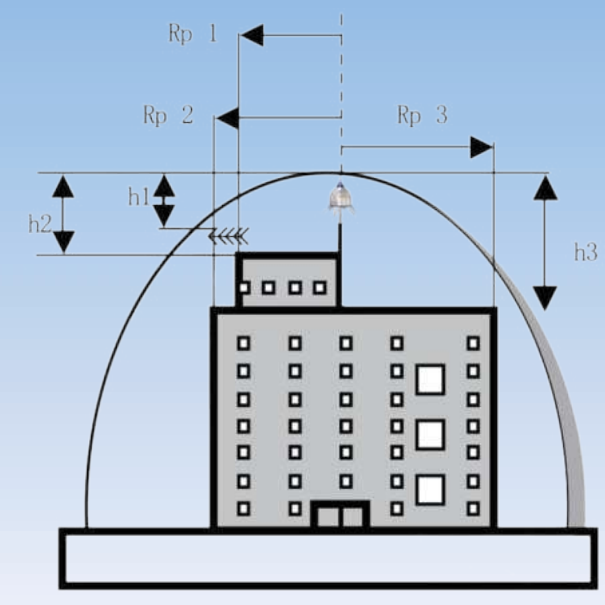


Installation procedure for ACS ESE Air Terminal is governed by the latest French standard NF C 17-102 and follows a series of simple rules catering for all type of structure; (Referring to installation stated in French standard NF C 17-102_2011)



- ① ACS ESE air terminal
- ② Elevation pole
- ③ Copper conductor
- ④ Copper clamp
- ⑤ Lightning counter
- ⑥ Test clamp
- ⑦ Protection sheath
- ⑧ Earth clamp
- ⑨ Inspection housing
- ⑩ Copper earthing
- ⑪ Rod to conductor clamp
- ⑫ Earth rod

Additional protection against direct lightning strike for the highest 20% of the structure height for buildings greater than 60m or any point above 120m by using ACS ESE Air Terminal or any other means, must be implemented at each facade wall according to a valid standard. Furthermore, a minimum of 4 down conductors interconnected by a ring conductor when applicable, shall be used, distributed along the perimeter, and if possible at each angle of the building.

NOTE: In general, the risk due to the lateral flashes is low because only a few percent of all flashes to tall structures will be to the side and moreover their parameters are a lot lower than those of flashes to the top of structures.



ACS

● **Lightning Protection System Products**

✓ **ACS Direct Lightning Protection (ESE AIR TERMINAL, TESTER, COUNTER, EARTHING MATERIAL)**



✓ **ACS Power Line Surge Protection (TYPE1+2, T1, T2, T3 SPD)**



✓ **ACS Signal Line Surge Protection (DATA, NETWORK, CCTV, CAMERA, PHONE, ANTENNA...SPD)**

