



Advanced connection solutions

for solar PV plants



sicame
SOLAR SOLUTIONS

About us



Sicame Group is one of the key players in the electrical equipment business worldwide. It has been able to adapt and develop to support the continuous evolution of electricity infrastructure in France and around the world, and become the largest independent entity in its sector.

A true player in the energy transition, it offers its customers new products and services to improve energy efficiency, deal with environmental risks and support the development of electric vehicle and solar power plant markets.

70

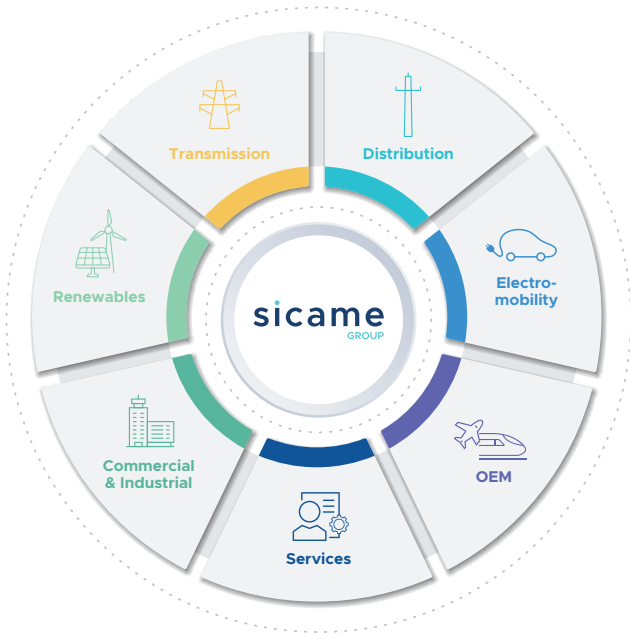
years of worldwide success

600 M€

2024 turnover

3,600

employees



Our fields of activity

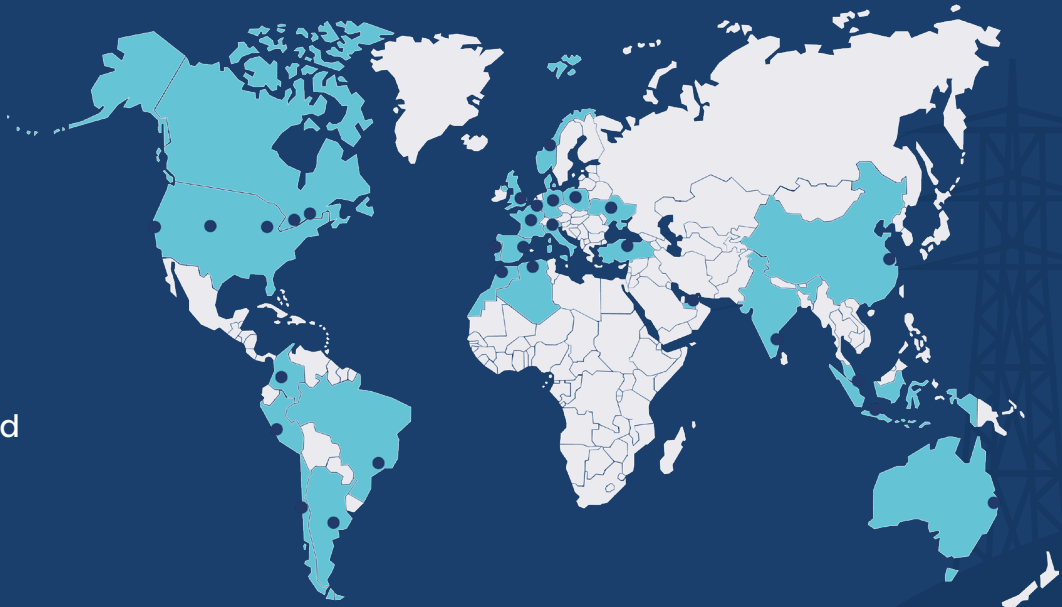
Sicame Group is specialised in **products and services** related to transmission and distribution of **electrical energy**, renewables, electro-mobility, safety equipment and industrial applications.

5 continents

26 countries

50 companies
around the world

Products distributed
in 157 countries



Today Sicame Group is gathering all its know-how and 65 years of experience in **one unique and innovative solution for solar farms connection using suspended DC Bus cable architecture...**

With the collaborative work of our R&D teams, **Sicame Group offers a global solution from the wiring of photovoltaic panels to the grid connection.**

In addition to offering excellent value for money with superior quality, our solution will allow to make significant savings on every construction site design from 1MWp to unlimited GWp.





01

Utility scale

Cable management system	11
DC Harnesses	15
Enclosures	16
Monitoring systems	17

03

Off-Grid

Protection of batteries	20
Shelters	20

02

Rooftop

DC/AC protection	18
------------------	----

04

Our complementary offer

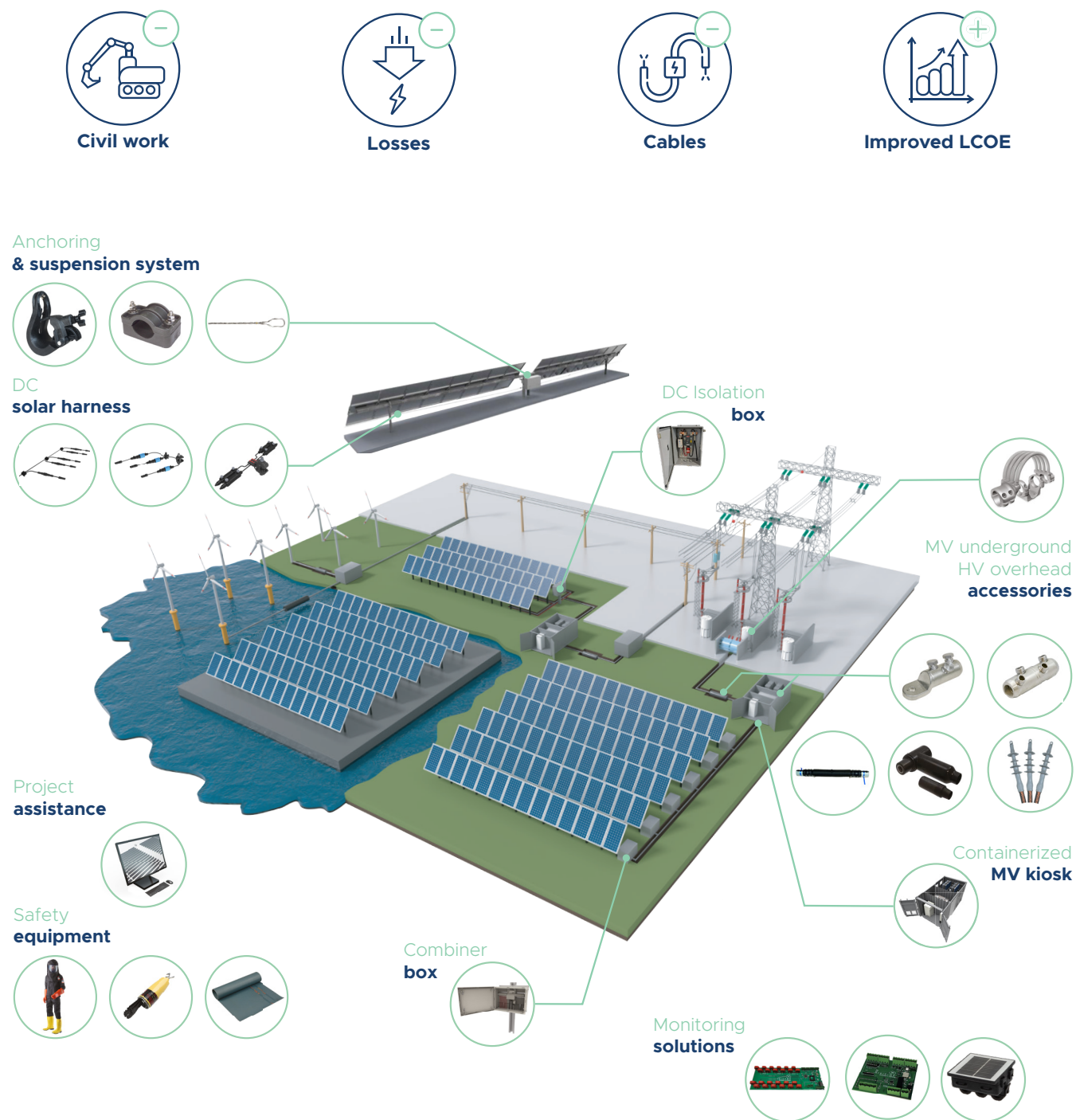
Grounding system	24
Safety equipment	30
Voltage detection	34
Emergency safety and kit prevention	36
Lugs	38
Tools	40
Services	41
HV & MV networks accessories	42
Network & wildlife protection	46



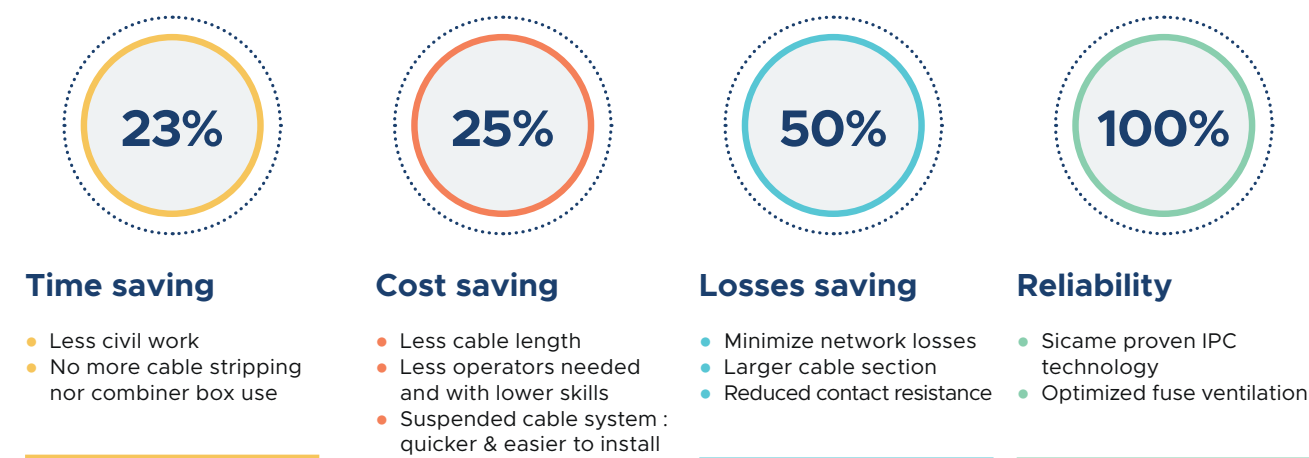
01

Utility scale

Cable management system	11
DC Harnesses	15
Enclosures	16
Monitoring systems	17

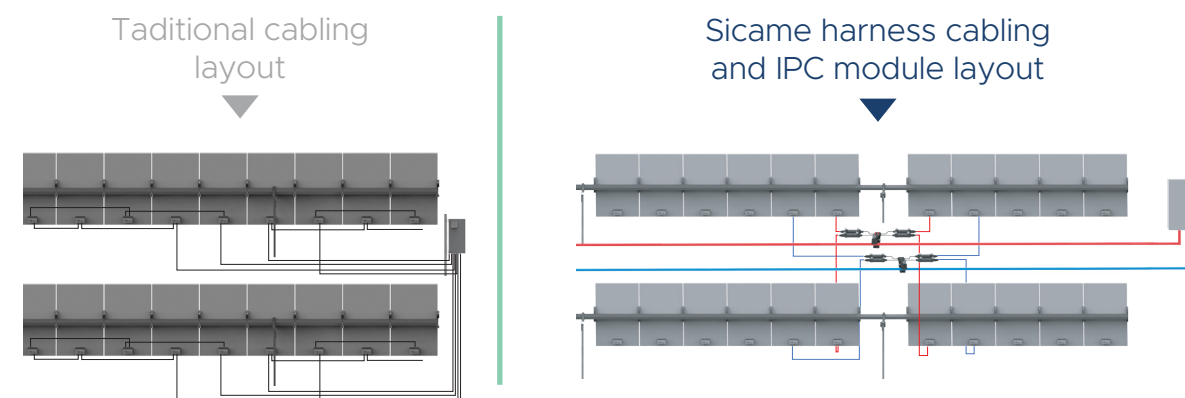
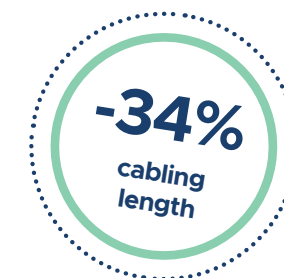


- Calculation of cable lengths
- Calculation of technical losses
- Calculation of complete bill of materials
- Evaluation implementation and product costs - from DC routing to inverter



DC Bus Solution

Cabling savings with Sicame IPC system versus string cabling



Sicame solar support

In addition to bringing you a complete and innovative product offering for DC bus connection, Sicame provides expert assistance in your electrical design construction.

Our dedicated team is at your disposal to assist you in the development of all stages of your project, from design to implementation of your electrical connection.

We have developed an in-house configurator to offer you a customized study of your project to help you assess costs & benefits and select optimized solutions. We will also guide you for on-site installation deployment of your solar farms.



