



ADVANCED LIGHTNING
PROTECTION SYSTEMS LTD.

ALPS

ESE Lightning Devices



CERTIFICADO POR
AENOR

Tested and certified to the standard **NF C 17-102: 2011**



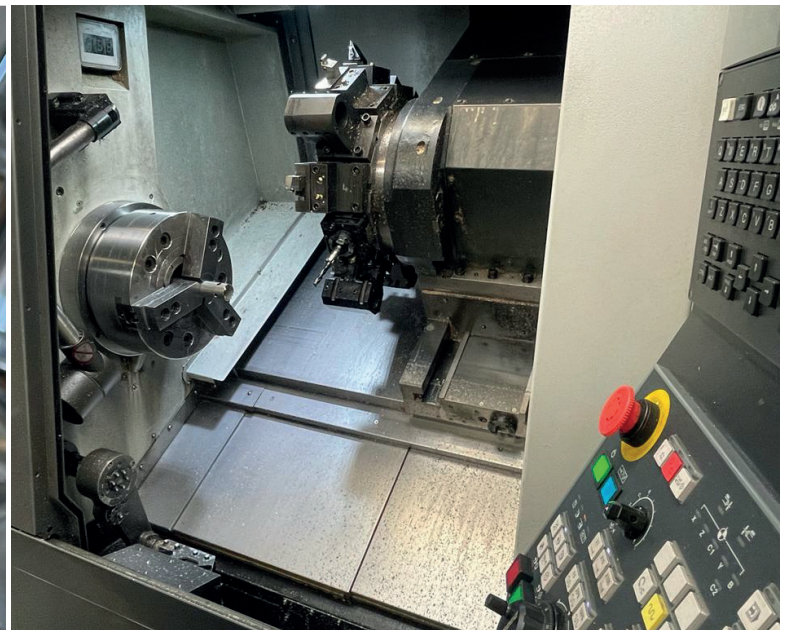
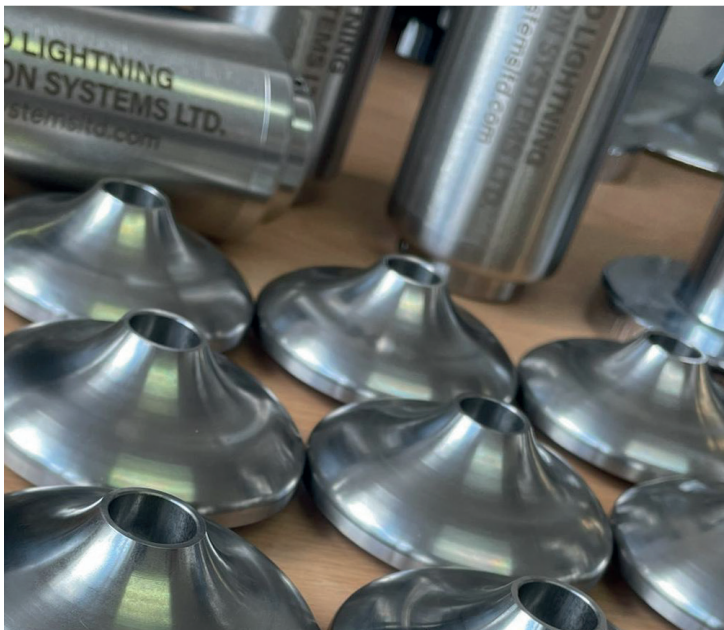


About Us

Established in 2017 Advanced Lightning Protection Systems Ltd.® is a leading UK provider of cutting-edge lightning protection solutions, specialising in safeguarding structures and critical assets from the devastating effects of lightning strikes. With the use of innovative technology, we are the first and only UK company to produce laboratory tested early streamer emission systems certified by a standardisation and certification association. Thanks to the use of advanced technology and modern methods we have successfully grown domestically providing our products to leading UK companies along with providing our high-quality systems internationally to companies in Europe and Asia.

We pride ourselves on quality and safety which is why we collaborate with various leading universities, testing facilities and certification organisations in both the UK and Europe to ensure our products meet all standards and requirements.

With a focus on innovation, sustainability, and safety, Advanced Lightning Protection Systems Ltd.® has garnered recognition for its modern technologies that provide unparalleled protection against lightning strikes. Through years of dedicated research and development, we have developed a range of solutions catering to various sectors, including residential, commercial, industrial, and infrastructure. Our products embody precision engineering and uncompromising quality. We are committed to exceeding customer expectations, Advanced Lightning Protection Systems Ltd.® has built enduring partnerships with global clients, making a profound impact on safeguarding lives, assets, and operations in the face of nature's most formidable force.



