ERITECH®

ERITECH® SYSTEM 1000

ESE Lightning Protection Products

ERICO®

Active Protection

ERICO® is a world leader in the provision of grounding solutions and lightning and surge protection technologies.

ERICO recognizes the importance of an integrated strategy in providing lightning protection and has incorporated several major concepts into a Six Point Plan of Protection:

1. Capture the lightning strike
2. Convey this energy to ground
3. Dissipate energy into the grounding system
4. Bond all ground points together
5. Protect incoming AC power feeders
6. Protect low voltage data/ telecommunications circuits

An unparalleled level of progressive engineering support and experience is built into each lightning and surge protection product and grounding solution. ERICO has developed specialized design software to enable the integration of all aspects affecting system performance, including local conditions, to help ensure that requirements of relevant standards are met or exceeded.

ERICO products are manufactured to ISO 9001:2000 and are subjected to rigorous field and laboratory testing and computer modeling during product development. They are backed by extensive literature, test reports and technical papers, data sheets, installation instructions and risk-analysis software.

ERICO operates in every region of the world and supports the global market with an extensive distribution network to help ensure that our products and expertise are available for any project, regardless of size or location. Dedicated consulting teams assess the requirements of any project and provide expertise for optimal lightning protection solutions.

Active Protection

ERICO offers three ERITECH® INTERCEPTOR SI air terminals.

- SI25 with a triggering advance of 25µs
- SI40 with a triggering advance of 40µs
- SI60 with a triggering advance of 60µs

The ERITECH INTERCEPTOR SI is an Early Streamer Emission (ESE) air terminal in accordance to the NFC 17-102 standard. The design requirements, protection level calculations and protection radius are obtained from this standard.

Due to the internal control circuit, the ERITECH INTERCEPTOR SI enables the early launching of an upward leader compared to other passive components.

1. Strike tip
2. Stainless steel, corrosion resistant body
3. High voltage control section
4. Locking screw
5. Threaded mast coupling
6. Support mast

Testing and Working Principles

Testing

The ERITECH® INTERCEPTOR SI ESE has been extensively tested at an independent high voltage laboratory* in accordance with the requirements of French NFC 17-102 and Spanish norm UNE-21186. The testing, as defined in the above two standards, was designed to simulate naturally occurring conditions and allow comparison of the performance between differing types of lightning protection systems.

The test simulates natural field conditions where a field impulse (the one due to the downward leader approaching ground, simulated by a Marx Generator with a long front time) is superimposed onto a permanent field (the one due to the charge between cloud and ground, simulated in the laboratory by a DC generator).

The corona at the tip of the rod is measured by a photo-multiplier that enables the determination of the triggering time of both the simple passive rod (SR) and the ERITECH INTERCEPTOR SI ESE.

The average value is then determined for both a simple passive rod and the ERITECH INTERCEPTOR SI ESE. The time difference is then T(SR) minus T(SI) to achieve the ΔT advantage for the ERITECH INTERCEPTOR SI ESE.

Working Principles

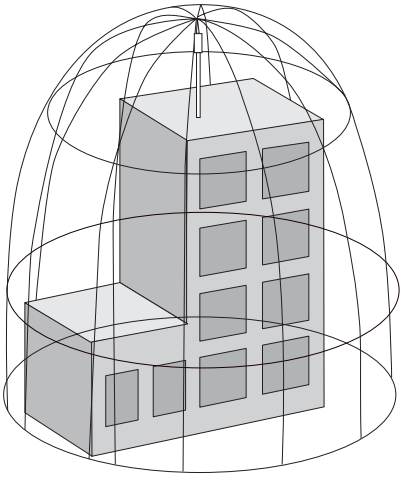
During thunderstorm conditions when the lightning down-leader is approaching ground level, an upward leader may be created by any conductive surface. In the case of a passive lightning rod, the upward leader propagates only after a long period of charge reorganization. In the case of the ERITECH INTERCEPTOR SI ESE, the initiation time of an upward leader is greatly reduced.