Cable management system

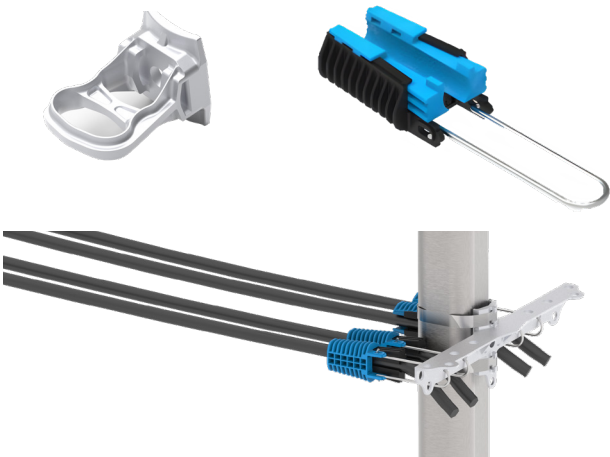
- No trenching needed
- Overcomes risk of cable insulation failure due to stagnant water in conduit (when underground)
- Can use armoured cable
- Excellent weather resistance
- Easy to use, highly reliable
- Brackets with bolted mounting or SS strap mounting.



DC cable anchoring system

Cable tension clamp

Technical specification	
Tested as per	NFC 33 042
Mechanical load	2KN
Cable size	8 to 20mm diameter
Material	UV Resistant plastic & SS bail
Ambient temp range	0 to 75 deg C



Helix tie clamp

Technical specification	
Tested as per	NFC 33 042
Mechanical load	Up to 5KN
Cable size	14 to 33mm diameter
Material	UV Resistant
Ambient temp range	0 to 75 deg C



DC cable suspension system

Solar cable support clamp

- Excellent weather resistance
- Easy to use, highly reliable
- Bolted mounting or SS strap mounting options

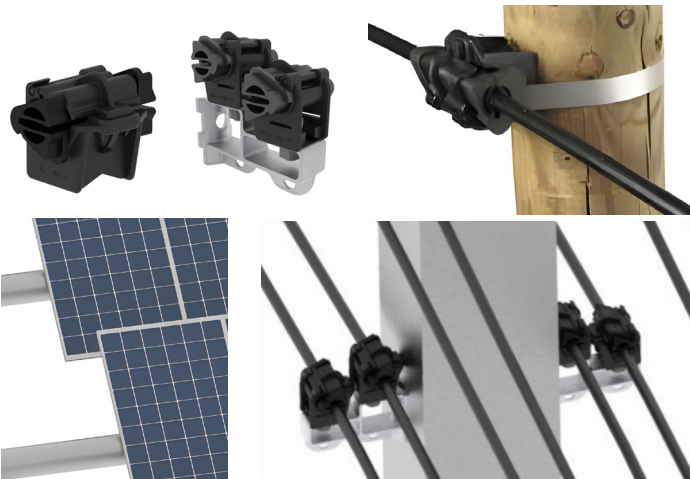
Technical specification	
Mechanical load	3.5KN
Cable size	0 to 15mm diameter
Material	UV Resistant plastic & elastomer
Ambient temp range	0 to 75 deg C



Solar cable support clamp

- Excellent weather resistance
- Easy to use, highly reliable
- Bolted mounting or SS strap mounting options

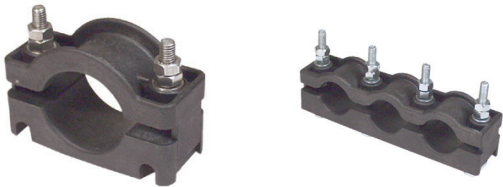
Technical specification	
Mechanical load	3.5KN
Cable size	8 to 20mm diameter
Material	UV Resistant plastic & elastomer
Ambient temp range	0 to 75 deg C



Solar cable support clamp

- Excellent weather resistance
- Easy to use, highly reliable
- Bolted mounting or SS strap mounting options

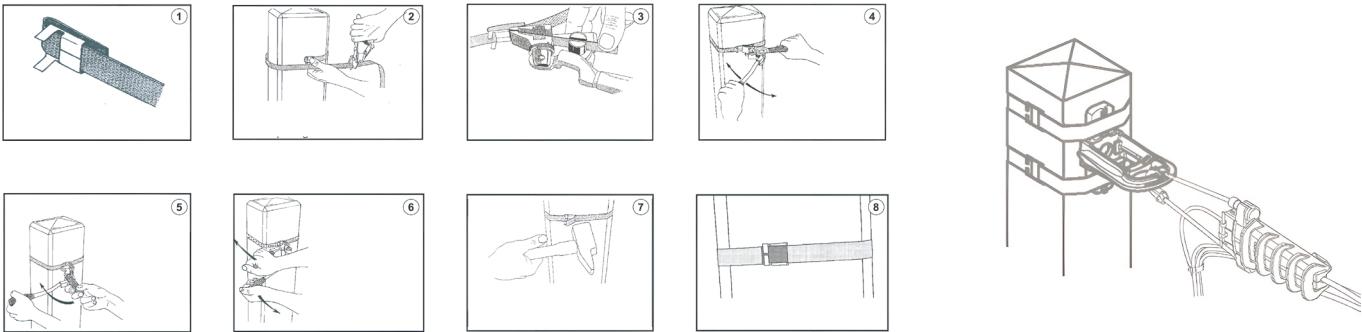
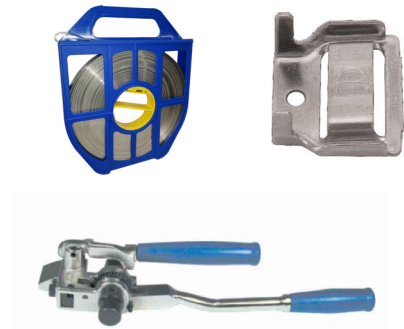
Technical specification	
Mechanical load	3.5KN
Cable size	20 to 130mm diameter
Material	UV Resistant plastic & elastomer
Ambient temp range	-40 to 130 deg C



SS strap & buckle

- For excellent weather resistance & strength
- Easy to install, versatile

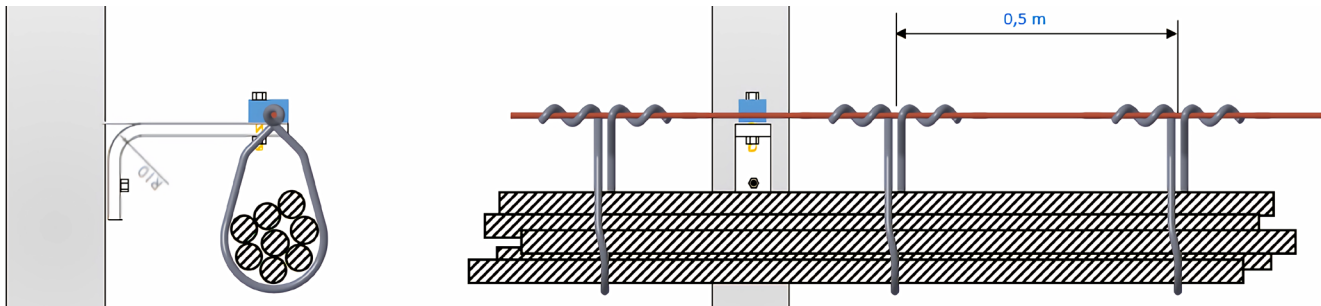
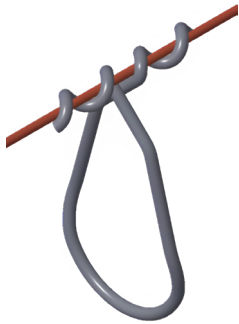
Technical specification	
Mechanical load	7KN/loop
Material	Stainless steel
Ambient temp range	0 to 75 deg C



Solar cable catenary tie

- For PVC catenary tie
- Easy to use
- Cost effective
- Large capacity

Technical specification	
Tested as per	UV resistant PVC
Mechanical load	2KN
Cable size	0.5m to 1m
Material	8x400sqmm or equivalent (up to 30 Ton/Km)
Ambient temp range	40 to 75 deg C



i Simplicity comes with great effectiveness

We've thought up and designed a solution to save you time and money, while guaranteeing optimal connectivity and productivity gains. Our harnesses are born of over 65 years' experience in IPC connection, giving you the same dielectric properties and guarantees.

100%
custom made according
to your project specs

IPC connector
for optimized cable
connection

Fuse holder
up to 60A

Solar connectors

Solar string cable
prewired in our factory

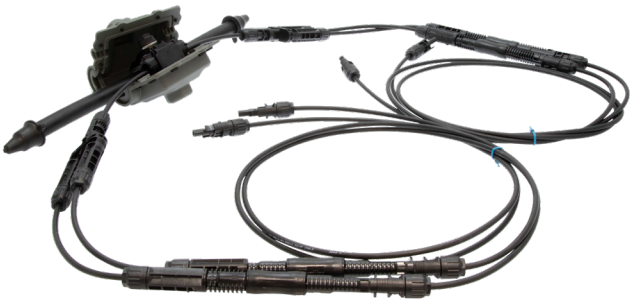
With a simple principle, you will connect up to 6 strings in an average time of 5 minutes only !

Simply tighten the IPC shear head bolt on the DC Bus cable, plug and play the MC4 connectors and that's it, as simple as that !

DC Solar Harnesses

Insultation piercing connector (IPC) Harness

- Easy to instal and safe to use
- Tightening controlled by cutting head screw
- Replaceable fuse cartridge
- Good dielectric and creepage propertes



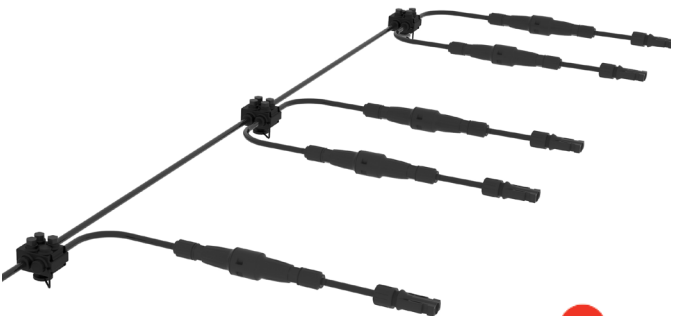
Also available with silicone cover option :
Double isolation and increased creepage
distance according to IEC 62 8 52 and
UL 67.03

Technical specification	
Dielectric test	6.5 kV – 300mm / 1 min under water
Operation temperature	- 40°C to +85 ° C
Degree of protection	IP 67
Configuration	DC Bus cable 50-500m ² Tap 4 - 16mm ²
System	1500 Vdc
Current Rating	Max 65 A or 260 A (4x65 A)
Fuse Cartridge	Ferrule type gPV Ø10 x 85
MC4 connecto	According to PV panel
Standards	IEC and UL

First Solar Harness

- Optimised for First Solar
- Customised for each project
- Specially designed to optimise First solar PV module production
- Easy plug-and-play installation
- Maximum reliability with harness manufactured and quality controlled at factory.
- No overmolding of cable allowing easy maintenance.
- IPC and Branch connector based system.

Technical specification	
Dielectric test	6.5 kV – 300mm / 1 min under water
Operation temperature	- 40 ° C to +90°C
Degree of protection	IP 68
System rating	1500 Vdc
Current Rating	up to 70 A
Fuse Cartridge	Ferrule type gPV Ø10 x 85
Standards	IEC and UL
MC4 connecto	According to PV panel
Standards	IEC and UL



Enclosures

DC Isolation box

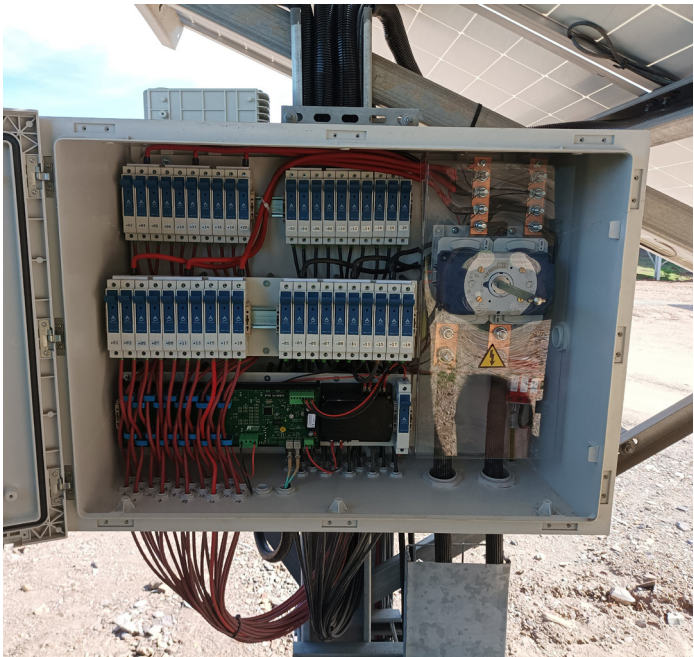
- High resistance to heat, fire, and abnormal heat
- High dielectric strength
- Light weight
- Door preservation system
- Configurable according to project specs.

