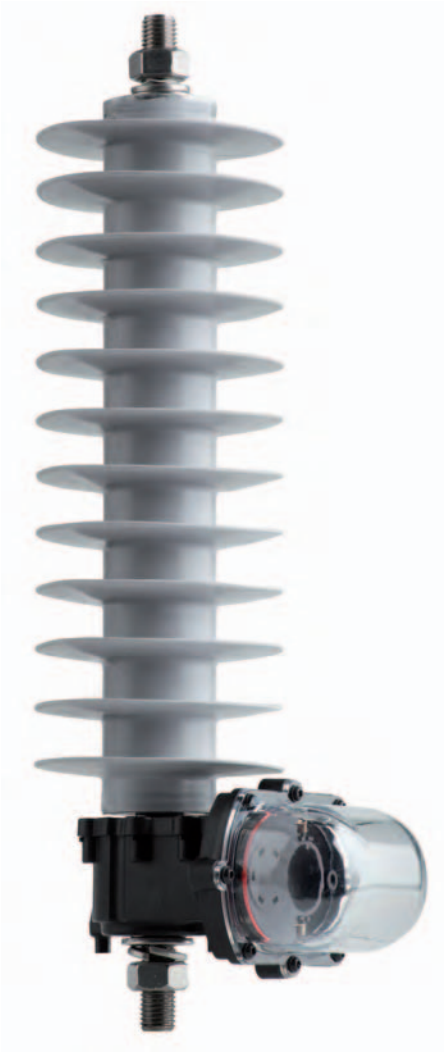
dervasil

MEDIUM VOLTAGE NETWORKS

LIGHTNING ARRESTERS & INSULATORS

SICAME GROUP



OUR EXPERIENCE

With 25 years of experience in the field of overvoltage protection for medium voltage lines, DERVASIL designs and manufactures zinc oxide varistor arresters and composite insulators.

OUR PRODUCTS

DERVASIL presents :

- A comprehensive range of latest generation arresters:
  - 5 kA or 10 kA arresters with fault indicators or disconnector.
  - Arresters for cutting off power follow currents.
  - Arresters for D.C voltage.
- These arresters do not have any internal spark gaps.
  They have very stable characteristics, practically constant and very short response times (30 to 50 nanoseconds).
- The directly moulded silicone housing provides both absolute sealing, exceptional resistance to pollution and a non-dangerous character in case of short-circuits.
  They are tested according to the latest version of the publication IEC 60099-4.
- A new range of composite insulators, suspension insulators, anchoring insulators and support insulators.
- Fault indicators and surge counters for maintaining and monitoring arresters.

OUR R & D RESOURCES

DERVASIL has computing resources and test equipment for designing medium voltage arresters and insulators.
Our experience is available to customers for specific applications.

QUALITY SYSTEM

DERVASIL is a certified company ISO 9001 and ISO 14001. Our production unit is approved by EDF and integrates all the equipment required for the routine tests required by the publications IEC 60099-4, IEC 61109 and IEC 61952.

OVERVOLTAGES ON DIRECT CURRENT RAILWAY NETWORKS

On these networks, the switching overvoltages are generally very energetic and the temporary overvoltages are frequent and long. The direct current power supply also imposes an additional stress.

The AZE range was specially designed for this use and the leakage distance is highly increased to withstand the high pollution generated by the friction of pantograph on the catenary. The varistors are designed to withstand the continuous DC voltage.

The model can be selected using the table below:

Nominal Voltage (V)	Highest continuous voltage Umax 1 (V)	Highest overvoltage of duration 300 s Umax 2 (V)	Highest overvoltage of duration 20ms Umax 3 (V)	Recommanded AZE arrester
500	700	650	850	**AZE 010T**
600	720	800	1010	**AZE 010T**
750	900	1000	1270	**AZE 010T**
800	960	1050	1350	**AZE 012T**
1000	1200	1300	1700	**AZE 012T**
1200	1450	1600	2030	**AZE 015T**
1500	1800	1950	2540	**AZE 020T**
2400	2900	3200	4050	**AZE 030T**
3000	3600	3900	5080	**AZE 040T**
3500	4200	4650	5900	**AZE 050T**

AZE 012T model

10 kA

AZE---T SERIES

ARRESTER 10 kA

NETWORK PROTECTION
MEDIUM VOLTAGE

AZE---T

GENERAL CHARACTERISTICS

ACCORDING TO IEC 60099-4.

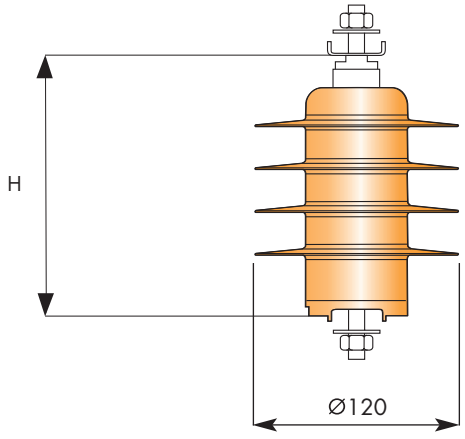
- Zinc oxide varistors.
- Silicone rubber housing.
- Outdoor and indoor use.
- High resistance to vibrations.
- High resistance to vandalism.