The ERITECH INTERCEPTOR SI ESE generates controlled magnitude and frequency pulses at the tip of the terminal during high static fields characteristic prior to a lightning discharge. This enables the creation of an upward leader from the terminal that propagates towards the downward leader coming from the thundercloud.

* Test report available upon request.

ERITECH® INTERCEPTOR SI ESE
Early Streamer Emission Lightning Terminal

According to the NFC 17-102 and UNE-21186 Standard



ERICO® is dedicated to providing the best lightning protection solution for any given application, whether this involves the use of the standards-compliant ERITECH® SYSTEM 1000, ERITECH® SYSTEM 2000, ERITECH® SYSTEM 3000 or a hybrid design utilizing a combination of multiple system types. ERICO® manufactures lightning protection systems in full accordance with more than twelve national and international standards, as well as non-conventional systems based on enhanced air terminals and insulated conductors for applications where these provide an advantageous solution for the customer.

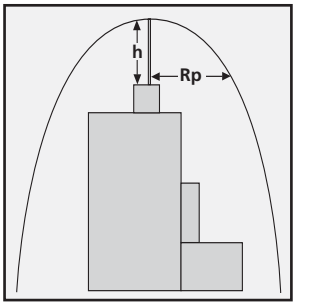
ERICO's approach is solutions driven. Some applications are more suited to the traditional conventional lightning protection – designs that require protection via complete building structure bonding. Other applications are more suited to a method that utilizes protection via isolation or applications that require area protection or the decision may be purely based on a risk – assessment evaluation.

Features

- Designed and tested to NFC 17-102, UNE-21186 and NP4426
- Stainless steel design suitable for most environments
- Available in three models to suit specific site requirements
- Suitable for connection to a variety of downconductor systems including tape, cable, smooth-weave and ERITECH® ERICORE conductor
- Fully compatible with the ERITECH SYSTEM 3000 mast, ERITECH ERICORE cable and accessories

Protecting Areas

According to NFC 17-102 1995, the standard protection radius (Rp) of the ERITECH® INTERCEPTOR SI ESE is linked to ΔT (below), the protection levels I, II or III (as calculated in Annex B of NFC 17-102) and the height of the ERITECH INTERCEPTOR SI ESE above the structure to be protected (H, defined by NFC 17-102 as a minimum 2 m).



Protection Level	Protection Level 1 (98%, D = 20 m)			Protection Level 2 (95%, D = 45 m)			Protection Level 3 (80%, D = 60 m)		
Model	SI 25	SI 40	SI 60	SI 25	SI 40	SI 60	SI 25	SI 40	SI 60
ΔT (μs)	25	40	60	25	40	60	25	40	60
Rp (m) Protection Radius									
h (m)									
2	17	23	32	23	30	40	26	34	44
3	25	35	48	34	45	59	39	50	65
4	34	46	64	46	60	78	52	67	87
5	42	58	79	57	75	97	65	83	107
6	43	59	79	58	76	97	66	84	107
7	44	59	79	59	76	98	67	85	108
8	44	59	79	60	77	99	68	86	108

