



CABLE JOINTS, CABLE TERMINATIONS, CABLE GLANDS, CABLE CLEATS  
FEEDER PILLARS, FUSE LINKS, ARC FLASH, CABLE ROLLERS, CUT-OUTS

11KV 33KV CABLE JOINTS & CABLE TERMINATIONS  
FURSE EARTHING  
[www.cablejoints.co.uk](http://www.cablejoints.co.uk)  
Thorne and Derrick UK

Tel 0044 191 490 1547 Fax 0044 191 477 5371  
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# The World of Electrical safety



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## First and largest european specialist in Electrical safety equipment

CATU was created in 1919 and, since the beginning, it has dedicated its activity to the manufacture of material and equipment for electricity networks and installations.

Since 1936, CATU's activity has been concentrated on equipment for personal protection against electrical hazards and accordingly, has now 70 years experience in this field.

After the end of World War II, many French companies involved in Production, Transmission and Distribution of Electrical Energy were amalgamated into one National Company, called "Electricité de France" (EDF).

A short time later, a central department for Safety and Prevention of Accidents was created within EDF. Because of the experience that CATU already had in this field, a very close cooperation was forged between EDF and CATU which resulted in joint development and improvement of all the important Safety Material and Equipment now used in France.

The international recognition gained by EDF in this field has contributed to giving CATU a foremost position at the World Wide level.

At the present time, CATU Safety Equipment, including all the range of short-circuiting and earthing systems, the DETEX<sup>TM</sup> voltage detectors and testers, the live working tools and the individual equipment for linesmen, is used by the Main Power Utilities, Electrical Contractors, Large Industries and Railways in about 100 countries spread over the 5 continents.

CATU's experience and level of investment and research is unmatched. As a member of the main national and international technical committees (such as UTE, CENELEC, IEC and ASTM), CATU is contributing to the development and application of the latest technologies. This quest for continuous improvement is now reinforced with the ISO 9001 Quality Insurance Certification.

Our endeavours to be the Specialist in Electrical Safety Equipment are made with genuine dedication to all aspects of Safety Engineering Principles. Together with our network of distributors, we acknowledge our commitment and obligations to our customers.

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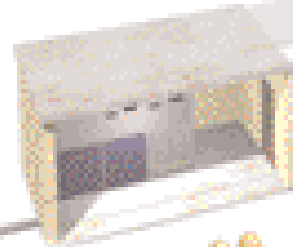
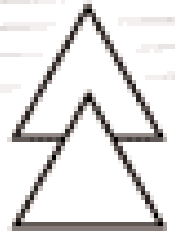
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# IEC Standard



International Electrotechnical Commission is a worldwide organization for standardization comprising national electrotechnical committees (NC). The object of the IEC is to promote international cooperation on all questions concerning standardization in the electrical fields. These standard have been approved by more than 50 different countries including Australia, Canada, China, France, Germany, Japan, Russia, Malaysia, Singapore, Mexico, India, Indonesia, South Africa, New Zealand, USA...

A rapid need to perform electrical operations evolved with the time. This resulted in regional or national working on specific standards without coordination.

IEC standards were developed according to a consensus procedure and approved by recognised body. They provide an adequate answer at worldwide level.

The IEC standard presents benefits to all parties involved:

- for the end-users: it is the guarantee of a suitable and internationally recognized quality equipment,
- for the Testing Laboratories: it determines better standards of testing and control procedures for materials,
- for the manufacturers: it helps them to make a better technico-commercial offer.

CATU designs, tests and manufactures under the IEC requirements.

CATU is the first manufacturer to provide a full range of products complying with the IEC standards.

CATU shows its innovation ability for the welfare of the electrical world.

**CATU™**

# Golden safety rules



*Electrical accidents are responsible for severe body injuries, which cause troubles not only for the workers themselves, but for their families as well.*

*Furthermore they cause financial penalties to the utilities, due to the failure of supply and the cost associated with the injured workers.*

## How does the electrical risk appears?

- When an electrical line or conductor is unexpectedly still live
- When current sources are not properly isolated
- When power generators are connected to the network
- When there are atmospheric phenomenons such as lightning
- Through induced currents

However, it has also been statistically observed that the most common causes of unexpected presence of voltage on electrical lines or installations were due to:

- A mistake in operating a switch
- A mistake in identifying the work to perform
- A "faulty" switch (one of the links for example remaining partially engaged)

## How to avoid electrical accidents?

1. By observing Simple Electrical Safety Rules directed by common Sense (even if Working Practices vary from a country to another, GOLDEN RULES always apply).
2. By using Simple, Light and Reliable Electrical Safety Equipment.

## First, select the right equipment

Personal protective equipment, safety padlock, voltage detector, short circuiting and earthing system, warning signs.



# Golden safety rules

**SEPARATE THE WORK AREA FROM ALL POSSIBLE SOURCES OF POWER-SUPPLY**  
by opening circuit-breakers, switches...

**1**

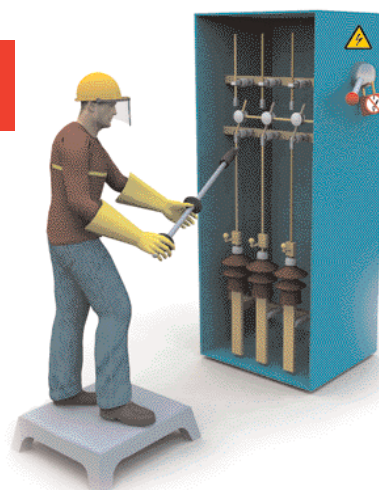


**2**

**LOCK THE LINK IN THE OPEN POSITION**  
with a safety lock system (safety padlock)

**CHECK THE ABSENCE OF VOLTAGE**  
at source and on site, on each conductor and  
apparatus involved.

**3**

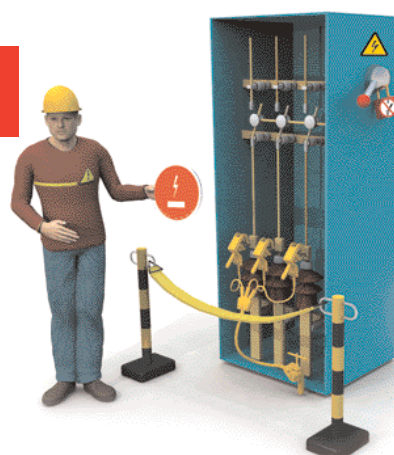


**4**

**APPLY APPROPRIATE SHORT-CIRCUIT AND EARTHING SYSTEMS**  
in sufficient numbers on the conductors of your  
network where operation is taking place.

**SHOW, WARN OTHERS AND LIMIT THE WORK AREA**  
even during the most simple temporary  
maintenance operation

**5**



# PERSONAL PROTECTIVE EQUIPMENT (P.P.E.)

## Specifications



*P.P.E. are defined as any device or means intended to be worn or held by one person to protect itself against one or several risks liable to threaten its safety or its security.*

The personal protective equipments have to be in compliance with the requirements of the European Directive 89/686 and the international standards which define:

- The protections adapted to the kind of risk.
- The highest level of protection possible
- The comfort, the ergonomics and the quality of the equipment

The obligations of use of the PPE in companies are defined by the Directive Européenne 89/656.

### **It is of the responsibility of the employer :**

- To give free of charge and in a personal way equipments necessary and adapted to the risks,
- To watch over their actual use,
- To assure the necessary replacement as well as the maintenance and the compliance,
- To inform the users of the risks against whom they are protected.

**Before any intervention it is imperative to equip itself with the appropriate equipment in compliance with the standards.**

### **P.P.E. check**

- Every PPE must be verified at least visually before and after every use.
- Regular tests must be made by qualified persons and at least annually.
- If the slightest doubt exists the equipment must be reformed and replaced at once.



# Below 1000V



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| Safety padlocks and warning signs     | 25 |
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| Installation testers                  | 32 |
| Short-circuiting and earthing systems | 37 |
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| Insulated tools                       | 46 |

# APPLICATIONS

## Examples of usual applications

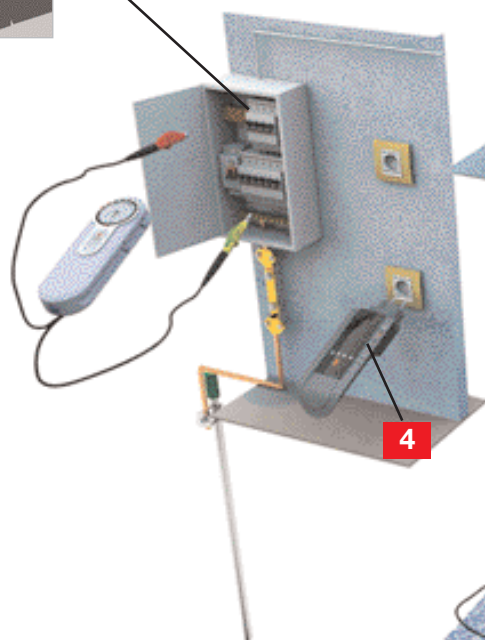


### Home and Building

Since 30 years, CATU has developed a full range of products especially designed for home and building electricians: self adhesive warning signs, personal protective equipment, voltage detectors, installation testers, insulated tools.



8



4



5



2

3

### Voltage detector

- 1** Bipolar voltage detector 6 to 690 V a.c./ d.c.

Reference: MS-911-EX

Page: 29

### Installation testers and accessories

- 2** Earth and continuity loop controller "CATOHM"

Reference: DT-300

Page: 34

- 3** Small 2 parts pole for working at distance

Reference: M-95-1143

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- 4** RCDs tester

Reference: DT-170

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- 5** Insulation tester

Reference: DT-500

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- 6** Phase rotation indicator

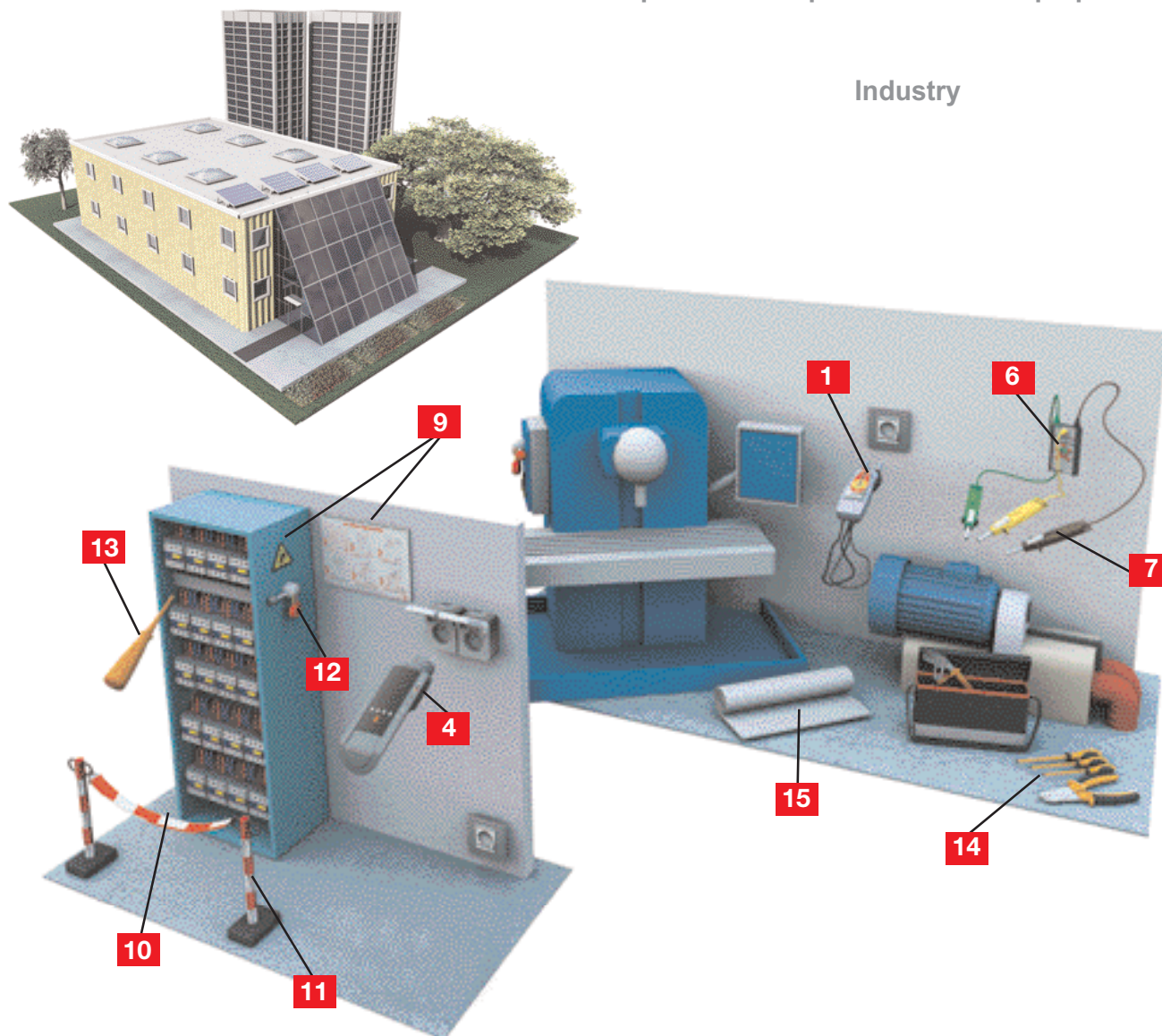
Reference: MS-152+

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# APPLICATIONS

Before intervention select the right personal protective equipment

## Industry



### Installation testers and accessories

|   |                                         |                        |          |
|---|-----------------------------------------|------------------------|----------|
| 7 | Safety test probes IP2X for controllers | Reference: CX- (serie) | Page: 31 |
|---|-----------------------------------------|------------------------|----------|

### Warning signs, safety padlocks and delineators

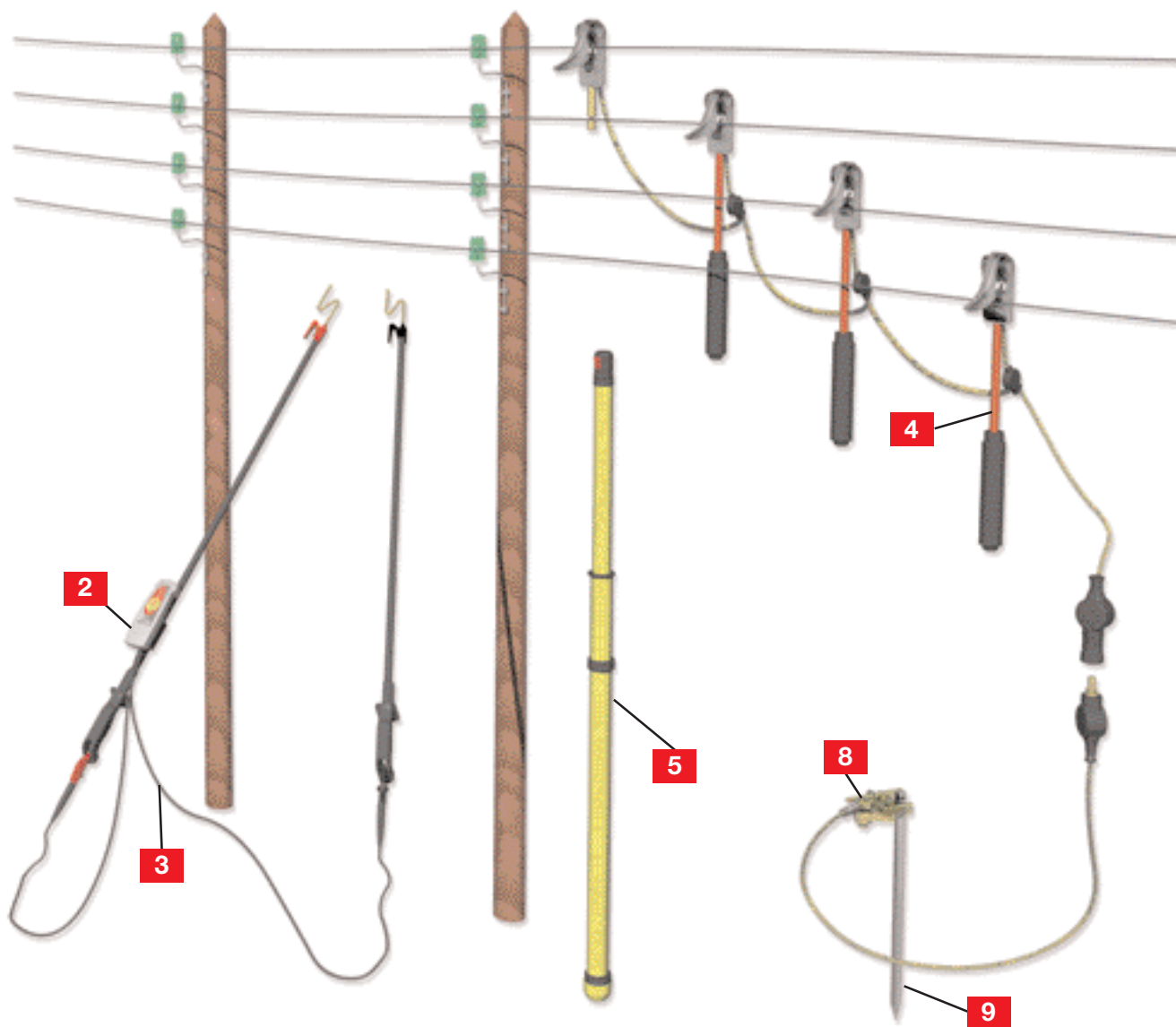
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| 8  | Single pole breaker lockout with padlock | Reference: AL-201-C/1 | Page: 26    |
| 9  | Warning signs aluminium or self adhesive |                       | Page: 27/28 |
| 10 | Chain delineator                         | Reference: AL-63-A    | Page: 27    |
| 11 | Safety boundary post                     | Reference: AL-318     | Page: 27    |
| 12 | Safety padlock                           | Reference: AL-230/... | Page: 25    |

### Insulated tools

|    |                                                                |                     |                |
|----|----------------------------------------------------------------|---------------------|----------------|
| 13 | Phase tester insulated screwdriver IEC-60900 1000 V            | Reference: MO-65222 | Page: 46       |
| 14 | Insulated screwdriver, pliers and accessories IEC-60900 1000 V | Reference: MO-72042 | Page: 43 to 46 |
| 15 | Insulated mat                                                  | Reference: MP-42/11 | Page: 23       |

# APPLICATIONS

Examples of usual applications



## Voltage detector

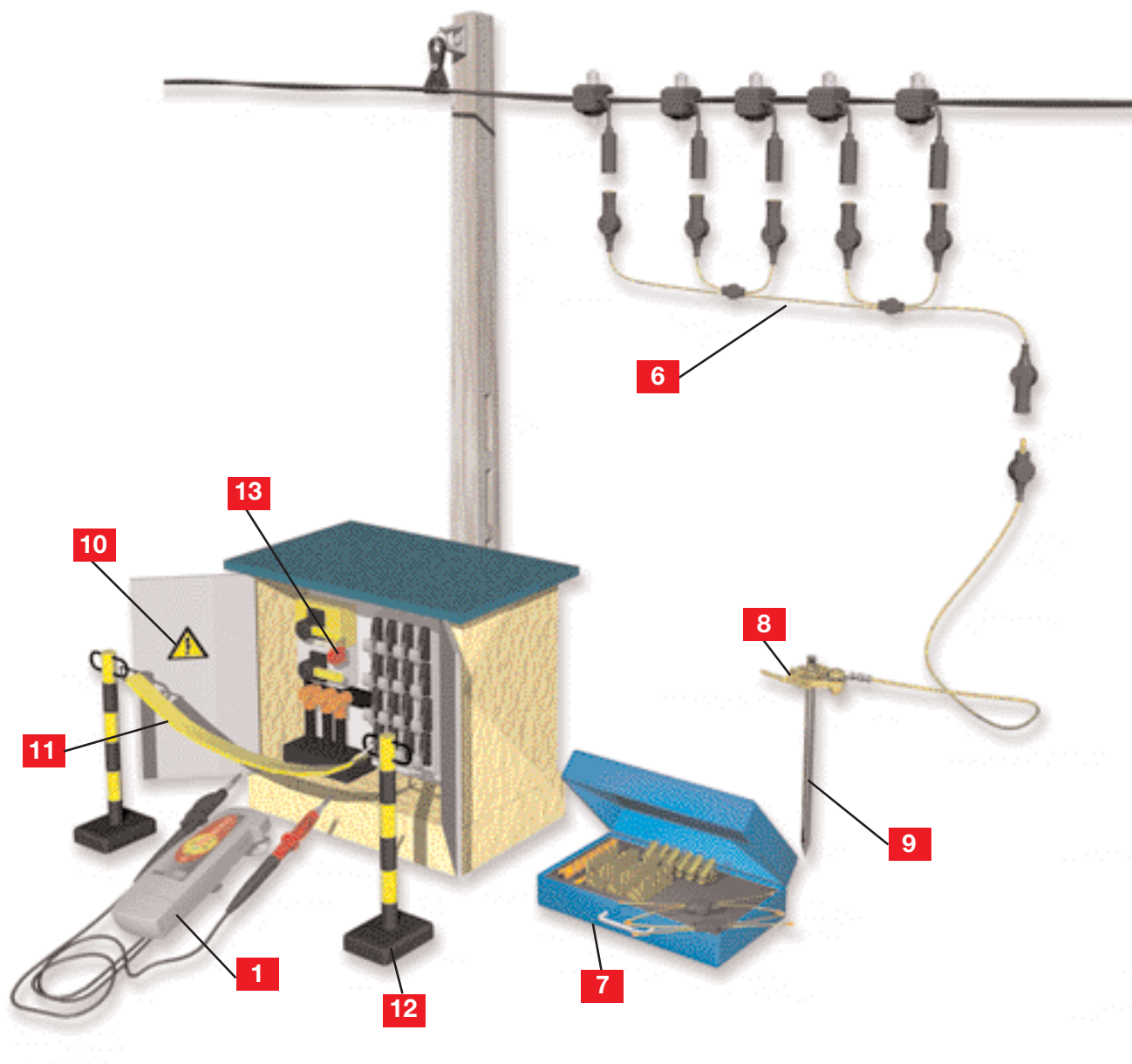
|   |                                                                     |                      |          |
|---|---------------------------------------------------------------------|----------------------|----------|
| 1 | Bipolar voltage detector with phase rotation 12 to 400 V a.c./ d.c. | Reference: MS-911/2  | Page: 30 |
| 2 | Bipolar voltage detector 6 to 690 V a.c./ d.c.                      | Reference: MS-911-EX | Page: 29 |
| 3 | Contact probes for use on bare overhead line length: 1.2 m          | Reference: MS-8014   | Page: 31 |

## Short-circuiting Systems

|   |                                                                      |                      |          |
|---|----------------------------------------------------------------------|----------------------|----------|
| 4 | Short-circuiting system for bare overhead line with snapping system  | Reference: MT-405    | Page: 37 |
| 5 | Insulating stick for short-circuiting bare overhead line system      | Reference: CE-2-21-C | Page: 37 |
| 6 | Short-circuiting system for insulated overhead line (sockets system) | Reference: MT-205    | Page: 38 |
| 7 | Short-circuiting and earthing systems for consumer units             | Reference: MC-290/2  | Page: 39 |

# APPLICATIONS

Before intervention select the right personal protective equipment



## Earthing systems

**8** Earthing equipment with cable and earth clamp

Reference: MT-245

Page: 38

**9** Hexagonal earth rod length: 1 m

Reference: MT-650

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## Safety padlocks and warning signs

**10** Warning signs aluminium or self adhesive

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**11** Chain delineator

Reference: AL-63-A

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**12** Safety boundary post

Reference: AL-318

Page: 27

**13** Safety padlock

Reference: AL-230/...

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# Personal protective equipment

## Head and eyes protection

Below 1000V

Head and eyes protection

Insulating rubber gloves

Insulating mats and boots

## Safety glasses

Protection against UV radiation and ejections of solid particles. Grilamid frame in orange Softflex. Anti-scratch, anti-impact and anti-chemical product treatments. **EN 166/EN 170 CE**

**CAUTION:** Do not use for welding operations.

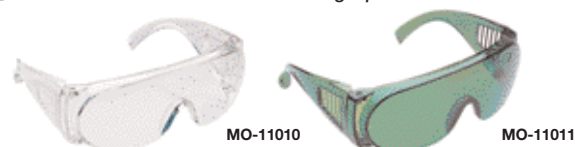


- MO-11000 Clear lenses, delivered in pouch
- MO-11001 Tinted lenses, delivered in pouch
- MO-11003 Tinted lenses, UV/IR protection, welding filter 2. EN 169. 80°C

## Overglasses

Polycarbonate overglasses. Protection against UV radiation and ejections of solid particles. **EN 166/EN 170 CE**

**CAUTION:** Do not use for welding operations.



- MO-11010 Clear lenses
- MO-11011 Green tinted lenses

## ABS helmet

Electrically insulating helmets for use on voltage installations. Safety industrial helmet, safety helmet for electrical use, especially designed to maximize wearer's comfort. Standard sizes 53 to 63. Leather trim 21 cm along the inside for added comfort. Multiple adjustments for a perfect fit headband: adjustable in 3 mm increments. Built-in cushion for optimum ventilation. Safety chin strap: fastenings to shell tear resistant. Weight: 0.300 kg. **EN 166/EN 170 EN 50365 ANSI Z89.1:2003 Class E 20 kV CE**



- MO-182/1-B White
- MO-182/1-R Red
- MO-182/1-J Yellow

## Face shield

Polycarbonate face shield adjustable on the head by milled wheel. Protection against electric arcs of short-circuits. Anti-mist treatment. Anti-scratch treatment. **EN 166/EN 170 CE**

**CAUTION:** Do not use for welding operations.



- MO-186 Single size, adjustable
- M-881635 Spare face shield for MO-186
- M-87384 Bag for face shield and helmet
- M-952206 Spare strap for MO-186

## Helmet with built-in face shield

Panoramic face shield in non-scratch and anti-mist polycarbonate. Chinstrap (with Velcro fastening) Head fit adjustment by milled wheel. Single size: 0.270 kg. **EN 166/EN 170/EN 397 EN 50365 CE**



- MO-185-BL White
- MO-185-BLM White, chinstrap with a chin
- MO-185-R Red
- MO-185-J Yellow
- MO-185-B Blue
- M-881622 Spare face shield for MO-185
- M-881836 Spare white padded headband
- M-881889 Spare complete set (harness, chinstrap, headband)

## Face shield

Protection against electric short-circuits arcs. Face shield adjustable on MO-182 helmet. 100% UV protection. Weight: 0.170 kg. **EN 166/EN 70 CE**

**CAUTION:** Do not use for welding operations.



- MO-184 Single size, adjustable by rubber band

## Polycarbonate helmet

Polycarbonate helmet. Shock and wear resisting, comfortable. Adjustable size from 53 to 63 cm. Weight: 0,465 Kg. **EN 397 CE**



- MO-183-BL White, single size, adjustable
- MO-183-RL Red, single size, adjustable

# Personal protective equipment

## Head and eyes protection

Below 1000V

Head and eyes protection

Insulating rubber gloves

Insulating mats and boots

### Headlamp with adjustable focus

Can be carried either on the head or any type of helmet.  
Lighting control and beam by switches.  
Range: 30 meters.  
Adjustable lamp height angle.  
Sealed against rain.  
Powered by 4 batteries LR 6.  
Autonomy: 6 hours.  
Standard bulb 4.8 V/0.3 A.

CE



MS-118 Headlamp - Weight: 0.187 kg

M-95-865 Halogen bulb (sold by set of 5 units)  
5.2 V 0.5 A

M-95-864 Hooks set for helmet

### LED's headlamp (4 LED's)

Can be carried either on the head or any kind of helmet thanks to it supplied adhesive clip. (fig. 1 and 2).  
3 lighting levels: large or narrow for a short or long distance, and both for maximal power.  
Flash mode.  
4 white LED's lamp with adjustable angle.  
Range: 10 to 15 meters.  
Powered by 3 batteries LR03 (AAA).  
Autonomy: 90 hours.

CE



Fig. 1



Fig. 2

MS-122 Delivered with batteries, carrying bag, headband and adhesive clip. Weight: 82g

SUPBAND122 Adhesive support and headband kit

SUP122 Kit of 5 adhesive supports

### LED's headlamp (5 LED's)

LED's Headlamp (5 LED's).  
Can be carried on the head or any kind of helmet.  
Lighting by 5 high performance white new generation LED's - 3 lighting levels + 1 flash mode + 1 red lighting.  
IPX6.  
Powered by four batteries LR06 (AA).  
Range : 30 meters.  
Autonomy : 100 hours.

CE



MS-127 Delivered with batteries and a carrying bag Weight: 226 g

M-95-864 Hooks set for helmet

### Intrinsically safe ATEX LED's Headlamp

Ex II 2GD EEx ia IIC T4

CE

Can be carried either on the head or any kind of helmet.  
- Lighting by 3 high performance White LEDs.  
- 2 lighting levels (High: 3 LEDs on or low: 1 LED on).  
- Adjustable lamp height angle.  
- Very light, ABS body.  
- ATEX certified Catégorie 2 (Zone 1)  
N° TRL03ATEX21005X.  
- Range: 10 to 15 meters.  
- Powered by 3 batteries LR03 (AAA).  
- Autonomy: 150 hours.  
- Strap: cloth or silicone rubber (for helmet).



MS-126 Delivered with batteries - Weight: 0.125Kg

M-95-864 Hooks set for helmet

# Personal protective equipment

Insulating  
rubber gloves

Below 1000V

Head and eyes protection

Insulating rubber gloves

Insulating mats and boots

## Insulating rubber gloves

Insulating rubber gloves conform to international IEC-60903 standard.

To satisfy the requirements of this standard, they are subjected to dielectrical, mechanical resistance and ageing tests. The acceptance levels for mechanical tests are stricter.

The tests are especially aimed at checking the tensile strength and elongation at break, the mechanical puncture test and tension set.

Our gloves are made of latex especially treated to obtain high dielectric characteristics; they are individually tested and delivered in sealed plastic bags.

IEC-60903

EN 60903

CE



| Reference | Class | Voltage (V) | Designation | Overgloves size | Weight (g) |
|-----------|-------|-------------|-------------|-----------------|------------|
| CG-05 (*) | 00    | 500         | latex       | **              | 90         |
| CG-10 (*) | 0     | 1 000       | latex       | **              | 200        |

\* References to be completed by size A, B, C, D.

\*\* See below

Correspondence with standard sizes: A = 8, B = 9, C = 10, D = 11.

## Composite gloves

Insulating gloves with higher mechanical properties for working in full safety without leather overgloves.

IEC-60903

EN 60903

CE



| Reference | Class | Voltage (V) | Designation                                        | Weight (g) |
|-----------|-------|-------------|----------------------------------------------------|------------|
| CG-02 (*) | 00    | 500         | orange composite gloves with mechanical properties | 270        |
| CG-12 (*) | 0     | 1 000       | orange composite gloves with mechanical properties | 450        |

\* References to be completed by size A, B, C, D.

Correspondence with standard sizes: A = 8, B = 9, C = 10, D = 11.

### SELECTION BOARD SIZE INSULATING GLOVES/OVER GLOVES

| Gloves reference                                                                                              | Gloves size | Overgloves reference                                                                              | Overgloves size |
|---------------------------------------------------------------------------------------------------------------|-------------|---------------------------------------------------------------------------------------------------|-----------------|
| CG-05 (*)<br>CG-10 (*)<br> | A           | CG-98 (*)<br> | B               |
|                                                                                                               | B           |                                                                                                   | C               |
|                                                                                                               | C           |                                                                                                   | D               |
|                                                                                                               | D           |                                                                                                   | D               |

# Personal protective equipment

Insulating  
rubber gloves

Below 1000V

Head and eyes protection

Insulating rubber gloves

Insulating mats and boots

## Insulating gloves testing equipment

Equipment intended for the verification of the dielectric properties of gloves, insulating tools, elements for maneuvers, insulators, blankets, sleeves, etc. It possesses output voltages according classes 00, 0, 1, 2 and 3 of IEC standards.

### The user of the CG-118 can set:

- Type of indication: acoustic signal that indicates if the insulation is fulfilling or not the standard or digital measurement of the leakage current of the element under test.
- Test period
- The language
- Select an Auto diagnose test

### Technical features:

Output voltage: 2.5, 5, 10, 20, 40 kVCC.

Class tests: 00, 0, 1, 2 and 3 according IEC.

Input voltage: 110-220 VAC / 50-60 Hz. / 12 VCC and internal rechargeable battery.

### Accessories:

- Bucket for testings
- Input and earthing cables
- Rubber gloves test electrodes
- User's manual
- Carrying case

CG-118

Insulating testing equipment



Accessories



Back panel CG-118

## Pneumatic glove tester

For compulsory control of gloves before use.  
Checking is done by inflating and immersing in water.

CG-117

140 x 150 x 160 mm - Weight: 0.600 kg



# Personal protective equipment

Insulating  
rubber gloves

Below 1000V

Head and eyes protection

Insulating rubber gloves

Insulating mats and boots

## Undergloves

Cotton undergloves

To be used with insulating rubber gloves.

These washable cotton undergloves improve the use of the insulating gloves.

They bring the best held, hygiene and a greater comfort.



CG-80 (\*\*)

\*\* H: men / F: women

CE

## Overgloves

Used as outer gloves to protect insulating gloves in dry environment.

Silicon grain leather, very flexible.

Large protective cuff in chrome tanned hide.

Protection against electric arcs.

Red adhesive strap.

EN 388

CE  
3122



CG-98 (\*)

Weight: 0.170 kg

\* Add sizes: A, B, C, D.

## Nomex undergloves

Undergloves 100 % Nomex.

To be used under insulating gloves, for a protection against the electric hazard.

FR - Flame Resistant undergloves.

Ideal complement to Arc Flash Equipment (see page 68)



CG-37

Nomex undergloves

CE

## Rubber gloves box

To be placed in high voltage stations, or to be carried.

Specially designed for protecting insulating gloves.

This plastic box also ensures the protection against UV radiation of insulating gloves.

The transparent cover enables to check gloves presence.

Bottle of talc included.

Can be fixed on wall.



CG-35/2

101 x 224 x 476 mm - Weight: 1.850 kg

## Mittens

Cotton mittens.

Wearing these undergloves also limits the effects of perspiration: its fingerless gloves shape allowing to keep the maximum of dexterity.



CG-81

Mittens

CE

## Carrying bag

Made from reinforced

waterproof fabric for transport of rubber gloves in vehicles and tool boxes.

Rear loop for belt and snaps.



CG-36

90 x 175 x 585 mm - Weight: 0.120 kg

# Personal protective equipment



Below 1000V

Head and eyes protection

Insulating rubber gloves

Insulating mats and boots

## Insulating mats

The matting is manufactured of elastomer compounds with slip-resistant surface. High quality dielectrical rubber.

IEC-61111  
EN 61111  
CE



Individual models.

| Reference | Thickness (mm) | Class | Voltage (kV) | Dimensions (m) |
|-----------|----------------|-------|--------------|----------------|
| MP-42/11  | 3              | 3     | ≤ 26.5       | 1 x 1          |
| MP-42/16  | 3              | 3     | ≤ 26.5       | 0.6 x 1        |
| MP-42/66  | 3              | 3     | ≤ 26.5       | 0.6 x 0.6      |

For placing in front of panels.

| Reference    | Thickness (mm) | Class | Voltage (kV) | Dimensions (m) |
|--------------|----------------|-------|--------------|----------------|
| MP-60/03-5   | 3              | 3     | ≤ 26.5       | 0.6 x 5        |
| MP-60/03-10  | 3              | 3     | ≤ 26.5       | 0.6 x 10       |
| MP-100/03-5  | 3              | 3     | ≤ 26.5       | 1 x 5          |
| MP-100/03-10 | 3              | 3     | ≤ 26.5       | 1 x 10         |

## Bags for insulating mats

Specially designed for carrying and protecting insulating mats. Equipped with a shoulder strap and a plastic window for instructions and storage identification.



|       |                                         |
|-------|-----------------------------------------|
| MP-01 | For MP-42/16 and MP-42/66 length: 70 cm |
| MP-02 | For MP-42/11 length: 110 cm             |

## Insulating stepladders

A complete range with top quality features:  
Insulation between two steps: 30 000 V  
Lateral risers in polyester/fiberglass  
Aluminium alloy rungs with anti-slip coating.

EN 131  
CE



| Reference | Nbr.of steps | Foot rest height (m) | Reach height (m) | Weight (kg) |
|-----------|--------------|----------------------|------------------|-------------|
| MP-700-4  | 3            | 0.68                 | 2.68             | 5.9         |
| MP-700-1  | 4            | 0.91                 | 2.81             | 6.9         |
| MP-700-2  | 5            | 1.14                 | 3.04             | 8.0         |
| MP-700-3  | 6            | 1.37                 | 3.27             | 9.4         |
| MP-700-5  | 7            | 1.60                 | 3.50             | 11          |

## Multi-pockets electrician bag

Specially designed for carrying and protecting insulating mats, face shield and controllers. Equipped with several pockets.



|         |                 |
|---------|-----------------|
| M-87386 | 65 x 15 x 25 cm |
|---------|-----------------|

# Personal protective equipment



Below 1000V

Head and eyes protection

Insulating rubber gloves

Insulating mats and boots

## Electrician suit

Suit without metallic part, avoiding any flash hazards. 100% cotton.

Colour: blue

- Front closed by injected zip every plastic part hidden.
- Gusset back.
- 2 flattened breasts pockets closed by injected zips every plastic part hidden.

- 2 flattened thighs pockets.
- Tape measure pocket on right back leg.
- Elastic in the back.
- Straight sleeves.



|          | *               | 01    | 02     | 03      | 04      | 05      | 06      | 07      |
|----------|-----------------|-------|--------|---------|---------|---------|---------|---------|
| MV-104/* | Size            | 40/42 | 44/46  | 48/50   | 52/54   | 56/59   | 60/62   | 64/66   |
|          | Chest size (cm) | 85/92 | 92/100 | 101/108 | 109/116 | 117/124 | 125/132 | 133/140 |

## Insulating boots

Made from high quality dielectrical rubber, very flexible and resistant.  
Anti-perforation composite sole and shell.  
Anti-slip sole.  
Protection against step and touch hazardous potential gradients.

ISO EN 20345

CE



MV-135\* Hight: 370 mm - Weight: 1.950 kg (42 size)

\* Add sizes: 39-40/41-42-43-44-45-46/47-48-49/50.

## Working gloves

All-grain leather, welt sewn, shirred elastic wrist back.  
These gloves are used for mechanical protection of hands during handling of tools, specially in wet environment.

EN 388

CE

3122



CG-96 (\*) Weight: 0.115 kg

\* Add sizes: A, B, C, D.

# Safety padlocks and warning signs

## Padlocks

Below 1000V

Padlocks

Warning signs and delineators

warning signs

A wide range of brass padlocks, in a plastic body.

Brass ring bow 50 or 70 mm. Diameter of the ring bow 4 or 6 mm. Different n° of keys. Colours : red, white, yellow, blue or green.

