Lightning Protection Systems France

LPS FRANCE

www.lpsfr.com

GROUPE CEMASO

Lightning Protection Systems France

LICENCED LPS DISTRIBUTOR

Groupe CEMASO - BP 80055 - F-33460 MARGAUX. France - www.cemaso.com
Phone : +33 (0) 557 226 577 / Fax : +33 (0) 517 476 563

Early Streamer Emitter
www.ellipsese.com

Lightning Protection Systems France

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MADE IN FRANCE

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ELLIPS

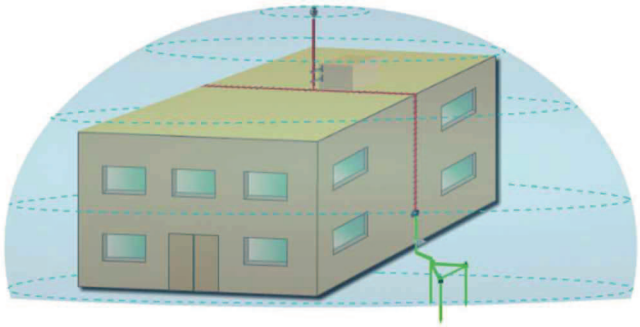
Early Streamer Emitter

MADE IN FRANCE

ELLIPS Early Streamer Emission (ESE) lightning rod is the result of over 10 years of research and laboratory experiments and field tests.
Combining advanced materials and technologies, ELLIPS ESE lightning rod is thought out to optimize the whole of your lightning protections system. Each ELLIPS ESE lightning rod can be tested by wired-controlled tester or remote-controlled tester (ELLIPS Contact options).

ELLIPS aesthetics and colors allow its integration within all possible drafts and structures (8 colors available - not effect on operation).

We manufacture the ELLIPS ESE lightning rods range and accessories exclusively in France.



ELLIPS ESE lightning rod is inspired by recent advances in our knowledge of lightning, electromagnetism, high voltage and fluid mechanics effects ...

The natural ionization (spark-over) is enhanced by our ELLIPS system independently any energy source. ELLIPS ESE lightning rods trigger spark-over in advance and become the preferential impact point.

Our unique and patented system is composed without any electronic or mechanical component which would proove too fragile and unreliable.

The simplicity of its design and operation combined with its qualitative manufacture and assembly allow us to provide every ELLIPS lightning rod with a 15 year warranty.

ELLIPS ESE lightning rods coloration is an aesthetic option and has no effect on the operation of the lightning protection system.

PHASE 1

1. Natural tracer

PHASE 2

2. ELLIPS triggering spark-over in advance

PHASE 3

3. ELLIPS captures the lightning strike

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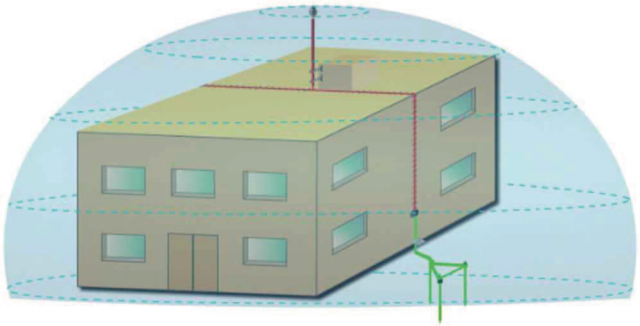
ELLIPS

Early Streamer Emitter

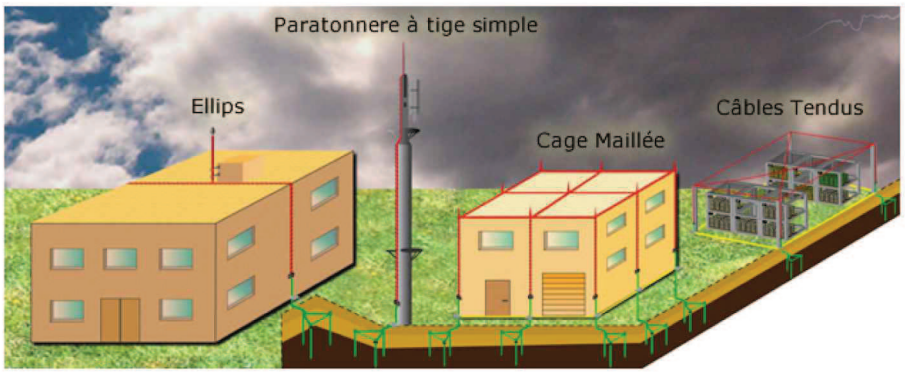
MADE IN FRANCE

Protection area	ELLIPS ESE lightning rods ensure up to a 120 meters radius protection zone in the best conditions. ELLIPS ESE lightning rods must be chosen according to the structure to find the best compromise cost / effectiveness.
Protection of open areas	ELLIPS ESE lightning rod becomes the preferential impact point in open areas (sports stadium, storage area, uncovered area ...). Frequently, an ELLIPS lightning rod protects a complete property.
Study	Lightning protection system study with ELLIPS ESE lightning rods is easy thanks to the flexibility of its implementation.
Implementation	ELLIPS lightning rods implementation is simple. A thoughtfully designed range of accessories enables easy adaptation on all structures.
Qualification required for implementation	The installer's qualification for the ELLIPS ESE lightning rods implementation is classic and is not an obstacle to obtain an excellent lightning protection installation.
Aesthetics (Architecture Integration)	ELLIPS ESE lightning rods and some accessories are available in 8 standard colors. Whatever the building or the structure, ELLIPS blends into its environment. Specific colors are also available at request.
Budget implementation	In favor of a large area of protection and ease of implementation ELLIPS ESE lightning rods ensure a low cost solution compared to other solutions.
Cost of Maintenance	ELLIPS ESE lightning rods do not require extensive maintenance (ensuring 15 years). Periodic inspections costs are low thanks to a simple protection system.



Normalisations / Standards

Argentine	IRAM 2426
Espagne	UNE 21186
France	NF C 17-102
Macédoine	MKS N.B4 810
Portugal	NP 4426
Roumanie	I-20
Slovaquie	STN 34 1391
RF Yougoslavie	JUS N.B4.810



	Ellips	Lightning rod single-point	Meshed cage	Tensioned cables
Protection zone				
Protection of open areas				
Study				
Implementation				
Qualification required for implementation				
Aesthetic (Architecture Integration)				
Budget implementation				
Cost of Maintenance				
Standards	NF C 17-102	NF-EN 62305	NF-EN 62305	NF-EN 62305
Appropriate structures	Any structure and its environment or open areas	Small size structure (Towers, antennas...)	Structure containing computer systems or pyrotechnic materials	Open storage area

Lightning Protection Systems France

LPS FRANCE

ELLIPS

Early Streamer Emitter

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MADE IN FRANCE

OUR ENGAGEMENTS

LPS France is engaging over the entire ELLIPS range.

- **Patented Technologies**
- **Manufactured in our factory in France**
- **Laboratory validation tests**
- **Reliability and robustness proven in extreme conditions**
- **Conforms to NF C 17-102, UNE 21-186, EN 50164-1, EN 62305**
- **Laser marking**
- **Optional wired-controlled tester or remote-controlled tester available in the whole ELLIPS range**
- **No electromagnetic interference (radar, radio ...)**
- **ELLIPS range is 100% recyclable.**
- **15 years warranty.**

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ELLIPS

Early Streamer Emitter

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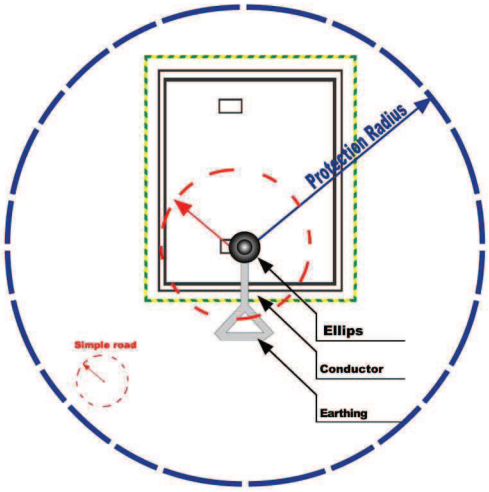
ELLIPS 1.0

1,800Kg

Packaging:
215x215x220 mm



ELLIPS 1.2

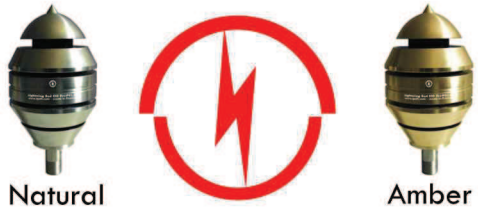
1,840Kg

Packaging:
215x215x220 mm

PROTECTION RADIUS

Δh \ Level Protection	I	II	III	IV
2	8	11	13	15
3	12	16	19	24
4	17	26	26	34
5	21	29	32	43
10	23	36	37	48
20	24	40	41	55
60	30	48	53	64

Comply with the limit NF C 17102 -Interpretation 007 - April 2011



PROTECTION RADIUS

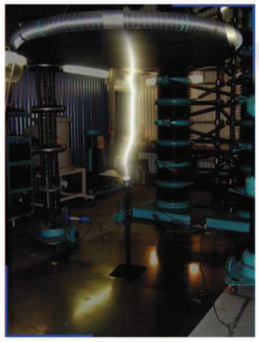
Δh \ Level Protection	I	II	III	IV
2	17	19	23	26
3	25	29	34	39
4	34	39	46	52
5	42	49	57	65
10	44	51	61	69
20	45	52	63	75
60	45	52	65	79

Comply with the limit NF C 17102 -Interpretation 007 - April 2011

ELLIPS 1.3

1,860Kg

Packaging:
215x215x220 mm



PROTECTION RADIUS

Δh \ Level Protection	I	II	III	IV
2	25	28	32	36
3	38	41	48	53
4	51	57	65	72
5	62	71	81	89
10	63	72	83	92
20	65	74	86	97
60	66	75	90	105

Comply with the limit NF C 17102 -Interpretation 007 - April 2011

ELLIPS 1.4

1,880Kg

Packaging:
215x215x220 mm

PROTECTION RADIUS

Δh \ Level Protection	I	II	III	IV
2	32	34	40	44
3	48	52	59	65
4	64	69	78	87
5	79	86	97	107
10	79	88	99	109
20	80	89	102	113
60	80	90	105	120

Comply with the limit NF C 17102 -Interpretation 007 - April 2011

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ELLIPS 1.0

Lightning Rod ESE

MADE IN FRANCE

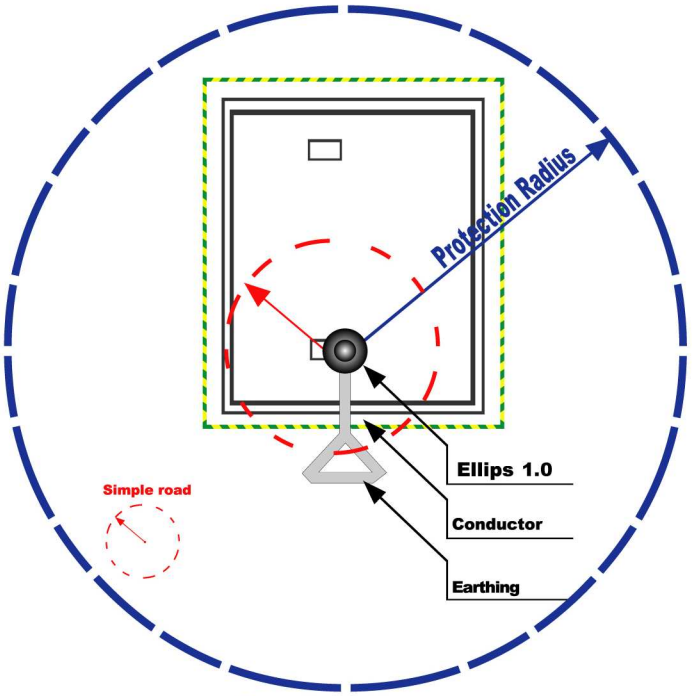
210 mm

99mm

Δt: 10 µs

1,800Kg

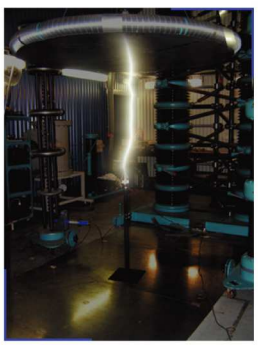
Packaging:
215x215x220 mm



PROTECTION RADIUS

Δh \ Level Protection	I	II	III	IV
2	8	11	13	15
3	12	16	19	24
4	17	26	26	34
5	21	29	32	43
10	23	36	37	48
20	24	40	41	55
60	30	48	53	64

Comply with the limit NF C 17102 -Interpretation 007 - April 2011



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ELLIPS 1.2

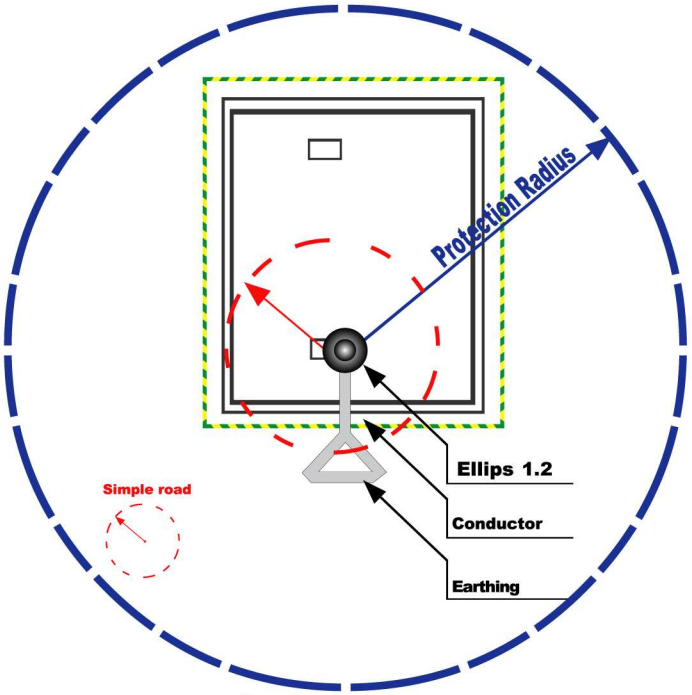
Lightning Rod ESE

MADE IN FRANCE

Δt: 25 µs

1,840Kg

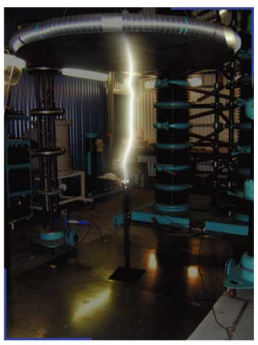
Packaging:
215x215x220 mm



PROTECTION RADIUS

Δh \ Level Protection	I	II	III	IV
2	17	19	23	26
3	25	29	34	39
4	34	39	46	52
5	42	49	57	65
10	44	51	61	69
20	45	52	63	75
60	45	52	65	79

Comply with the limit NF C 17102 -Interpretation 007 - April 2011



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ELLIPS 1.3

Lightning Rod ESE

MADE IN FRANCE

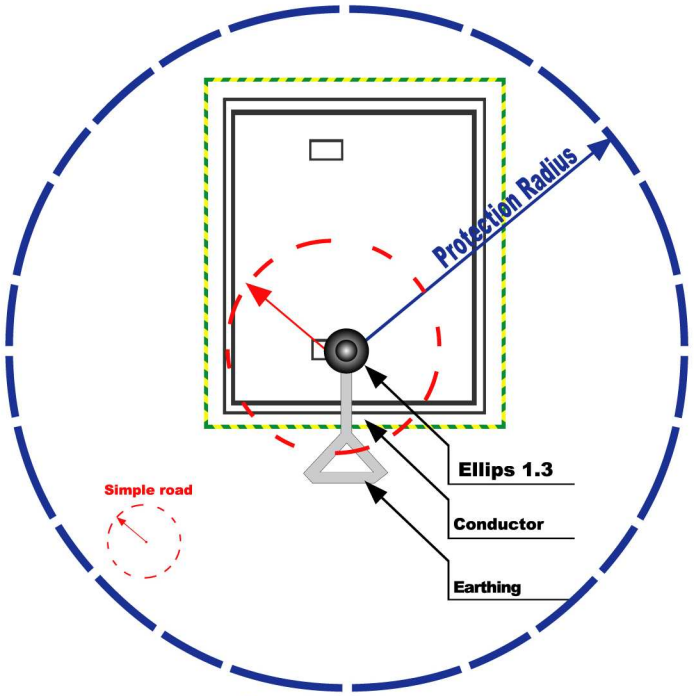
210 mm

99mm

Δt: 45 µs

1,860Kg

Packaging:
215x215x220 mm



PROTECTION RADIUS

Δh \ Level Protection	I	II	III	IV
2	25	28	32	36
3	38	41	48	53
4	51	57	65	72
5	62	71	81	89
10	63	72	83	92
20	65	74	86	97
60	66	75	90	105

Comply with the limit NF C 17102 -Interpretation 007 - April 2011

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Lightning Protection Systems France

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ELLIPS 1.4

Lightning Rod ESE

MADE IN FRANCE

210 mm

99mm

Δt: 60 µs

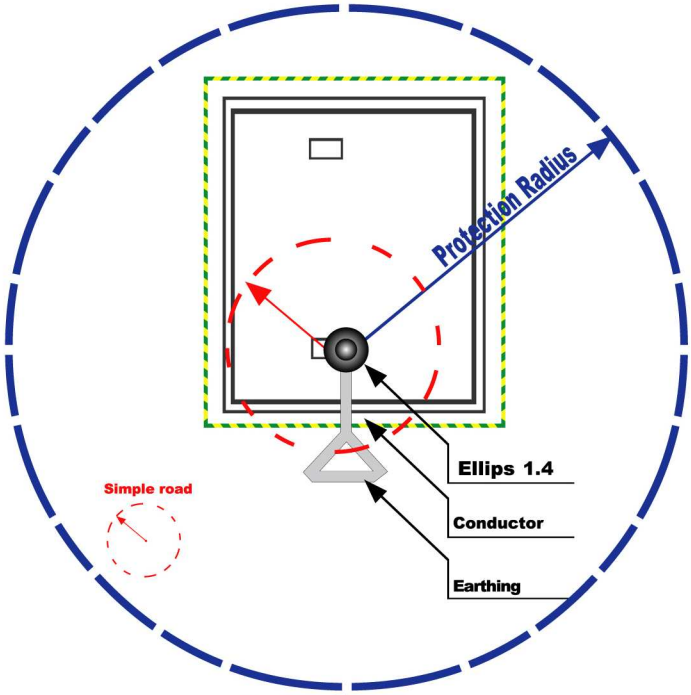
1,880Kg

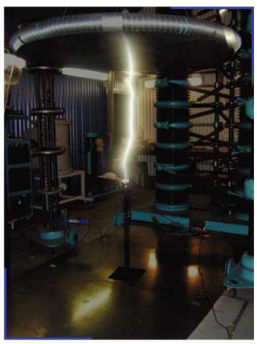
Packaging:
215x215x220 mm

PROTECTION RADIUS

Level Protection / Δh	I	II	III	IV
2	32	34	40	44
3	48	52	59	65
4	64	69	78	87
5	79	86	97	107
10	79	88	99	109
20	80	89	102	113
60	80	90	105	120

Comply with the limit NF C 17102 -Interpretation 007 - April 2011





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ELLIPS CONTACT AIR

The wireless diagnosis solution of the ELLIPS lightning rod

Requirement:
An outside protection against lightning by means of a lightning rod must be checked every year and after every lightning strike so as to ensure its good working order. NFC 17 102 – December 2001

The whole range of ELLIPS lightning rods offers a testing and transfer of information possibility without any physical link. This function is named **ELLIPS CONTACT AIR**. Indeed, an **ELLIPS CONTACT AIR** emitter can be optionally added on each ELLIPS lightning rod.

The **ELLIPS CONTACT AIR** option was developed in the same spirit as the ELLIPS lightning rod. Efficiency, reliability, as well as convenience and aesthetic have been the mainsprings of our researches.

LIGHTNING PROTECTION SYSTEMS FRANCE
Groupe CEMASO SAS - BP 80055 - F-33460 MARGAUX
SIRET: 521 876 433 RCS BDX

The **ELLIPS CONTACT AIR** emitter constantly indicates the working state of the ELLIPS lightning rod as well as its communication reliability. It communicates in real time and registers a warning when a lightning strike is detected by the ELLIPS lightning rod.

ELLIPS CONTACT AIR is supplied by a photovoltaic cell that guarantees its autonomy. The technology of this photovoltaic cell allows to obtain a charging of the communication system even in weak luminosity conditions and to ensure a twenty-four-hours-a-day communication. Communication is possible within a minimum range of 30 meters and a maximum range of 300m (depending on the receiver, its positioning and its environment). **ELLIPS CONTACT AIR** can be added at the initial assembly or during the life length of the installation, at any time, very easily and rapidly, without any effect on the efficiency of the protection.

In keeping with the requirements of each user and the sensitivity of the site to protect, we conceived two kinds of receivers.

ELLIPS
CONTACT AIR

LIGHTNING PROTECTION SYSTEMS FRANCE
Groupe CEMASO SAS - BP 80055 - F-33460 MARGAUX
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Nomadic receiver
ELLIPS CONTACT AIR USB (E.C.A.U.)

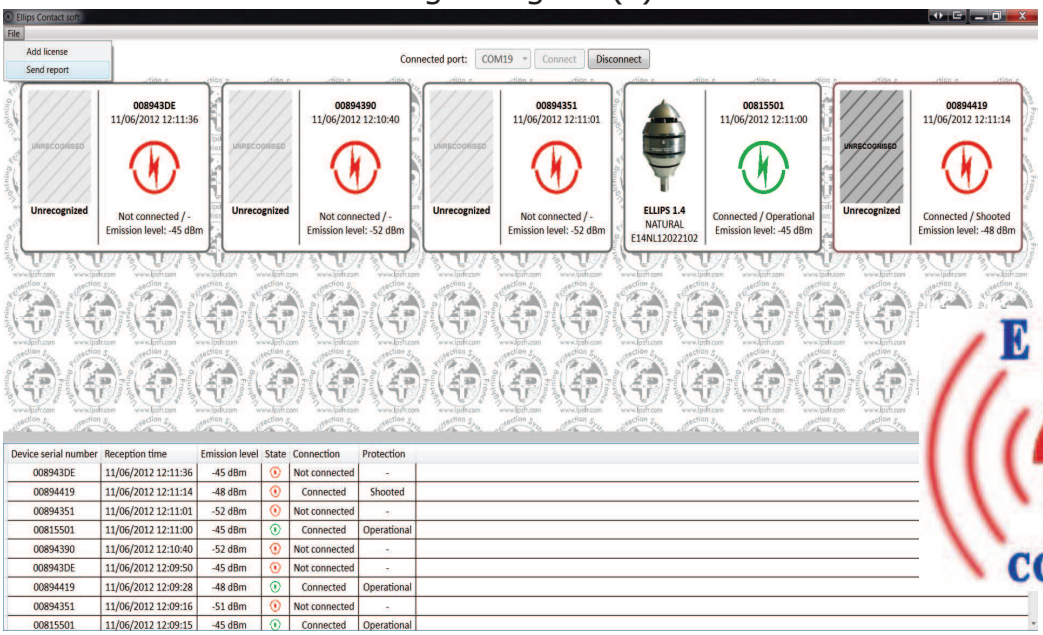
E.C.A.U. is connected to a Windows(1) portable PC and communicates with the whole of ELLIPS lightning rods equipped with an ELLIPS CONTACT unit.
Information is collected on demand.