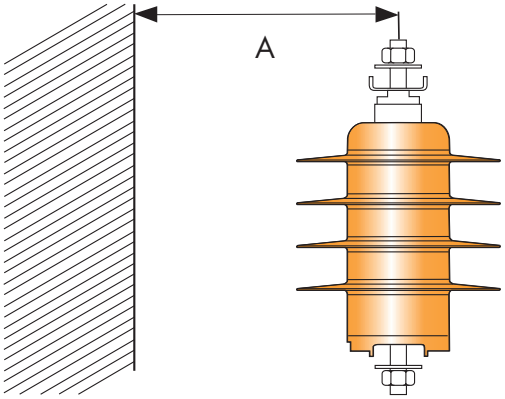
Can be connected to line with aluminium or copper cables from 25 to 148 mm² (with or without terminal).

Single-arrester packed in a cardboard box.
Ordering example: 1 AZE 040T

PHYSICAL CHARACTERISTICS

Arrester type	Leakage (mm)	Height H (mm)	Unit weight (kg)	Insulation withstand of housing		Mounting clearances
				① Lightning impulse 1.2/50 µs (kVc)	② 50 Hz voltage wet (kVrms)	A min (mm)
AZE 010T	400	174	1,2	29	160	160
AZE 012T	400	174	1,2	29	160	160
AZE 015T	400	174	1,3	38	180	160
AZE 020T	400	174	1,4	38	180	160
AZE 030T	400	176	1,4	38	190	160
AZE 040T	400	176	1,4	43	210	160
AZE 050T	400	176	1,5	46	230	160





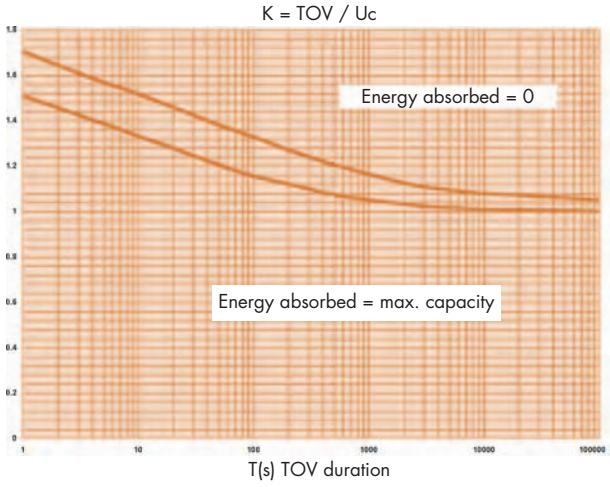
ELECTRICAL AND MECHANICAL CHARACTERISTICS

• Nominal discharge current	10 kA 8/20 µs impulse
• Line discharge class	2
• High current withstand	2 x 100 kA 4/10 µs impulses
• Long duration current withstand	20 x 600 A 2000 µs impulses
• Energy absorption capacity	5.5 kJoule/kV of Uc for one 2000 µs impulse
• Service temperature	- 40°C to + 50°C (+60°C short duration)
• Permanent cantilever strength	100 N.m
• Max cantilever strength for one minute	250 N.m
• Max torsion strength	30 N.m
• Pollution area IEC 60815	3
• Short circuit rating after overvoltage failure according to IEC 60099-4	20000 A for 0.2 s / 600 A for 1 s
• Partial discharge level at 1.05 Uc	< 3pc

CAPABILITY TEMPORARY OVERVOLTAGE

AZE---T line arresters do not have spark gaps in series. The zinc oxide ceramics are designed to withstand the continuous phase to ground voltage of the network. They are capable of bearing increased operational voltages for a limited period. The temporary overvoltage characteristics give the duration T and corresponding TOV with respect to continuous voltage Uc.

The curve E = 0 is valid for arresters without any energy preloading. The other curve is valid for arresters that have already absorbed impulses corresponding to their maximum energy absorption capacity.



PROTECTIVE CHARACTERISTICS

Arrester type	Nominal Voltage (V)	Highest Continuous Voltage Umax1(V)	Highest overvoltage of duration 300s Umax2 (V)	Highest overvoltage of duration 20 ms Umax3 (V)	Max. Residual voltage (kVc) LIGHTNING IMPULSE ❺					Max. Residual voltage (kVc) at 10 kA 1/20µs STEEP CURRENT IMPULSE	Max. Residual voltage (kVc) SWITCH IMPULSE ❻		
					2,5 kA 8/20µs	5 kA 8/20µs	10 kA 8/20µs	20 kA 8/20µs	40 kA 8/20µs		125 A	250 A	500 A
AZE 010T	750	900	1000	1270	2,4	2,5	2,7	3,0	3,3	2,9	2,0	2,1	2,2
AZE 012T	1000	1200	1300	1700	3,0	3,2	3,4	3,7	4,2	3,7	2,5	2,6	2,7
AZE 015T	1200	1450	1600	2030	5,3	5,7	6,1	6,7	7,5	6,7	4,5	4,7	4,9
AZE 020T	1500	1800	1950	2540	5,9	6,3	6,8	7,5	8,3	7,5	5,0	5,2	5,4
AZE 030T	2400	2900	3200	4050	8,4	9,0	9,7	10,6	11,8	10,6	7,1	7,4	7,7
AZE 040T	3000	3600	3900	5080	8,9	9,5	10,2	11,2	12,5	11,2	7,5	7,9	8,1
AZE 050T	3500	4200	4650	5900	11,9	12,6	13,6	15,0	16,7	15,0	10,0	10,5	10,8