Technical specification	
Mechanical shock resistance	IK10
Protection degree	IP66 C
Operation temperature	- 40°C to +105°C
Switch	Up to 600 A 2P or 4P
Surger arrester	Type II or type I+II
System rating	1500 Vdc A
Fire extinguisher	Up to 960 °C
Resistant	chemical and atmospheric agents and to UV rays
Standards	IEC and UL



String combiner box

- Strong mechanical shock resistance – IK10
- IP54 or IP66 protection degree
- High resistance to heat, fire and abnormal heat
- High dielectric strength
- Light weight
- Fused inputs according on project requirement
- 2 pole pad lockable load break switches
- 2 pole surge arresters
- 1500 VDC cabling
- Monitoring in option



- Customizable according to project requirements
- Watertightness
- Strong mechanical resistance
- UV and corrosion resistance

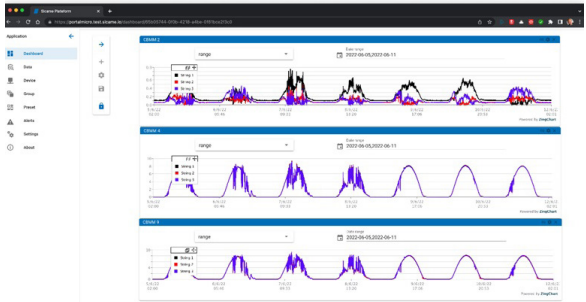
Monitoring systems

Enhance your productivity

String monitoring module - SMM30

- Smart non-intrusive to assess string activity and fault detection.
- Easy to install, no specific tooling. Retrofit compatible.
- Outdoor, maintenance free with integrated solar-powered.
- Wireless standardized communication protocol
- Fully insulated from the primary DC circuits.

Technical specification	
Number of monitored strings	2 or 3 channels / Max 32 A per channel
Operation temperature	-40°C to +85°C
Degree of protection	IP 55
Communication	Bluetooth 5.0 (Max. distance 150 m)



DCIB monitoring module - DCIBMM

- Voltage and temperature measurement
- Switch and surge arrester status monitoring
- Wireless standardized communication protocol

Technical specification	
Power supply	from 12 to 24 V DC or from 12 to 24 V AC
Operation temperature	- 40°C to +85°C
Power consumption	< 3W
Communication	Modbus over wired RS485 bus or RF Mesh network



Combiner box monitoring module - CBMM

- Voltage and temperature measurement, switch and surge arrester status monitoring
- Up to 24 DC inputs
- Current sensor from 20-45A



- Smart sensors to assess combiner box activity and fault detection
- Easy to install, no specific tooling
- Wireless standardized communication protocol
- Alert configuration & reporting
- Retrofit compatible



02

Rooftop

DC/AC protection box

- Ease of installation and complete solution (cabinet, protections and solar connectors included). Hang up, connect and go.
- Good quality internal components and cabinet with our glass reinforced polyester material that gives us robustness, durability (outdoors, sun rays, aggressive environments,...).
- Same type of cabinet for indoor use (garages, common areas,...) and outdoor (rooftops, terraces, common areas,...).
- Same type of cabinet for domestic/Industrial use.
- It can incorporate a lock device. It is important to emphasize that they are panels that work at 1000V continuously and should be well protected from possible manipulation. If these panels are installed in garages or transit areas, it is important that they are well closed so that children or unqualified personnel do not handle them.
- An installation and identification manual for strings included
- For large projects we can customize the cabinets, either with aesthetic or equipment customizations.

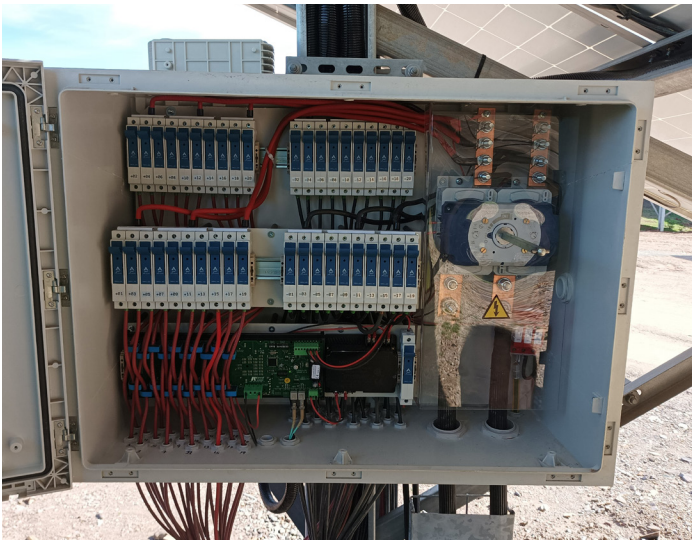


Enclosure type	Tension CC	Strings	Caracteristic	Fusibles tension	Protection AC	Reference
CC	1000 Vdc	1	Surge arrester + fuses	16A	-	AC62111
		2				AC62112
		3				AC62113
		4				AC62114
		2	Surge arrester + switch + fuses	25A	-	AC62002
		4				AC62004
		5				AC62005
		8				AC62008
		2	Surge arrester + switch com. + fuses	16A	-	AC62131
		3				AC62132
		4				AC62133
		5				AC62134
CC/AC	1000 Vdc	1	Surge arrester + fuses	16A	Circuit breaker 32A	AC62121
		2			Differential switch 30mA	AC62122
		3				AC62123
		4				AC62124
		1	Surge arrester + switch + fuses	16A	Circuit breaker 32A	AC62125
		2			Differential switch 30mA	AC62126
		3				AC62127
		4				AC62128

String combiner box

- Strong mechanical shock resistance – IK10
- IP54 or IP66 protection degree
- High resistance to heat, fire and abnormal heat
- High dielectric strength
- Light weight
- Fused inputs according on project requirement
- 2 pole pad lockable load break switches
- 2 pole surge arresters
- 1500 VDC cabling
- Monitoring in option

- Customizable according to project requirements
- Watertightness
- Strong mechanical resistance
- UV and corrosion resistance



03

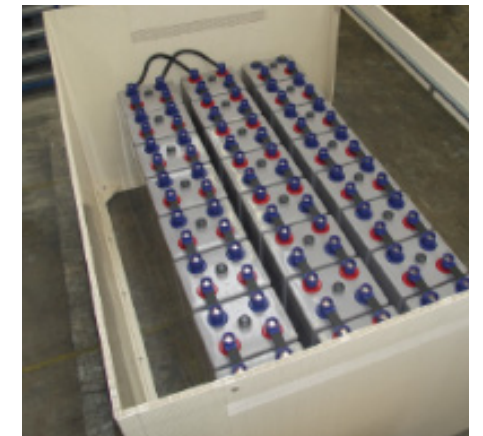
Off-Grid

Protection of batteries

Batt'box

- Modular construction process
- Thermoplastic double skin profiles UL 94 V0
- High protection against ageing and corrosion free.
- Protection of batteries on off-grid solar site
- No restriction on the number of elements, its depends on the configuration of battery rack
- Outdoor use
- Covers the battery that is placed directly on concrete slab
- Top and bottom ventilation for hydrogen escape due to battery charge/discharge
- Openable front back door
- Cable glands for incoming and outgoing of cables
- Delivered as a kit (assembly instructions are supplied).
- Acid resistant

Technical specification	
Mechanical shock	IK10
Protection degree	IP43 C
Operation temperature	- 40°C to +65°C
Fire extinguisher	Up to 960°C
Resistant	chemical and atmospheric agents and to UV rays
Color	grey (ivory upon request)



Shelters

Sol'R cont

- Standard or Custom design solutions.
- Seifel 60mm thick thermal insulation into one 10' / 20' / 40' / 40' HC shipping container
- Ventilation: natural, mechanical, electrical fan, air conditionner
- Sizing of ventilation defined by Seifel's engineering department
- Integration of equipment (inserts for battery chargers, inverter), battery rack, battery
- Separation wall (between battery, generator)
- Container with 2 double doors also possible
- Internal / external lighting
- Cable trays
- Earthing
- Pre-cabling possible
- Direct shipment from Seifel to seaport
- Equipment available: Air cooling, HVAC, Cable trays, Pre-wiring, Batteries wiring, Inverters wiring, Fire detection and extinguishing, Earth wiring and connection

Technical specification	
Mechanical shock resiatnce	IK10
Protection degree	IP44 C
Operation temperature	- 40°C to +105°C
Fire extinguisher	Up to 960°C
Resistant	chemical and atmospheric agents and to UV rays





04

Our complementary offer

Grounding system	24
Safety equipment	30
Voltage detection	34
Emergency safety and kit prevention	36
Lugs	38
Tools	40
Services	41
HV & MV networks accessories	42
Network & wildlife protection	46

Grounding system

Earthing rods & grids

AMI - Self-extending stainless steel rods

- For the evacuation of fault currents to earth.
- Self-extending rods: the lower end of each rod has a point intended both for driving in and connecting; the upper end is pierced, receiving, without any sleeve, the point of the previous rod.
- Material: stainless steel EN 1.4028 (Z30 C13)
- Resistance: 90/100 daN/mm²
- Driving pins: CH-LMZ (small model), CH-MZ (large model), CH-MP (with handle)
- Connection terminal: B-CHROM model

Ref.	Capacity	Lenght (mm)	Height (mm)	Depth (mm)	Diameter (mm)	Weight (mm)	Quantity (kit)
AMI-10	-	1 000	-	-	16	1.5	5
AMI-15	-	1 500	-	-	16	2.25	5
B-CHROM	-	30	35	20	16	0.07	1

A3MC - Self-extending copper-steel rods

- For the evacuation of fault currents to earth.
- Self-extending rods: the lower end of each rod has a point intended both for driving in and connecting; the upper end is pierced, receiving, without any sleeve, the point of the previous rod.
- Steel with copper electroplating: minimum thickness 350 µm
- Resistance: 70 daN/mm²
- Driving pins: CH-MZ, CH-LMZ and CH-MP
- Connection terminals: C2C-95, TO-2-19 et TO-3-16/19

Ref.	Lenght (mm)	Diameter (mm)	Weight (mm)	Quantity (kit)
A3MC-10Z	1 000	17.3	1.800	1
A3MC-15Z	1 500	17.3	2.750	5

TFT - Connector heads for earthing rod

- Head/rod connection obtained by conical press-fitting with force.
- Head/cable connection made by striking a stainless steel peg located in the upper part of the head. This strike guarantees the connection head/posts and head/cable.
- For earthing rods: Ø 17,3 mm copper-steel and Ø 16 mm stainless-steel.
- Model TFTI-16/17: the head/rod connection fits inside the earthing rod.

Ref.	Use	Diameter (mm)	Capacity	Height (mm)	Weight (mm)	Quantity (kit)
TFT-16/17	Right-angled running through copper cable 25-29 mm ²	25	Cu 25 / 29 mm ²	75	0.150	5
TFT-16/17-1	Running through copper cable 38-50 mm ²	25	Cu 25 / 29 mm ²	75	0.200	5
TFTI-16/17	Right-angled running through copper cable 25-29 mm ²	25	Cu 25 / 29 mm ²	75	0.080	5
TFTT-16/17	Tangential running through copper cable 25-29 mm ²	25	Cu 25 / 29 mm ²	75	0.220	5

GTC - Expanded copper earthing grids

- Ensures the proper flow of lightning currents or 50 Hz fault currents to earth.
- Prevents the formation of harmful cavities on the contact surface.
- Made of copper wires and cable.
- A longitudinal link made of galvanized steel wire Ø 1 mm holds the ellipses in place. It ensures the rigidity of the grids.

Ref.	Use	Lenght (mm)	Width (mm)	Weight (mm)
GTC-6	2 m long connecting cable	600	450	1.400
GTC-14	2 m long connecting cable	1400	460	1.800
GTC-25/2	0,5 m long connecting cable (x2)	2500	400	2.500
GTC-25/4	4 m long connecting cable	2500	460	3.200
GTC-25	2 m long connecting cable	2500	460	2.750
GTC-25/1	29 mm ² sleeve	2500	460	2.800

TR-115 - Improvement of earthing systems

- Material of very high conductivity which considerably improves the efficiency of earth circuits.
- Spread around the earth conductors at the bottom of the trench, it allows to locally reduce earth resistance and impedance.
- Can be used dry or mixed with water.
- Solubility in water: not very important.
- Specific gravity(H2O = 1): 0.9
- Melting temperature: 3500°C
- Appearance : grey powder
- Composition: aluminum silicate hydroxide, carbon, hydraulic binders, quartz crystals, dust fixing oil & sulphur.

Ref.	Height (mm)	Width (mm)	Depth (mm)	Weight (kg)	Quantity (kit)
TR-115	500	400	300	1.400	1

SE-S - Cable clamps for copper line

- On request, cable clamps type SE can be fitted with bronze screws. In this case, please suffix the PN with the letter "B".

Ref.	Conductor			A (mm)	C (mm)	B (mm)	D Ø	Packaging
	Section (mm ²)	Section (mm ²)	Section (mm ²)					
SE2-50S	50	50	2x(6-50)	29	20	57	6	10
SE2-120S	120	75	2x(10-95)	43	28	75	8	10

BCY - Connection terminal for cables and earthing rod

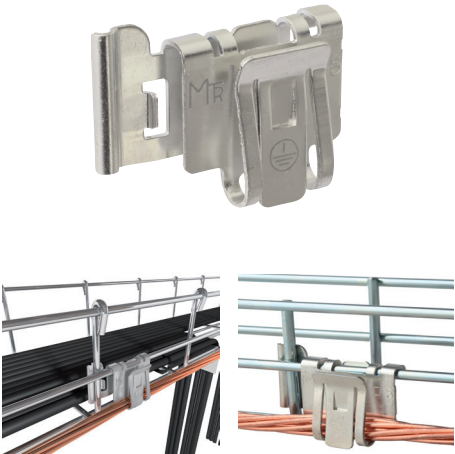
- Allows to do both electrical and mechanical connections between the earth cable and the rod.