(2)

Sedentary receiver
ELLIPS CONTACT AIR BOX (E.C.A.B.)

E.C.A.B. constantly communicates with the ELLIPS lightning rods. Customizable by remote control by our teams and connected to the internet or a GSM network, E.C.A.B. communicate the lightning warnings in real time. A photovoltaic supply is optionally available for an all-autonomous working.

ELLIPS CONTACT AIR SOFT is the software developed by LPS France that locally collects information from ELLIPS lightning rod(s).

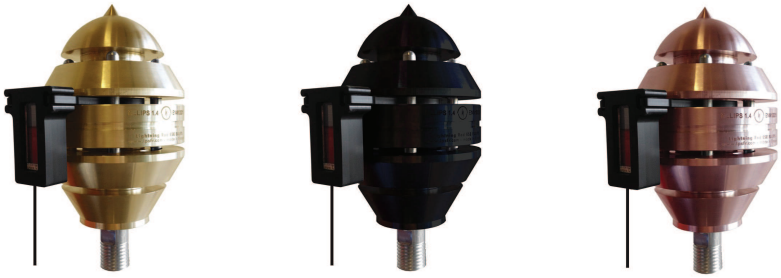


ELLIPS CONTACT AIR

LIGHTNING PROTECTION SYSTEMS FRANCE
Groupe CEMASO SAS - BP 80055 - F-33460 MARGAUX
SIRET: 521 876 433 RCS BDX

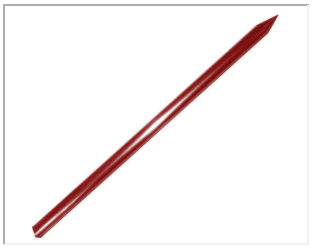
ELLIPS CONTACT AIR SOFT sends its results – in all cases – toward our dedicated online data base. The latter, which is accessible at any time and communicates toward the preferential interlocutors of each installation (as wished: manufacturer, distributor, fitter, customer…) allows to follow the lightning rods at any time.
ELLIPS lightning rods thus become real tools for the protection and prevention of lightning-related risks.

RANGE OF COLORS AVAILABLE OPTIONALLY



LIGHTNING RODS & GROUNDING ACCESSORIES

POINTED AIR SINGLE RODS

Nomination		Dim. HxØ	Réf.	Weight/U (en kg)	Cond. U	Short Description
	COPPER ROD 30	300x20	PTEC30	0,620	1	300 mm Single rod in naked copper wit Thread M20
	COPPER ROD 50	500x20	PTEC50	0,980	1	500 mm Single rod in naked copper wit Thread M20
	CHROME COPPER ROD 30	300x20	PTECC30	0,620	1	300 mm Single rod in chrome coppe with Thread M20
	CHROME COPPER ROD 50	500x20	PTECC50	0,980	1	500 mm Single rod in chrome coppe with Thread M20
	INOXIDIZABLE STEEL ROD 30	300x20	PTEAI30	0,620	1	300 mm Single rod in inoxidizable ste with Thread M20
	INOXIDIZABLE STEEL ROD 50	500x20	PTEAI50	0,980	1	300 mm Single rod in inoxidizable ste with Thread M20

CONDUCTOR CONNECTION FOR S .T.A.R.® OR SINGLE ROD

Nomination		Dim. HxLxl	Réf.	Weight/U (en kg)	Cond. U	Short Description
	LIGHTNING ROD – CONDUCTOR CONNECTION	10x50x50	RAPC01	0,400	1	Inoxidizable Steel Connection between the lightning rod and the conductor which can be screwn down the lightning rod's base. Tapping M20. The conductor is set by tightening – inoxidizable fastenings supplied.

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SIRET: 521 876 433 RCS BDX

S.T.A.R.® OR SINGLE ROD ADAPTATIONS AND BASES

Nomination		Dim. **HxØint ou HxLxl**	Réf.	Weight/U (en kg)	Cond. U	Short Description
	ROUND CYLINDRICAL COVER	100x32	MAN-R01	0,600	1	Aluminium adaptation (it is possible to apply a colour/ carbon colour if no request) round section with an intern diameter of 30 mm (40 mm External diameter) - tridirectional tightening on the base thanks to inoxidizable fastenings which are supplied.
	QUADRATE CYLINDRICAL COVER	300x60x60	MAN-C01	1,500	1	Inoxidizable Steel adaptation with a quadrate section of 50 mm intern sideway (60 mm external side) – four-directions tightening on the base thanks to inoxidizable fastenings which are supplied. (it is possible to put a colour/ carbon colour if no request)
	COCK-WEATHERCOCK SCABBARD	75x80	FOU-CG1	1,500	1	Copper adaptation that allows fastening a lightning protection on a base (cross, for instance.) where a cock/weathercock has already been fastened. The weathercock will be fastened by brazing on the scabbard.
 01 02 03	ELEVATION MAST 2,00 m (1° element)	2000x28	MAT-IE1 (inox) MAT-GE1 (galva)	3,500	1	Lightning rod's Inoxidizable or galavanised steel elevation mast (length: 2,00 m) and its adaptation for fastenings M20. (external diameter 34 mm)
	ELEVATION MAST 2,00 m (2° element)	2000x36	MAT-IE2 (inox) MAT-GE2 (galva)	4,500	1	Inoxidizable or galavanised steel elevation mast for the mast MAT-IE1 (length obtained: 3,60 m) - The masts stack themselves and are fastened thanks to a longitudinal tightening– inoxidizable fastenings supplied. (External diameter 42 mm)
	ELEVATION MAST 3,00 m (3° element)	3000x44	MAT-IE3 (inox) MAT-GE3 (galva)	6,000	1	Inoxidizable or galavanised steel elevation mast for the mast MAT-IE2 (height obtained : 6,00 m) -- The masts stack themselves and are fastened thanks to a longitudinal tightening .inoxidizable fastenings supplied. (external diameter 50 mm) No guying required for the entirety for a holdfast hold of 1 metre.

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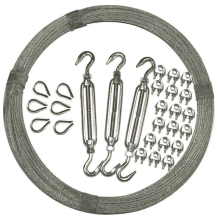
S.T.A.R.® OR SINGLE ROD ADAPTATIONS AND BASES

Nomination		Dim. **HxLxl**	Réf.	Weight/U (en kg)	Cond. U	Short Description
	ALUMINIUM ELEVATION MAST 1,50 m	1500x32	MAT-AL1	2,400	1	Aluminium Elevation mast (it is possible to apply a colour/ carbon colour if no request) 1,50 m (external diameter 34 mm) Mast to be preferred if the whole air terminal harmony (lightning protection + base) has to be protected. At most, 4 elements can be used without guying with a fixation's hold of 1 ml (height obtained: 5m).
	GUYWIRE KIT	-	KIT-HAU	2,550	1	Guy wire kit for masts, extreme base and wind or pose conditions. This kit is composed of : Twisted inoxidizable steel cables Ø2 mm (50 metres) Inoxidizable Steel cable joints (x 18) Hooks (x 3) Clamps (Shape of hearts) (x 6) Fixation star cable/mast(x 1)
	POLYAMIDE WATERPROOFING COLLAR	100x100x90	CON-PAL	0,150	1	Waterproofing collar in black polyamide which base is composed of two materials: aluminium and polyamide. Enables to ensure waterproofing around a mast until a 70 mm diameter.
	WATERPROOF SCREW	-	CON-VIS	-	100	Waterproof screw to be used with Polyamide Collar.
	ZINC WATERPROOFING COLLAR	120x90	CON-ZNC	0,220	1	Zinc waterproofing Collar. Enables to ensure waterproofing around a mast until a 70 mm diameter.
	SILICONE	Standard	CON-SIL	0,850	1	A Silicone tube in order to achieve waterproofing.

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LIGHTNING PROTECTION SYSTEMS FRANCE
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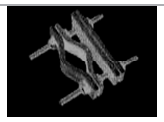
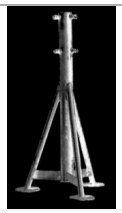
SIRET: 521 876 433 RCS BDX

ADAPTATIONS AND S.T.A.R.® OR SIMPLE ROD BASES

Nomination		Dim. **HxØint ou HxLxl**	Réf.	Weight/U (en kg)	Cond. U	Short description
	OFFSET in X flat	hickness. steel 10 mm Ømin. : 28 Ømax. : 60	DPI-XP1 DPG-XP1	0,950	3	Offset mast fixings to set by tightening on the base. Material Inoxidizable or Galvanised Steel 40 mm offset between axes.
	OFFSET in X		DPI-X1 DPG-X1	0,950	3	Offset mast fixings to set by tightening on the base. Material Inoxidizable or Galvanised Steel 60mm offset between axes.
	ASYMMETRICAL OFFSET in X	hickness. steel 10 mm Small diameter Ømin. : 28 Ømax : 60 Big diameter Ømin. : 32 Ømax :140	DPI-XA1 DPG-XA1	1,250	3	Offset mast fixings to set by tightening on the base. Asymmetrical, this fixation allows to be set on 140mm diameter (maximum) base. Material Inoxidizable or Galvanised Steel
	MAST TRIPOD	H : 1200 Øint.: 100	TRPI-01 TRPG-01	7,000	1	Mast base for flat roof Material Inoxidizable or Galvanised Steel A concrete plate can be supplied to help to its carriage Hold : diam. 600 mm
LIGHT SELF-STANDING MAST		On request				Galvanised steel Lattice mast which height is situated between 6 to 30 metres.
FIBREGLASS MAST		On request				Fire-glass mast which height is situated between 8 to 15 metres.
TOWER		On request				Galvanised steel Lattice Tower which height is situated between 15 to 90 metres.

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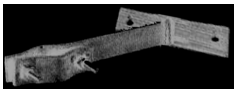
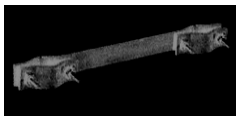
HOLDFAST AND MAST BASES FOR S.T.A.R.® OR SIMPLE ROD

Nomination		Dim.	Réf.	Weight/U (en kg)	Cond. U	Short Description
	OFFSET TO FASTEN	th steel 10 mm Ømin. : 28 Ømax. : 60	DPG-FIXH2 DPG-FIXH2 DPI-FIXH3 DPG-FIXH3 DPI-FIXH5 DPG-FIXH5	2,000	3	Offset mast fixings to set by cementing in the base or tightening by par plywood and fastenings (on request). Have to be used by group of 3 to ensure vertical height and mast carriage Material: Inoxidizable or Galvanised Steel 200 mm offset between axes : *-* 2 300 mm offset between axes : *-* 3 500 mm offset between axes : *-* 5
	OFFSET TO FASTEN		DPI-FIXV2 DPG-FIXH2 DPI-FIXH3 DPG-FIXH3 DPI-FIXV5 DPG-FIXV5	2,000	3	
	OFFSET TO CEMENT		DPI-SEL DPG-SEL	2,000	3	Offset mast fixings to set by cementing (total length : 200mm) Material : Inoxidizable or Galvanised Steel
	MAST OFFSET		DPI-MA14 DPG-MA14 DPI-MA24 DPG-MA24	2,300	3	Offset mast fixings to set by tightening on the base. Material: Inoxidizable or Galvanised Steel Between axes 140 mm : *-*14 Between axes 240 mm : *-*24
	THREADED OFFSET		DPI-FIL DPG-FIL	1,420	3	Offset mast fixings to screw down (M10) (length of threaded rod 400 mm) Material: Inoxidizable or Galvanised Steel
	FLAT OFFSET		DPI- PLA DPG- PLA	1,850	3	Offset mast fixings to set by cementing in the base Material: Inoxidizable or Galvanised Steel
	OFFSET in U		DPI-ENU DPG-ENU	1,900	2	Offset mast fixings to set by cementing in the base Material: Inoxidizable or Galvanised Steel
	CHROME PLUGS	M10	FIX-CHB	0,200	1	Chrome plug with expansion (M10) for DEP-*** fixations, built (Concrete, Stone, Loaded Brick)
	CHIMNEY HOLDFASTS	Ømin. : 28 Ømax. : 60	DP-CHE	3,400	1	Offset mast fixings for Chimney with strapping (5 m) Material : Galvanised Steel.

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Nota :

Products' index has to be read :

- Inoxidizable Steel : *I-*
- Gavanised Steel : *G-*

All the fastening materials and lightning rods S.T.A.R or simple rods' bases are produced in inoxidizable steel or galvanised steel (except if it is mentioned something else) in our engineering factory. Please can you specify the material you wish by choosing the corresponding product's reference, when you ask price.

Our engineering factory and our research industry are here to realise any special request.

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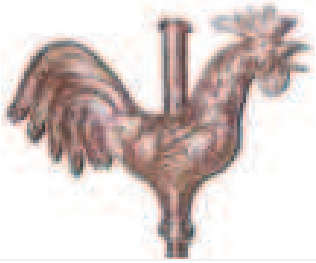
COCKS AND WEATHERCOCKS BASES ADAPTED TO S.T.A.R.® OR SIMPLE ROD

Nomination		Dim. **Hxl**	Réf.	Weight/U (en kg)	Cond. U	Short Description
	COCK-WEATHERCOCK	530x520	GIR-COQ53	4,000	1	Coppered- Cock-Weathercock scale: 53cm with screw tightening on the base and lightning rod adaptation M20. Inoxidizable steel ball-bearing and brass pebbles.
	COCK-WEATHERCOCK	630x520	GIR-COQ63	4,500	1	Coppered- Cock-Weathercock scale : 63cm with screw tightening on the base and lightning rod adaptation M20. Inoxidizable steel ball-bearing and brass pebbles.
	COCK-WEATHERCOCK	730x520	GIR-COQ73	5,000	1	Coppered- Cock-Weathercock scale: 73cm with screw tightening on the base and lightning rod adaptation M20. Inoxidizable steel ball-bearing and brass pebbles.
	WEATHERCOCK STEEPLE AND CARDINAL POINTS	450x300	GIR-FLEPC	2,800	1	Coppered- Cock-Weathercock scale: 73cm with screw tightening on the base and lightning rod adaptation M20. Immovable Coppered and brassed-cardinal points. Inoxidizable steel ball-bearing and brass pebbles.
	We remain at your entire disposal in order to create on request any coppered-weathercock adapted to the bases.					

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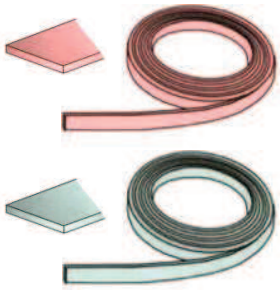
CONDUCTORS AND EARTHING

LADEN PLANE CONDUCTORS

Coil delivery	Section mm²	Width x ep. mm	Réf.	Weight/m (en kg)	Cond. mètre	Materials
 **COND-P****	60	30 x 2	COND-PC60	0,534	70 à 80	Naked Copper
	60	30 x 2	COND-PCE60	0,534	70 à 80	Tinned Copper
	105	30 x 3,5	COND-PAG	0,850	50 à 60	Galvanised Steel
	105	30 x 3,5	COND-PAI	0,825	50 à 60	Stainless Steel

ROUND LADEN CONDUCTORS

Coil delivery	Ø mm	Réf.	Weight/m (en kg)	Cond. mètre	Materials
 **COND-R****	6	COND-RC6	0,250	110 à 130	Naked copper
	8	COND-RC8	0,448	90 à 110	Naked copper
		COND-RCE8	0,448	90 à 110	Tinned Copper
		COND-RAG8	0,395	120 à 130	Galvanised Steel
		COND-RAI8	0,395	120 à 130	Stainless Steel
		COND-RAL8	0,135	110 à 150	Aluminium

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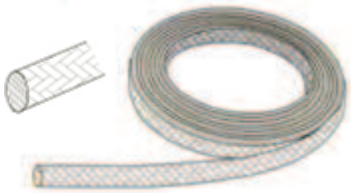
EQUIPOTENTIAL CONDUCTORS

WOVEN CONDUCTORS

ROUND WOVEN CABLE	Section mm²	Réf.	Weight/m (en kg)	Cond. mètre	Materials
 *EQ-TR***	25	EQ-TRC25	0,223	50 ou 100	Naked electrolytic copper
	29	EQ-TRC29	0,258	50 ou 100	Naked electrolytic copper
	35	EQ-TRC35	0,312	50 ou 100	Naked electrolytic copper
	50	EQ-TRC50	0,445	50 ou 100	Naked electrolytic copper
	75	EQ-TRC75	0,667	50 ou 100	Naked electrolytic copper
	150	EQ-TRC150	1,335	50 ou 100	Naked electrolytic copper
	Coil delivery – For other sections ask us – annealing copper available				
 *EQ-TRCE***	5	EQ-TRCE05	0,045	50 ou 100	Tinned Copper
	8	EQ-TRCE08	0,071	50 ou 100	Tinned Copper
	10	EQ-TRCE10	0,089	50 ou 100	Tinned Copper
	16	EQ-TRCE16	0,142	50 ou 100	Tinned Copper
	25	EQ-TRCE25	0,223	25 ou 50	Tinned Copper
	50	EQ-TRCE50	0,445	25 ou 50	Tinned Copper
	Coil delivery – For other sections ask us.				

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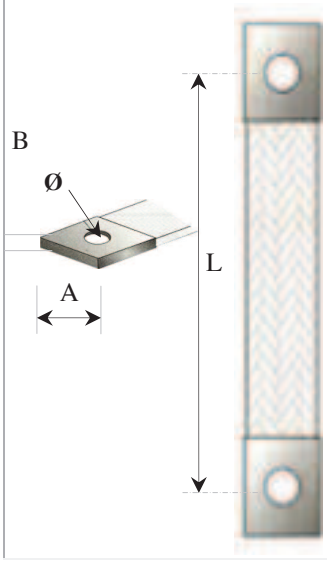
EQUIPOTENTIAL CONDUCTORS

WOVEN CONDUCTORS

FLAT BRAID	Section mm²	Width x ep. mm	Réf.	Weight/m (en kg)	Cond. meter	Materials
 *EQ-TPCE***	5	8 x 1,1	EQ-TPCE05	0,045	50 ou 100	Tinned Copper
	8	8 x 1,5	EQ-TPCE08	0,071	50 ou 100	Tinned Copper
	10	10 x 1,5	EQ-TPCE10	0,089	50 ou 100	Tinned Copper
	16	15 x 2	EQ-TPCE16	0,142	50 ou 100	Tinned Copper
	25	25 x 2	EQ-TPCE25	0,223	25 ou 50	Tinned Copper
	50	30 x 3,5	EQ-TPCE50	0,445	25 ou 50	Tinned Copper
	Coil delivery – For other sections ask us.					

SHUNTS	Section mm²	Lenght available (L) mm	Réf.	AxBxØ	Cond. U	Materials-current allowed
	10	100-150-200-250-300	EQ-SH10	11x3,2x6,5	50 ou 100	Tinned Copper - 75 A
	16	100-150-200-250-300	EQ-SH16	17x3,5x8,5	50 ou 100	Tinned Copper - 120 A
	25	100-150-200-250-300	EQ-SH25	26x4x8,5	25 ou 50	Tinned Copper - 150 A
	35	100-150-200-250-300	EQ-SH35	30x4x10,5	25 ou 50	Tinned Copper - 190 A
	50	150-200-250-300-400-500	EQ-SH50	33x4,5x10,5	25 ou 50	Tinned Copper - 250 A
	70	200-250-300-400-500	EQ-SH70	32x5x12,5	10 ou 25	Tinned Copper - 290 A
	Special production available by request.					