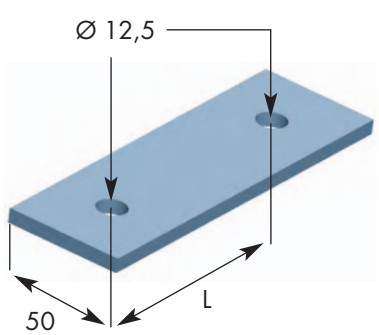
❶ ❷ ❺ ❻ See page 14

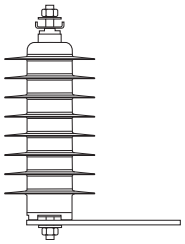
ACCESSORIES

ACCESSOIRES

ARRESTER MOUNTING BRACKETS

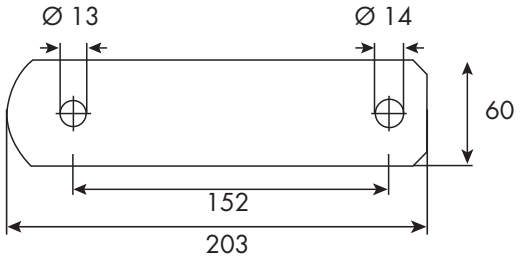
STANDARD



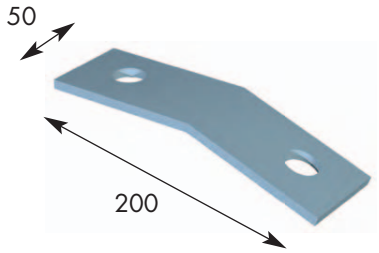


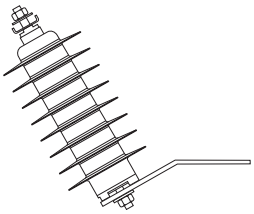
Strip	L (mm)
EZX 1	100
EZX 2	150
EZX 3	210