Active Lightning Protection



Advanced Lightning Protection Systems Ltd.® is the only UK company to produce tested ESE devices assessed by a certification organisation. We provide high-quality early streamer emission lightning protection systems; by using advanced technology the ALPS ESE system offers several advantages over conventional lightning protection methods.

- Enhanced protection radius
- Improved efficiency
- Reduced visual impact
- Reduced material usage
- Reduced maintenance costs
- Extensively tested

ALPS ESE lightning protection systems provide advanced and effective solutions for safeguarding structures against the devastating impact of lightning strikes. Designed to offer an extended protection radius and faster response time, ALPS ESE systems utilize innovative technology to intercept lightning at a greater distance, reducing the risk of direct strikes and potential damage. Our systems are engineered to emit an upward leader in response to approaching lightning, creating a preferred path for the electrical discharge. Their versatility, modern technology, and reduced maintenance needs make ALPS ESE lightning protection systems a trusted choice for ensuring safety and structural integrity in the face of lightning-related risks. ALPS ESE products are manufactured to ISO 9001:2015 and are subjected to rigorous laboratory testing. Products are supported by test reports, technical data, and installation instructions.

Advanced Lightning Protection Systems Ltd.® offers three different versions of the ALPS Early Streamer Emission (ESE) air terminal:

- **ALPS ESE 20** - With a triggering advance of: 20 μ s
- **ALPS ESE 35.5** - With a triggering advance of: 35.5 μ s
- **ALPS ESE 60** - With a triggering advance of: 60 μ s

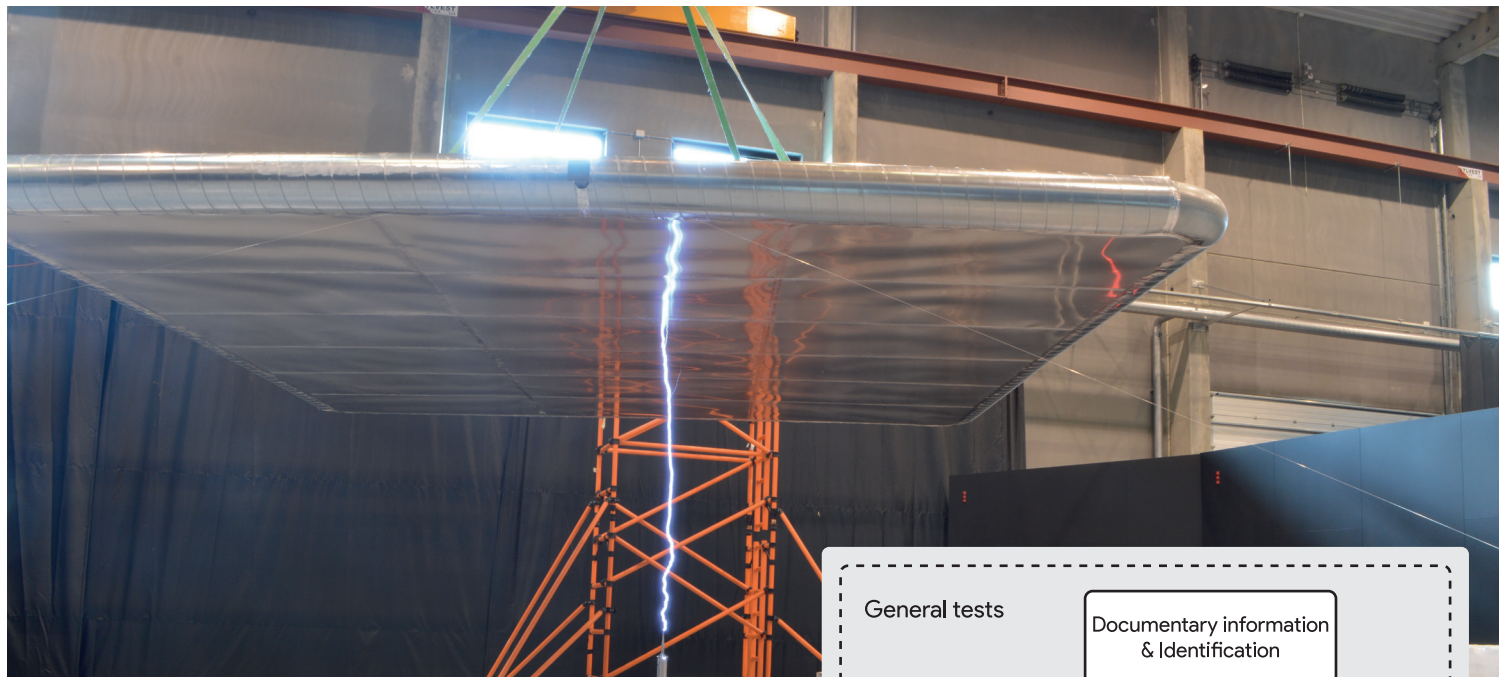
The ALPS Early Streamer Emission Air Terminals (ESEAT) are in accordance with the September 2011 edition of NF C 17-102. The design requirements, protection level calculations and protection radius are obtained from this standard.