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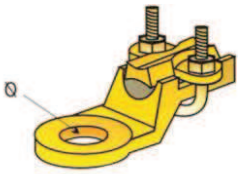
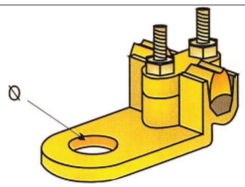
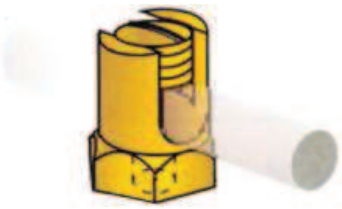
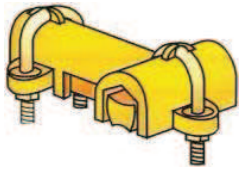
EQUIPOTENTIAL CONNECTIONS

	Sections allowed mm²	Ø	Réf.	Weight/U (en kg)	Cond. U	Materials
	6-70	12	REQ-RD70	0,070	25	Copper alloy
	25-120	12	REQ-RD120	0,135	25	Copper alloy
	35-150	12	REQ-RD150	0,135	25	Copper alloy
	6-70	8	REQ-RP70	0,080	25	Copper alloy
	25-120	12	REQ-RP120	0,180	25	Copper alloy
	6-25	Fixation par M8	REQ-RV25	0,018	25	Copper alloy
	10-35		REQ-RV35	0,030	25	Copper alloy
	35-60		REQ-RV60	0,048	25	Copper alloy
	50-95		REQ-RV95	0,070	25	Copper alloy
	70-120		REQ-RV120	0,089	25	Copper alloy
	95-150		REQ-RV150	0,115	25	Copper alloy
	10-70		REQ-RT70	0,100	25	Copper alloy
	25-120		REQ-RT120	0,200	25	Copper alloy

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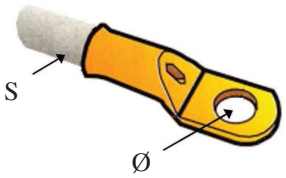
CLAMPS TO SET



Section (S) mm²	Ø mm	Réf.	Weight /100U (en kg)	Cond. U	Materials
10	4,30	CO-1004	0,490	100	Copper alloy.
	5,30	CO-1005	0,540	100	
	6,50	CO-1006	0,550	100	
	8,50	CO-1008	0,600	100	
	10,50	CO-1010	0,720	100	
	13,00	CO-1013	0,660	100	
16	5,30	CO-1605	0,680	100	
	6,50	CO-1606	0,700	100	
	8,50	CO-1608	0,770	100	
	10,50	CO-1610	0,790	100	
	13,00	CO-1613	0,800	100	
25	5,30	CO-2505	1,050	100	
	6,50	CO-2506	1,060	100	
	8,50	CO-2508	1,240	100	
	10,50	CO-2510	1,330	100	
	13,00	CO-2513	1,300	100	
	15,00	CO-2515	1,400	100	
35	5,30	CO-3505	1,330	100	
	6,50	CO-3506	1,400	100	
	8,50	CO-3508	1,450	100	
	10,50	CO-3510	1,600	100	
	13,00	CO-3513	1,650	100	
	15,00	CO-3515	1,650	100	
50	6,50	CO-5006	1,800	100	
	8,50	CO-5008	1,950	100	
	10,50	CO-5010	2,200	100	
	13,00	CO-5013	2,310	100	
	15,00	CO-5015	2,410	100	
	17,00	CO-5017	2,500	100	
70	8,50	CO-7008	3,280	100	
	10,50	CO-7010	3,380	100	
	13,00	CO-7013	3,580	100	
	15,00	CO-7015	3,850	100	
	17,00	CO-7017	4,000	100	
95	8,50	CO-9508	4,300	100	
	10,50	CO-9510	4,450	100	
	13,00	CO-9513	4,650	100	
	15,00	CO-9515	4,870	100	
	17,00	CO-9517	5,850	100	

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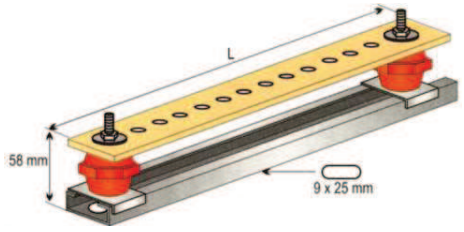
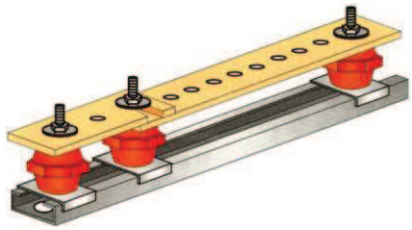
LIGHTNING RODS & GROUNDING ACCESSORIES

EQUIPOTENTIAL BARS



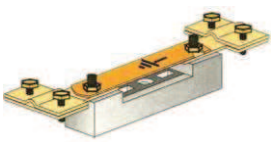
L	Holes number	Réf.	Weight/U (en kg)	Cond. U	Materials
280	6	BAR-D280	1,250	1	Copper plane 50 x 5mm assembled on fibreglass/polyester insulators.
420	10	BAR-D420	1,750	1	
595	15	BAR-D595	2,250	1	
770	20	BAR-D770	2,800	1	
945	25	BAR-D945	3,350	1	



350	6	BAR-C350	1,650	1	Copper plane 50 x 5mm assembled on fibreglass/polyester insulators. Supplied with a cut.
490	10	BAR-C490	2,150	1	
665	15	BAR-C665	2,650	1	
840	20	BAR-C840	3,200	1	
1015	25	BAR-C1015	3,750	1	

Insulators sold singly by request

EARTHING CLIP



Dim. mm	Section maxi. mm²	Réf.	Weight/U (en kg)	Cond. U	
120x30x40	35	BAR-T35	0,120	1	Earthing clip Copper and polyester alloy
150x34x65	70	BAR-T70	0,270	1	

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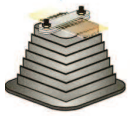
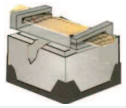
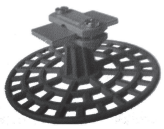
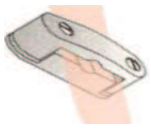
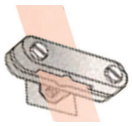
CONDUCTORS BASES AND HOLDFASTS

Nomination		Dim. mm	Réf.	Weight/U (en kg)	Cond. U	Short description
	PYRAMID CONCRETE BLOCK	140x140x80	PLOBET-P1	1	10	Concrete – plastic cover-for the paths. Horizontal. Suitable for flat or round conductor.
	CUBE CONCRETE BLOCK	100x100x70	PLOTBET-C1	1	10	Concrete – plastic cambium-for the paths. Horizontal.
	GRAVEL BLOCK	H : 50 Ø : 100	PLOT-GRA	0,100	10	PVC base stabilize with gravel's weight (terrace roof). Suitable for flat or round conductor.
	TAR STRIP ALUMINIUM	200x4x50	AGR-RUBE	1	10	Tar- aluminium strip. To be put on the steel tub.
	TILE STAPLE CONDUCTOR 30x2	150x50x9 ép. 1	AGR-TUIL1	0,045	50	Inertial strips'hodfasts on tile or slate roof.
	PLASTIC STAPLE	50x10x8	AGR-PL1	0,025	100	Plastic base to be screwed down in the base without offset. Suitable for flat or round conductors.
	SWERVED PLASTIC STAPLE	50x10x8 dép. 20 mm	AGR-PLD1	0,022	100	Plastic base to be screwed down in the base with offset. Suitable for flat or round conductors.
	CLIP CONDUCTOR 30x2	50x10x8	CLIP-PLA	0,0025	100	Stainless steel clip to be settled on the base thanks to screws or rivets.
	GALVANISED STEEL CRAMP	35x30x5	CRA-AG30	0,020	100	Galvanised steel holdfast cramp
	GALVANISED STEEL CRAMP	35x40x5	CRA-AG40	0,020	100	Galvanised steel holdfast cramp
	GALVANISED STEEL CRAMP	35x50x5	CRA-AG50	0,020	100	Galvanised steel holdfast cramp
	STAINLESS STEEL CRAMP	35x30x5	CRA-AI30	0,020	100	Stainless steel holdfast cramp
	STAINLESS STEEL CRAMP	35x40x5	CRA-AI40	0,020	100	Stainless steel holdfast cramp
	STAINLESS STEEL CRAMP	35x50x5	CRA-AI50	0,020	100	Stainless steel holdfast cramp

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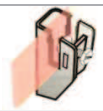
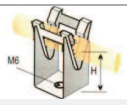
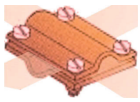
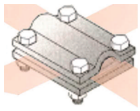
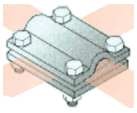
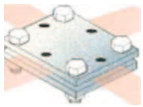
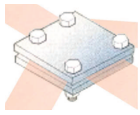
…CONDUCTORS BASES AND HOLDFASTS

Nomination		Dim. **mm**	Réf.	Weight/U (en kg)	Cond. U	Short description
	LEAD PLUGS	Ø5x30	CHEV-PB6	0,005	100	Lead plugs for holdfast cramp.
	HORIZONTAL BASE	30x40x15	SUP-PL1	0,155	25	Galvanised steel base to screw down in the base
	ROUND CONDUCTOR CLIP	H = 20 mm	CLIP-RON	0,014	50	Stainless steel clip for round conductor 8 mm diameter.

MECHANICAL CONNECTIONS

Nomination		Dim. **HxWxl** (in mm)	Réf.	Weight/U (en kg)	Cond. U	Short Description
	COPPER CONNECTION	18x50x50	RAC-CU	0,130	10	Mechanical connection for flat conductors and/or round ones in naked copper. Provided with stainless screw tightening.
	TIN COPPER CONNECTION	18x50x50	RAC-CE	0,140	10	Mechanical connection for flat conductors and/or round ones in tin copper. Provided with stainless screw tightening.
	INOXIDIZABLE STEEL CONNECTION	18x50x50	RAC-IN	0,230	10	Mechanical connection for flat conductors and/or round ones in stainless steel. Provided with stainless screw tightening.
	FLAT INOXIDIZABLE STEEL	12x50x50	RAC-PL	0,310	10	Mechanical connection for flat conductors in stainless steel. Provided with stainless screw tightening.
	CROW'S FOOT OFFSET INOXIDIZABLE STEEL	12x60x60	RAC-PO	0,600	10	Mechanical connection for flat conductors which allows conductors departure for a crow's foot earthing. Provided with stainless screw tightening.

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DOWN CONDUCTORS AND EARTHING SPECIAL COMPONENTS

Nomination		Dim. (mm) **HxLxl**	Réf.	Weight/U (en kg)	Cond. U	Short description
	ISOLATING SPARK GAPS	94 x Ø 45,9	ED-ECL	0,355	1	Balancing in the potential of ground which are not interlinked. Aerial masts, protection discharge spout, metal constructions (stem M8)
	RACCORD CHENEAU	30x70x60	ED-RC01	0,300	1	Mechanical connection galvanised steel. Allows equipotential balance (same potential) of the conductor and the rain gutter it crosses.
	STROKE COUNTER	70x50x60	ED-CMPT	0,750	1	Stroke counter to be connected in series to the downward conductor. A counter's raising occurs each time we notice a strike's impulse. Treaty IP65. 8mm diameter Conductor tin copper Sensitivity 200A, admissible current 100kA (8/20µs)
	CONTROLL SEAL	Ø 50 mm ep. 20 mm	ED-JC01	0,115	1	The controll Seal allows disconnect the downward conductor from the earthing on order to measure the ohmic resistance of the latter. Prescriptive stamping. Provided with stainless screw tightening M5.
	PROTECTION SHEATH	2000x10 (ext.) ep. 1 mm	ED-GP01	0,900	1	The protection sheath allows the overall plane conductor protection against whatever mechanical shock covering from the ground 2 meters high. Provided with 3 holdfast strips with their stainless screws and polyamide plugs.
	CAST IRON INSPECTION HOUSING	110x250x250	ET- REGF	14,000	1	The Inspection housing can be used for buried connections between conductors.

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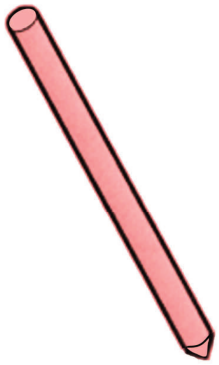
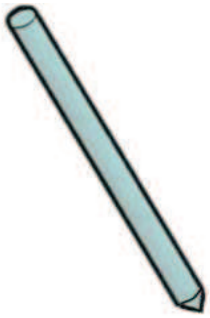
EARTH RODS

NOT ABLE TO BE LENGHTENED	Diameter mm	Length mm	Réf.	Weight/U (en kg)	Cond. U	Materials
	14	1000	PIQNA-1410	1,300	5	Steel – Copper 50 µm
	14	2000	PIQNA-1420	2,550	5	Steel – Copper 50 µm
	16	1000	PIQNA-1610	1,300	5	Steel– Copper254 µm respects UL SPEC 467
	16	1500	PIQNA-1615	1,900	5	Steel – Copper 254 µm respects UL SPEC 467
	16	2000	PIQNA-1620	2,550	5	Steel – Copper 254 µm respects UL SPEC 467
	16	2500	PIQNA-1625	3,200	5	Steel – Copper 254 µm respects UL SPEC 467
	16	3000	PIQNA-1630	3,800	5	Steel - Copper 254 µm respects UL SPEC 467
	19	1000	PIQNA-1910	1,850	5	Steel– Copper 254 µm respects UL SPEC 467
	19	1500	PIQNA-1915	2,700	5	Steel– Copper 254 µm respects UL SPEC 467
	19	2000	PIQNA-1920	3,700	5	Steel – Copper 254 µm respects UL SPEC 467
	19	2500	PIQNA-1925	4,550	5	Steel– Copper 254 µm respects UL SPEC 467
	19	3000	PIQNA-1930	5,400	5	Steel– Copper 254 µm respects UL SPEC 467
	16	1000	PIQNA-1610I	1,500	5	Stainless Steel
	16	1500	PIQNA-1615I	2,250	5	Stainless Steel
	16	2000	PIQNA-1620I	3,000	5	Stainless Steel
	16	2500	PIQNA-1625I	3,750	5	Stainless Steel
	16	3000	PIQNA-1630I	4,500	5	Stainless Steel



*PIQNA-*****



*PIQNA-****I*

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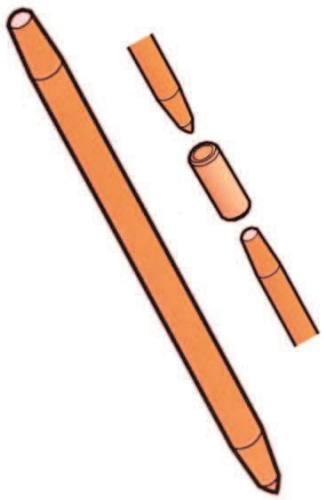
LIGHTNING RODS & GROUNDING ACCESSORIES

EARTH RODS

ABLE TO BE LENGHTENED THANKS TO CONE-SHAPED CYLINDRICAL COVERS	Diameter mm	Length mm	Réf.	Weight/m (en kg)	Cond. mètre	Materials
 *PIQAC-*****	16	1000	PIQAC-1610	1,300	5	Steel– Copper 254 µm respects UL SPEC 467
	16	1500	PIQAC-1615	1,900	5	Steel – Copper 254 µm respects UL SPEC 467
	16	2000	PIQAC-1620	2,550	5	Steel– Copper 254 µm respects UL SPEC 467
	16	2500	PIQAC-1625	3,200	5	Steel – Copper 254 µm respects UL SPEC 467
	16	3000	PIQAC-1630	3,800	5	Steel – Copper 254 µm respects UL SPEC 467
	19	1000	PIQAC-1910	1,850	5	Steel – Copper254 µm respects UL SPEC 467
	19	1500	PIQAC-1915	2,700	5	Steel– Copper 254 µm respects UL SPEC 467
	19	2000	PIQAC-1920	3,700	5	Steel– Copper 254 µm respects UL SPEC 467
	19	2500	PIQAC-1925	4,550	5	Steel– Copper 254 µm respects UL SPEC 467
	19	3000	PIQAC-1930	5,400	5	Steel – Copper 254 µm respects UL SPEC 467

CONE-SHAPED CYLINDRICAL COVERS

	Diameter mm	Height mm	Réf.	Weight/m (en kg)	Cond. mètre	Materials
	int. : 16	70	MANC-C16	0,100	5	High mechanical resistance copper alloy (does not corrode)
	int. : 19	70	MANC-C19	0,150	5	High mechanical resistance copper alloy (does not corrode)

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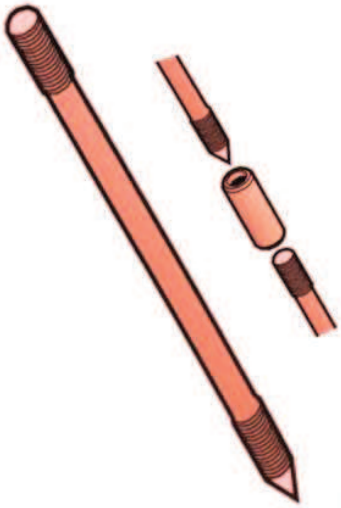
LIGHTNING RODS & GROUNDING ACCESSORIES

EARTH RODS

ABLE TO BE LENGHTENED THANKS TO THREADED CYLINDRICAL COVERS	Diameter mm	Length mm	Réf.	Weight/U (en kg)	Cond. U	Materials
 *PIQAF-*****	16	1000	PIQAF-1610	1,300	5	Steel – Copper 254 µm respects UL SPEC 467
	16	1500	PIQAF-1615	1,900	5	Steel – Copper 254 µm respects UL SPEC 467
	16	2000	PIQAF-1620	2,550	5	Steel – Copper 254 µm respects UL SPEC 467
	16	2500	PIQAF-1625	3,200	5	Steel – Copper 254 µm respects UL SPEC 467
	16	3000	PIQAF-1630	3,800	5	Steel – Copper 254 µm respects UL SPEC 467
	19	1000	PIQAF-1910	1,850	5	Steel – Copper 254 µm respects UL SPEC 467
	19	1500	PIQAF-1915	2,700	5	Steel – Copper 254 µm respects UL SPEC 467
	19	2000	PIQAF-1920	3,700	5	Steel – Copper 254 µm respects UL SPEC 467
	19	2500	PIQAF-1925	4,550	5	Steel – Copper 254 µm respects UL SPEC 467
	19	3000	PIQAF-1930	5,400	5	Steel – Copper 254 µm respects UL SPEC 467

THREADED CYLINDICAL COVERS

	Diameter mm	Height mm	Réf.	Weight/U (en kg)	Cond. U	Materials
	int. : 16	70	MANC-F16	0,100	5	High mechanical resistance copper alloy (does not corrode)
	int. : 19	70	MANC-F19	0,150	5	High mechanical resistance copper alloy (does not corrode)

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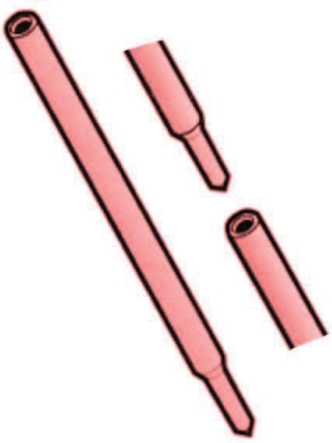
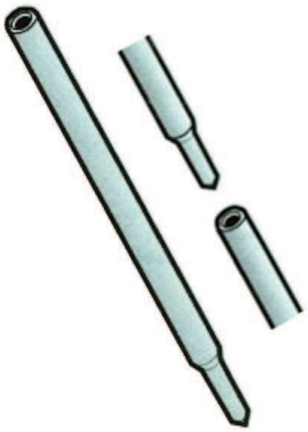
EARTH RODS

SELF-STANDING	Diameter mm	Length mm	Réf.	Weight/U (en kg)	Cond. U	Materials
 *PIQAA-*****	16	1000	PIQAA-1610	1,300	5	Steel – Copper 254 µm respects UL SPEC 467
	16	1500	PIQAA-1615	1,900	5	Steel – Copper254 µm Respects UL SPEC 467
	16	2000	PIQAA-1620	2,550	5	Steel– Copper 254 µm respects UL SPEC 467
	16	2500	PIQAA-1625	3,200	5	Steel – Copper 254 µm respects UL SPEC 467
	16	3000	PIQAA-1630	3,800	5	Steel – Copper 254 µm respects UL SPEC 467
	19	1000	PIQAA-1910	1,850	5	Steel – Copper 254 µm respects UL SPEC 467
	19	1500	PIQAA-1915	2,700	5	Steel– Copper 254 µm respects UL SPEC 467
	19	2000	PIQAA-1920	3,700	5	Steel – Copper 254 µm respects UL SPEC 467
	19	2500	PIQAA-1925	4,550	5	Steel – Copper 254 µm respects UL SPEC 467
	19	3000	PIQAA-1930	5,400	5	Steel – Copper 254 µm respects UL SPEC 467
 *PIQAA-****I*	19	1000	PIQAA35-1910	1,850	5	Steel – Copper 350 µm
	19	1500	PIQAA35-1915	2,700	5	Steel – Copper 350 µm
	19	2000	PIQAA35-1920	3,700	5	Steel – Copper 350 µm
	16	1000	PIQAA-1610I	1,500	5	Stainless Steel
	16	1500	PIQAA-1615I	2,250	5	Stainless Steel
	16	2000	PIQAA-1620I	3,000	5	Stainless Steel

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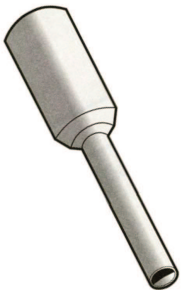
DRIVING-IN EQUIPMENT

	Nomination	Réf.	Weight/U (en kg)	Cond. U	Short description
	SLIPPERY SLEDGE	MF-MAS	10,000	1	Slippery Sledge fitted to rods' driving-in up to a 19mm diameter.
	SHORT SLEDGE	MF-B01	0,400	1	Short Sledge for driving-in (up to the 19 mm diameter) for rods.
	SHORT SLADGE PAA	MF-B02	0,450	1	Short Sledge driving-in for self-standing rods *(PIQAA-****)*

RODS –CONDUCTORS CONNECTION

Nomination		Dim. mm	Réf.	Weight/U (en kg)	Cond. U	Short Description
	CLAMP ROD	40x40x15	COS-P01	0,120	5	Brass connection clamp for strip and rods from 14 to 19mm

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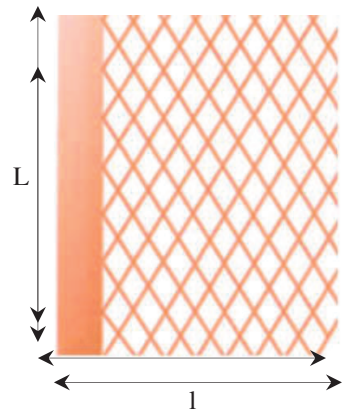
GROUND GRILLS



Dimensions Width x Length (en mm)	Section (en mm)	Réf.	Weight/U (en kg)	Cond. U	Material - Meshes
2000 x 8800	3 x 3	GRT-2088	53,000	1	Copper – 115 x 55
2000 x 1000	3 x 3	GRT-2010	9,000	1	Copper – 115 x 55
1000 x 1000	3 x 3	GRT-1010	4,500	1	Copper– 115 x 55
700 x 1000	3 x 3	GRT-0710	3,000	1	Copper – 115 x 55
Roll delivery					

GROUND PLATES

Dimensions Width x Length (en mm)	Thickness (en mm)	Réf.	Weight/U (en kg)	Cond. U	Material
2000 x 1000	2	PLC-2010	36,000	1	Copper
1000 x 1000	2	PLC-1010	18,000	1	Copper
1000 x 670	2	PLC-1067	12,000	1	Copper

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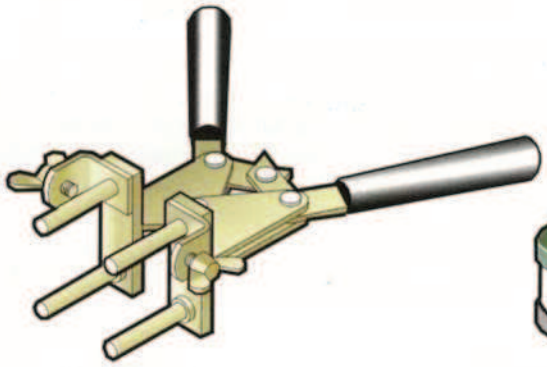
ALUMINIUM-THERMAL WELDING

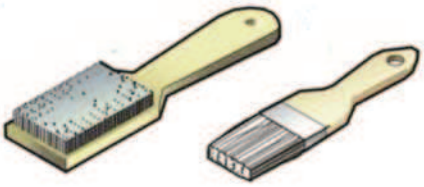
Moule :
Le moule est fabriqué à partir d'un bloc de graphite. Un couvercle métallique protège contre les projections de matières incandescentes.