Where h>5 m, then Rp can be calculated from

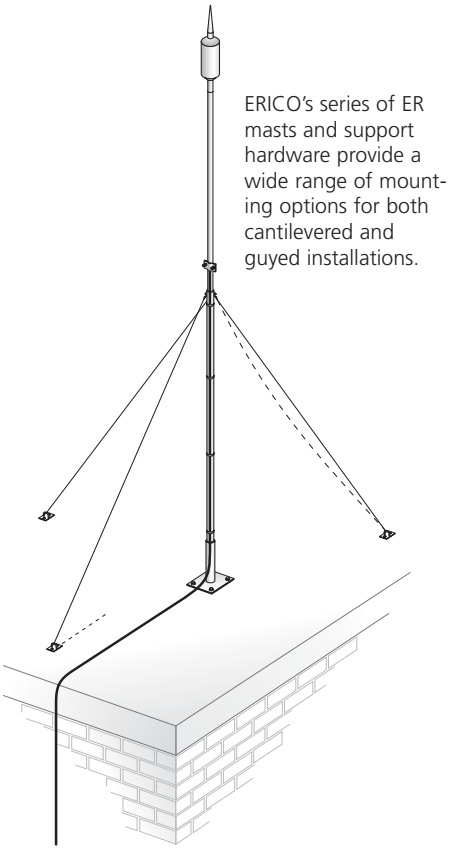
$$Rp = \sqrt{h(2D-h) + \Delta L(2D+\Delta L)}$$

ΔL = v(m/μs) x ΔT(μs), where v is assumed to be 1m/μs
D = Protection Level, where D = 20, 45 or 60 m

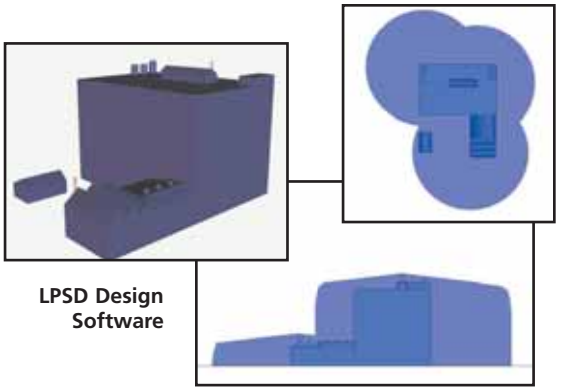
Design

The aim of lightning protection design is to mitigate all the factors that can impact the lightning risk. The requirements of NFC 17-102 Annex B provide guidance on calculation and selection of protection level for each specific application.

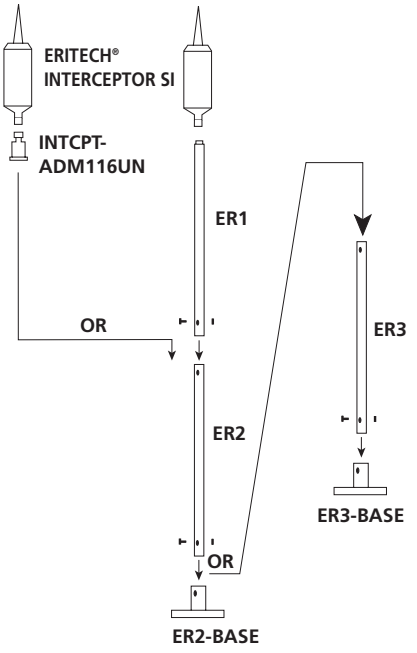
ERICO's unique computer-aided program provides design support for a variety of design techniques and standards including both NFC 17-102 and UNE-21186. Based on individual site parameters such as structure dimensions, terminal type and protection requirements, each LPSD (Lightning Protection System Design) design is customized for the project. It provides elevation, 3D and plan views enabling terminal location, downconductor routing and grounding system requirements to be optimized for your facility.