Our ESE technology uses an electronic circuit designed working alongside Aston University. This circuit is what makes the device function generating an upward leader and delivering an ionised route for discharge to earth. No external power supply is required for the device to operate.

**This image does not represent a real-world installation and is for illustration purposes only*



Testing & Working Principle



Testing

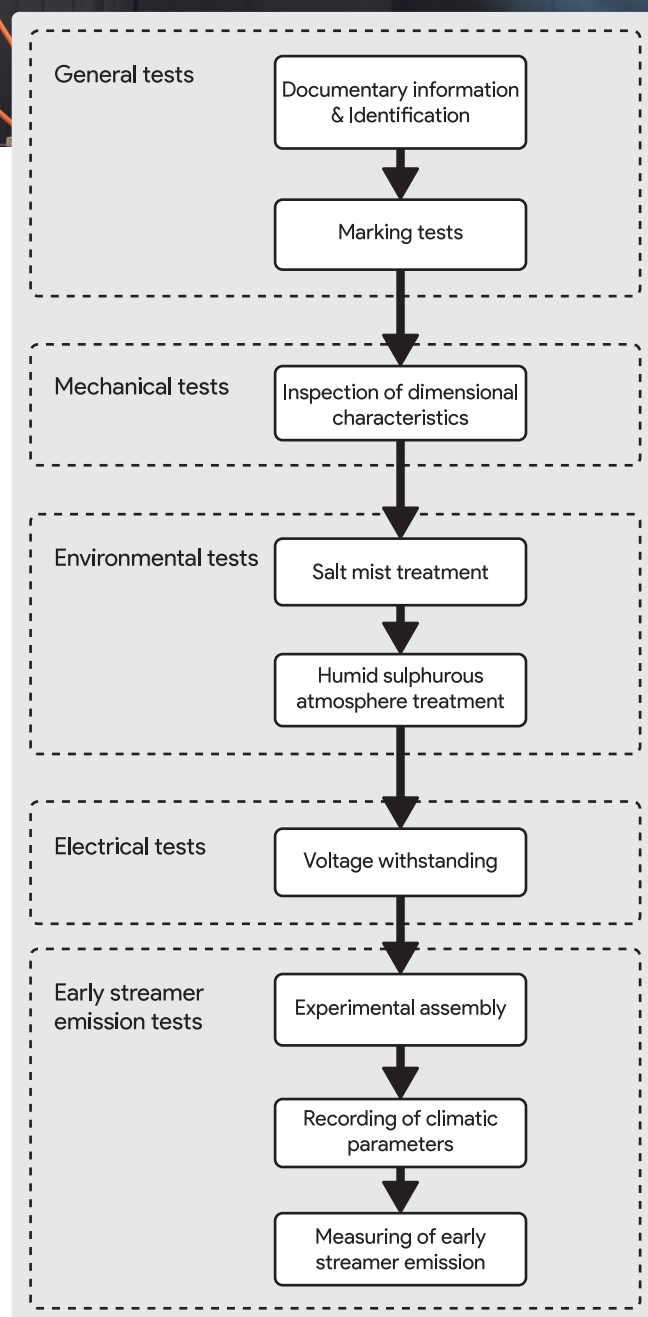
ALPS ESE devices have been extensively tested at independent high-voltage laboratories in accordance with the 2011 requirements of the European NF C 17-102 standard. The testing, as defined in the standard, was designed to simulate naturally occurring conditions to allow comparison of the performance between the different types of lightning protection systems.

Replacing the 1995 version of NF C 17-102 the 2011 version implements a new sequence of tests which all ALPS ESE devices have passed successfully. General, mechanical, and environmental tests are performed before the device is subjected to three consecutive current impulses of 100 kA in 10/350 wave form, finally the same sample is tested for the ESE advance time (ΔT).