Pince-support :
Utilisée pour maintenir le moule, permettre son ouverture et sa fermeture ainsi que le positionnement des éléments à souder. Le type de pince dépend de la taille et de la forme du moule.

Cartouche et disque obturateur :
La cartouche contient la poudre de soudage (couvercle de couleur) et la poudre d'allumage (couvercle noir).
Le disque métallique est introduit dans le creuset afin d'obturer le trou de coulée avant de déposer la poudre de soudage.

Allumeur AL-FI :
Utilisé pour la mise à feu de la poudre d'allumage.



Brosse à Cardes BR-CA :
Utilisée pour un parfait nettoyage des pièces métalliques à souder.

Pinceau de moule BR-PC :
Utilisé pour le nettoyage du moule après chaque soudure.

Curette-pige R- :
Sa forme est spécialement étudiée pour enlever le laitier aluminothermique du creuset et du trou de coulée du moule.

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LIGHTNING RODS & GROUNDING ACCESSORIES

The use of aluminothermic welding is specific to each site and each user, you will find in the tables below our guidance of dimensions and layout, as materials to implement in order to choose the references that are best suited for welding. We will then be able to offer the mussels and associated accessories.

COPPER CONDUCTORS DIMENSIONS

Section *Cross section* mm²	Composition *Composition* Nr x Ø mm	Diamètre *Diameter* Ø mm
10	7 x 1.40	4.1
	19 x 0.80	4.2
	37 x 0.60	4.2
16	7 x 1.68	5.1
	19 x 1.03	5.2
	37 x 0.75	5.2
25	7 x 2.13	6.4
	19 x 1.30	6.5
	37 x 0.90	6.4
29	19 x 1.40	7.0
35	7 x 2.53	7.6
	19 x 1.53	7.7
	37 x 1.10	7.7
50	7 x 3.00	9.0
	19 x 1.83	9.2
	37 x 1.31	9.2
70	7 x 3.56	10.7
	19 x 2.17	10.9
	37 x 1.55	10.9
95	19 x 2.50	12.5
	37 x 1.81	12.7
	61 x 1.40	12.6
120	19 x 2.84	14.2
	37 x 2.03	14.2
	61 x 1.60	14.4
150	19 x 3.18	15.9
	37 x 2.25	16.0
	61 x 1.77	15.9
185	37 x 2.52	17.7
	61 x 1.96	17.7
240	37 x 2.83	19.8
	61 x 2.25	20.3
300	37 x 3.21	22.5
	61 x 2.50	22.5
400	61 x 2.89	26.0
500	91 x 2.65	29.1

CONCRETE IRON DIMENSIONS

Taille nominale *Nominal size* Ø mm	Diamètre *Diameter* Ø mm
6	7.2
8	9.6
10	12.0
12	14.4
14	16.8
16	19.2
20	24.0
25	30.0
32	38.4

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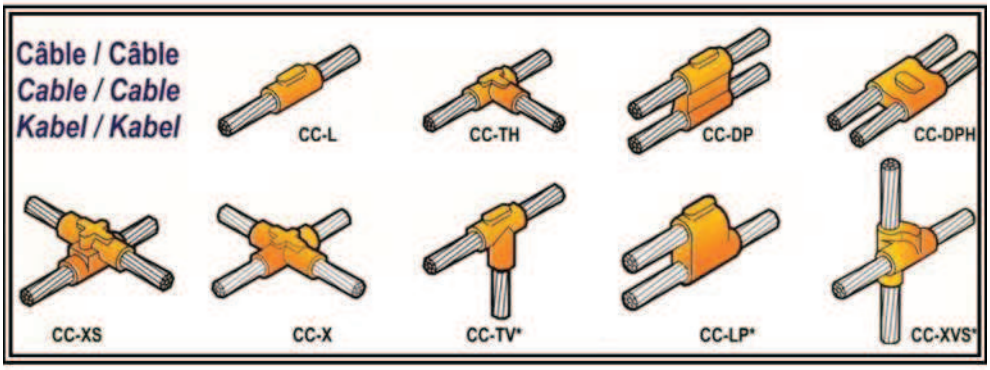
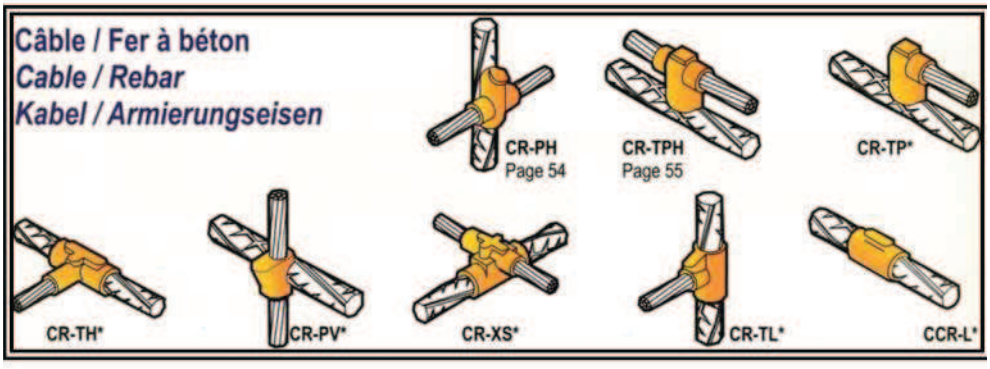
LIGHTNING PROTECTION SYSTEMS FRANCE
Groupe CEMASO SAS - BP 80055 - F-33460 MARGAUX
SIRET: 521 876 433 RCS BDX

LIGHTNING RODS & GROUNDING ACCESSORIES





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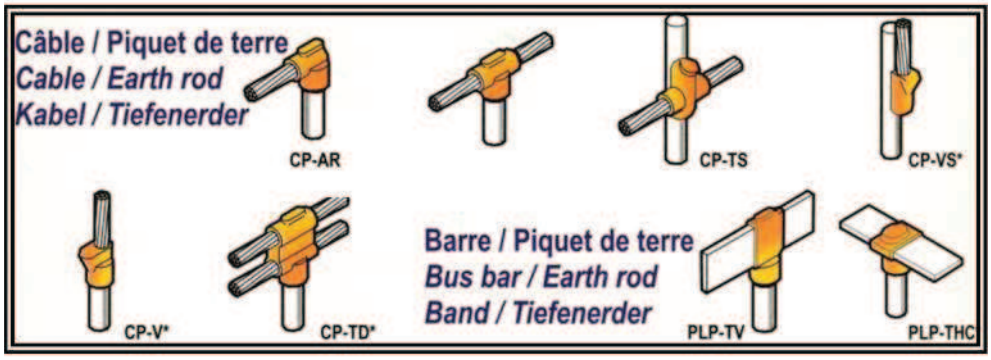
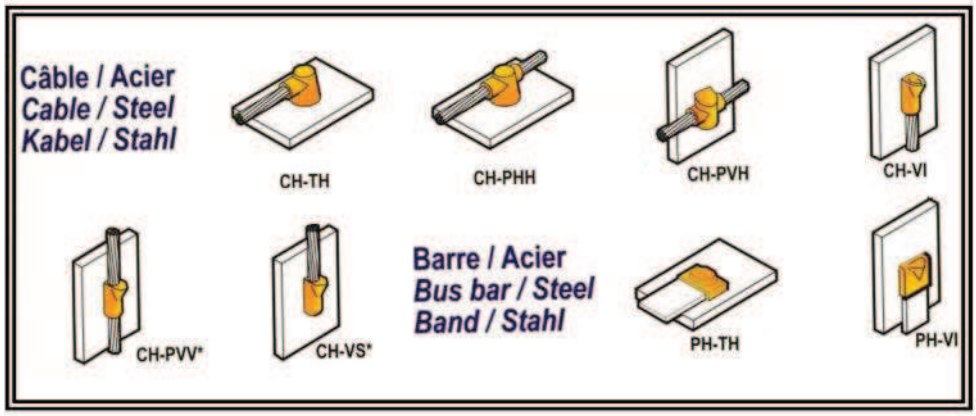
LIGHTNING RODS & GROUNDING ACCESSORIES





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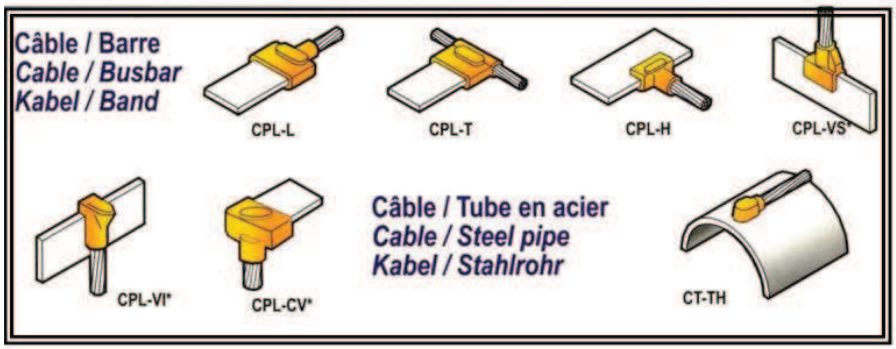
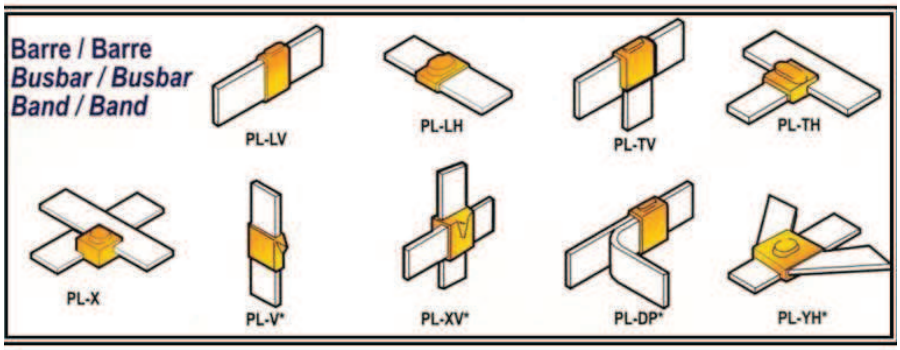
LIGHTNING RODS & GROUNDING ACCESSORIES





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LIGHTNING PROTECTION SYSTEMS FRANCE
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GROUND GAUGE

Dimensions L x l x Epaisseur (en mm)	Réf.	Poids/U (en kg)	Cond. U	Descriptif
240x250x100	MES-PRO	4,250	1	Mesureur de terre spécifique. Compact et léger, il est fourni avec sa valisette de transport dans laquelle sont logés ses 3 câbles équipés et ses 2 piquets de mesures. Il convient parfaitement pour toutes mesures de prise de terre.

Technical features

Mesure de résistance de terre par courant constant :	800 Hz, 2 mA
	0-200 V CA, 40 ~ 500 Hz
Calibres :	0-20 Ω (res. 0,01 Ω) 0-200 Ω (res. 0,01 Ω) 0-2000 Ω (res. 0,01 Ω)
Alimentation :	6 piles de 1,5 V
Fonctions :	Mesure de prise de terre Indication de circuit ouvert Mémoire de mesure
Conformité :	Norme IEC 1010 Catégorie de surtension III

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PRICE ENQUIRY FORM

Customer Code :			*Cf. your last invoice*
e-mail :	@		
Society :			
Name contact :			
Firstname contact :			
Adress :			
County Code :		City :	
Country :			
Phone. :			
Telecopy :			
Delivery: *(Specify if it is a different address)*			
Society :			
Adress:			
County Code:		***City :***	
County :			
Comments :			

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QUANTITY

References	Nomination	Quantity

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LIGHTNING PROTECTION SYSTEMS FRANCE
Groupe CEMASO SAS - BP 80055 - F-33460 MARGAUX
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PURCHASE CONDITIONS

1- **Generalities :** All the orders that come from a quotation made by LPS FRANCE is addressed to LPS FRANCE – BP 80055 – F-33460 CUSSAC FORT MEDOC - RCS Bordeaux 521 876 433 and thus triggers the acceptance of the customer of our sale general conditions herein and despite whatever opposite clause from his part.

2- **Orders:** They must be certified by written word thanks to the purchase attached to the quotation or thanks to numbered purchase orders coming from your service or society. They must contain all the usual, legal information, linked to the ordering party.

3- **Price:** The prices indicated on our offers or quotations are valid during 6 months (six) and according to the quantity that is foreseen on the quotation. They are changeable if the quantities asked do not stick to those in the quotation. LPS FRANCE® allows itself to modify the prices according to the construction's index, BT 47 index in particular. In the framework of a basic supplies' order, that does not include the installation, our prices are duty-free, sold free alongside ship, concerning the metropolis, for orders upper than 305,00 Euros net duty-free (for lower amounts, the transport will have to be paid by the purchaser). Concerning the delivery outside the Metropolis, our prices are Ex-works (the customer has in charge the transport from our factory) and the transport expenses will have to be paid by the purchaser only, except if LPS FRANCE mentions the contrary.

4- **Delivery delay:** LPS FRANCE society will stick to the delay foreseen, so far as possible, (9 to 10 weeks as from the purchase orders' reception). However, the purchaser can't oppose to a potential delay. The recipient is in charge of the delivery risks, whatever the sales and transport conditions are. In case of contest for delay, loss or damage of the goods, it is the role of the recipient to have recourse to third party.

5- **Transport:** According to article 105 of commercial code, the goods are travelling to the riskiness of the purchaser, recipient who must check the state of the goods in the presence of the deliverer. In case of damage, it is compulsory to mention it on the freight forwarder's written document with the maximum of precision, followed by a registered letter addresses to the freight forwarder within 48 hours. If the goods are totally unusable, refuse it. The latter will be replaced within the best extension.
If you sign the freight deliverer's without any reservation, that means you recognise having received the goods in a good state and from that moment, no recourse or repayment is possible anymore, neither replacement of the pieces will be possible.

6- **Payment:** Body corporate of public law will settle payment through administrative transfer 60 days in date of reception of the works or material. Concerning all other orders, 30% of the total amount of the quotation and chosen options will be compelled. This down payment will be settled cash at the order's certification. The payment will be settled either cash at the reception of the works, or by bank draft 30 days at the end of the month for the remaining to be paid. The lack of the bank draft at the date planned or the change of their due date without previous agreement of our society will automatically trigger the suppression of payment's easy terms. The loss of payment of at least one of the due date will trigger, by rights, the payability of the interests and of the inherent expenses as well as the cessation of the orders in process. Every payment that comes after the payment date which is on the invoice, will be mark-up with a 1.5% penalty for each month past due, having for known that all entered month will be due integrally. The invoicing date is the goods' delivery date, or the date when the goods will be available in our factory, but also at the reception of the works. Body corporate of public law will settle the payment thanks to administrative transfer 60 days at the date of reception of the works or material.

7- **Reserve of property:** Concerning supplies' order only, the supplied goods' ownership will only be transferred to the buyer after the whole payment of the price, the supplier allowing himself the right to claim the said goods in the conditions foreseen by the law n°80-335 of May 12th 1980. All the expenses which would follow from the implementation of this clause would be at the charge of the buyer.

8- **Warranty-liability limit:** There is a five (5) years warranty on the supplies, but it is effective only in a normal use of the material. All return of material must be first accepted by LPS FRANCE.
Our responsibility is limited to the only starting value of the supplied pieces and recognized as flawed without being linked to any other indemnity towards the buyer such as expenses of dismantling, reassembly, diagnostics, evaluation, loss of use, or other expenses.
The return expenses must be paid by the customer. It is specialized that LPS FRANCE society won't be responsible for damages directly or indirectly induced by the material the customer has got, it can be awry or not.

9- **Return of the goods:** Except a mistake of our part, no piece will be taken back, neither swapped – beyond 15 days from the invoicing date.
Contact us to obtain a return authorization and know the conditions to complete this return in the best conditions. In no case we will accept returns of pieces in cash on delivery or in freight due or bad-packed.
The returns are limited only to pieces in their first packaging and in perfect state of commercialization, which means not assembled.

10- **Jurisdiction:** In case of disagreement, Bordeaux Tribunal de Commerce (France) are the only interested for the issue.

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LIGHTNING PROTECTION SYSTEMS FRANCE
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Lightning Protection Systems France

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ELLIPS

Early Streamer Emitter

MADE IN FRANCE

Lightning Protection Systems France (LPS France) is your expert to find your lightning protection solutions.

LPS France manufactures and proposes the ELLIPS ESE lightning rods range and the ELLEC SP lightning arrestors range.

LPS France designs, manufactures and implements lightning protections systems adapted to all your projects thanks our worldwide extensive network of agents and installers.

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www.ellipsese.com

Lightning **P**rotection **S**ystems **FRANCE**

Groupe CEMASO SAS - BP 80055

F-33460 MARGAUX. France

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TABLE OF CONTENTS

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LIGHTNING PROTECTION SYSTEMS FRANCE
Groupe CEMASO SAS - BP 80055 - F-33460 MARGAUX
SIRET: 521 876 433 RCS BDX

Inner Lightning Protection Installation : Surges Arresters

Inner Lightning Protection Installation's goal is to guard inner electrical fittings installations and supplies, and persons, against direct or inferred high voltage and potential rise.

Surge Arrester Protection

High Voltage (inferred effect) appears between the entrance of external electricity supply and the ground equipotential system of the framework. These surges «spread" in the inner framework (along the wire).

As it is impossible to connect immediately the wires with the equipotential network (court-circuit danger), we connect them thanks to devices which limit surge, which is called ***parafoudre***.

Surges Arresters Main features definition

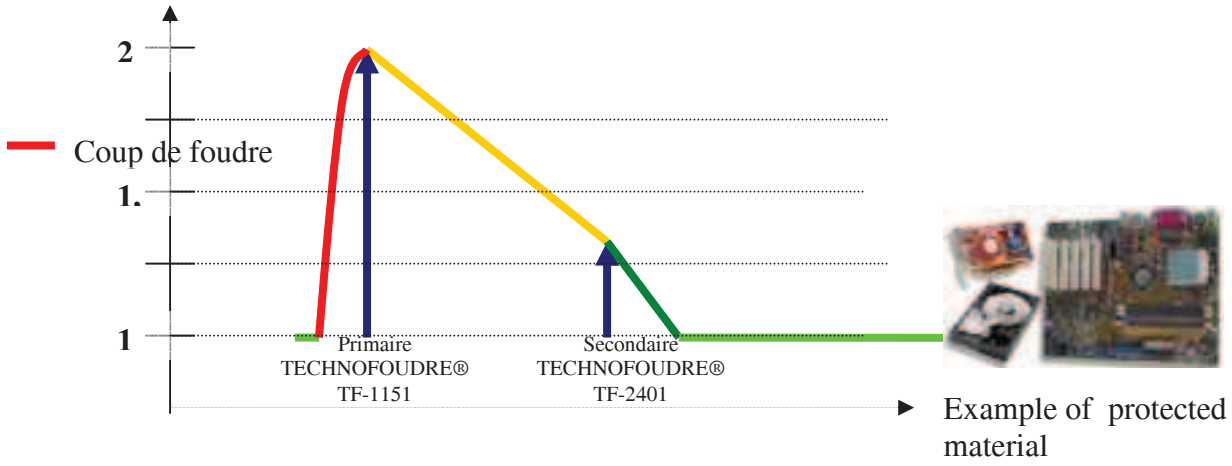
- *Discharge nominal current*: It represents the protection ability of absorption on repeated a transitional phenomena (express in kA).

- Discharge *Maximum current*: It is the maximum intensity value that protection is able to discharge at bolt upright without being destroyed; it is linked to the discharge nominal current.

Implementation

Surge arresters implementation requires engineering and installation technical mastery (guide UTE 15-443), indeed advices protections have to ensure supplies preservation and especially to guaranty people safety.

Cascade protection principle



Prices request can be done on demand, for the only boxes, plastic or steel, cables, connection clamps, but also for the acceptance of surge arresters solutions in your products … our engineering factories and our manufacturing research department are here to take into account whatever request you may ask us concerning a special production.

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LIGHTNING PROTECTION SYSTEMS FRANCE
Groupe CEMASO SAS - BP 80055 - F-33460 MARGAUX
SIRET: 521 876 433 RCS BDX

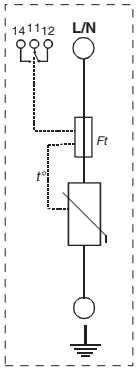
TYPE 1
TECHNOFOUDRE® TF-1251

Type 1
I_{imp} : 25kA/20kA
1 pole/module

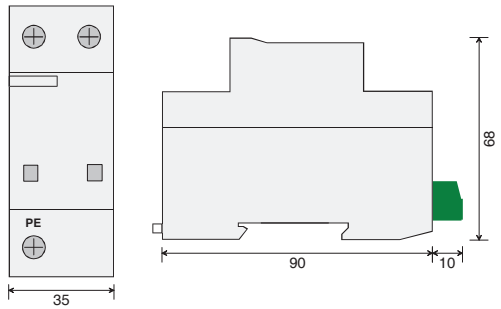
Cast in one piece Surge arrester, 1 high voltage pole TF-1251 for the protection against direct lightning effects (if there is a lightning rod) and indirect ones on single phased or three-phase networks of the installations situated in areas with strong lighting strikes density.