EZX

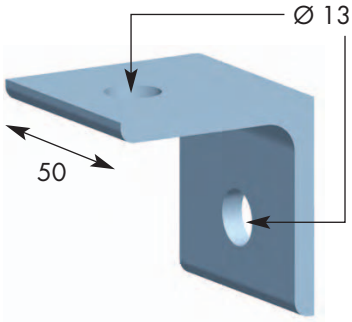


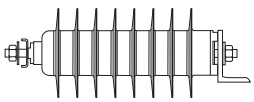
AZ 200





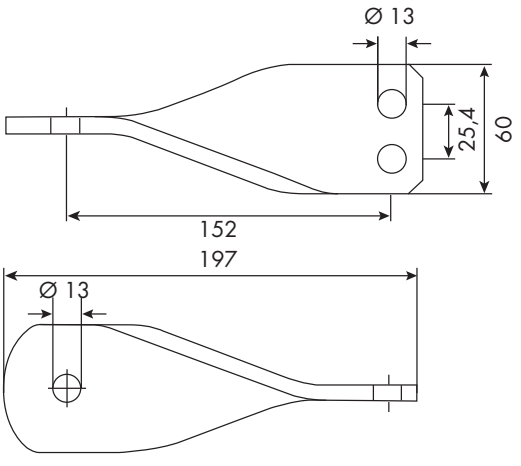
AZPTR



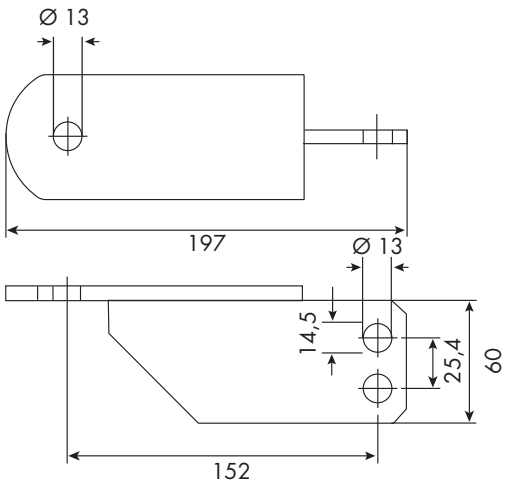


AZ 50-50

TYPE DIN

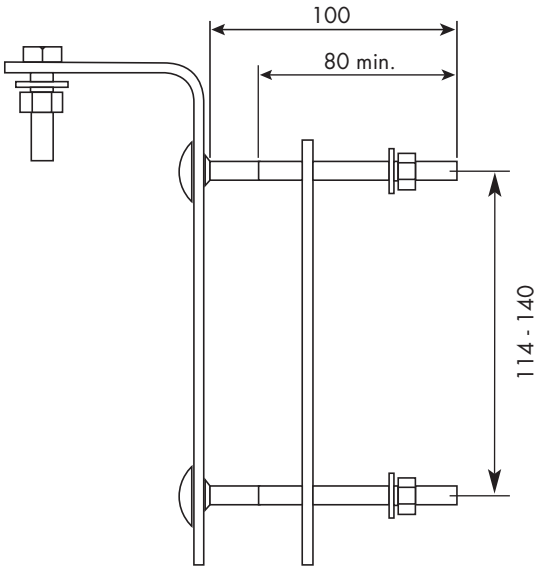


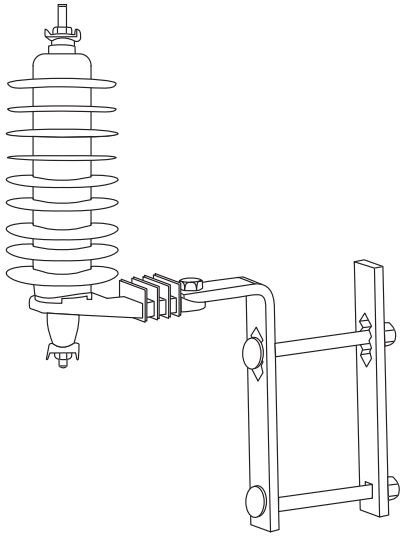
AZX 1



AZX 2

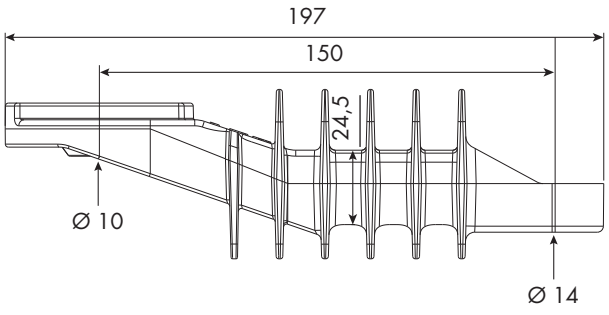
NEMA



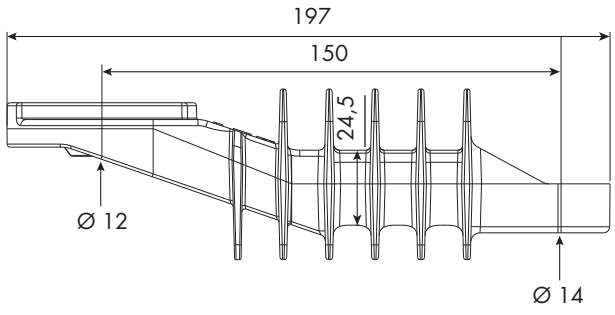


AZNEMA

INSULATING

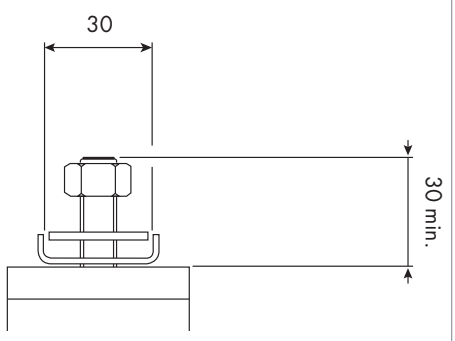


SUP M10

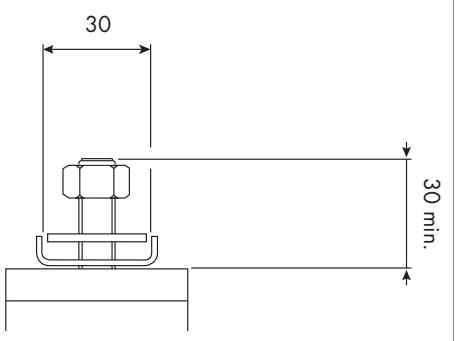


SUP M12

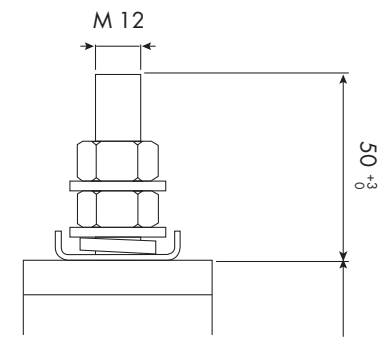
ARRESTER LINE CONNECTIONS



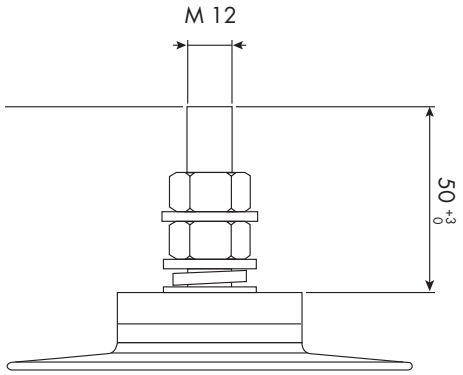
M 10



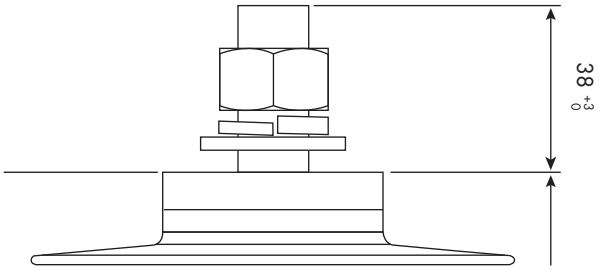
M 12



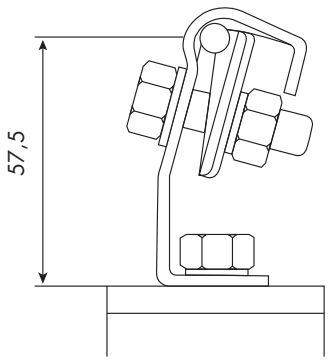
M 12 A



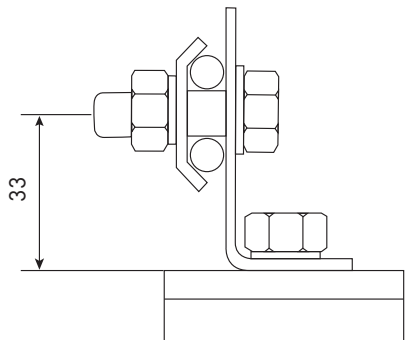
M 12 B



M 16



M 12 C

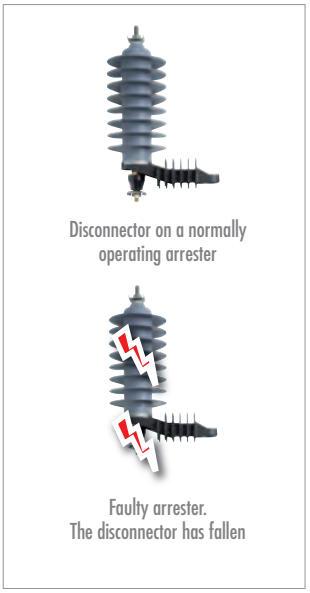


M 12 D

AUTOMATIC DISCONNECTION DEVICE

DEC M10

Device for **disconnecting an arrester** in the event of arrester failure to prevent a permanent fault and provides a visible signal of the faulty arrester. The operator can energize the line again and re-establish the service. However, the overvoltage protection is removed. Periodic maintenance inspections must be scheduled to replace disconnected arresters.
The device must be connected to ground by a flexible cable to enable an effective operation and provide a visual indication of the disconnection.



To order this accessory,
use the references with the figure 2:
Examples : EZBD 12**2** - AZBD 12**2** - AZC 12**2** - AZE 012**2** T.

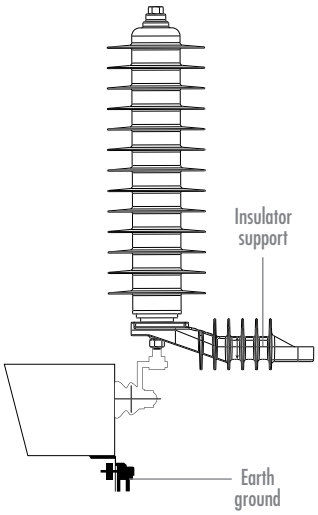
SURGE COUNTER WITH LEAKAGE CURRENT METER

ZC B1-M