As well as testing required in accordance with the NF C 17-102: 2011 standard ALPS ESE systems have also been tested through WMG - The University of Warwick for resistance to high speed winds through simulation tests with speeds reaching 100 mph.

The 2011 revision of the NF C 17-102 standard has defined more rigorous environmental and performance criteria during testing and has introduced a higher standard for early streamer emission air terminals.

* Test reports available upon request.



Testing & Working Principle

Working Principle

ALPS ESE technology uses the atmospheric gradient to store energy. When the device is charged, and a strike is imminent the device activates the release of the accumulated energy. The upward leader delivers an ionised route for discharge to earth. No external power supply is required for the device to operate.

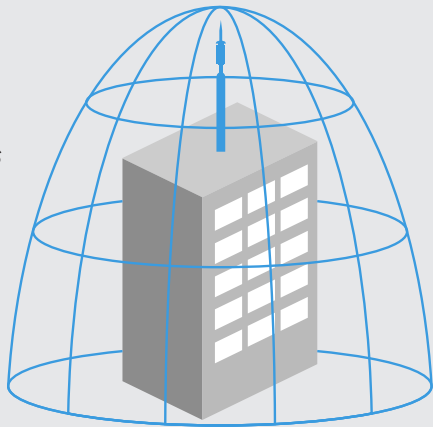
It's thanks to this advanced technology that ALPS ESE devices are designed to emit an upward leader earlier than conventional lightning rods in response to an approaching lightning discharge. It's for this reason that our ALPS ESE devices can intercept lightning strikes at a greater distance providing an increased protection radius.

ALPS ESE Devices

Early Streamer
Emission Air Terminals

NF C 17-102: 2011

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Key Features

- Available in three different models to suit specific site protection requirements
- Developed and tested working alongside leading UK Universities and testing facilities around Europe
- Designed, tested and certified to the standard NF C 17-102: 2011 through AENOR
- Manufactured using high grade 304L stainless steel and suitable for most environments
- Use ALPS Authenticate to ensure your device is a genuine product manufactured by Advanced Lightning Protection Systems Ltd.®



Protection Radius

The radius of protection ‘Rp’ of an ALPS ESE is calculated by using the standard NF C 17-102 (September 2011).

It depends on the ESEAT efficiency ‘ΔT’ of the ALPS ESE measured in a high voltage laboratory, on the levels of protection I, II, III or IV calculated according to the lightning risk assessment guides (NF C 17-102 annex A or IEC 62305-2) and on the height ‘h’ of the ALPS ESE device over the area to be protected (minimum height = 2 m).

Note: According to NF C 17-102: 2011, for tested results of ΔT greater than 60 μs, the early streamer emission time will be considered ΔT= 60 μs

ΔT			r values			
ESE 20	ESE 35.5	ESE 60	LVL I	LVL II	LVL III	LVL IV
20 μs	35.5 μs	60 μs	r = 20	r = 30	r = 45	r = 60

H (m)	Protection Level											
	I			II			III			IV		
	ESE 20	ESE 35.5	ESE 60	ESE 20	ESE 35.5	ESE 60	ESE 20	ESE 35.5	ESE 60	ESE 20	ESE 35.5	ESE 60
2	15	21	31	17	24	35	20	28	39	23	31	43
3	22	32	47	26	36	52	31	42	58	35	47	64
4	30	43	63	35	48	69	41	56	78	46	62	85
5	37	53	79	43	61	86	51	70	97	58	78	107
6	37	54	79	44	61	87	52	70	97	59	79	107
8	38	54	79	45	62	87	53	71	98	61	80	108
10	39	55	79	46	62	88	55	72	99	62	81	109



Where $h \geq 5$ m; the radius of protection can be calculated by:

$$R_p(h) = \sqrt{(2rh - h^2 + \Delta(2r + \Delta))}$$

Where $2 \text{ m} \leq h \leq 5 \text{ m}$; the radius of protection can be calculated by:

$$R_p = h \times R_p(5) / 5$$

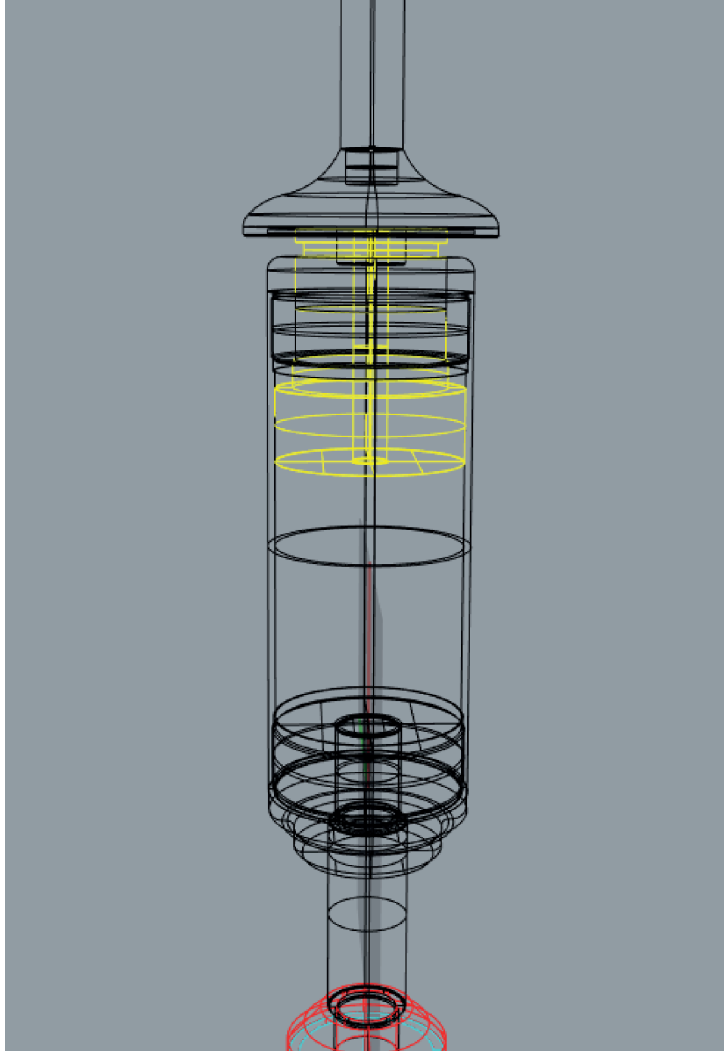
$R_p(h)$ (m) is the protection radius at a given height h

h (m) is the height of the ESEAT tip over the horizontal plane through the furthest point of the object to be protected

r (m) 20 m for protection level I
30m for protection level II
45m for protection level III
60m for protection level IV

Δ (m) $\Delta = \Delta T \times 10^6$
Field experience has proved that Δ is equal to the efficiency obtained during the ESEAT evaluation tests

Research & Development



Collaboration with specialists

After several years of long work, research and testing Advanced Lightning Protection Systems Ltd.® have created the first fully tested, laboratory proven, and certified ESE system manufactured by a UK engineering company.

Working with specialists in electronic development at Aston University an electronic circuit was produced. The electronics in the ALPS ESE device controls the emission of the upward leader from the emitter. It regulates the release of the ionized charge to create a well-defined path for the upward leader to develop. This process involves precise timing and control to ensure the upward leader's proper initiation and guidance towards the approaching lightning discharge.

A specialist from Manchester University with expertise in high voltage and electrical power engineering provided field enhancement simulation testing on the ALPS ESE device with encouraging results prior to high voltage laboratory tests being performed.

Testing was carried out to NF C 17-102: 2011 via ISO 17025 accredited laboratories in the UK and around Europe, while additional testing such as wind simulation was carried out in the UK in conjunction with specialists at WMG - The University of Warwick.

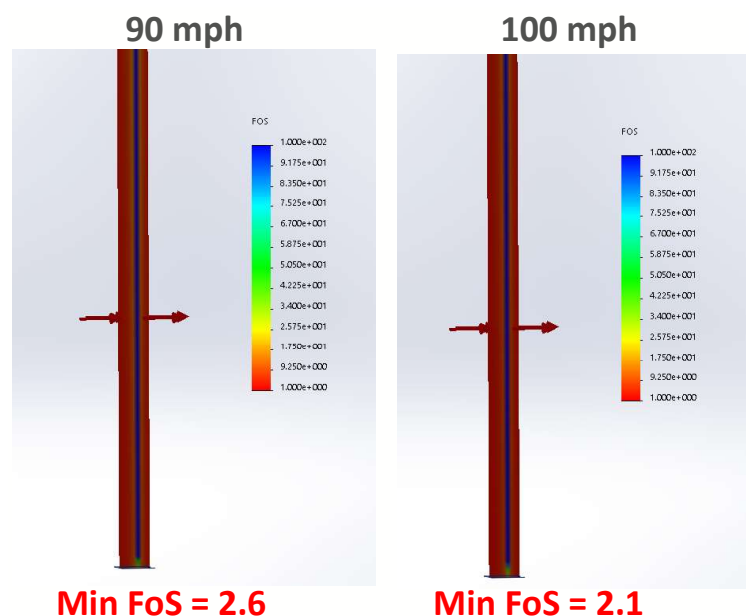


Certified by AENOR

We have worked closely with AENOR, The Spanish Association for Standardisation (<https://www.en.aenor.com/>) and gained an AENOR certificate of conformity for our ESE systems.