- **Surge arrester type 1 I_{imp} 25 kA / I_{max} 100 kA**
- **Discharge nominal current I_n 30 kA**
- **Life-ending signal**
- **life-ending carrying forward (option)**

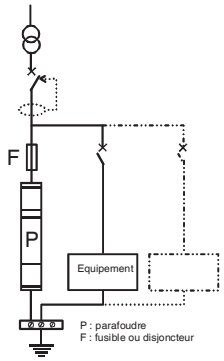
Inner system



Dimensions in mm



Installation principle



Features

References	TF-1251/440	TF-1251/440-T	TF-1251/335	TF-1251/335-T
Kind of network	TT-TN-IT	TT-TN-IT	TT-TN	TT-TN
nominal tension Un	400 VAC	400VAC	230 VAC	230 VAC
maximal tension of permanent service Uc (50Hz)	440 VAC	440 VAC	335 VAC	335 VAC
kept of temporary surges U_T	Uc	Uc	> 400 VAC	> 400 VAC
specific energy / charge				
discharge nominal current In (8/20µs)	30 kA	30 kA	30 kA	30 kA
discharge nominal current Iimp (10/350µs)	20 kA	20 kA	25 kA	25 kA
protection level Up under In / under 5 kA	1,9 kV / 1,2 kV	1,9 kV / 1,2 kV	1,5 kV /1,1 kV	1,5 kV /1,1 kV
protection level Up under Iimp	1,7 kV	1,7 kV	1,2 kV	1,2 kV
special energy / charge	100 kJ/Ω / 10 As	100 kJ/Ω / 10 As	155 kJ/Ω / 12,5 As	155 kJ/Ω / 12,5 As
Features of parasurges				
discharge current nom. /max. In / Imax (8/20µs)	*70 kA /140 kA*	*70 kA /140 kA*	*70 kA /140 kA*	*70 kA /140 kA*
leaking current	< 2 mA	< 2 mA	< 2 mA	< 2 mA
delay of answer	< 25 ns	< 25 ns	< 25 ns	< 25 ns
Fuse (associated protection's device)	max. 250 A gG/gL	max. 250 A gG/gL	max. 250 A gG/gL	max. 250 A gG/gL
admissible current of short circuit	25 kA / 50 Hz	25 kA / 50 Hz	25 kA / 50 Hz	25 kA / 50 Hz
life-ending signage	oui	oui	oui	oui
distance deferment life-ending information	non	oui	non	oui
nnection ability				
L/N		4-35 mm² (souple : 25 mm² max.)		
PE		4-35 mm² (souple : 25 mm² max.)		
deferment terminal signage				
supple rigid	--	1,5 mm²	--	1,5 mm²
temperature in use		-20°C / +80°C		
housing material		thermoplastic Polyester UL 94 5VA		
protection degree		IP20		
installation		asymmetrical Rail din (EN 50022 / DIN46277-3)		
quantity of ports		1		

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LIGHTNING PROTECTION SYSTEMS FRANCE
Groupe CEMASO SAS - BP 80055 - F-33460 MARGAUX
SIRET: 521 876 433 RCS BDX

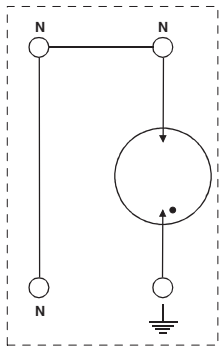
TYPE 1
TECHNOFOUDRE® TF-1001

Type 1
I_{imp} : 100Ka
Neutral equipment

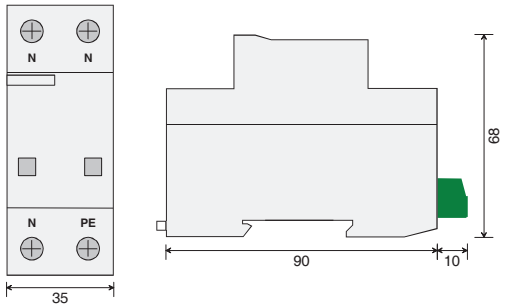
Cast in one piece Surge arrester very high voltage TF-1001 for the protection of the neutral of the power network in addition to the surge arresters TF-1251 (scheme 3+1 or 1+1), about the installations with lightning rods on

- **Surge arrester type 1 I_{imp} 100 kA / I_{max} 160 kA**
- **Discharge nominal current I_n 80 kA**

Internal system



Dimensions in mm



Features

References	TF-1001
kind of network	TT / TNS
nominal tension Un	230 VAC
permanent service maximal tension. Uc (50Hz)	255 VAC
temporary surges U_T	Uc
discharge nominal current In (8/20µs)	80 kA
discharge maximal current Iimp (10/350µs)	100 kA
protection level Up under In	1,5 kV
protection level Up under Iimp	1,75 kV
specific energy / charge	2,5 MJ/Ω / 50 As
parasurges'features	
nominal discharge current /max. In / Imax (8/20µs)	-
discharge maximal current Iimp (10/350µs)	-
residual tension Ures under In / under Iimp	-
cut-off the current in succession	> 100 A rms
time of answer	< 100 ns
Fuse (associated protection device)	
admissible short circuit current	25 kA / 50 Hz
life-ending signage	-
distance deferment life-ending information	-
connection ability	
N	4-35 mm² (souple : 25 mm² max.)
PE	4-35 mm² (souple : 25 mm² max.)
terminal deferment signage	
Supple rigid	--
service temperature	-20°C / +80°C
housing Material	Polyester thermoplastique UL 94 5VA
protection degree	IP20
connection	Rail DIN symétrique (EN 500022 / DIN46277-3)
quantity of ports	1

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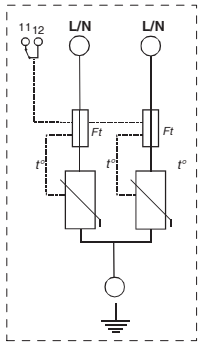
TYPE 1
TECHNOFOUDRE® TF-1151

Type 1
I_{imp} : 12.5kA
2 poles/module

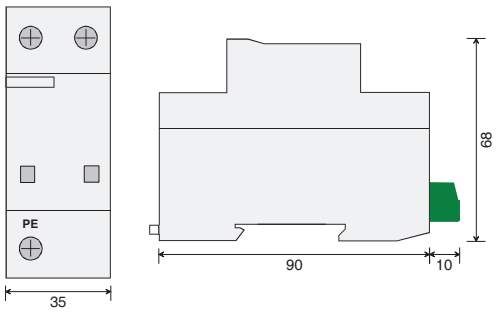
We advice you the use of surge arresters TF-1151 for the protection, against direct lightning effects (if there is a lightning rod) and indirects ones, and single phase or three phase networksfor installations situated in areas with very strong lightning strikes density.

- **Surge arrester type 1 I_{imp} 12.5 kA / I_{max} 80 kA**
- **Discharge nominal current I_n 20 kA**
- **Incorporated Thermal disjuncture (carrying forward in option)**

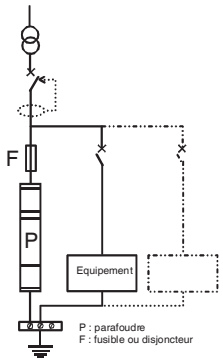
Inner system



Dimensions in mm



Installation principle



Features

References	TF-1151/440	TF-1151/440-T	TF-1151/335	TF-1151/335-T
king of network	TT-TN-IT	TT-TN-IT	TT-TN	TT-TN
nominal Tension Un	400 VAC	400 VAC	230 VAC	230 VAC
maximal tension of permanent service Uc (50Hz)	440 VAC	440 VAC	335 VAC	335 VAC
kept of the temporary surges U_T	Uc	Uc	> 400 VAC	> 400 VAC
discharge nominal current In (8/20µs)	20 kA	20 kA	20 kA	20 kA
discharge maximal current Iimp (10/350µs)	12.5 kA	12.5 kA	12.5 kA	12.5 kA
protection level Up under In	1,8 kV	1,8 kV	<1,5 kV	<1,5 kV
protection level Up under Iimp	1,7 kV	1,7 kV	1,2 kV	1,2 kV
special Energy/ charge	40 kJ/Ω / 6,25 As	40 kJ/Ω / 6,25 As	40 kJ/Ω / 6,25 As	40 kJ/Ω / 6,25 As
residual tension Ures				
à 5kA	1,2 kV	1,2 kV	1 kV	1 kV
à 10kA	-	-	1,15 kV	1,15 kV
à 15kA	-	-	1,25 kV	1,25 kV
à 20 kA	-	-	1,31 kV	1,31 kV
Features of parasurges only				
discharge current nom. /max In / Imax (8/20µs)	*40 kA /80 kA*	*40 kA /80 kA*	*40 kA /80 kA*	*40 kA /80 kA*
leaking current Ic	< 2 mA	< 2 mA	< 2 mA	< 2 mA
delay of answer	< 25 ns	< 25 ns	< 25 ns	< 25 ns
Fuse (associated protection device)	max. 250 A gG/gL	max. 250 A gG/gL	max. 250 A gG/gL	max. 250 A gG/gL
admisible current of associated protection	25 kA/ 50 Hz	25 kA / 50 Hz	25 kA/ 50 Hz	25 kA / 50 Hz
life-ending signage	oui	oui	oui	oui
distance referment life-ending information	non	oui	non	oui
fork bridging section that tools up the parasurge	16 mm²	16 mm²	16 mm²	16 mm²
onnection ability	4-35 mm² (souple : 25 mm² max)			
terminal signage referment (supple, rigid)	--	1,5 mm²	--	1,5 mm²
temperature in use	-20°C / +80°C			
housing material	Polyester thermoplastique UL 94 5VA			
protection degree	IP20			
installation	Rail din symetrical (EN 50022 / DIN46277-3)			
quantity of ports	1			

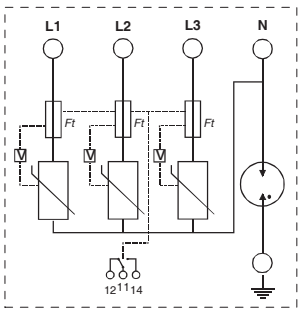
TYPE 1
TECHNOFOUDRE® TF-1154

Type 1
I_{imp} : 12.5kA
4 poles (3+1)

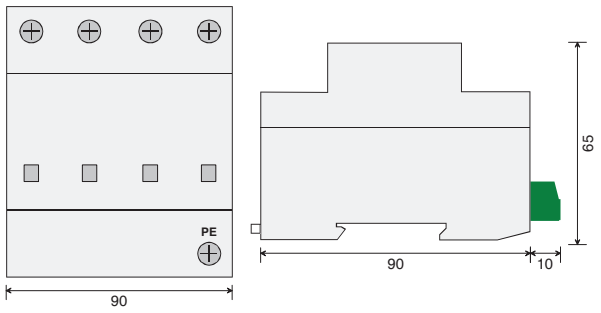
Cast in one piece surge arrester TF-1154 – protection against direct lightning effects (if there is a lightning rod) and indirect ones on three phase networks (scheme C2: protection common and differential mode) of the installations situated in areas with very strong lightning strikes density.

- **Surge arrester type 1 I_{imp} 12.5 kA**
- **Discharge nominal current I_n 12.5/50 kA**
- **Common and differential mode protection**
- **Incorporated thermal disjuncture (carrying forward in option)**

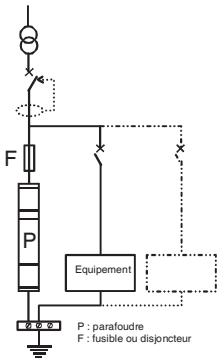
Inner system



Dimensions in mm



Installation principle



Features

References	TF-1154/440	TF-1154/440-T	TF-1154/335	TF-1154/335-T
kind of network	TT-TN-IT	TT-TN-IT	TT-TN	TT-TN
nominal tension Un	400 VAC	400VAC	230 VAC	230 VAC
maximal tension of permanent service Uc L/N-N/PE	440 VAC / 255 VAC	440 VAC / 255 VAC	335 VAC / 255 VAC	335 VAC / 255 VAC
kept of temporary tension U_T L/N-N/PE	Uc / Uc	Uc / Uc	> 400 VAC / Uc	> 400 VAC / Uc
discharge nominal current In L/N-N/PE (8/20µs)	20 kA - 50 kA	20 kA - 50 kA	20 kA - 50 kA	20 kA - 50 kA
discharge maximal current Iimp (L/N-N/PE) (10/350µs)	12,5 kA - 50kA	12,5 kA - 50kA	12,5 kA - 50kA	12,5 kA - 50kA
protection level Up under In (L/N-N/PE)	1,8 kV - 1,2 kV	1,8 kV - 1,2 kV	<1,5 kV - 1,2 kV	<1,5 kV - 1,2 kV
protection level Up under Iimp	1,5 kV	1,5 kV	1 kV	1 kV
specific energy / charge	40 kJ/Ω / 6,25 As	40 kJ/Ω / 6,25 As	40 kJ/Ω / 6,25 As	40 kJ/Ω / 6,25 As
residual tension				
à 5kA	1,2 kV	1,2 kV	1 kV	1 kV
à 10kA	-	-	1,15 kV	1,15 kV
à 15kA	-	-	1,25 kV	1,25 kV
à 20 kA	-	-	1,31 kV	1,31 kV
discharge maximal current Imax L/N-N/PE (8/20µs)	80 kA /100 kA	80 kA /100 kA	80 kA /100 kA	80 kA /100 kA
leaking current Ic / following current N-PE	- / ?100A	- / ?100A	- / ?100A	- / ?100A
delay of answer	< 25 ns	< 25 ns	< 25 ns	< 25 ns
Fuse (associated protection features)	max. 250 A gG/gL	max. 250 A gG/gL	max. 250 A gG/gL	max. 250 A gG/gL
admissible current of associated protection	25 kA / 50 Hz	25 kA / 50 Hz	25 kA / 50 Hz	25 kA / 50 Hz
life ending signage	oui	oui	oui	oui
distance referment life ending information	non	oui	non	oui
fork bridging that tools up the parasurge	16 mm²	16 mm²	16 mm²	16 mm²
connection capacity	4-35 mm² (souple : 25 mm² max.)			
terminals signage referment (supple, rigid)	--	1,5 mm²	--	1,5 mm²
Temperature in use	-20°C / +80°C			
housing material	thermoplastic Polyester UL 94 5VA			
protection degree	IP20			
installation	Rail din symetrical (EN 50022 / DIN46277-3)			
quantity of ports	1			

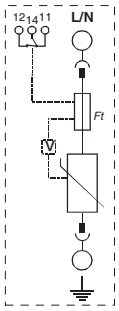
TYPE 2
TECHNOFOUDRE® TF-2600

Type 2
I_n / I_{max} : 20 / 60 kA
1 to 4 poles removable

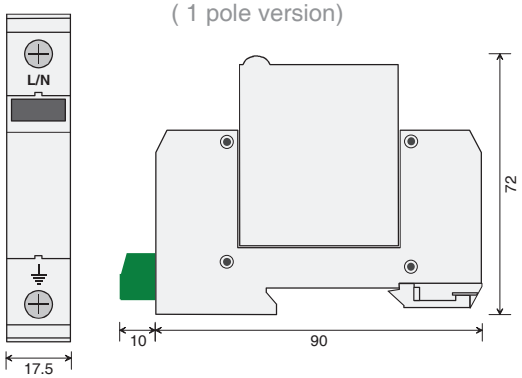
Surge arrester TF-2600 very high voltage for the first protection of single phase or three phase networks of installations that are proned to lightning strikes. Assembly in 2, 3 or 4 poles.

- **Surge arrester type 2 I_{max} 60 kA**
- **Discharge nominal current I_n 20 kA**
- **Removable shell**
- **Incorporated thermal disjuncture (carrying forward in option)**

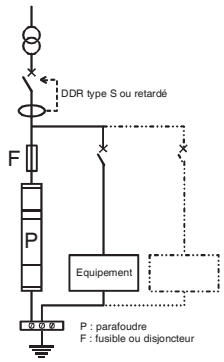
Inner system



Dimensions in mm
(1 pole version)



Installation principle



Features

References	TF-2600/440	TF-2600/440-T	TF-2600/335	TF-2600/335-T
kind of network	TT-TN-IT	TT-TN-IT	TT-TN	TT-TN
nominal tension Un	400 VAC	400VAC	230 VAC	230VAC
maximal tension of permanent service Uc	440 VAC	440 VAC	335 VAC	335 VAC
kept of temporary surges U_T	Uc	Uc	> 400 VAC	> 400 VAC
discharge nominal current In wave 8/20µs	20 kA *(30 kA)* [1]	20 kA *(30 kA)* [1]	20 kA *(30 kA)* [1]	20 kA *(30 kA)* [1]
discharge maximum current Imax	60kA *(1x70 kA)* [1]	60kA *(1x70 kA)* [1]	60kA *(1x70 kA)* [1]	60kA *(1x70 kA)* [1]
protection level Up under In	2 kV	2 kV	1,5 kV	1,5 kV
residual tension				
à 5kA	1,3 kV	1,3 kV	1 kV	1 kV
à 10kA	-	-	1,15 kV	1,15 kV
à 15kA	-	-	1,25 kV	1,25 kV
leaking current Ic	< 2 mA	< 2 mA	< 2 mA	< 2 mA
follwing current	sans	sans	sans	sans
delay of answer	< 25 ns	< 25 ns	< 25 ns	< 25 ns
Fuse (associated protection device)	max. 160 A gG/gL	max. 160 A gG/gL	max. 160 A gG/gL	max. 160 A gG/gL
admissible current of short-circuit	25 kA / 50 Hz	25 kA / 50 Hz	25 kA / 50 Hz	25 kA / 50 Hz
thermal disjuncture intergrated	oui	oui	oui	oui
distance deferment information disjuncture	non	oui	non	oui
nnection capacity				
main terminals				
L/N		4-35 mm² (souple : 25 mm² max.)		
PE		4-35 mm² (souple : 25 mm² max.)		
derferment terminals signage				
Supple rigid	--	1,5 mm²	--	1,5 mm²
Temperature of use	-20°C / +80°C			
housing material	thermoplastic Polyester UL 94 V-0			
protection degree	IP20			
installation	Rail din symetrical (EN 50022 / DIN46277-3)			
quantity of ports	1			

[1] *In et Imax for the parasurge only*

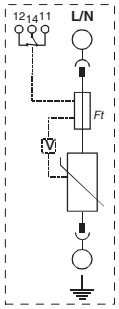
Type 2
I_n / I_{max} : 15 / 40 kA
1 to 4 poles
removable +
reducedUp

TYPE 2
TECHNOFOUDRE® TF-2400

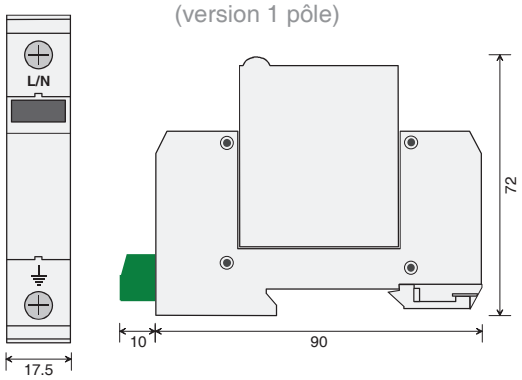
Surge arrester TF-2400 for the first protection of single phase or three phase installations that are often exposed. Low residual voltage (Up). Assembly in 2, 3 or 4 poles.

- **Surge arrester type 2 I_{max} 40 kA**
- **Discharge nominal current I_n 15 Ka with UP reduced**
- **Removable shell**
- **Incorporated thermal disjuncture (carrying forward in option)**
-

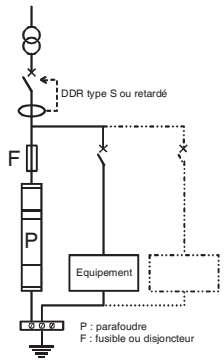
Inner system



Dimensions in mm
(version 1 pôle)



Installation principle



Features

References	TF-2400/440	TF-2400/440-T	TF-2400/335	TF-2400/335-T
kind of network	TT-TN-IT	TT-TN-IT	TT-TN	TT-TN
nominal tension Un	400 VAC	400VAC	230 VAC	230VAC
maximal tension of permanent service Uc	440 VAC	440 VAC	335 VAC	335 VAC
kept of temporary surges UT	Uc	Uc	> 400 VAC	> 400 VAC
discharge nominal current In wave 8/20µs	15kA	15 kA	15 kA	15 kA
discharge maximum current Imax	40kA	40 kA	40 kA	40 kA
protection level Up under In	1,8kV	1,8 kV	1,4 kV	1,4 kV
residual tension				
à 5kA	1,3 kV	1,3 kV	1 kV	1 kV
à 10kA	-	-	1,15 kV	1,15 kV
à 15kA	-	-	1,25 kV	1,25 kV
leaking current Ic	< 2 mA	< 2 mA	< 2 mA	< 2 mA
follwing current	sans	sans	sans	sans
delay of answer	< 25 ns	< 25 ns	< 25 ns	< 25 ns
Fuse (associated protection device)	max 160 A gG/gL	max. 160 A gG/gL	max. 160 A gG/gL	max. 160 A gG/gL
admissible current of short-circuit	25 kA / 50 Hz	25 kA / 50 Hz	25 kA / 50 Hz	25 kA / 50 Hz
thermal disjuncture intergrated	oui	oui	oui	oui
distance deferment information disjuncture	non	oui	non	oui
nnection capacity				
main terminals				
L/N		4-35 mm² (souple : 25 mm² max.)		
PE		4-35 mm² (souple : 25 mm² max.)		
derferment terminals signage				
Supple rigid	--	1,5 mm²	--	1,5 mm²
Temperature of use		-20°C / +80°C		
housing material		Polyester thermoplastique UL 94 V-0		
protection degree		IP20		
installation		Rail din symétrique (EN 50022 / DIN46277-3)		
quantity of ports		1		

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SIRET: 521 876 433 RCS BDX

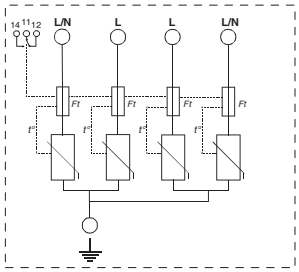
TYPE 2
TECHNOFOUDRE® TF-2404

Type 2
I_n / I_{max} : 15 / 40 kA
2 and 4 poles
Not removable

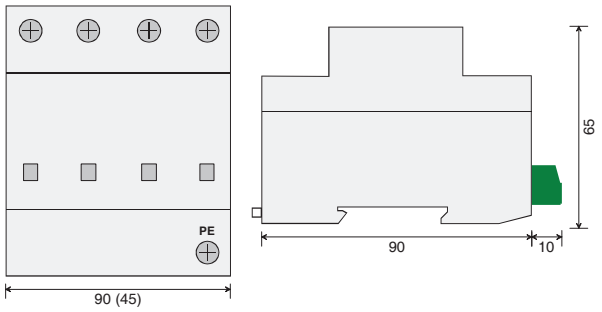
Cast in one piece surge arrester TF-2404 for the first protection of single phase or three phase installations exposed (scheme C1 : common mode protection).