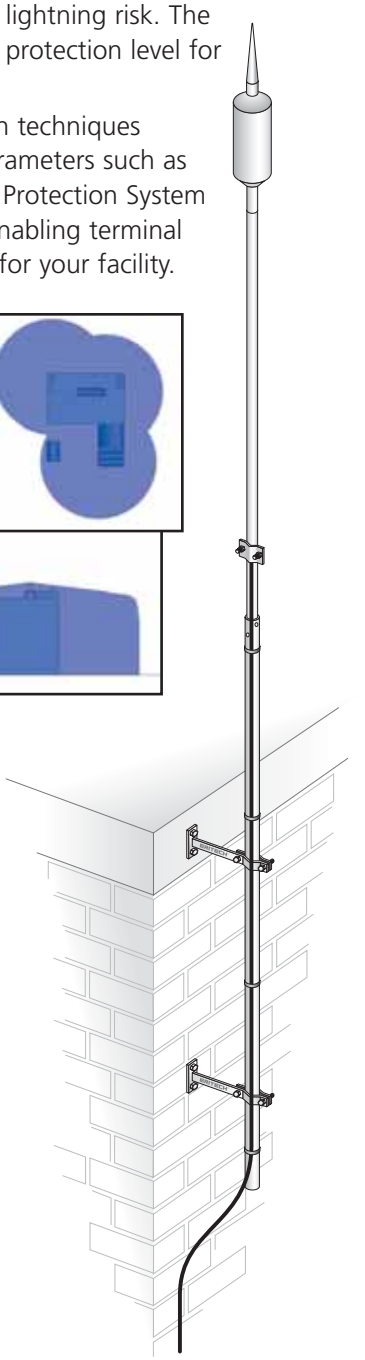


ERICO's series of ER masts and support hardware provide a wide range of mounting options for both cantilevered and guyed installations.



LPSD Design Software





System Requirements:

The design and installation of the terminals should be completed in compliance with the requirements of the French Standard NFC 17-102. In summary, this standard limits the terminal's application to structures less than 60 m high. In addition to providing the protection level calculation and terminal placement requirements, the standard requires one or two downconductors depending upon building profile. A downconductor cross-sectional area of ≥50 mm^2 with minimum dimensions is specified. For copper, the dimensions are 30 x 2 mm or 8 mm diameter. The downconductor(s) are to be secured at three points per meter with equipotential bonding made to nearby metallic items.

Each downconductor requires a test clamp and dedicated earth system of 10 ohms or less. Should 10 ohms not be achievable, then 100 m of conductor with no single vertical or horizontal element exceeding 20 m is acceptable. The lightning protection ground should be connected to the main building ground and any nearby buried metallic items.

The NFC 17-102 requirement for inspection and testing ranges from each year to every three years dependant upon location and protection level selected.

Ordering Information

Air Terminals

ERITECH® INTERCEPTOR SI

SI 25	(701535)	25 µs	5 kg
SI 40	(701536)	40 µs	5 kg
SI 60	(701537)	60 µs	5 kg

Masts and Bases

Masts and Bases

ER1-1000-SS	(702255)	Upper section, 1 m	3.5 kg
ER1-2000-SS	(702260)	Upper section, 2 m	6.2 kg
ER2-2000-SS	(702265)	Mid section, 2 m	4.9 kg
ER2-3000-SS	(702270)	Mid section, 3 m	7.3 kg
ER3-2000-SS	(702275)	Lower section, 2 m	5.3 kg
ER3-3000-SS	(702280)	Lower section, 3 m	7.9 kg
ER2-BASE-SS	(702290)	Base for ER2 mast	5.2 kg
ER3-BASE-SS	(702295)	Base for ER3 mast	5.6 kg
ER1-xxxx-SS	mast diameter 25 mm		
ER2-xxxx-SS	mast diameter 32 mm		
ER3-xxxx-SS	mast diameter 38 mm		

Masts Accessories

Guy Kit

GUYKIT4MGRIP	(701305)	4 m	0.4 kg
GUYKIT7MGRIP	(701315)	7 m	0.7 kg

Guy kits for 4 m and 7 m vertical guy heights

Mast Clamp

TMC-SS (702165) 0.2 kg

Clamp for connecting 25x3, 30x2 or 8 mm diameter conductor to ER1 or ER2 masts.

Cable Tie

CABTIE-SS (701420) 0.05 kg

520 mm stainless steel cable tie for strapping downconductor to lower mast sections

Mast Bracket

ALOF-1-GS (702175) 1.5 kg

280 mm galvanized steel bracket for masts 28 to 55 mm diameter.