Ref.	Mounting	Capacity	Height (mm)	Weight (mm)	Depth (mm)	Weight (kg)	Quantity (kit)
BCY	Ø. 14.3 mm max	38 mm ²	250	190	20	0.346	5

F Clip - Bonding clip for basket cable trays

- Material: Steel
- Plating: Tin
- Equipotential bonding for uninsulated earthing conductor from 6 to 35 mm²
- No tools are required
- For basket cable trays diameter 3-5mm²
- Patented
- Fixing time approximately 5 times faster than traditional methods

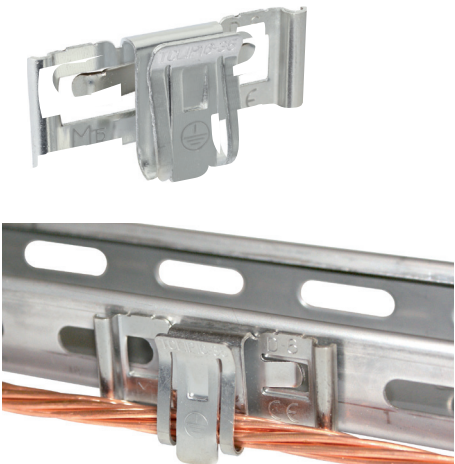
Ref.	Conductor	Packaging
	Section (mm²)	
FCLIP 6-10	6 - 10	40
FCLIP 16-35	16 - 35	40



T Clip - Bonding clip for basket cable sheet metals

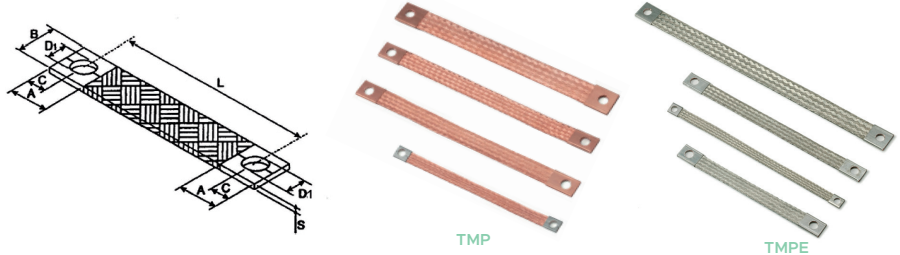
- Material: Steel.
- Plating: Tin.
- Equipotential bonding for uninsulated earthing conductor from 6 to 35 mm².
- No tools are required.

Ref.	Conductor	Packaging
	Section (mm²)	
TCLIP 6-10	6 - 10	30
TCLIP 16-35	16 - 35	30



TMP-TMPE

- Cu ETP copper thread.
- Crimped copper flat wire ends.
- Available in unplated or tin-plated copper ("E" references)



Ref.	Section (mm)	Ø Fils	L (mm)	A (mm)	B (mm)	C (mm)	S (mm)	D1 (mm)
TMP6-6-100	6	0,10	100	13	11	5	2	7
TMP6-6-150	6	0,10	150	13	11	5	2	7
TMP10-8-150	10	0,20	150	23	17	10	2	9
TMP10-8-200	10	0,20	200	23	17	10	2	9
TMP10-8-250	10	0,20	250	23	17	10	2	9
TMP16-8-150	16	0,20	150	23	17	10	2	9
TMP16-8-200	16	0,20	200	23	17	10	2	9
TMP16-8-250	16	0,20	250	23	17	10	2	9
TMP16-8-300	16	0,20	300	23	17	10	2	9
TMP25-8-150	25	0,20	150	23	23	10	3	9
TMP25-8-200	25	0,20	200	23	23	10	3	9
TMP25-8-250	25	0,20	250	23	23	10	3	9
TMP25-8-300	25	0,20	300	23	23	10	3	9

Solfil

- Use of existing earthing holes Ø 3.5 mm.
- No. 2 screwdriver or portable electric screwdriver with PZ2 bit.
- Tightening torque at 3N/m max.
- Presence of flats which provide an anti-rotation function when screwing.

Ref.	Item Code	Packaging
SFP41916	7341913	100 pieces+ 1 screw bit



Solfil +

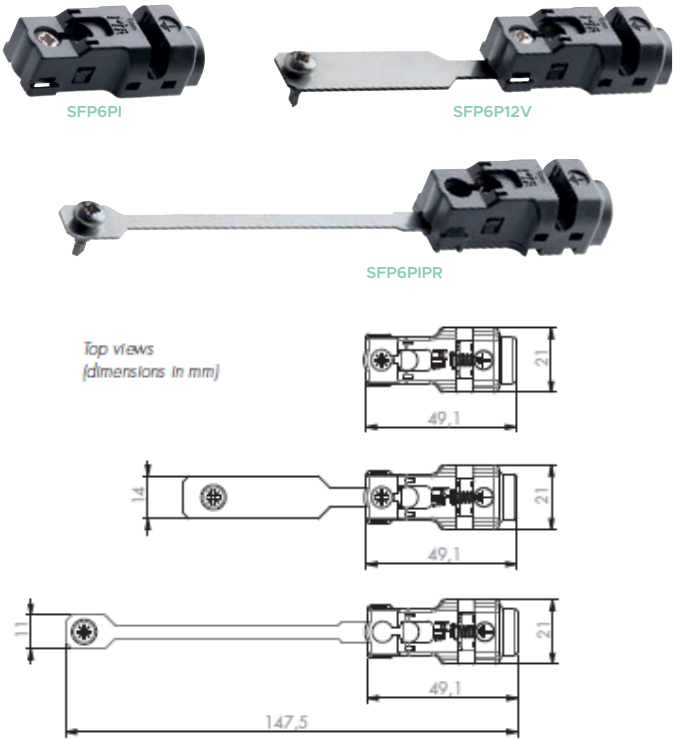
- Patented insulation displacement connector
- The range of connectors offer a convenient solution to most of installation requirements without the need for prior preparation of the equipotential bonding cable.
- A simple powered screwdriver is the only tool required.
- The range meets the requirements of UL 1703 and UTE C15-712 standards.
- Thickness of the chassis for fixing/drilling: 1.2 to 2 mm in aluminium only.
- Recommended cable:

6mm²*	Type	Colour	Quality	Nbr of strands
	insulated H07	Stainless steel	100	7

* according to the requirements of UTE C 15-712 standard



Ref.	Item Code	Materiel	Packging
SFP6PI	7341960	Stainless steel	100
SFP6PI2V	7341966	Stainless steel	50
SFP6PIPR	7341971	Stainless steel	50



MX-430-M : resistance and resistivity measurement tool before installation or electric

- Measures earthing resistances (3 posts method).
- Measures soil resistivities (4 posts method).
- Allows to know the parasitic tensions of the soils.
- The equipment is suitable for fast and easy measurement of the grounding resistance in home, industrial buildings, substations ...

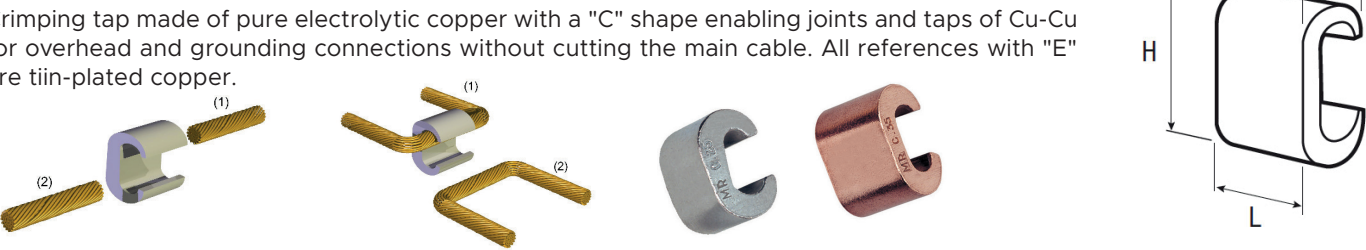


MX-433-T : Earth resistance tester

- Measurement kit for MX-430-M.
- 1 storage bag,
- 4 earth rods copper plated steel,
- 1 x 5 meter black cable,
- 1 x 40 meter red cable,
- 2 x 20 meter cable (1 blue and 1 green),
- 1 x 5 meter green cable to connect to the grounding system,
- 1 hammer,
- 1 reel tape meter 50 m.




Compression tap-off copper connectors type C

- Crimping tap made of pure electrolytic copper with a "C" shape enabling joints and taps of Cu-Cu for overhead and grounding connections without cutting the main cable. All references with "E" are tiin-plated copper.
- 

Ref.	Main conductor (mm²)		Derivation conductor (mm²)		L	H	B
	min	max	min	max			
YC10	2,5	6	1,5	6	8	9,8	6,4
YC8	10	10	1,5	10	12,7	12,6	8,4
C25PM	25	25	10	16	19	21	11,9
C16	10	16	2 x 1,5	16	17	19	11,5
YC4C6	16	25	2,5	16	17,7	19,3	11,9
YC4	16	25	16	25	17,7	21	11,9
C25	25	29,3	10	29,3	20	24,3	15
C35	30	35	25	35	20	26,5	15
YC2C2	35	40	35	40	21,2	26,5	15,6
C50	50	50	16	50	20	26,5	17,2
YC26C2	50	70	10	35	28	33,1	20,4
YC26	50	70	40	70	28	34,1	21
C95-35	95	100	4	40	30	41	26
C75	70	95	35	70	30	41	26
YC28	95	100	95	100	29	39,6	25,1
YC29	100	125	25	125	30	44	27
YC31C28	150	185	25	100	27,2	44,1	27,2
YC240C120	150	240	95	120	22,4	68	34
C150	150	150	75	150	30	45	28
C185	150	185	60	150	35	54	33
YC120C070	95	120	10	70	18,5	50	23,5
YC120C	95	120	95	120	21,8	52,5	24

Exothermic welding

- Unique process for the permanent connection of grounding conductors,
 - Molecular bond for permanent connection,
 - High resistance to corrosion,
 - Current carrying capacity of connections is equal or greater than the conductor,
 - Easy visual inspection.
- 

Ref.	Characteristics	Ref. to order separately
Electronic ignitor	Safety light and warning sound Ignition start when pressing 2 keys simultaneously Minimum of 5000 welds Delivered with 1.8 m lead and Type C charger	CEW-EI
Handle clamps	Used to close the mold Unique handle clamp for all configurations Gloveasy: user-friendly to operate with gloves Ergonomic Heat resistance	CEW-HC
Welding powder	Self contained welding material with copper oxide and aluminium Safer transportation and storage Available in 65 g, 90 g, 115 g, 150 g, 200 g ie : CEW-WP150 (welding powder 150 g)	CEW-WPXXX
Graphic mold	Delivered with metal plate indicating the quantity of powder required (from 65 to 200 g) Part number to be defined according to customer needs ie : CEW-050T050 (T connection for 2 cables of 50 mm2)	CE-WXXXXXXX



Connection type	Illustration	Primary conductor (mm²)	Secondary conductor (mm²)	Mold reference	Welding powder reference
End to End connection		25	25	CEW-025E025	CEW-WP65
		35	35	CEW-035E035	CEW-WP65
		50	50	CEW-050E050	CEW-WP65
		70	70	CEW-070E070	CEW-WP65
		95	95	CEW-095E095	CEW-WP90
		120	120	CEW-120E120	CEW-WP115
T connection		25	25	CEW-025T025	CEW-WP65
		35	25	CEW-035T025	CEW-WP65
		35	35	CEW-035T035	CEW-WP65
		50	35	CEW-050T035	CEW-WP65
		50	50	CEW-050T050	CEW-WP90
		70	50	CEW-070T050	CEW-WP90
		70	70	CEW-070T070	CEW-WP90
		95	70	CEW-095T070	CEW-WP90
		95	95	CEW-095T095	CEW-WP115
		120	95	CEW-120T095	CEW-WP150
Cross connection		120	120	CEW-120T120	CEW-WP150
		25	25	CEW-025X025	CEW-WP65
		35	25	CEW-035X025	CEW-WP65
		35	35	CEW-035X035	CEW-WP65
		50	35	CEW-050X035	CEW-WP90
		50	50	CEW-050X050	CEW-WP90
		70	50	CEW-070X050	CEW-WP115
		70	70	CEW-070X070	CEW-WP115
		95	70	CEW-095X070	CEW-WP150
		95	95	CEW-095X095	CEW-WP150
Parallel connection		120	95	CEW-120X095	CEW-WP200
		120	120	CEW-120X120	CEW-WP200
		25	25	CEW-025T025	CEW-WP65
		35	25	CEW-035T025	CEW-WP65
		35	35	CEW-035T035	CEW-WP65
		50	35	CEW-050T035	CEW-WP90
		50	50	CEW-050T050	CEW-WP90
		70	50	CEW-070T050	CEW-WP115
		70	70	CEW-070T070	CEW-WP115
		95	70	CEW-095T070	CEW-WP150
End to End connection for tape conductors		25x3 mm	25x3 mm	CEW-253E253	CEW-WP90
		30x2 mm	30x2 mm	CEW-253E253	CEW-WP65
T connection for tape conductors		25x3 mm	25x3 mm	CEW-253T253	CEW-WP90
		30x2 mm	30x2 mm	CEW-302T302	CEW-WP90
Cross connection for tape conductors		25x3 mm	25x3 mm	CEW-253X253	CEW-WP150
		30x2 mm	30x2 mm	CEW-302X302	CEW-WP115

Safety equipment

PPE

CAT'ARC multi-risk switching jacket to protect against an electric arc

- Especially designed to be worn on top of the usual clothing, for short operations (eg. power-breaking operations, live working on batteries).
- Offers the perfect protection for Live Working.
- Complies with IEC 61482-2 APC 1 & ATPV 12 cal/cm²
- Adjustable hood for a better protection of the head and the neck in case of higher risk, to be worn with a visor or a helmet.
- A velcro® central fastening along the entire lenght: easy to open and close.
- A back lenght of 121 cm to ensure an efficient protection of the operator down to the knees.
- Pictograms of the standards clearly visible on the left sleeve.