## Padlocks with warning signs

| Reference       | Ring bow (mm) | Ø (mm) | Weight (kg) |
|-----------------|---------------|--------|-------------|
| AL-230-(*)-EX   | 50            | 6      | 0.170       |
| AL-230-S-(*)-EX | 70            | 6      | 0.190       |
| AL-230-Z-EX     | 50            | 6      | 0.170       |
| AL-230-S-Z-EX   | 70            | 6      | 0.190       |
| AL-240-(*)-EX   | 50            | 4      | 0.170       |
| AL-240-S-(*)-EX | 70            | 4      | 0.190       |
| AL-240-Z-EX     | 50            | 4      | 0.170       |
| AL-240-S-Z-EX   | 70            | 4      | 0.190       |

\* Add n° of key: 111 or 222

"00" n° standard key: n° of key upon request. Z: random n° of key



## Colour padlocks range

| Reference         | Ring bow (mm) | colour | Ø (mm) | Weight (kg) |
|-------------------|---------------|--------|--------|-------------|
| AL-240-B-Z-EX     | 50            | White  | 4      | 0.170       |
| AL-240-B-00-EX    | 50            | White  | 4      | 0.170       |
| AL-240-S-B-00-EX  | 70            | White  | 4      | 0.190       |
| AL-240-J-Z-EX     | 50            | Yellow | 4      | 0.170       |
| AL-240-J-00-EX    | 50            | Yellow | 4      | 0.170       |
| AL-240-S-J-00-EX  | 70            | Yellow | 4      | 0.190       |
| AL-240-BL-Z-EX    | 50            | Blue   | 4      | 0.170       |
| AL-240-BL-00-EX   | 50            | Blue   | 4      | 0.170       |
| AL-240-S-BL-00-EX | 70            | Blue   | 4      | 0.190       |
| AL-240-V-Z-EX     | 50            | Green  | 4      | 0.170       |
| AL-240-V-00-EX    | 50            | Green  | 4      | 0.170       |
| AL-240-S-V-00-EX  | 70            | Green  | 4      | 0.190       |



## Marking

For indelible writing on the warning signs and padlocks, our ALU-SCRIPT™ markers are ideal.



AS-404

4 markers in assorted colours (red, black, blue and green)

# Safety padlocks and warning signs

## Padlocks

Below 1000V

Padlocks

Warning signs and delineators

warning signs

### Multiple locking apparatus

Holds up to four padlocks and a sign.



AL-200



AL-202

AL-200 100 x 60 x 10 mm - Weight: 0.150 kg

AL-202 165 x 50 x 12 mm - Weight: 0.200 kg

### Handle for 10 and 30 padlocks

PVC.  
Shock resistant.  
Ivory colour.  
With holes Ø 9 mm.



AL-207/10 For 10 padlocks - Weight: 0.06 kg

AL-207/30 For 30 padlocks - Weight: 0.130 kg

### Handle with 6 padlocks

Handle of moulded plastic  
for holding up to six padlocks.  
Compartment with  
transparent cover  
for key storage.

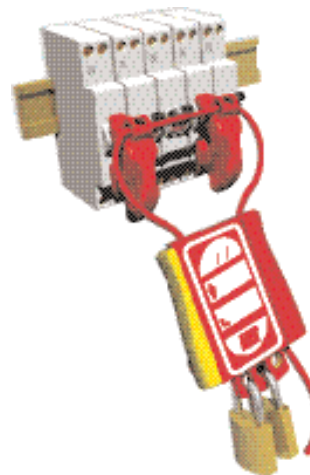


| Reference       | Weight (kg) | Handle with 6 padlocks |
|-----------------|-------------|------------------------|
| AL-236-111-EX   | 1.150       | AL-230-111-EX          |
| AL-236-S-111-EX | 1.210       | AL-230-S-111-EX        |
| AL-236-222-EX   | 1.150       | AL-230-222-EX          |
| AL-236-S-222-EX | 1.210       | AL-230-S-222-EX        |

### Multiple locking

**NEW !**

Ideal complement to AL-201 ; also useful on padlockable levers of isolation switch. Flexible plastic cable high resistance Length: 2m - Ø 4 mm. Up to 3 padlocks Ø 4 mm to Ø 6 mm.



AL-205

The locking device with 2m cable

### Single pole breaker lockout

Clipblock™, locks lever in off position to isolate and prevent breaker use.  
Clipblock fits most of standard single pole devices.  
Quick installation with a flat blade screwdriver N°3 (MO-65203).

Lockable



AL-201/1

Delivered in Pack of 5 units

### Single pole breaker lockout with padlock

Clipblock™, locks lever in off position to isolate and prevent breaker use.  
Clipblock fits most of standard single pole devices.  
Quick installation with a flat blade screwdriver N°3 (MO-65203).  
Locked by padlock.



AL-201-C/1

Delivered with a padlock

# Safety padlocks and warning signs

Warning signs  
and delineators

Below 1000V

Padlocks

Warning signs and delineators

warning signs

## Warning signs

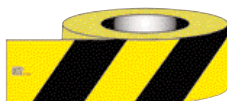
Special tool steel, oil-hardened.



| Reference    | Type      | Dimensions   | Characteristics                 |
|--------------|-----------|--------------|---------------------------------|
| AM-344-GB    | aluminium | 100 mm side  | black letters on yellow         |
| AM-345-GB    | aluminium | 100 mm side  | black letters on yellow         |
| AM-467-GB    | aluminium | Ø 80 mm      | white letters on red            |
| AP-510-BT-GB | plastic   | 297 x 210 mm | golden rules                    |
| AM-344       | aluminium | 100 mm side  | black or yellow                 |
| AM-344/05    | aluminium | 50 mm side   | black or yellow                 |
| AM-49/1      | aluminium | 100 mm side  | black or yellow                 |
| AM-49/2      | aluminium | 200 mm side  | black or yellow                 |
| AM-41/1      | aluminium | 100 mm side  | black or yellow                 |
| AM-41/2      | aluminium | 200 mm side  | black or yellow                 |
| AM-20-GB     | aluminium | 350 x 250 mm | blue letters or plain aluminium |
| AP-499/1     | plastic   | Ø 100 mm     | white or red                    |

## Safety adhesive tape

Adhesive tape black and yellow.



AT-5005 Length: 100 m

## Chain delineators

Polyamide chains.



|          |                                |
|----------|--------------------------------|
| AL-31/25 | Red and white - Length: 25 m   |
| AL-31/05 | Red and white - Length: 5 m    |
| AL-32/05 | Black and yellow - Length: 5 m |
| AL-31    | Opening ring for AL-31/25      |

## Delineators

Brightly colored ribbon.  
Snap hook on one ribbon  
end and another on spool.  
A ring on spool brakes  
ribbon at desired length.  
wide: 50 mm  
length: 20 m.



|         |               |
|---------|---------------|
| AL-62-A | Red ribbon    |
| AL-63-A | Yellow ribbon |

Plastique consommable.  
Length: 500 m. Wide: 70 mm.



|        |               |
|--------|---------------|
| AL-138 | Red and white |
|--------|---------------|

## Safety boundary post

For temporary installation  
used with tough link  
chain delineators.  
Removal foot  
Ø 50 mm  
Length: 0.9 m.



|        |                                   |
|--------|-----------------------------------|
| AL-316 | Red and white - Weight: 4.2 kg    |
| AL-318 | Black and yellow - Weight: 4.2 kg |

## Fixing tools for warning signs



|       |                                                                     |
|-------|---------------------------------------------------------------------|
| AC-21 | Small nickelled chain sold in bags of 10 units                      |
| AD-01 | Roundheaded screw anti-vandalism M3x15 sold in bags of 100 units    |
| AC-44 | Self-adhesive plastic plates Ø 40 mm for magnetic fixing (10 units) |

# Safety padlocks and warning signs

## Warning signs

Below 1000V

Padlocks

Warning signs and delineators

warning signs

### Self adhesive warning signs

Complete range of self adhesive, warning signs conditioned in box of 20, 30 or 50 units.



| Reference | Dimensions  | Characteristics   | Quantity/box |
|-----------|-------------|-------------------|--------------|
| AT-41/025 | 25 mm side  | self adhesive PVC | 50           |
| AT-41/05  | 50 mm side  | self adhesive PVC | 30           |
| AT-41/1   | 100 mm side | self adhesive PVC | 20           |
| AT-49/025 | 25 mm side  | self adhesive PVC | 50           |
| AT-49/05  | 50 mm side  | self adhesive PVC | 30           |
| AT-49/1   | 100 mm side | self adhesive PVC | 20           |
| AT-50/025 | 25 mm side  | self adhesive PVC | 50           |
| AT-50/053 | 50 mm side  | self adhesive PVC | 30           |
| AT-50/1   | 100 mm side | self adhesive PVC | 20           |
| AT-51/025 | 25 mm side  | self adhesive PVC | 50           |
| AT-51/05  | 50 mm side  | self adhesive PVC | 30           |
| AT-51/1   | 100 mm side | self adhesive PVC | 20           |
| AT-52/05  | 50 mm side  | self adhesive PVC | 30           |
| AT-52/1   | 100 mm side | self adhesive PVC | 20           |
| AT-53/05  | 50 mm side  | self adhesive PVC | 30           |
| AT-53/1   | 100 mm side | self adhesive PVC | 20           |
| AT-54/05  | Ø 50 mm     | self adhesive PVC | 30           |
| AT-54/1   | Ø 100 mm    | self adhesive PVC | 20           |
| AT-55/05  | Ø 50 mm     | self adhesive PVC | 30           |
| AT-55/1   | Ø 100 mm    | self adhesive PVC | 20           |
| AT-56/05  | Ø 50 mm     | self adhesive PVC | 30           |
| AT-56/1   | Ø 100 mm    | self adhesive PVC | 20           |
| AT-57/05  | Ø 50 mm     | self adhesive PVC | 30           |
| AT-57/1   | Ø 100 mm    | self adhesive PVC | 20           |
| AT-58/05  | Ø 50 mm     | self adhesive PVC | 30           |
| AT-58/1   | Ø 100 mm    | self adhesive PVC | 20           |
| AT-59/05  | Ø 50 mm     | self adhesive PVC | 30           |
| AT-59/1   | Ø 100 mm    | self adhesive PVC | 20           |
| AT-60/05  | Ø 50 mm     | self adhesive PVC | 30           |
| AT-60/1   | Ø 100 mm    | self adhesive PVC | 20           |
| AT-61/05  | Ø 50 mm     | self adhesive PVC | 30           |
| AT-61/1   | Ø 100 mm    | self adhesive PVC | 20           |
| AT-62/05  | Ø 50 mm     | self adhesive PVC | 30           |
| AT-62/1   | Ø 100 mm    | self adhesive PVC | 20           |
| AT-63/05  | Ø 50 mm     | self adhesive PVC | 30           |
| AT-63/1   | Ø 100 mm    | self adhesive PVC | 20           |
| AT-66/1   | 100 mm side | self adhesive PVC | 10           |



**"Customize your labels! On request"**

Available on request: Self adhesive rigid plastic warning signs. High Quality, strong sticking on every surfaces: concrete, painted wall, metal, wood, plastic, glass.

# Voltage detectors

## Voltage detectors

Below 1000V

Voltage detectors

Voltage detectors accessories

Insulation tester

Installation testers identifier

Multimeter clamp-meter

Infrared Thermometer

## Voltage multi-tester DETEX™ MS-911-EX

The DETEX MS-911-EX has been designed in compliance with IEC/CENELEC standard 61243-3 in response to the requirements of European standard EN 50110-1.

The device is a voltage detector which checks the absence of voltage (AC and DC) and a multi-tester.

It enables to:

- check the voltage levels from 6 to 690 Volts;
- check the continuity of disconnected electric circuit;
- find phase or neutral (by single pole method);
- determine polarities.

### A.C or D.C voltage test

voltage level testing by light-emitting diodes: 6, 12, 24, 50, 127, 230, 400, 690 V and emission of audible signal.

### Polarity Test

Presence of A.C voltage signalling by lighting of +6 and -6 V diodes.

Presence of D.C voltage signalling by lighting of the +6V or -6V diode.

### Phase/neutral identification

Signaling by lighting of the + 6V diode when the red probe is in contact with the phase.

### Continuity test

Continuity resistance lower than 80 Ohms is indicated by lighting of all diodes and emission of audible signal.

### Operating check

By short-circuit on the probes; all of the diodes light up, the audible signal sounds.

### Technical features

Field of use: from 6 to 690 V z or =

Frequency: 50-60 Hz

Operating temperature: -10 °C / +55 °C

Storage temperature: -25 °C / +55 °C

Protection level: IP54 / IK 06

Double insulation Class II 

Power supply by 9 volt 6LR61 type alkaline battery

IEC 61243-3

IEC-61243-3   
EN 50110-1

CE



Fits on safety power plug (patented)



M-87369

Storage bag

MS-911-EX

Delivered with power supply  
Weight: 0.370 kg

### ACCESSORIES

M-87369

Storage Bag

# Voltage detectors

## Voltage detectors

Below 1000V

Voltage detectors

Voltage detectors accessories

Insulation tester

Installation testers identifier

Multimeter clamp-meter

Infrared Thermometer

## Voltage multi-tester with phase rotation DETEX™ MS-911/2

The DETEX MS-911/2 has been designed in compliance with IEC/CENELEC standard 61243-3 in response to the requirements of European standard EN 50110-1.

The device is a voltage detector which checks the absence of voltage (AC and DC) and a multi-tester.

It enables to:

- check the voltage levels 12 to 400 Volts;
- check the continuity of disconnected electric circuit;
- find phase or neutral (by single pole method);
- Control the phase rotation;
- Determine polarities.

It is equipped with IP2X safety test probes.

### A.C or D.C voltage test

voltage level testing by light-emitting diodes: 12, 24, 50, 127, 230, 400V and emission of audible signal.

### Polarity Test

Presence of A.C voltage signaling by lighting of +12 and -12 V diodes.

Presence of D.C voltage signaling by lighting of the +12V or -12V diode.

### Phase/neutral identification

Signaling by lighting of the + 12V and -12V diodes with audible signal when the red probe is in contact with the phase.

### Phase rotation

Signaling by lighting of a green diode when the rotation is correct and by a red diode when the rotation is not correct.

Control method with only two safety test probes.

### Continuity test

Continuity resistance lower than 80 Ohms is indicated by lighting of all diodes and emission of audible signal.

### Operating check

By short-circuit on the probes; all of the diodes light up, the audible signal sounds.



IEC-61243  
EN 50110-1

CE

MS-911/2

Delivered with power supply  
Weight: 0.370 kg

M-87369

Storage Bag

### Technical features

Field of use: From 12 to 400 V A.C and D.C

Frequency: 50/60 Hz

Operating temperature: -10/+55°C

Storage temperature: -25/+55°C

Protection level: IP54

Double insulation Class II

Power supply by 9 volt 6LR61 type alkaline battery

## Phase rotation indicator DETEX™ MS-152+

Signaling via the successive lighting of diodes symbolising rotation. Input terminals are connected to the corresponding phases

(green, yellow, brown):

correct connection: lighting according to "OK" order,

incorrect connection: "REVERSE" order lighting: reverse 2 phases.

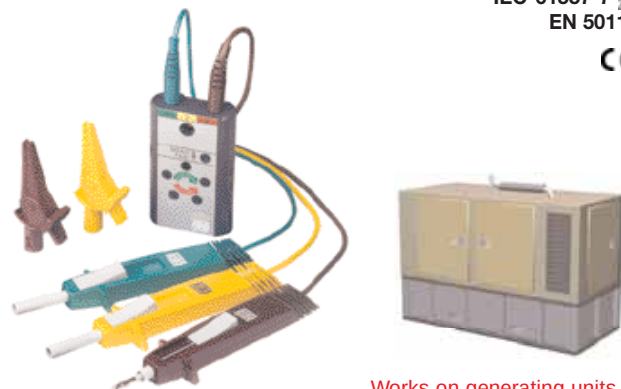
"FAULT" diode lits: phase cut off or incorrectly connected.

90 to 400 V - 50/60 Hz / IP54 IK06 / CAT III.

Works on generating units.

Device delivered in storage bag with:

3 probes with retractable protectors and 1.20 m lead - yellow, green and brown - clamps - yellow and brown, 2 insulated crocodile clamps.



IEC-61557-7  
EN 50110

CE

MS-152+

Delivered complete with storage bag  
Weight: 0.380 kg - 60 x 100 x 25 mm

Works on generating units

# Voltage detectors



Below 1000V

Voltage detectors

Voltage detectors accessories

Insulation tester

Installation testers identifier

Multimeter clamp-meter

Infrared Thermometer

## Contact probes for L.V. tester

To be used only with MS-911-EX or MS-911/2 tester.  
For overhead lines  
Contact antennas serve as suspension hooks.  
Marked with standard colours: black and red.  
Total length: 1.25 m.

**MS-8014** 2 probes, in bag 50 x 130 x 1.300 mm - 0.40 kg

To be used only with MS-911-EX or MS-911/2 tester.  
For installations  
Round tip contact. Total length: 0.50 m.

**MS-8013** 2 probes, in bag 50 x 150 x 470 mm - 0.750 kg



## Voltage take-off punch

The voltage take-off punch is able to make an insulating piercing on a low voltage wire to plug a measurement device.  
Fit with pin or safety test probe with 4 mm diameter.

| Reference    | Capacity (Ø mm) | Weight (kg) |
|--------------|-----------------|-------------|
| <b>MS-62</b> | 5.6 - 14.4      | 0.015       |
| <b>MS-63</b> | 12 - 31         | 0.05        |



## POINTEST™ Safety test probes for voltage detectors

Safety test probe for voltage detector use only.  
4 mm retractable shrouded plug, 4 mm standard socket or 1,20 m double sheathed lead, Probe 26 mm length, 1 000 V A.C or D.C, IP2X.

IEC 61010-2-031



**CX-35811** Green safety test probe 1.20 m lead  
**CX-45211** Brown safety test probe 1.20 m lead  
**CX-45511** Black safety test probe 1.20 m lead  
**CX-45411** Yellow safety test probe 1.20 m lead



## Safety crocodile clamps

Crocodile clamps.  
Fully insulated crocodile clamps with large jaw opening: 20 mm.

IEC 61010-2-031



**CX-01222** 5 brown crocodile clamps  
**CX-01422** 5 yellow crocodile clamps  
**CX-01822** 5 green crocodile clamps  
**DX-02006** 2 crocodile clamps - black and red



### Insulation tester

The insulation resistance of an installation must be checked periodically and when it is commissioned. Furthermore, a measurement of the insulation resistance of the entire installation (or group of circuits) may be necessary when troubleshooting.

#### Operating principle

The measurement voltage shall be 500 V DC (for installations operating at 500 V or less) in order to detect any insulation defect between two cables that are normally isolated from each other. The choice of a high test voltage provides an easier means of demonstrating a latent insulation fault (conventional ohmmeters only output a few volts).

An installation is declared to be conform if the insulation resistance is  $> 500 \text{ k}\Omega$ .

The DT-500 insulation tester provides an easy, fast and safe means of making this measurement.

The insulation tester DT-500 is designed to test in total safety the insulation resistance of a low voltage installation.

DT-500 is equipped with:

- 3 safety test probes IP2X
- 1 red safety test probe (phase)
- 1 Yellow/green safety test probe (earthing)
- 1 blue safety test probe (neutral) raccordable (Fig.3) on a safety plug
- 3 safety crocodile clamps (red, yellow/green and blue).

It enables to test the insulation resistance between each active wire and the earth (Fig.1). For fragiles receptors (electronics), we recommend to use the third blue test probe. In this configuration, the neutral and the phase are linked together which avoids any damage on electronic components (Fig.2).

#### Insulation resistance test

**When the DT-500 is connected to a low voltage switch off installation it output 500 V DC.**

Signaling by a blue flashes diode. During the measurment the diodes light up in sequence.

The value is indicated on one of the diodes:

Red between: 0, 300, 400  $\text{k}\Omega$ .

Green between: 500, 600, 700, 800, 900, 1000  $\text{k}\Omega$  and  $\infty$ .

#### Complete safety

The DT-500 is equipped with a safety system. If it is connected on a live installation, a flashes red warning diode light and measurement is impossible.

#### Technical characteristics

our insulation tester is designed according to standard EN 61557-2.

It also respects international electrical safety standard IEC 61010-1.

- Output voltage 500 V DC.
- Nominal output current at 500 V: 1 mA.
- Measurement range 0 +  $\infty$ .
- IP54, IK06.
- Batteries 4 x LR6.
- Size 213 x 75 x 46 mm.
- Storage temperature:  $-25^\circ\text{C}/+70^\circ\text{C}$ .
- Usage temperature:  $-15^\circ\text{C}/+45^\circ\text{C}$ .

CEI 61010-1  
EN 61557-2



Fig. 1

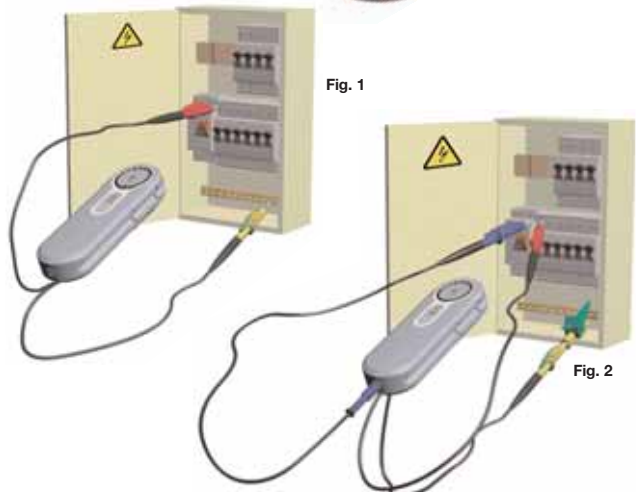


Fig. 2



Fig. 3



M-87-292

DT-500

Delivered complete with batterie, accessories and a storage plastic case  
Weigth: 0.6 kg

M-87292

Storage bag for DT-500 - 280 x 180 x 70

# Installation testers



Below 1000V

Voltage detectors

Voltage detectors accessories

Insulation tester

Installation testers identifier

Multimeter clamp-meter

Infrared Thermometer

## CATEX™ NG DT-170 RCDs (Residual Current Devices) tester

The main function of the DT-170 is to test and measure the trip values of RCDs (Residual Differential Devices):

- in trip time (expressed in ms) or
- in trip current value (expressed in mA).

This enables 10mA / 30mA / 300mA and 500mA differential circuit breakers to be tested irrespective of their type (normal or delayed S).

The backlight, dual colour screen immediately informs you whether the values measured are compliant (blue) or not compliant (red). To make your testing missions easier, the DT-170 can be used directly on 2P+T sockets.

Selection of the differential type and measurement type:

Before testing an RD, you must select the characteristics on the display (sensitivity, delayed or not) together with the type of test that you are required to perform (trip time or current).

Comment: The selection can be made with the appliance unconnected (switch on the appliance in this case) or connected to the socket (the appliance then switches on automatically).

- Selecting the RCD sensibility:
- Normal/Delayed selection:
- Selecting 0∞ or 180∞∞
- Selecting the type of test (current or time).

The digital result is shown and the backlighting:

- stays blue if the result is correct
- goes to red if the values are not compliant

This comprehensive appliance can also be used to test the conformity of the network (\*Caution, CATEX NG is not a voltage detector), to indicate the phase and to test the connection of the earthing conductor.

### Technical characteristics

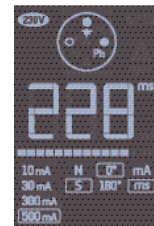
- 3-digit measurement display
- Operates on a TT neutral and TN system
- Operating voltage: 230 V (Ph/N)-10/+6% 50/60 Hz
- Operating temperature: -15°C/+45°C
- Storage temperature: -25°C/+45°C
- IP40
- Cat III 600 V

- Double insulation
- 7.2 V, 110 mA/H Ni-MH battery
- IEC 61010-1
- IEC 61557-6 NF EN 61557-6
- IEC 61236 (EMC)

Locking and warning signals for 400 V network voltage and contact potential >50V

CEI 61 010-1  
NF EN 61557-6

CE



Example of trip time value measure



Example of 400 V tension between phases

DT-170

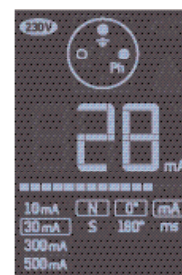
Dimensions: 71 x 210 x 51 mm  
Weight: 360 g



Control over board with M-952271



M-952271



Example of trip current value measure

### ACCESSORIES

M-952271 Lead set for checks on L.V distribution board (for DT-110/DT-150/DT-300 only)

M-881954 Socket adaptorator UK

# Installation testers

## Installation testers identifier

Below 1000V

Voltage detectors

Voltage detectors accessories

Insulation tester

Installation testers identifier

Multimeter clamp-meter

Infrared Thermometer

## Earth and continuity loop controllers CATOHM™

### "TT" network

The CATOHM earth and continuity loop controller enables:

- checking electrical resistance level of local earth socket, indicating by LCD display:
  - back lighting blue (1) if the value is above 100  $\Omega$
  - back lighting red (3) if the value is
    - uper than 100  $\Omega$
    - incorrect voltage (2)
    - earth not corrected (2)
- checking the presence and level of voltage at the connection terminals of a live 10/16 A socket,
- checking the integrity of the earth circuit (continuity < 2  $\Omega$ ), correct polarity (position of the phase and the neutral is indicated),
- checking electrical continuity of metal masses.

Operating voltage: 230V - 10% / + 6%

Frequency: 50/60 Hz

Temperature of use: -15°C/+45°C

IP 40

Fuse protection: 2 fuses 5 x 20 mm,

160 mA, (delayed fuse).

Class II category III

Delivered with wound-up extension.

Weight: 0.340 kg.

Dimensions: 71 x 210 x 51 mm.

IEC 61010-1  
EN 61557-4



Figure 1



Figure 2



Figure 3



DT-300

DT-300

For use on schuko socket

### ACCESSORIES

- M-87-292 Storage bag
- M-92-2271 Lead set for checks on L.V distribution board (for DT-110/DT-150/DT-300 only)
- M-95-1143 Small 2 parts pole for working at a distance - 0.8 m
- M-92-1647 Wound-up extension



Figure 4



M-87292



M-92-1647



M-952271



M-951143

# Installation testers



Below 1000V

## Digital multimeter- Cat III 600 V

This digital multimeter is compact 3 1/2 digit. For measuring DC and AC voltage and current, resistance, continuity and temperature.

- AC frequency response: 40 - 400 HZ
- DC voltage: 200 mV/2 V/20 V/200 V/600 V
- AC voltage: 200 mV/2 V/20 V/200 V/600 V
- DC current: 200  $\mu$ A/2000  $\mu$ A/200 mA/2 A/10 A
- AC current: 200  $\mu$ A/2000  $\mu$ A/200 mA/2 A/10 A
- Resistance: 200  $\Omega$ /2 k $\Omega$ /20 k $\Omega$ / 200 k $\Omega$ /2 M $\Omega$ /20 M $\Omega$
- Capacitance: 20  $\mu$ F 200  $\mu$ F/2  $\mu$ F/20  $\mu$ F/200  $\mu$ F/1000  $\mu$ F

### General specifications

- 3 1/2 digital multimeter, 30 ranges, 70 x 50 mm LCD display, 1999 counts max.
- Back light, data hold
- Diode, triode performance testing, continuity test (audible)

### General characteristics

- Battery: 3 x 1.5 V AAA batteries
- Low battery indication level on LCD
- Operation temperature: 0°C / 40°C, < 75%RH
- Storage temperature: -10°C / 50°C, < 85%RH



CE

**MX-701** 158 x 75 x 35 mm - Weight: 200 g

## Digital clamp meter - Cat III 600 V

This digital clamp meter is compact 3 1/2 digit.

Autorange for measuring DC and AC voltage, AC current, resistance, diode, continuity and temperature.

AC current: 2 A - 600 A.

AC voltage: 2 V - 600 V. DC voltage: 0.2 V - 600 V.

Resistance: 200  $\Omega$  - 20 M $\Omega$ . Continuity: buzzer (< 50  $\Omega$ ).

Temperature range: -40°C/+1000°C -40°F/-1832°F.

### General specifications

- Display: 3 1/2 digit LCD with a max. reading of 1999
- Polarity: auto polarity indication
- Overrange indication: "OL" or "-OL"
- Automatic zeroing function
- Sensor: clamp-shape transformer for AC measurement
- Jaw opening capability:  $\varnothing$  36 mm
- Max. measurable conductor:  $\varnothing$  30 mm

### General characteristics

- Battery: 2 x 1.5 V AAA batteries
- Low battery indication
- Operation temperature: 0°C / 40°C, < 75% RH
- Storage temperature: -20°C / 60°C, < 85% RH



CE

**MX-702** 190 x 70 x 38 mm - Weight: 220 g

## POINTEST™ Safety test probes for multimeter and clamp-meter

Safety test probes for multimeter and clamp-meter use only.

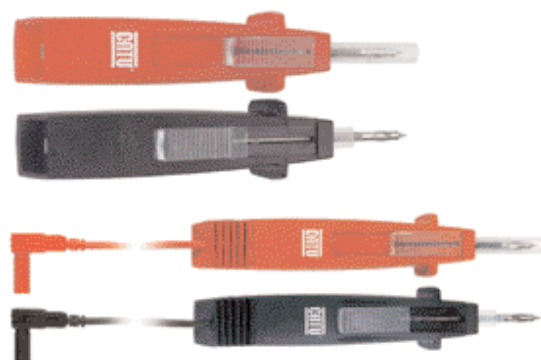
4 mm retractable shrouded plugs, 4 mm standard

socket or 1.20 m double sheathed lead,

Probes 26 mm length, 1 000 V A.C or D.C, IP2X.

**DX-02001** Set of 2 contact probes, black and red with socket

**DX-02002** Set of 2 contact probes, black and red 1.20 m lead



# Installation testers

## Infrared Thermometer

Below 1000V

Voltage detectors

Voltage detectors accessories

Insulation tester

Installation testers identifier

Multimeter clamp-meter

Infrared Thermometer

### Infrared Thermometer

MX-704 is a thermometer based on the infrared technology. It is particularly adapted to detect the abnormally warm points in the electrical installations.

IEC 61000-4-2   
IEC 61000-4-8   
EN 61326  
CE

#### Technical characteristics:

- Temperature range: -20/+500°C
- Accuracy:  $\pm 2^{\circ}\text{C}$  from -20°C to 100°C
- Distance/Spot ration: 8:1
- Thermopile: 5-14  $\mu\text{m}$
- Resolution: 0.2°C
- Battery type: 9V



MX-704

150 x 133 x 45 mm - Weight: 135g



## Low voltage product display

Protective equipment

Warning signs

Safety padlocks

Voltage detectors

Insulated tools 1000V

**The major products are now at your electrical dealer's**

# Short-circuiting and earthing systems

## Overhead lines systems

Below 1000V

Overhead lines systems

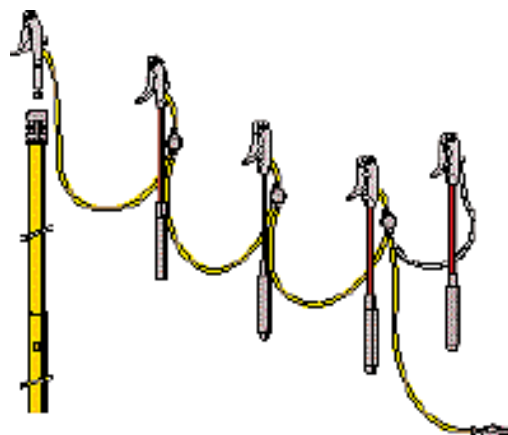
Consumer units system

Jumper cables

## Short-circuiting systems for bare L.V. overhead lines

For conductors: 3 - 15 mm Ø.  
Easily attached by snapping on with a firm downward pull.  
Released by lateral swinging, no need to push upwards.  
First grip installed by insulating stick.  
First clamp/stick connection has automatic ratchet.  
Waterproof bag.  
To be completed with earthing equipment. See page 32.

IEC 61230

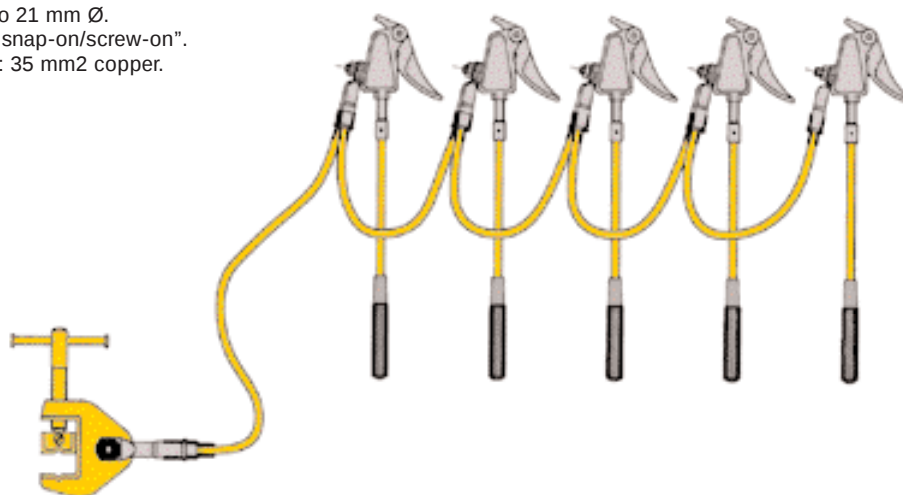


Packaging: waterproof bag 250 x 85 x 1 160 mm.

| Reference | Rating (kA/1s) | Short-circuit cables (mm <sup>2</sup> ) | Weight (kg) | Number of clamps    | Insulated telescopic stick |
|-----------|----------------|-----------------------------------------|-------------|---------------------|----------------------------|
| MT-404    | 3              | 16                                      | 3.4         | 3 MT-411/1 MT-411-C | CE-2-21-C/length: 2 m      |
| MT-405    | 3              | 16                                      | 3.8         | 4 MT-411/1 MT-411-C | CE-2-21-C/length: 2 m      |
| MT-406    | 3              | 16                                      | 4.2         | 5 MT-411/1 MT-411-C | CE-2-21-C/length: 2 m      |
| MT-407    | 3              | 16                                      | 4.6         | 6 MT-411/1 MT-411-C | CE-2-21-C/length: 2 m      |

## Short-circuiting and earthing systems

Lowlock system:  
For conductors 3 to 21 mm Ø.  
With clamps type "snap-on/screw-on".  
Connecting cables: 35 mm<sup>2</sup> copper.



| Reference    | Rating (kA/1s) | Weight (kg) | Composition                                                                                                                                                |
|--------------|----------------|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MT-615/1-7,5 | 7.5            | 3           | 5 MT-616/1-03 contact clamps on handles (l = 0.35 m each)<br>4 braids of M-24-35 copper cable (1.00 m)<br>1 M-87-153 carrying bag 250 x 85 x 750 mm        |
| MT-615/2-7,5 | 7.5            | 6.5         | 5 MT-616/1-03 contact clamps on handles<br>4 braids of M-24-35 copper cable (1.00 m)<br>1 braid of M-24-35 copper cable (7.00 m)<br>1 MT-840/1 earth clamp |

For other models, please consult us.

# Short-circuiting and earthing systems

Overhead lines systems

Below 1000V

Overhead lines systems

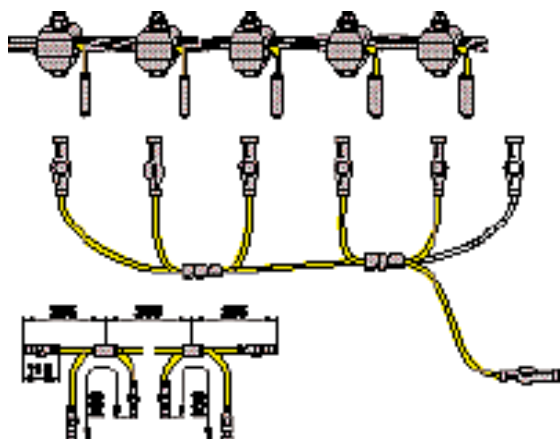
Consumer units system

Jumper cables

## Short-circuiting systems for insulated L.V. overhead lines

Connected to female sockets permanently installed on power lines. Equipment includes either 5 or 6 copper-aluminium alloy stubs with bayonet locking and insulating cap. To be completed with earthing equipment. See below.

IEC 61230   
CE



Packaging: polypropylene case - 234 x 215 x 75 mm.

| Reference | Rating (kA/1s) | Short-circuit cables (mm <sup>2</sup> ) | Weight (kg) | Composition |
|-----------|----------------|-----------------------------------------|-------------|-------------|
| MT-205    | 4              | 16                                      | 1.10        | 5 stubs     |
| MT-206    | 4              | 16                                      | 1.50        | 6 stubs     |
| MT-207    | 4              | 16                                      | 1.9         | 7 stubs     |

## Earthing equipment

Earthing equipment with bayonet splicing. Earth rod to be ordered separately. See below.



| Reference | Weight (kg) | Cable (m x mm <sup>2</sup> ) | Earth clamp |
|-----------|-------------|------------------------------|-------------|
| MT-244    | 2.5         | 10 x 10                      | MT-841      |
| MT-245    | 3.0         | 10 x 16                      | MT-840/1    |
| MT-248    | 3.0         | 15 x 10                      | MT-841      |
| MT-249    | 3.8         | 15 x 16                      | MT-840/1    |



Packaging: polypropylene case - 234 x 215 x 75 mm.

## Earth rod

For use with earthing equipment  
Hexagonal 18 mm per side.  
Galvanized steel.



MT-650 Length: 1 m - Weight: 2.2 kg

# Short-circuiting and earthing systems

Consumer units  
system

Jumper cables

Below 1000V

Overhead lines systems

Consumer units system

Jumper cables

## Short-circuiting system for consumer units

The link assemblies, included in this equipment, consist of extra flexible 16 mm<sup>2</sup> multistrand copper cable with an IEC 1230 silicone envelope, recommended for indoor equipment.

The elements contained in the case can be used for establishing the equipment suited to the unit to be processed.

The cartridge equipment is intended for HBC 22 x 58 mm fuse cartridge connection boxes and knife cartridges size 00.

The knife equipment is intended for connection boxes or knife switch networks.

The mini-clip equipment is designed for the short-circuiting of take-off boxes more particularly using intermediate parts (sockets with 10 mm Ø terminals and M8 hexagonal end).

The standard equipment for a three phase installation includes: the sets of cartridges, knives or mini-clips for adaptation to any type of unit, the interconnecting assemblies consisting of 4 extra flexible 16 mm<sup>2</sup> copper cables connected at the center by a connector, 1 installation and crimping kit.

Rating: 4 kA/1s

Weight: 4.3 kg.



| Reference | Composition                                                                                                                                                                                                                                                               |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MC-290/2  | 8 cartridges<br>8 cartridges type "00"<br>8 clamps<br>8 M8 connections<br>2 (280 x 320 mm) cable connections<br>2 (370 x 440 mm) cable connections<br>1 M8 key wrench<br>1 right angle hexagonal key wrench 4 mm<br>1 13/17 and 14 mm open end spanner<br>1 handle MC-161 |

## Short-circuiting system for L.V equipment ISOSTOP™ system

Rating: 6 kA/1S

Standard equipment composition: 1 or 2 sets of 3 knives, cables connections: H07 RN-F 25 mm<sup>2</sup>, 1 earth clamp MT-841  
1 handle MC-161.

| Reference | Composition                             | Weight (kg) |
|-----------|-----------------------------------------|-------------|
| MC-165/40 | 3 MC-160<br>earth cable 0.60 m          | 4.00        |
| MC-175/40 | 3 MC-115<br>earth cable 0.60 m          | 3.75        |
| MC-166/40 | 3 MC-115 3 MC-160<br>earth cable 0.60 m | 5.60        |
| MC-166/60 | 3 MC-115 3 MC-160<br>earth cable 6 m    | 7.50        |



## Jumper cable with clamps on insulated handle

2 clamps on insulated handle - MT-315

Capacity (mm): Ø 4 - 27 - 40

Cable connection: 35 mm<sup>2</sup>

Rating: 6 kA/1s

Continuous rating: 75 A

Clamp material: copper aluminium alloy

1 insulated cable

Length: 1 m, Section: 25 mm<sup>2</sup>.

|          |                                                 |
|----------|-------------------------------------------------|
| MT-315/2 | Dimensions: 40 x 60 x 910 mm - Weight: 0.530 kg |
|----------|-------------------------------------------------|



LOW VOLTAGE

# Short-circuiting and earthing systems

Consumer units system

Below 1000V

Overhead lines systems

Consumer units system

Jumper cables

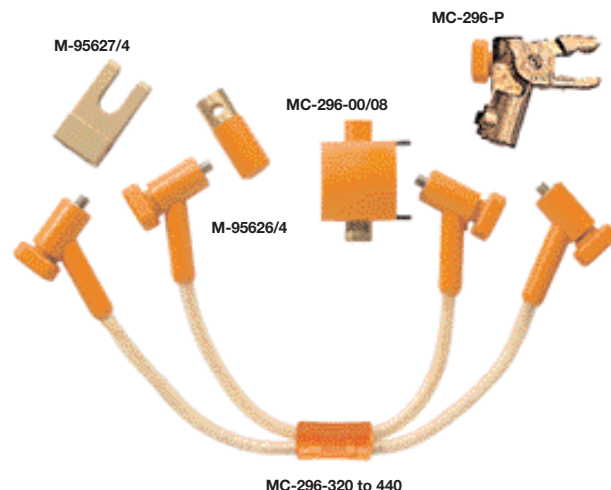
## Short-circuiting equipment

Connecting set formed by extra flexible multi-strand copper cables 16 mm<sup>2</sup> with silicon sheath according IEC-61230.  
Wide use temperature range (-40°C, +70°C).  
No toxic smokes emission in case of short circuit.

