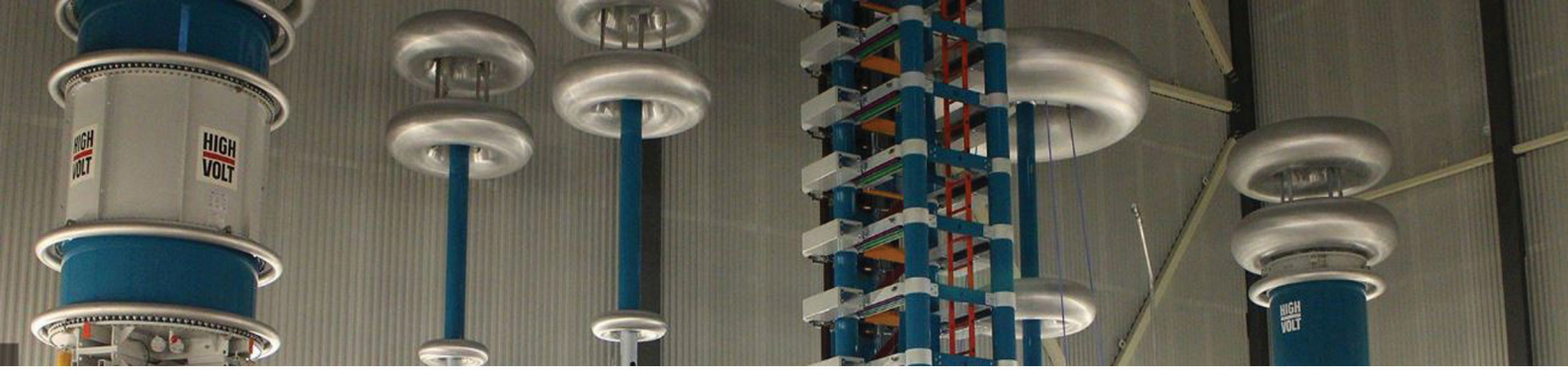
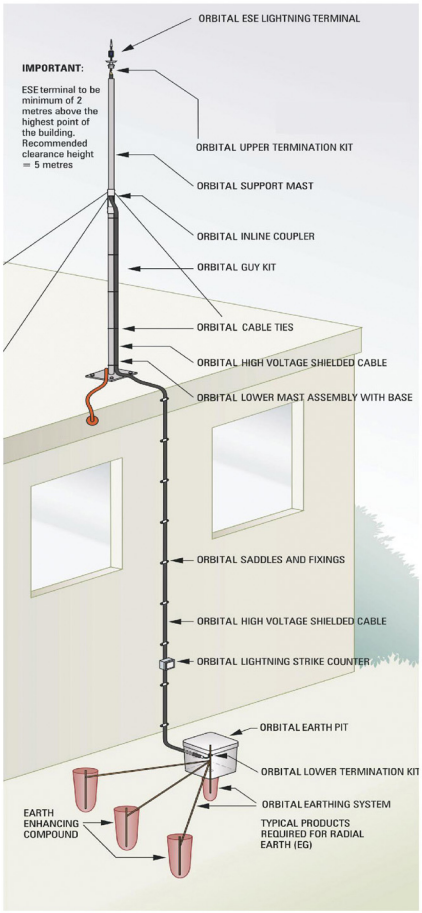
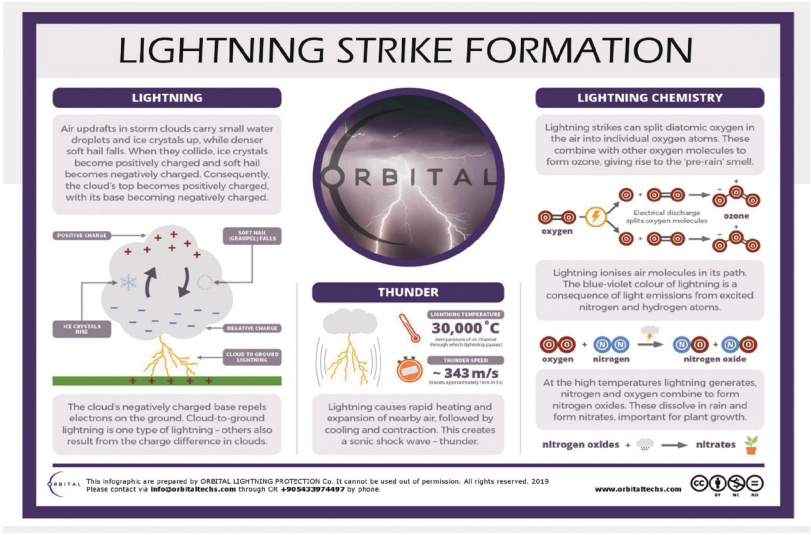


Lightning discharges are one of the most destructive and dangerous natural phenomenas.