Ref.	Size	ATPV (cal/c)	Box test	Color
AFG-2300-S	S	12	APC 1	grey & black
AFG-2300-L	L	12	APC 1	grey & black
AFG-2300-2XL	2XL	12	APC 1	grey & black
AFG-2300-4XL	4XL	12	APC 1	grey & black



MO-185 - Insulated Arc Flash safety helmet with integrated face shield for electrician, APC 1

- Head protection : mechanical protection and insulating protection in case of contact with live parts.
- Face protection against heat hazard of an arc flash APC 1.
- Insulated shell until 20 kV (ANSI).
- Complies with EN 397EN 50365 - 1000 V AC, Arc flash GS-ET-29 APC 1, EN 166/EN 170
- Arc flash face shield totally retractable inside the helmet. Height of the screen 18 cm.
- Anti-scratch and anti-fogging face shield.
- 4 points chinstrap around the ears with easy locking buckle.
- Adjustable head band.



Ref.	Composition	Size	Box test	Color
MO-185-BL	Helmet	52 - 64 cm	APC 1	white
MO-185-B	Helmet	52 - 64 cm	APC 1	blue
MO-185-J	Helmet	52 - 64 cm	APC 1	yellow
MO-185-R	Helmet	52 - 64 cm	APC 1	red
MO-185-BLM	Helmet with chincup	52 - 64 cm	APC 1	white
M-882677	Spare face shield	-	APC 1	white
M-881836	Spare headband	52 - 64 cm	APC 1	

MO-70 - Basic body fall arrester harness

- Fall arrester harness for work at height.
- Universal size adjustable by buckles.
- 2 attachment points: dorsal and sternal.
- 45 mm wide polyester straps

Ref.	Size
MO-70	S - XL



MO-71 - Pro single fall protection harness with 2 anchor points

- Fall arrest harness for work at height.
- Individual protective equipment.
- 2 attachment points: dorsal and sternal.
- Equipped with a back-rest.

Ref.	Size
MO-71	S - XL



MV-138-.. - Insulating overboots class 1 (7 500 V AC), 10 kV tested

- The overboots offer an electric insulation protecting the linesman against the risks of step voltage on the ground or a current circulating between the feet and the ground.
- Ideal for temporary and frequent use.
- Fit perfectly over safety shoes allowing live working up to 7.5 kV AC with every boot tested to 10 kV AC.
- Rubber sole promoting a superior slip resistance.
- Class 1: 7 500 V AC, 11 250 V DC according to EN 50321-1:2018
- Meets the requirements of ASTM 1117 (20kV).
- Colour: highly visible yellow.
- Complies with EN 50321-1:2018, ASTM 1117, EN ISO 20347.
- Material : special compound formulation to ensure high voltage dielectric resistance.
- Slip resistance performance (SRC) compliant with SATRA TM144 standard.
- Sole pattern design avoids clogging and catching on rungs when climbing ladders
- Greater cut resistance than conventional soles.
- Fuel and oil resistant sole.
- Hot contact resistant sole to 300°C for 60 seconds to EN ISO 20347-HRO.
- One piece injection moulded part, without any seams to ensure 100% waterproof performance.
- Quick and easy to fix and remove; kick-off lug for hands free removal.
- Comfortable, durable and lightweight.



Ref.	Size	Class	Operating voltage AC	Operating voltage DC
MV-138-M	M (39-42)	1	7 500V	11 250V
MV-138-L	L (43-45)	1	7 500V	11 250V
MV-138-XL	XL (46-49)	1	7 500V	11 250V

CG-10-. - Electrical insulating rubber electrical gloves class 0 - 1 000 V AC

- Wellfit finish: soft, supple, durable and ergonomic with high flexibility to ease the work.
- Convenient to any hand shape.
- Gloves without extra-mechanical protection; to be worn with leather over-gloves CG-981 to ensure full mechanical protection.
- Electrical insulating gloves, class 0 (1 000 V AC, 1 500 V DC). Length: 360 mm.
- Cut edge.
- Complies with IEC 60903:2014.
- Material: natural color latex ensuring highest dielectric features.
- Traceability through flashcode on color-coded label. The color is according to the class.
- Category: RC (Acid, Ozone, Cold, Oil resistance).



Ref.	Class	Operating voltage AC	Operating voltage DC	Lenght (mm)	Category
CG-10-A	0	1 000V	1 500V	360	RC
CG-10-B	0	1 000V	1 500V	360	RC
CG-10-C	0	1 000V	1 500V	360	RC
CG-10-D	0	1 000V	1 500V	360	RC

CG-984-.. - Short leather overgloves for low voltage insulating gloves with Arc Flash protection 12 cal/cm²

- Short overgloves (25 cm) ensure mechanical protection for insulating gloves for class 00 & 0, CG-00-XX-R28, CG-0-XX-R28, CG-05 and CG-10.
- They protection against hazards up to 12 cal/cm² ATPV (according to ASTM F 2675)
- They are resistant to flame and contact heat of 100°C for 10 s according to EN 407.
- Velcro at the cuff adjusts the tightness of the glove to the user's hand.
- Silicone goat grain leather, Kevlar® thread stitching.
- Wide protective cuff in cowhide crust (10 cm long).
- American assembly, nested thumb.
- Adjustable width by fireproof Velcro strap mounted on leather.
- Complies with EN 388:2016 / EN 420 +A1:5 / EN 407:2004.
- Grey color.
- Arc Flash Protection: ASTM F 2675 - ATPV 12 cal/cm².
- Complies with standard EN 388: 2016 2122X
- Complies with standard EN 407: 2004 412X4X
- Level of dexterity according to EN 420 A1 : 5 (excellent grip)
- Packaging: 1 pair in a plastic bag with an instruction for use.



Ref.	Size	Lenght (mm)	Weight (kg)
CG-984-07	7	250	0,2
CG-984-08	8	250	0,2
CG-984-09	9	250	0,2
CG-984-10	10	250	0,2
CG-984-11	11	250	0,2
CG-984-12	12	250	0,2

CGM-00-.- Insulating gloves with mechanical protection and Arc Flash 12 cal/cm², class 00 - 500 V AC, length: 360 mm

- Wellfit finish: soft, supple, durable and ergonomic with high flexibility to ease the work.
- Convenient to any hand shape.
- Resistant: latex with reinforced mechanical protection against tearing. used without over-gloves.
- Protection against the thermal hazards of an electric arc 12 cal/cm². 61482-1-2 APC 2 (box test 7 kA).
- Complies with IEC 60903:2014 IEC 61482-1-2: APC Class 2.
- Electrical insulating gloves, class 00 (500 V AC, 750 V DC).
- Cut edges.
- Material: bicolor natural latex. (exterior: orange, interior: natural).
- Traceability through flashcode on color-coded label. The color is according to the class.
- Category: RC (Acid, Ozone, Cold, Oil resistance).



Ref.	Length (mm)	Class	ATP (cal/cm²)	Box test	Category
CGM-00	360	00	12	7kA/30cm	RC

MP-5.-2 - Insulating ladders 2 sections with rope and pulley

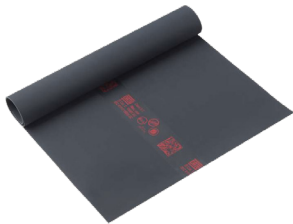
- Insulating ladders 2 sliding sections with rope and pulley
- For work on electrical installations with a maximum voltage of 1000 V AC - 1500 V DC
- Complies with NF EN 50528. Tested 30 kV / 1 minute
- Max. working load : 150 daN
- Composite insulating slides of rectangular section and orange colour
- Non-slip grooved aluminium rungs. Spacing between rungs : 280 mm
- Extension system by rope and pulley centred on the access side with double safety aluminium locking device
- Interchangeable upright end pads
- Equipped with 2 front wheels diameter 100 mm
- Equipped with a pole leaning device



Ref.	Extended length (mm)	Foldedlength (mm)	Operating voltage AC	Operating voltage DC	Weight (kg)
MP - 506/2	6 050	3 530	1 000 V	1 500 V	23
MP - 508/2	8 300	4 660	1 000 V	1 500 V	35,4
MP - 509/2	9 140	5 220	1 000 V	1 500 V	39
MP - 510/2	10 260	5 780	1 000 V	1 500 V	43

MP-...O_100 - Insulating mat class 0 – width 1 m

- Insulating mat for live and dead work. Maximum operating voltage: 1000 V AC - 1500 V DC.
- Used to cover the floor for the electrical protection of operators in electrical installations.
- Protect the workers from the ground potential.
- Must be adapted to the nominal voltage of the network supplying the installation on which it is used.
- In accordance with IEC 61111: 2009 standard and to specific properties of the “C” Category (extremely low temperature folding test at – 40°C).
- RoHS2 compliant. REACH compliant (SVHC free).
- Material : elastomere without halogen.
- Unit test in production.
- D bar code (Datamatrix) on marking with direct link to user guide and technical sheet.
- Storage temperature: +10°C to +21°C.
- Operating temperature: -40°C to +55°C.



Ref.	Class	Operating voltage AC	Operating voltage DC	Width (mm)	Length (mm)	Thickness (mm)
MP - 11/11	0	1 000 V	1 500 V	1 000	1 000	2,2
MP - 11/21	0	1 000 V	1 500 V	1 000	1 200	2,2
MP - 100/02-5	0	1 000 V	1 500 V	1 000	5 000	2,2
MP - 100/02-10	0	1 000 V	1 500 V	1 000	10 000	2,2

Voltage detection

MS-927-.. DETEX low voltage voltage detector - Expert

- Checking for absence of voltage. 3 thresholds: AC: 50 V, 230 V, 400 V; DC: 48V, 127V, 300V
- Voltage ranges: 50-1000 V AC; 48-1500 V DC.
- Sound and light continuity check of a de-energized circuit.
- Unipolar phase identification.
- Search for direct current polarities.
- Self-test (control).
- Resistive voltage detector made up of 3 parts:
 - Insulated control box with its integrated test tip;
 - Insulated secondary box with integrated test tip;
 - Double-insulated connecting cord with a length of 1.4 m.
- IP2X test tips:
 - Retractable sheaths over a length of between 8 and 10 mm per pressure, in accordance with NF C18-510;
 - Retractable sheaths to a length of 4 mm by trigger action;
- Contact electrodes with 23 mm elastic cage (conductive over 19 mm), Ø 4 mm.
- Continuity check of a de-energized circuit for an impedance < 100 Ω.
- Flashlight.
- Insulation category: CAT IV 1,000 V AC.
- Class II double insulation.
- Protection index: IP65.
- Degree of shock resistance: IK08.
- Temperatures: - Operation: -15°C to +45°C; Storage: -25°C to +55°C.
- Power supply: 2 AA batteries (type LR06 Alkaline or L91 Lithium) supplied.
- Comes with a soft carrying case with belt loop and carabiner.
- Contact antennas for DDT BT MS-927. For installation and curb enclosures. Ref. MS-8023.
- Contact antennas for DDT BT MS-927, for overhead lines. Ref. MS-8024.
- 2 adapters to attach to the IP2X test probes to reach the test plugs test Ø 4 mm, WAGO type. Ref. DX-04



MS-8023

DX-04 - 2 test plug adapters

- 2 test plug adapters to be fixed on low voltage detector MS-917-PG, MS-918-PG, MS-920-PG enabling to target test plugs Ø 4 mm.
- Enable to test rail-mounted terminal blocks, WAGO type.



MS-917-PG - Low Voltage detector DETEX

- Check the absence of voltage.
- Checks voltage levels from 12 to 900 V AC, 1 000 V DC.
- Sound and light continuity for a non-live circuit (threshold of 200 Ω).
- Search for the polarities of a DC circuit.
- Unipolar phase identification.
- For indoor/outdoor use.
- Fitted with IP2X test lead points with retractable trigger tips.
- Total safety with hazardous voltage indicator light (> 50 V).
- Protection level: IP65/IK06.
- Self test button to discern the verification of the good functioning and the continuity function.
- Completely modular and adjustable to eclipse sockets.
- LED display.
- Supplied with soft carrying case and belt loop Ref. M-87285.
- 2 test plug adapters to be fixed on IP2X test lead points with retractable trigger tips enabling to target test plugs Ø 4 mm. Ref. DX-04
- Holder, Ref. M-952325.
- Contact probes for L.V. detectors for installation and sidewalk boxes. Ref. M-8013.
- Contact probes for L.V. detectors for flight path. Ref. M-8014.
- Hand stick & stick extension. Ref. M-951143.



Ref.	Frequency	Operating voltage AC	Operating voltage DC	Category	Weight (kg)	Length(mm)
MS-917-PG	50/60/400 Hz	12 - 900 V	12 - 1000 V	CAT III 1000 V CAT IV 600V	1 000	2,2

MX-702 - Digital Clamp Meter

- Digital clamp meter compact (3 ½ digit) with autorange for measuring DC and AC voltage, AC current, resistance, diode, continuity and temperature.
- AC current: 0,01 A – 1 000 A.
- AC voltage: 4 V – 750 V.
- DC voltage: 4 V – 1 000 V.
- Resistance : 400 Ω - 40 MΩ.
- Continuity: buzzer (>150 Ω).
- Cat III 600 V.
- Display: 3 3/4 digit LCD with a max. reading of 1999.
- Polarity: auto polarity indication.
- Automatic zeroing function.
- Jaw opening capability: about 50 mm.
- Battery: 3 x 1,5 V AAA batteries.
- Low battery indication.
- Operation temperature: -20°C / 1 000°C.
- Storage temperature: -30°C / 60°C.
- Supplied with a soft carrying case.
- 2 test probes with angled connector IP2X
- 1 thermometric probe



Ref.	Frequency	Dimensions (mm)	Weight (kg)	Category
MX-702	10 Hz - 10 MHz	243 x 87 x 44	0,374	III - 1 000 V

Emergency safety kit and prevention

CZ-54 - Life saving kit for substation - electrical shock

- Allows an intervention on victims in case of electrical shock.
- Immediately makes available to rescuers all the necessary rescue equipment.
- Kit delivered with a transparent closet to be fixed in the substation (wall mountings supplied).
- 1 insulated cable cutter CZ-60.
- 1 telescopic rescue stick extended lenght 1.65 m M-952160.
- 1 voltage detector with flexible contact antenna and equipped with a metal rescue hook (3 kV - 40 kV) M-952170.
- 1 pair of insulating gloves class 3 CG-3-10-NR (CZ-54 models), CG-4-10-NR (CZ-55 models)
- 1 pair of insulating boots MV-135-45 (CZ-54 & CZ-55), over boots class 3 MV-139-LZ-54-FM & CZ-55-FM)
- 1 insulating platform.
- 1 "First aid for electric shock victims" poster in english on the cabinet door.