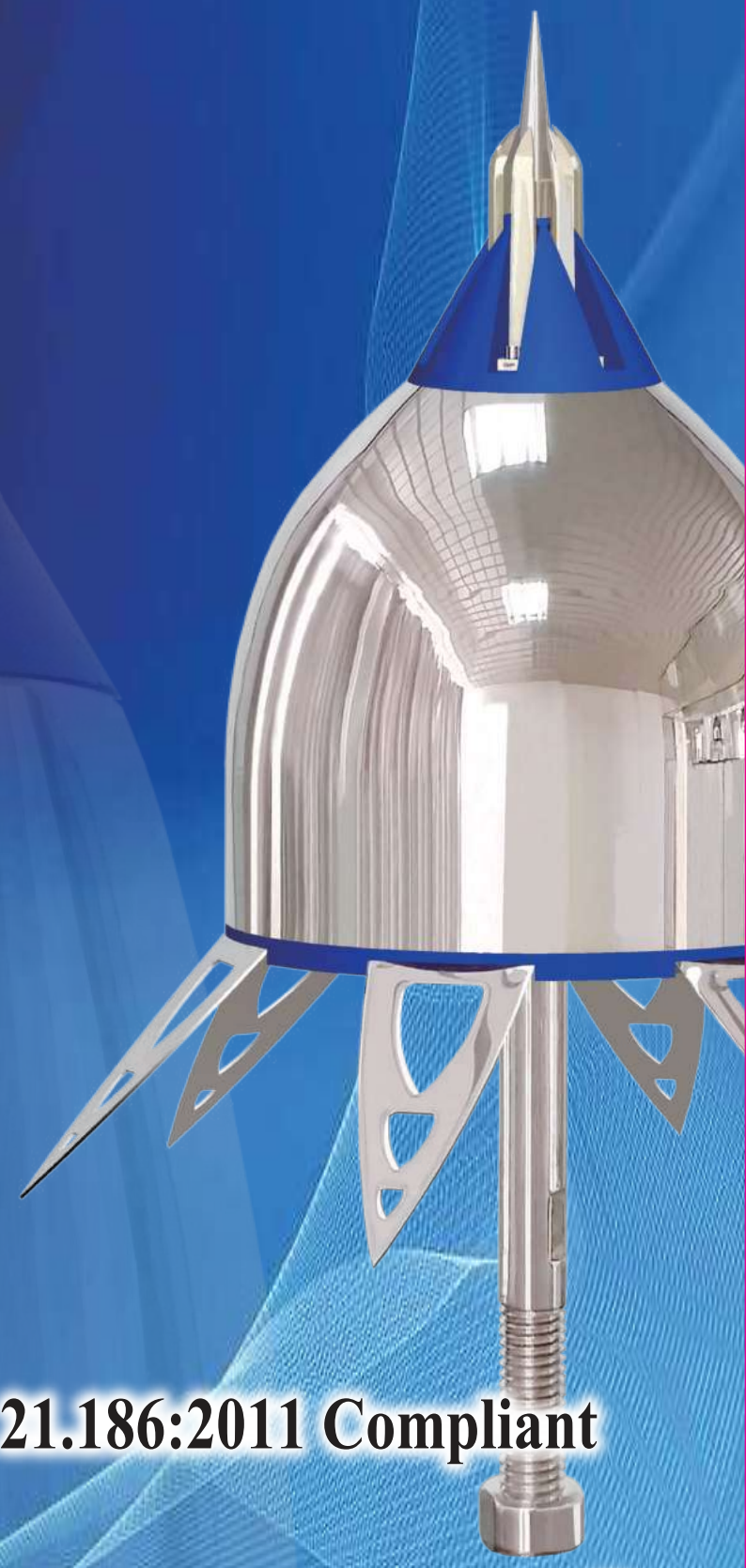


ACS ESE AIR TERMINAL

NF C 17-102:2011 & UNE 21.186:2011 Compliant
CE & Patented



ACS



ACS is one of the TOP brands specializing in lightning & surge protection field around the world, especially **UPDATED ACS Early Streamer Emission Air Terminal** according to international most popular standards for structural lightning protection.

Key Benefits:

- ✓ Series **PATENTED** models offering customized solutions for each project.
- ✓ Successfully **TESTED** according to NF C 17-102:2011 Annexe C & UNE 21.186:2011 Paragraph C at **ACCREDITED** High-Voltage Laboratories in Europe (SPAIN & Romania) & Shanghai (Authorized Test Reports with **ilac-MRA, ENAC, Romania-RENAR, CAL & CMA** marks) as well as **CE certificate** to ensure your full satisfaction.
- ✓ ACS ESE air terminal only becomes active when electrical field intensity rises (lightning discharge likely), ESE air terminal presents no danger to the site.
- ✓ Fully reliability, even in extreme climatic conditions.
- ✓ Robust to withstand multiple lightning strikes.
- ✓ Standardized Manufacturing Process.