IEC 61230 

| Reference  | Designation                  |
|------------|------------------------------|
| MC-296-440 | Connection set 440 + 370 mm* |
| MC-296-320 | Connection set 320 + 280 mm* |

\* Other models and length on request.



Set of: cartridge, connecting blade and jumper clamp.

| Reference       | Designation                 |
|-----------------|-----------------------------|
| M-95627/4*      | Connecting blade            |
| M-95626/4*      | Round cartridge HPC 22 x 58 |
| MC-296-00/08/4* | Cartridge size 00           |
| MC-296-P/4*     | Jumper clamp                |

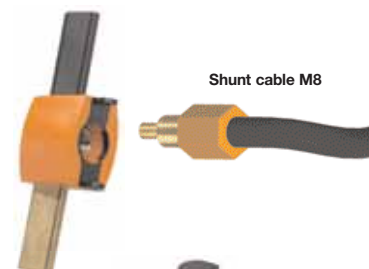
Case (340 x 250 x 80 mm) for specific set. Réf.: M-91209.

\* Set of 4.

|        |                    |
|--------|--------------------|
| MC-161 | Manceuvring handle |
|--------|--------------------|

Case (340 x 250 x 80 mm) for specific set. Réf.: M-91209.

MC-296-115/12 or MC-296-115/08



Shunt cable M8

MC-161

MC-296-160/12

Connection set M8 or M12



## Connecting blades M8 or M12

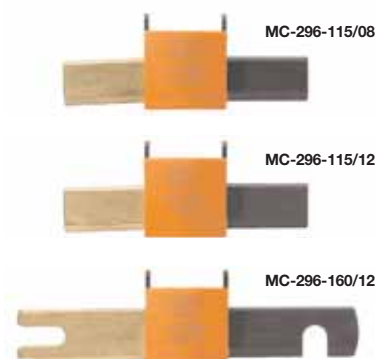
| Reference        | Designation             |
|------------------|-------------------------|
| MC-296-115/08/4* | Between axes 115 mm M8  |
| MC-296-115/12/4* | Between axes 115 mm M12 |
| MC-296-160/12/4* | Between axes 160 mm M12 |

\* Set of 4.

To be used with jumper cable (M8 or M12) connection cable (on request).

Additional equipment:

- Jumper cable (see page 41)
- Threated adapter (see page 42)



# Short-circuiting and earthing systems

## Jumper cables

Below 1000V

Overhead lines systems

Consumer units system

Jumper cables

### Mini jumper clamps fully insulated for switchboard use

These clamps are specially designed for use on energized parts in LV installations (switchboards, etc.) to make temporary connections when limited space is available. Models with jaws designed to axially grip conductors can be used on threaded bolts or shanks and nuts. The MC-142 model, whose size has been reduced to the strict minimum, is designed to be tightened with a nut wrench. All other models in this series tighten with T-handle screw. All clamps receive cable terminals with ISO 8 mm pitch threading as in the MC-153 series (described below). Current rating: 200 A.



| Reference | Clamp capacity to main conductor                                                                               | Orientation with respect           | Size (mm)     | Weight (kg) |
|-----------|----------------------------------------------------------------------------------------------------------------|------------------------------------|---------------|-------------|
| MC-141    | Six-sided 17-19 mm                                                                                             |                                    | 71 x 150 x 24 | 0.26        |
| MC-142    | Round 6-10 flat 0-5 mm                                                                                         | Axial (at cable end) + transversal | 58 x 38 x 33  | 0.130       |
| MC-142/1  | With handle. Round 6-10 flat 0-5 mm                                                                            | Axial (at cable end) + transversal | 58 x 38 x 33  | 0.140       |
| MC-143    | Flat bar, thickness 2-25 mm                                                                                    |                                    | 67 x 145 x 26 | 0.230       |
| MC-144    | Round 8-12 square 9-10 mm                                                                                      | Axial (at cable end)               | 150 x 75 x 23 | 0.280       |
| MC-145    | 16-75 mm <sup>2</sup>                                                                                          | Transversal                        | 110 x 70 x 23 | 0.220       |
| MC-146    | 38-240 mm <sup>2</sup>                                                                                         | Transversal                        | 110 x 70 x 23 | 0.230       |
| MC-147    | Threaded rod M8                                                                                                |                                    | 66 x 98 x 25  | 0.18        |
| MC-147/1  | Threaded rod M10                                                                                               |                                    | 66 x 98 x 25  | 0.195       |
| MC-148    | Clamp with tapped revolving rod end M8, 200 A shunt. To be used with an insulated six-sided male hex key 5 mm. |                                    | 66 x 80 x 25  | 0.175       |
| MC-148/1  | Clamp with tapped revolving rod end M8 for 10 to 50 mm cable                                                   |                                    | 66 x 80 x 25  | 0.175       |
| MC-149    | Bar 20-30 mm width                                                                                             |                                    | 56 x 165 x 58 | 0.486       |

### Jumper cables with threaded ferrules

To be used in conjunction with any of the clamps described above to make jumper equipment suit most any need both quickly and easily. Cable is IEC-60245 type, either 35 mm<sup>2</sup> current rating: 200 A or 50 mm<sup>2</sup> current rating: 250 A, depending on the models. Delivered with screwing ISO M8.



Section: 50 mm<sup>2</sup>

Section: 35 mm<sup>2</sup>

|           |                                   |
|-----------|-----------------------------------|
| MC-153/05 | Length: 0.50 m - Weight: 0.270 kg |
| MC-153/10 | Length: 1.00 m - Weight: 0.570 kg |
| MC-153/30 | Length: 3.00 m - Weight: 1.720 kg |
| MC-153/60 | Length: 6.00 m - Weight: 3.460 kg |

|           |                                   |
|-----------|-----------------------------------|
| MC-155/05 | Length: 0.5 m - Weight: 0.380 kg  |
| MC-155/10 | Length: 1.00 m - Weight: 0.760 kg |
| MC-155/20 | Length: 2.00 m - Weight: 1.520 kg |
| MC-155/30 | Length: 3.00 m - Weight: 2.280 kg |
| MC-155/60 | Length: 6.00 m - Weight: 4.560 kg |
| MC-155/80 | Length: 8.00 m - Weight: 6.080 kg |

# Short-circuiting and earthing systems

## Jumper cables

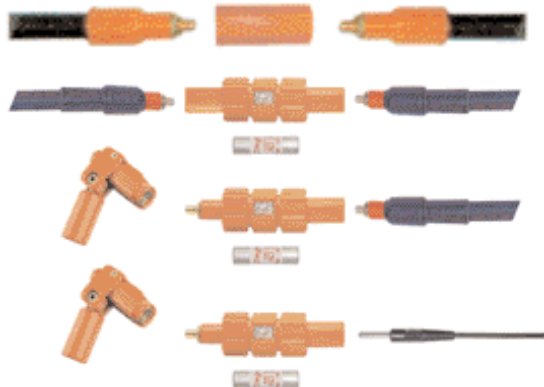
Below 1000V

Overhead lines systems

Consumer units system

Jumper cables

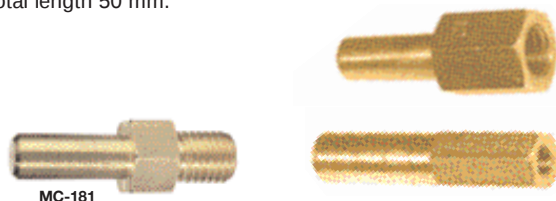
### Jumper cable with insulated jumper clamps



| Reference |                        | Size (mm)    | Weight (g) |
|-----------|------------------------|--------------|------------|
| MC-121    | Junction for shunt M8  | Hexa. 22 L60 | 0.055      |
| MC-122    | Fuse holder for shunt  | Ø 35 L125    | 0.130      |
| MC-123    | Fuse holder for shunt  | Ø 35 L125    | 0.140      |
| MC-124    | Fuse holder for clamps | Ø 35 L125    | 0.140      |

### Threaded adapter

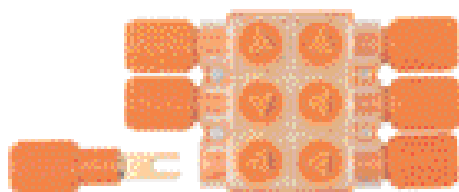
Cylindrical body diameter 10 mm to fits on panel network thread.  
Total length 50 mm.



|        |                                                          |
|--------|----------------------------------------------------------|
| MC-181 | 4 adapters for short-circuiting - M12<br>Weight: 0.05 kg |
| MC-182 | 4 adapters M8<br>Width: 50 x 10 mm – Weight: 0.027 kg    |
| MC-183 | 4 adapters M12<br>Width: 50 x 17 mm – Weight: 0.048 kg   |

### Tap off box

The tap off box allows on each side to connect 3 by pass jumpers type MC-153/... is delivery equipped with six removable fittings type MC-156/1 and an insulating wrench. This item in conjunction with by pass jumpers allows to shunt a tap off box by means of a second tap off box. Current rating 200 A.



|          |                                  |
|----------|----------------------------------|
| MC-156   | 40 x 80 x 158 mm                 |
| MC-156/1 | Spare part                       |
| MO-237-D | Triangular spanner with T handle |

### Jumper cable with insulated jumper clamps

2 clamps MC-120  
Spring tightening. Connector for 8 mm cable Ø.  
Tightening capacity: 12 mm (diameter - flat).  
Rated insulation: 1 500 V. Rating 5 (kA/1s).  
Continuous rating 75 A. 1 insulated cable  
25 mm<sup>2</sup> section.



| Reference  | Cable length (m) | Weight (kg) |
|------------|------------------|-------------|
| MC-120/15  | 1.50             | 0.850       |
| MC-120/50  | 5.00             | 1.950       |
| MC-120/100 | 10.00            | 4.000       |

### Shunt Telescopic probe

This probe is completely insulated through the end, and includes a retractable shroud containing a 10 mm diameter copper braided stem that connects to device terminals and network connector boards. The female screw socket allows attachment to shunt cables. Nominal current: up to 250 A.



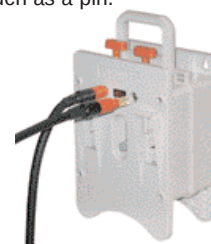
|          |                                                                                |
|----------|--------------------------------------------------------------------------------|
| MC-126   | Connector with insulated probe<br>1.5 to 16 mm In 60 A - 65 x 185 x 29 - 0.130 |
| MC-126/1 | Connector with insulated probe<br>10 to 70 mm In 100 A - 65 x 185 x 29 - 0.166 |



|        |                                     |
|--------|-------------------------------------|
| MC-150 | Ø 33 mm L 180 mm - Weight: 0.160 kg |
|--------|-------------------------------------|

### Jumper connecting box with fuse

The shunt for collective channeling is a box used to make sure, before proceeding to the replacement of/removing a molten fuse situated on a channeling, that the defect which brought about the molten is eliminated. This box is used with a fuse when the (nominal) assigned intensity of the channeling is < 100 A and with 2 fuses when this intensity is included between 100 A and 200 A. It can also be used to open a circuit in load, for example to change a damaged accessory such as a pin.



|        |                                                     |
|--------|-----------------------------------------------------|
| MC-116 | Shunt for collective channeling<br>from 30 to 200 A |
|--------|-----------------------------------------------------|

# Bimaterial insulated tools

## Screwdrivers

Below 1000V

Screwdrivers

Cutters and pliers

Tool sets

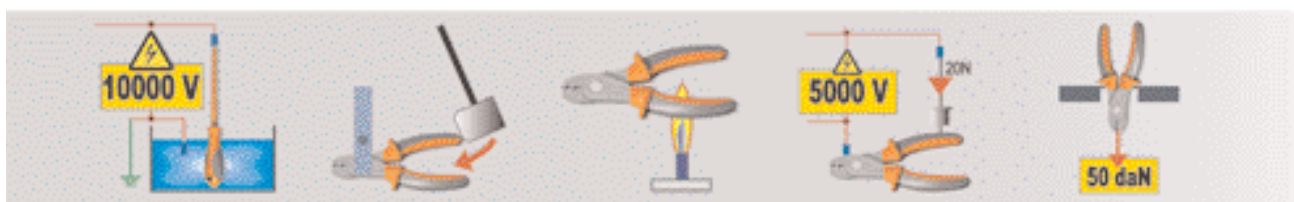
# ISOMIL™ 2



1000 V  
IEC60900 EN60900

The new range of bimaterial insulated tools for live working up to 1 000 Volts according to IEC 60900 standard.

Each ISOMIL tool is controlled and tested to 10 000 volts. This ensured by strict quality control procedures.



## Flat blade screwdrivers

Chrome - molybdenum vanadium steel blade.



| Reference | Characteristics    | Weight (g) |
|-----------|--------------------|------------|
| MO-72003  | Blade 3 x 100 mm   | 40         |
| MO-72004  | Blade 3.5 x 100 mm | 43         |
| MO-72005  | Blade 4 x 100 mm   | 58         |
| MO-72006  | Blade 5.5 x 125 mm | 76         |
| MO-72007  | Blade 6.5 x 150 mm | 112        |
| MO-72009  | Blade 8 x 175 mm   | 171        |



## POZIDRIV screwdrivers

Chrome - molybdenum vanadium steel blade.



| Reference | Characteristics      | Weight (g) |
|-----------|----------------------|------------|
| MO-72040  | n°0 head 3 x 60 mm   | 37         |
| MO-72042  | n°1 head 4.5 x 80 mm | 58         |
| MO-72044  | n°2 head 6 x 100 mm  | 91         |
| MO-72046  | n°3 head 8 x 150 mm  | 170        |



# Bimaterial insulated tools

## Cutters and pliers

Below 1000V

Screwdrivers

Cutters and pliers

Tool sets

### Universal plier

Special steel, chrome mat finished.

| Reference | Length (mm) | Cutting capacity                            | Weight (g) |
|-----------|-------------|---------------------------------------------|------------|
| MO-72102  | 180         | For copper and aluminium<br>Ø max (mm): 2.5 | 255        |



### Bent snipe nose plier

Special steel, chrome mat finished.

| Reference | Length (mm) | Cutting capacity                            | Weight (g) |
|-----------|-------------|---------------------------------------------|------------|
| MO-72142  | 160         | For copper and aluminium<br>Ø max (mm): 2.5 | 140        |



### Flat nose plier

Special steel, chrome mat finished.

| Reference | Length (mm) | Weight (g) |
|-----------|-------------|------------|
| MO-72132  | 160         | 140        |



### Round nose plier

Special steel, chrome mat finished.

| Reference | Length (mm) | Weight (g) |
|-----------|-------------|------------|
| MO-72122  | 160         | 140        |



### Side cutter

Special steel, chrome mat finished.

| Reference | Length (mm) | Cutting capacity                            | Weight (g) |
|-----------|-------------|---------------------------------------------|------------|
| MO-72162  | 160         | For copper and aluminium<br>Ø max (mm): 4.0 | 212        |



### Cable cutter

Special steel, chrome mat finished.

| Reference | Length (mm) | Cutting capacity                            | Weight (g) |
|-----------|-------------|---------------------------------------------|------------|
| MO-72200  | 160         | For copper and aluminium<br>Ø max (mm): 5.0 | 238        |



### Wire stripping plier

Special steel, chrome mat finished.

| Reference | Length (mm) | Cutting capacity                            | Weight (g) |
|-----------|-------------|---------------------------------------------|------------|
| MO-72172  | 160         | For copper and aluminium<br>Ø max (mm): 5.0 | 166        |



### Water pump plier

Special steel.

| Reference | Length (mm) | Weight (g) |
|-----------|-------------|------------|
| MO-72155  | 250         | 347        |



# Bimaterial insulated tools



Tool sets

Below 1000V

Screwdrivers

Cutters and pliers

Tool sets

## Screwdrivers kit

| Reference | Composition                                   |
|-----------|-----------------------------------------------|
| KIT-23    | MO-72004 Flat blade screwdriver 3.5 x 100 mm  |
|           | MO-72006 Flat blade screwdriver 5.5 x 125 mm  |
|           | MO-72009 Flat blade screwdriver 8 x 175 mm    |
|           | MO-72042 Pozidriv screwdriver n°1 4.5 x 80 mm |
|           | MO-72044 Pozidriv screwdriver n°2 6 x 100 mm  |



## Pliers kit

| Reference | Composition                           |
|-----------|---------------------------------------|
| KIT-27    | MO-72102 Universal plier 180 mm       |
|           | MO-72155 Water pump plier 250 mm      |
|           | MO-72172 Wire stripping plier 160 mm  |
|           | MO-72142 Bent snipe nose plier 160 mm |
|           | MO-72200 Cable cutter 170 mm          |



## Intervention kit

| Reference | Composition                                   |
|-----------|-----------------------------------------------|
| KIT-24    | MO-72004 Flat blade screwdriver 3.5 x 100 mm  |
|           | MO-72006 Flat blade screwdriver 5.5 x 125 mm  |
|           | MO-72009 Flat blade screwdriver 8 x 175 mm    |
|           | MO-72042 Pozidriv screwdriver n°1 4.5 x 80 mm |
|           | MO-72044 Pozidriv screwdriver n°2 6 x 100 mm  |
|           | MO-72172 Wire stripping plier 160 mm          |
|           | MO-72142 Bent snipe nose plier 160 mm         |
|           | MO-72200 Cable cutter 160 mm                  |



## Complete intervention kit

| Reference | Composition                                   |
|-----------|-----------------------------------------------|
| KIT-25    | MO-72004 Flat blade screwdriver 3.5 x 100 mm  |
|           | MO-72006 Flat blade screwdriver 5.5 x 125 mm  |
|           | MO-72009 Flat blade screwdriver 8 x 175 mm    |
|           | MO-72042 Pozidriv screwdriver n°1 4.5 x 80 mm |
|           | MO-72044 Pozidriv screwdriver n°2 6 x 100 mm  |
|           | MO-72102 Universal plier 180 mm               |
|           | MO-72155 Water pump plier 250 mm              |
|           | MO-72172 Wire stripping plier 160 mm          |
|           | MO-72142 Bent snipe nose plier 160 mm         |
|           | MO-72200 Cable cutter 160 mm                  |



# Insulated tools

## Screwdrivers

Below 1000V

Screwdrivers

Pliers

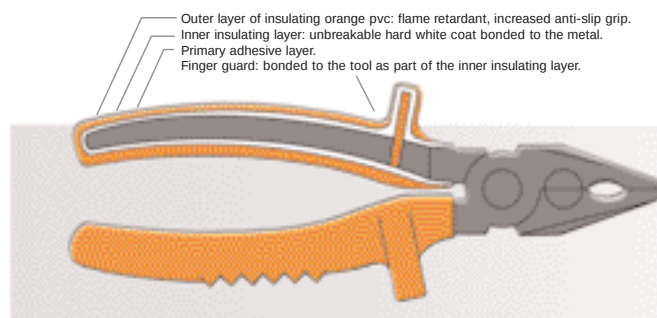
Cutters and pliers

Wrenches, spanners and sockets

Tool sets



Complete range of insulated tools for live working up to 1 000 Volts according to IEC 60900 standard.  
Each ISOMIL tool is controlled and tested to 10 000 volts.  
This ensured by strict quality control procedures.



## Phase tester insulated screwdriver

Phase detection from 127 V A.C.  
Maximum voltage use: 1000 V.  
Signaling by intermittent lighting through ultra high intensity diode.  
Works with an unremovable lithium battery (life time guarantee 3 years). Frequency: 50/60 Hz.

| Reference | Characteristics      | Weight (g) |
|-----------|----------------------|------------|
| MO-65222  | Flat blade 4 x 85 mm | 65         |



Patented

## Flat blade screwdrivers

Chrome - molybdenum vanadium steel blade.

| Reference | Characteristics                                                   | Weight (g) |
|-----------|-------------------------------------------------------------------|------------|
| MO-65203  | Blade 3 x 100 mm                                                  | 33         |
| MO-65204  | Blade 3.5 x 100 mm                                                | 37         |
| MO-65205  | Blade 4 x 100 mm                                                  | 46         |
| MO-65206  | Blade 5.5 x 125 mm                                                | 75         |
| MO-65207  | Blade 6.5 x 150 mm                                                | 94         |
| MO-65209  | Blade 8 x 175 mm                                                  | 165        |
| MO-65211  | Blade 10 x 200 mm                                                 | 195        |
| MO-652-D  | Set of 4 screwdrivers<br>3 x 100 - 4 x 100<br>6.5 x 100 - 8 x 175 | 310        |



## POZIDRIV screwdrivers

Chrome - molybdenum vanadium steel blade.

| Reference | Characteristics      | Weight (g) |
|-----------|----------------------|------------|
| MO-65240  | n°0 head 3 x 60 mm   | 25         |
| MO-65242  | n°1 head 4.5 x 80 mm | 50         |
| MO-65244  | n°2 head 6 x 100 mm  | 75         |
| MO-65246  | n°3 head 8 x 150 mm  | 150        |
| MO-65248  | n°4 head 10 x 200 mm | 230        |



## PHILLIPS screwdrivers

Chrome - molybdenum vanadium steel blade.

| Reference | Characteristics                        | Weight (g) |
|-----------|----------------------------------------|------------|
| MO-65230  | n°0 head 3 x 60 mm                     | 25         |
| MO-65232  | n°1 head 4.5 x 80 mm                   | 50         |
| MO-65234  | n°2 head 6 x 100 mm                    | 75         |
| MO-65236  | n°3 head 8 x 150 mm                    | 150        |
| MO-65238  | n°4 head 10 x 200 mm                   | 230        |
| MO-653-D  | Set of 3 screwdrivers<br>n°0, n°2, n°3 | 230        |



# Insulated tools



Below 1000V

Screwdrivers

Pliers

Cutters and pliers

Wrenches, spanners and sockets

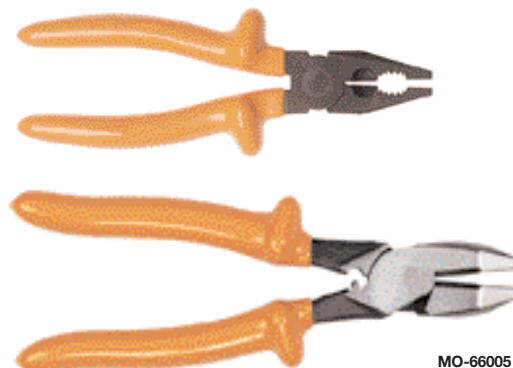
Tool sets

## Universal pliers

Special steel, oil-hardened. Burnished head.

| Reference | Overall length (mm) | Weight (g) |
|-----------|---------------------|------------|
| MO-66001  | 160                 | 210        |
| MO-66002  | 180                 | 260        |
| MO-66003  | 200                 | 300        |
| MO-66005* | 250                 | 510        |

\* New England style



## Flat nose pliers

Special steel, oil-hardened. Burnished head.

| Reference | Overall length (mm) | Weight (g) |
|-----------|---------------------|------------|
| MO-66300  | 145                 | 115        |
| MO-66302  | 160                 | 160        |



## Round nose plier

Special steel, oil-hardened. Burnished head.

| Reference | Overall length (mm) | Weight (g) |
|-----------|---------------------|------------|
| MO-66202  | 160                 | 150        |



## Bent snipe nose pliers

Chrome-vanadium steel. Burnished head.

| Reference | Overall length (mm) | Weight (g) |
|-----------|---------------------|------------|
| MO-66402  | 160                 | 160        |
| MO-66404  | 200                 | 185        |



## Long nose pliers with side cutter

Special steel, oil-hardened. Burnished head.

| Reference | Overall length (mm) | Weight (g) |
|-----------|---------------------|------------|
| MO-66102  | 160                 | 145        |



LOW VOLTAGE

# Insulated tools

| Pliers       |        | Cutters and pliers |                                | Below 1000V |  |
|--------------|--------|--------------------|--------------------------------|-------------|--|
| Screwdrivers | Pliers | Cutters and pliers | Wrenches, spanners and sockets | Tool sets   |  |

## Plug plier for preinsulated pin terminals

Chrome-vanadium steel for pin terminals 2.8/5/6.35 mm.

| Reference | Overall length (mm) | Weight (g) |
|-----------|---------------------|------------|
| MO-66105  | 200                 | 200        |



## Waterpump plier

Chrome-vanadium steel. Burnished head.

STANDARD

| Reference | Overall length (mm) | Weight (g) |
|-----------|---------------------|------------|
| MO-66502  | 250                 | 410        |



## Side cutters

Special carbon steel, oil-hardened. Burnished head.

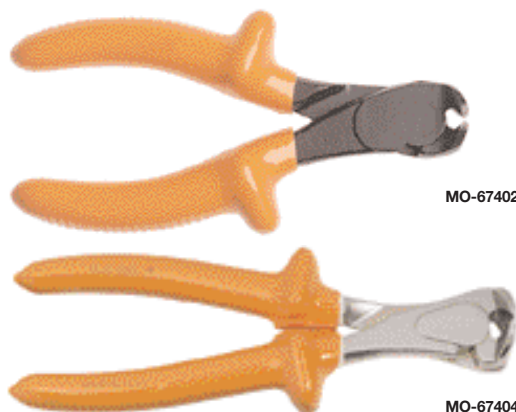
| Reference | Overall length (mm) | Cutting capacity (mm)         |                                | Weight (g) |
|-----------|---------------------|-------------------------------|--------------------------------|------------|
|           |                     | Soft<br>80 kg/mm <sup>2</sup> | Hard<br>140 kg/mm <sup>2</sup> |            |
| MO-67101  | 140                 | Ø 2                           | Ø 1                            | 150        |
| MO-67102  | 160                 | Ø 2.5                         | Ø 1.5                          | 180        |
| MO-67103  | 180                 | Ø 3                           | Ø 2.5                          | 210        |



## End cutting pliers

Special carbon steel, oil-hardened. Burnished head.

| Reference | Overall length (mm) | Cutting capacity (mm)         |                                | Weight (g) |
|-----------|---------------------|-------------------------------|--------------------------------|------------|
|           |                     | Soft<br>80 kg/mm <sup>2</sup> | Hard<br>140 kg/mm <sup>2</sup> |            |
| MO-67401  | 140                 | Ø 2                           | Ø 1                            | 165        |
| MO-67402  | 160                 | Ø 3                           | Ø 2                            | 210        |
| MO-67404  | 200                 | Ø 4                           | Ø 3                            | 450        |



MO-67402

MO-67404

## Cable cutter

Chrome-vanadium forged steel oil-hardened.

| Reference | Overall length (mm) | Cutting capacity (mm) | Weight (g) |
|-----------|---------------------|-----------------------|------------|
| MO-67500  | 170                 | Maximum Ø 4           | 420        |



# Insulated tools



Below 1000V

Screwdrivers

Pliers

Cutters and pliers

Wrenches, spanners and sockets

Tool sets

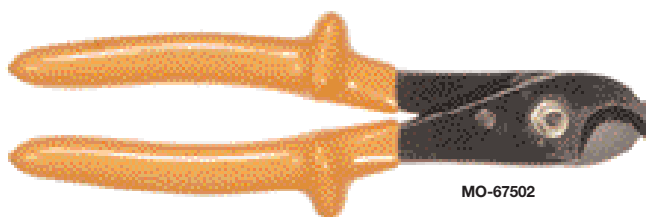
## Cable cutters

Chrome-vanadium forged steel oil-hardened.

| Reference | Overall length (mm) | Cutting capacity (mm) | Weight (g) |
|-----------|---------------------|-----------------------|------------|
| MO-67501  | 170                 | Maximum Ø 15          | 285        |
| MO-67502  | 230                 | Maximum Ø 20          | 520        |



MO-67501



MO-67502

## Ratchet cable cutters

For copper and aluminium cables only. Treated forged steel blade.

| Reference | Cutting capacity                                         | Weight (g) |
|-----------|----------------------------------------------------------|------------|
| MO-67599  | Ø 32 mm/180 mm <sup>2</sup> Cu<br>250 mm <sup>2</sup> Al | 900        |
| MO-67600  | Ø 38 mm/240 mm <sup>2</sup> Cu<br>300 mm <sup>2</sup> Al | 950        |
| MO-67601  | Ø 55 mm/300 mm <sup>2</sup> Cu<br>450 mm <sup>2</sup> Al | 975        |



MO-67599



MO-67600

## Frontal ratchet cable cutter

For copper and aluminium only. Treated forged steel blade.

| Reference | Cutting capacity                                            | Weight (g) |
|-----------|-------------------------------------------------------------|------------|
| MO-67611  | Ø 32 mm<br>180 mm <sup>2</sup> Cu<br>250 mm <sup>2</sup> Al | 900        |



## Hacksaw

Protected hard forged steel. Two blade positions. Flush and 90° cutting supplied. Delivered with 2 blades.

| Reference | Blade length (mm) | Overall length (mm) | Weight (g) |
|-----------|-------------------|---------------------|------------|
| MO-64502  | 300               | 450                 | 780        |



# Insulated tools

## Cutters and pliers

Below 1000V

Screwdrivers

Pliers

Cutters and pliers

Wrenches, spanners and sockets

Tool sets

## Stripping plier for L.V. cables

Aluminium casting plier.  
To strip L.V. twisted cables.

| Reference | Overall length (mm) | Stripping capacity             | Weight (g) |
|-----------|---------------------|--------------------------------|------------|
| MO-67304  | 220                 | from 16 to 150 mm <sup>2</sup> | 470        |



## Stripping pliers for L.V. cables

Aluminium casting plier. To strip L.V. cables.

| Reference | Overall length (mm) | Stripping capacity (mm <sup>2</sup> ) | Weight (g) |
|-----------|---------------------|---------------------------------------|------------|
| MO-67305  | 265                 | From 16 to 150                        | 650        |
| MO-67306  | 270                 | From 50 to 240                        | 670        |



## Wire stripping plier

Chrome vanadium steel. Burnished head.

| Reference | Overall length (mm) | Capacity (mm <sup>2</sup> ) | Weight (g) |
|-----------|---------------------|-----------------------------|------------|
| MO-67302  | 160                 | 0.6 to 10                   | 170        |



## Stripping knives

Delivered with pouch.

| Reference | Blade length (mm) | Overall length (mm) | Weight (g) |
|-----------|-------------------|---------------------|------------|
| MO-61001  | 62 (Straight)     | 190                 | 110        |
| MO-61002  | 50 (Curve)        | 190                 | 110        |



## Electrician's scissors

Stainless steel blades.  
Softgrip handles.  
Adjustable screw joint.  
Non insulated tool.

| Reference | Overall length (mm) | Weight (g) |
|-----------|---------------------|------------|
| MO-72100  | 145                 | 62         |



# Insulated tools



Below 1000V

## Adjustable spanners

Special steel, oil-hardened.

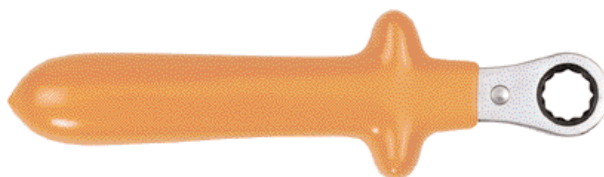
| Reference | Overall length (mm) | Maximum capacity (mm) | Weight (g) |
|-----------|---------------------|-----------------------|------------|
| MO-69002  | 210                 | 24                    | 295        |
| MO-69003  | 250                 | 28                    | 450        |
| MO-69004  | 310                 | 34                    | 550        |
| MO-69005  | 385                 | 43                    | 1 350      |



## Reversible hexagonal ratchet handles

Special steel, oil-hardened.

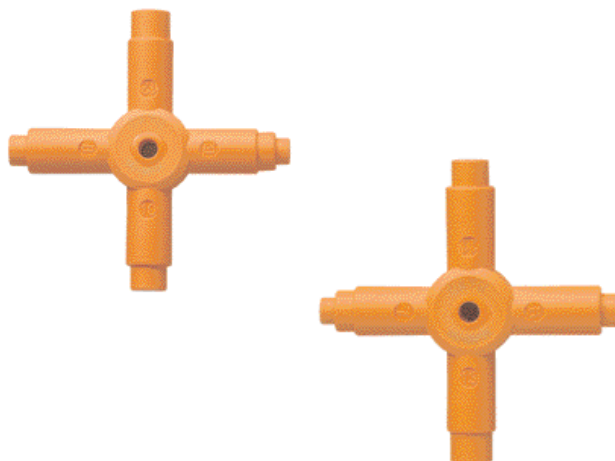
| Reference | Size (mm) | Weight (g) |
|-----------|-----------|------------|
| MO-69210  | 10        | 160        |
| MO-69213  | 13        | 190        |
| MO-69216  | 16        | 350        |
| MO-69217  | 17        | 370        |
| MO-69218  | 18        | 380        |
| MO-69219  | 19        | 390        |



## Combination wrenches

Special steel sockets.

| Reference | 4 hexagonal sockets        | Weight (g) |
|-----------|----------------------------|------------|
| MO-68701  | 6-8-10-12 mm/150 x 150 mm  | 225        |
| MO-68702  | 8-10-12-14 mm/150 x 150 mm | 260        |
| MO-68703  | 7-9-11-13 mm/150 x 150 mm  | 250        |
| MO-68704  | 8-10-13-17 mm/150 x 150 mm | 260        |



## Right angle hexagonal key wrenches

Chrome-vanadium steel.

| Reference | Hexagonal head    | Weight (g) |
|-----------|-------------------|------------|
| MO-69903  | 3 mm/83 x 123 mm  | 30         |
| MO-69904  | 4 mm/84 x 124 mm  | 40         |
| MO-69905  | 5 mm/84 x 126 mm  | 50         |
| MO-69906  | 6 mm/85 x 126 mm  | 70         |
| MO-69908  | 8 mm/87 x 128 mm  | 110        |
| MO-69910  | 10 mm/87 x 130 mm | 150        |
| MO-69912  | 12 mm/90 x 132 mm | 240        |



# Insulated tools

Wrenches, spanners  
and sockets

Below 1000V

Screwdrivers

Pliers

Cutters and pliers

Wrenches, spanners and sockets

Tool sets

## Open end spanners

Chrome-vanadium steel.

| Reference | Size (mm) | Weight (g) | Reference | Size (mm) | Weight (g) |
|-----------|-----------|------------|-----------|-----------|------------|
| MO-68008  | 8         | 40         | MO-68020  | 20        | 185        |
| MO-68009  | 9         | 40         | MO-68021  | 21        | 200        |
| MO-68010  | 10        | 45         | MO-68022  | 22        | 220        |
| MO-68011  | 11        | 50         | MO-68023  | 23        | 250        |
| MO-68012  | 12        | 60         | MO-68024  | 24        | 260        |
| MO-68013  | 13        | 80         | MO-68025  | 25        | 280        |
| MO-68014  | 14        | 100        | MO-68026  | 26        | 300        |
| MO-68015  | 15        | 110        | MO-68027  | 27        | 340        |
| MO-68016  | 16        | 120        | MO-68028  | 28        | 360        |
| MO-68017  | 17        | 140        | MO-68029  | 29        | 400        |
| MO-68018  | 18        | 160        | MO-68030  | 30        | 500        |
| MO-68019  | 19        | 170        | MO-68032  | 32        | 570        |

| Reference   | Characteristics                                          | Weight (g) |
|-------------|----------------------------------------------------------|------------|
| MO-68008/19 | 8 open end spanners set<br>8/10/11/12/13/<br>14/17/19 mm | 685        |



## Cranked ring wrenches

Chrome-vanadium steel.

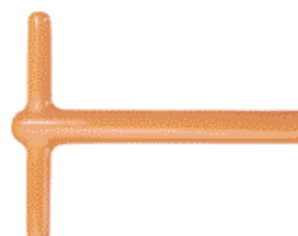
| Reference | Size (mm) | Weight (g) | Reference | Size (mm) | Weight (g) |
|-----------|-----------|------------|-----------|-----------|------------|
| MO-68107  | 7         | 35         | MO-68120  | 20        | 240        |
| MO-68108  | 8         | 40         | MO-68121  | 21        | 260        |
| MO-68109  | 9         | 45         | MO-68122  | 22        | 260        |
| MO-68110  | 10        | 50         | MO-68123  | 23        | 270        |
| MO-68111  | 11        | 65         | MO-68124  | 24        | 280        |
| MO-68112  | 12        | 80         | MO-68125  | 25        | 300        |
| MO-68113  | 13        | 100        | MO-68126  | 26        | 360        |
| MO-68114  | 14        | 120        | MO-68127  | 27        | 400        |
| MO-68115  | 15        | 150        | MO-68128  | 28        | 440        |
| MO-68116  | 16        | 180        | MO-68129  | 29        | 480        |
| MO-68117  | 17        | 190        | MO-68130  | 30        | 500        |
| MO-68118  | 18        | 195        | MO-68132  | 32        | 540        |
| MO-68119  | 19        | 200        |           |           |            |



## Hexagonal spanners with T handle

Chrome steel. length 130 mm

| Reference | Size (mm) | Weight (g) |
|-----------|-----------|------------|
| MO-68610  | 10        | 145        |
| MO-68613  | 13        | 185        |
| MO-68614  | 14        | 220        |



# Insulated tools



Below 1000V

Screwdrivers

Pliers

Cutters and pliers

Wrenches, spanners and sockets

Tool sets

## Sockets wrenches sets

Chrome steel.