- **Surge arrester type 2 I_{max} 40 kA**
- **Discharge nominal current I_n 15 kA**
- **Incorporated thermal disjuncture (carrying forward in option)**
-

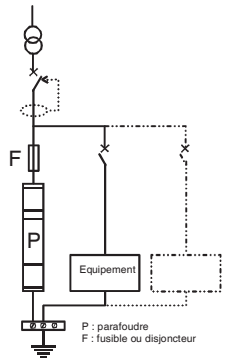
Inner system
4 poles version



Dimensions in mm
4 poles version



Installation principle



Caractéristiques

Références	TF-2404/440	TF-2404/440-T	TF-2404/335	TF-2404/335-T
Type de réseau	TT-TN-IT	TT-TN-IT	TT-TN	TT-TN
Tension nominal Un	400 VAC	400VAC	230 VAC	230VAC
Tension max. de service perm. Uc	440 VAC	440 VAC	335 VAC	335 VAC
Tenue aux surtensions temporaires U_T	Uc	Uc	> 400 VAC	> 400 VAC
Courant nominal de décharge In (8/20µs)	15 kA	15 kA	15 kA	15 kA
Courant maximal de décharge Imax	40kA	40kA	40kA	40kA
Niveau de protection Up sous In	2 kV	2 kV	1,5 kV	1,5 kV
Tension résiduelle				
à 5kA	1,5 kV	1,5 kV	1,1 kV	1,1 kV
à 10kA	-	-	1,3 kV	1,3 kV
à 15kA	-	-	1,36 kV	1,36 kV
courant de fuite Ic	< 1 mA	< 1 mA	< 1 mA	< 1 mA
Couirant de suite	sans	sans	sans	sans
Temps de réponse	< 25 ns	< 25 ns	< 25 ns	< 25 ns
Dispositif de protection associé	max. 125 A gG/gL	max. 125 A gG/gL	max. 125 A gG/gL	max. 125 A gG/gL
Courant de court-circuit admissible	25 kA / 50 Hz	25 kA / 50 Hz	25 kA / 50 Hz	25 kA / 50 Hz
Déconnexion thermique intégrée	oui	oui	oui	oui
Report à distance information déconnexion	non	oui	non	oui
Capacité de raccordement				
L/N		4-35 mm² (souple : 25 mm² max.)		
PE		4-35 mm² (souple : 25 mm² max.)		
Bornes report signalisation				
Souple rigide	--	1,5 mm²	--	1,5 mm²
Souple rigide	--	1,5 mm²	--	1,5 mm²
Température de service	-20°C / +80°C			
Matériau boîtier	Polyester thermoplastique UL 94 V-0			
Degré de protection	IP20			
Montage	Rail din symétrique (EN 50022 / DIN46277-3)			
Nombre de ports	1			

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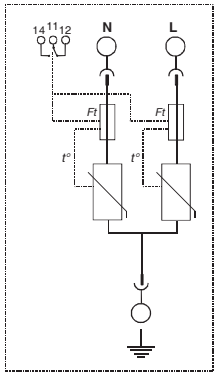
TYPE 2
TECHNOFOUDRE® TF-2302

Type 2
I_n / I_{max} : 15 / 30 kA
2 poles/module removable

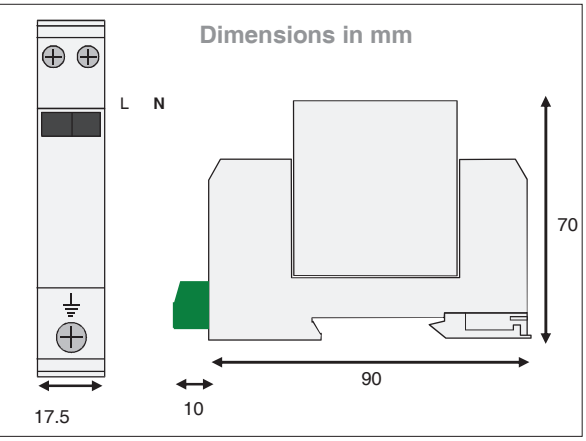
Single phase removable shell TF-2302 (scheme C1: common mode protection) for the second power network's protection. To be used in addition to the first protections, or in single protection for areas fairly exposed to lightning.

- **Surge arrester type 2 I_{max} 30 kA**
- **Discharge nominal current I_n 15 kA**
- **Removable shell**
- **Incorporated thermal disjuncture (carrying forward in option)**

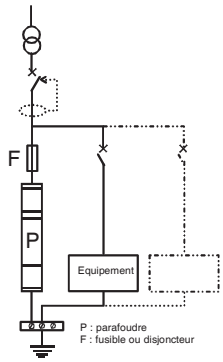
- Inner system



Dimensions in mm



Installation principle



Features

References	TF-2302/440	TF-2302/440-T	TF-2302/335	TF-2302/335-T
kind of network	TT-TN-IT	TT-TN-IT	TT-TN	TT-TN
nominal tension Un	400 VAC	400VAC	230 VAC	230VAC
maximal tension of permanent service Uc	440 VAC	440 VAC	335 VAC	335 VAC
kept of temporary surges UT	Uc	Uc	> 400 VAC	> 400 VAC
discharge nominal current In wave 8/20µs	15 kA	15 kA	15 kA	15 kA
discharge maximum current Imax	30kA (1x40 kA)	30kA (1x40 kA)	30kA (1x40 kA)	30kA (1x40 kA)
protection level Up under In	2 kV	2 kV	1,5 kV	1,5 kV
residual tension				
à 5kA	1,5 kV	1,5 kV	1,1 kV	1,1 kV
à 10kA	-	-	1,3 kV	1,3 kV
à 15kA	-	-	1,4 kV	1,4 kV
leaking current Ic	< 1 mA	< 1 mA	< 1 mA	< 1 mA
follwing current	sans	sans	sans	sans
delay of answer	< 25 ns	< 25 ns	< 25 ns	< 25 ns
Fuse (associated protection device)	max. 100 AgG/gL	max. 100 A gG/gL	max. 100 AgG/gL	max. 100 A gG/gL
admissible current of short-circuit	10 kA / 50 Hz	10 kA / 50 Hz	10 kA / 50 Hz	10 kA / 50 Hz
thermal disjuncture intergrated	oui	oui	oui	oui
distance deferment information disjuncture	non	oui	non	oui
nnection capacity				
main terminals				
L/N	1,5-6mm²	1,5-6mm²	1,5-6mm²	1,5-6mm²
PE	4-25 mm²	4-25 mm²	4-25 mm²	4-25 mm²
derfement terminals signage				
Supple rigid	--	1,5 mm²	--	1,5 mm²
Temperature of use	-20°C / +80°C			
housing material	Polyester thermoplastique UL 94 V-0			
protection degree	IP20			
installation	Rail din symétrique (EN 50022 / DIN46277-3)			
quantity of ports	1			

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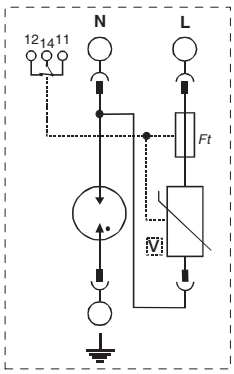
TYPE 2
TECHNOFOUDRE® TF-2202

Type 2
I_n / I_{max} : 10 / 20 kA
Single phased removable

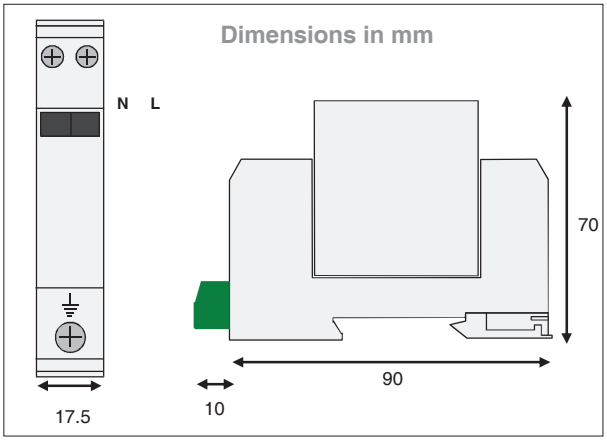
Single phase removable surge arrester TF-2202 (scheme C2 : common and differential mode protection) for second protection of power network. To be used in addition to first protection, or in single protection in areas that are fairly exposed to lightning.

- **Surge arrester type 2 I_n 10 kA / Imax 20 kA**
- **Common and differential mode protection**
- **Removable shell**
- **Incorporated thermal disjuncture (carrying forward in option)**

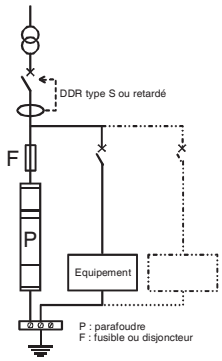
Inner system



Dimensions in mm



Installation principle



Features

References	TF-2202/335	TF-2202/335-T
kind of network	TT - TN-S	TT - TN-S
nominal tension Un	230 VAC	230VAC
maximal tension of permanent service Uc	335 VAC / 255 VAC	335 VAC / 255 VAC
kept of temporary surges UT	>400 VAC	>400 VAC
discharge nominal current In wave 8/20µs	10 kA / 20 kA	10 kA / 20 kA
discharge maximum current Imax	20 kA / 40 kA	20 kA / 40 kA
protection level Up under In	1,4 kV / 1,2 kV	1,4 kV / 1,2 kV
residual tension		
à 5kA (L-N/N-PE)	1,1/ 0,2 kV	1,1/ 0,2 kV
loaking current	<1mA	<1mA
following current N-PE	? 100 A	? 100 A
Delay of answer	<100 ns	<100 ns
associated protection device	max. 63 A gG/gL	max. 63 A gG/gL
admissible current of short-circuit	10 kA / 50 Hz	10 kA / 50 Hz
thermal disjuncture intergrated	oui	oui
distance deferment information disjuncture	non	oui
connection capacity		
Main terminals		
L,N	4-6 mm²	4-6 mm²
PE	4-25 mm²	4-25 mm²
deferment terminals signage		
supple rigid	--	1,5 mm²
Temperature of use	-20°C / +80°C	
housing material	Polyester thermoplastique UL 94 V-0	
protection degree	IP20	
montage	Rail din symétrique (EN 50022 / DIN46277-3)	
quantity of ports	1	

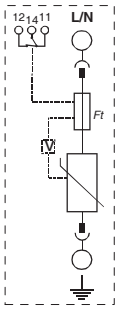
TYPE 2
TECHNOFOUDRE® TF-2100

Type 2
I_n / I_{max} : 5 / 10 kA
1 to 4 poles
removable

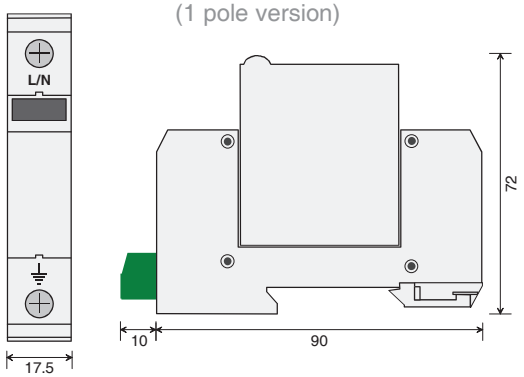
Removable surge arrester TF-2100 for the first protection of single phase or three phase networks for installations that are little exposed to lightning.
Assembly in 2, 3 ou 4 poles.

- **Surge arrester type 2 I_{max} 10 kA**
- **Discharge nominal current I_n 5 kA**
- **Removable shell**
- **Incorporated thermal disjuncture (carrying forward in option)**

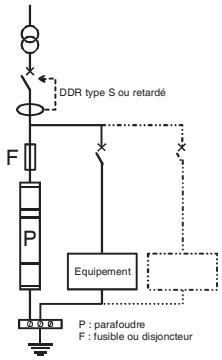
Inner system



Dimensions in mm
(1 pole version)



Installation principle



Features

References	TF-2100/440	TF-2100/440-T	TF-2100/335	TF-2100/335-T
kind of network	TT-TN-IT	TT-TN-IT	TT-TN	TT-TN
nominal tension Un	400 VAC	400VAC	230 VAC	230VAC
maximal tension of permanent service. Uc	440 VAC	440 VAC	335 VAC	335 VAC
kept of temporary surges U_T	Uc	Uc	> 400 VAC	> 400 VAC
discharge nominal current In (8/20µs)	5 kA	5 kA	5 kA	5 kA
discharge maximal current Imax	10 kA	10 kA	10 kA	10 kA
protection level Up under In	1,6 kV	1,6 kV	1,2 kV	1,2 kV
residual tension				
à 4kA	1,5 kV	1,5 kV	1,1 kV	1,1 kV
leaking current Ic	< 1 mA	< 1 mA	< 1 mA	< 1 mA
following current	sans	sans	sans	sans
delay of answer	< 25 ns	< 25 ns	< 25 ns	< 25 ns
Fuse (associated protection device)	max. 63 A gG/gL	max. 63 A gG/gL	max. 63 A gG/gL	max. 63 A gG/gL
admissible current for short circuit	25 kA / 50 Hz	25 kA / 50 Hz	25 kA / 50 Hz	25 kA / 50 Hz
thermal disjuncture integrated	oui	oui	oui	oui
distance deferment disjuncture information	non	oui	non	oui
connection capacity				
main terminals				
L/N	4-35 mm²	4-35 mm²	4-35 mm²	4-35 mm²
PE	4-35 mm²	4-35 mm²	4-35 mm²	4-35 mm²
deferment terminals signage				
Supple rigid	--	1,5 mm²	--	1,5 mm²
temperature in use	-20°C / +80°C			
housing material	thermoplastic Polyester UL 94 V-0			
protection degree	IP20			
installation	Rail din symetrical (EN 50022 / DIN46277-3)			
quantity of ports	1			

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LIGHTNING PROTECTION SYSTEMS FRANCE
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SIRET: 521 876 433 RCS BDX

*TECHNOFOUDRE® Box C/TF-1151/**

Un	400 V
Uc	440 V
In	20 kA
Up (sous Imp)	1,7 kV

visual not contractual

References

Single-phased : C/TF-1151/1
Three phase : C/TF-1151/3
Three phase + neutral : C/TF-1151/4
(model shown)

Module TF 1151

This TECHNOFOUDRE® C/TF-1151/* kit is in keeping with NFC 15-100 convention (December 2003) and is particularly adapted to the first protection of the edifices equipped with lightning rods (industries, churches, individuals, rest-home…)

These systems are made up of « high voltage » modular surge arresters with incorporated thermal disjuncture for an ending-life in open circuit.
For an easy care, each module is made up of a signal in front with a mechanical braw, a removable shell, and is assembled forward an adapted fusible selector .

These modules are, presented in a thermoplastic kit IP 65 self-standing, supplied with a see-through door assembled on a waterproofing juncture. These doors allow us to see quickly if the modules work well. The kit is set on a wall by screwing the bottom of the kit with fastenings and lugs adapted to the bases (not supplied). These kits are in keeping with recommendations et regulation in force. (*accordance to the conventions - NFC 15-443 - NFC 15-100 - NFC 61740-95 - ULI449-ed.2 - IEC 61643-11 - VDE 0675-6)*
Standard Cables and accessories are supplied for the best implementation.
Our products are under one year warranty within the framework of a normal use. (cf. CGV)

Content of the box: (installation explanation supplied)
- 12 modules box
- Fusible selector 22x58 single phased with a visual access
- firing-pin fusible 22x58 – 50 A gG
- Surge arresters modules (x2) as described before
- 3 metre cables10mm² (1 blue metre, 1 black metre, 1green-yellow metre)

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LIGHTNING PROTECTION SYSTEMS FRANCE
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SIRET: 521 876 433 RCS BDX

*TECHNOFOUDRE® Box C/TF-2400/**

Un	400 V
Uc	440 V
In	15 kA
Imax	40 kA
Up (sous Imax)	1,8 kV

visual not contractual

References
Single-phased : C/TF-2400/2
Three phase : C/T-2400/3
Three phase + neutral : C/TF-2400/4

Module TF 2400 (removable)

This TECHNOFOUDRE® C/TF-2400/* kit is particularly adapted to the SECOND protection of the edifices equipped with lightning rods (industries, churches, individuals, rest-home…) AND already equipped with protections at least equivalent to the TF-1151.

These systems are made up of « high voltage » modular surge arresters with incorporated thermal disjuncture for an ending-life in open circuit.

For an easy care, each module is made up of a signal in front with a mechanical braw, a removable shell, and is assembled forward an adapted fusible selector.

These modules are, presented in a thermoplastic kit IP 65 self-standing, supplied with a see-through door assembled on a waterproofing juncture. These doors allow us to see quickly if the modules work well. The kit is set on a wall by screwing the bottom of the kit with fastenings and lugs adapted to the bases (not supplied). These kits are in keeping with recommendations and regulation in force. (*Accordance to the conventions - NFC 15-443 - NFC 15-100 - NFC 61740-95 - ULI449-ed.2 - IEC 61643-11 - VDE 0675-6)*

Standard Cables and accessories are supplied for the best implementation.

Our products are under one year warranty within the framework of a normal use. (cf. CGV)

Content of the Box: (installation explanation supplied)

- 12 modules box
- Fusible selector 22x58 single phased with a visual access
- firing-pin fusible 22x58 – 50 A gG
- Surge arresters modules (x2) as described before
- 3 metres cables10mm² (1 blue metre, 1 black metre, 1green-yellow metre)

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LIGHTNING PROTECTION SYSTEMS FRANCE
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SIRET: 521 876 433 RCS BDX

TECHNOFOUDRE® Box
C/TF-2202

Un	400 V
Uc	440 V
In	15 kA
Imax	40 kA
Up (sous Imax)	1,8 kV

visual not contractual

Module TF 2202
(removable)

This TECHNOFOUDRE® C/TF-2202 Box is particularly adapted to the single phase electrical communications FIRST protection of houses and all the electrical communications bound to individuals. *(Buildings which use is not professional – buildings without any lightning rods on)**.***
These systems are made up of « high voltage » modular surge arresters with incorporated thermal disjuncture for an ending-life in open circuit.
For an easy care, each module is made up of a signal in front with a mechanical braw, a removable shell, and is assembled forward an adapted fusible selector.

These modules are, presented in a thermoplastic box IP 65 self-standing, supplied with a see-through door assembled on a waterproofing juncture. These doors allow us to see quickly if the modules work well. The kit is set on a wall by screwing the bottom of the kit with fastenings and lugs adapted to the bases (not supplied). These kits are in keeping with recommendations et regulation in force. (*Accordance to the conventions - NFC 15-443 - NFC 15-100 - NFC 61740-95 - ULI449-ed.2 - IEC 61643-11 - VDE 0675-6)*
Standard Cables and accessories are supplied for the best implementation.
Our products are under one year warranty within the framework of a normal use. (cf. CGV)

Content of the box: (installation explanation supplied)
- 4 modules box
- Fusible selector14 x 51 single phased with a visual access
- firing-pin fusible 14x51 – 50 A gG
- 1 module 2202 as described before
- 3 metres cable 10mm2 (1 blue metre, 1black metre, 1 green-yellow metre)

-3 nozzles 10mm2

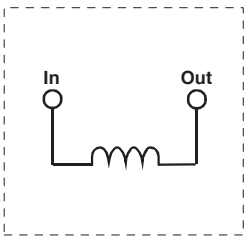
COORDINATION INDUCTION
TF-IND

Inductance
I_N : 35 / 63 / 125 A

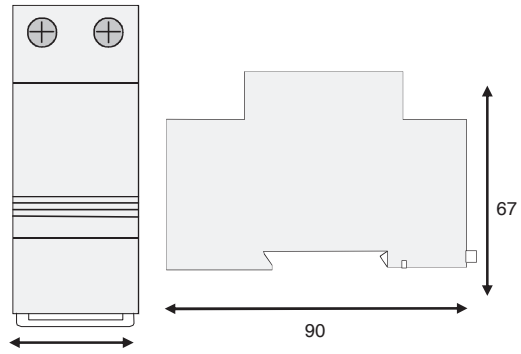
Inductions for first and second surge arrester coordination in the event that the cable distance between those two protection floors is very low.

- **Coordination induction**
- **Current max. 35 / 63 / 125 A**
- **Modular**

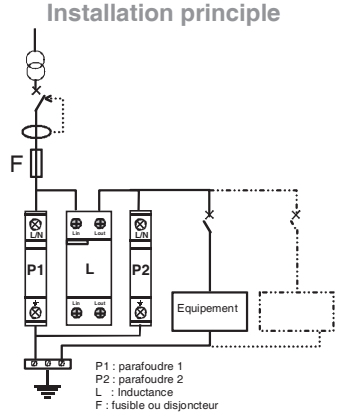
Inner system



Dimensions in mm



Installation principle



Features

References	TF-IND35	TF-IND63	TF-INDK125
nominal tension Un	500VAC	500VAC	500VAC
Inductance	15µH	15µH	15µH
Maximal current	35 A	63 A	125 A
upstream fuse	35 A gL	63 A gL	125 A gL
mode of connection	série	série	série
connection capacity			
supple	16 mm²	16 mm²	35 mm²
rigid	35 mm²	35 mm²	50 mm²
Temperature of use	-20°C / +85°C	-20°C / +85°C	-20°C / +85°C
housing material	Thermoplastique UL 94 V0	Thermoplastique UL 94 V0	Thermoplastique UL 94 V0
protection degree	IP20	IP20	IP55
Dimension	2 modules	4 modules	159x119x76

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LIGHTNING PROTECTION SYSTEMS FRANCE
Groupe CEMASO SAS - BP 80055 - F-33460 MARGAUX
SIRET: 521 876 433 RCS BDX

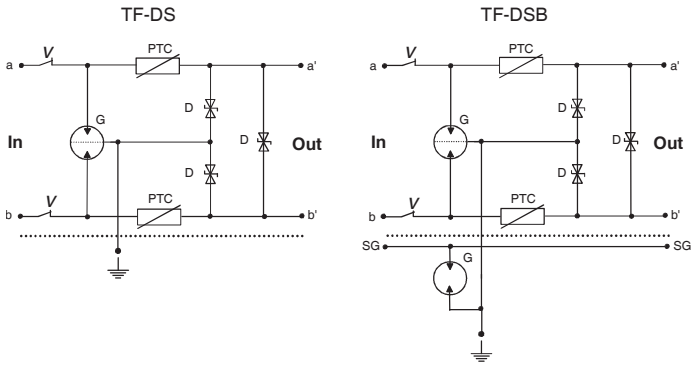
Link in series
I_n / I_{max} : 10 / 20 kA
removable
Signage by default

TECHNOFOUDRE® INDICATIONS TF-DS

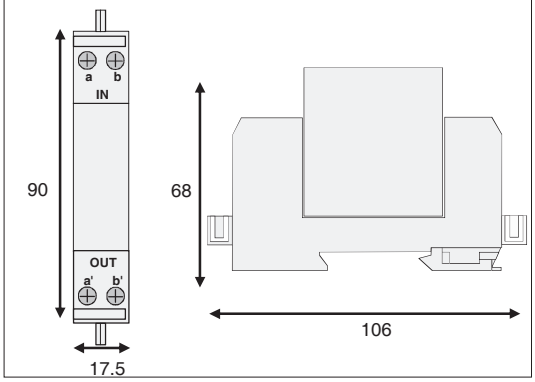
Removable surge arrester with signal TF-DS for electronic transmission supplied protection :
TF-DS/5,12,15,24,30,48 : E/S automaton
TF-DS/24 : link series RS232 (V24)
TF-DS/12 : link series high speed RS422 (V11), RS485, Ethernet

- **Removable shell**
- **Thermal protection and current (with signal)**
- **Connection terminal for shoring (option)**
- **Grounding thanks to the rail**

Inner system



Dimensions in mm



Features

References	TF-DS/5	TF-DS/12	TF-DS/15	TF-DS/24	TF-DS/30	TF-DS/48	TF-DS/60
nominal tension Un	5VDC	12VDC	15VDC	24VDC	30VDC	48VDC	60VDC
maximal tension Umax	6VDC	14VDC	17VDC	26VDC	34VDC	55VDC	65VDC
nominal intensity I_N at 25°C	100 mA	100 mA	100 mA	100 mA	100 mA	100 mA	100 mA
discharge nominal current In (Imax)	10kA (20kA)	10kA (20kA)	10kA (20kA)	10kA (20kA)	10kA (20kA)	10kA (20kA)	10kA (20kA)
residual tension at 5kA	env. 3xUn	env. 3xUn	env. 3xUn	env. 3xUn	env. 3xUn	env. 3xUn	env. 3xUn
series resistance in ohm	env. 1	env. 1	env. 1	env. 1	env. 1	env. 1	env. 1
boundward frequency	0,6MHz	0,9MHz	1,1MHz	1,4MHz	1,8MHz	2,2MHz	3MHz
delay of answer	< 1ns						
life ending	open circuit						
connection capacity	6 mm² max						
temperature in use	-25°C/+70°C						
housing material	Thermoplastic. UL 94 V0						
installation	sur rail Din						
colour	yellow						

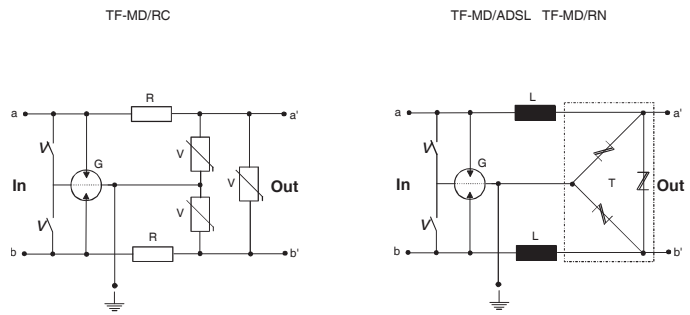
TECHNOFOUDRE® ANALOG TELEPHONE LINES ADSL – NUMERIS TF-MD/…

Telephone RTC / ADSL / RNIS
I_n / I_{max} : 10 / 20 kA
removable
To be installed on rail

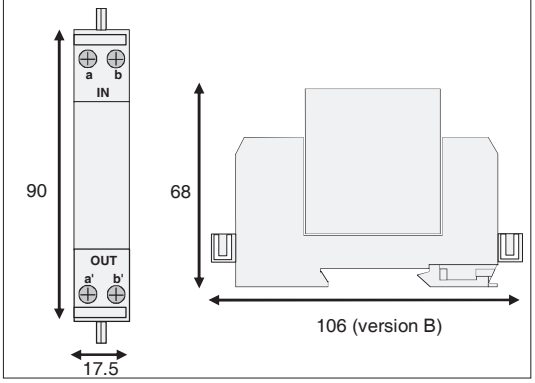
Removable surge arrester TF-MD for telephone supplies protection:
- analog (RTC/ADSL) : modems, fax, phones, Answer machines, videotransmitters.
- digital (Numéris 2 wire access S) : modems, main station.