ALPS ESE devices have now been developed and tested in collaboration with eight different facilities and organisations including Warwick University, Sheffield University, Aston University, Manchester University, Cobham Technical Services, ICMET Craiova, ITE Instituto Tecnológico de la Energía & AENOR.

It's thanks to our dedication to quality and safety that the ALPS ESE device is one of the most heavily researched and tested devices on the market.



ALPS Authenticate

We are now introducing the ability to authenticate your device so you can confirm the device you have purchased is a genuine ALPS manufactured product from an approved supplier.

You will require some basic information including: serial number, product model, your supplier / distributors name, along with some general information.

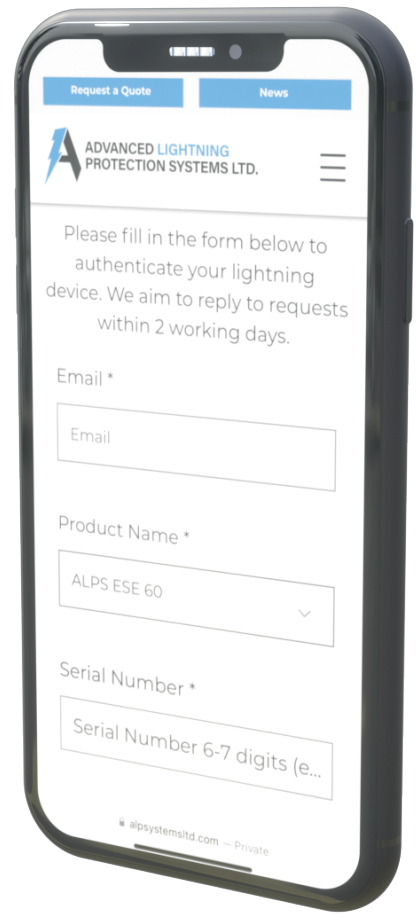
Both the product model and the serial number will be provided with your device. This information can be found from the following two methods:

- The information attached to the box
- The details engraved on your ALPS ESE device

General information will be required such as your name, company, country and your email address.

Visit the authenticate page on our website; you can do this by scanning any of the QR codes supplied with your product and clicking the 'Authenticate' button or by visiting www.alpsystems ltd.com/authenticate. Once there you will see a form to fill in, enter all the required information and submit your details, you will receive an email confirming we have received your request.

Once you have submitted the required information and we have received your request for authentication we will aim to reply within two working days via email. You will receive a digitally signed PDF confirmation of authenticity.



ALPS AUTHENTICATE



ALPS ESE Technical Data:

Testing Standard:	NF C 17-102:2011		
Origin:	United Kingdom		
HS Code:	8535.40.00		
Specifications:			
ALPS ESE Model:	ALPS ESE 20	ALPS ESE 35.5	ALPS ESE 60
ESE Efficiency (ΔT):	20 μs	35.5 μs	60 μs
Withstand Current (10/350):	100 kA		
Protection radius (h = 5m, Level IV) (m):	58	78	107
Wind Resistance:	Min FoS = 2.1 (100 mph)		
Housing Material:	Stainless Steel 304L		
Mast Fixing:	M20 Thread		
Down Conductor Connection:	Brass Connector		
Warranty:	5 years		
Dimensions (excluding adaptors & connectors):	\varnothing 74 x 216 mm	\varnothing 74 x 361 mm	\varnothing 74 x 401 mm
Box Contents:	ALPS ESE Device, QR code key tag, Allen key set, Connector for mast		
Working Environment:	Suitable for most environments; including corrosive atmospheres		
NET Weight (kg):	2.42	2.68	3.02
Gross Weight (kg):	2.9	3.12	3.5

Testing & Certification (NF C 17-102:2011 & Additional)

Testing By:	WMG - University of Warwick, Sheffield Hallam University, Cobham Lightning Testing and Consultancy (Element), ICMET Laboratory Craiova, ITE Instituto Tecnológico de la Energía
Manufactured to ISO 9001: 2015:	URS Accreditation
Certification:	AENOR Certificate of Conformity (No: A28/000049)