The **ZC B1-M surge counter** is supplied for monitoring arresters with the purpose of preventive maintenance. It is used to measure the leakage current circulating in the arresters and record the number of discharges that it absorbs.

The counter must be connected between the arrester and the ground, ideally by an insulated cable of the shortest possible length.

The arrester will be replaced when the leakage current will exceed three times the initial value when arrester was installed. The current must be read under normal, dry atmospheric conditions. Indeed, wet or rainy conditions can increase the value of the current due to additive surface currents circulating on the arrester housing.



BIRD PROTECTIVE INSULATING CAP

CAP M10

The Dervasil insulating cap (Polyamid moulded) is specially designed for fitting on the arrester top.

FAULT INDICATORS

Designed to **indicate the failure of an arrester** without disconnecting the arrester from the network. The line can be energised again after replacing the failed arrester.
The fault indicator enables the maintenance staff to quickly locate the damaged arrester and replace it to re-establish the service.

Three indicator types are available.

MODELS TO MOUNT ON THE ARRESTER

MX 481

Device operating from 15 A for compensated or high impedance grounded neutral networks.

To order this accessory,
use the references with the letter P:
Examples : EZ**P** 12 - AZ**P** 12 - AZC**P** 12 - AZE **P** 012 T.


Visual indication


Indicator in normal condition


Indicator after arrester failure

INDIC 150 A

Device operating from 150 A for low impedance or solidly grounded neutral networks.

To order this accessory,
use the references with the figure 1:
Examples : EZBD 12**1** - AZBD 12**1** - AZC 12**1** - AZE 012**1** T.