### Sockets 3/8" (9.53 mm)-6 sided

| Reference   | Characteristics (mm)                               | Weight (g) |
|-------------|----------------------------------------------------|------------|
| MO-69306    | Socket 6                                           | 25         |
| MO-69307    | Socket 7                                           | 30         |
| MO-69308*   | Socket 8                                           | 30         |
| MO-69309    | Socket 9                                           | 30         |
| MO-69310*   | Socket 10                                          | 35         |
| MO-69311    | Socket 11                                          | 35         |
| MO-69312*   | Socket 12                                          | 35         |
| MO-69313*   | Socket 13                                          | 45         |
| MO-69314*   | Socket 14                                          | 45         |
| MO-69315    | Socket 15                                          | 50         |
| MO-69316    | Socket 16                                          | 55         |
| MO-69317*   | Socket 17                                          | 60         |
| MO-69318    | Socket 18                                          | 65         |
| MO-69319*   | Socket 19                                          | 70         |
| MO-69321*   | Socket 21                                          | 85         |
| MO-69322*   | Socket 22                                          | 90         |
| MO-69323*   | Socket 23                                          | 100        |
| MO-69513*   | Reversible ratchet                                 | 600        |
| MO-69523*   | Extension 130                                      | 124        |
| MO-69533    | Extension 250                                      | 270        |
| MO-69542    | T wrench 130                                       | 220        |
| MO-69543    | T wrench 200                                       | 380        |
| MO-69308/23 | complete sockets set in plastic box 410 x 120 x 75 | 1 250      |

\* Sockets composing the sets

### Sockets 1/2" (12.7 mm)-12 sided

| Reference   | Characteristics (mm)                               | Weight (g) |
|-------------|----------------------------------------------------|------------|
| MO-69408*   | Socket 8                                           | 60         |
| MO-69410*   | Socket 10                                          | 60         |
| MO-69411    | Socket 11                                          | 60         |
| MO-69412*   | Socket 12                                          | 70         |
| MO-69413*   | Socket 13                                          | 70         |
| MO-69414*   | Socket 14                                          | 70         |
| MO-69415    | Socket 15                                          | 75         |
| MO-69416    | Socket 16                                          | 75         |
| MO-69417    | Socket 17                                          | 80         |
| MO-69418    | Socket 18                                          | 80         |
| MO-69419*   | Socket 19                                          | 85         |
| MO-69420    | Socket 20                                          | 90         |
| MO-69421*   | Socket 21                                          | 100        |
| MO-69422*   | Socket 22                                          | 100        |
| MO-69423*   | Socket 23                                          | 115        |
| MO-69424    | Socket 24                                          | 130        |
| MO-69430    | Socket 30                                          | 160        |
| MO-69514*   | Reversible ratchet                                 | 600        |
| MO-69524*   | Extension 125                                      | 250        |
| MO-69534    | Extension 250                                      | 435        |
| MO-69544    | T wrench 300                                       | 520        |
| MO-69408/23 | complete sockets set in plastic box 410 x 120 x 75 | 1 500      |

\* Sockets composing the sets

# Insulated tools

Wrenches, spanners  
and sockets

Below 1000V

Screwdrivers

Pliers

Cutters and pliers

Wrenches, spanners and sockets

Tool sets

## Insulated torque wrench 3/8"

Capacity: 8 to 54 Nm (ibF Ft: 5-40).  
Linear graduation, english and french scales (ibF Ft and Nm).  
Length: 325 mm.  
Tolerance: 4%.



| Reference | Characteristics | Weight (g) |
|-----------|-----------------|------------|
| MO-69050  | 8 to 54 Nm      | 790        |

## Sockets 3/8" U.S Standard

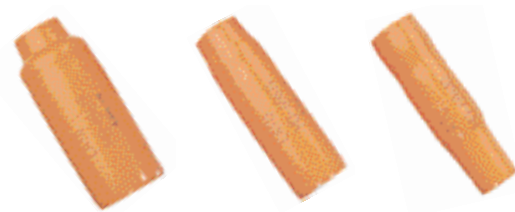
Chrome steel.



| Reference | Socket | Weight (g) |
|-----------|--------|------------|
| MO-69735  | 3/8"   | 25         |
| MO-69736  | 7/16"  | 30         |
| MO-69737  | 1/2"   | 35         |
| MO-69738  | 9/16"  | 35         |
| MO-69739  | 5/8"   | 42         |
| MO-69740  | 11/16" | 50         |
| MO-69741  | 3/4"   | 55         |
| MO-69742  | 13/16" | 60         |

## Sockets 3/8" Long series

65 mm length. Chrome steel.



| Reference | Socket (mm) | Weight (g) |
|-----------|-------------|------------|
| MO-69610  | 10          | 75         |
| MO-69613  | 13          | 80         |
| MO-69614  | 14          | 100        |
| MO-69616  | 16          | 115        |
| MO-69617  | 17          | 125        |
| MO-69618  | 18          | 140        |
| MO-69619  | 19          | 160        |
| MO-69621  | 21          | 190        |

## 6 sided male hex Key / Socket 3/8"

Steel.



| Reference | Socket (mm) | Weight (g) |
|-----------|-------------|------------|
| MO-69393  | 3           | 45         |
| MO-69394  | 4           | 55         |
| MO-69395  | 5           | 60         |
| MO-69396  | 6           | 65         |
| MO-69397  | 7           | 70         |
| MO-69398  | 8           | 70         |
| MO-693100 | 10          | 80         |

# Insulated tools



Tool sets

Below 1000V

Screwdrivers

Pliers

Cutters and pliers

Wrenches, spanners and sockets

Tool sets

## Tool bag

For intervention works, strong waterproof, canvas reinforced bottom, large capacity of storage, shoulder strap.



| Reference | Characteristics    | Weight (Kg) |
|-----------|--------------------|-------------|
| M-87370   | 440 x 330 x 160 mm | 1 100       |

## Tool bag

Black grained leather with handle. The interior includes: a pocket, a separation which forms a tool tray and a fold-down tool tray.



| Reference | Characteristics    | Weight (Kg) |
|-----------|--------------------|-------------|
| MO-34     | 410 x 280 x 150 mm | 3 200       |

## Insulated tool kits

For the most common operations, CATU proposes 4 kits of ISOMIL handtools.

| Reference | Composition                                    |
|-----------|------------------------------------------------|
| KIT-03    | MO-65242 Pozidriv screwdriver* N°1 4.5 x 80 mm |
|           | MO-65244 Pozidriv screwdriver N°2 6 x 100 mm   |
|           | MO-65204 Flat blade screwdriver 3.5 x 100 mm   |
|           | MO-65206 Flat blade screwdriver 5.5 x 125 mm   |
|           | MO-65209 Flat blade screwdriver 8 x 175 mm     |

| Reference | Composition                                           |
|-----------|-------------------------------------------------------|
| KIT-07    | MO-66002 Universal pliers overall length 180 mm       |
|           | MO-66502 Water pump pliers overall length 250 mm      |
|           | MO-67302 End stripping pliers overall length 160 mm   |
|           | MO-66402 Bent snipe nose pliers overall length 160 mm |
|           | MO-67500 Cable cutter overhall length 170 mm          |

| Reference | Composition                                           |
|-----------|-------------------------------------------------------|
| KIT-04    | MO-65242 Pozidriv screwdriver* N°1 4.5 x 80 mm        |
|           | MO-65244 Pozidriv screwdriver N°2 6 x 100 mm          |
|           | MO-65204 Flat blade screwdriver 3.5 x 100 mm          |
|           | MO-65206 Flat blade screwdriver 5.5 x 125 mm          |
|           | MO-65209 Flat blade screwdriver 8 x 175 mm            |
|           | MO-67302 End stripping pliers overall length 160 mm   |
|           | MO-66402 Bent snipe nose pliers overall length 160 mm |
|           | MO-67500 Cable cutter overhall length 170 mm          |

| Reference | Composition                                           |
|-----------|-------------------------------------------------------|
| KIT-05    | MO-65242 Pozidriv screwdriver* N°1 4.5 x 80 mm        |
|           | MO-65244 Pozidriv screwdriver N°2 6 x 100 mm          |
|           | MO-65204 Flat blade screwdriver 3.5 x 100 mm          |
|           | MO-65206 Flat blade screwdriver 5.5 x 125 mm          |
|           | MO-65209 Flat blade screwdriver 8 x 175 mm            |
|           | MO-66002 Universal pliers overall length 180 mm       |
|           | MO-66502 Water pump pliers overall length 250 mm      |
|           | MO-67302 End stripping pliers overall length 160 mm   |
|           | MO-66402 Bent snipe nose pliers overall length 160 mm |
|           | MO-67500 Cable cutter overhall length 170 mm          |



### Low voltage complete set

Complete equipment for live line (L.V.) interventions.

MO-510-03-EX Tool bag not included (MO-34)

#### Personal equipment

MO-11001 1 safety glasses

CG-98 1 working gloves

#### Voltage detector

MS-911-EX 1 voltage multimeter

#### Insulating

CG-05-B 1 rubber gloves size B

CG-36 1 carrying bag for rubber gloves

MP-42/16 1 insulating mat

MP-26-A 10 insulating caps

MP-35/12 1 insulating blanket

MP-39 10 wood clamps for insulating blanket

MP-32/15 6 line protectors

MP-19 5 insulated adhesive tapes

#### Insulated tools

MO-61001 1 stripping knife

MO-67502 1 cable cutter 230 mm

MO-68008/19 1 open end spanners set with 8, 10, 11, 12, 13, 14, 17, 19 mm open end spanners

MO-69903 1 right angle hexagonal key wrench 3 mm

MO-69904 1 right angle hexagonal key wrench 4 mm

MO-69906 1 right angle hexagonal key wrench 6 mm

MO-751 1 insulating folding rule

MO-69003 1 adjustable spanner 250 mm



MO-66002 1 universal pliers 180 mm

MO-66202 1 round nose pliers 160 mm

MO-66502 1 water pump pliers 250 mm

MO-67102 1 side cutter 160 mm

MO-69308/23 1 sockets 3/8" wrench set with 10 sockets: 8, 10, 12, 13, 14, 17, 19, 21, 22, 23

MO-65205 1 flat blade screwdriver 4 x 100

MO-65207 1 flat blade screwdriver 6.5 x 150

MO-65209 1 flat blade screwdriver 8 x 175

MO-65232 1 Phillips screwdriver n° 1

MO-65234 1 Phillips screwdriver n° 2

MO-65236 1 Phillips screwdriver n° 3

### Intervention kit for electricians

MO-38510 Composition:

M-87370 1 tool bag

CG-05-C 1 pair of insulated gloves

MO-11001 1 safety glasses

AL-230 1 safety padlock

MO-65204 Flat blade screwdriver - 3.5 x 100 mm

MO-65206 Flat blade screwdriver - 5.5 x 125 mm

MO-65209 Flat blade screwdriver - 8 x 175 mm

MO-65242 Pozidriv screwdriver\* - N°1 4.5 x 80 mm

MO-65244 Pozidriv screwdriver - N°2 6 x 100 mm

MO-66002 Universal pliers overall length 180 mm

MO-66502 Water pump pliers overall - length 250 mm

MO-67302 End stripping pliers overall length 160 mm

MO-66402 Bent snipe nose pliers overall length 160 mm

MO-67500 Cable cutter overhall length 170 mm



# From 1kV to 52kV



MEDIUM VOLTAGE

|                                       |     |
|---------------------------------------|-----|
| Equipment guide                       | 58  |
| Personal protective equipment         | 62  |
| Substation equipment                  | 73  |
| Voltage detectors                     | 86  |
| Short-circuiting and earthing systems | 92  |
| General tools                         | 99  |
| Earth rods                            | 104 |

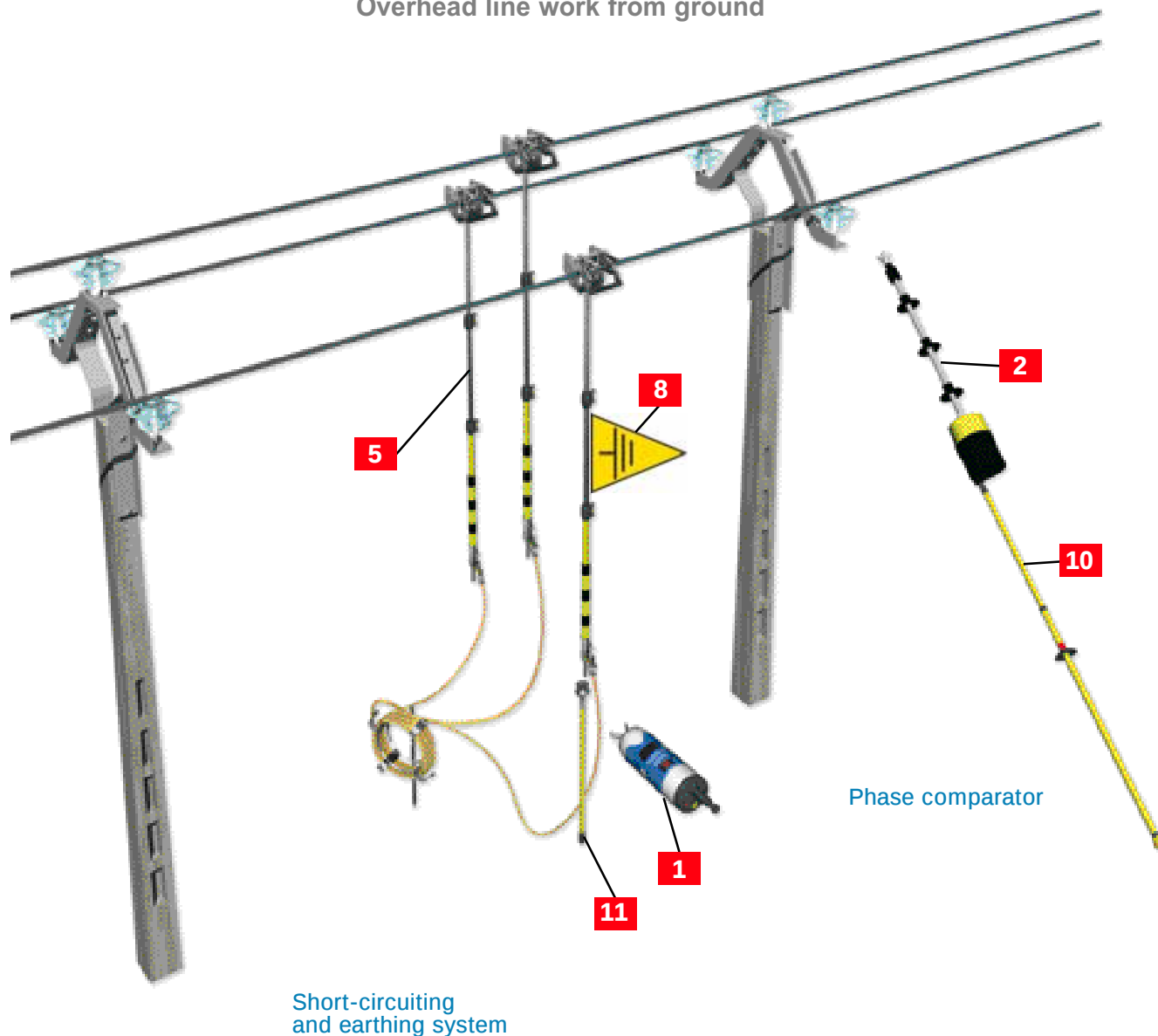
The diagram illustrates the use of safety equipment for working on overhead power lines. It shows two main systems: a short-circuiting and earthing system on the left and a voltage detector on the right. The short-circuiting system includes a crossbar (3), a short-circuiting and earthing device (4), a warning sign (8), a grounding point (6), and a grounding rod (7). The voltage detector system includes a detector (1), a detector cable (10), and a detector head (9). The equipment is shown in use on a set of overhead lines.

## Page: 95

# APPLICATIONS

Before intervention select the right personal protective equipment

Overhead line work from ground



## Earth Clamps, rod and flags

|          |              |                              |          |
|----------|--------------|------------------------------|----------|
| <b>6</b> | Earth Clamps | References: MT-840/1, MT-843 | Page: 94 |
| <b>7</b> | Earth rods   | References: MT-650, MT-652/2 | Page: 94 |
| <b>8</b> | Earth Flags  | References: AL-58, AL-60     | Page: 77 |

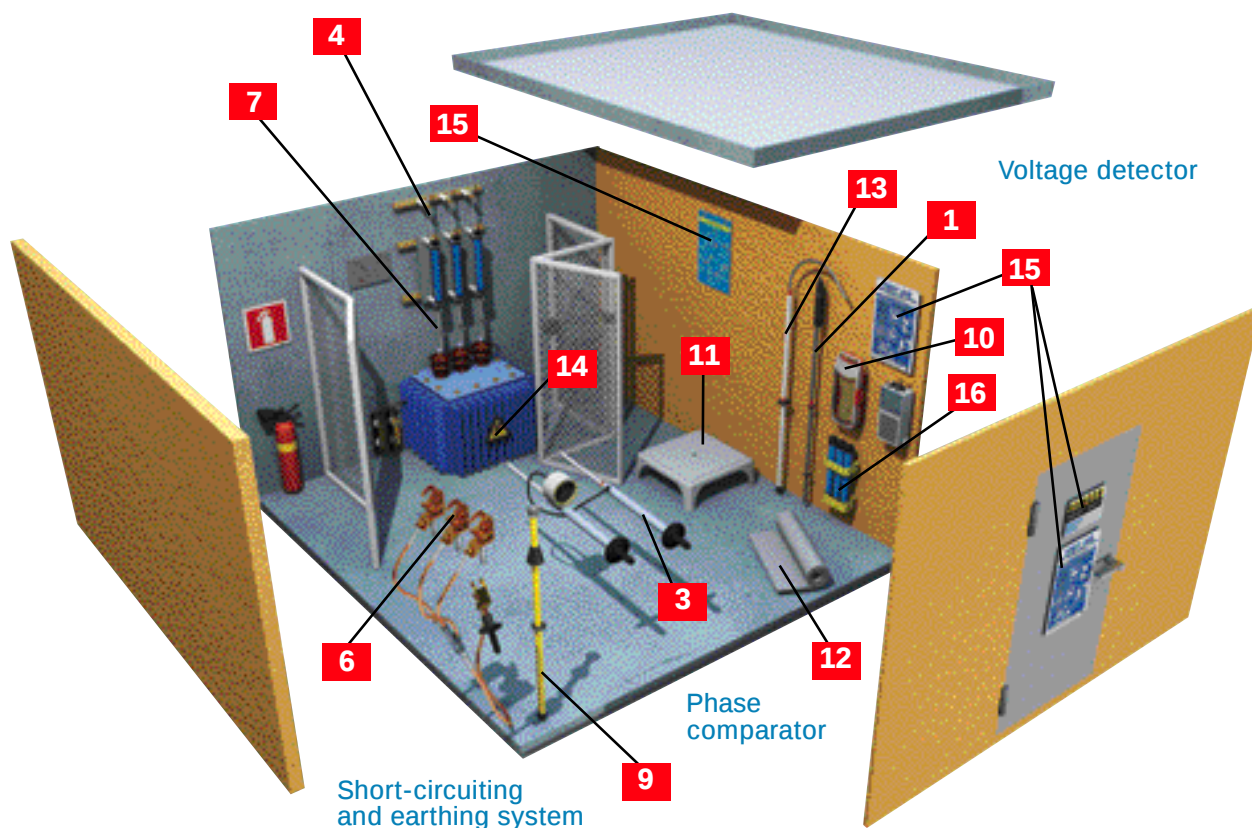
## Insulating sticks

|           |                                                                          |                                 |          |
|-----------|--------------------------------------------------------------------------|---------------------------------|----------|
| <b>9</b>  | Insulating Sticks IEC For short-circuiting systems and Voltage detectors | References: CM-4, CM-7, CM-4000 | Page: 96 |
| <b>10</b> | Insulating sticks IEC for voltage detectors                              | References: CE-4-21, CE-75      | Page: 88 |
| <b>11</b> | Insulating sticks for short circuiting system MT-512                     | Reference: MT-531               | Page: 95 |

# APPLICATIONS

## Examples of usual applications

### Substation with Bare conductors



### Voltage detectors and phase comparators

|   |                                            |                                     |             |
|---|--------------------------------------------|-------------------------------------|-------------|
| 1 | Voltage detectors for indoor use 5-40 kV   | References: CL-4, CL-2 series       | Page: 83    |
| 2 | Voltage detector for separable connectors  | Reference: CC-151-K                 | Page: 83    |
| 3 | Phase comparators two poles or single pole | References: CL-5, CL-8, CL-7 series | Page: 89/90 |
| 4 | Permanent luminous indicator               | Reference: CL-40010                 | Page: 83    |
| 5 | Integrated systems VIS VDS                 | References: CL-495, CL497, CL-498   | Page: 89    |

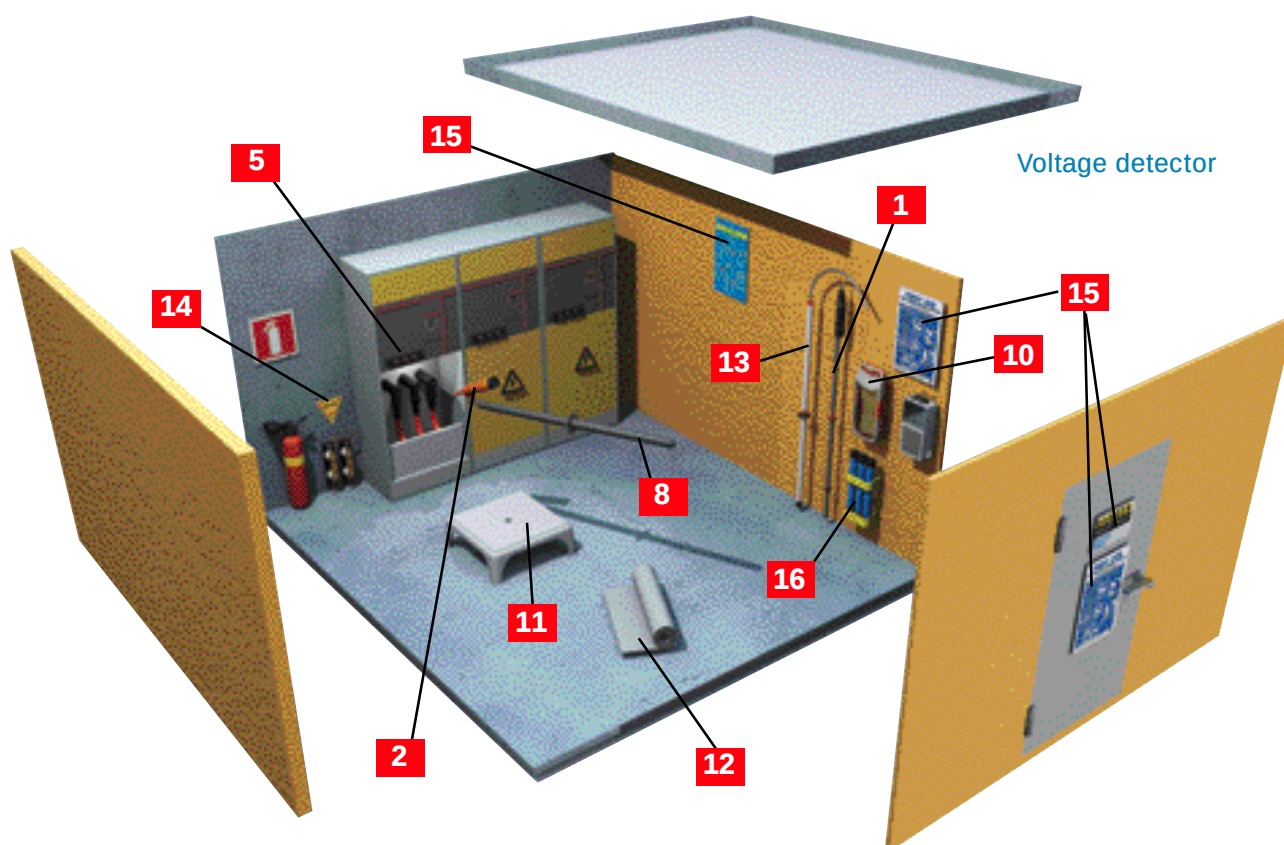
### Short-circuiting Systems

|   |                                                                                                                                  |                                                            |          |
|---|----------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|----------|
| 6 | Short-circuiting system for MV substations:<br>For installation on permanent fixed points<br>For installation on bare conductors | References: MT-1910/MT-1920<br>References: MT-5805/MT-9801 | Page: 80 |
| 7 | Fixed points                                                                                                                     | References: MT-2950/MT-3950 series                         | Page: 81 |

# APPLICATIONS

Before intervention select the right personal protective equipment

Substation with semi-automatic switchgear and metalclad switchgear



## Insulating sticks

|   |                                                 |                                |          |
|---|-------------------------------------------------|--------------------------------|----------|
| 8 | Voltage detectors for indoor use 5-40 kV        | Reference: CC-45-K             | Page: 83 |
| 9 | Insulating sticks for substations use IEC-61235 | References: CF-5-40/CE-4-21... | Page: 82 |

## Protective equipment

|    |                                                   |                           |          |
|----|---------------------------------------------------|---------------------------|----------|
| 10 | Insulating rubber gloves 26500 V with storage box | References: CG-30/CG-35/2 | Page: 64 |
| 11 | Insulating Platform 24000 V                       | Reference: CT-7-25/1      | Page: 67 |
| 12 | Insulating mat 26.5 kV                            | Reference: MP-42/11       | Page: 67 |
| 13 | Rescue stick 45 kV                                | Reference: CS-45          | Page: 78 |

## Warning signs and accessories

|    |                            |                                |          |
|----|----------------------------|--------------------------------|----------|
| 14 | Warning signs in aluminium | References: AM-49/1, AM-344-GB | Page: 76 |
| 15 | Specialised signs          | References: AP-510-GB/AM-20-GB | Page: 76 |
| 16 | Fuse holder                | Reference: CI-23               | Page: 78 |

# Personal protective equipment

## Head and eyes protection

Head and eyes protection

Insulating rubber gloves

Insulating mats and platforms

Arc flash equipment

Equipment for working on pole

From 1kV to 52kV

### Safety glasses

Protection against UV radiation and ejections of solid particles. Grilamid frame in orange Softflex. Anti-scratch, anti-impact and anti-chemical product treatments. **EN 166/EN 170** **CE**

**CAUTION** : Do not use for welding operations.



|          |                                                                 |
|----------|-----------------------------------------------------------------|
| MO-11000 | Clear lenses, delivered in pouch                                |
| MO-11001 | Tinted lenses, delivered in pouch                               |
| MO-11003 | Tinted lenses, UV/IR protection, welding filter 2. EN 169. 80°C |

### Overglasses

Polycarbonate overglasses. Protection against UV radiation and ejections of solid particles. **EN 166/EN 170** **CE**

**CAUTION** : Do not use for welding operations.



|          |                     |
|----------|---------------------|
| MO-11010 | Clear lenses        |
| MO-11011 | Green tinted lenses |

### Face shield

Polycarbonate face shield adjustable on the head by milled wheel. Protection against electric arcs of short-circuits. Anti-mist treatment. Anti-scratch treatment. **EN 166/EN 170** **CE**

**CAUTION** : Do not use for welding operations.



|          |                                |
|----------|--------------------------------|
| MO-186   | Single size, adjustable        |
| M-881635 | Spare face shield for MO-186   |
| M-87384  | Bag for face shield and helmet |
| M-952206 | Spare strap for MO-186         |

### ABS helmet

Electrically insulating helmets for use on voltage installations. Safety industrial helmet, safety helmet for electrical use, especially designed to maximize wearer's comfort. Standard sizes 53 to 63. Leather trim 21 cm along the inside for added comfort. Multiple adjustments for a perfect fit headband: adjustable in 3 mm increments. Built-in cushion for optimum ventilation. Safety chin strap: fastenings to shell tear resistant. Weight: 0.300 kg. **EN 166/EN 170** **EN 50365** **ANSI Z89.1:2003** **Class E 20 kV** **CE**



|            |        |
|------------|--------|
| MO-182/1-B | White  |
| MO-182/1-R | Red    |
| MO-182/1-J | Yellow |

### Face shield

Protection against electric short-circuits arcs. Face shield adjustable on MO-182 helmet. 100% UV protection. Weight: 0.170 kg. **EN 166/EN 70** **CE**

**CAUTION** : Do not use for welding operations.



|        |                                        |
|--------|----------------------------------------|
| MO-184 | Single size, adjustable by rubber band |
|--------|----------------------------------------|

### Polycarbonate helmet

Polycarbonate helmet. Shock and wear resisting, comfortable. Adjustable size from 53 to 63 cm. Weight: 0.465 Kg. **EN 397** **CE**



|           |                                |
|-----------|--------------------------------|
| MO-183-BL | White, single size, adjustable |
| MO-183-RL | Red, single size, adjustable   |

### Helmet with built-in face shield

Panoramic face shield in non-scratch and anti-mist polycarbonate. Chinstrap (with Velcro fastening) Head fit adjustment by milled wheel. Single size: 0.270 kg. **EN 166/EN 170/EN 397** **EN 50365** **CE**



|            |                                                   |
|------------|---------------------------------------------------|
| MO-185-BL  | White                                             |
| MO-185-BLM | White, chinstrap with a chin                      |
| MO-185-R   | Red                                               |
| MO-185-J   | Yellow                                            |
| MO-185-B   | Blue                                              |
| M-881622   | Spare face shield for MO-185                      |
| M-881836   | Spare white padded headband                       |
| M-881889   | Spare complete set (harness, chinstrap, headband) |

# Personal protective equipment

## Head and eyes protection

Head and eyes protection

Insulating rubber gloves

Insulating mats and platforms

Arc flash equipment

Equipment for working on pole

From 1kV to 52kV

### Headlamp with adjustable focus

Can be carried either on the head or any type of helmet.  
Lighting control and beam by switches.  
Range: 30 meters.  
Adjustable lamp height angle.  
Sealed against rain.  
Powered by 4 batteries LR 6.  
Autonomy: 6 hours.  
Standard bulb 4.8 V/0.3 A.

CE



MS-118 Headlamp - Weight: 0.187 kg

M-95-865 Halogen bulb (sold by set of 5 units)  
5.2 V 0.5 A

M-95-864 Hooks set for helmet

### LED's headlamp (4 LED's)

Can be carried either on the head or any kind of helmet thanks to it supplied adhesive clip. (fig. 1 and 2).  
3 lighting levels: large or narrow for a short or long distance, and both for maximal power.  
Flash mode.  
4 white LED's lamp with adjustable angle.  
Range: 10 to 15 meters.  
Powered by 3 batteries LR03 (AAA).  
Autonomy: 90 hours.

CE



Fig. 1



Fig. 2

MS-122 Delivered with batteries, carrying bag, headband and adhesive clip. Weight: 82g

SUPBAND 122 Adhesive support and headband kit

SUP122 Kit of 5 adhesive supports

### LED's headlamp (5 LED's)

LED's Headlamp (5 LED's).  
Can be carried on the head or any kind of helmet.  
Lighting by 5 high performance white new generation LED's - 3 lighting levels + 1 flash mode + 1 red lighting.  
IPX6.  
Powered by four batteries LR06 (AA).  
Range : 30 meters.  
Autonomy : 100 hours.

CE



MS-127 Delivered with batteries and a carrying bag Weight: 226 g

M-95-864 Hooks set for helmet

### Intrinsically safe ATEX LED's Headlamp

Ex II 2GD EEx ia IIC T4

CE

Can be carried either on the head or any kind of helmet.  
- Lighting by 3 high performance White LEDs.  
- 2 lighting levels (High: 3 LEDs on or low: 1 LED on).  
- Adjustable lamp height angle.  
- Very light, ABS body.  
- ATEX certified Catégorie 2 (Zone 1)  
N° TRL03ATEX21005X.  
- Range: 10 to 15 meters.  
- Powered by 3 batteries LR03 (AAA).  
- Autonomy: 150 hours.  
- Strap: cloth or silicone rubber (for helmet).



MS-126 Delivered with batteries - Weight: 0.125Kg

M-95-864 Hooks set for helmet

# Personal protective equipment

## Insulating rubber gloves

From 1kV to 52kV

Head and eyes protection

Insulating rubber gloves

Insulating mats and platforms

Arc flash equipment

Equipment for working on pole

## Insulating rubber gloves

Insulating rubber gloves conform to international IEC-60903 standard.

To satisfy the requirements of this standard, they are subjected to dielectrical, mechanical resistance and ageing tests.

The acceptance levels for mechanical tests are stricter.

The tests are especially aimed at checking the tensile strength and elongation at break, the mechanical puncture test and tension set.

Our gloves are made of latex especially treated to obtain high dielectric characteristics; they are individually tested and delivered in sealed plastic bags.

IEC-60903  
EN 60903



| Reference | Class | Voltage (V) | Designation | Overgloves size | Weight (g) |
|-----------|-------|-------------|-------------|-----------------|------------|
| CG-15 (*) | 1     | 7 500       | latex       | **              | 270        |
| CG-20 (*) | 2     | 17 000      | latex       | **              | 450        |
| CG-30 (*) | 3     | 26 500      | latex       | **              | 560        |

\* References to be completed by size A, B, C, D

\*\* See below

Correspondence with standard sizes: A = 8, B = 9, C = 10, D = 11



## Composite gloves

Insulating gloves with higher mechanical properties for working in full safety without leather overgloves.

IEC-60903



| Reference | Class | Voltage (V) | Designation                                        | Weight (g) |
|-----------|-------|-------------|----------------------------------------------------|------------|
| CG-16 (*) | 1     | 7 500       | orange composite gloves with mechanical properties | 400        |
| CG-22 (*) | 2     | 17 000      | orange composite gloves with mechanical properties | 500        |



\* References to be completed by size A, B, C, D. Correspondence with standard sizes: A = 8, B = 9, C = 10, D = 11.

### SELECTION BOARD SIZE INSULATING GLOVES/OVER GLOVES

| Gloves reference | Gloves size | Overgloves reference | Overgloves size |
|------------------|-------------|----------------------|-----------------|
| CG-15 (*)        | A           | CG-99 (*)            | B               |
| CG-20 (*)        | B           |                      | C               |
| CG-30 (*)        | C           |                      | D               |
|                  | D           |                      | E               |

# Personal protective equipment

Insulating  
rubber gloves

From 1kV to 52kV

Head and eyes protection

Insulating rubber gloves

Insulating mats and platforms

Arc flash equipment

Equipment for working on pole

## Insulating testing equipment

Equipment intended for the verification of the dielectric properties of gloves, insulating tools, elements for maneuvers, insulators, blankets, sleeves, etc. It possesses output voltages according classes 00, 0, 1, 2 and 3 of IEC standards.

### The user of the CG-118 can set:

- Type of indication: acoustic signal that indicates if the insulation is fulfilling or not the standard or digital measurement of the leakage current of the element under test.
- Test period
- The language
- Select an Auto diagnose test

### Technical features:

Output voltage: 2.5, 5, 10, 20, 40 kVCC.

Class tests: 00, 0, 1, 2 and 3 according IEC.

Input voltage: 110-220 VAC / 50-60 Hz. / 12 VCC and internal rechargeable battery.

Accessories: Bucket for testings

Input and earthing cables

Rubber gloves test electrodes

User's manual

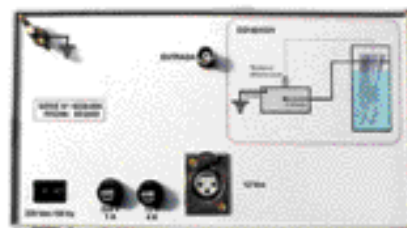
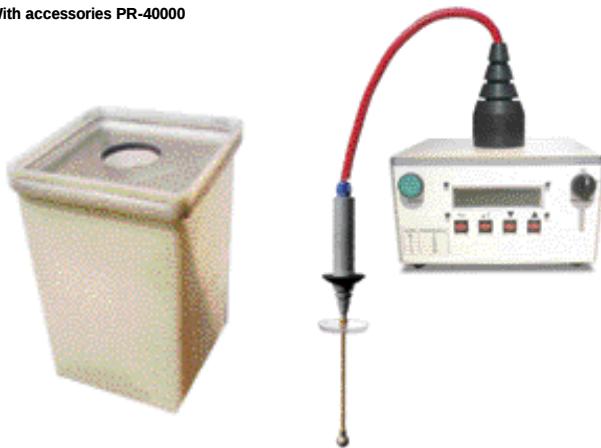
Carrying case

CG-118

Insulating testing equipment



With accessories PR-40000



Back panel PR-40000

## Pneumatic glove tester

For compulsory control of gloves before use.  
Checking is done by inflating and immersing in water.

CG-117

140 x 150 x 160 mm - Weight: 0.600 kg



MEDIUM VOLTAGE

# Personal protective equipment

## Insulating rubber gloves

From 1kV to 52kV

Head and eyes protection

Insulating rubber gloves

Insulating mats and platforms

Arc flash equipment

Equipment for working on pole

### Undergloves

Cotton undergloves

To be used with insulating rubber gloves.

These washable cotton undergloves improve the use of the insulating gloves.

They bring the best held, hygiene and a greater comfort.



CG-80 (\*\*)

\*\* H: men / F: women

### Nomex undergloves

Undergloves 100 % Nomex.

To be used under insulating gloves, for a protection against the electric hazard.

FR - Flame Resistant undergloves.

Ideal complement to Arc Flash Equipment (see page 68)



CG-37

Nomex undergloves

### Mittens

Cotton mittens.

Wearing these undergloves also limits the effects of perspiration: its fingerless gloves shape allowing to keep the maximum of dexterity.



CG-81

Mittens

### Overgloves

Used as outer gloves to protect insulating gloves in dry environment.

Silicon grain leather, very flexible.

Large protective cuff in chrome tanned hide.

Red adhesive strap.



CG-99 (\*)

Weight: 0.170 kg \* Add size: C, D, E

### Working gloves

Handling leather and cotton gloves. Docker type.

Protection against mechanical risks.

EN 388



CE  
3122



CG-97-C

Single size (C = 10)

### Rubber gloves box

To be placed in high voltage stations, or to be carried.

Specially designed for protecting insulating gloves.

This plastic box also ensures the protection against UV radiation of insulating gloves.

The transparent cover enable to check gloves presence.

Bottle of talc included.

Can be fixed on wall.



CG-35/2

101 x 224 x 476 mm - Weight: 1.850kg

### Carrying bag

Made from reinforced waterproof fabric for transport of rubber gloves in vehicles and tool boxes.

Rear loop for belt and snaps.



CG-36

90 x 175 x 585 mm - Weight: 0.120 kg

Electrician suit see page 24

# Personal protective equipment



From 1kV to 52kV

Head and eyes protection

Insulating rubber gloves

Insulating mats and platforms

Arc flash equipment

Equipment for working on pole

## Insulating boots

Made from high quality dielectrical rubber, very flexible and resistant.  
Anti-perforation composite sole and shell.  
Anti-slip sole.  
Protection against step and touch hazardous potential gradients.  
EDF HTA 70B 20 000V

ISO EN 20345  
CE



MV-135\* Hight: 370 mm - Weight: 1.950 kg (42 size)

\* Add sizes: 39-40/41-42-43-44-45-46/47-48-49/50

## Insulating mats

The matting is manufactured of elastomer compounds with slip-resistant surface.  
High quality dielectrical rubber.

IEC-61111  
EN 61111  
CE



Individual models.

| Reference | Thickness (mm) | Class | Voltage (kV) | Dimensions (m) |
|-----------|----------------|-------|--------------|----------------|
| MP-42/11  | 3              | 3     | ≤ 26.5       | 1 x 1          |
| MP-42/16  | 3              | 3     | ≤ 26.5       | 0.6 x 1        |
| MP-42/66  | 3              | 3     | ≤ 26.5       | 0.6 x 0.6      |

For placing in front of panels.

| Reference    | Thickness (mm) | Class | Voltage (kV) | Dimensions (m) |
|--------------|----------------|-------|--------------|----------------|
| MP-60/03-5   | 3              | 3     | ≤ 26.5       | 0.6 x 5        |
| MP-60/03-10  | 3              | 3     | ≤ 26.5       | 0.6 x 10       |
| MP-100/03-5  | 3              | 3     | ≤ 26.5       | 1 x 5          |
| MP-100/03-10 | 3              | 3     | ≤ 26.5       | 1 x 10         |
| MP-60/05-5   | 5              | 4     | ≤ 36         | 0.6 x 5        |
| MP-60/05-10  | 5              | 4     | ≤ 36         | 0.6 x 10       |
| MP-100/05-5  | 5              | 4     | ≤ 36         | 1 x 5          |
| MP-100/05-10 | 5              | 4     | ≤ 36         | 1 x 10         |

## Bags for insulating mats

Specially designed for carrying and protecting insulating mats.  
Equipped with a shoulder strap and a plastic window for instructions and storage identification.



MP-01 For MP-42/16 and MP-42/66 length: 70 cm

MP-02 For MP-42/11 length: 110 cm

## Multi-pockets electrician bag

Specially designed for carrying and protecting insulating mats, face shield and controllers.  
Equipped with several pockets.