Ref.	Weight (kg)	Dimensions (mm)
CZ-54	27	840 x 750 x 270

AL-260-...Safety padlock, insulated shackle

- For locking separating devices (e.g. circuit breakers) in order to prevent their operation.
- Available with keys alike, keys different (Z) or with a key number to be defined (00).
- Marking on both sides:
 - On one side: English text and standard symbol.
 - On the other side: area for marking the user's name and coordinates.
- Padlock delivered with 2 keys.



Ref.	Color	Key number	Shackle
AL-260-...EX	Red	Z (=random) / 111, 222, 333, 444, 555, 666, 777, 888, 999, 1111, 2222, 3333, 4444, 5555, 6666, 7777, 8888, 9999 / 00	6,2
AL-260_S...EX	Red	111	6,2

AT-7036 - Board of 4 stickers

- "Batterie hazard PPE Mandatory" without text for photovoltaic systems.

Ref.	Dimensions (mm)
AT-7036	110 x 42



AT-49/05 - Warning sticker "ELECTRIC SHOCK" for photovoltaic systems.

Ref.	Dimensions (mm)	Quantity
AT-49/05	50 x 50 x 50	30



PL-100 - Plug lockout small model

- Small electric or pneumatic plug condemner.
- Easy installation thanks to the two articulated parts.
- Locking by padlock. Made of polystyrene.
- Operating temperature up to 75 °C.
- Axis hole diameter: 13 mm.
- External dimensions: Length: 87 mm, width: 50 mm and height: 50 mm.
- Accepts up to 2 padlocks of 7 mm diameter.
- "DANGER" warning label and identification of the person in intervention.



Ref.	Color	Composition	Ø Hole (mm)	Dimension (mm)	Weight
MX-702	Red	Small model socket lock - For Ø 12 mm cable	0,374	85 x 75 x 50	0,078

MP-635/..-D- Insulating cap class 0

- To cover the stripped ends of LV cables.
- Protects live LV connectors.
- For all installations. (Indoor, overhead and underground).
- For use on electric and hybrid vehicles and machinery.
- Maximum operating voltage: 1,000 V AC - 1,500 V DC..
- Cross-shaped slotted ends for inserting and holding a cable, protruding part or connector.
- Complies with NF C18-425.
- Tested at 10 kV in accordance with IEC 60900:2018 5.5.3.
- Material: semi-rigid PVC.
- Standard packaging quantity (SPQ): 5 caps.



Ref.	Lenght	Use
MP-635/10-D	75	For cables with external diameter of 5 to 9 mm or cross-section of 6 to 25 mm²
MP-635/15-D	100	For cables with external diameter of 7 to 13 mm or cross-section of 10 to 50 mm²
MP-635/20-D	100	For cables with external diameter of 9 to 16 mm or cross-section of 25 to 95 mm²
MP-635/25-D	100	For cables with external diameter of 12 to 20 mm or cross-section of 50 to 150 mm²
MP-635/30-D	120	For cables with external diameter of 14 to 25 mm or cross-section of 70 to 240 mm²
MP-635/40-D	135	For cables with external diameter of 16 to 30 mm or cross-section of 30 to 300 mm²
MP-635/50-D	155	For cables with external diameter of 20 to 40 mm or cross-section of 150 to 600 mm²
MP-635/60-D	180	For cables with external diameter of 25 to 50 mm or cross-section of 240 to 1000 mm²

Lugs

Bimetallic terminals Y4A-A-C

- Al barrel and Cu palm friction welded.
- Filled with neutral contact grease and with plastic cap.
- Crimping with deep indent.



Section (mm²)	Stud	Part Number	Dimensions (mm)								
			I.D	O.D	Ø K	B	C	F	Ø G	T	L
16	M10	Y4A16A105C	5.5	16	10.5	20	48.0	41.5	12	4.5	83
25	M10	Y4A25A105C	6.5	16	10.5	20	48.0	41.5	12	4.5	83
25	M12	Y4A25A128C	6.5	16	12.8	20	48.0	41.5	12	4.5	83
35	M12	Y4A35A128C	8.0	16	12.8	25	48.0	41.5	12	5.0	89
50	M12	Y4A50A128C	9.0	20	12.8	25	47.0	41.5	14.8	5.0	89
70	M12	Y4A70A128C	11.0	20	12.8	25	47.0	41.5	14.8	5.0	89
95	M12	Y4A95A128C	12.5	20	12.8	25	47.0	41.5	14.8	5.0	89
120	M12	Y4A120A128C	13.7	25	12.8	30	63.5	57.0	18.8	6.0	112
150	M12	Y4A150A128C	15.5	25	12.8	30	63.5	57.0	18.8	6.0	112
185	M12	Y4A185A128C	17.0	32	12.8	30	63.0	57.0	23.8	6.0	114
240	M12	Y4A240A128C	19.5	32	12.8	30	63.0	57.0	23.8	6.0	114
300	M16	Y4A300A34165C	23.3	34	16.5	36	72.0	65.0	28.0	7.0	130
300	M12	Y4A300A165C	23.3	40	16.5	36	99.0	91.0	28.0	7.0	156
400	M16	Y4A400A165C	26.0	40	16.5	36	99.0	91.0	28.0	7.0	156

Aluminium mechanical terminal ML-20

- Solid Al terminals for connections Al/Al and Al/Cu. (Bimetallic)
- Terminations can be jointed using simple hands tool
- Shear bolt installation



Ref	Capacity Alu (mm²)	Dimensions (mm)							Screws	
		Øe	Øi	Ø B	P1	P2	Ep	L	Number	H on flats
ML 20/1-12	25-95	25	13	13	25	26	10,5	66	1	13
ML 20/2-12	70-150	28	16	13	28	29,5	12	83	1	17
ML 20/3-12	120-240	34	20	13	34	35	14	100	2	17
ML 20/3-16*	120-240	34	20	17	34	35	14	145	3	17
ML 20/4-12	240-400	42	26	13	42	45	14	145	3	22
ML 20/4-16*	240-400	42	26	17	42	45	14	145	3	22
ML 20/4-20*	240-400	42	26	21	42	45	14	145	3	22
ML 20/5-4 H	400-630	50	33	4x9	60	60	14	180	3	22

Ref	Cross section range mm²					
	Alu				Cu	
	RM	RE	SM	SE	RM	SM
ML 20/1	25-95	25-95	25-70 (95)		25-95	25-70 (95)
ML 20/2	70-150	70-150	70-120 (150)		70-150	70-120 (150)
ML 20/3	120-240	120-240	120-185 (240)	120-185	120-240	120-185 (240)
ML 20/4	240-400	240-400	240-300 (400)	240-300	240-400	240-300(400)
ML 20/5	400-630	400-630			400-630	

(x) Press round

Aluminium terminal Y4A-AM

- Solid Al terminals for connections Al/Al and Al/Cu. (Bimetallic)
- Electrolytic tin plated (15µm min.) to avoid corrosion in contact with copper surfaces
- Filled with neutral contact grease and with plastic cap.
- Crimped with deep indent and hexagonal dies



Section (mm²)	Stud	Part Number	Dimensions (mm)									Aenor	Tool
			I.D	O.D	Ø K	B	C	Ø G	F	T	L		
16	M12	Y4A16AM12	5.5	20	13	25	47.0	15	47.0	6.0	86		120 kN
25	M12	Y4A25AM12	6.5		13								
35	M12	Y4A35AM12	8.0		13								
50	M8	Y4A50AM8	9.0	20	9	25	4.7	15	47.0	6.0	86		
50	M10	Y4A50AM10	9.0		11								
50	M12	Y4A50AM12	9.0		13								
70	M12	Y4A70AM10	11.0		11								
70	M12	Y4A70AM12	11.0		13								
95	M8	Y4A95AM8	12.5		9								
95	M10	Y4A95AM10	12.5		11								
95	M12	Y4A95AM12	12.5		13								
120	M12	Y4A120AM12	13.7	25	13	30	63.5	19	63.5	9.0	110		
150	M10	Y4A150AM10	15.5		11								
150	M12	Y4A150AM12	15.5		13								
185	M12	Y4A185AM12	17.0	32	13	35	63.5	24	63.5	10.0	118		
240	M12	Y4A240AM10	19.5		13		65.0	22	65.0		116		
240	M16	Y4A240AM16	19.5		17		65.0	22	65.0		116		
300	M12	Y4A300AM12	23.3	40	13	40	100.0	28	100.0	11.5	165		200 kN
300	M16	Y4A300AM16	23.3		17								
400	M12	Y4A300AM12	26.0		13								
400	M16	Y4A400AM16	26.0		17								

Tools

MO-67102 - Diagonal cutting pliers

- Insulated diagonal cutting pliers for live working at low voltage.
- Maximum operating voltage: 1 000 V AC - 1 500 V DC.
- Orange hardened PVC insulation.
- Special steel tool body. In accordance with DIN ISO 5749.

Ref.	Weight (kg)
MO-67102	0.190



Electro-hydraulic crimping tools

- **NEW GENERATION** of tool smarter, faster and having more autonomy with the Li-Ion battery 18V 4Ah.
- The embedded electronic card controls tool operation, stops the motor at end of crimp, records the cycle data and allows to set the piston return to auto or manual. New double speed hydraulic system with maximum efficiency to further improve speed and autonomy.

Designation	Reference	Quantity
Tool	ESU137	1
Battery	BL1840	2
Charger	CLM1890-HC	1
Metallic carrying case	CM-ESU	1
Adapter	C12PP	1
Adapter	U137C12	1



Hand operated hydraulic crimping tools

- Hand operated hydraulic crimping tool operable with both hands.
- U type head according to NF C33-090. This tool features a two stage rapide advance pumping system. The hydraulic body is protected by a neoprene cover. Positive die locking by push button.

Designation	Reference	Quantity
Tool	HU137	1
Adapter	C12PP	1
Plastic carrying case	CP-HU135/137	1



Remote operated hydraulic crimping tools

- Single acting connectable hydraulic crimping tool.
- U type head according to NF C33-090 with extended arms for larger capacities. Double spring system for powerfull retraction.

Designation	Reference	Quantity
Tool	SRU210	1
Adapter	PR210	1



Services

Solar Farms | Arc Flash

- **Hazards specific to Solar farm** : The main issue specific to Solar Farms that we identified was with the Solar Panels themselves as they generate electricity. The good news is that Solar Farms are modular and so it is easier to produce isolation and safe working procedures, than for more typical industrial or commercial electrical distribution systems.
“Test before touch” or “Test for dead” processes are very important, and you should ensure that the correct type of test equipment is used. Voltage indicators should be tested immediately before and after use with a proprietary proving unit.
There are also a lot of power inverters and other enclosures out in the field that should be shrouded to IP2X to minimize electric shock risk during fault finding activities. As the Solar Farm gets older, it is important to make sure that the IP2X protection is maintained by auditing and inspection especially during and after maintenance activities.
- **Arc Flash Studies** : Calculating the arc flash hazard for each of piece of equipment on a Solar Farm should cost significantly less that carrying out an arc flash study on a typical industrial or commercial electrical distribution system. The reason for this is that Solar Farms tend to be very modular in their construction, which means detailed modelling of one of the modules can be quickly and cheaply replicated many times for the rest of the network. This obviously reduces the overall cost of the arc flash study for a Solar Farm versus other types of electrical networks.



Electrical Safety Management

- **Electrical Safety** : The success of battery storage systems hinges on robust electrical safety measures. As large-scale deployment grows, adherence to stringent safety standards is paramount to prevent electrical hazards, fires, and other potential risks. Rigorous testing, proper installation procedures, and ongoing maintenance are essential to mitigate safety concerns and build public trust in these technologies.
- **Your Partner in Electrical Safety** We understand the importance of electrical safety in the integration and operation of battery storage systems. Improper procedures, testing, or repairs on these systems can increase the risk of arc flash incidents. Electrical faults or human errors can lead to short circuits and a significant release of energy.
- We can be your partner in navigating the electrical safety landscape of battery storage systems. We offer a comprehensive range of services to help you:
Conduct thorough risk assessments and hazard analyses to identify potential arc flash hazards. Implement appropriate engineering controls to mitigate these hazards.
Provide comprehensive training for personnel involved in the operation, maintenance, and servicing of battery storage systems.
- By prioritizing electrical safety, we can instill confidence in the reliability and resilience of battery storage systems, accelerating their adoption and contributing to the energy transition goals.