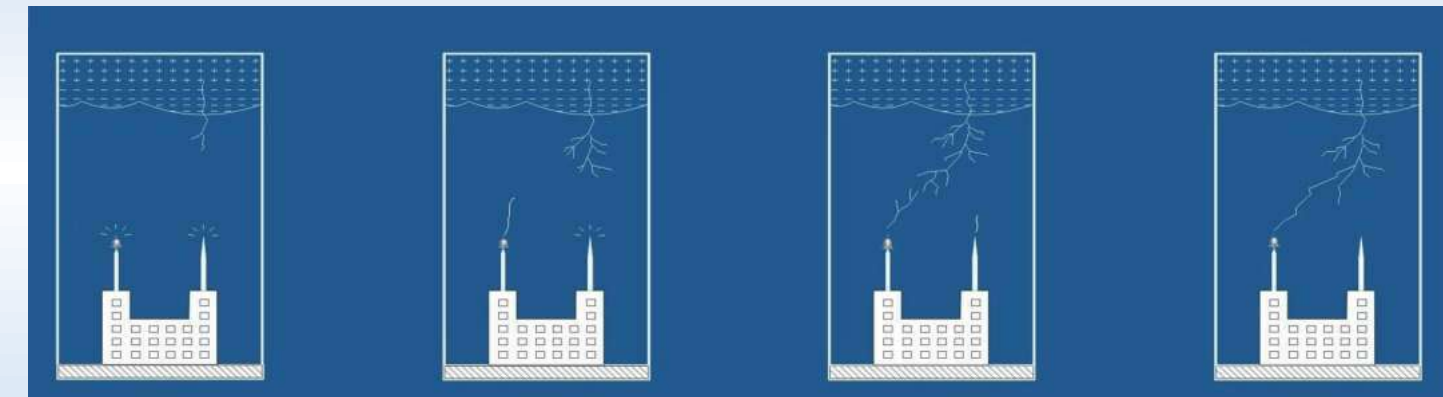


ACS / AC30

Patent No. ZL 2013 3 0019136.3

- 1. The IONIZATION SYSTEM IS CHARGED** - via the lower electrodes using the ambient electrical field (several thousand volts/meter when storms are approaching), which means ACS Air Terminal is a fully autonomous system requiring no external power supply.
- 2. ACTIVATING THE NEW ACS-ESE TECHNOLOGY** - Whilst dynamically assessing the development of the surrounding electrical field, the ACS-ESE detects the appearance of downward leaders. This innovative ACS-ESE system is then activated to neutralize the space charges, which naturally occur around the air terminal. The ACS-ESE Air Terminal is always ready to operate in an optimal environment.
- 3. CONTROLLING THE IONIZATION PROCESS** - The ambient electrical field increases rapidly when a discharge is imminent and a downward leader descends from cloud to ground. This triggers the ionization process, using a spark ionization system between the upper electrodes and the central tip. The ACS-ESE Air Terminal reacts at the precise moment, when the risk of lightning discharge is imminent.
- 4. EARLY TRIGGERING OF THE UPWARD LEADER** - The controlled ionization process and the new ACS-ESE technology guarantee the triggering of an upward leader ahead of any other protruding point within the area to be protected, making ACS-ESE Air Terminal to be the preferential point of impact for the lightning discharge and provides the structure with maximum protection.

Comparing ACS ESE Air Terminal with generic air terminal.