M-87386 65 x 15 x 25 cm

## Insulating platforms (indoor models)

Moulded insulating material, one-piece. Top 50 x 50 cm.



| Reference | Rated insulation (V) | Height (mm) | Weight (kg) |
|-----------|----------------------|-------------|-------------|
| CT-7-25/1 | 24 000               | 220         | 3.7         |
| CT-7-40/1 | 40 000               | 260         | 3.8         |

## Insulating platforms (outdoor models)

Solid plate with moulded insulating material 52 x 52 cm, thickness 40 cm.  
Feet with rubber tips.



| Reference | Rated insulation (V) | Number of skirts per foot | Height (mm) | Weight (kg) |
|-----------|----------------------|---------------------------|-------------|-------------|
| CT-9-25   | 24 000               | 2                         | 350         | 6.00        |
| CT-9-45   | 45 000               | 3                         | 435         | 6.50        |

# Personal protective equipment



From 1kV to 52kV

Head and eyes protection

Insulating rubber gloves

Insulating mats and platforms

Arc flash equipment

Equipment for working on pole

In many countries regulations have been established to protect workers from electrical shock and flash hazards in specific areas within which arc flash protection is required. These equipment must be used with insulating gloves and leather overgloves. Equipment up to 100 cal/cm<sup>2</sup> on request.

In compliance with NFPA 70E and ASTM Standards. FR - Flame Retardant garments.

## Arc flash face shield kit (10 cal/cm<sup>2</sup>)

Composition of the kit:

- 1 Face shield with chin cup 10 cal/cm<sup>2</sup>, absorbs > 99.9% of harmful UV radiation, 70% light transmission, tested to ASTM F2178 specifications
- 1 ABS helmet electrically insulated EN397, EN 50365, ANSI Z89.1 20kV.
- 1 carrying bag for face shield and helmet



KIT-ARC-01 Weight: 1.5 kg

## Arc flash protective kits (25, 40, 55, 65 or 100 cal/cm<sup>2</sup>)

Composition of the kit:

- 1 arc flash protective hood with an integrated face shield 25, 40, 55, 65 or 100 cal/cm<sup>2</sup>, ASTM F2178 and NFPA 70E Standards
- 1 arc flash protective coat 25, 40, 55, 65 or 100 cal/cm<sup>2</sup>, ASTM F1506 and NFPA 70E Standards
- 1 arc flash protective bib overall 25, 40, 55, 65 or 100 cal/cm<sup>2</sup>, ASTM F1506 and NFPA 70E Standards
- 1 ABS helmet electrically insulated EN397, EN 50365, ANSI Z89.1 20kV.
- 1 safety glasses EN 166/EN 170
- 1 carrying bag for face shield and helmet
- 1 all kit carrying bag



KIT-ARC-25



KIT-ARC-65/100

## Arc flash jacket and protective coverall kits (8 or 10 cal/cm<sup>2</sup>)

Composition of the kit:

- 1 Face shield with chin cup 10 cal/cm<sup>2</sup>, absorbs > 99.9% of harmful UV radiation, tested to ASTM F2178 specifications
- 1 ABS helmet electrically insulated EN397, EN 50365, ANSI Z89.1, 20kV.
- 1 safety glasses EN 166/EN 170
- 1 arc flash protective hood (10 cal/cm<sup>2</sup>, only with coverall)
- 1 protective coverall 8 or 11 cal/cm<sup>2</sup>, ASTM F1506 and NFPA 70E Standards or
- 1 arc flash protective jacket 11 cal/cm<sup>2</sup>, ASTM F1506 and NFPA 70E Standards
- 1 carrying bag for face shield and helmet
- 1 all kit carrying bag



|               |                                      |                 |
|---------------|--------------------------------------|-----------------|
| KIT-ARC-08-C* | 8 cal/cm <sup>2</sup> with coverall  | Weight: 4.03 kg |
| KIT-ARC-10-J* | 10 cal/cm <sup>2</sup> with jacket   | Weight: 4.03 kg |
| KIT-ARC-10-C* | 10 cal/cm <sup>2</sup> with coverall | Weight: 4.03 kg |

\* Add size M, L or XL (S to 3XL on request).



KIT-ARC-40/55

|                |                                          |                |
|----------------|------------------------------------------|----------------|
| KIT-ARC-25-B*  | 25 cal/cm <sup>2</sup> Indura Ultra Soft | Weight: 6.7 kg |
| KIT-ARC-40-B*  | 40 cal/cm <sup>2</sup> Indura Ultra Soft | Weight: 6.7 kg |
| KIT-ARC-55-B*  | 55 cal/cm <sup>2</sup> Indura Ultra Soft | Weight: 6.7 kg |
| KIT-ARC-65-B*  | 65 cal/cm <sup>2</sup> Kevlar/Nomex      | Weight: 6.7 kg |
| KIT-ARC-100-B* | 100 cal/cm <sup>2</sup> Kevlar/Nomex     | Weight: 6.7 kg |

\* Add size M, L or XL (S to 3XL on request).

# Personal protective equipment

Equipment for  
working on pole

From 1kV to 52kV

Head and eyes protection

Insulating rubber gloves

Insulating mats and platforms

Arc flash equipment

Equipment for working on pole

## Pro electric full body fall arrest harness

2 fall arrest attachment point: dorsal and sternal. Automatic buckles of the belt and leg loops. Elastic shoulder straps. Padded leg loops. A work positioning belt, with a comfortable and lightweight pad. 2 buckles of work positioning Belt. Leg loops and shoulder straps adjustable. Polyamide straps.

Tools holders.

3 sizes : S, M, XL. Delivered in a protective bag with a users manual. Weight: 2.7 kg.



EN 358  
EN 361

CE

MO-563(\*) S = small M = medium XL = large

\* add size: S/M/XL

## Pro electric full body fall arrest harness

2 fall arrest attachment point: one dorsal point, one sternal point. Easy and fast to wear with a ventral snap-hook. A ventral attachment point for a descender and / or lanyard. Padded leg loops. A work positioning belt, with a comfortable and lightweight pad. 2 buckles of work positioning Belt. Leg loops and shoulder straps adjustable.

Polyamide straps. Tools holders

3 sizes : S, M, XL. Delivered in a protective bag with a users manual. Weight: 3 kg.



EN 358  
EN 361  
EN 813

CE

MO-565(\*) S = small M = medium XL = large

\* add size: S/M/XL

## Full body fall arrest harness

2 fall arrest attachment point : dorsal and sternal. A work positioning belt, with a comfortable and lightweight pad. 2 buckles of work positioning Belt. Leg loops and shoulder straps adjustable. Polyamide straps. Unique size. Delivered in a protective bag.



EN 358  
EN 361

CE

MO-71 Weight: 1.9 kg

## Equipped rope straps with lever stretcher

Equipped with adjuster. Hooks to belt with rapid link.



EN 358

CE

MO-52-L Length: 4 m - Weight: 1 kg

## Anti-fall grip

The safety block runs freely on its rope but can be automatically locked in case of a sudden downward drop. Must be used only with special 15 mm Ø rope delivered with the device.



EN 353-3

CE

MO-68/10 With 10 m of rope - Weight: 2.300 kg

MO-68/15 With 15 m of rope - Weight: 3.250 kg

## Double safety descent device

Articulated stainless steel cam. Aluminium housing. High-resistance handle. Operates with 9-12 mm diameter lanyard. Ideal for evacuation. Lets you regulate descent.



EN 361

CE

MD-02 Weight: 0.32 Kg

## Tether rope with energy absorber

Tether rope in polyamide Ø14 mm.

EN 355

CE



MO-52020 Length: 1.50 m

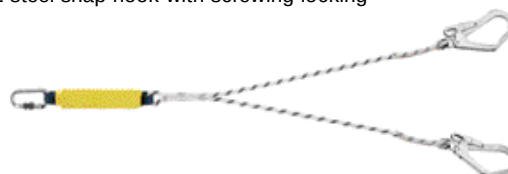
MO-52021 Length: 2.00 m

## Double tether rope with energy absorber

Double tether rope with energy absorber Equipped with 2 steel snap hooks with automatic locking and 1 steel snap hook with screwing locking

EN 355

CE



MO-54010 Length: 1.20 m - Weight: 1.4 kg

# Personal protective equipment



From 1kV to 52kV

Head and eyes protection

Insulating rubber gloves

Insulating mats and platforms

Arc flash equipment

Equipment for working on pole

## Snap hooks (stainless steel)



MO-54



MO-55/1

EN 362  
CE

**MO-54** Locks with threaded ring - Opening: 15 mm  
100 x 58 mm - 0.154 kg

**MO-55/1** Locking by screwing ring on a spring loaded mobile catch; an additional catch is provided to prevent the rope from slipping in the carabiner - 155 x 75 mm - 0.140 kg

## Snap hooks (aluminium alloy) zicral



MO-54000



MO-54004

EN 362  
CE

**MO-54000** Oval snap hook - Opening: 15 mm  
Individually tested - Weight: 0.071 kg  
110 x 58 mm

**MO-54004** D-shaped snap hook with automatic locking  
Opening: 23 mm - Individually tested  
Weight: 0.087 kg - 120 x 72 mm

## Lanyard

Synthetic fibre ropes - 10 mm.  
Loops spliced at both ends.  
Delivered without snap hook.



EN 354  
CE

**MO-53** Length: 1.50 m - Weight: 0.125 kg

## Fall arrester - retractable type

Designed for lineman safety. Quick acceleration causes instant locking. Corrosion protected steel shell. Integrated braking mechanism and dissipating element. Self locking mechanism and automatic tensioning and return facility. Galvanized cable Ø 4 mm. Strength: 1 200 daN. Delivered with a screw crab. Max. length: 10 m.



EN 360  
CE

**MO-591002** Weight: 7.00 kg

## Snap hook with double safety latch

Opening: 50 mm  
Body in steel  
Fingers in stainless steel  
Resistance: 20 kN.

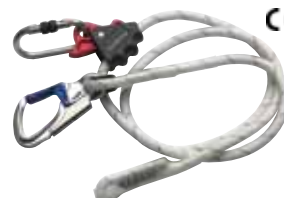


EN 362  
CE

**MO-54002** Weight: 0.390 Kg

## Tether rope equipped with a tension device

The tether rope is intended to ensure that operators are held in position when working at a height. This tether rope must be associated with a harness belt. Ends sewn to form an attachment and protected with a plastic girdle. Polyamide Ø 12 mm. Light alloy.



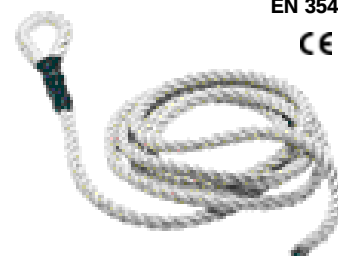
EN 358  
CE

**MO-56009** Weight: 0.750 kg - Length: 2 m

**MO-56010** Weight: 1.000 kg - Length: 5 m

## Safety rope with wear tell tales

Rope: 14 PEPT multi-filament (15 mm diam.)  
Two-colour safety rope, 100% polyester made of 3 white strands with black central thread (wear telltale). Buckle: Polyamide central lug attaches to snap-hook of belt.



EN 354  
CE

**MO-052** Safety rope only - Length: 4 m - 0.76 kg

## Mobile safety line

5 to 20 metres mobile safety line with adjustable harness. Easy and quick to set up, this line can be used by 2 people. It is equipped with a tension device. It has 2 harness rings with screw gate karabiners, reference 40. This safety line is designed for short operations. It takes a few minutes to set it up on 2 attachment points and can withstand a force of 2,000 kg. The line is tightened by hand to be taut as possible. The users can then hook themselves to the safety line using a fall arrest device or a shock absorbing lanyard. When using a shock absorbing lanyard, allow for at least 7 metres clearance.



EN795B  
CE

**MO-53002** Weight: 2.82 kg

# Personal protective equipment



From 1kV to 52kV

Head and eyes protection

Insulating rubber gloves

Insulating mats and platforms

Arc flash equipment

Equipment for working on pole

## Anti-fall device with automatic release strap

Winder with self-locking strap.  
Length: 2 m.  
Equipped with shock absorber.  
Allows 2 m of movement autonomy around anchoring point.

EN 360



MO-591000 Weight: 1.160 kg

## Constraint tie

Tie in polyamide.

EN 795

CE



MO-52031 Length: 0.8 m - Weight: 0.100 kg

MO-52033 Length: 1.20 m - Weight: 0.135 kg

MO-52034 Length: 1.50 m - Weight: 0.150 kg

## Snap hook with stick adapter

To fix a life line from the ground.  
Snap hook to be operated with a stick and unlocking using a cord.

| Reference  | Characteristics                           |
|------------|-------------------------------------------|
| MO-54005-C | Opening: 50 mm End-piece C                |
| MO-54005-K | Opening: 50 mm End-piece K                |
| CE-5-90-C  | Length: 9 m max. Weight: 4 kg End-piece C |
| CE-5-90-K  | Length: 9 m max. Weight: 4 kg End-piece K |

Other length, see page 88.



EN 362

CE

## Working on pole kits



| Reference        | Use                                     |
|------------------|-----------------------------------------|
| KIT-HAUT-01-(* ) | To go up a pole with insulating ladders |
| KIT-HAUT-02-(* ) | To go up a pole with spliced ladders    |
| KIT-HAUT-03-(* ) | To go up a catenary                     |
| KIT-HAUT-04-(* ) | To go up on a pylon                     |
| KIT-HAUT-05-(* ) | To go up on a roof                      |
| KIT-HAUT-06-(* ) | To go up using a nacelle                |

| Composition                              | KIT-HAUT- |     |     |                  |     |     |
|------------------------------------------|-----------|-----|-----|------------------|-----|-----|
|                                          | 01*       | 02* | 03* | 04*              | 05* | 06* |
| Harness MO-563                           | n         | n   | n   |                  |     |     |
| Harness MO-565                           |           |     |     | n                |     |     |
| Harness MO-71                            |           |     |     |                  | n   | n   |
| Tether rope MO-52020                     | n         |     |     |                  |     | n   |
| Double tether rope MO-54010              |           | n   |     | n                | n   |     |
| Constraint tie MO-52034                  | n         | n   |     |                  |     |     |
| Constraint tie MO-52031                  |           |     |     | n <sup>(2)</sup> |     |     |
| Tether rope with tension device MO-56009 | n         | n   | n   | n                | n   |     |
| Anti-fall grip MO-68/15                  | n         | n   | n   | n                |     |     |
| Snap hook MO-54                          | n         | n   |     |                  |     |     |
| Carrying bag M-87-295                    | n         | n   | n   | n                | n   | n   |

(\*) add size : M or XL - order example : KIT-HAUT-02-XL.

# Personal protective equipment

Equipment for  
working on pole

From 1kV to 52kV

Head and eyes protection

Insulating rubber gloves

Insulating mats and platforms

Arc flash equipment

Equipment for working on pole

## Insulating ladders

A complete range with top quality features: Insulation between two steps: 30000 V (test performed after immersion in water for 24 hours). High mechanical resistance to bending and twisting. Good resistance/weight ratio. High fire resistance. High resistance against bad weather and corrosive elements. Lateral risers in polyester/glass fiber rectangular section 70 x 25 mm. Aluminium alloy rungs with square 29 x 29 mm section and anti-slip coating.

INSULATING 2 SECTION EXTENSION LADDERS,  
HAND OPERATED

| Reference  | Folded length | Extended length | Number of rungs | Weight (kg) |
|------------|---------------|-----------------|-----------------|-------------|
| MP-514/2   | 2.41 (m)      | 4.09 (m)        | 2 x 8           | 13.9        |
| MP-515/2-R | 2.97 (m)      | 5.21 (m)        | 2 x 10          | 17          |

INSULATING 2 SECTION EXTENSION LADDERS,  
ROPE AND PULLEY OPERATED

|          |          |           |        |      |
|----------|----------|-----------|--------|------|
| MP-506/2 | 3.53 (m) | 6.05 (m)  | 2 x 12 | 22.9 |
| MP-508/2 | 4.66 (m) | 8.30 (m)  | 2 x 16 | 35.4 |
| MP-509/2 | 5.22 (m) | 9.14 (m)  | 2 x 18 | 39.3 |
| MP-510/2 | 5.78 (m) | 10.26 (m) | 2 x 20 | 43   |

## Forged steel climbers for round wooden poles

Hard forged steel - Leather belts with cast buckles.  
Delivered by pair.



|       |                                     |
|-------|-------------------------------------|
| MO-24 | Ø 20 cm - 2.6 kg - Pair of climbers |
| MO-25 | Ø 25 cm - 2.8 kg - Pair of climbers |
| MO-26 | Ø 30 cm - 3.0 kg - Pair of climbers |
| MO-35 | Ø 35 cm - 3.2 kg - Pair of climbers |

## Mechanical climbers for round and hexagonal concrete poles

Manual locking  
Adaptable to the pole diameter  
For poles Ø 140 to 300 mm.



|         |                                   |
|---------|-----------------------------------|
| MO-16-A | Pair of climbers - Weight: 6.5 Kg |
|---------|-----------------------------------|



EN 131

CE



## Mechanical climbers for rectangular shaped concrete poles

Automatic locking of jaws by elastic cord.  
Sole in aluminium alloy, high resistance, with leather belts and steel buckle.  
Wear plate placed on sole arm.  
Mobile drum on axis can be removed; processed steel rollers.  
High resistance aluminium alloy rack, used for clamping onto poles 14 to 42 cm wide.



Spare parts:  
MO-17-01: pair of elastic cords  
MO-17-02: pair of wear plates  
MO-17-03: blade roller  
MO-17-04: pair of runners

|         |                                   |
|---------|-----------------------------------|
| MO-17-A | Pair of climbers - Weight: 6.5 Kg |
|---------|-----------------------------------|

## Climbers for H profile metallic poles

Hard forged steel.  
Delivered by pair.



|       |                                    |
|-------|------------------------------------|
| MO-23 | Pair of climbers - Weight: 5.10 kg |
|-------|------------------------------------|

# Substation equipment

From 1kV to 52kV

## Padlocks, warning signs and delineators

Padlocks, warning signs and delineators

Safety equipment & lamps

Short-circuiting & earthing systems

Voltage detectors and V.I.S / V.D.S

Saving kits

A wide range of brass padlocks, in a plastic body.

Brass ring bow 50 or 70 mm. Diameter of the ring bow 4 or 6 mm. Different n° of keys. Colours : red, white, yellow, blue or green.

## Padlocks with warning signs

| Reference       | Ring bow (mm) | Ø (mm) | Weight (kg) |
|-----------------|---------------|--------|-------------|
| AL-230-(*)-EX   | 50            | 6      | 0.170       |
| AL-230-S-(*)-EX | 70            | 6      | 0.190       |
| AL-230-Z-EX     | 50            | 6      | 0.170       |
| AL-230-S-Z-EX   | 70            | 6      | 0.190       |
| AL-240-(*)-EX   | 50            | 4      | 0.170       |
| AL-240-S-(*)-EX | 70            | 4      | 0.190       |
| AL-240-Z-EX     | 50            | 4      | 0.170       |
| AL-240-S-Z-EX   | 70            | 4      | 0.190       |



\* Add n° of key: 111 or 222

"00" n° standard key: n° of key upon request. Z: random n° of key

## Colour padlocks range

| Reference         | Ring bow (mm) | colour | Ø (mm) | Weight (kg) |
|-------------------|---------------|--------|--------|-------------|
| AL-240-B-Z-EX     | 50            | White  | 4      | 0.170       |
| AL-240-B-00-EX    | 50            | White  | 4      | 0.170       |
| AL-240-S-B-00-EX  | 70            | White  | 4      | 0.190       |
| AL-240-J-Z-EX     | 50            | Yellow | 4      | 0.170       |
| AL-240-J-00-EX    | 50            | Yellow | 4      | 0.170       |
| AL-240-S-J-00-EX  | 70            | Yellow | 4      | 0.190       |
| AL-240-BL-Z-EX    | 50            | Blue   | 4      | 0.170       |
| AL-240-BL-00-EX   | 50            | Blue   | 4      | 0.170       |
| AL-240-S-BL-00-EX | 70            | Blue   | 4      | 0.190       |
| AL-240-V-Z-EX     | 50            | Green  | 4      | 0.170       |
| AL-240-V-00-EX    | 50            | Green  | 4      | 0.170       |
| AL-240-S-V-00-EX  | 70            | Green  | 4      | 0.190       |



# Substation equipment

Padlocks, warning signs and delineators

From 1kV to 52kV

Padlocks, warning signs and delineators

Safety equipment & lamps

Short-circuiting & earthing systems

Voltage detectors and V.I.S / V.D.S

Saving kits

## Multiple locking apparatus

Holds up to four padlocks and a sign.

AL-200



AL-202



|        |                                     |
|--------|-------------------------------------|
| AL-200 | 100 x 60 x 10 mm - Weight: 0.150 kg |
| AL-202 | 165 x 50 x 12 mm - Weight: 0.200 kg |

## Handle for 10 and 30 padlocks

PVC.  
Shock resistant.  
Ivory colour.  
With holes Ø 9 mm.



|           |                                    |
|-----------|------------------------------------|
| AL-207/10 | For 10 padlocks - Weight: 0.06 kg  |
| AL-207/30 | For 30 padlocks - Weight: 0.130 kg |

## Safety locking badge

Fit with multiple locking apparatus AL-202  
White letters on red aluminium  
Fixing with 1 hole Ø 10 mm.



|           |         |
|-----------|---------|
| AM-467-GB | Ø 80 mm |
|-----------|---------|

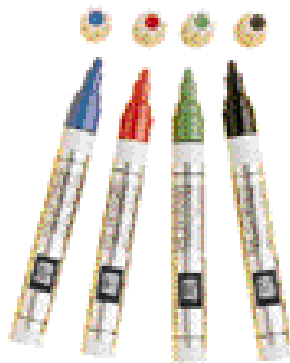
## Handle with 6 padlocks

Handle of moulded plastic for holding up to six padlocks.  
Compartment with transparent cover for key storage.



## Marking

For indelible writing on the warning signs and padlocks, our ALU-SCRIPT™ markers are ideal.



|        |                                                            |
|--------|------------------------------------------------------------|
| AS-404 | 4 markers in assorted colours (red, black, blue and green) |
|--------|------------------------------------------------------------|

| Reference       | Weight (kg) | Handle with 6 padlocks |
|-----------------|-------------|------------------------|
| AL-236-111-EX   | 1.150       | AL-230-111-EX          |
| AL-236-S-111-EX | 1.210       | AL-230-S-111-EX        |
| AL-236-222-EX   | 1.150       | AL-230-222-EX          |
| AL-236-S-222-EX | 1.210       | AL-230-S-222-EX        |

# Substation equipment

## Padlocks, warning signs and delineators

From 1kV to 52kV

Padlocks, warning signs and delineators

Safety equipment & lamps

Short-circuiting & earthing systems

Voltage detectors and V.I.S / V.D.S

Saving kits

## Self adhesive warning signs

Complete range of self adhesive, warning signs conditioned in box of 20, 30 or 50 units.



| Reference | Dimensions  | Characteristics   | Quantity/box |
|-----------|-------------|-------------------|--------------|
| AT-41/025 | 25 mm side  | self adhesive PVC | 50           |
| AT-41/05  | 50 mm side  | self adhesive PVC | 30           |
| AT-41/1   | 100 mm side | self adhesive PVC | 20           |
| AT-49/025 | 25 mm side  | self adhesive PVC | 50           |
| AT-49/05  | 50 mm side  | self adhesive PVC | 30           |
| AT-49/1   | 100 mm side | self adhesive PVC | 20           |
| AT-50/025 | 25 mm side  | self adhesive PVC | 50           |
| AT-50/053 | 50 mm side  | self adhesive PVC | 30           |
| AT-50/1   | 100 mm side | self adhesive PVC | 20           |
| AT-51/025 | 25 mm side  | self adhesive PVC | 50           |
| AT-51/05  | 50 mm side  | self adhesive PVC | 30           |
| AT-51/1   | 100 mm side | self adhesive PVC | 20           |
| AT-52/05  | 50 mm side  | self adhesive PVC | 30           |
| AT-52/1   | 100 mm side | self adhesive PVC | 20           |
| AT-53/05  | 50 mm side  | self adhesive PVC | 30           |
| AT-53/1   | 100 mm side | self adhesive PVC | 20           |
| AT-54/05  | Ø 50 mm     | self adhesive PVC | 30           |
| AT-54/1   | Ø 100 mm    | self adhesive PVC | 20           |
| AT-55/05  | Ø 50 mm     | self adhesive PVC | 30           |
| AT-55/1   | Ø 100 mm    | self adhesive PVC | 20           |
| AT-56/05  | Ø 50 mm     | self adhesive PVC | 30           |
| AT-56/1   | Ø 100 mm    | self adhesive PVC | 20           |
| AT-57/05  | Ø 50 mm     | self adhesive PVC | 30           |
| AT-57/1   | Ø 100 mm    | self adhesive PVC | 20           |
| AT-58/05  | Ø 50 mm     | self adhesive PVC | 30           |
| AT-58/1   | Ø 100 mm    | self adhesive PVC | 20           |
| AT-59/05  | Ø 50 mm     | self adhesive PVC | 30           |
| AT-59/1   | Ø 100 mm    | self adhesive PVC | 20           |
| AT-60/05  | Ø 50 mm     | self adhesive PVC | 30           |
| AT-60/1   | Ø 100 mm    | self adhesive PVC | 20           |
| AT-61/05  | Ø 50 mm     | self adhesive PVC | 30           |
| AT-61/1   | Ø 100 mm    | self adhesive PVC | 20           |
| AT-62/05  | Ø 50 mm     | self adhesive PVC | 30           |
| AT-62/1   | Ø 100 mm    | self adhesive PVC | 20           |
| AT-63/05  | Ø 50 mm     | self adhesive PVC | 30           |
| AT-63/1   | Ø 100 mm    | self adhesive PVC | 20           |
| AT-66/1   | 100 mm side | self adhesive PVC | 10           |



**"Customize your labels! On request"**

Available on request: Self adhesive rigid plastic warning signs. High Quality, strong sticking on every surfaces: concrete, painted wall, metal, wood, plastic, glass.

# Substation equipment

Padlocks, warning signs and delineators

Safety equipment & lamps

Short-circuiting & earthing systems

Voltage detectors and V.I.S / V.D.S

Saving kits

From 1kV to 52kV

## Substation signs

### WARNING SIGNS

| Reference | Type      | Dimensions  | Characteristics                                  |
|-----------|-----------|-------------|--------------------------------------------------|
| AM-41/1*  | aluminium | 100 mm side | black on yellow fixing: 3 holes Ø 4.5 mm         |
| AM-41/2   | aluminium | 200 mm side | black on yellow fixing: 3 holes Ø 4.5 mm         |
| AM-49/1*  | aluminium | 100 mm side | black on yellow fixing: 3 holes Ø 4.5 mm         |
| AM-49/2   | aluminium | 200 mm side | black on yellow fixing: 3 holes Ø 4.5 mm         |
| AM-344-GB | aluminium | 100 mm side | black letters on yellow fixing: 3 holes Ø 4.5 mm |
| AM-345-GB | aluminium | 100 mm side | black letters fixing: 3 holes Ø 4.5 mm           |
| AM-344/05 | aluminium | 50 mm side  |                                                  |
| AM-344    | aluminium | 100 mm side |                                                  |

\*Pack of 10 units.

### SPECIALIZED SIGNS

| Reference   | Type      | Dimensions   | Characteristics                 |
|-------------|-----------|--------------|---------------------------------|
| AM-20-GB    | aluminium | 350 x 250 mm | blue letters on plain aluminium |
| AM-20-RM    | aluminium | 350 x 500 mm | blue letters on plain aluminium |
| AM-61-GB    | aluminium | 150 x 200 mm |                                 |
| AM-61-RM    | aluminium | 150 x 200 mm |                                 |
| AM-215-RM   | aluminium | 350 x 250 mm | black on yellow SF6 warning     |
| AM-282/2-RM | aluminium | 200 x 60 mm  |                                 |
| AM-7002     | aluminium | 300 x 200 mm | black on yellow                 |
| AM-33/3     | aluminium | Ø 300 mm     | red-black on alu                |
| AM-34/2     | aluminium | Ø 200 mm     | red-black on alu                |
| AM-32/3     | aluminium | Ø 300 mm     |                                 |
| AP-510-GB   | plastic   | 420 x 297 mm | golden rules                    |
| AP-951/2    | plastic   | 200 x 200 mm | red on white                    |



AM-41/1



AM-49/1



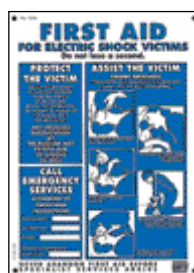
AM-344/05 - AM-344



AM-344-GB



AM-345-GB



AM-20-GB



AM-20-RM



AP-510-GB



AM-215-RM



AM-282/2-RM



AM-7002



AM-61-GB



AM-61-RM



AP-951/2



AM-33/3



AM-34/2



AM-32/3

For other models, please consult us.

# Substation equipment

## Padlocks, warning signs and delineators

From 1kV to 52kV

Padlocks, warning signs and delineators

Safety equipment & lamps

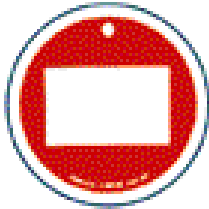
Short-circuiting & earthing systems

Voltage detectors and V.I.S / V.D.S

Saving kits

### Warning sign

Attachment: one hole Ø 10 mm.  
Marking for indelible writing: see page 74.



| Reference | Type    | Ø (mm) |
|-----------|---------|--------|
| AP-499/1  | plastic | 100    |

### Safety boundary post

For temporary installation.  
Used with tough link chain delineators (AL-32/05).  
Removal Foot.  
Ø 50 mm.  
Height: 0.9 m.



|        |                                   |
|--------|-----------------------------------|
| AL-316 | Red and white - Weight: 4.2 kg    |
| AL-318 | Black and yellow - Weight: 4.2 kg |

### Warning flags

Brightly colored ribbon.



| Reference | Dimensions (mm) | Fixing    |
|-----------|-----------------|-----------|
| AL-53     | 650 x 350       | on handle |

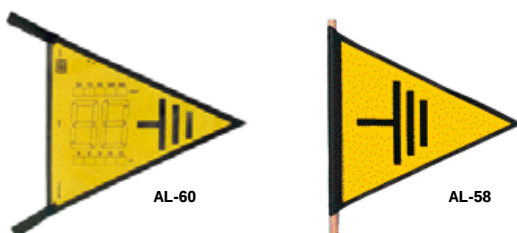
### Chain delineators

Polyamide chains.



|          |                                |
|----------|--------------------------------|
| AL-31/25 | Red and white - Length: 25 m   |
| AL-31/05 | Red and white - Length: 5 m    |
| AL-32/05 | Black and yellow - Length: 5 m |
| AL-31    | Opening ring for AL-31/25      |

### Grounding flags



|       |                                                                                                                                                   |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| AL-58 | Fixing on handle; for work site                                                                                                                   |
| AL-60 | Fixing on earthing cable; for immediate identification in open-type switchgears<br>possible inscription: 0 to 99<br>(by using ALU-SCRIPT markers) |

### Delineators

Brightly colored ribbon.  
Snap hook on one ribbon end and another on spool.  
A ring on spool brakes ribbon at desired length.  
Wide: 50 mm - length: 20 m.



|         |               |
|---------|---------------|
| AL-62-A | Red ribbon    |
| AL-63-A | Yellow ribbon |

# Substation equipment

Safety equipment  
& lamps

From 1kV to 52kV

Padlocks, warning  
signs and delineators

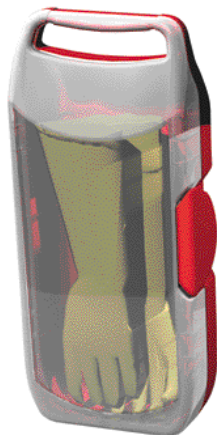
Safety equipment  
& lamps

Short-circuiting  
& earthing systems

Voltage detectors  
and V.I.S / V.D.S

Saving kits

## Intervention kits



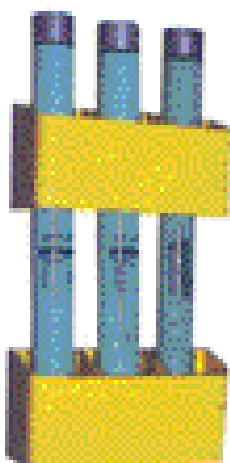
CG-35/2



CG-30 (IEC 60903)



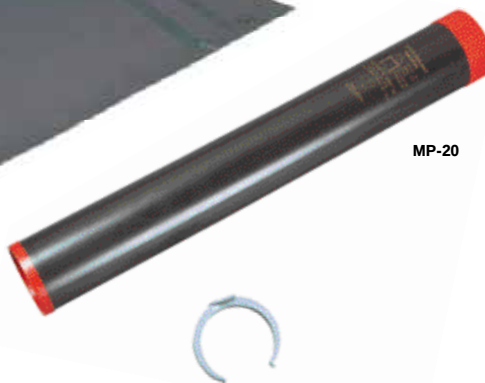
CT-7-25/1



CI-23



MP-42/16



MP-20

CS-45

| Reference  | Composition              | Characteristics      | Dimensions         |
|------------|--------------------------|----------------------|--------------------|
| CG-30-C    | Insulating rubber gloves | 26 500 V max         | size 10            |
| CG-35/2    | Rubber gloves box        |                      | 101 x 224 x 476 mm |
| CI-23      | Fuse holder              |                      | 90 x 240 x 260 mm  |
| CS-45      | Rescue stick             | 45 kV                | 1.65 m             |
| CI-06-D    | Wall mounted supports    | Delivered with CS-45 |                    |
| CT-7-25/1* | Insulating platform      | 24 000 V max         | 500 x 500 x 220 mm |
| MP-42/16** | Insulating MAT           | ≤ 26.5 kV            | 0.6 x 1 mm         |

KIT-01\*

Intervention kit with insulating platform

KIT-10\*\*

Intervention kit with insulating mat delivered with a protective P.V.C. container

# Substation equipment

## Safety equipment & lamps

From 1kV to 52kV

Padlocks, warning signs and delineators

Safety equipment & lamps

Short-circuiting & earthing systems

Voltage detectors and V.I.S / V.D.S

Saving kits

## Safety lamps

For MV indoor substations.

**CD-122** Halogen lamp - Automatic switch on in case of power break  
Adjustable flood beam - power beam:  
5.5 W Operates: 3 hours - Weight: 1.2 kg

**CD-124** Delivered with a wall mounted support  
Bulb: 6 W/12 W  
Operates: 1 hour (12 W), 2 hours (6 W)  
Rechargeable on 230 V 50/60 Hz  
3 positions switch: Off, 6 W, 12 W  
100 x 190 x 220 mm - Weight: 1.9 kg



CD-124



CD-122

## Intrinsically safe Atex torch light

Ex II 2GD EEx ibe IIC T4 or T6.

Zone 1 and 2 - 21 and 22.

- Simple optical system.
- Power supply by 1.5 V LR20 batteries (x3).
- Bulb P13, 559 - 3.7 V - 0.3 A.
- IP 66.

**CD-103** Torchlight Ø 50 x 244 mm - Weight: 0.250 kg

**MS-115-1** Bulb for CD-103 (ordering by 5)



Double optical systems.

Ex II 2GD EEx ibe IIC T6 or T4 or T3.

Zone 1 and 2 - 21 and 22.

Protection mode (suitable for all areas and gases).

Appropriate certificates for Merchant Marine and VERITAS.

Power supply by 1.5 V LR20 batteries (x2).

Fixed light or intermittent optical signals.

IP 66/68.

**CD-104** Dimensions: 230 x 90 x 90 mm - Weight: 400 g



## Intrinsically safe ATEX LED's Headlamp

Ex II 2GD EEx ia IIC T4.

Can be carried either on the head or any kind of helmet.

- Lighting by 3 high performance White LEDs.
- 2 lighting levels (High: 3 LEDs on or low: 1 LED on).
- Adjustable lamp height angle.
- Very light, ABS body.
- ATEX certified Categorie 2 (Zone 1)  
N° TRL03ATEX21005X.
- Range: 10 to 15 meters.
- Powered by 3 batteries LR03 (AAA).
- Autonomy: 150 hours.
- Strap: cloth or silicone rubber (for helmet).

**MS-126** Delivered with batteries - Weight: 0.125Kg

**M-95-864** Hooks set for helmet



CE

MEDIUM VOLTAGE

# Substation equipment

Short-circuiting  
& earthing systems

From 1kV to 52kV

Padlocks, warning  
signs and delineators

Safety equipment  
& lamps

Short-circuiting  
& earthing systems

Voltage detectors  
and V.I.S / V.D.S

Saving kits

## IEC short-circuiting and earthing systems for MV substations

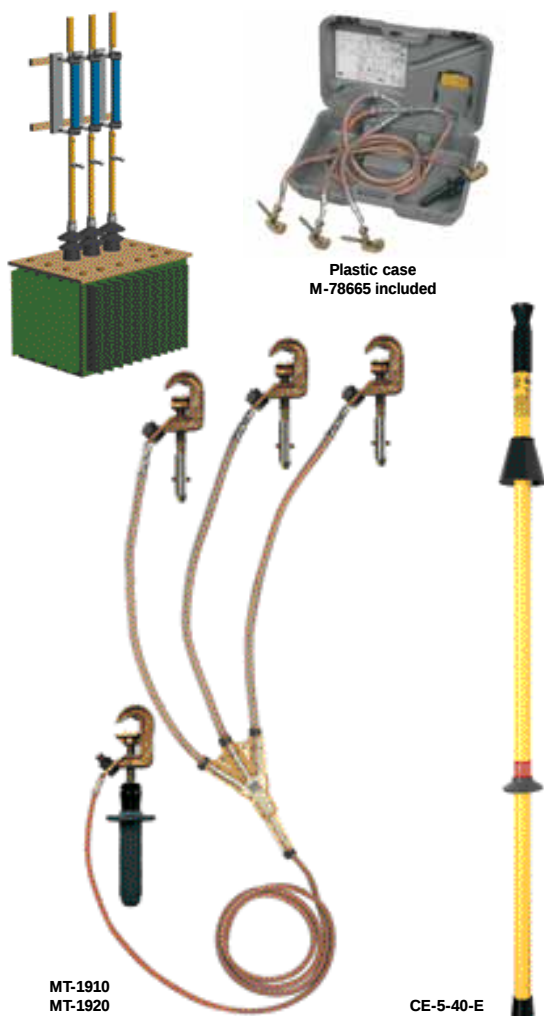
These equipment are intended for connection: to permanent fixed points or to bare conductors.

IEC-61230 

They consist of 3 contact clamps.

1 short-circuit earthing connection set consisting of 3 extra-flexible copper cables with silicone sheath, L = 1.5 m each. 1 trifurcation connector earthed by an extra-flexible copper cable with silicone sheath, L = 2.5 m. 1 earthing clamp. 1 plastic case (M-78665).