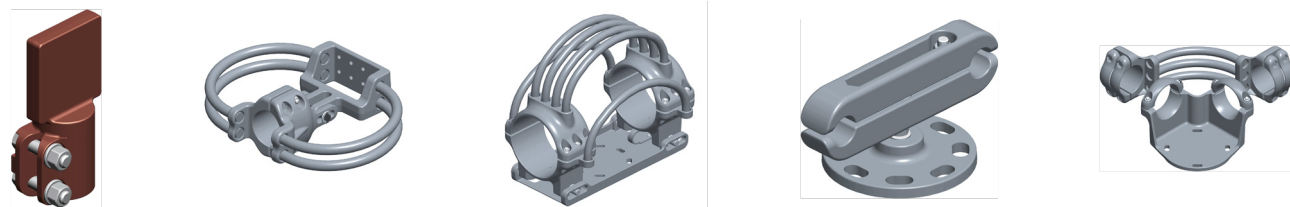
Network accessories

High voltage networks and substations

High voltage connectors

Wide range of high voltage connectors for substations up to 1200kV AC & 800kV DC. Application in AIS and GIS substations, FACTS, pantographs, circuit breakers, HVDC converters.

- According to NEMA CC1 standard, IEC and BS standards.
- Type tests reports and corona or heating simulation reports available.
- Cable range from Ø16 to 50mm, busbar and studs from Ø30 to 350mm. Nema pad sizes and post insulators supports 76/127/225mm.

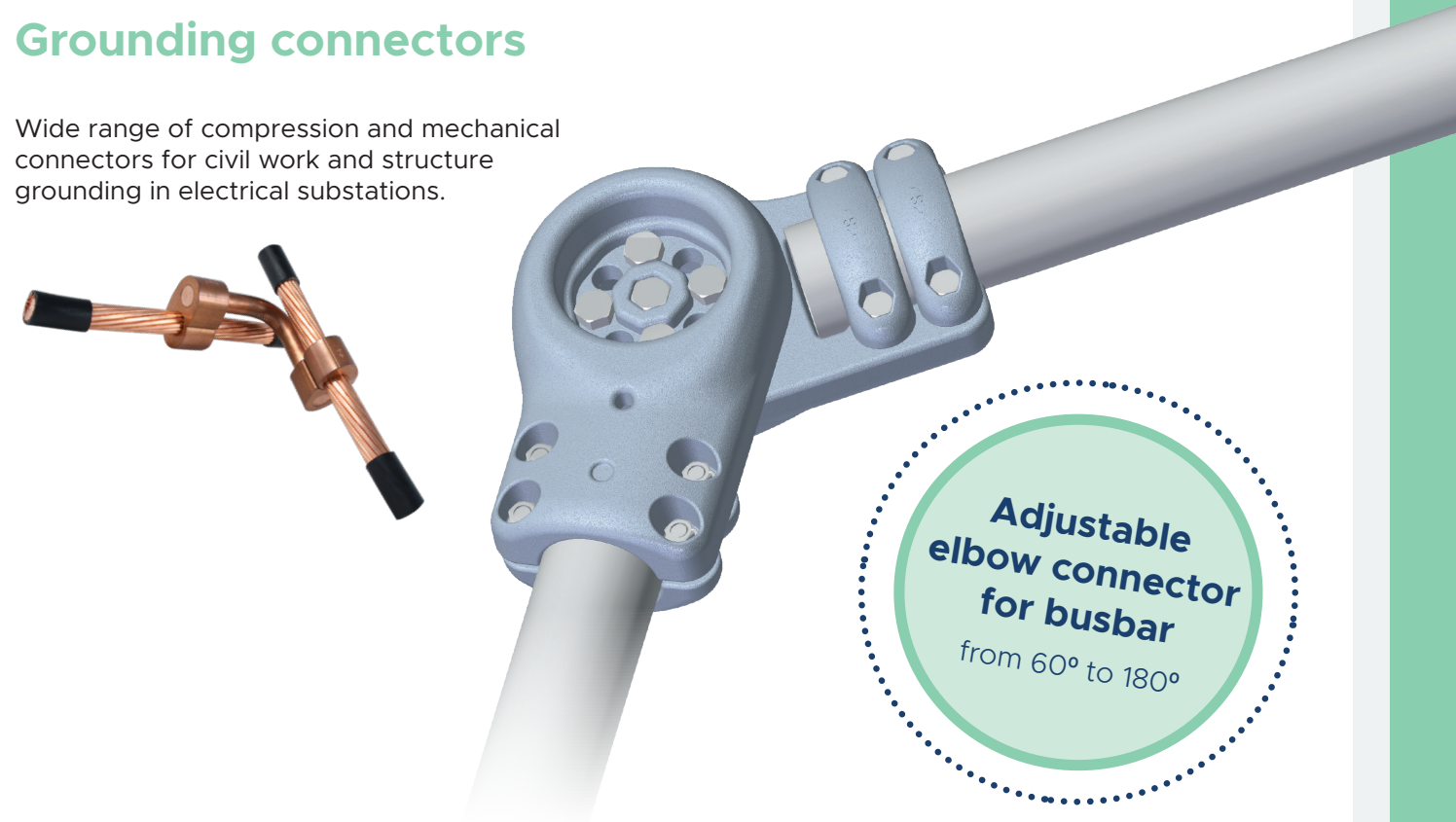


Network accessories

High voltage networks and substations

Grounding connectors

Wide range of compression and mechanical connectors for civil work and structure grounding in electrical substations.

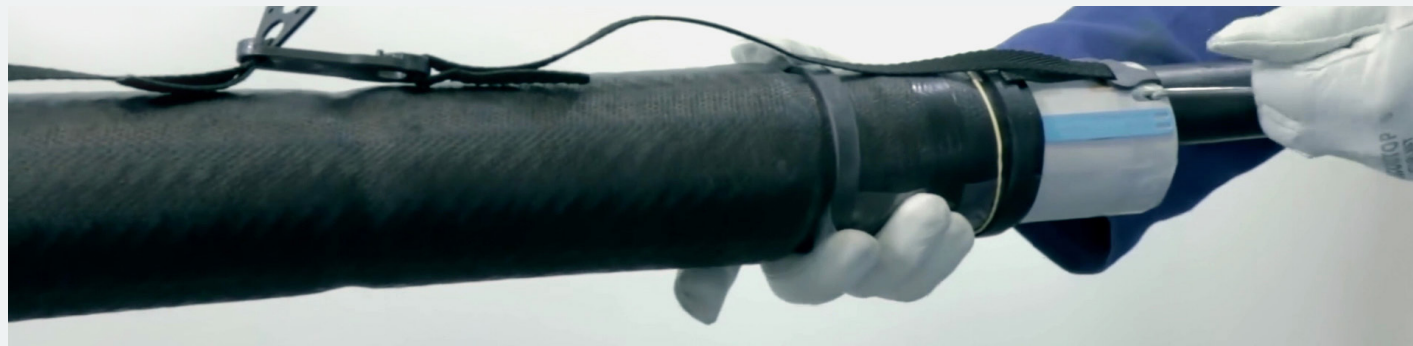


Contact us for custom application



Network accessories

Underground medium voltage networks



Cold shrink technology

- Easiest and quickest assembly
- Extremely reliable
- Product customization for individualized needs
- Limits misassembling risks

Material selection to maximize robustness

EPDM rubber

Naturally, EPDM materials present superior properties when it comes to mechanical strength, tear resistance and high molecular resistance to humidity. This is why EPDM material is commonly the best solution for below grade applications such as joints and derivations.

Silicone rubber

Presenting high performance with elasticity and hydrophobic behaviour, silicone is typically suitable on outdoor and indoor terminations, cold shrink, and push on.



Full range of cold shrink accessories for splices and terminations for networks up to 36 kV & cables up to 630 mm².

JUPRF: the best all-in-one joint

JUPRF cold shrink joint is the most acclaimed all-in-one joint on the market. **Its unique conception reduces the number of installation steps to an unmatched low in the market.**

JUPRF has passed all of the most severe tests including robustness and bending. JUPRF is an all-EPDM that maximizes joint protection against water ingress. JUPRF is so easy to install that it has been vastly adopted by field crews.

JTpRFI: transition joints made simple

Transition joints are typically complex and tedious to install. Not anymore, JTpRFI has combined the best techniques at each step of the installation:

- The mastic to prepare the cables,
- The cold-shrink electrical bodies,
- Easy to set-up injected resin protection.

With this Hybrid solution, jointers save time and gain peace of mind knowing that each joint is the highest quality, and perfectly protected.

EUxRF: termination with patented application technique

Sicame has developed a unique and patented system to apply cold shrink terminations that eliminates the most frustrating part of it: "the zip" spiral. This new and improved application technique is associated with high quality silicone rubber for a long lasting termination even in the most difficult environments.



Network accessories

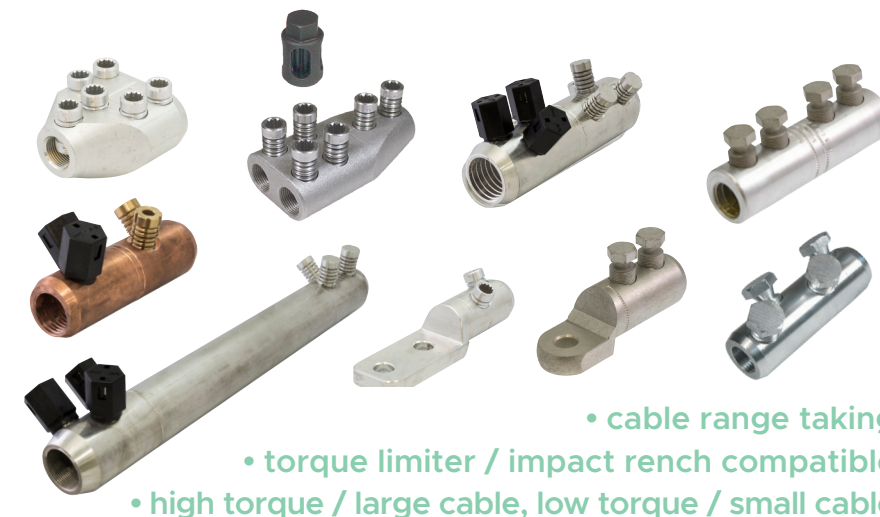
Underground medium voltage networks

Mechanical Connectors

Since the substitution of medium voltage paper cables by polymeric cables, a highly increasing number of different cable types are used in the world. To connect MV cables with different conductor material, shapes and cross sections, mechanical connectors are a good solution to this technical challenge. A variety of Sicame mechanical connector designs had been developed.



Complete range of cable range-taking mechanical connectors and terminations for MV cable conductors, with the patented universal shear head screw for either a ratchet or impact wrench installation.



- cable range taking
- torque limiter / impact wrench compatible
- high torque / large cable, low torque / small cable

- Design features/benefits.
- Manufactured from solid, profiled aluminium alloy extrusion.
- One piece manufacture.
- Three thread sizes: M16 / M18 / M22.
- Ease and speed of manufacture.
- Screws shear flush/recessed within connector body.
- Integral moisture block.
- Shear screws can be removed after installation.
- Aluminum or copper cable configurations.
- Multiple cable configurations.

Separable Connectors

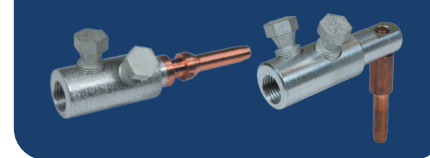
As a result of the different models of bushings and the varying field requirements, different versions of separable connectors are available. Sicame offers separable connectors that are elbow-shaped, straight or T-shaped. In many cases, the insulation bodies made of EPDM rubber are multi-ranged and can be combined with mechanical cable lugs with shear-off bolts.

For connection of MV single-core cables with synthetic insulation to transformers, cubicles, compact substations, motors, etc.

- One-piece connector made of insulating EPDM rubber with semi-conductor screen.
- Indoor and outdoor installation in any position.
- Connectable/disconnectable under no-load and no-voltage conditions.
- Test point for voltage status monitoring.
- Fixture device on the bushing.
- Energization only after plugging on the bushing.

CSE 250 / CSD 250:

12 and 24 kV for A interface type in accordance with EN 50180 and EN 50181 standards. For single core synthetic insulation cables without armour.