Mast Bracket

LSEB 4554 (702180) 10.5 kg

550 mm galvanized steel bracket for masts 38 to 76 mm diameter. Supplied as set of two brackets.

Mast Bracket

ACF-2-GS (103100) 2.1 kg

Parallel pipe clamp for masts 30 to 50 mm diameter. Supplied as set of two brackets.

Adapters

ER2-xxxx-SS Adapter

INTCPT-ADM116UN (702301) 0.1 kg

Adapter to allow ERITECH INTERCEPTOR SI terminal to connect direct to ER2-xxxx-SS masts.

Water Pipe Adapter

INTCPT-AD2BSPF*	(702297)	0.1 kg
INTCPT-ADF2NSP**	(702298)	0.1 kg

For mounting Air Terminals to non-insulated water pipe masts
* 2" British thread
** 2" USA thread

Adapter to ¾" thread

INTCPT-ADM3/4UNC (702299) 0.1 kg

Adapter to mount Air Terminal to conventional ¾" lightning protection hardware.

Mast Butt Adapter

INTCPT-ADBUTT (702296) 0.05 kg

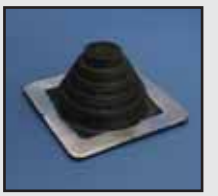
Required to mount the ERITECH INTERCEPTOR Air Terminal into the System 3000 FRP mast.

Accessories

Lightning Event Counter

LEC-IV (702050) 2.0 kg

Installed on downconductor to record number of lightning strikes.