Indicator in normal condition


Faulty arrester.
The indicator has fallen

MODEL TO MOUNT ON THE GROUND CABLE OF ARRESTER

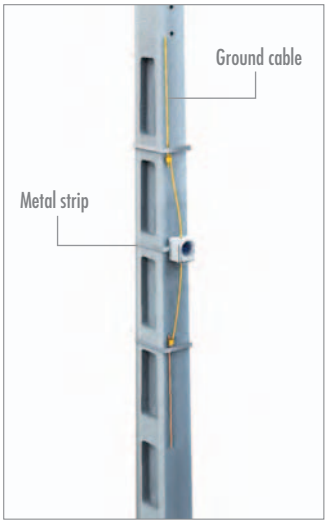
MX 480


Normal condition


Fault condition


RESET
After removal of faulty arrester, reset with the device MX-480/test


TEST
Before installation, test with the device MX-480/test

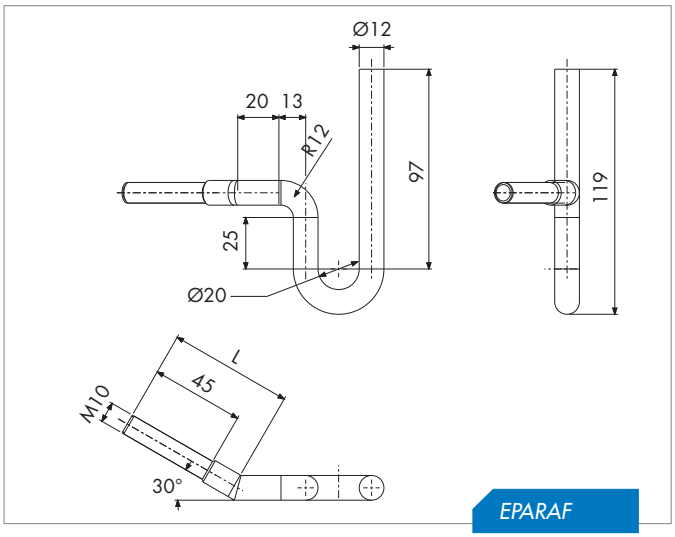


Mounting on the ground connection cable

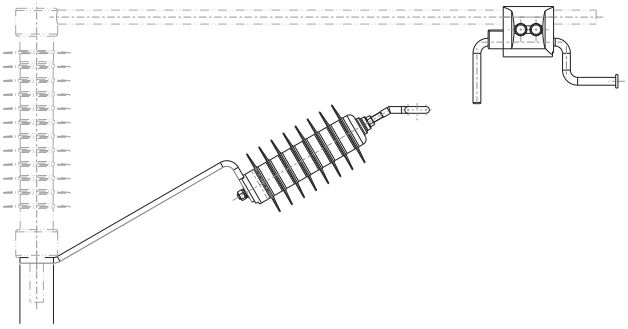
ARCING HORNS

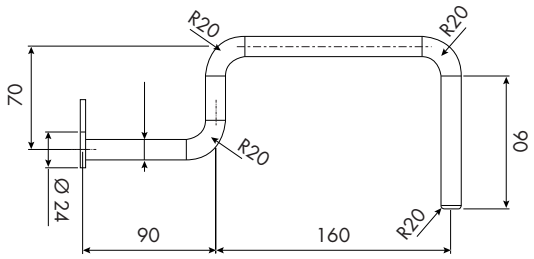
For isolated cable overhead lines, large installation of overvoltage protection is absolutely necessary. We provide an economical solution by combining arcing horns with the arrester. This device is installed in parallel to line post, suspension or tension insulators.