- **Removable shell**
- **Thermal protection**
- **Connection terminal for shoring (option)**
- **Grounding thanks to the rail**

Inner system



Dimensions in mm



Features

References	TF-MD/RC	TF-MD/RNIS	TF-MD/ADSL
nominal tension Un	150VDC	120VDC	120VDC
maximal tension Umax	170VDC	170VDC	170VDC
nominal intensity I_N at 25°C	1A	200 mA	200 mA
discharge nominal current In (Imax)	10kA (20kA)	10kA (20kA)	10kA (20kA)
residual tension at 5kA	approx. 3Un	< 350V	< 350V
series resistance in ohm	1	0,3	0,3
boundary frequency	10M Hz	17M Hz	17M Hz
delay of answer	< 25 ns	< 1ns	< 1ns
connection capacity		6 mm² max	
Temperature in use		-25°C/+70°C	
housing material		Thermoplastic. UL 94 V0	
installation		on rail Din	
Colour		yellow	

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LIGHTNING PROTECTION SYSTEMS FRANCE
Groupe CEMASO SAS - BP 80055 - F-33460 MARGAUX
SIRET: 521 876 433 RCS BDX

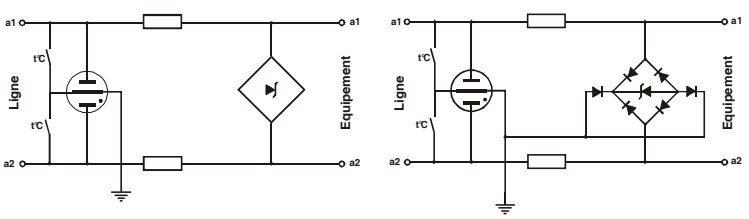
TECHNOFOUDRE® FOR ANALOG TELEPHONE LINES / ADSL – NUMERIS TF-M/…

Telephone RTC/ADSL Numéris
I_n / I_{max} : 5 / 10 kA
To be installed on rail

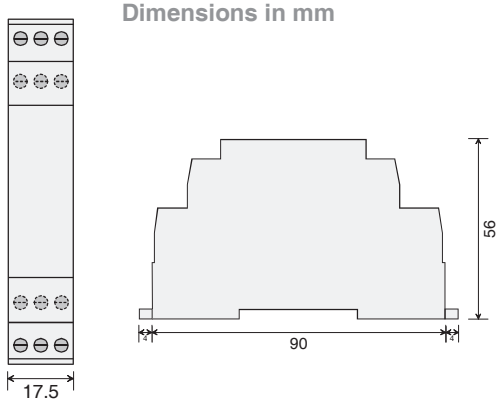
Removable surge arrester TF-MD for telephone supplies protection:
- analog (RTC/ADSL) : modems, fax, phones, Answer machines, videotransmitters.
- digital (Numéris 2 wire access S) : modems, main station.

- **TF-M/RC compatible ADSL 2 Mbits/s**
- **TF-M/RN compatible Numéris 4 Mbits/s (1 and 2 brac es)**
- **Surge arresters with Thermal protection**

Inner system



Dimensions in mm



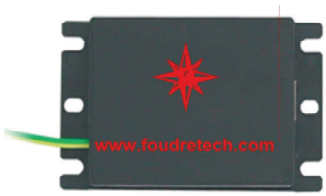
Features

References	TF-M/RC	TF-M/RN
nominal tension Un	175VDC	*/- 6VDC
maximal tension Umax	185VDC	*/- 7VDC
nominal intensity $I_{N\ at\ 25℃}$	275 mA	275 mA
discharge nominal current In (Imax) (category C2 10 shocks 8/20)	5kA (10kA)	5kA (10kA)
residual tension at 5kA (a1/a2 / a1-a2/PE)	<250V / 700V	15V / 700V
series resistance in ohm	0,1	< 8
nominal rate	2 Mbits/s	2 Mbits/s
delay of answer	< 25 ns	< 25 ns
connection capacity	2,5 mm² max	
Temperature of use	-25℃/+70℃	
housing material	Polyamide. UL 94 V0	
installation	on collar	
Colour	Grey	
trial group (NF EN 61643-21)	C2, C3, D1	

TECHNOFOUDRE® FOR ANALOG TELEPHONE LINES / ADSL – NUMERIS TF-MO/…

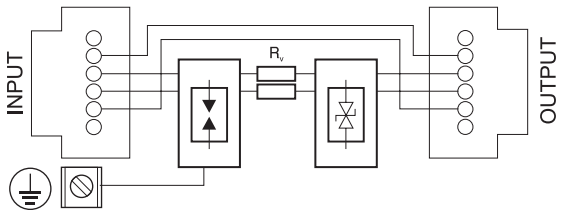
Telephone RTC
Telephone Numeris
I_n : 10 kA
Mural holdfast

Urge arrestor (fixation on the wall) TF-MO/ for telephone supplies protection (telephone, fax, modem…)
TF-MO/RC- analog (RTC/ADSL) : modems, fax, phones, answer machines, videotransmitters.
TF-MO/RN- digital (Numéris 2 wire access S) : modems, main st tion.

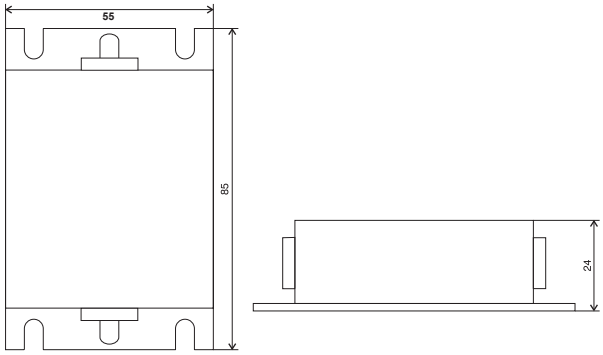


- **Fixation on the wall**
- **2 floors protection**
- **RJ11 (RTC) RJ45 connection (numéris)**

Inner system



Dimensions in mm



Features References	TF-MO/RC	TF-MO/RN
Nominal tension Un	175VDC	48VDC
max.imal tension Umax	185VDC	-
Nominal intensity at 25°C I_N	200mA	-
discharge nominal current In	10kA	10kA
Protection level at In Up		
Line – line	< 250 V	< 60 V
Line - PE	< 250 V	< 600 V
Series resistance in ohm	6,8	1
Frequency	-	2 MHz
Transmission gear	128 kbit/s	128 kbit/s
Delay of answer line-line / line - PE	< 1 ns / 100 ns	< 1 ns / 100 ns
connection (entrance, exit)	Connecteur RJ11 (RJ 12) femelle	RJ 45
Connection capacity BJ PE	4 mm² max	4 mm² max
Tightening couple BJ PE	0,6 Nm	0,6 Nm
Temperature in use	-25°C/+70°C	-25°C/+70°C
Housing material	PA	PA
installation	Mural holdfast	Mural holdfast
comment	Protected pair : 3-4	Protected pair : 4-5 / 3-6

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TECHNOFOUDRE® ANALOGICAL TELEPHONE LINES / ADSL – NUMERIS TF-SU/…

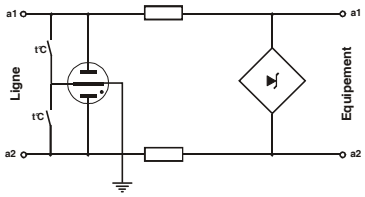
Telephone RTC/ADSL Numeris
I_n / I_{max} : 5 / 10 kA

Surge arrester TF-SU/ for telephone supplies protection (telephone, fax, modem…).
These surge arresters can be directly implemented on the distributors.

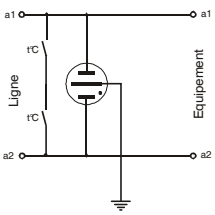
- **TF-SU/RC compatible ADSL 2 Mbits/s**
- **TF-SU/RN compatible Numéris 4 Mbits/s**
- **Surges arresters with thermal protection**
- **Direct connection on distributors.**

Inner system

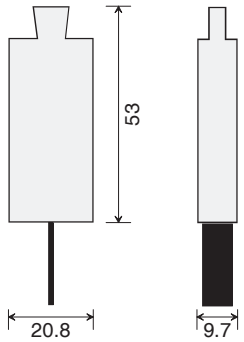
TF-SU/R…



TF-SU…



Dimensions in mm



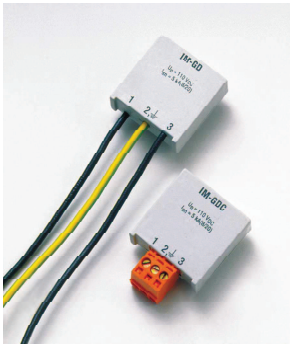
Features

references	TF-SU/RC	TF-SU/RN	TF-SU/G
nominal tension Un	175VDC	*/- 6VDC	175VDC
maximal tension Umax	185VDC	*/- 7VDC	185VDC
nominal intensity I_N at 25C	275 mA	275 mA	275 mA
discharge nominal current In (Imax) (category C2 10 shocks 8/20)	5kA (10kA)	5kA (10kA)	5kA (10kA)
residual tension at 5kA (a1/a2 / a1-a2/PE)	<250V / 700V	15V / 700V	700V / 700V
resistance in series in ohm	0,1	<8	-
nominal rate	2 Mbits/s	4 Mbits/s	10 Mbits/s
delay of answer	<25 ns	<25 ns	<100 ns
Connection capacity		-	
temperature in use		-25C/+70C	
housing material		Polyamide. UL 94 V0	
installation		on collar	
Colour		Grey	
		-	

Compatibilities :
Series K : Krone®
Series I : Infra+®
Series P : Pouyet® (3M®)
(® : Krone, Infra+ and Pouyet are the brand laid douwn)

TECHNOFOUDRE® ANALOG TELEPHONE LINES / ADSL – NUMERIS
OEM
TF-GD

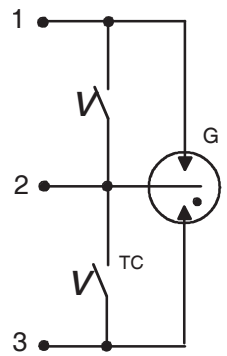
Telephone
I_n : 5 kA



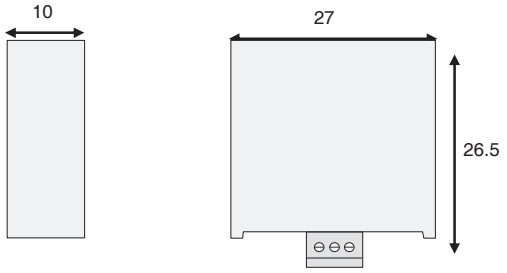
Surge arrester TF-GD for analog telephone lines protection, RTC, RNIS, ADSL.
OEM Version to be directly incorporated in supplies
Gas burst with a short-circuit setting up (fail-safe).

- **Low voltage surge arrester**
- **Discharge nominal current I_n 5 KA**

Inner system



Dimensions in mm



Features

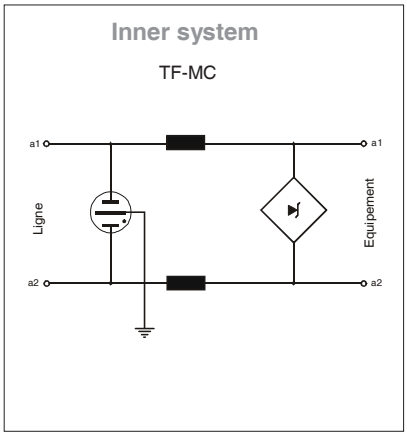
References	TF-GD	TF-GD/C
nominal tension Un	150VDC	150VDC
maximal tension Umax	170VDC	170VDC
nominal intensity I_N at 25℃	6A	6A
discharge nominal current In	5 kA	5 kA
residual tension	approx. 3Un	approx. 3Un
Section		
1-3	0,5 mm²	max 1,5 mm²
2 (PE)	0,75 mm²	max 1,5 mm²
conductor length	150 mm	-
delay of answer	< 1ns	
life ending	short circuit	
temperature in use	-25℃/+70℃	
storage temperature	-40℃/+80℃	
housing material	Thermoplastic. UL 94 V0	
housing colour	grey	

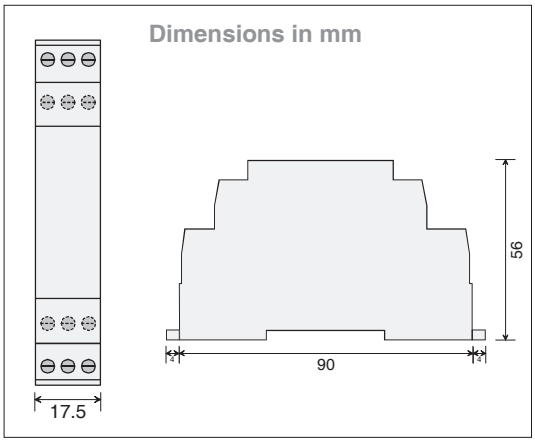
TECHNOFOUDRE® ONGOING ALIMENTATION TF-MC

Alim. 12, 24, 48 VDC
I_n / I_{max} : 5 / 10 kA
To be installed on rail

Cast in one piece surge arrester TF-MC for surge protection on supplies connected to ongoing feed (12 ou 24 VDC) : transducers, transmitters, automatons, acquired peripheral.

- **To be installed on a Din rail**
- **Thermal protection**
- **Strong discharge power In : 5kA / Imax : 10kA**





Features

References	TF-MC/12	TF-MC/24	TF-MC/48
nominal tension Un	12VDC	24VDC	48VDC
Maximal tension Umax	14VDC	27VDC	53VDC
Nominal intensity I_N à 20°C	10 A	10 A	10 A
Discharge nominal current In (Imax)	5kA (10kA)	5kA (10kA)	5kA (10kA)
Residual tension à 5kA	25 V	40 V	85 V
Resistance in series in ohm	< 0.1	< 0.1	< 0.1
Boundary ferequency / nominal rate	-	-	-
Delay of answwer	< 25 ns		
Life ending	short circuit		
Connection capacity	2.5 mm² max		
Temperature in use	-25°C/+70°C		
Housing material	Polyamide UL 94 V0		
installation	On rail Din		
Trial group (NF EN 61643-21)	C2, C3, D1		

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LIGHTNING PROTECTION SYSTEMS FRANCE
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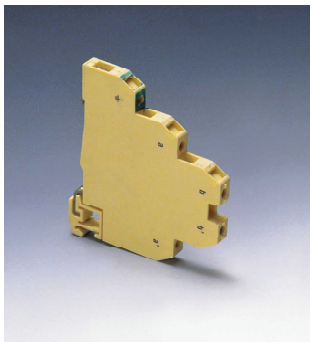
SIRET: 521 876 433 RCS BDX

TECHNOFOUDRE® INDICATIONS TF-DF

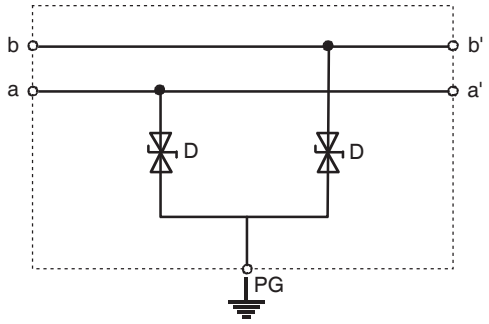
Indications
I_n : 0.12 à 0.5 kA
Rail stone



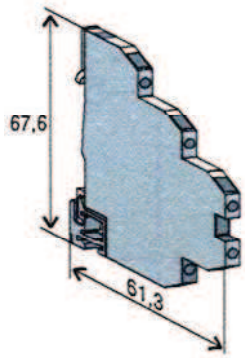
Surge arresters TF-DF allow to ensure electronic supplies protection: E/S automaton…Their pales appearance enables them to be located in cupboard so as to save room.

- **Low voltage surge arrester**
- **Discharge nominal current I_n 120 à 550A**
- **To be installed on a rail (grounding thanks to the rail)**

Inner system



Dimensions in mm



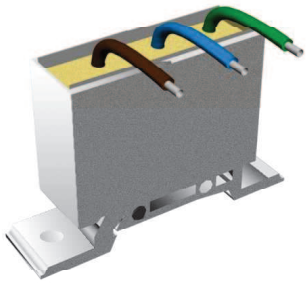
references	TF-DF12V	TF-DF24V	TF-DF60V
nominal tension Un	12VDC	24VDC	60VDC
maximal tension Umax	15VDC	28VDC	64VDC
nominal intensity at 25°C I_N	10A	10A	10A
discharge nominal current In	500A	250A	100A
residual tension	approx. 3Un	approx. 3Un	approx. 3Un
Frequency			
thermal protection			
delay of answer		< 1 ns	
life ending		short circuit	
section able to be connected		max. 2,5mm²	
Temperature in use		-25°C/+70°C	
storage temperature		-40°C/+80°C	
housing material		Thermoplastic. UL 94 V0	
housing colour		Beige	
installation		sur rail din	

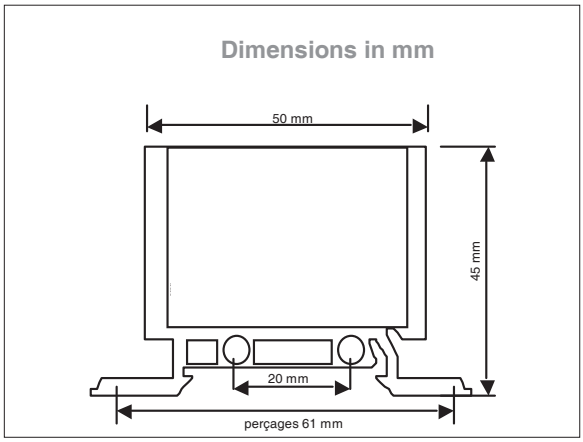
TECHNOFOUDRE® BT OEM
TF-MI

Parasurge OEM
I_n / I_{max} : 5 / 10 kA
Single phase
Installation on rail ordirect

Feeded on network - Supplies protection 230 Veff.
OEM Products which aim is to incorporate into the supply to be protected.
A forward Fusible protection is compulsory in order to limit whatever overload danger.

- **Exit on wire 2.5mm²**
- **Fixation on DIN rail or direct one**
- **varistance technology + spark**





Features

References	TF-M I
kind of network	TT-TNS
nominal tension Un	230 VAC
permanent service maximal tension Uc	335 VAC
kept of temporary surges U_T	> 400 VAC
discharge nominal current In (8/20µs)	5 kA
discharge maximal current Imax	10 kA
protection level Up under In (MC/MD)	1,4 kV/1,3 kV
residual tension à 5kA	<1 kV
leaking current Ic	< 0,1 mA
following current	sans
delay of answer	< 100 ns
associated protection device	maximal fuse 15 A gG/gL
admissible short circuit current	5 kA / 50 Hz
connection capacity main terminals L,N,PE	2,5 mm²
Temperature in use	-20°C / +80°C
housing material	Polyamide UL 94 V-0
protection degree	IP20
installation	Rail din symétrique (EN 50022 / DIN46277-3)
quantity of ports	1

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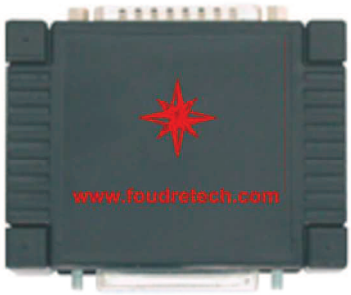
TECHNOFOUDRE® INDICATIONS
TF-RS

Links in series
RS 232,422, 485
Connector SUB D

Surge arresters TF-RS for electronical interfaces protection: series link RS232(V24), RS422(V11), RS485… equipped with conenctors SUB D.