Waterproof Cone

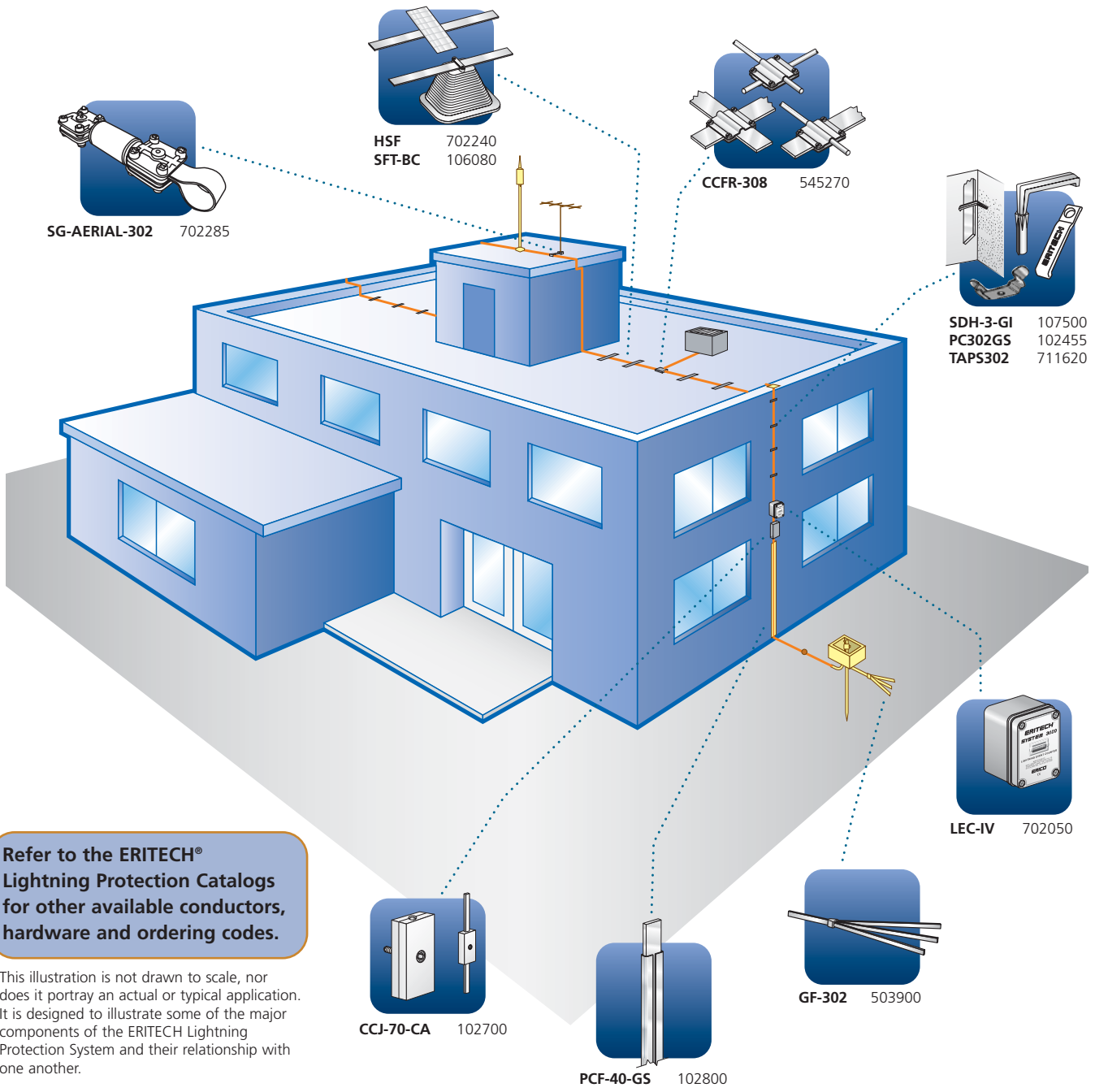
WPC (702230) 0.07 kg

Aerial Spark Gap

SG-AERIAL-302 (702285) 0.5 kg

For the connection of TV and communication masts to the lightning protection systems.

Other Lightning Protection and Grounding Accessories



Refer to the ERITECH® Lightning Protection Catalogs for other available conductors, hardware and ordering codes.

This illustration is not drawn to scale, nor does it portray an actual or typical application. It is designed to illustrate some of the major components of the ERITECH Lightning Protection System and their relationship with one another.

WARNING

ERICO products shall be installed and used only as indicated in ERICO's product instruction sheets and training materials. Instruction sheets are available at www.erico.com and from your ERICO customer service representative. Improper installation, misuse, misapplication or other failure to completely follow ERICO's instructions and warnings may cause product malfunction, property damage, serious bodily injury and death.

WARRANTY

ERICO products are warranted to be free from defects in material and workmanship at the time of shipment. NO OTHER WARRANTY, WHETHER EXPRESS OR IMPLIED (INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE), SHALL EXIST IN CONNECTION WITH THE SALE OR USE OF ANY ERICO PRODUCTS. Claims for errors, shortages, defects or nonconformities ascertainable upon inspection must be made in writing within 5 days after Buyer's receipt of products. All other claims must be made in writing to ERICO within 6 months from the date of shipment or transport. Products claimed to be nonconforming or defective must, upon ERICO's prior written approval in accordance with its standard terms and procedures governing returns, promptly be returned to ERICO for inspection. Claims not made as provided above and within the applicable time period will be barred. ERICO shall in no event be responsible if the products have not been stored or used in accordance with its specifications and recommended procedures. ERICO will, at its option, either repair or replace nonconforming or defective products for which it is responsible or return the purchase price to the Buyer. THE FOREGOING STATES BUYER'S EXCLUSIVE REMEDY FOR ANY BREACH OF ERICO WARRANTY AND FOR ANY CLAIM, WHETHER SOUNDING IN CONTRACT, TORT OR NEGLIGENCE, FOR LOSS OR INJURY CAUSED BY THE SALE OR USE OF ANY PRODUCT.

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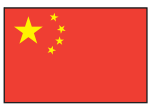

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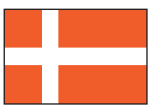

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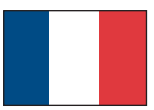

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