FOR LINE POST INSULATORS



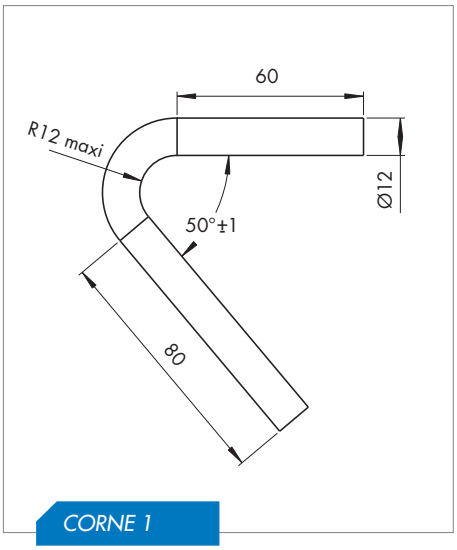
EPARAF



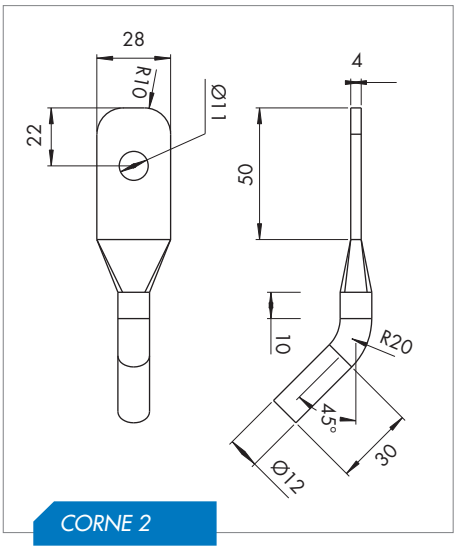


EPHASE

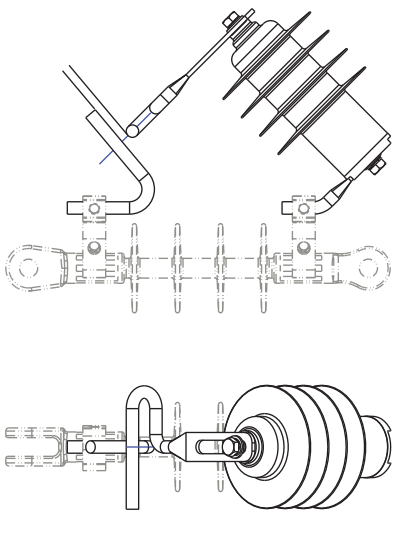
FOR SUSPENSION AND TENSION INSULATORS



CORNE 1



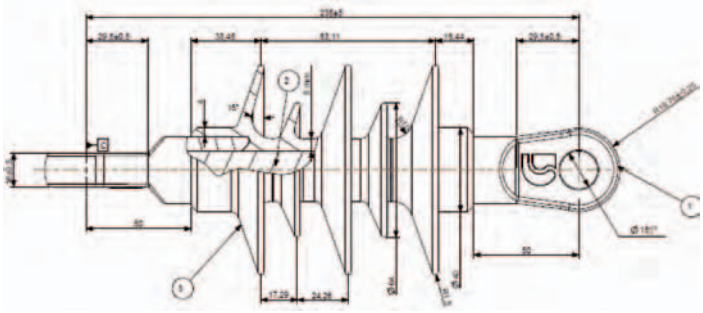
CORNE 2

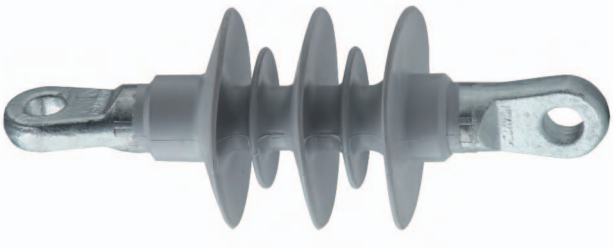


RC 60-3A1 TENSION INSULATOR 3 kV CC

INFRABEL (BELGIUM)

COMPLIANT WITH IEC 61952 STANDARD AND INFRABEL SPECIFICATION I405 460003



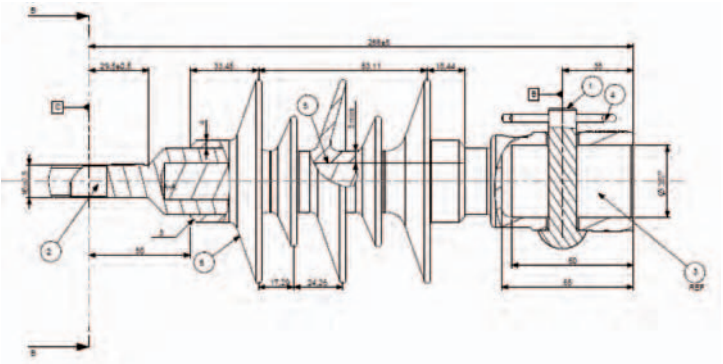


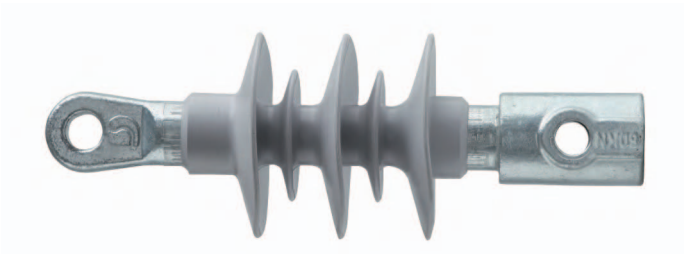
Insulator Reference	Typical line voltage (kV)	CTS specified tensile load (kN)	Leakage distance (mm)	Arcing distance (mm)	Number of sheds	Shed diameter (mm)	Weight (Kg)	Dry power frequency voltage withstand (kV)	Wet power frequency voltage withstand (kV)	Lightning impulse withstand 1.2/50 µs (kV)	
										Positive	Negative
RC 60-3 Type A1	3	60	374	164	3/2	100/64	1,2	75	38	95	95

RC 60-3B2 TENSION INSULATOR 3 kV CC

INFRABEL (BELGIQUE)

COMPLIANT WITH IEC 61952 STANDARD AND INFRABEL SPECIFICATION I405 460003



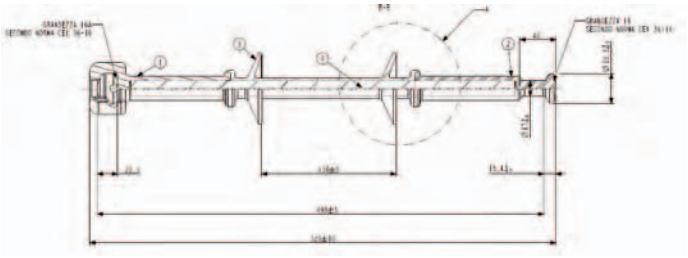


Reference Insulator	Nominal voltage (kV)	CTS specified tensile load (kN)	Leakage distance (mm)	Arcing distance (mm)	Number of sheds	Shed diameter (mm)	Weight (Kg)	Dry power frequency voltage withstand (kV)	Wet power frequency voltage withstand (kV)	Lightning impulse withstand 1.2/50 µs (kV)	
										Positive	Negative
RC 60-3 Type B2	3	60	374	164	3/2	100/64	1,4	75	38	95	95

RC 70-4 — TENSION INSULATOR 3 kV CC

RFI TYPE (ITALY)

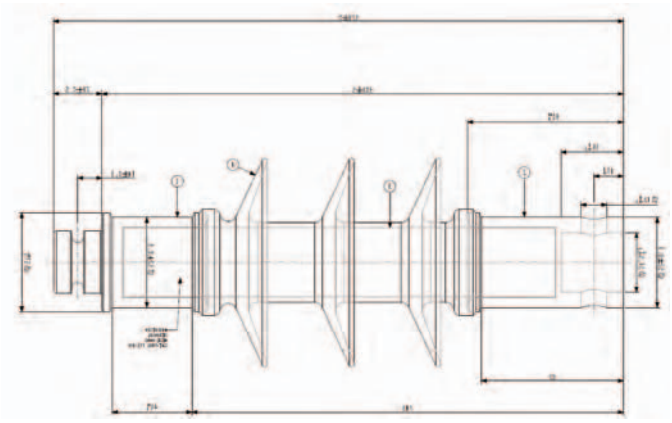
COMPLIANT WITH IEC 61109 STANDARD AND RFI SPECIFICATION TE 128