Contact us for custom application

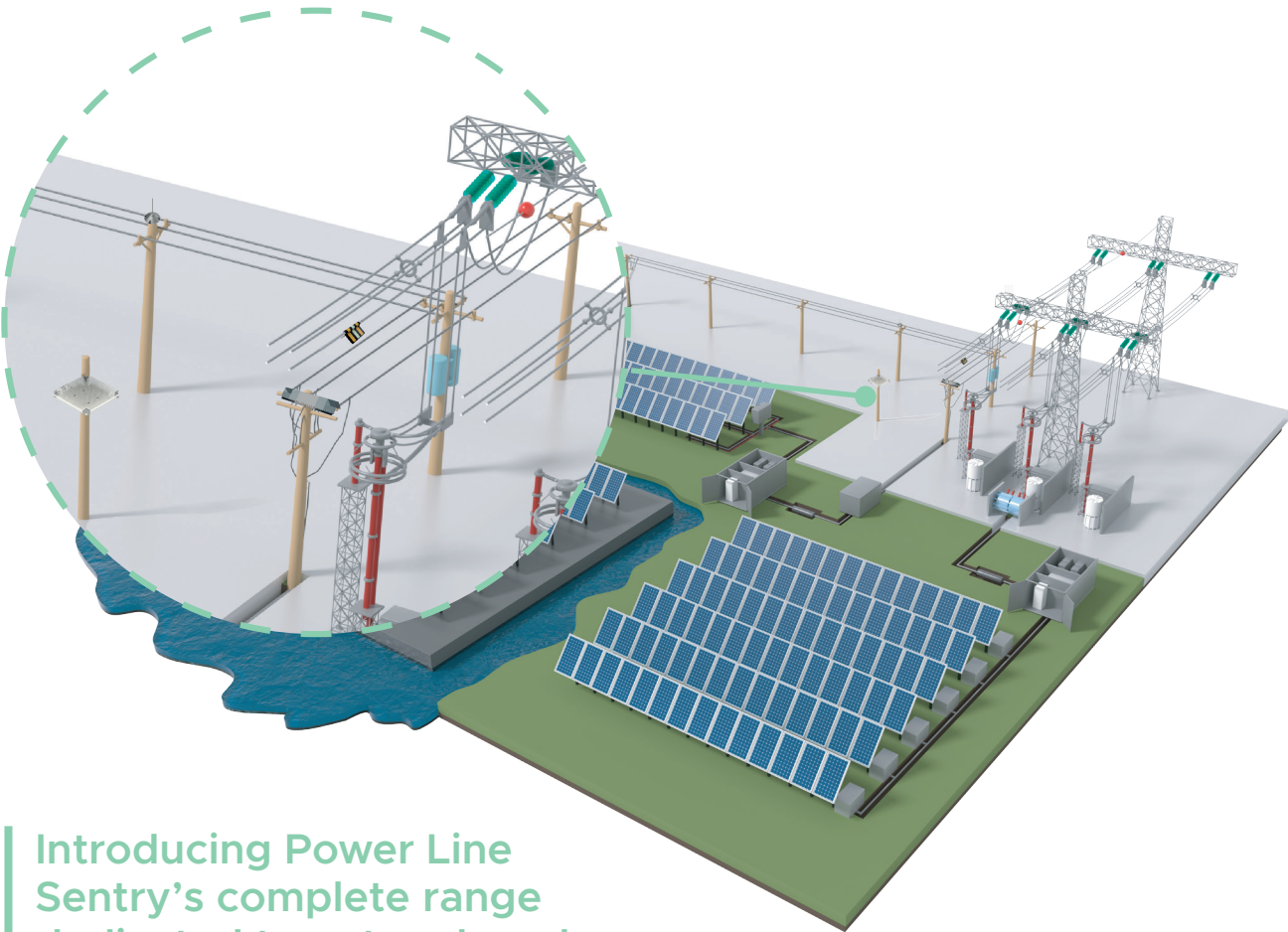


Network accessories

Network & wildlife protection

To meet the demand for a reliable electrical grid, environmentally caused outages must be prevented.

To minimize downtime and avoid dreadful losses, high quality wildlife mitigation solutions are required.



Introducing Power Line Sentry's complete range dedicated to network and wildlife protection for all systems and kVs.

Designed in collaboration with wildlife biologists, environmental specialists, electrical engineers and operations linemen, Power Line Sentry's premium solutions are proven effective, durable and secure. From insulating covers to avian deterrents, from custom designs to turn key solutions, these are effective solutions tailored to your exact needs.

Designs for premium durability and security in even the most extreme environments:

- Hotstick friendly
- V-O flame retardant
- Proven effective



Raptor Guard pole top cap

- Pole top cap with blunt-tipped spike for 11"-13" diameter pole top
- Flush mounting protects against weather deterioration, bird nesting, and perching
- Can be installed on wood, steel, or composite – by bolting or banding

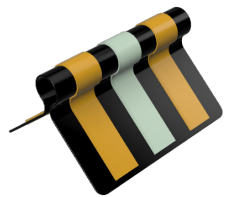


Ref.	Diameter (cm)	Recommended pole top diameter (cm)	Référence	Diameter (cm)	Recommended pole top diameter (cm)
RGPT-8	20.32	22.86	RGPT-28*	66.04	78.66
RGPT-10	25.4	27.94	RGPT-30*	76.2	78.74
RGPT-12	30.48	33.02	RGPT-32*	81.28	83.82
RGPT-14*	35.56	38.1	RGPT-34*	86.36	88.9
RGPT-16*	40.64	43.18	RGPT-36*	91.44	93.98
RGPT-18*	45.72	48.26	RGPT-38*	96.52	99.06
RGPT-20*	50.8	53.34	RGPT-40*	101.6	104.14
RGPT-22*	55.88	63.5	RGPT-42*	106.68	109.22
RGPT-24*	60.96	68.58	RGPT-K	kit d'adaptation pour le marquage des poteaux en bois	

* includes adapter kit for branding to non-wood poles

Hawk Eye™ Bird Flight Diverters

- Shape and design supports research proving that visibility in low light is the most important aspect in preventing avian collisions.
- Photoluminescent white stripe is 24-hour-rated glow-in-the-dark.
- Fluorescent prismatic yellow is mirrored to effectively reflect light.
- A-frame shape provides maximum visibility from all angles.
- Colorfast UV resistant RPVC with UV resistant black additive.
- Durable rubber hose cradles overhead wire and guy wire without pinching or grinding.
- Secure in high winds (100+ mph) for sustained periods.
- Hotstick compatible and drone installation available.



Ref.	Length (cm)	Width (cm)	System KV	Wire fitment	MIN QTY
BFD-050	15.24	7.62	up to 345 KV	#4 - 300 OPGW	50
BDF-075		10.16		336 - 795 MCM	
BDF-075-HV		10.16		336 - 795 MCM	
BDF-150		12.7		850 - 1780 MCM	
BDF-150-HV		12.7		850 - 1780 MCM	
BDF-051/Guy wire marker*		7.62		#4 - 300 OPGW	
BDF-076 Guy wire marker*		10.16		336 - 795 MCM	

*guy wire marker includes retention clip



Raptor Guard™ Perching Deterrents

- Spikes deter perching, as proven by live flight cage raptor tests conducted in collaboration with the Rocky Mountain Raptor Program.
- Optional side extension covers vertical insulators or ends of cross arm.
- Modular design allows for custom lengths.
- UV resistant fiberglass spikes // UV resistant polymer saddles.
- Secure in high winds (100+ mph) for sustained periods.
- Multiple attachment methods.



Ref.	Length (cm)	Mount type	Quantity
RGSP-12-EC *	30.48	cross arm	10
RGSP-24	60.96	cross arm	10
RGSP-24-AN	60.96	angle iron	20
RGSP-24-EC*	60.96	cross arm	10
RGSP-24A	60.96	davit arm	20
RGSP-24A-EC*	60.96	davit arm	10
RGSP-36	91.44	cross arm	10
RGSP-36-AN	91.44	angle iron	10
RGSP-36-EC*	91.44	cross arm	10
RGSP-36A	91.44	davit arm	10
RGSP-36A-EC*	91.44	davit arm	10
RGSP-48	121.92	cross arm	10
RGSP-48-AN	121.92	angle iron	10
RGSP-48-EC*	121.92	cross arm	10
RGSP-48A	121.92	davit arm	10
RGSP-48A-EC	121.92	davit arm	10

* Spikes with EC feature additional side spike extension to cover vertical insulators or ends of arm

RGNO-42-A - Nest Platform

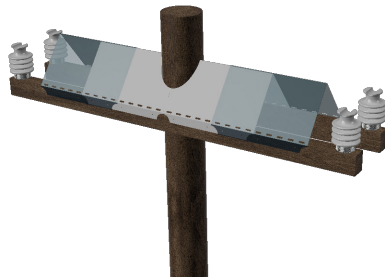
- 500+ lbs. capacity for nesting material
- Angled sides provide enhanced nest holding ability
- Ideal for eagles and osprey
- Grates allow for water to drain
- Mounting options for poles and crossarms
- Secure in high winds (100+ mph) for sustained periods
- Glass-Fiber Reinforced Polyester : UV resistant, corrosion resistant, fire resistant, high di-electric strength
- Use in combination with Nest Diverter product line for best results



Ref.	Description	Length (cm)	Width (cm)	Height (cm)
RGNP-42-A	Includes attachment kit for 6"-12" diameter poles	106.68	106.68	15.24
RGNP-42	Nest platform only (for double cross arm installation)	106.68	106.68	15.24

Raptor Guard™ Nesting Diverters

- Inverted “V” shape prevents nesting ability
- Design diverts nesting to other structures, even when past nesting activity has occurred in the location
- Independent studies have highlighted effectiveness
- Sleek and durable UV resistant HDPE polymer
- Option for pole cutout
- Multiple attachment methods



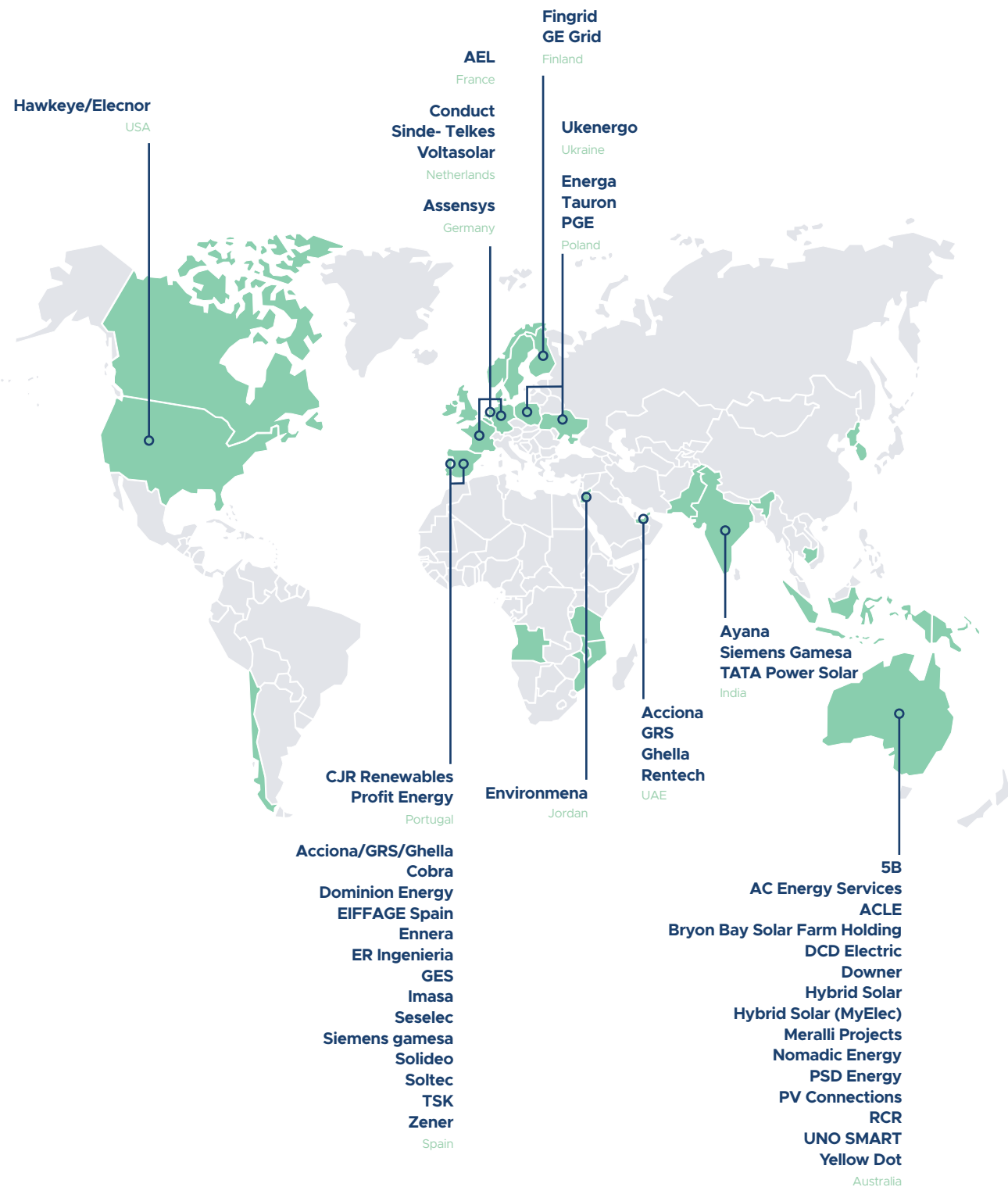
Ref.	Coverage (cm)	Structure type	Quantity
RGNS-12	12	Wood Double Cross Arm	10
RGNS-12-HD	12	Wood Double Cross Arm	10
RGNS-36	36	Wood Double Cross Arm	10
RGNS-36-1*	36	Wood Double Cross Arm	10
RGNS-36-K	36	Wood Double Cross Arm	5
RGNS-36-k-SS**	36	Fiberglass or Steel Double Cross Arm	5
RGNS-36S	36	Wood Double Cross Arm	10
RGNS-36S-1*	36	Wood Double Cross Arm	10
RGNS-40	40	Transmission	10
RGNS-40-EC	40	Transmission	10
RGNS-48	48	Wood Double Cross Arm	10
RGNS-48-1*	48	Wood Double Cross Arm	10
RGNS-48-HD	48	Wood Double Cross Arm	5
RGNS-48-HD-1*	48	Wood Double Cross Arm	5
RGNS-48-K	48	Wood Double Cross Arm	5
RGNS-48-K-SS**	48	Fiberglass or Steel Double Cross Arm	5

* Nest Diverters without pole cut outs are designed for double cross arm structures with arms mounted 6"+ below pole top

** Includes Super Strap banding for easy installation

i Main projects & customers

Our main customers are utilities, engineering, installers & electrical equipment manufacturers worldwide. Our team of professionals has gained international recognition on customized studies conducted in different projects worldwide.





Sicame Group

+33 (0)5 55 73 89 00

1 boulevard Marius Vivier Merle, 69003 Lyon, France

● sicame-group.com

Sicame Solar Solution

info@sicame-solar-solutions.com