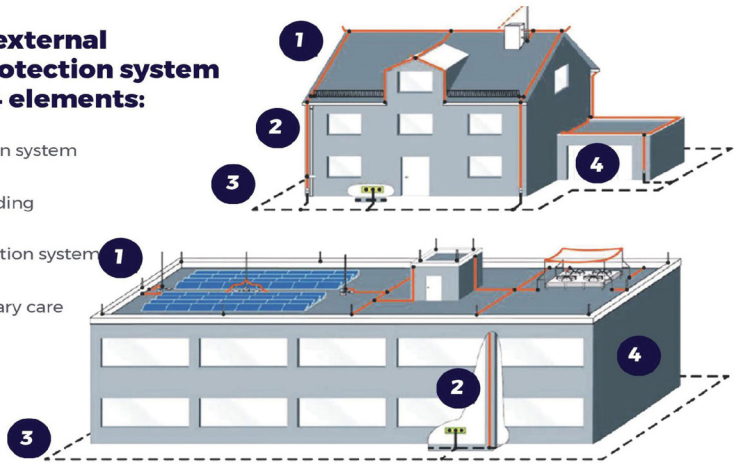
There are many atmospheric discharges during lightning storms and some of them can even reach hundreds of kiloamperes. These electrical discharges might mean great hazard to people, animals, buildings and electronical equipments as well. Economical consequences of Lightning strikes are also very curical and considerable. Lightning strikes can cause huge fire. A direct lightning discharge to a person results in current flowing through the body. This current stays a very short time on the body itself however its intensity is strong enough to provoke electrocution which resulting in heart failure and causing burns at different degrees.





A standard external lightning protection system consists of 4 elements:

1. Air termination system
2. Earthing/Bonding
3. Earth termination system
4. Complementary care



The protection radius (Rp) of an ESE teriminal is calculated using the following formula as defined in NF C 17-102 (2011)

$$Rp(h) = \sqrt{2rh - h2} + \Delta(2r + \Delta) \quad \text{for } h \geq 5\ m$$

Rp(h) = Protection radius at a given height (h)
h (m) = Height of the mast / pole

VALUES

r (m) = Protection Level I / Very High — Computer database centres, facilities, nuclear power stations
Protection Level II / High — Mass industrial zones, chemical manufacturing facilities
Protection Level III / Medium — Photovoltaic systems > 10 kW, Solar panels, Hospitals, Schools
Protection Level IV / Standard — Others

Δ = Time triggering advance time value of the ESE air terminal

CONTRA60 CSE Lightning Terminal is exclusively suitable to install where primary protection is needed like critical points; military zones and aero-space bases at higher protection radiuses range.

GENERAL DESCRIPTIONS

CONTRA60 Controlled Early Streamer Emission (CESE) lightning terminal can anticipate all other elements and items within its protectable range according to its protection level radius by intercepting the lightning strikes and conducting these strikes into the earth through the safest and projected ways. CONTRA60 CESE Terminal work as to principle of creating IONs by its internal ION GENERATION channels. This structure itself allows the terminal to conduct the high voltage lightning strikes, even up to 200kA, to the earthing system then to the earth at the safest way.

Tested and certified according to NFC 17-102/2011 Controlled Early Streamer Emission Standard including DeltaT (ΔT) advance time test, current withstanding test to determine CONTRA60's protection levels.	> High Salt mist treatment
	> Humid sulphurous atmosphere treatment
	> Current withstanding test: 200kA (10/350µs).
	> Advance time DeltaT (ΔT) test

TECHNICAL CHARACTERISTICS

Material	**Stainless Steel**
Weight	**3.00 kg**
Ext. Diameter	**120 mm.**
Lenght (h)	**52 cm.**
Box Lenght	**56 cm.**
Rod Diameter	**20 mm.**
Adapter Diameter	**60mm. Male**
IP Code	**IP67**
Working Temperature	**-25°C / 90°C**
Type of Terminal	**Electroatmospheric**
Internal Insulation	**High Density Polyurethane Resin**
Standard	**NFC 17-102/2011**
Grounding Method	**Wire/Tape**
Max. Current Withstand (10/350µs) / >2.5 MJ/Ω	**200kA**
Advance Time (ΔT)	**60 µs.**

PROTECTION RADIUS LEVEL

Height(m)	Rp (m) Early Streamer Emission			
	Level 1	Level 2	Level 3	Level 4
2	35	38	44	47
4	19	77	85	89
5	81	90	99	110
10	83	91	101	112

HELIA ESE Lightning Terminal is exclusively suitable to install for high-rise buildings, airports, naval bases, open areas, critical military zones, stadiums and highways.