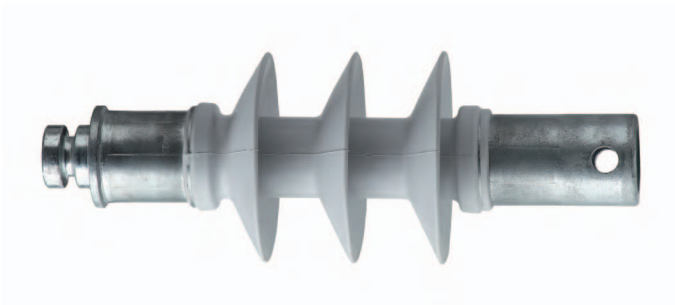


Reference Insulator	Nominal voltage (kVcc)	CTS specified tensile load (kN)	Leakage distance (mm)	Arcing distance (mm)	Number of sheds	Shed diameter (mm)	Weight (Kg)	Dry power frequency voltage withstand (kV)	Wet power frequency voltage withstand (kV)	Lightning impulse withstand 1.2/50 µs (kV)	
										Positive	Negative
RC 70-4	3	70	330	216	2	80	1,6	90	55	125	138

RC 9-4 — SUSPENSION INSULATOR 3 kV CC

COMPLIANT WITH IEC 61952 STANDARD AND RFI SPECIFICATION TE SP IFS 009 A

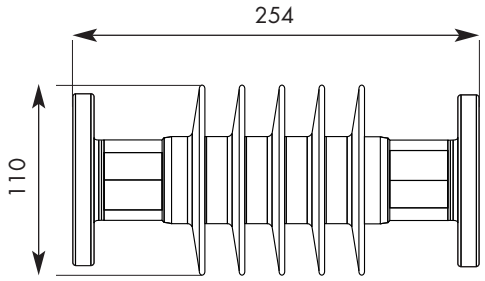


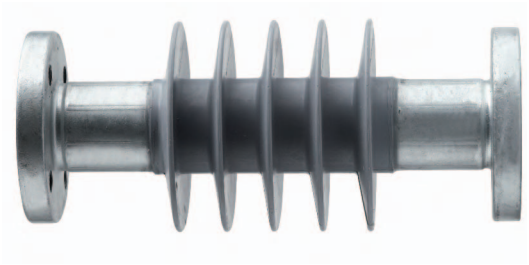


Reference Insulator	Nominal voltage (kVcc)	CTS specified tensile load (kN)	Leakage distance (mm)	Arcing distance (mm)	Number of sheds	Shed diameter (mm)	Weight (Kg)	Dry power frequency voltage withstand (kV)	Wet power frequency voltage withstand (kV)	Lightning impulse withstand 1.2/50 µs (kV)	
										Positive	Negative
RC 9-4	3	40	350	150	3	120	2,2	55	50	125	138

RC 6-1 SUPPORT INSULATOR 3 kV CC

COMPLIANT WITH IEC 61952 STANDARD
AND INFRABEL SPECIFICATION I405 -464.002

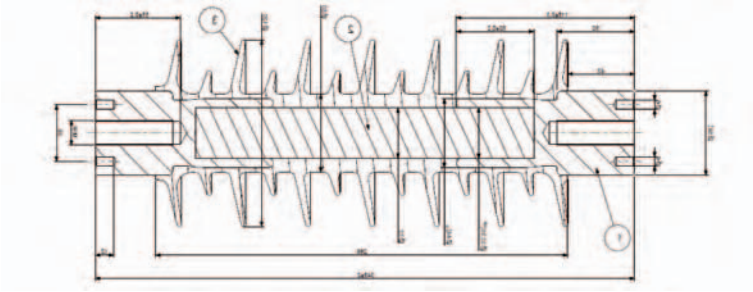


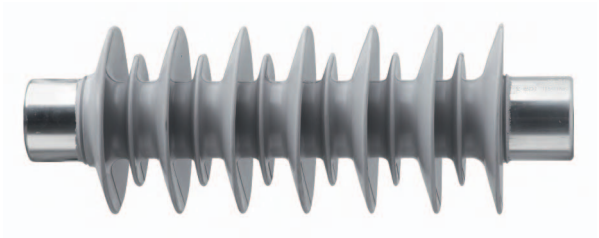


Reference Insulator	Nominal voltage (kVcc)	CTS specified tensile load (kN)	Leakage distance (mm)	Arcing distance (mm)	Number of sheds	Shed diameter (mm)	Weight (Kg)	Dry power frequency voltage withstand (kV)	Wet power frequency voltage withstand (kV)	Lightning impulse withstand 1.2/50 µs (kV)	
										Positive	Negative
RC 6-1	3	25	385	165	5	110	3,2	68	38	130	143

IC 50-3 SUPPORT INSULATOR 25 KV AC

COMPLIANT WITH IEC 61952 STANDARD





Reference Insulator	Nominal voltage (kV)	CTS specified tensile load (kN)	Leakage distance (mm)	Arcing distance (mm)	Number of sheds	Shed diameter (mm)	Weight (Kg)	Dry power frequency voltage withstand (kV)	Wet power frequency voltage withstand (kV)	Lightning impulse withstand 1.2/50 µs (kV)	
										Positive	Negative
IC 50-3	25	50	860	310	7/6	120/80	2,2	125	100	200	255

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