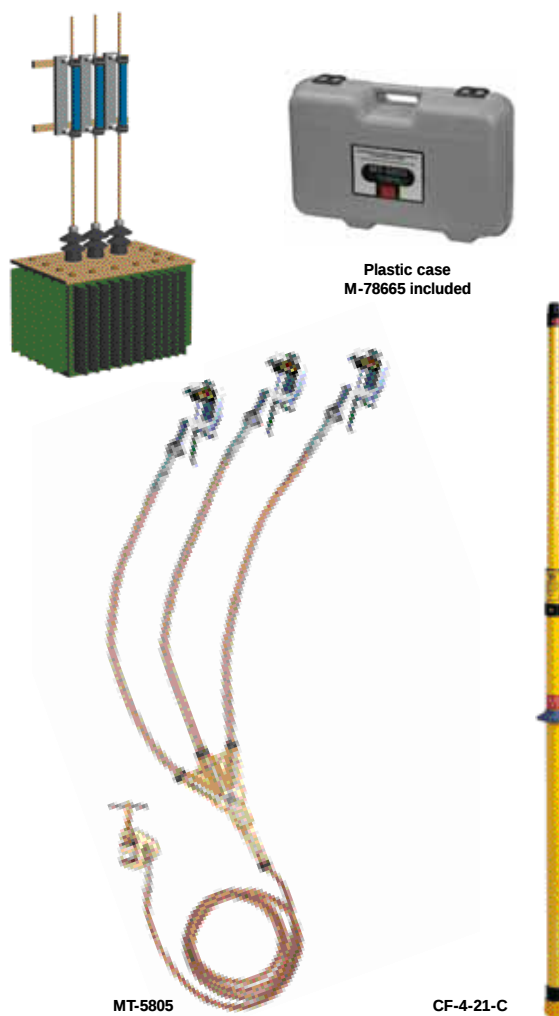
### Installation on permanent fixed points



MT-1910  
MT-1920

CE-5-40-E

### Installation on bare conductors



MT-5805

CE-4-21-C

| Reference                    | MT-1910                                                         | MT-1920                                                          |
|------------------------------|-----------------------------------------------------------------|------------------------------------------------------------------|
| Icc (kA/1s)                  | 20                                                              | 30                                                               |
| Installation on fixed points | Ø 20 mm<br>MT-2951 range                                        | Ø 25 mm<br>MT-3951 range                                         |
| Composition                  | 3 clamps MT-1911-E<br>1 MT-1911                                 | 3 clamps MT-1921-E<br>1 MT-1921                                  |
| Connection set               | 3 cables 95 mm <sup>2</sup><br>1 earth cable 35 mm <sup>2</sup> | 3 cables 150 mm <sup>2</sup><br>1 earth cable 50 mm <sup>2</sup> |
| Sticks**                     | CF-5-40-E                                                       | CF-5-40-E                                                        |

\*\* Stick to be ordered separately

| Reference       | MT-5805                                                         | MT-9801                                                          |
|-----------------|-----------------------------------------------------------------|------------------------------------------------------------------|
| Icc (kA/1s)     | 20                                                              | 10                                                               |
| Conductors (mm) | • Ø 5-35<br>— 16-40<br>— 5-35                                   | • Ø 5-16<br>— 0-16<br>— 40-16<br>• Ø 5-28                        |
| Composition     | 3 clamps MT-815-C<br>1 earth clamp MT-840/1                     | 3 clamps MT-817-C<br>3 clamps MT-814/2<br>1 earth clamp MT-840/1 |
| Connection set  | 3 cables 95 mm <sup>2</sup><br>1 earth cable 35 mm <sup>2</sup> | 3 cables 50 mm <sup>2</sup><br>1 earth cable 25 mm <sup>2</sup>  |
| Sticks**        | CE-4-21-C                                                       | CE-4-21-C                                                        |

*For earthing systems to your own specifications,  
please see page 129.*

# Substation equipment

Short-circuiting  
& earthing systems

From 1kV to 52kV

Padlocks, warning  
signs and delineators

Safety equipment  
& lamps

Short-circuiting  
& earthing systems

Voltage detectors  
and V.I.S / V.D.S

Saving kits

## Clamps for MV installations and substations

### Attachment (C-Type)

Hexagonal end-fitting. A circumferential braking system prevents the clamp from turning under the weight of the cable.

Separates by simple pulling.

Earth cable connection

With a crimped lug (12 mm Ø hole).

Material

Aluminium alloy except MT-814, MT-1911 and MT-1921:  
copper-aluminium bronze.

IEC-61230 

| Reference  | Weight<br>(kg) | Dimensions<br>(mm)                                                            | Conductors<br>(mm)    | Test current<br>(kA/1s) |
|------------|----------------|-------------------------------------------------------------------------------|-----------------------|-------------------------|
| MT-812-C   | 0.320          | 35 x 79 x 143                                                                 | ● Ø 5-16<br>■ 0-16    | 21                      |
| MT-813-C   | 0.330          | 35 x 79 x 169                                                                 | ■ 40 x 16             | 21                      |
| MT-814/2   | 0.660          | 85 x 56 x 192                                                                 | ● Ø 5-28              | 14.5                    |
| MT-817-C   | 0.330          | 30 x 90 x 140                                                                 | ● Ø 5-16<br>■ 40 x 16 | 21                      |
| MT-814/3   | 0.620          | 85 x 56 x 195                                                                 | ● Ø 18-33             | 14.5                    |
| MT-815-C   | 0.650          | 44 x 108 x 173                                                                | ● 5-40                | 30                      |
| MT-815-E   |                |                                                                               | ■ 16-40               |                         |
| MT-815-S   |                | 44 x 126 x 173                                                                | ■ 5-40                |                         |
| MT-815-S1  |                |                                                                               |                       |                         |
| MT-1911-E  | 0.580          | For permanent<br>fixed point Ø 20 mm<br>and round conductors<br>Ø 8 to 18 mm  |                       | 20                      |
| MT-1911-S1 |                |                                                                               |                       |                         |
| MT-1921-E  | 0.69           | For permanent<br>fixed point Ø 25 mm<br>and round conductors<br>Ø 10 to 25 mm |                       | 30                      |
| MT-1921-S1 |                |                                                                               |                       |                         |



## Earth clamps

Copper aluminium bronze earth clamps.



FOR BARE CONDUCTORS.

| Reference | Weight<br>(kg) | Connection             | Conductors<br>(mm) |
|-----------|----------------|------------------------|--------------------|
| MT-840/1  | 0.48           | Thread:<br>Ø 12.5 mm   | ● Ø 6-25<br>■ 0-25 |
| MT-841    | 0.48           | Thread:<br>≤ Ø 12.5 mm | ● Ø 6-25<br>■ 0-30 |

FOR FIXED POINT.

| Reference | Weight<br>(kg) | Connection conductors<br>(mm)                                          |
|-----------|----------------|------------------------------------------------------------------------|
| MT-1911   | 0.58           | Spheric fixed points MT-2951 Ø 20 mm<br>Round conductors Ø 8 to 18 mm  |
| MT-1921   | 0.69           | Spheric fixed points MT-3951 Ø 25 mm<br>Round conductors Ø 10 to 25 mm |

## Fixed points



| Reference   | Sphere<br>dimension | Weight<br>(g) | Fixing                 |
|-------------|---------------------|---------------|------------------------|
| MT-2951     | Ø 20 mm             | 130           | Thread: M 12           |
| MT-2951/1   | Ø 20 mm             | 180           | Bolt: M 12 - L = 35 mm |
| MT-2951/2   | Ø 20 mm             | 200           | Bolt: M 12 - L = 45 mm |
| MT-2950/35* | Ø 20 mm             | 247           | Bolt: M 12 - L = 35 mm |
| MT-3951     | Ø 25 mm             | 240           | Thread: M 12           |
| MT-3952     | Ø 25 mm             | 240           | Thread: M 16           |
| MT-3951/1   | Ø 25 mm             | 300           | Bolt: M 12 - L = 45 mm |
| MT-3952/1   | Ø 25 mm             | 350           | Bolt: M 16 - L = 45 mm |
| MT-3950/35* | Ø 25 mm             | 300           | Bolt: M 16 - L = 35 mm |

# Substation equipment

Short-circuiting  
& earthing systems

From 1kV to 52kV

Padlocks, warning  
signs and delineators

Safety equipment  
& lamps

Short-circuiting  
& earthing systems

Voltage detectors  
and V.I.S / V.D.S

Saving kits

## Insulating sticks for substation use

Telescopic sticks for voltage detectors  
and earthing systems for use in dry  
and wet conditions

IEC-61235 

Telescopic stick contains 2 elements made of resin polyester/glass  
fiber foam filled tube, which slide together and are equipped with a  
push button lock.

| Reference | Rated<br>insulation<br>(kV) | Ø<br>(mm) | Overall<br>length (m) |          | Weight<br>(kg) |
|-----------|-----------------------------|-----------|-----------------------|----------|----------------|
|           |                             |           | folded                | extended |                |
| CE-4-21*  | 90                          | 41/32     | 1.15                  | 2.00     | 1.50           |

\* Add end-piece C, K or E

Fixed length stick for use in dry  
and wet conditions

IEC-61235 

Manufactured from 36 mm dia. elements, with single 100 dia. skirts,  
light and rigid, shock resistant.

| Reference | Rated<br>insulation<br>(kV) | Ø<br>(mm) | Overall<br>length<br>(m) | Weight<br>(kg) |
|-----------|-----------------------------|-----------|--------------------------|----------------|
| CF-5-40*  | 40                          | 36        | 1.50                     | 1.15           |

\* Add end-piece C, K or E

Standard stick for use in dry conditions

| Reference | Rated<br>insulation<br>(kV) | Ø<br>(mm) | Overall<br>length<br>(m) | Weight<br>(kg) |
|-----------|-----------------------------|-----------|--------------------------|----------------|
| CF-3-72*  | 72.5                        | 36        | 1.50                     | 0.88           |

\* Add end-piece C, K or E

Short length clamp stick

IEC-61235 

| Reference  | Ø<br>(mm) | Overall<br>length<br>(m) | Weight<br>(kg) |
|------------|-----------|--------------------------|----------------|
| MG-115/1-S | 32        | 1.50                     | 2.40           |

Rescue stick

| Reference | Rated<br>insulation<br>(kV) | Overall<br>length<br>(m) | Weight<br>(kg) |
|-----------|-----------------------------|--------------------------|----------------|
| CS-45     | 45                          | 1.65                     | 1              |



## Wall mounted supports

For sticks and voltage detectors. Plastic. Delivered with wood screws.

| Reference | Top        | Bottom       |
|-----------|------------|--------------|
| CI-06-D   | Ø 28-30 mm | Ø 36 mm max. |
| CI-10-D   | Ø 28-36 mm | Ø 58 mm max. |
| CI-12-D   | Ø 28-30 mm | Ø 58 mm max. |



Top



Bottom

# Substation equipment

Voltage detectors  
and V.I.S / V.D.S

From 1kV to 52kV

Padlocks, warning  
signs and delineators

Safety equipment  
& lamps

Short-circuiting  
& earthing systems

Voltage detectors  
and V.I.S / V.D.S

Saving kits

## Voltage tester for M.V. separable connectors

Check the absence of voltage on the capacitive terminals of plug-in M.V. bushings.

Sensor in the form of a bent finger enabling removal and reinstallation of the terminal insulating cover.

Signal via beeping and bright red flashing of electro-luminescent diodes.

Built-in function test via the "TEST" button which covers the entire device.

Permanent stand-by state.

Power supply: four 1.5 V, R-6 batteries.

Mounting on insulating stick via a universal end.



**CC-151-K** Tester in rigid case with batteries  
70 x 100 x 165 mm - 0.70 kg

**CC-45-K** Special 45 kV insulating stick  
L = 1.25 m - 0.6 kg

## Voltage detector

For indoor use

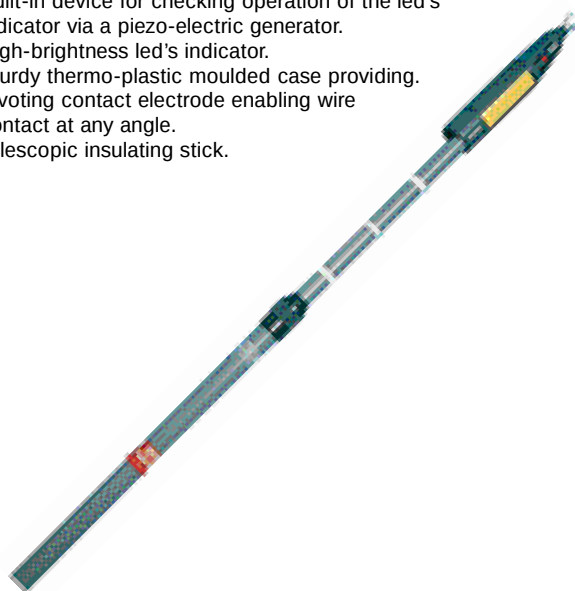
Built-in device for checking operation of the led's indicator via a piezo-electric generator.

High-brightness led's indicator.

Sturdy thermo-plastic moulded case providing.

Pivoting contact electrode enabling wire contact at any angle.

Telescopic insulating stick.



| Operating<br>voltage (kV) | Length (m) |        | Weight<br>(kg) |
|---------------------------|------------|--------|----------------|
|                           | extended   | folded |                |
| 5-40                      | 1.26       | 0.85   | 0.95           |

**CL-4-41/2** Delivered in a waterproof fabric case with strap  
Weight: 0.95 kg

## Permanent luminous indicator

Permanently installed on bus bars, luminous indicator signals the presence of voltage at a glance.

Single-pole 5 to 75 kV indicators.

Signaling the presence of voltage by 7 electroluminescent diodes.

For indoor use.



**CL-40010** For round 5 to 20 mm Ø wires and 1 to  
20 mm flat bars

## Voltage detector "compact serie"

For indoor use

This compact serie voltage detector is designed to be carried easily by operators.

Voltage presence is indicated by a high-brightness LED's indicator.

Built-in device for checking of the LED's indicator by a piezotest generator.

Equipped with a telescopic handle.

Delivered in holster.



| Reference           | Operating<br>voltage (kV) | Extended | Folded | Weight<br>(kg) |
|---------------------|---------------------------|----------|--------|----------------|
| <b>CL-2-5/36-2</b>  | 5-36                      | 0.7      | 0.3    | 0.4            |
| <b>CL-2-10/30-2</b> | 10-30                     | 0.7      | 0.3    | 0.4            |

*Electronic type detectors can also be used.  
Please refer pages 86 and 87.*

# Substation equipment

Voltage detectors  
and V.I.S / V.D.S

From 1kV to 52kV

Padlocks, warning  
signs and delineators

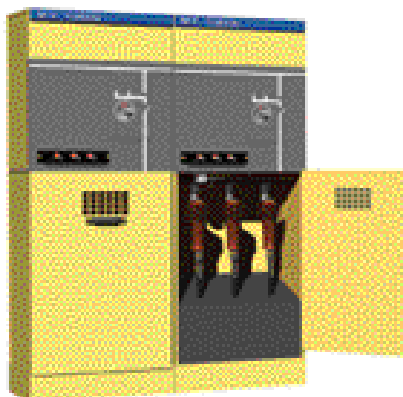
Safety equipment  
& lamps

Short-circuiting  
& earthing systems

Voltage detectors  
and V.I.S / V.D.S

Saving kits

We can deliver complete set with foot capacitance, head capacitance and wirings to your own specifications. Please consult us.



## Integrated voltage presence indicating system (V.P.I.S)

Indicates the voltage presence on M.V. cubicles by being installed on the capacitive dividers.  
Voltage of use behind capacitive dividers:  $V < 1\,000\text{ V}$ .  
Light threshold: 90 V.  
Signalling: 3 neons.  
Attachment: male/female plugs.

EC 61958



CL-495-3

Packaging: vinyl cover  
Dimensions: 130 x 30 mm

## Integrated voltage detecting system (V.D.S)

Indicates the voltage presence on M.V. cubicles by being installed on the capacitive dividers.  
Voltage of use behind capacitive dividers: 1 000 V (between phase and earth).  
Light threshold: 70/90 V.  
Input impedance: 36 M $\Omega$ .  
Signalling by 3 red diodes.

IEC 61243-5



CL-497-00

Packaging: vinyl cover  
Dimensions: 146 x 30 mm

## Interface for integrated voltage detecting system (V.D.S)

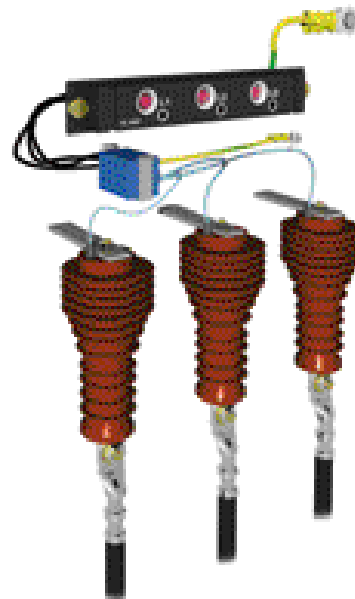
Indicates the voltage presence on M.V. cubicles by being installed on the capacitive dividers.  
For High impedance detecting systems  
Input impedance: 36/43 M.  
Voltage indication by 4 mm standard sockets on the front of the indicator.

IEC 61243-5



CL-498-00

Packaging: vinyl cover  
Dimensions: 146 x 30 mm



## Sound phase comparator

The MX-404 sound phase comparator checks the concordance between 2 phases.  
The comparator's operation is indicated by:  
Emission of an audible signal when there is discrepancy between the two phases. Absence of an audible signal when there is no discrepancy between the two phases.  
Power supply: 9V type 6LR battery.

IEC 61243-5



MX-404

Delivered in a storage box  
Dimensions: 145 x 80 mm

## Separable voltage detecting system (V.D.S)

This device enables to check the absence or presence of voltage on three phases (L1, L2, L3).  
HR high impedance.  
Voltage max: 1 080 V rms. 50/60 Hz.  
Voltage presence: red flashing LED > 1 Hz.  
Fits in CL-498 devices.

IEC 61243-5

CL-499/101



CL-499/101

Delivered in plastic bag

# Substation equipment



Saving kits

From 1kV to 52kV

|                                         |                          |                                     |                                     |             |
|-----------------------------------------|--------------------------|-------------------------------------|-------------------------------------|-------------|
| Padlocks, warning signs and delineators | Safety equipment & lamps | Short-circuiting & earthing systems | Voltage detectors and V.I.S / V.D.S | Saving kits |
|-----------------------------------------|--------------------------|-------------------------------------|-------------------------------------|-------------|

## Life saving kits for M.V. substations

In case of an electrical accident, quick response is essential: seconds gained or lost can decide the life or death of a victim. Our life saving equipment is designed to make all necessary materials immediately available to rescue personnel. It includes:

- 1 rescue telescopic stick
- 1 voltage detector with flexible antenna contact (with autotest)
- 1 cable cutter with insulated handles Forged steel blades maximum opening: 30 mm
- 1 insulating platform, 24 kV or 36 kV high voltage Insulating gloves, insulating boots
- Safety instructions on the plastic board
- 1 talcum powder can.

|          |                                                                                         |
|----------|-----------------------------------------------------------------------------------------|
| CZ-54-R  | Wall mounted panel 0.84 x 0.745 x 0.27 m<br>21 kg - With instructions in English - 24kV |
| CZ-54-MR | Same as CZ-54-R<br>With instructions in English/Arabic - 24kV                           |
| CZ-55-R  | Same as CZ-54-R<br>except use tension: 36 kV                                            |
| CZ-55-MR | Same as CZ-55-R<br>With instructions in English/Arabic - 36kV                           |



## Compact carrying KIT

This compact kit is designed especially to be carried in a vehicle for safety electrical intervention. Made in two part (of moulded material: PEHD), the case is also on its red part, an insulating platform. Composition of the kit:

- 1 insulating platform
- 1 telescopic insulating stick
- 1 voltage detector with autotest
- 1 rescue hook
- 1 insulated cable cutter
- 1 pair of insulating gloves
- 1 pair of insulating boots
- 1 talcum powder can
- 1 safety instructions and safety first aid posters
- 1 adhesive tape (black and yellow).

|            |                                                                             |
|------------|-----------------------------------------------------------------------------|
| CZ-53-R    | 710 x 570 x 240 mm - Weight: 18.5 kg<br>with instructions in English - 25kV |
| CZ-53-MR   | Same as CZ-53-R<br>with instructions in English/Arabic - 25kV               |
| CZ-53-R/2  | Same as CZ-53-R<br>except use tension: 36 kV                                |
| CZ-53-MR/2 | Same as CZ-53-R/2<br>With instructions in English/Arabic - 36kV             |



# Voltage detectors

IEC voltage detectors

From 1kV to 52kV

IEC voltage detectors

Standard voltage detector

Insulating sticks for voltage detectors

Phase comparators

## IEC electronic Voltage Detectors, "Compact serie" for indoor and outdoor use

Ultimate technology of voltage detector "Head Capacitive Technology"

IEC-61243-1



Compact and light

It offers:

- a wide band (10/36 kV)
- a universal application (50/60 Hz)

Voltage presence is indicated by:

- red flashing LED (very bright -visible at more than 20 m in direct lighting)
- powerful rated audible signal > 60 dB(A)/2 m

Operating check:

By pressing the TEST button, correct operation is indicated as follows :

- a red LED flashes on
  - sound signal
- (during and after this test, the timed green LED lights up. While remaining on, it indicates the good working order of the detector)

Characteristics:

- Detectors have unitary adjustment and are checked by routine test
- Dielectrically tested on substation bars (bridging test)
- Precise and stable operating threshold
- Reduced sensitivity to induced voltages
- Reduced sensitivity to interference field
- High environmental resistance (impacts, vibrations, moisture)

Use from 50 to 60 Hz

Temperature conditions: class N (IEC-61243-1 standard)

Storage and operation: -25/ +55 °C

Robust housing

Power supply: 1 x 9V alkaline battery type 6LR61

Contact electrodes fitted to the housing by screwing and are easily interchangeable

End fittings:

C = hexagonal 12 mm, for hexagonal end-fitting sticks

K = universal, for universal end-fitting sticks

Weight of the detector: 420 g

Size of the detector: Ø 59 x 270 mm

Packaging: unit supplied complete in a case with batteries and contact electrodes

Total weight: 1100 g

Total size: 340 x 275 x 83 mm

Recommended stick:

CE-4-21. See page 81.



CC-875-C

CC-875-K



C

K

Frequency 50/60 Hz

| Reference     | Operating voltage (KV) |
|---------------|------------------------|
| CC-875-10/36* | 10-36                  |
| CC-875-11/33* | 11-33                  |

\* Specify type of mounting when ordering: C or K.

*For other voltages, please consult us.*

# Voltage detectors



From 1kV to 52kV

- IEC voltage detectors
- Standard voltage detector
- Insulating sticks for voltage detectors
- Phase comparators

## Standard electronic voltage detector for indoor and outdoor use

With a precise and absolutely stable operating threshold, the DETEX ELECTRONIC DETECTORS offer users maximum safety on MV lines and installations.



### Double signalling

Voltage presence is indicated by both:

- extremely bright red flashing LED's (visible at more than 50 meters even in unfavourable light),
- powerful rated audible signal > 60 dB/2 m.

### Checking

By pressing the test button, the operator checks that the detector is working properly. When the test button is released, a timed green LED lights, indicating both the detector is operational and the self testing of the unit continues.

### Continuous monitoring conditions

### High reliability

Tropicalized: -25 / +55 °C.

- housing made from polycarbonate with high mechanical properties and dielectric strength.

### Removable electrode

### Power supply

- four 1.5 V batteries type LR 6.

### End fittings:

- "C" for hexagonal sticks.
- "K" for universal sticks.

### Weight

500 g with batteries.

### Packaging

Units supplied complete in a case with batteries and two contact electrodes (straight and V-shaped) - 390 x 90 x 90 mm  
Weight: 0.800 kg.

### Recommended sticks:

CE-4-21. See page 81.



CC-363-C

CC-363-K

| Reference | Operating voltage (Ph/ph - kV) |
|-----------|--------------------------------|
| CC-363*   | 5-36                           |

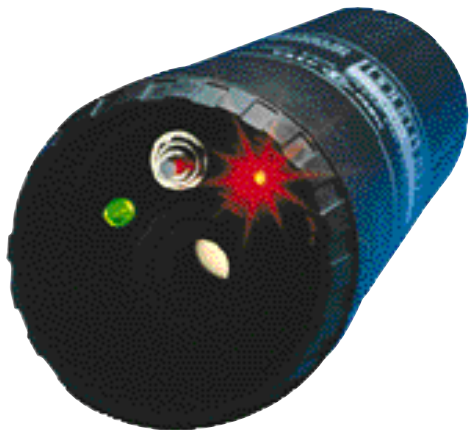
\* Specify type of mounting when ordering: C or K.

|            |                                                                        |
|------------|------------------------------------------------------------------------|
| CC-365-101 | Flag/Vee contact electrode                                             |
| C-92-492   | Contact electrode for installations<br>L = 310 mm, insulated on 300 mm |



C

K



For other voltages, please consult us.

# Voltage detectors

Insulating sticks  
for voltage detectors

From 1kV to 52kV

IEC voltage detectors

Standard voltage detector

Insulating sticks for voltage detectors

Phase comparators

## Telescopic sticks for voltage detectors

Telescopic stick contains 2 elements made of **IEC-61235**   
resin polyester/glass fiber foam filled tube, which  
slide together and are equipped with a push button lock.

| Reference | Rated<br>insulation<br>(kV) | Ø<br>(mm) | Overall<br>length (m) |          | Weight<br>(kg) |
|-----------|-----------------------------|-----------|-----------------------|----------|----------------|
|           |                             |           | folded                | extended |                |
| CE-4-21*  | 90                          | 41/32     | 1.15                  | 2.00     | 1.50           |

\* Specify type of mounting when ordering: C or K.

## Telescopic sticks for voltage detectors

Contains 2 elements:

**\*\*IEC-60855** 

A yellow lower element made of resin  
polyester/glass fiber foam filled 41 mm diameter base tube.  
An upper orange element made of glass fiber/resin epoxy foam  
filled of 32 mm diameter (\*\*).

| Reference | Rated<br>insulation<br>(kV) | Ø<br>(mm) | Overall<br>length (m) |          | Weight<br>(kg) |
|-----------|-----------------------------|-----------|-----------------------|----------|----------------|
|           |                             |           | folded                | extended |                |
| CE-75*    | 75                          | 41/32**   | 1.15                  | 2.00     | 1.20           |

\* Specify type of mounting when ordering: C or K.

## Extension for insulating sticks

Extension with a male end-piece.

**IEC-61235** 

| Reference | Length (m) | Weight (Kg) |
|-----------|------------|-------------|
| CM-7-10-A | 1.00       | 1.10        |

Connection adaptors see page 99.



# Voltage detectors



From 1kV to 52kV

|                       |                           |                                         |                   |
|-----------------------|---------------------------|-----------------------------------------|-------------------|
| IEC voltage detectors | Standard voltage detector | Insulating sticks for voltage detectors | Phase comparators |
|-----------------------|---------------------------|-----------------------------------------|-------------------|

Unlike single-pole voltage detectors, two-pole testers may detect differences in voltage between any two points of an installation. Essentially used for phase balance operations, they may also be used for two-pole detection operations and H.V. fuse checking.

## Two-pole Phase comparators for indoor use

The DETEX CL-8-36 detect differences in voltage between any two points of an installation indicated by LED's. It also enables assessment of the order of magnitude of the residual voltage induced by nearby live lines or circuits, and thus differentiates it from the one provided directly from a high voltage source.

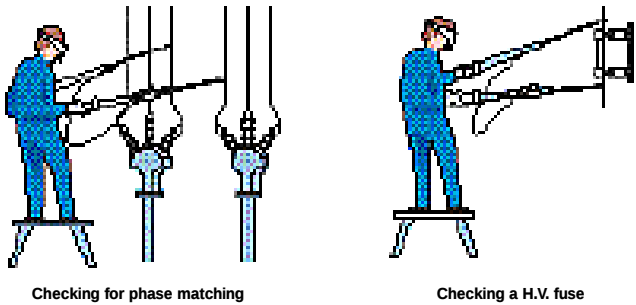
- Wide range of voltages: 2 to 36 kV.
- High luminosity.
- Compact: 0.62 m with probes dismounted.
- High dielectric quality insulating material.
- Two 1.25 m elements with removable probes, connected via a high-insulation lead.
- Max. use distance: 2.25 m (with probe extenders).
- Operation testing: with a checking device.



|           |                                                                                                                                             |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------|
| CL-8-36   | CL-8-36 tester in plastic case<br>150 x 195 x 650 mm - Weight: 7.5 kg                                                                       |
| CL-8-36/1 | CL-8-36 tester with two probe extenders<br>0.550 m - cable, lenght: 2.87m delivered<br>in plastic case 150 x 195 x 650 mm<br>Weight: 7.8 kg |

### ACCESSORIES

|         |                         |
|---------|-------------------------|
| C-92-20 | Spare 0.550 m probe     |
| CL-8-05 | Probe extenders 0.550 m |



## PIEZOTEST™ Separate testing device for phase comparator

Piezo-electric generator activated via a handle mechanism providing a high frequency voltage.  
Metal contact at the tip of the device. This contact may receive the "banana" plug of the extension lead to facilitate testing on very long detectors.  
Earth socket at the base of the unit receiving a plug for making closed-circuit tests.



|         |                                                           |
|---------|-----------------------------------------------------------|
| CL-1-06 | In case, with lead - 190 x 32 x 65 mm<br>Weight: 0.300 kg |
|---------|-----------------------------------------------------------|

# Voltage detectors



From 1kV to 52kV

IEC voltage detectors

Standard voltage detector

Insulating sticks for voltage detectors

Phase comparators

## Single pole phase comparator for indoor and outdoor use

Frequency and voltage phase memory.  
Integrated TEST push-button.  
Orange LED = indication that frequency and voltage are in memory.  
Green LED = phasing indication.  
Red LED = non-phasing indication.  
Powered by a 6 LR 61 9 V battery.  
Delivered in carrying case.

IEC-61481

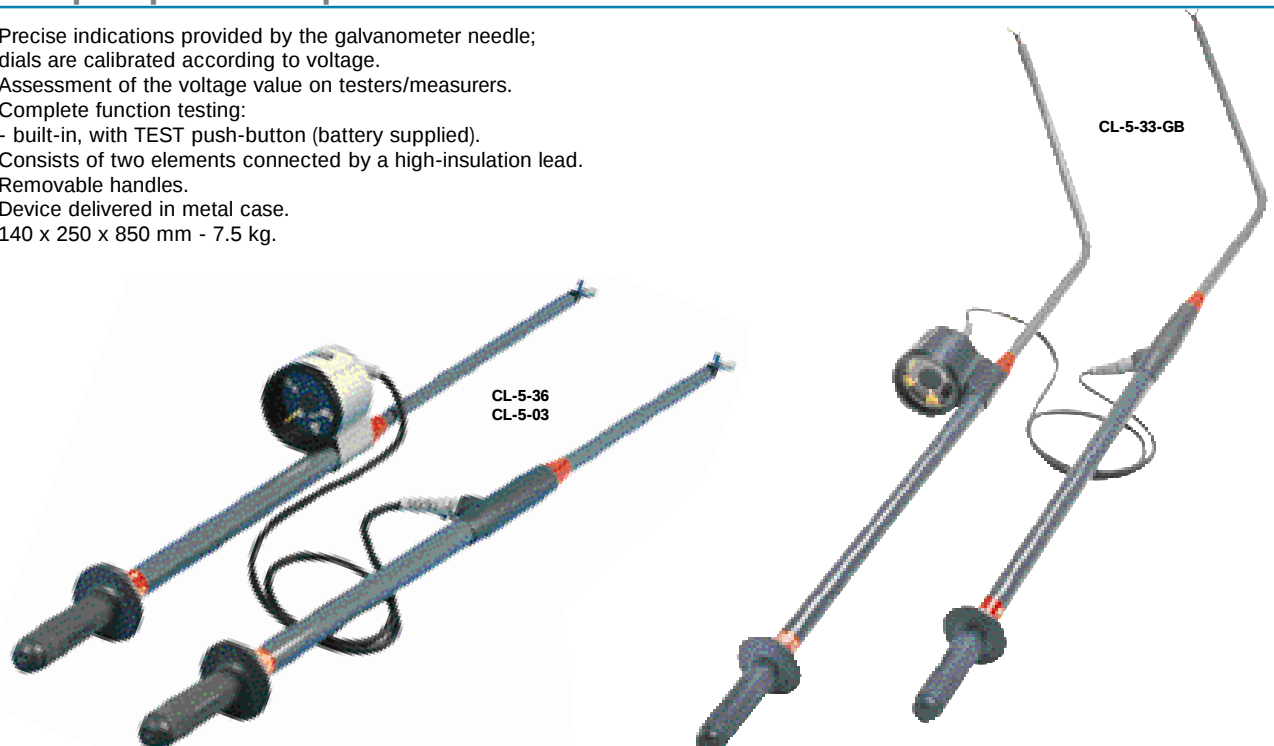


| Reference     | Voltage (kV) | Length of antenna (m) |
|---------------|--------------|-----------------------|
| CL-7-06/18*   | 6-18         | 0.55                  |
| CL-7-10/30*   | 10-30        | 0.85                  |
| CL-7-10/30-1* | 10-30        | 1.15                  |
| CL-7-12/36*   | 12-36        | 1.20                  |

\* Please specify type C or K when ordering.

## Two-pole phase comparator for indoor and outdoor use

Precise indications provided by the galvanometer needle;  
dials are calibrated according to voltage.  
Assessment of the voltage value on testers/measurers.  
Complete function testing:  
- built-in, with TEST push-button (battery supplied).  
Consists of two elements connected by a high-insulation lead.  
Removable handles.  
Device delivered in metal case.  
140 x 250 x 850 mm - 7.5 kg.



| Reference       | Voltage (kV) | Dial scale (kV)             | Observations                 |
|-----------------|--------------|-----------------------------|------------------------------|
| Phase tester    |              |                             |                              |
| CL-5-33-GB      | 11-33        | 11-33 A.C/D.C               | straight and angled antennae |
| CL-5-36         | 5-36         | 5-10-15-20-25-30-36 A.C/D.C | straight antennae            |
| Tester-measurer |              |                             |                              |
| CL-5-03         | 0.75-3       | 0.75-1-1.25-1.5-3 A.C/D.C   | straight antennae            |

# Voltage detectors



From 1kV to 52kV

IEC voltage detectors

Standard voltage detector

Insulating sticks for voltage detectors

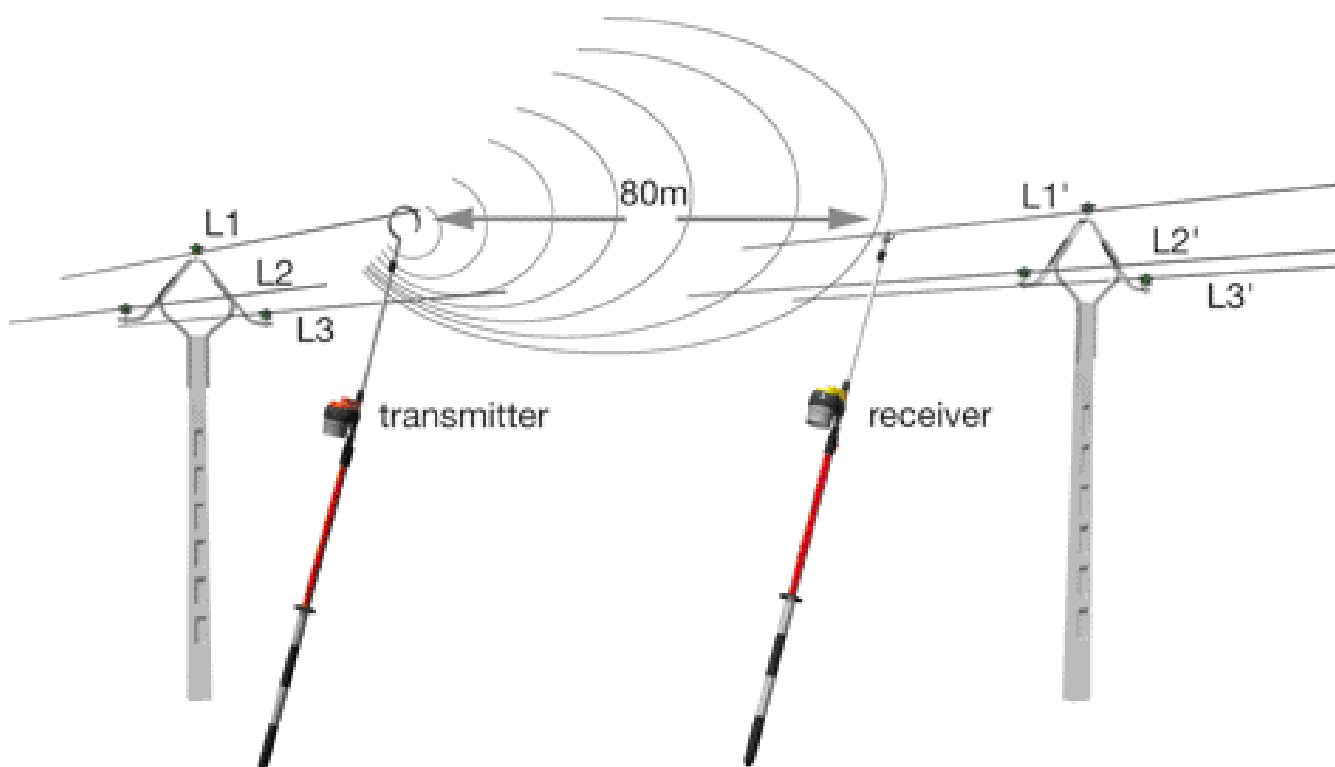
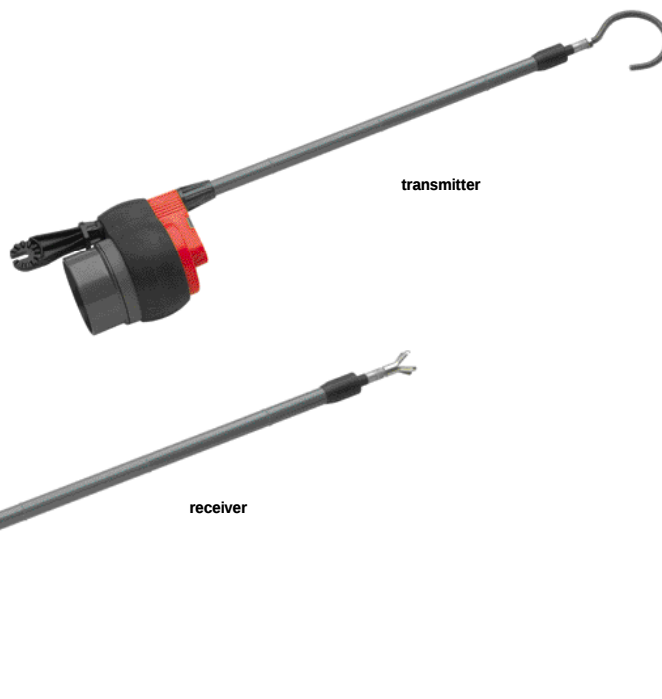
Phase comparators

## Wireless phase comparator

**NEW !**

The wireless phase comparator allow to check if the 2 active conductors' voltage are in phase or not.

- On electrical networks 50/60Hz from 1kV to 232kV.
- Distances between both points of measurement until 80m in open field.
- Wireless and without maximum time measurement.
- Autotest of the receiver, the transmitter and good radio link between both device.
- IEC 61481 (phase comparator).
- Sound and luminous indication:  
Green diodes: synchronization (angular difference lower  $\pm 10\%$  ).  
Red diodes: no synchronization (angular difference superior  $\pm 30\%$  ).
- Communication frequency 433 MHz. Battery 9V.



| Reference | Voltage (kV) | Length of antenna (m) | Weight (kg) |
|-----------|--------------|-----------------------|-------------|
| CL-12     | 1-232        | 0.6                   | 1.750       |

To be use with insulating sticks: CM-4400 and CM-4600 series (see page 96 and 124) and K end-pieces adaptors (see page 99).