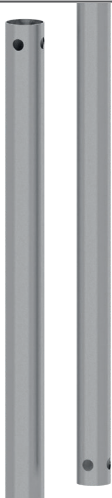


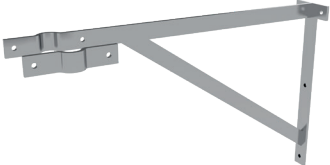


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Product Details

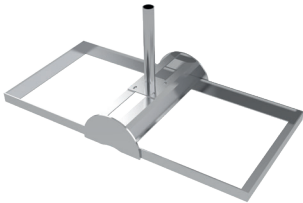




ALPS ESE Devices: <i>ALPSESEAT: ALPS ESE 20, ALPS ESE 35.5, ALPS ESE 60</i> ALPS ESE 20 20 μs 2.9 kg ALPS ESE 35.5 35.5 μs 3.12 kg ALPS ESE 60 60 μs 3.5 kg <i>Devices manufactured to NF C 17-102: 2011</i>	ALPS Standard Lightning Counter: <i>ALPSCOUNTER: 810 407</i> The counter is installed on the down conductor to record the number of lightning strikes. Registry range: 0-99999999 Impulses 0.34 kg	Brass Mast Connector: <i>BRASSCON: BC48, BC40, BC35</i> For connecting the mast to the ALPS ESE device with down conductor connections. To fit mast sizes (mm): Ø 48, Ø 40, Ø 35 0.72, kg, 0.52 kg, 0.36 kg screws etc. included*	ST/ST Vertical Mounting Bracket: <i>VBCKTST: VBCKT250, VBCKT350</i> Vertical stainless steel side mounting bracket for ALPS masts To fit mast sizes (mm): Ø 48, Ø 40, Ø 35 Length: 250 mm, 350 mm 1.74 kg, 2.02 kg

Product Details

					
ALPS ST/ST Lightweight Mast: <small>STMAST: STMAST2M, STMAST3M, STMAST4M, STMAST5M, STMAST6M</small>		ALPS Galvanized Heavy Duty Mast: <small>GALVMAST: GALVMAST2M, GALVMAST3M, GALVMAST4M, GALVMAST5M, GALVMAST6M</small>		ST/ST Horizontal Mounting Bracket: <small>HBCKTST: HBCKT250, HBCKT350</small>	ST/ST Large Mounting Bracket: <small>LBCKTST: LBCKT750</small>
Stainless steel masts used for mounting the ALPS ESE device. They can be used with our mounting brackets, tripods or base stands		Galvanized heavy duty masts used for mounting the ALPS ESE device. They can be used with our mounting brackets, tripods or base stands		Horizontal stainless steel side mounting bracket for ALPS masts.	Large supported stainless steel side mounting bracket for ALPS masts.
Available sizes:		Available sizes:		To fit mast sizes (mm): Ø 48, Ø 40, Ø 35 Length: 250 mm, 350 mm 1.74 kg, 2.02 kg	To fit mast sizes (mm): Ø 48, Ø 40, Ø 35 Length: 750 mm 6.18 kg
				Galvanized Base Stand: <small>BASESTD: BASESTDWO, BASESTDW</small>	Galvanized Tripod Stand: <small>TRISTD: TRISTD</small>
Single sections: Ø 35 mm x 1 m (extension) 1.7 kg Ø 35 mm x 2 m 3.3 kg Ø 35 mm x 3 m 5 kg Two sections: Ø 40 mm (lower section) x 4 m 6.7 kg Ø 40 mm (lower section) x 5 m 8.3 kg Ø 40 mm (lower section) x 6 m 10 kg weight excluding adaptors*		Single sections: Ø 48 mm x 1 m (extension) 3.1 kg Ø 48 mm x 2 m 6.1 kg Ø 48 mm x 3 m 9.2 kg Two sections: Ø 48 mm (lower section) x 4 m 12 kg Ø 48 mm (lower section) x 5 m 15 kg Ø 48 mm (lower section) x 6 m 18 kg weight excluding adaptors*		Galvanized base stands for mounting ALPS masts on a flat surface. Available with weight sections. To fit mast sizes (mm): Ø 48, Ø 40, Ø 35 16.04 kg, 39.0 kg	Galvanized tripod stands for mounting ALPS masts on a flat surface. To fit mast sizes (mm): Ø 48, Ø 40, Ø 35 7.42 kg