- **Protection RS 232, RS 422, RS 485**
- **Connectors SUB D 9 and 25 points**
- **Thin protection thanks to diodes.**

Features References	TF-RS/D9	TF-RS/D25
nominal tension Un	15VDC	15VDC
Maximal tension Umax	17VDC	17VDC
Nominal intensity I_N à 25°C	1A	1A
Discharge niminal current In (Imax)	0,5 kA / 5 kA (SG- PE)	0,5 kA / 5 kA (SG- PE)
discharge maximal current Imax	0,75 kA / 10 kA (SG- PE)	0,75 kA / 10 kA (SG- PE)
Protection level at In Up		
Line - line	< 44V	< 44V
Line - SG	< 22V	< 22V
Line - PE	< 880V	< 880V
SG - PE	< 880V	< 880V
Protection level at 1 kV/µs Up		
Line - line	< 45V	< 45V
Line - SG	< 45V	< 45V
Line - PE	< 890V	< 890V
SG - PE	< 890V	< 890V
Delay of answer (L-L,L-SG/L-PE, SG-PE)	< 1 ns / < 100ns	
Fréequency	13MHz	13MHz
Transmission gear	10 Mbit/s	10 Mbit/s
Connectors	SUB D 9 points	SUB D 25 points
Clamp Connection capacity PE	2,5 mm²	2,5 mm²
Temperature in use	-25°C/+70°C	-25°C/+70°C
Housing material	ABS	ABS
Dimensions (LxHxP)	58x79x29 mm	78x58x29 mm
Norm	NF EN 61643-21	NF EN 61643-21

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LIGHTNING PROTECTION SYSTEMS FRANCE
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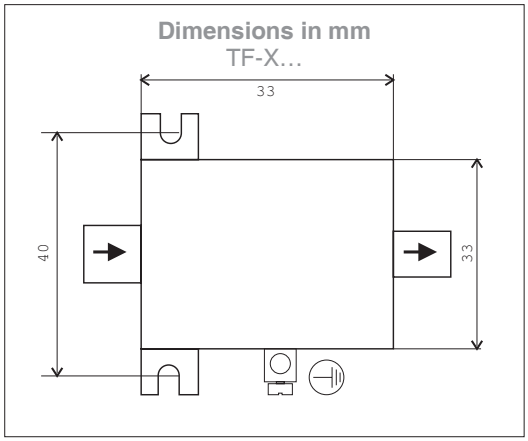
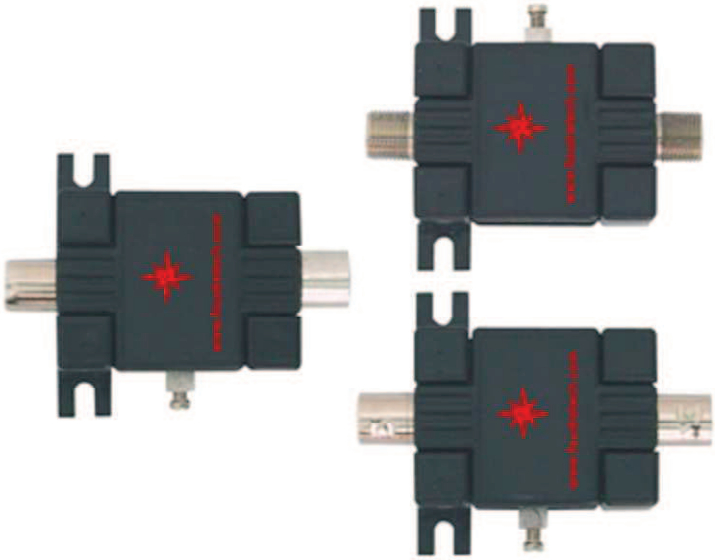
Coax : TV / Sat./ Video
I_n : 10 kA
I_{imp} : 2.5 kA
Mural holdfast

TV VIDEO SATELLITE TECHNOFOUDRE®
TF-X...TV - TF-X...SAT - TF-X...VID

Surge arresters TF-X… ensure video reception system(s protection : land aerial, inner dispersion, cable TV (CATV), satellite reception, video camera

- **Discharge nominal current I_n 10kA**
- **type TV, F, BNC connection**
- **Fixation on a wall**





Features

References	TF-X230TV-M/F	TF-X230SAT-F/F	TF-X230VID-F/F
nominal tension	180 VDC	180 VDC	180 VDC
permanent service tension Uc	200 VDC	200 VDC	200 VDC
discharge nominal current I_N	4 A	4 A	4 A
discharge maximal current Iimp (10/350µs)	2,5 kA	2,5 kA	2,5 kA
discharge nominal current In (8/20µs)	10 kA	10 kA	10 kA
combine tension U_{oc}	-	-	-
protection level at In Up	600	600	600
maximal frequency	< 862 MHz	< 2,15 GHz	< 2,15 GHz
maximal exit power P_T	-	-	-
loss by insertion a_E	< 0,5 dB		
lay of answer	< 100 ns	< 100 ns	< 100 ns
distinctive Impedance	75 Ω	75 Ω	50 Ω
temperature in use	-40°C/+80°C	-40°C/+80°C	-40°C/+80°C
kind of connectors	TV F/F	F F/F	BNC 50 F/F
housing material	ABS / métal	ABS / métal	ABS / métal
Norm	NF EN 61643-21	NF EN 61643-21	NF EN 61643-21

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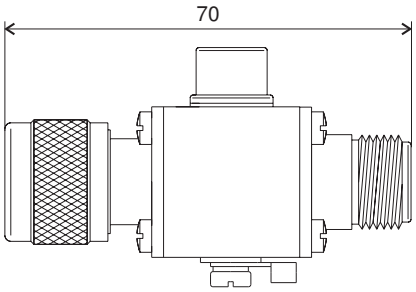
TRANSMISSION SYSTEMS
TECHNOFOUDRE® TF-230… / TF-230…

Conn. : N et BNC
Conn. : M/F ou F/F
I_n / Imax :
10kA/20kA

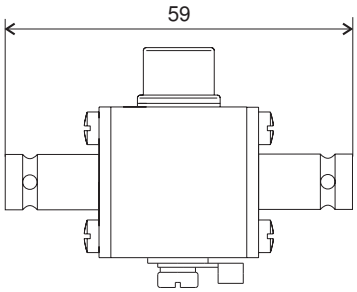
Surges arresters TF-230… ensure the protection of transmission systems against surges.
transmitters`/receptors, repeaters, people lookup, oder by radio.

- **Discharge nominal current I_n 10kA**
- **type N et BNC connection**
- **max. Frequency < 2.5 GHz (2 GHz BNC)**
- **Power max. 20 à 100W**

Dimensions in mm
TF-230…



Dimensions in mm
TF-230…



Features

References	TF-230N50F/F(M/F)	TF-230B50F/F(M/F)
nominal tension	150 VDC	150 VDC
permanent service maximal tension Uc	170 VDC	170 VDC
discharge nominal current I_N	4 A	4 A
discharge nominal current In (8/20µs)	10 kA	10 kA
discharge maximal current Imax (8/20µs)	20 kA	20 kA
combined tension U_{oc}	20 kV	20 kV
protection level at U_{oc} Up	900 V	900 V
maximal frequency	< 2,5 GHz	< 2 GHz
maximal exit power P_T	100 W	100 W
loss by insertion a_E	< 0,4 dB	< 0,4 dB
delay of answer	< 100 ns	< 100 ns
distinctive Impedance	50 Ω	50 Ω
temperature in use	-40°C/+80°C	-40°C/+80°C
kind of connectors	N 50 Male/Female ou N50 Female/Female	BNC 50 Female/Male ou BNC 50 Female/Female
housing material	metal	metal
Norms	NF EN 61643-21	NF EN 61643-21

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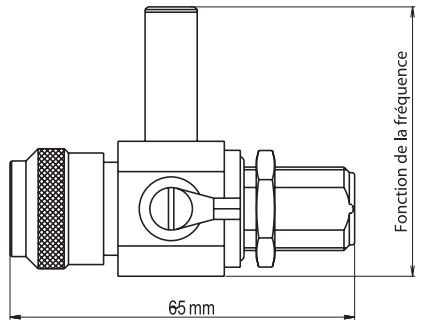
FOURTH WAVE TECHNOFOUDRE®
TF- …N TF- …7/16

A fourth of wave
Connectors : N et 7/16
I_n / I_{imp} : 10kA/40kA
Use : GSM

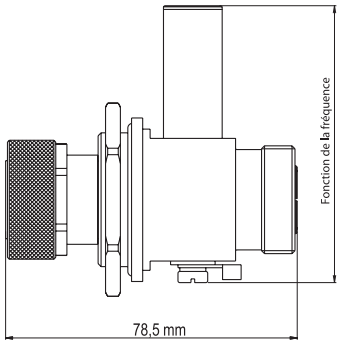
Surge arresters TF-…N / TF-…7/16 ensure protection against transmission systems' inferred surges:
transmitters/receptors, GSM repeaters, radio broadcast FM band.

- **Discharge nominal/max current I_n/I_{imp} : 10kA / 40kA**
- **type N et 7/16 connection**
- **Frequency 0.9 à 2.4 GHz**
- **low Up (<40 V)**

Dimensions in mm
TF-…N50



Dimensions in mm
TF-…7/16



Features		Connecteurs type N		Connecteurs type 7/16	
References	TF-0,9N50-M/F	TF-1,8N50-M/F	TF-2,4N50-M/F	TF-0,9-7/16-M/F	TF-1,8-7/16-M/F
discharge pulse current Iimp (10/350µs)	40 kA	40 kA	40 kA	40 kA	40 kA
discharge nominal current In (8/20µs)	10 kA	10 kA	10 kA	10 kA	10 kA
discharge maximal current Imax (8/20µs)	50 kA	50 kA	50 kA	50 kA	50 kA
combine tension U_{oc}	20 kV	20 kV	20 kV	20 kV	20 kV
protection level at U_{oc} Up	34 V	34 V	34 V	34 V	34 V
frequency range	0,9 GHz ± (5-20%)	1,8 GHz ± (5-20%)	2,4 GHz ± (5-20%)	0,9 GHz ± (5-20%)	1,8 GHz ± (5-20%)
loss by insertion aE	< 0,1 dB	< 0,1 dB	< 0,1 dB	< 0,1 dB	< 0,1 dB
distinctive Impédance	50 Ω	50 Ω	50 Ω	50 Ω	50 Ω
ture in use	-40°C/+80°C			-40°C/+80°C	
kind of connectors	N 50 mâle/femelle			7/16 male/female	
housing material	métal			métal	
Norms	NF EN 61643-21			NF EN 61643-21	
Use	GSM900	GSM1800	E/R with narrow tape	GSM900	GSM1800

Fourth wave technology: the gas spark is replaced by a short-circuit which is calculated according to the use frequency band (bandpass filter).
Advantage comparing to the gas spark: really low Up and unlimited shelf life

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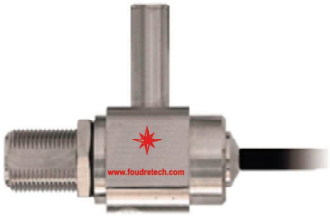
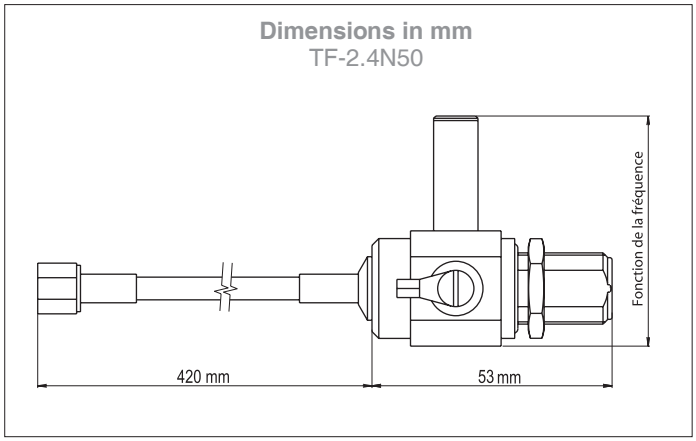
FOURTH WAVE TECHNOFOUDRE® TF-2.4N50/…

A fourth wave
Conn. : N-SMA,SMB
Conn. : N-BNC, PIGTAIL
I_n / I_{imp} : 10kA/40kA

Surge arresters TF-2.4N50 ensure protection against transmission systems' inferred surges:
Diversified way of connection adaptable to many situations.



- **discharge nominal/max. current I_n/I_{imp} : 10kA / 40kA**
- **type N-SMA,SMB, connection Pigtail, et N-BNC**
- **Frequency : 2.4 GHz**
- **Low Up (< 40V)**



Connectors available

Kind of	*connectors*
	M-SMA
	FR-SMA
	Pigtail
	FR-SMB

Features	Kind of connectors			Kind of conn. N - BNC
References	**TF-2,4N50/SMA-F/L/F**	**TF-2,4N50/SMA-F/L/M**	**TF-2,4N50/SMA-F/L/RF**	**TF-2,4N50/B50-F/L/M**
discharge pulse current Iimp (10/350µs)	40 kA	40 kA	40 kA	40 kA
discharge nominal current In (8/20µs)	10 kA	10 kA	10 kA	10 kA
discharge maximal current Imax (8/20µs)	50 kA	50 kA	50 kA	50 kA
combined tension U_{oc}	20 kV	20 kV	20 kV	20 kV
protection level at U_{oc} Up	34 V	34 V	34 V	34 V
frequency range	2,4 GHz ± (5-20%)	2,4 GHz ± (5-20%)	2,4 GHz ± (5-20%)	2,4 GHz ± (5-20%)
loss by insertion aE	< 0,4 dB	< 0,4 dB	< 0,4 dB	< 0,4 dB
distinctive impédance	50 Ω	50 Ω	50 Ω	50 Ω
temperature in use		-40°C/+80°C		-40°C/+80°C
kind ofconnectors	N 50 femelle - SMA femelle	N 50 fem. - SMA mâle (mod.)	N 50 fem. - SMA fem. (inv.)	N 50 fem. - BNC 50 mâle
housing material		métal		métal
Norms		NF EN 61643-21		NF EN 61643-21

Comment : identical technical features with N-SMB et N-PIGTAIL connectors

Fourth wave technology: the gas spark is replaced by a short-circuit which is calculated according to the use frequency band (bandpass filter).
Advantage comparing to the gas spark: really low Up and unlimited shelf life.

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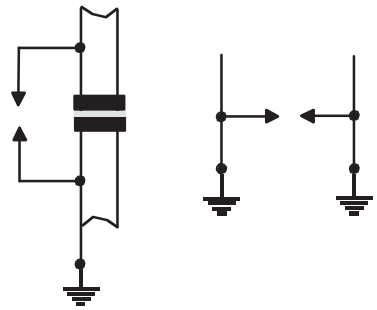
ISOLATING SPARK GAPS
ED-ECL

Eclateur
I_n : 100 kA
Racc. : tige M8

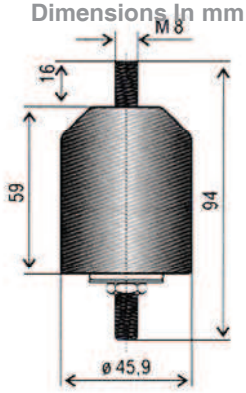
Isolating spark gaps ensure supplies potential balancing when the grounds are not connected together. They also allow aerial masts' protection, protection discharge spout, metal framework.

- **Isolating spark gaps**
- **Discharge nominal current I_n 100kA**
- **Exterior installation**
- **Threaded rod M8**

SYSTEMS



Dimensions In mm



Features

References	ED-ECL/1	ED-ECL/2,5	ED-ECL/10
alternative tension of solicitation (50hz)	1KV	2,5KV	10KV
baiting Tension (1,2/50µs)	2KV	5KV	<15KV
discharge nominal current In (8/20µs)	100 KA	100 KA	50 KA
insulation resistance	<10 Gohms	<10 Gohms	<10 Gohms
Dimensions		94x45,9 mm	
connection's mode		threaded pipe M 8	
Temperature in use		-30°C / +80°C	
housing material		thermoplastic polyester UL 94 V-0	
protection degree			
installation		external	

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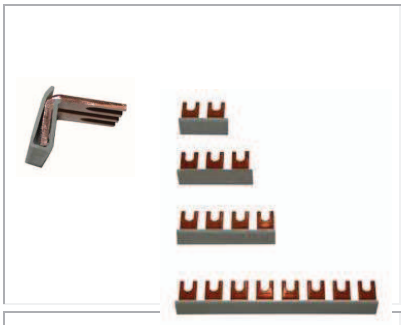
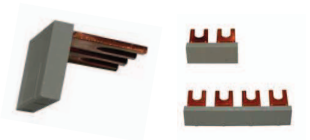
SURGE ARRESTERS' ACCESSORIES

	Nomination	Number of poles		References
	**PF Fork Bridging bar** (section 16 mm²)	2 poles		PF-O2
		3 poles		PF-O3
		4 poles		PF-O4
		6 poles		PF-O6
		8 poles		PF-O8
		28 poles		PF-O28
		57 poles		PF-O57
	Bridging bar with casting insulator (section 16 mm²)	2 poles		PF-F2
		4 poles		PF-F4
	Cut-circuit fusible for 22x58 rounds (with indication fusible melting)	2 poles		PF-S2
		3 poles		PF-S3
		4 poles		PF-S4
 	**Cylinder-shape fusibles type gG 22x58 mm** (avec percuteur)	In	U(V)	
		16	690	PF-Fu16
		20	690	PF-Fu20
		25	690	PF-Fu25
		32	690	PF-Fu32
		40	690	PF-Fu40
		50	690	PF-Fu50
		63	690	PF-Fu63
		80	500	PF-Fu80
		100	500	PF-Fu100

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Groupe CEMASO SAS - BP 80055 - F-33460 MARGAUX
SIRET: 521 876 433 RCS BDX

ENQUIRY FORM

Customer code :		*Cf. your last invoice*	
e-mail :	@		
Society :			
Contact name :			
Contact firstname :			
Adress :			
County code :		City:	
Country:			
Phone. :			
Fax :			
Delivery: *(specify is the applicant's address is different)*			
Society :			
Adress :			
Conty code :		***City :***	
Country:			
Comments :			

Phone : +33 (0) 557 226 577
Fax : +33 (0) 517 476 563
Mail : info@lpsfr.com

LIGHTNING PROTECTION SYSTEMS FRANCE
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References	Nomination	Quantity

PURCHASE CONDITIONS

1- Generalities : All the orders that come from a quotation made by LPS FRANCE is addressed to LPS FRANCE – BP 80055 – F-33460 MARGAUX – RCS BORDEAUX 521 876 433 and thus triggers the acceptance of the customer of our sale general conditions herein and despite whatever opposite clause from his part.

2- Orders: They must be certified by written word thanks to the purchase attached to the quotation or thanks to numbered purchase orders coming from your service or society. They must contain all the usual, legal information, linked to the ordering party.

3- Price: The prices indicated on our offers or quotations are valid during 6 months (six) and according to the quantity that is foreseen on the quotation. They are changeable if the quantities asked do not stick to those in the quotation. LPS FRANCE allows itself to modify the prices according to the construction's index, BT 47 index in particular. In the framework of a basic furnitures'order, that does not include the installation, our prices are duty-free, sold free alongside ship, concerning the metropolis, for orders upper than 305,00 Euros net duty-free (for lower amounts, the transport will have to be paid by the purchaser). Concerning the delivery outside the Metropolis, our prices are Ex-works (the customer has in charge the transport from our factory) and the transport expenses will have to be paid by the purchaser only, except if LPS FRANCE mentions the contrary.

4- Delivery delay: LPS FRANCE society will stick to the delay foreseen, so far as possible, (9 to 10 weeks as from the purchase orders' reception). However, the purchaser can't oppose to a potential delay. The recipient is in charge of the delivery risks, whatever the sales and transport conditions are. In case of contest for delay, loss or damage of the goods, it is the role of the recipient to have recourse to third party.

5- Transport: According to article 105 of French commercial code, the goods are travelling to the riskiness of the purchaser, recipient who must check the state of the goods in the presence of the deliverer. In case of damage, it is compulsory to mention it on the freight forwarder's written document with the maximum of precision, followed by a registered letter addresses to the freight forwarder within 48 hours. If the goods are totally unusable, refuse it. The latter will be replaced within the best extension.
If you sign the freight deliverer's without any reservation, that means you recognise having received the goods in a good state and from that moment, no recourse or repayment is possible anymore, neither replacement of the pieces will be possible.

6- Payment: Body corporate of public law will settle payment through administrative transfer 60 days in date of reception of the works or material. Concerning all other orders, 30% of the total amount of the quotation and chosen options will be compelled. This down payment will be settled cash at the order's certification. The payment will be settled either cash at the reception of the works, or by bank draft 30 days at the end of the month for the remaining to be paid. The lack of the bank draft at the date planned or the change of their due date without previous agreement of our society will automatically trigger the suppression of payment's easy terms. The loss of payment of at least one of the due date will trigger, by rights, the payability of the interests and of the inherent expenses as well as the cessation of the orders in process. Every payment that comes after the payment date which is on the invoice, will be mark-up with a 1.5% penalty for each month past due, having for known that all entered month will be due integrally. The invoicing date is the goods' delivery date, or the date when the goods will be available in our factory, but also at the reception of the works. Body corporate of public law will settle the payment thanks to administrative transfer 60 days at the date of reception of the works or material.

7- Reserve of property: Concerning supplies' order only, the supplied goods' ownership will only be transferred to the buyer after the whole payment of the price, the supplier allowing himself the right to claim the said goods in the conditions foreseen by the law n°80-335 of May 12th 1980. All the expenses which would follow from the implementation of this clause would be at the charge of the buyer.

8- Warranty-liability limit: There is a one (1) year warranty on the supplies, but it is effective only in a normal use of the material. All return of material must be first accepted by LPS FRANCE.
Our responsibility is limited to the only starting value of the supplied pieces and recognized as flawed without being linked to any other indemnity towards the buyer such as expenses of dismantling, reassembly, diagnostics, evaluation, loss of use, or other expenses.
The return expenses must be paid by the customer. It is specialized that LPS FRANCE society won't be responsible for damages directly or indirectly induced by the material the customer has got, it can be awry or not.

9- Return of the goods: Except a mistake of our part, no piece will be taken back, neither swapped – beyond 15 days from the invoicing date.
Contact us to obtain a return authorization and know the conditions to complete this return in the best conditions. In no case we will accept returns of pieces in cash on delivery or in freight due or bad-packed.
The returns are limited only to pieces in their first packaging and in perfect state of commercialization, which means not assembled.

10- Jurisdiction: In case of disagreement, Bordeaux Tribunal de Commerce (France) are the only interested for the issue.

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