GENERAL DESCRIPTIONS

HELIA Early Streamer Emission (ESE) lightning terminal can anticipate all other elements and items within its protectable range according to its protection level radius by intercepting the lightning strikes and conducting these strikes into the earth through the safest and projected ways. HELIA ESE Terminal work as to principle of creating IONs by its internal ION GENERATION channels. This structure itself allows the terminal to conduct the high voltage lightning strikes, even up to 200kA, to the earthing system then to the earth at the safest way.

Tested and certified according to NFC 17-102/2011 Early Streamer Emission Standard including DeltaT (ΔT) advance time test, current withstanding test to determine HELIA's protection levels.	> High Salt mist treatment
	> Humid sulphurous atmosphere treatment
	> Current withstanding test: 200kA (10/350µs).
	> Advance time DeltaT (ΔT) test

ISO 9001 QUALITY ASSURANCE MANGEMENT

ISO 14001 ENVIRONMENTAL MANAGEMENT

OHSAS 18001 OCCUPATIONAL HEALTH & SAFETY

CE

TECHNICAL CHARACTERISTICS

Material	**Stainless Steel**
Weight	**4.40 kg**
Ext. Diameter	**145 mm.**
Lenght (h)	**77 cm.**
Box Lenght	**81 cm.**
Rod Diameter	**20 mm.**
Adapter Diameter	**60mm. Male**
IP Code	**IP67**
Working Temperature	**-25°C / 90°C**
Type of Terminal	**Electroatmospheric**
Internal Insulation	**High Density Polyurethane Resin**
Standard	**NFC 17-102/2011**
Grounding Method	**Wire/Tape**
Max. Current Withstand (10/350µs) / >2.5 MJ/Ω	**200kA**
Advance Time (ΔT)	**67 µs.**

PROTECTION RADIUS LEVEL

Height(m)	Rp (m) Early Streamer Emission			
	Level 1	Level 2	Level 3	Level 4
2	35	38	44	47
4	19	77	85	89
5	81	90	99	110
10	83	91	101	112

ZERU ESE Lightning Terminal is specially suitable to install for solar and wind panels, telecommunication towers, hospitals, schools and transportation stations.

GENERAL DESCRIPTIONS

ZERU Early Streamer Emission (ESE) lightning terminal can anticipate all other elements and items within its protectable range according to its protection level radius by intercepting the lightning strikes and conducting these strikes into the earth through the safest and projected ways. ZERU ESE Terminal work as to principle of creating IONs by its internal ION GENERATION channels. This structure itself allows the terminal to conduct the high voltage lightning strikes, even up to 200kA, to the earthing system then to the earth at the safest way.

Tested and certified according to NFC 17-102/2011 Early Streamer Emission Standard including DeltaT (ΔT) advance time test, current withstanding test to determine ZERU's protection levels.	> High Salt mist treatment
	> Humid sulphurous atmosphere treatment
	> Current withstanding test: 200kA (10/350µs).
	> Advance time DeltaT (ΔT) test

TECHNICAL CHARACTERISTICS

Material	**Stainless Steel**
Weight	**3.60 kg**
Ext. Diameter	**155 mm.**
Lenght (h)	**58 cm.**
Box Lenght	**62 cm.**
Rod Diameter	**20 mm.**
Adapter Diameter	**60mm. Male**
IP Code	**IP67**
Working Temperature	**-25°C / 90°C**
Type of Terminal	**Electroatmospheric**
Internal Insulation	**High Density Polyurethane Resin**
Standard	**NFC 17-102/2011**
Grounding Method	**Wire/Tape**
Max. Current Withstand (10/350µs) / >2.5 MJ/Ω	**200kA**
Advance Time (ΔT)	**60 µs.**

PROTECTION RADIUS LEVEL

Height(m)	Rp (m) Early Streamer Emission			
	Level 1	Level 2	Level 3	Level 4
2	31	35	39	43
4	63	69	78	85
5	79	86	97	107
10	79	88	99	109