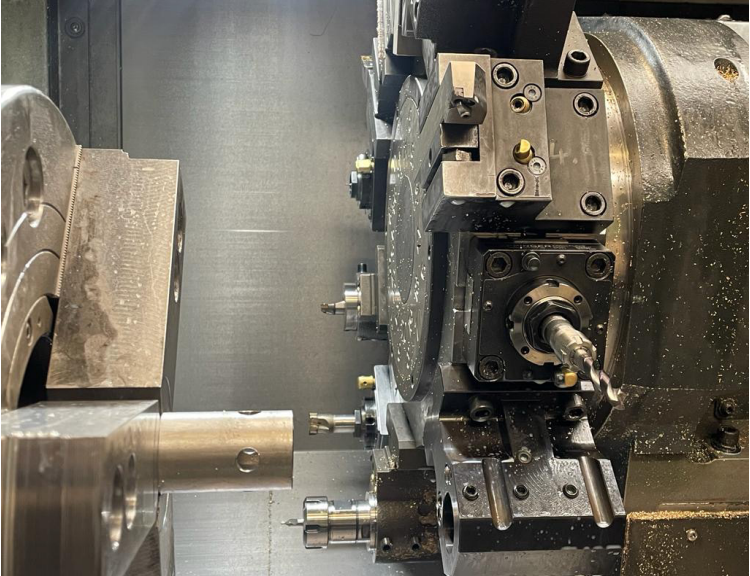
Product Details

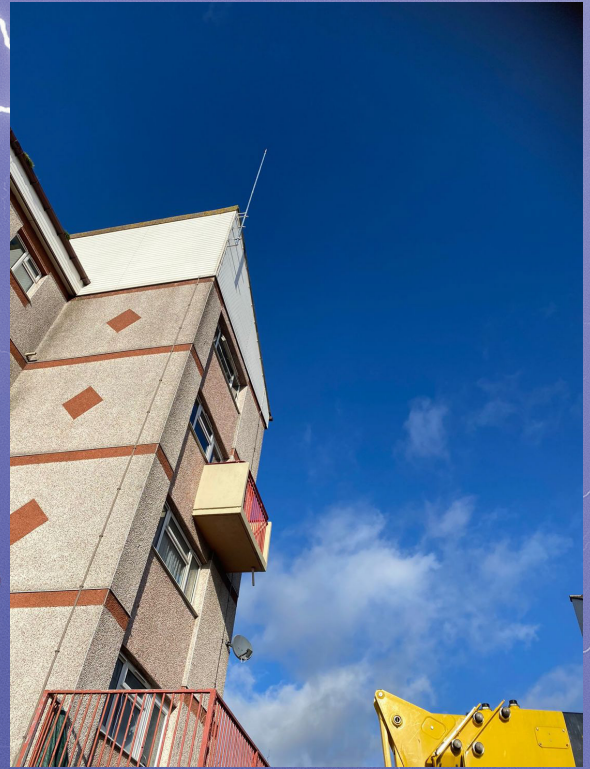
		
Universal Apex Bracket: <small>UAPEXBCKT: UAPEXBCKT</small> Universal apex bracket for mounting ALPS masts on a pitched style roof. To fit mast sizes (mm): Ø 40, Ø 35 21.25 kg	ST/ST Offset Mounting Bracket <small>OFFBCKT: OFFBCKTS, OFFBCKTL</small> Used to fix a mast on any vertical tubular support (e.g. pole, railings etc.) To fit mast sizes (mm): Ø 40, Ø 35 1.60 kg	Middle Mast Coupling: <small>MMAST: MMAST48, MMAST40/35</small> Coupling for connecting two mast sections or for adding a mast extension. To fit mast sizes (mm): Ø 48, Ø 40, Ø 35 1.06 kg, 0.68 kg, 0.54 kg screws etc. included*

With an extensive background in the engineering industry, we are fully equipped and can produce bespoke components upon request.

Thanks to our in-house machining and fabrication capabilities we are able to provide a service offering bespoke and unique products such as brackets, plates, fixings, and more in one-offs or in batches to your specification completed to ISO 9001: 2015.

By using a CAD model, drawing, or even a sample we're able to manufacture components to your required specifications. There are many reasons a bespoke product may be required whether it's due to accessibility issues, non-standard fittings, etc. we are able to assist you and provide a bespoke solution.





Installations performed by third parties*



*Installations performed by third parties**



Unit 3, Hare Street, Bilston, West Midlands, WV14 7DX, United Kingdom

sales@alpsystemsLtd.com | +44(0) 1902 200687
www.alpsystemsLtd.com