A-1

A-2

A-3

A-4



ACS / AC40

Patent No.: ZL 2013 3 0032034.5



ACS / AC50

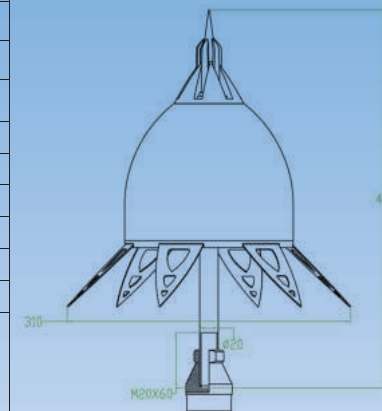
Patent No.: ZL 2013 3 0019139.7



ACS / AC60

Patent No. ZL 2013 3 0019138.2

TSTLP® Model	AC60	AC50	AC40	AC30
Patent N°	2013300191382	2013300191397	2013300320345	2013300191363
Efficiency (AT)	60µs	50µs	40µs	30µs
Standard Deviation ESE / Single Rod σ	σ _{ESE} < 0.4 σ _{PTS}	σ _{ESE} < 0.5 σ _{PTS}	σ _{ESE} < 0.55 σ _{PTS}	σ _{ESE} < 0.6 σ _{PTS}
Lightning current withstanding test Iimp	100kA (normative test at 10/350µs waveform as standard requires)			
Lightning current withstanding Iimp	≥ 200kA (10/350 µs)			
Capacity against wind speed	≥40 m/s			
Dimension(Length)	408mm			418 mm
Approx net weight	4.0 kg	3.8 kg	3.5 kg	3.0 kg
Enclosure material	Stainless Steel (Superior Quality)			
Test standards	NF C 17-102:2011 Annexe C IEC 60060-1:2010 Part 1 GB/T T 16927.1-2011 Part 1		UNE 21.186:2011 Paragraph C EN 60060-1:2010	



Size(mm)

Protection Radius.

The protection radius of ACS ESE Air Terminal is related to its height (h) relative to the surface to be protected, to its efficiency and to the selected protection level

$$R_p(h) = \sqrt{(2r-h)h + \Delta(2r + \Delta)} \quad \text{for } h \geq 5 \text{ m}; \quad \text{and } R_p = h \times R_p(5)/5 \quad \text{for } 2 \text{ m} \leq h \leq 5 \text{ m}$$

R_p(h) (m): is the protection radius at a given height h

h (m) : is the height of the ESE air terminal tip over the horizontal plane through the furthest point of the object to be protected