# Short-circuiting and earthing systems

Cables

From 1kV to 52kV

Cables

Overhead line systems

Insulating sticks

Specific sticks and bags

Underground systems

## Copper and aluminium cables

### Copper cables

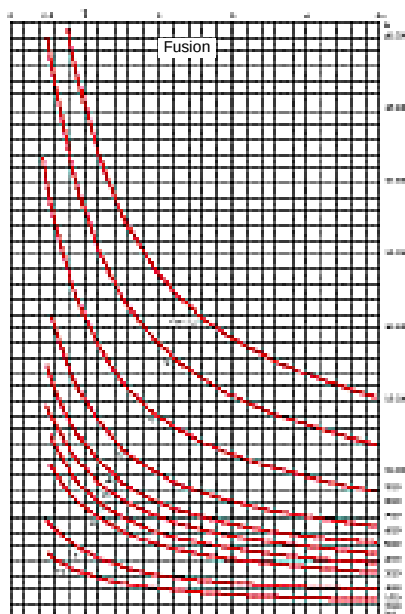
Extra flexible braided multi-strand cables.

- A** Transparent PVC sheath, with cable section identification.
- B** Transparent silicon sheath according to IEC-61230. Resistant to temperature variations (-40 °C to +70 °C) with double IEC triangle marked on cable section.

IEC-61481 

| <b>A</b> | <b>B</b><br>IEC-61481  | Rating<br>(kA/1s) | Cable<br>Weight<br>(kg/m) | Cable<br>Ø<br>(mm) | Section<br>(mm²) |
|----------|---------------------------------------------------------------------------------------------------------|-------------------|---------------------------|--------------------|------------------|
| M-24-10  |                                                                                                         | 2                 | 0.105                     | 4.5                | 10               |
| M-24-16  | M-24-16-S                                                                                               | 3.5               | 0.156                     | 5.6                | 16               |
| M-24-25  | M-24-25-S                                                                                               | 6                 | 0.275                     | 7.5                | 25               |
| M-24-30  |                                                                                                         | 7                 | 0.330                     | 8                  | 30               |
| M-24-35  | M-24-35-S                                                                                               | 8                 | 0.386                     | 9                  | 35               |
| M-24-40  |                                                                                                         | 10                | 0.440                     | 9.5                | 40               |
| M-24-50  | M-24-50-S                                                                                               | 12                | 0.545                     | 10                 | 50               |
| M-24-70  | M-24-70-S                                                                                               | 16                | 0.768                     | 12                 | 70               |
| M-24-75  |                                                                                                         | 20                | 0.800                     | 12                 | 75               |
| M-24-95  | M-24-95-S                                                                                               | 20                | 1.000                     | 14                 | 95               |
| M-24-120 | M-24-120-S                                                                                              | 30                | 1.280                     | 17                 | 120              |
| M-24-150 | M-24-150-S                                                                                              | 40                | 1.630                     | 19                 | 150              |

Copper cables only: Heating curves (Gut & Grundberg method)



### Aluminium cables

Extra flexible braided multi-strand cables.

Transparent PVC sheath, with cable section identification.



| Reference | Rating<br>(kA/1s) | Cable<br>Weight<br>(kg/m) | Cable<br>Ø<br>(mm) | Section<br>(mm²) |
|-----------|-------------------|---------------------------|--------------------|------------------|
| M-28-50   | 7.0               | 0.170                     | 11.5               | 50               |
| M-28-70   | 10.0              | 0.240                     | 13.4               | 70               |
| M-28-120  | 17.5              | 0.430                     | 19.00              | 120              |
| M-28-150  | 20.0              | 0.510                     | 21.00              | 150              |

## Jumper cables realisation specially manufactured items

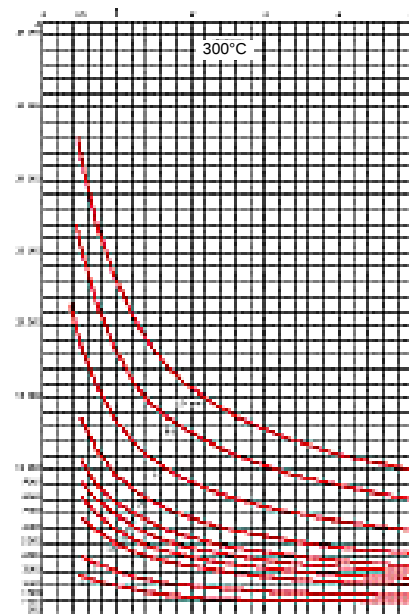


Quotations in accordance with faisability.

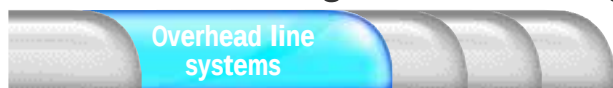
For all details:

Tel.: 33 1 42 31 46 24 / [www.catuelec.com](http://www.catuelec.com)

Copper cables only: Heating curves - 300 °C



# Short-circuiting and earthing systems



Cables

Overhead line systems

Insulating sticks

Specific sticks and bags

Underground systems

From 1kV to 52kV

In the context of the IEC-61230 international standard, CATU offers and answers to your needs with a large range of short-circuiting and earthing systems for substations and lines. These equipments are fitted with silicone-sheathed cables and double-crimped lugs at both ends: crimped once to the cable itself and once to the cable envelope.

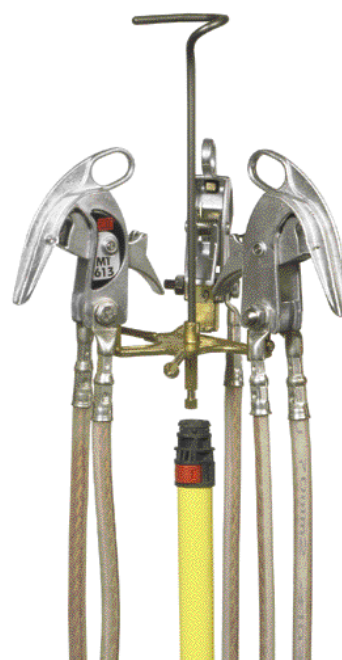
This type of connection has been mechanically tested by simultaneous traction and twisting, followed by a proofing test in a soda bath. Before the short-circuiting tests, all components of this equipment are subjected to a cycle in a saline mist, to provide artificial ageing.

## IEC short-circuiting and earthing systems (three-phase crossarm networks)

MT-613 clamps are automatic contact clamps. They are put into position from above the conductor, using the clamp dispenser head MT-635/1-C, which gives remarkable rapidity and ease of handling. Removal is carried out by pulling down the clamp, which revolves around the conductor by means of the pig tail fixed in the centre of the clamps dispenser head.

IEC-61230 

| Characteristics                                           | MT-6613           | MT-6613/1                                   |
|-----------------------------------------------------------|-------------------|---------------------------------------------|
| Rating                                                    | 8 kA/1s           | 25 kA/0.5s<br>17.5 kA/1s                    |
| Connection copper cable between clamps (mm <sup>2</sup> ) | 35                | 95                                          |
| Earth connection copper cable (mm <sup>2</sup> )          | 16                | 35                                          |
| For conductors Ø (mm)                                     | 5 to 30           | 5 to 30                                     |
| Recommended sticks**                                      | CE-4-21-C (P. 74) | CF-5 serie (P. 88)<br>CM-4400 serie (P. 88) |



Earth rod - 1 m:

MT-650/MT-652/10 or MT-652/15 to be ordered separately.

\*\* To be ordered separately.

| Reference | Rating                   | Equipment composition                                                                                                                                                                                                                                                                                                                                   |
|-----------|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MT-6613   | 8 kA/1s                  | <ul style="list-style-type: none"> <li>- 3 automatic contact clamps MT-613</li> <li>- Connection cables 35 mm<sup>2</sup>, max. gap between clamps: 2.75 m</li> <li>- 1 clamp dispenser head MT-635/1-C</li> <li>- 1 spool with earthing cable connection MT-640-S</li> <li>- 1 carrying bag M-87295</li> </ul>                                         |
| MT-6613/1 | 25 kA/0.5s<br>17.5 kA/1s | <ul style="list-style-type: none"> <li>- 3 automatic contact clamps MT-613</li> <li>- Connection cables 95 mm<sup>2</sup>, max. gap between clamps: 2.75 m</li> <li>- 1 clamp dispenser head MT-635/1-C</li> <li>- 1 earthing cable connection 15 x 35 mm<sup>2</sup></li> <li>- 1 earthing clamp MT-840/1</li> <li>- 1 carrying bag M-87295</li> </ul> |

*For earthing systems to your own specification please see page 129.*

## Short-circuiting automatic contact clamps

Aluminium alloy.

| Reference | Rating                      | For conductors Ø (mm) |
|-----------|-----------------------------|-----------------------|
| MT-613    | 25 kA/0.5s<br>or 17.5 kA/1s | 5 to 30               |
| MT-613/1  | 10 kA/1s                    | 5 to 30               |
| MT-613/2  | 8 kA/1s                     | 5 to 30               |



MT-613



MT-613/1  
MT-613/2

# Short-circuiting and earthing systems

Overhead line systems

From 1kV to 52kV

Cables

Overhead line systems

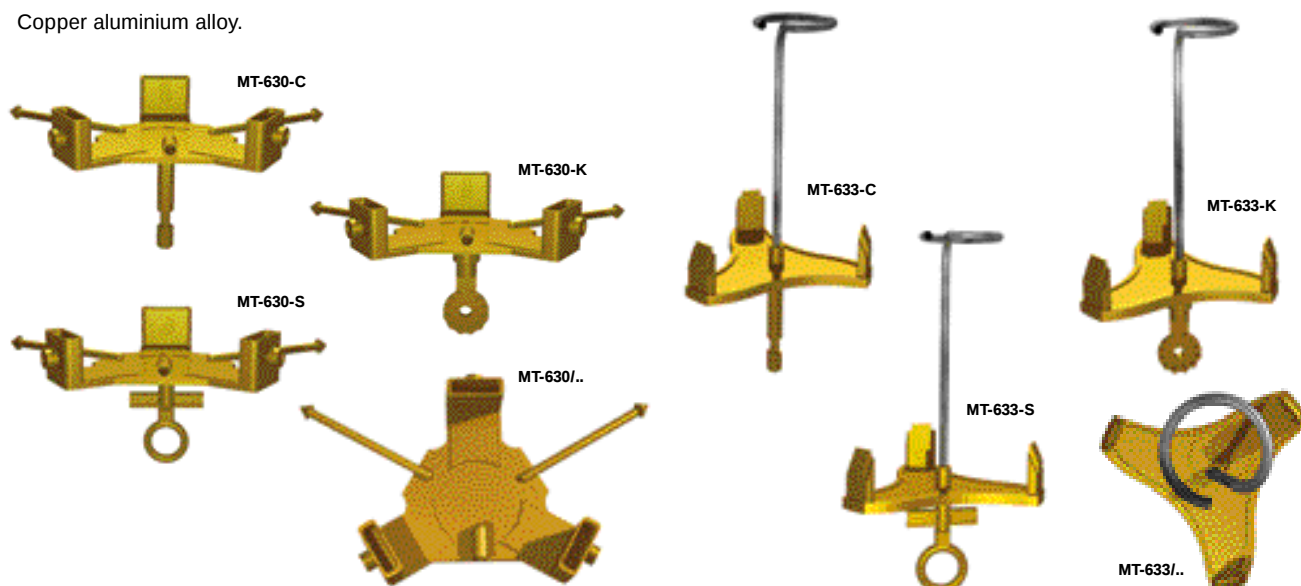
Insulating sticks

Specific sticks and bags

Underground systems

## Clamp dispenser heads

Copper aluminium alloy.



For MT-613 clamp

| Reference      | Head for 3 clamps | Head for 4 clamps | With pigtail hook |
|----------------|-------------------|-------------------|-------------------|
| MT-630-C       | n                 |                   |                   |
| MT-630-K       | n                 |                   |                   |
| MT-630-S       | n                 |                   |                   |
| MT-635/1-C/K/S | n                 |                   | n                 |
| MT-634-C/K     |                   | n                 |                   |

For MT-613/1 and 613/2 clamps

| Reference    | Head for 3 clamps | Head for 4 clamps | With pigtail hook |
|--------------|-------------------|-------------------|-------------------|
| MT-633-C     | n                 |                   | n                 |
| MT-633-K     | n                 |                   | n                 |
| MT-633-S     | n                 |                   | n                 |
| MT-634/1-C/K |                   | n                 | n                 |

## Earth rod

| Reference | Characteristics        | Length (m) |
|-----------|------------------------|------------|
| MT-652/10 | Screw ground rod.      | 1          |
| MT-652/15 | Screw ground rod.      | 1.50       |
| MT-650    | Hexagonal section rod. | 1          |



## Earth clamp

Copper aluminium bronze earth clamps.



| Reference | Weight (kg) | Conductors (mm) |
|-----------|-------------|-----------------|
| MT-840/1  | 0.48        | • Ø 6-25 — 0-25 |
| MT-843    | 0.95        | • Ø 6-35 — 0-35 |

## Spool with earthing connection

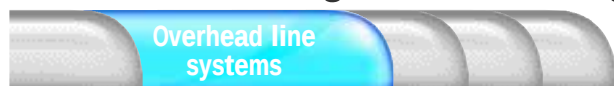
Spool with cable and earth clamp.

IEC-61230



| Reference | Silicone cable (mm²) | Length (m) |
|-----------|----------------------|------------|
| MT-640-S  | 16                   | 16         |
| MT-641-S  | 16                   | 25         |

# Short-circuiting and earthing systems



From 1kV to 52kV

Cables

Overhead line systems

Insulating sticks

Specific sticks and bags

Underground systems

## Short-circuiting and earthing systems (mid-span horizontal configurations, work from ground)

| Icc     | Connecting cables  | For conductors |
|---------|--------------------|----------------|
| 8 kA/1s | 35 mm <sup>2</sup> | 3-22 mm Ø      |

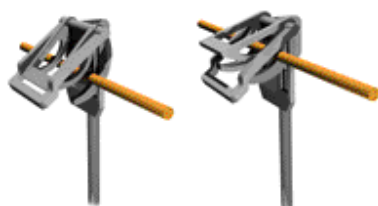
Installed from the ground on conductors up to 10.50 m.  
Self locking contact clamp: powerful conductor clamping and very good performance at short-circuiting, does not slide.

### PELICAN 2

- Easier installation features.
- More rigid metallic stick.
- Lower tube 30.6 mm dia.
- Upper tube 16 mm dia.
- Re-inforced insulated stick (36 mm dia.).
- Antisliding gripping area on the insulated stick: improves operator's grip.

### Self locking clamp

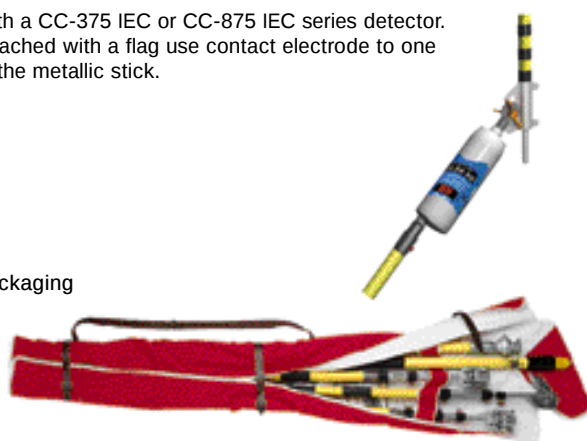
Absence of spring increases reliability, facilitates cleaning and removal.



### Used to check voltage absence beforehand

With a CC-375 IEC or CC-875 IEC series detector.  
Attached with a flag use contact electrode to one of the metallic stick.

### Packaging



### Equipment composition

| Reference | Icc (kA/1s) | Composition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MT-508/36 | 8           | 3 telescopic metallic sticks 3 elements MT-512/36 - L = 6.00/2.37 m - 2.4 kg<br>1 insulated stick MT-531 2 elements 1.65 m<br>Reel for 3 cables 10 m x 35 mm <sup>2</sup> with earth connect. for attachment to stick - MT-543/35<br>1 earth rod 1 m MT-650<br>1 bag M-87127: 2.50 x 0.30 x 0.15 - 10.5 kg                                                                                                                                                                                                                                    |
| MT-508/46 | 8           | 3 telescopic metallic sticks 4 elements MT-512/46 - L = 5.10/1.62 m - 2.1 kg<br>1 insulated stick MT-531 2 elements 1.65 m<br>1 insulated intermediate stick element 1.65 m CM-4-165-B<br>Reel for 3 cables 10 m x 35 mm <sup>2</sup> with earth connect. for attachment to stick - MT-543/35<br>1 stick lifter MT-546<br>1 earth rod 1 m MT-650<br>1 bag M-87-208: 1.70 x 0.30 x 0.20 m - 11.3 kg with separate parts: <ul style="list-style-type: none"> <li>- cable reel 0.42 x 0.42 x 0.14 m - 13.2 kg</li> <li>- rod - 2.2 kg</li> </ul> |

# Short-circuiting and earthing systems



From 1kV to 52kV

Cables

Overhead line systems

Insulating sticks

Specific sticks and bags

Underground systems

## Insulating sticks for short-circuiting and earthing systems

These 39 mm dia. elements are assembled using a new safety bayonet system connector in aluminium alloy. They allow construction of a large variety of custom made sticks that meet the most varied conditions of application. Calibrated lengths of 1 to 3 meters (with fraction of 0.50 m) permit a huge number of applications.

This range thus allows a stick-length limitation in case of space requirements and carrying capabilities. For common applications a serie of complete sets including 2 or 3 elements are made to give simple solutions for working distance from 2 to 6 meters.

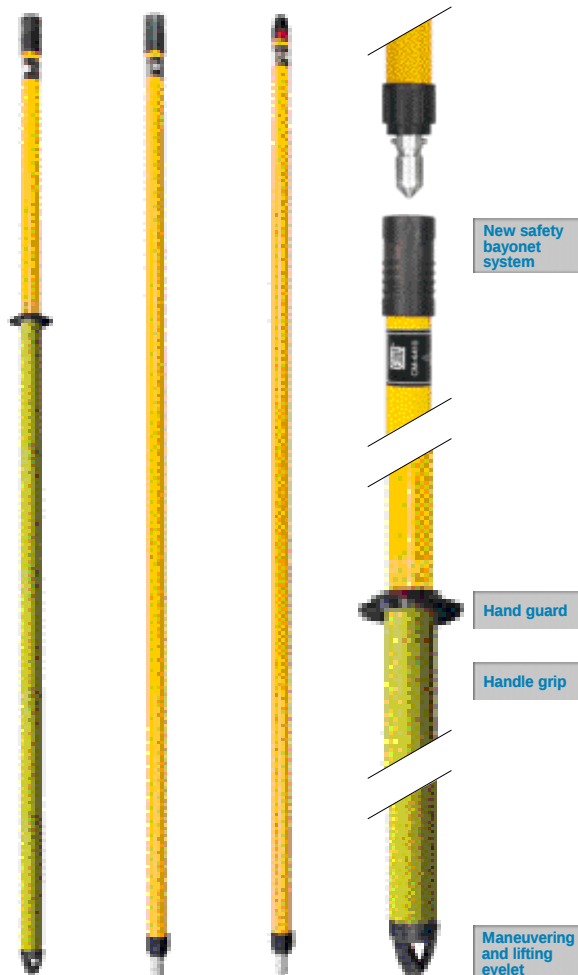
| Reference                                     | Complete stick length (m)* | Complete stick length (m)** | Insulating length (m) | Weight (kg) |
|-----------------------------------------------|----------------------------|-----------------------------|-----------------------|-------------|
| <b>Basic elements</b>                         |                            |                             |                       |             |
| CM-4410                                       | 1.13                       |                             | 0.7                   | 1.25        |
| CM-4415                                       | 1.63                       |                             | 1                     | 1.70        |
| CM-4420                                       | 2.13                       |                             | 1.2                   | 2.70        |
| CM-4425                                       | 2.63                       |                             | 1.5                   | 3.20        |
| <b>Intermediate elements</b>                  |                            |                             |                       |             |
| CM-4410-I                                     | 1.165                      |                             | 0.9                   | 1.20        |
| CM-4415-I                                     | 1.665                      |                             | 1.4                   | 1.60        |
| CM-4420-I                                     | 2.165                      |                             | 1.9                   | 2.50        |
| CM-4425-I                                     | 2.665                      |                             | 2.4                   | 3.00        |
| <b>Terminal elements</b>                      |                            |                             |                       |             |
| CM-4410-*                                     | 1.115                      | 1.21                        | 0.9-1                 | 0.90        |
| CM-4415-*                                     | 1.615                      | 1.71                        | 1.4-1.5               | 1.30        |
| CM-4420-*                                     | 2.115                      | 2.21                        | 1.9-2                 | 2.10        |
| CM-4425-*                                     | 2.615                      | 2.71                        | 2.4-2.5               | 2.60        |
| <b>Intermediate elements with rain skirts</b> |                            |                             |                       |             |
| CM-4400-J                                     | 0.36                       |                             |                       | 0.95        |

\* Add end piece C, K, E.

• With the smallest end fitting.  
•• With the biggest end fitting.



CM-4400-J



New safety bayonet system

Hand guard

Handle grip

Maneuvering and lifting eyelet

## Sticks with rain skirts, C, K or E terminals

Epoxy reinforced fibre-glass insulating Ø 36 mm. IEC-61235 ⚠  
Shock resisting polycarbonate rain skirts Ø 100 mm, height 90 mm.

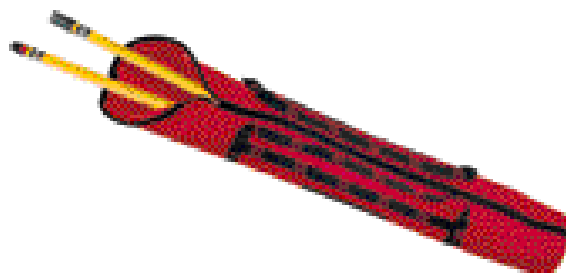
| Reference | Length (m) | Rain skirt number | Weight (kg) |
|-----------|------------|-------------------|-------------|
| CF-5-40*  | 1.50       | 1                 | 1.150       |
| CF-5-90*  | 2.00       | 1                 | 1.550       |

\* Add end piece C, K, E.

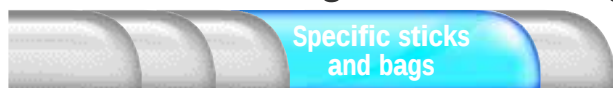
## Stick covers

Strong waterproof fabric, strap for carrying for CM-4 and CM-7.

| Reference | Elements length (m) | Overall dimensions (m) |
|-----------|---------------------|------------------------|
| CM-3-03   | 1.75                | 0.575 x 1.950          |
| CM-3-04   | 2.00                | 0.575 x 2.450          |
| CM-3-05   | 2.50                | 0.575 x 2.950          |
| CM-3-06   | 3.00                | 0.575 x 3.400          |



# Short-circuiting and earthing systems



From 1kV to 52kV

Cables

Overhead line systems

Insulating sticks

Specific sticks and bags

Underground systems

## Clampsticks

For operations carried out on dead line networks.

Clamp stick for M.V. systems.

Cylindrical tubular rod Ø 32 mm in laminated epoxy glass fiber foam-filled.

Test voltage: 100 kV applied for

1 min, between alternate electrodes 30 cm away from one another.

Plastic control rod reinforced with glass fibre Ø 10 mm.

Rack-system operating handle, with 3 positions.

Suspension hook on the upper part.

Protective cap on the lower part.

Standard clampsticks

| Reference | Length (m) | Weight (Kg) |
|-----------|------------|-------------|
| MGS-100-S | 2          | 2.8         |
| MGS-103-S | 3.80       | 4.3         |



MGS-103-S

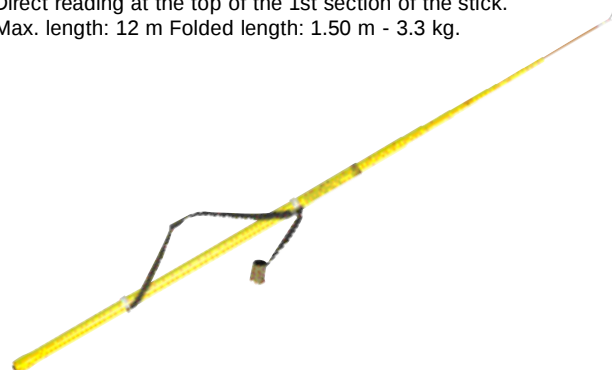
## Telescopic measuring stick

8 telescopic sections of insulated polyester glass, graduated and operated by a push-button mechanism.

Upper portion made of high voltage "live working tool" quality orange epoxy glass.

Direct reading at the top of the 1st section of the stick.

Max. length: 12 m Folded length: 1.50 m - 3.3 kg.



MO-832

Max. length: 12 m - For use on L.V., M.V., H.V. lines 220 kV max.

## Telescopic and disconnect telescopic sticks

Sections made of reinforced high density electrical grade fiber glass.

Top sections insulated with fire retardant polyurethane foam core.

Tip section: triply reinforced to eliminate breakages.

Universal head adaptable to standard fit or accessories, K end-pieces.

Test: 100 kV/30 cm - 5 minutes.



|               |                                        |
|---------------|----------------------------------------|
| CE-5-50-(* )  | Max. length: 5 m - Weight: 2.50 kg     |
| CE-5-60-(* )  | Max. length: 6 m - Weight: 3.00 kg     |
| CE-5-70-(* )  | Max. length: 7 m - Weight: 3.50 kg     |
| CE-5-90-(* )  | Max. length: 9 m - Weight: 4.00 kg     |
| CE-5-105-(* ) | Max. length: 10.50 m - Weight: 5.50 kg |

\* add the end-piece reference C or K.

## Static discharge stick

Static discharge stick until 50kV.



| Reference | Composition                             | Length (m) |
|-----------|-----------------------------------------|------------|
| CM-50     | Medium voltage static ground discharger | 1.5        |



# Short-circuiting and earthing systems

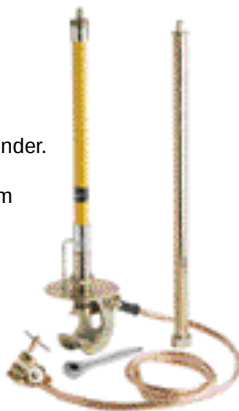
| Specific sticks and bags |                       | Underground systems |                          |                     |
|--------------------------|-----------------------|---------------------|--------------------------|---------------------|
| Cables                   | Overhead line systems | Insulating sticks   | Specific sticks and bags | Underground systems |

From 1kV to 52kV

## Short-circuiting and earthing systems for underground cables

### Cable testing stick

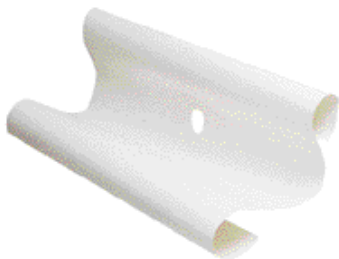
Enables piercing of cable insulation and shielding, earthing up to 50 kV.  
Double bezel cutting blade  
Capacity: 70 mm dia.  
Cable-guide with protecting guide.  
0.60 m insulating sleeve with 0.80 m extender.  
Ratchet type operating handle.  
Woven copper earth wire 70 mm<sup>2</sup> x 2.50 m with earth clamp.



MP-211 Total length: 1.60 m - Weight: 8.75 kg

### Insulating blanket

Must be placed over the piercing point. 0.90 x 0.90 m with 50 mm Ø hole in the centre for inserting the sleeve.



MP-212 Dimensions: 0.9 x 0.9 m

### Spade-cable

Device to test the voltage on underground cables (1<sup>st</sup> and 2<sup>nd</sup> categories) and their earthing, using a system with cartridges and throwing in the cable a steel treated blade.



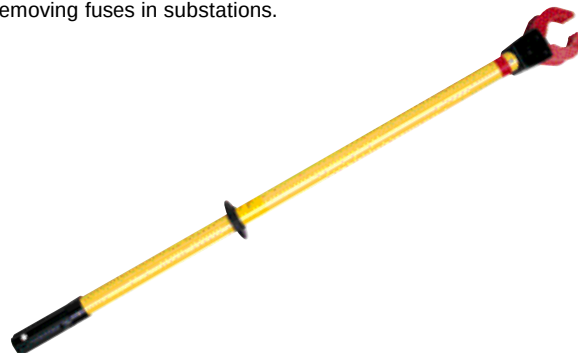
MP-213 Spade-cable delivered complete in suitcase  
Weight: 20 kg

MP-213/LAM Spare blade for spade-cable MP-213  
Weight: 0.02 kg

MP-213/EXT Blade extractor for spade-cable MP-213  
Weight: 0.20 kg

### Fuse holder stick

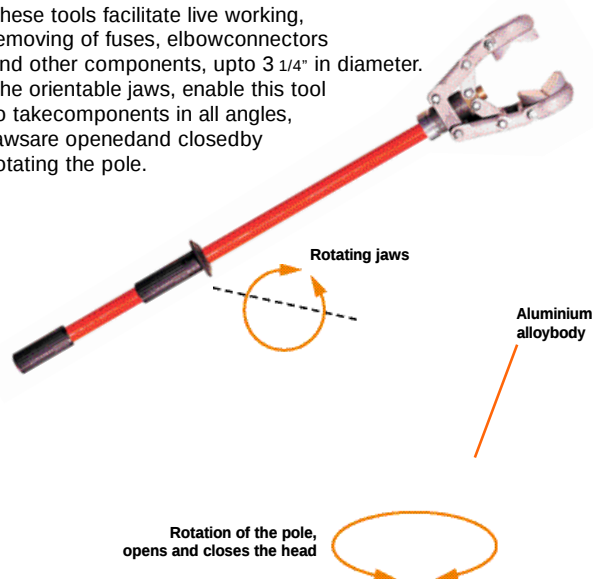
For removing fuses in substations.



MO-630 Total length: 1.165 m Weight: 1.7 kg

### Elbow and fuse puller tool

These tools facilitate live working, removing of fuses, elbowconnectors and other components, upto 3 1/4" in diameter. The orientable jaws, enable this tool to takecomponents in all angles, jawsare openedand closedby rotating the pole.



| Reference | Lenght (m) | Weight (kg) |
|-----------|------------|-------------|
| MO-833    | 1.8        | 3.8         |
| MO-834    | 2.4        | 4.5         |

### Stick bags

Strong waterproof fabric, strap for carrying.



| Reference | Max. stick length (m) |
|-----------|-----------------------|
| CM-1-10   | 1.30                  |
| CM-1-15   | 1.80                  |
| CM-1-20   | 2.40                  |

Connection adaptors for insulating sticks

|                     |                                                                                                                                |                                                                                                                                |                                                                                                                              |                                                                                                                                    |                                                                                                                                                              |                                                                                                                  |                                                                                                                  |                                                                                                                  |                                                                                                                  |                                                                                                                   |                                                                                                                    |                                                                                                                    |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|
|                     | <div>C</div> <div></div> <div>hexagonal</div> | <div>K</div> <div></div> <div>universal</div> | <div>E</div> <div></div> <div>bayonet</div> | <div>S</div> <div></div> <div>clamp-stick</div> | <div>A or B</div> <div></div> <div>"MAJOR" Serie<br/>CM-4/CM-6/CM-7</div> |                                                                                                                  |                                                                                                                  |                                                                                                                  |                                                                                                                  |                                                                                                                   |                                                                                                                    |                                                                                                                    |
| Accessories         | <div>C</div> <div></div>                     |                                                                                                                                | <div>K</div> <div></div>                   |                                                                                                                                    | <div>E</div> <div></div>                                                 |                                                                                                                  |                                                                                                                  |                                                                                                                  |                                                                                                                  |                                                                                                                   |                                                                                                                    |                                                                                                                    |
|                     |                                                                                                                                |                                                                                                                                |                                                                                                                              |                                                                                                                                    |                                                                                                                                                              |                                                                                                                  |                                                                                                                  |                                                                                                                  |                                                                                                                  |                                                                                                                   |                                                                                                                    |                                                                                                                    |
| Connection adaptors | <div></div> <div>CI-7-C</div>               | <div></div> <div>CI-3-C</div>               | <div></div> <div>CI-6-C</div>             | <div></div> <div>CI-5-C</div>                   | <div></div> <div>CI-3-K</div>                                             | <div></div> <div>CI-4-K</div> | <div></div> <div>CI-6-K</div> | <div></div> <div>CI-7-K</div> | <div></div> <div>CI-5-K</div> | <div></div> <div>CI-3-E</div> | <div></div> <div>CI-7-E</div> | <div></div> <div>CI-4-E</div> |
|                     |                                                                                                                                |                                                                                                                                |                                                                                                                              |                                                                                                                                    |                                                                                                                                                              |                                                                                                                  |                                                                                                                  |                                                                                                                  |                                                                                                                  |                                                                                                                   |                                                                                                                    |                                                                                                                    |
| Sticks              | <div></div> <div>E</div>                    | <div></div> <div>A B</div>                  | <div></div> <div>K</div>                  | <div></div> <div>S</div>                        | <div></div> <div>A B</div>                                                | <div></div> <div>C</div>      | <div></div> <div>K</div>      | <div></div> <div>E</div>      | <div></div> <div>S</div>      | <div></div> <div>A B</div>    | <div></div> <div>K</div>      | <div></div> <div>C</div>      |
|                     |                                                                                                                                |                                                                                                                                |                                                                                                                              |                                                                                                                                    |                                                                                                                                                              |                                                                                                                  |                                                                                                                  |                                                                                                                  |                                                                                                                  |                                                                                                                   |                                                                                                                    |                                                                                                                    |

With this range any accessory can be attached to any stick by using connection adaptors. Other models, please consult us.

# General tools

## Sticks accessories

Sticks accessories

Tensioning equipment

Handling and uncoiling blocks

From 1kV to 52kV

### Manoeuvring hook



CM-02-C



CM-02-K

**CM-02\*** Bronze-copper nickel aluminium  
Weight: 0.120 kg

\* Add end-piece C, E or K.

### Conductor brushes

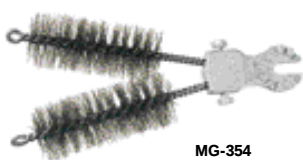
Pivoting - 95 x 90 x 64 mm  
Weight: 0.090 kg.



**MG-206-AK** Moulded red colour body with card.  
Reserved for aluminium conductors.

**MG-206-CK** Moulded red colour body with card.  
Reserved for copper conductors.

Pivoting - 110 x 110 x 70 mm - Weight: 0.250 kg.



MG-354



MG-352

**MG-352-K** Moulded orange colour body with card.  
Reserved for aluminium conductors.

**MG-352-VK** Moulded green colour body with card.  
Reserved for copper conductors.

**MG-353-R** Orange spare brush for MG-353-V.  
For hand brushing use.

**MG-353-V** Green spare brush for MG-353-V.  
For hand brushing use.

**MG-354-K** Round brush - Ø 58 x 100 mm  
Weight: 0.250 kg

**MG-355** Spare brush for MG-354-K.

### Diameter gauge

For conductors 3 to 16 mm Ø.  
Entirely insulated material 270 x 35 x 12 mm.  
Delivered in bag.



**MD-535-K** Weight: 0.090 kg

### Pig tail hook

Bronze end piece.  
Spiral rod of corrosion-proof steel.



**MG-207-K** K end-pieces steel - 120 x 65 x 60 mm  
Weight: 0.210 kg

**MG-207-S** S end-pieces steel - 250 x 65 x 60 mm  
Weight: 0.280 kg

### Cleaning brushes



MD-12-C



MD-10-C



MD-14-C

**MD-10-C** Concave brush with two rows of  
perpendicular bristles  
100 x 125 x 170 mm - 0.500 kg

**MD-12-C** Round head brush Ø 175 x 228 mm  
0.500 kg

**MD-14-C** Adjustable hinged round head brush  
Ø 175 x 328 mm - 0.500 kg

### Trimmer and pruning saw



MD-40-B



MD-42-B

**MD-40-\*** Trimmer, maximum capacity Ø 45 mm  
(for branches up to 28 mm depending on  
tree species) - 375 x 240 x 60 mm - 1.200 kg

**MD-42-B** Pruning saw on rigid frame, 34 cm blade  
125 x 610 x 60 mm - 1.100 kg

**M-92-28** Replacement blade

\* Add end-piece B or K.

### Fuse puller

All parts in metal protected against corrosion.  
Jaws sheathed with plastic.  
Capacity : up to Ø 70 mm.



**CM-04-K** Overall dimensions: 230 mm x 80 mm

## Automatic come-along clamp

For non-insulated conductors: alloy, ACSR, alu, steel.

Characteristics

Steel body - mild bronze jaws.

Field on use

Overhead network.

Working method

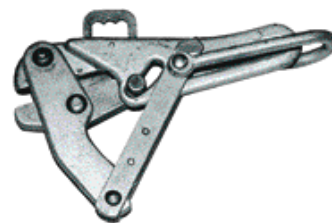
Distance method.

Function use

The AUTOMATIC COME-ALONG CLAMPS

are used to produce an anchoring on a line conductor in view of:

- moving it lengthwise
- locking it in position
- alternating its mechanical tension.



| Reference | mini  | Ø (mm) | max.  | Max. working load (daN) | Jaws length (mm) | Max. length (mm) | Weight (kg) |
|-----------|-------|--------|-------|-------------------------|------------------|------------------|-------------|
| MO-339/02 | 5.54  |        | 13.97 | 3 636                   | 127              | 400              | 2.84        |
| MO-339/03 | 13.46 |        | 18.8  | 3 636                   | 140              | 450              | 3.52        |

## Automatic come-along

For alu, alu alloy or ACSR.

| Reference   | Ø cable (mm) | Working load (daN) | Weight (kg) |
|-------------|--------------|--------------------|-------------|
| MO-332/09-D | 2.6-9.4      | 800                | 1.000       |
| MO-332/14-D | 6.4-14.3     | 1 500              | 1.300       |
| MO-332/13-E | 6-14         | 800                | 2.600       |
| MO-332/18-E | 10-20        | 1 400              | 4.000       |



Insulated cables.

| Reference   | Ø cable (mm) | Working load (daN) | Weight (kg) |
|-------------|--------------|--------------------|-------------|
| MO-331/13-P | 6-13.5       | 600                | 1.000       |
| MO-331/22-P | 17-22        | 400                | 1.000       |
| MO-331/38-P | 33-38        | 800                | 3.775       |



## Come-along

Not suitable for alu conductors.

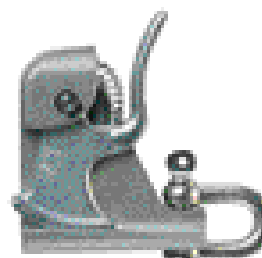


| Reference | Clamping capacity Ø (mm) | Weight (Kg) |
|-----------|--------------------------|-------------|
| MO-337/06 | 1-8                      | 0.300       |

## Adjustment "Come-along"

Tightening by cam jaw.

For copper and aluminium conductors.



| Reference | Clamping capacity Ø (mm) | Weight (Kg) |
|-----------|--------------------------|-------------|
| MK-08     | 2-18                     | 0.300       |
| MK-15     | 7-15                     | 0.550       |
| MK-20     | 14-18                    | 0.3600      |

# General tools

Tensioning  
equipment

From 1kV to 52kV

Sticks accessories

Tensioning equipment

Handling and uncoiling blocks

## “TIRFOR” and “JOCKEY” winches

System traction produced by jaws which reproduces movement of hands pulling on cord, thus making it possible to enter an unlimited cable length.



| Reference | Type       | Maximum force (daN)** | Requirements (cm)  | Weight without cable (kg) | Cable weight (kg) |
|-----------|------------|-----------------------|--------------------|---------------------------|-------------------|
| ML-05/10  | Jockey J-5 | 500                   | 31 x 21.5 x 5.5    | 4                         | 2.5               |
| ML-08/20* | T-508      | 800                   | 42 x 25 x 9.9      | 6.6                       | 7                 |
| ML-16/20* | T-516      | 1 600                 | 53 x 31.5 x 12.7   | 13.5                      | 12.5              |
| ML-32/20* | T-532      | 3 200                 | 63.1 x 35.7 x 14.8 | 24                        | 26                |

\*Equipment delivered with 20 m cable equipped with hook.