r (m) : 20m for protection level I

30m for protection level II

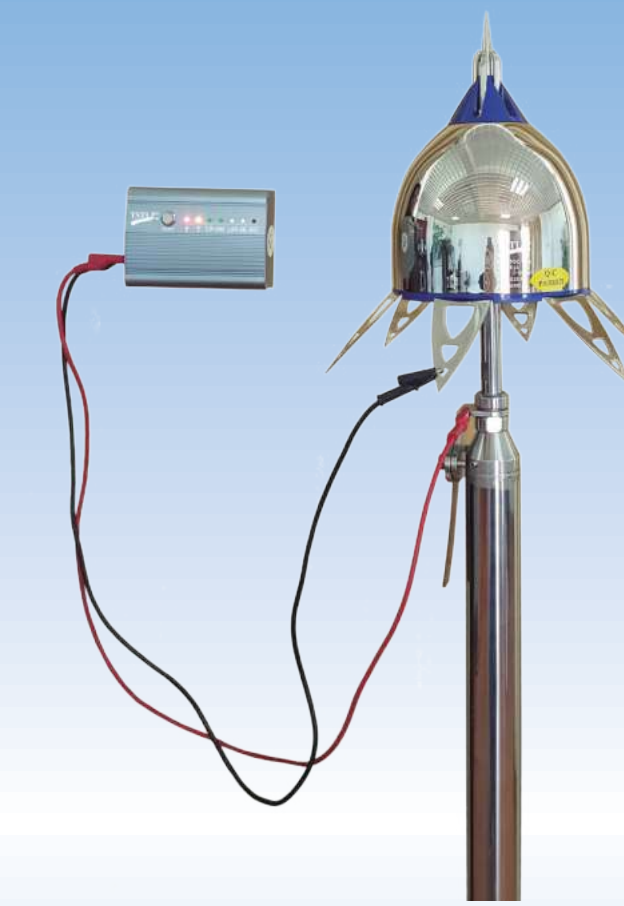
45m for protection level III

60m for protection level IV

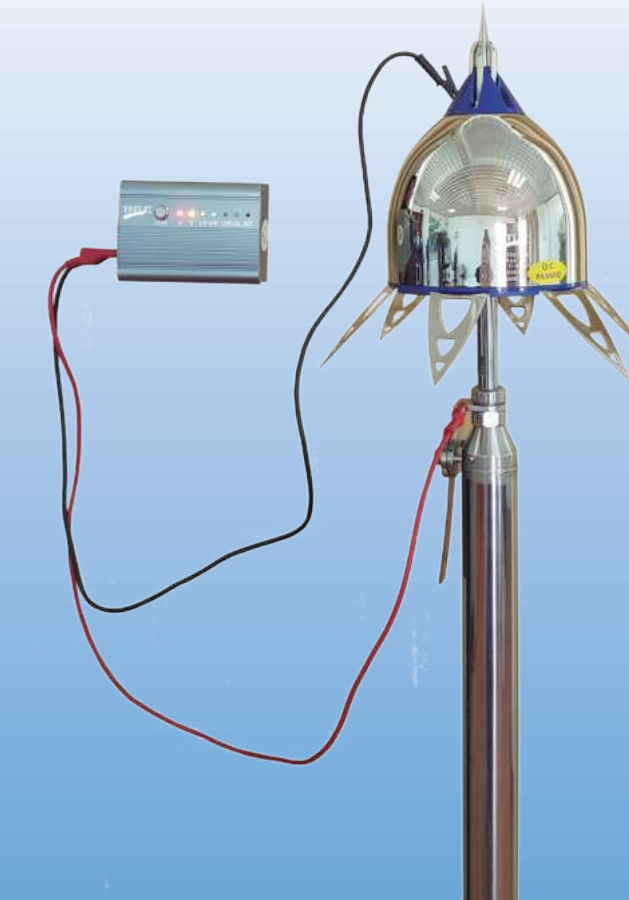
$$\Delta (m) = \Delta T \times 10^6$$

Field experience has proved that Δ is equal to the efficiency obtained during the ESE Air Terminal evaluation tests

Protection Level	Level I (99% D=20M)				Level II (97% D=30M)				Level III (91% D=45M)				Level IV (84% D=60M)			
	ACS-ESE				ACS-ESE				ACS-ESE				ACS-ESE			
ACS Model	30	40	50	60	30	40	50	60	30	40	50	60	30	40	50	60
(Δ T)	30µs	40µs	50µs	60µs	30µs	40µs	50µs	60µs	30µs	40µs	50µs	60µs	30µs	40µs	50µs	60µs
h (m)	Radius Protection (m)															
2	19	23	27	32	22	26	30	34	25	30	34	39	28	34	38	43
3	29	35	41	47	33	39	46	52	38	45	52	58	43	50	57	64
4	38	46	54	63	44	52	61	69	50	60	69	78	57	67	76	86
5	48	58	68	79	55	65	76	86	63	75	86	97	71	84	95	107
6	48	58	69	79	55	66	76	87	64	76	87	97	72	84	96	107
8	49	59	69	79	56	66	77	87	65	77	87	98	73	86	97	108
10	49	59	69	79	57	67	77	88	66	77	88	99	75	87	98	109
12	49	59	70	80	57	68	78	88	67	78	89	100	76	88	99	110
20	50	60	70	80	59	69	79	89	71	81	92	102	81	92	102	113
30	/	/	/	/	60	70	80	90	73	84	94	104	85	95	106	116
45	/	/	/	/	/	/	/	/	75	85	95	105	89	99	109	119
60	/	/	/	/	/	/	/	/	/	/	/	/	90	100	110	120



LOWER ELECTRODE TEST
Status - **OK**



UPPER ELECTRODE TEST
Status - **OK**



ACS ESE TESTER



PORTABLE ACS ESE TESTER