\*\*The first number indicates the maximum authorized lifting load.

## “TIRVIT” mechanical adjusters

The conductor to be adjusted is directly clamped between two cam jaws which alternately approach and move away from each other by lever manœuvring. Very simple, sturdy and reliable, the Tirvit is the ideal apparatus for tightening up small and medium section lines. It is equipped with a chain and handle for fixed anchoring.



| Reference | Force (daN) | Clamping capacity Ø (mm) | Total - Length (m) - lever |       | Weight (kg) |
|-----------|-------------|--------------------------|----------------------------|-------|-------------|
| MK-40     | 400         | 2-8                      | 0.680                      | 0.540 | 4.000       |
| MK-60     | 600         | 7-15                     | 0.780                      | 0.630 | 5.200       |
| MK-100    | 800         | 14-18                    | 0.875                      | 0.700 | 6.200       |

## Parallel jaws “Come-along”

| Reference   | Conductor size<br>Ø (mm) | section (mm²) | Safe load<br>(daN) | Weight<br>(kg) |
|-------------|--------------------------|---------------|--------------------|----------------|
| MO-331/06-A | 8.5                      | 25-35         | 1 000              | 0.800          |
| MO-331/09-A | 12                       | 50-70         | 1 700              | 1.100          |
| MO-331/12-A | 16                       | 95-120        | 3 000              | 1.800          |
| MO-331/04-B | 1-4                      | 1-16          | 500                | 0.270          |
| MO-331/08-B | 3-8                      | 6-35          | 1 000              | 0.800          |
| MO-331/10-B | 5-10                     | 16-70         | 1 700              | 1.100          |
| MO-331/16-B | 8-16                     | 50-150        | 3 000              | 1.900          |
| MO-331/26-B | 8-26                     | 90-400        | 4 000              | 3.700          |

For bare cables (material: forged steel).

References are followed by the index A or B to indicate:

A - Suitable for use with aluminium conductors  
(including all aluminium alloys),

B - Suitable for use with copper or steel conductors.



# General tools

## Handling and uncoiling blocks

From 1kV to 52kV

Sticks accessories

Tensionning equipment

Handling and uncoiling blocks

## Uncoiling block

For bare cables.

Made entirely from aluminium alloy.

Pivoting safety hook. Full wheel rigger. Ring with greaser.

Safety catch.

For insulated cables.

Single piece body made of aluminium alloy. Nylon strap (length 1.5 m) firmly attached to the body equipped with automatic ratchet tightener.

Maximum load of use: F1: 800 daN, F2: 400 daN, F3: 120 daN.

| Reference  | Utilisation      | Groove bottom diameter (mm) | Capacity (mm) | Maximum load (daN) | Hook capacity (mm) | Weight (kg) |
|------------|------------------|-----------------------------|---------------|--------------------|--------------------|-------------|
| MO-375/150 | Bare cables      | 160                         | 22            | 1 000              | 25                 | 1.55        |
| MO-375/250 | Bare cables      | 250                         | 38            | 1 000              | 25                 | 2.1         |
| MO-375/300 | Bare cables      | 300                         | 36            | 1 500              | 25                 | 2.85        |
| MO-375/400 | Bare cables      | 400                         | 80            | 2 000              | NC*                | 15.0        |
| MO-371/01  | Insulated cables | 140                         | 80            | 800                | 24                 | 1.5         |

|            |                                  |   |     |   |     |
|------------|----------------------------------|---|-----|---|-----|
| MO-371/100 | Bracket with strap for MO-371/01 | - | 800 | - | 2.2 |
|------------|----------------------------------|---|-----|---|-----|

\* NC : not communicated.



## Opening block

For elevation handling, single block and tackle and return block.

Can also be used as uncoiling block.

Aluminium alloy - block assembled on needle bearings.

Block Ø at groove bottom: 114 mm.

Maximum rope Ø: 16 mm.

Permissible load on rope strands: 250 daN.

Hook opening: 33 mm.

|        |              |
|--------|--------------|
| MO-308 | Weight: 3 kg |
|--------|--------------|



## Ratchet lift-chain hoists

Precise: 1.3 to 0.3 mm travel.

Aluminium alloy body and lever.

360° short lever used without large effort.

Chain can enter from all angles.

Three position selector:

up - down - free chain.

Safety factor > 5.



| Reference | Maximum lifting load (kg) | Overall width (mm) | Weight (kg) |            |
|-----------|---------------------------|--------------------|-------------|------------|
|           |                           |                    | run 1.50 m  | run 5.00 m |
| MO-431/07 | 750                       | 84                 | 7.00        | -          |
| MO-435/07 | 750                       | 84                 | -           | 10.35      |
| MO-431/15 | 1 500                     | 108                | 11.00       | -          |
| MO-435/15 | 1 500                     | 108                | -           | 15.80      |
| MO-431/30 | 3 000                     | 115                | 20.00       | -          |

## Guying equipment

Used whenever pole stability is doubtful.

Hinged jaw device installed, from the ground, at a 6 to 8 m height using connectable rods.

Guy wires fixed on jaws and staked to the ground by rods ensure pole stability.

Forged hot galvanised steel jaws, test load: 1 000 daN.

Control rod 6 m in elements of 1.20 m, aluminium alloy. Set of ropes: 3 guy wires 11 or 15 m + a strap with centre ring - with heart shaped thimble and snaps.

3 steel anchoring rods, 1 m.



**MP-315** Guying equipment with 15 m guy wires in metallic box 480 x 340 x 200 mm and control rod + rods with carrying belt - 26.5 kg

**MP-311** Guying equipment with 11 m guy wires in metallic box 480 x 340 x 200 mm and control rod + rods - 22 kg

# Earth rods

Earth rods

Connectors

From 1kV to 52kV

Earth rods

Connectors

Earthing clip

Earth tester

The rod is, in most cases, the most practical, effective and reliable earth connection means.

**Highly effective:** for a given contact surface area, the linear type electrode provides, both theoretically and practically, the least earth resistance. Furthermore, it enables the most moist and conductive layers to be reached.

**Easy and quick to install,** it requires no earth work. Even inside industrial buildings, it is often possible to install an earth rod exactly where required by breaking through a small area of the floor.

**Accessible and testable connection:** the use of an inspection box makes it possible to leave the head of the rod and its connection unburied and to periodically test it and measure its resistance.

## Self connectable rods

The lower end of each rod is equipped with a point used both for driving into the earth and for connection; the upper pierced end receives (without the sleeve) the point of the previous rod. Use a riveting head so as not to damage the upper end when driving in.

## Connectable rods

Conical slide-in provides perfect assembly stability. For deep earth connections.

## Copper/steel (350 µm coating) earth rods

| Reference | Type             | Ø (mm)       | Length (m) | Weight (kg) | Connection                                       |
|-----------|------------------|--------------|------------|-------------|--------------------------------------------------|
| TP-1610-R | standard (1)     | 14.2 Unit 16 | 1.0        | 1.200       |                                                  |
| TP-1615-R | standard (1)     | 14.2 Unit 16 | 1.5        | 1.800       |                                                  |
| TP-1620-R | standard (1)     | 14.2 Unit 16 | 2.0        | 2.400       |                                                  |
| TP-1910-R | standard         | 17.3 Unit 19 | 1.0        | 2.000       |                                                  |
| TP-1915-R | standard         | 17.3 Unit 19 | 1.5        | 2.800       |                                                  |
| TP-1920-R | standard         | 17.3 Unit 19 | 2.0        | 3.600       |                                                  |
| TR-116-10 | self connectable | 14.2 Unit 16 | 1.0        | 1.100       | TO-3-16/19<br>TO-2-16 TS-1601                    |
| TR-116-15 | self connectable | 14.2 Unit 16 | 1.5        | 2.000       |                                                  |
| TR-119-10 | self connectable | 17.3 Unit 19 | 1.0        | 1.800       | TO-3-16/19<br>TO-2-19 TS-1901                    |
| TR-119-15 | self connectable | 17.3 Unit 19 | 1.5        | 2.750       |                                                  |
| TR-119-20 | self connectable | 17.3 Unit 19 | 2.0        | 3.500       |                                                  |
| TR-1610   | connectable (2)  | 14.2 Unit 16 | 1.0        | 1.250       | TO-3-16/19<br>TO-2-16 TS-1601<br>TS-1602 TS-1603 |
| TR-1615   | connectable (2)  | 14.2 Unit 16 | 1.5        | 1.900       |                                                  |
| TR-1620   | connectable (2)  | 14.2 Unit 16 | 2.0        | 2.500       |                                                  |
| TR-1910   | connectable (2)  | 17.3 Unit 19 | 1.0        | 1.950       | TO-3-16/19<br>TO-2-19<br>TS-1901                 |
| TR-1915   | connectable (2)  | 17.3 Unit 19 | 1.5        | 1.850       |                                                  |
| TR-1920   | connectable (2)  | 17.3 Unit 19 | 2.0        | 3.750       |                                                  |

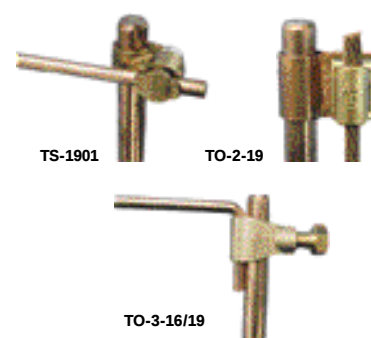


## Stainless steel earth rods

| Reference | Type        | Ø (mm) | Length (m) | Weight (kg) | Connection |
|-----------|-------------|--------|------------|-------------|------------|
| TRI-1610  |             |        | 1.0        | 1.450       |            |
| TRI-1615  | connectable | 16     | 1.5        | 2.200       | TZI-2001   |

## Connectors

| Reference          | Rod      | Conductors<br>Ø max. (mm) | Type<br>section max. (mm²) |
|--------------------|----------|---------------------------|----------------------------|
| TO-2-16<br>TO-2-19 | 16<br>19 | 40<br>40                  | Copper                     |
| TO-3-16/19         | 19       | 40                        | Copper aluminium alloy     |
| TS-1601<br>TS-1901 | 14<br>19 | 95<br>95                  | Copper aluminium alloy     |



# Earth rods



From 1kV to 52kV

## Earthing clip

Interconnects to earth every metallic part of installations.

| Reference | Conductors section (mm <sup>2</sup> ) | Capacité de serrage sur tuyaux (Ø mm) |
|-----------|---------------------------------------|---------------------------------------|
| TO-8/32   | 1 x 2.5 to 2 x 6                      | 8-32                                  |
| TO-32/100 | 1 x 2.5 to 2 x 16                     | 32-100                                |

|      |                                   |
|------|-----------------------------------|
| TF-1 | Length: 180 mm - Weight: 0.110 kg |
|------|-----------------------------------|



## Earth resistance tester

The MX-430-M allows for the measurement of earth resistance and earth specific resistivity and also the spurious voltages caused by grounding parasitic voltage presence.

This equipment is suitable for fast and easy measurement of the grounding resistance in home, industrial buildings, substations,...

- Wide range of measurement from 0.01  $\Omega$  to 20 K $\Omega$
- High visibility 3 1/2 digit display with direct readings, even under sunlight
- Supplied with a rechargeable internal battery. A smart charger is microprocessor-controlled and can be powered from the mains by a power plug provided source or from a 12 V car battery.

### Technical features

- Application: measurement of grounding resistances (with 3 earth rods), earth resistivity (with 4 earth rods) and spurious voltage presence
- Range of measurement: 0 - 20  $\Omega$  ; 0-200  $\Omega$  ; 0-2000  $\Omega$  and 20 K $\Omega$
- Voltmeter: voltmeter function in AC range as a conventional voltmeter 0-200 V AC
- Operation frequency: 1470 Hz
- Current in and out put power: less than 0,5 W and the out put current is limited to less than 15 mA (peak to peak)
- Operation temperature: -10°C / +50°C
- Storage temperature: -25°C / +65°C
- Humidity: 95% RH (without condemnation)
- Accessories included:
  - Connection wire to supply the charger with a 12 V battery
  - Battery charger 220-240 V
  - Storage bag



|          |                                  |
|----------|----------------------------------|
| MX-430-M | 221 x 189 x 99 mm - Weight: 2 kg |
|----------|----------------------------------|

## Accessories (measurement kit) MX-433-T

- 1 storage bag
- 4 earth rods copper plated steel
- 1 x 5 meters black cable
- 1 x 40 meters red cable
- 2 x 20 meters cable (1 blue and 1 green)
- 1 x 5 meters green cable to connect to the grounding system
- 1 hammer

|          |                                     |
|----------|-------------------------------------|
| MX-433-T | 570 x 220 x 160 mm - Weight: 7.7 kg |
|----------|-------------------------------------|



# Equipment for working on pole

**ARC FLASH HARNESS**  
PLEASE CONSULT US



**CATU™**



# Above 52kV

# 52



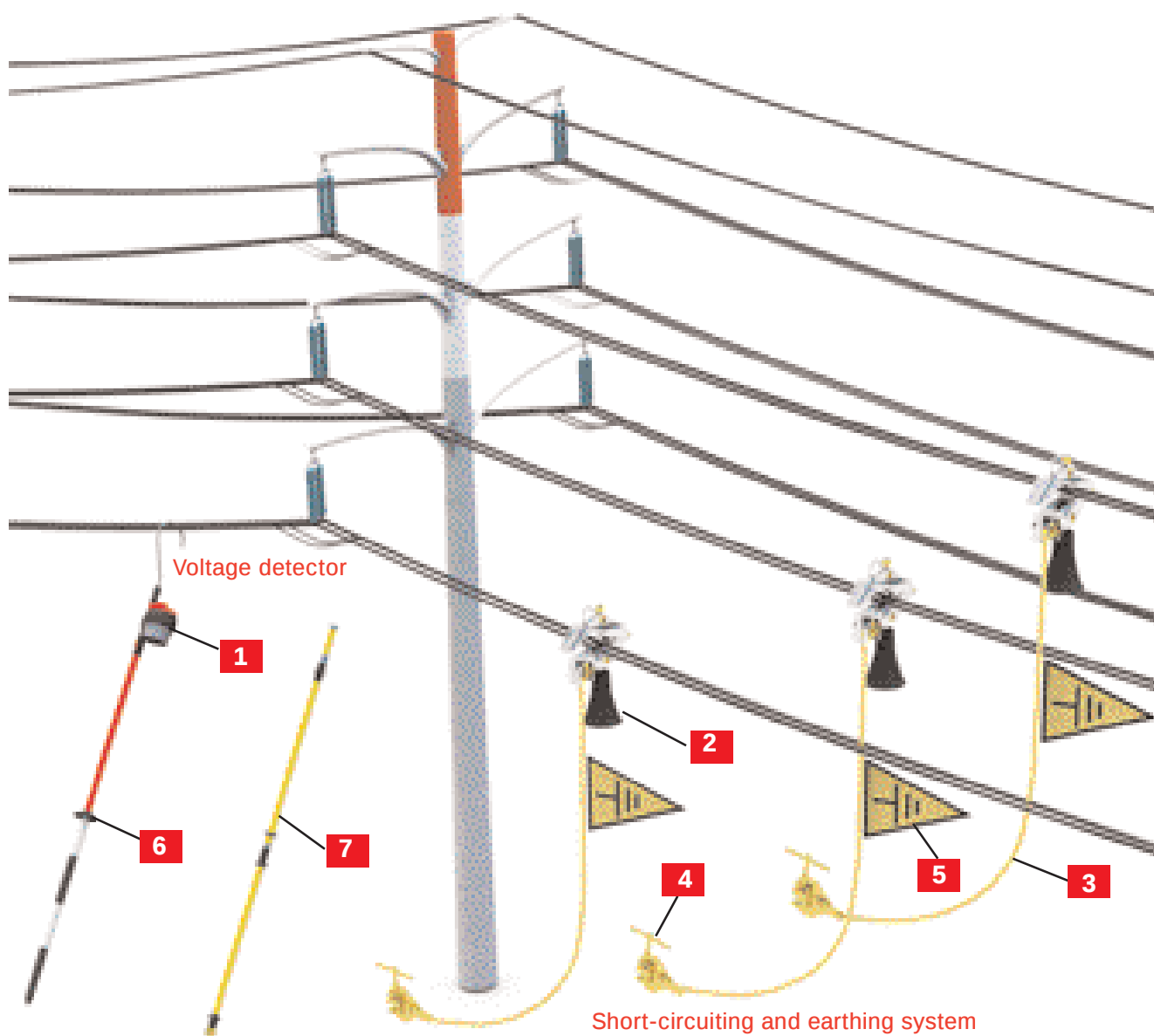
|                                       |     |
|---------------------------------------|-----|
| Equipment guide                       | 108 |
| Personal protective equipment         | 110 |
| Safety padlocks and warning signs     | 119 |
| Voltage detectors                     | 123 |
| Short-circuiting and earthing systems | 125 |



# APPLICATIONS

Examples of usual applications

Overhead line work from pole



## Voltage detectors and phase comparators

- 1** Electronic voltage detectors IEC or standard

References: CC-245 serie

Page: 123

## Short-circuiting Systems

- 2** Clamps manœuvrable by insulating sticks

References: MT-730 serie

Page: 125

- 3** Cables (copper)

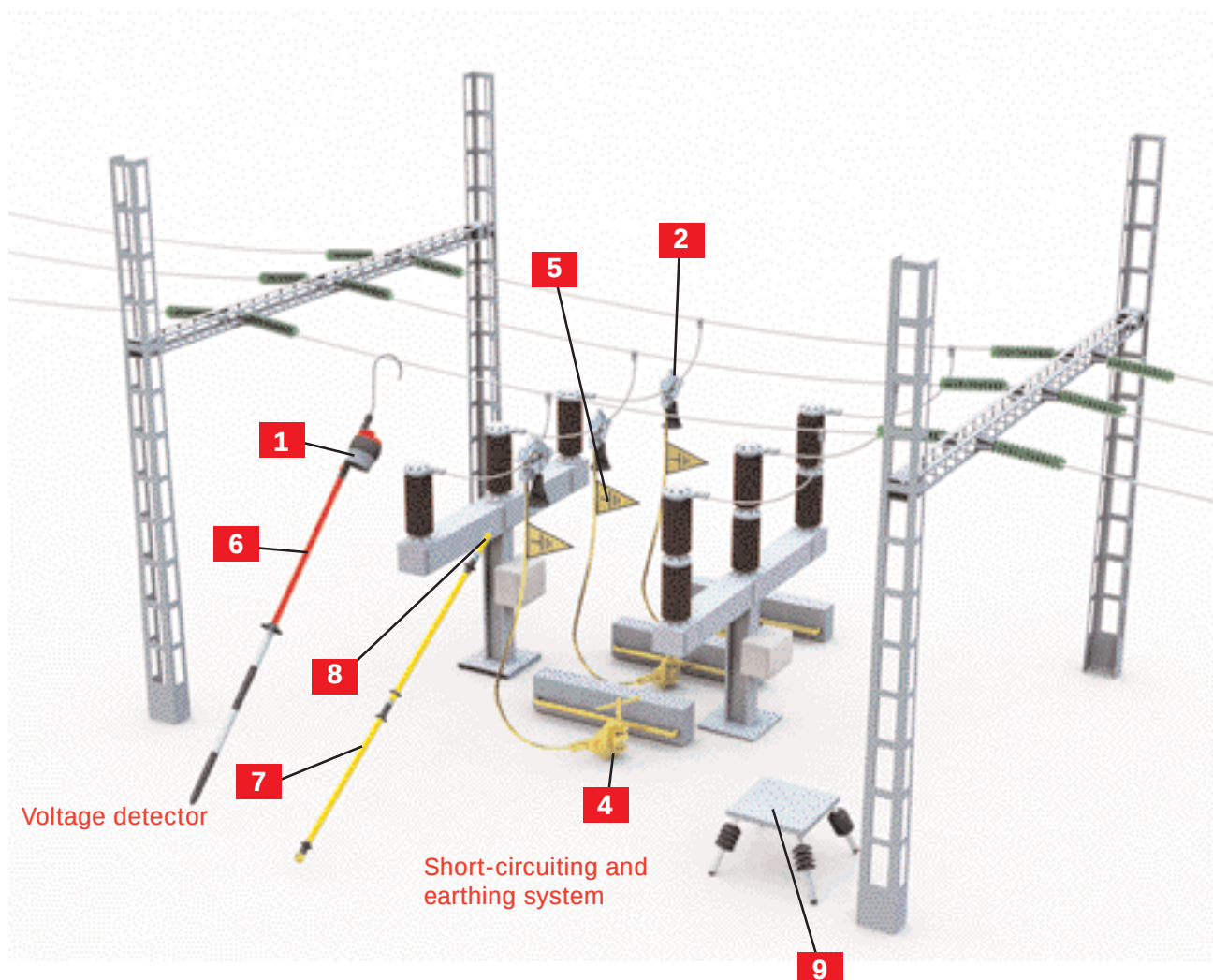
References: M-24-... serie

Page: 127

# APPLICATIONS

Before intervention select the right personal protective equipment

Substation line (work from ground)



| Earth Clamps, rod and flags |                                                                          |                            |           |
|-----------------------------|--------------------------------------------------------------------------|----------------------------|-----------|
| 4                           | Earth Clamps                                                             | References: MT-847, MT-843 | Page: 126 |
| 5                           | Earth Flags                                                              | References: AL-58, AL-60   | Page: 122 |
| Insulating sticks           |                                                                          |                            |           |
| 6                           | Insulating Sticks IEC For short-circuiting systems and Voltage detectors | References: CM-4000 serie  | Page: 124 |
| 7                           | Insulating sticks for short circuiting and earthing system               | References: CM-6 serie     | Page: 126 |
| 8                           | Connection adaptors                                                      | References: CI-... serie   | Page: 125 |
| Insulating platform         |                                                                          |                            |           |
| 9                           | Insulating platform outdoor use                                          | References: CT-9-63        | Page: 114 |

# Personal protective equipment

## Head and eyes protection

Head and eyes protection

Insulating rubber gloves

Insulating mats and boots

Equipment for working on pole

Above 52 kV

### Safety glasses

Protection against UV radiation and ejections of solid particles. Grilamid frame in orange Softflex. Anti-scratch, anti-impact and anti-chemical product treatments. **EN 166/EN 170 CE**

**CAUTION** : Do not use for welding operations.

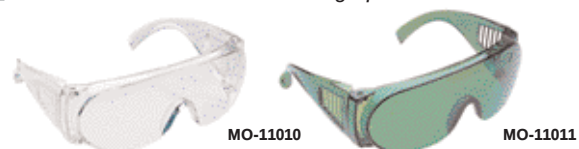


|          |                                                                 |
|----------|-----------------------------------------------------------------|
| MO-11000 | Clear lenses, delivered in pouch                                |
| MO-11001 | Tinted lenses, delivered in pouch                               |
| MO-11003 | Tinted lenses, UV/IR protection, welding filter 2. EN 169. 80°C |

### Overglasses

Polycarbonate overglasses. Protection against UV radiation and ejections of solid particles. **EN 166/EN 170 CE**

**CAUTION** : Do not use for welding operations.



|          |                     |
|----------|---------------------|
| MO-11010 | Clear lenses        |
| MO-11011 | Green tinted lenses |

### ABS helmet

Electrically insulating helmets for use on voltage installations. Safety industrial helmet, safety helmet for electrical use, especially designed to maximize wearer's comfort. Standard sizes 53 to 63. Leather trim 21 cm along the inside for added comfort. Multiple adjustments for a perfect fit headband: adjustable in 3 mm increments. Built-in cushion for optimum ventilation. Safety chin strap: fastenings to shell tear resistant. Weight: 0.300 kg.

**EN 166/EN 170 EN 50365 ANSI Z89.1:2003 Class E 20 kV CE**



|            |        |
|------------|--------|
| MO-182/1-B | White  |
| MO-182/1-R | Red    |
| MO-182/1-J | Yellow |

### Face shield

Protection against electric short-circuits arcs. Face shield adjustable on MO-182 helmet. 100% UV protection. Weight: 0.170 kg.

**EN 166/EN 70 CE**

**CAUTION** : Do not use for welding operations.



|        |                                        |
|--------|----------------------------------------|
| MO-184 | Single size, adjustable by rubber band |
|--------|----------------------------------------|

### Polycarbonate helmet

Polycarbonate helmet. Shock and wear resisting, comfortable. Adjustable size from 53 to 63 cm. Weight: 0.465 Kg.

**EN 397 CE**



|           |                                |
|-----------|--------------------------------|
| MO-183-BL | White, single size, adjustable |
| MO-183-RL | Red, single size, adjustable   |

### Face shield

Polycarbonate face shield adjustable on the head by milled wheel. Protection against electric arcs of short-circuits. Anti-mist treatment. Anti-scratch treatment.

**EN 166/EN 170 CE**

**CAUTION** : Do not use for welding operations.



|          |                                |
|----------|--------------------------------|
| MO-186   | Single size, adjustable        |
| M-881635 | Spare face shield for MO-186   |
| M-87384  | Bag for face shield and helmet |
| M-952206 | Spare strap for MO-186         |

### Helmet with built-in face shield

Panoramic face shield in non-scratch and anti-mist polycarbonate. Chinstrap (with Velcro fastening) Head fit adjustment by milled wheel. Single size: 0.270 kg.

**EN 166/EN 170/EN 397 EN 50365 CE**



|            |                                                   |
|------------|---------------------------------------------------|
| MO-185-BL  | White                                             |
| MO-185-BLM | White, chinstrap with a chin                      |
| MO-185-R   | Red                                               |
| MO-185-J   | Yellow                                            |
| MO-185-B   | Blue                                              |
| M-881622   | Spare face shield for MO-185                      |
| M-881836   | Spare white padded headband                       |
| M-881889   | Spare complete set (harness, chinstrap, headband) |

# Personal protective equipment

Head and eyes protection

Insulating rubber gloves

Insulating mats and boots

Equipment for working on pole

Above 52 kV

## Headlamp with adjustable focus

Can be carried either on the head or any type of helmet. **CE**  
Lighting control and beam by switches.  
Range: 30 meters.  
Adjustable lamp height angle.  
Sealed against rain.  
Powered by 4 batteries LR 6.  
Autonomy: 6 hours.  
Standard bulb 4.8 V/0.3 A.



|          |                                                      |
|----------|------------------------------------------------------|
| MS-118   | Headlamp - Weight: 0.187 kg                          |
| M-95-865 | Halogen bulb (sold by set of 5 units)<br>5.2 V 0.5 A |
| M-95-864 | Hooks set for helmet                                 |

## LED's headlamp (4 LED's)

Can be carried either on the head or any kind of helmet thanks to it supplied adhesive clip. (fig. 1 and 2). **CE**  
3 lighting levels: large or narrow for a short or long distance, and both for maximal power.  
Flash mode.  
4 white LED's lamp with adjustable height angle.  
Range: 10 to 15 meters.  
Powered by 3 batteries LR03 (AAA).  
Autonomy: 90 hours.



|             |                                                                                 |
|-------------|---------------------------------------------------------------------------------|
| MS-122      | Delivered with batteries, carrying bag, headband and adhesive clip. Weight: 82g |
| SUPBAND 122 | Adhesive support and headband kit                                               |
| SUP122      | Kit of 5 adhesive supports                                                      |

## LED's headlamp (5 LED's)

LED's Headlamp (5 LED's). **CE**  
Can be carried on the head or any kind of helmet.  
Lighting by 5 high performance white new generation LED's - 3 lighting levels + 1 flash mode + 1 red lighting. IPX6.  
Powered by four batteries LR06 (AA).  
Range : 30 meters.  
Autonomy : 100 hours.



|          |                                                           |
|----------|-----------------------------------------------------------|
| MS-127   | Delivered with batteries and a carrying bag Weight: 226 g |
| M-95-864 | Hooks set for helmet                                      |

## Intrinsically safe ATEX LED's Headlamp

**Ex** II 2GD EEx ia IIC T4 **CE**  
Can be carried either on the head or any kind of helmet.  
- Lighting by 3 high performance White LEDs.  
- 2 lighting levels (High: 3 LEDs on or low: 1 LED on).  
- Adjustable lamp height angle.  
- Very light, ABS body.  
- ATEX certified Categorie 2 (Zone 1)  
N° TRL03ATEX21005X.  
- Range: 10 to 15 meters.  
- Powered by 3 batteries LR03 (AAA).  
- Autonomy: 150 hours.  
- Strap: cloth or silicone rubber (for helmet).



|          |                                            |
|----------|--------------------------------------------|
| MS-126   | Delivered with batteries - Weight: 0.125Kg |
| M-95-864 | Hooks set for helmet                       |

# Personal protective equipment



Above 52 kV

Head and eyes protection

Insulating rubber gloves

Insulating mats and boots

Equipment for working on pole

## Insulating rubber gloves

Insulating rubber gloves conform to international IEC-60903 standard.

To satisfy the requirements of this standard, they are subjected to dielectrical, mechanical resistance and ageing tests. The acceptance levels for mechanical tests are stricter.

The tests are especially aimed at checking the tensile strength and elongation at break, the mechanical puncture test and tension set.

Our gloves are made of latex especially treated to obtain high dielectric characteristics; they are individually tested and delivered in sealed plastic bags.

IEC-60903

EN 60903



| Reference | Class | Voltage (V) | Designation | Overgloves size | Weight (g) |
|-----------|-------|-------------|-------------|-----------------|------------|
| CG-30 (*) | 3     | 26 500      | 2.9         | **              | 560        |
| CG-40 (*) | 4     | 36 000      | 3.6         | **              | 800        |

\* References to be completed by size A, B, C, D

\*\* See below

Correspondence with standard sizes: A = 8, B = 9, C = 10, D = 11

### SELECTION BOARD SIZE INSULATING GLOVES/OVER GLOVES

| Gloves reference | Gloves size | Overgloves reference | Overgloves size |
|------------------|-------------|----------------------|-----------------|
| CG-30 (*)        | B           | CG-99 (*)            | C               |
| CG-40 (*)        | C           |                      | D               |
|                  | D           |                      | E               |

## Undergloves

Cotton undergloves

To be used with insulating rubber gloves.

These washable cotton undergloves improve the use of the insulating gloves.

They bring the best held, hygiene and a greater comfort.



CG-80 (\*\*) \*\* H: men / F: women

## Working gloves

Handling leather and cotton gloves. Docker type. Protection against chemical risks.

EN 388



CG-97-C Single size (C = 10)

Working shoes and electrician suit see page 24

## Overgloves

Used as outer gloves to protect insulating gloves in dry environment. Silicon grain leather, very flexible.

Large protective cuff in chrome tanned hide.

Red adhesive strap.

EN 388



CG-99 (\*) Weight: 0.170 kg \* Add size: C, D, E

# Personal protective equipment



Above 52 kV

Head and eyes protection

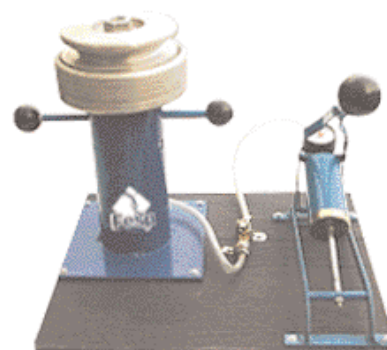
Insulating rubber gloves

Insulating mats and boots

Equipment for working on pole

## Insulating tester

Tester insulation rubber gloves, manual, head alloy in aluminum alloy and paint steel body. Check holes or cracks in insulating gloves.



CG-119

Insulating tester

## Pneumatic glove tester

For compulsory control of gloves before use.  
Checking is done by inflating and immersing in water.

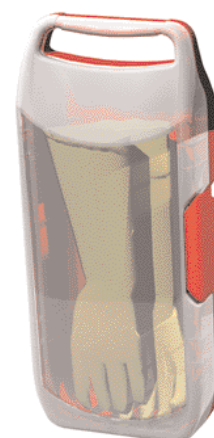


CG-117

140 x 150 x 160 mm - Weight: 0.600 kg

## Rubber gloves storage box with window

To be placed in high voltage stations, or to be carried.  
Specially designed for protecting insulating gloves.  
This plastic box also ensures the protection against UV radiation of insulating gloves.  
The transparent cover enable to check gloves presence.  
Bottle of talc included.  
Can be fixed on wall.



CG-35/2

101 x 224 x 476 mm - Weight: 1.850 kg

## Carrying bag

Made from reinforced waterproof fabric for transport of rubber gloves in vehicles and tool boxes.  
Rear loop for belt and snaps.



CG-36

90 x 175 x 585 mm - Weight: 0.120 kg

Nomex undergloves CG-37 and mittens CG-81 see page 22

# Personal protective equipment

Insulating mats  
and boots

Above 52 kV

Head and eyes protection

Insulating rubber gloves

Insulating mats and boots

Equipment for working on pole

## Insulating mats

The matting is manufactured of elastomer compounds with slip-resistant surface. High quality dielectrical rubber.



| Reference    | Thickness (mm) | Dimensions (m) |
|--------------|----------------|----------------|
| MP-60/10-5   | 10             | 0.6 x 5        |
| MP-60/10-10  | 10             | 0.6 x 10       |
| MP-100/10-5  | 10             | 1 x 5          |
| MP-100/10-10 | 10             | 1 x 10         |

## Insulating platform (indoor model)

Solid plate with moulded insulating material 52 x 52 cm, thickness 40 cm. Feet with rubber tips.



| Reference | Rated insulation (V) | Height (mm) | Weight (kg) |
|-----------|----------------------|-------------|-------------|
| CT-7-63   | 63 000               | 340         | 3.35        |

## Insulating platform (outdoor model)

Solid plate with moulded insulating material 52 x 52 cm, thickness 40 cm. Feet with rubber tips.



| Reference | Rated insulation (V) | Number of skirts per foot | Height (mm) | Weight (kg) |
|-----------|----------------------|---------------------------|-------------|-------------|
| CT-9-63   | 63 000               | 4                         | 515         | 7.00        |

## Rescue sticks

Insulating sticks ended by a large hook in order to rescue quickly an electrified victim in case of accident.



|         |                                           |
|---------|-------------------------------------------|
| CS-90*  | Length: 2.05 m - Rated insulation: 90 kV  |
| CS-225* | Length: 2.45 m - Rated insulation: 225 kV |

\* Delivered with wall mounted supports.

# Personal protective equipment

Equipment for  
working on pole

Above 52 kV

Head and eyes protection

Insulating rubber gloves

Insulating mats and boots

Equipment for working on pole

## Pro electric full body fall arrest harness

2 fall arrest attachment point: dorsal and sternal. Automatic buckles of the belt and leg loops. Elastic shoulder straps. Padded leg loops. A work positioning belt, with a comfortable and lightweight pad. 2 buckles of work positioning Belt. Leg loops and shoulder straps adjustable. Polyamide straps.

Tools holders.

3 sizes: S, M, XL. Delivered in a protective bag with a users manual. Weight: 2.7 kg.



EN 358  
EN 361  
CE

MO-563(\*) S = small M = medium XL = large

\* add size: S/M/XL

## Pro electric full body fall arrest harness

2 fall arrest attachment point: one dorsal point, one sternal point. Easy and fast to wear with a ventral snap-hook. A ventral attachment point for a descender and / or lanyard. Padded leg loops. A work positioning belt, with a comfortable and lightweight pad. 2 buckles of work positioning Belt. Leg loops and shoulder straps adjustable.

Polyamide straps. Tools holders

3 sizes: S, M, XL. Delivered in a protective bag with a users manual. Weight: 3 kg.



EN 358  
EN 361  
EN 813  
CE

MO-565(\*) S = small M = medium XL = large

\* add size: S/M/XL

## Full body fall arrest harness

2 fall arrest attachment point : dorsal and sternal. A work positioning belt, with a comfortable and lightweight pad. 2 buckles of work positioning Belt. Leg loops and shoulder straps adjustable. Polyamide straps. Unique size. Delivered in a protective bag.



EN 358  
EN 361  
CE

MO-71 Weight: 1.9 kg

## Equipped rope straps with lever stretcher

Equipped with adjuster. Hooks to belt with rapid link.

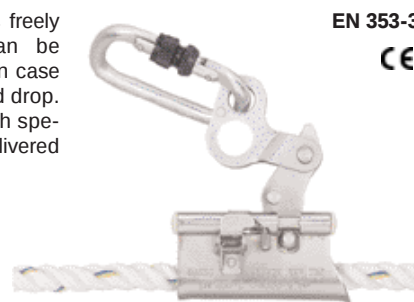


EN 358  
CE

MO-52-L Length: 4 m - Weight: 1 kg

## Anti-fall grip

The safety block runs freely on its rope but can be automatically locked in case of a sudden downward drop. Must be used only with special 15 mm Ø rope delivered with the device.



EN 353-3  
CE

MO-68/10 With 10 m of rope - Weight: 2.300 kg

MO-68/15 With 15 m of rope - Weight: 3.250 kg

## Double safety descent device

Articulated stainless steel cam. Aluminium housing. High-resistance handle. Operates with 9-12 mm diameter lanyard. Ideal for evacuation. Lets you regulate descent.



EN 361  
CE

MD-02 Weight: 0.32 Kg

## Tether rope with energy absorber

Tether rope in polyamide Ø14 mm.



EN 355  
CE

MO-52020 Length: 1.50 m

MO-52021 Length: 2.00 m

## Double tether rope with energy absorber

Double tether rope with energy absorber Equipped with 2 steel snap hooks with automatic locking and 1 steel snap hook with screwing locking



EN 355  
CE

MO-54010 Length: 1.20 m - Weight: 1.4 kg

# Personal protective equipment

Equipment for  
working on pole

Above 52 kV

Head and eyes protection

Insulating rubber gloves

Insulating mats and boots

Equipment for working on pole

## Snap hooks (stainless steel)



MO-54



MO-55/1

EN 362  
CE

**MO-54** Locks with threaded ring - Opening: 15 mm  
100 x 58 mm - 0.154 kg

**MO-55/1** Locking by screwing ring on a spring  
loaded mobile catch; an additional catch is  
provided to prevent the rope from slipping  
in the carabiner - 155 x 75 mm - 0.140 kg

## Snap hooks (aluminium alloy) zicral



MO-54000



MO-54004

EN 362  
CE

**MO-54000** Oval snap hook - Opening: 15 mm  
Individually tested - Weight: 0.071 kg  
110 x 58 mm

**MO-54004** D-shaped snap hook with automatic locking  
Opening: 23 mm - Individually tested  
Weight: 0.087 kg - 120 x 72 mm

## Lanyard

Synthetic fibre ropes - 10 mm.  
Loops spliced at both ends.  
Delivered without snap hook.



EN 354  
CE

**MO-53** Length: 1.50 m - Weight: 0.125 kg

## Fall arrester - retractable type

Designed for lineman safety. Quick  
acceleration causes instant locking.  
Corrosion protected steel shell.  
Integrated braking mechanism and  
dissipating element.  
Self locking mechanism and auto-  
matic tensioning and return facility.  
Galvanized cable Ø 4 mm.  
Strength: 1 200 daN.  
Delivered with a screw crab.  
Max. length: 10 m.



EN 360  
CE

**MO-591002** Weight: 7.00 kg

## Snap hook with double safety latch

Opening: 50 mm  
Body in steel  
Fingers in stainless steel  
Resistance: 20 kN.

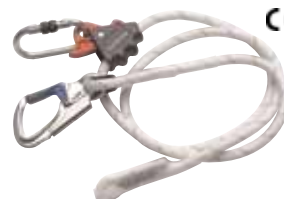


EN 362  
CE

**MO-54002** Weight: 0.390 Kg

## Tether rope equipped with a tension device

The tether rope is intended to  
ensure that operators are held in  
position when working at a  
height. This tether rope must be  
associated with a harness belt.  
Ends sewn to form an attachment  
and protected with a plastic  
girdle.  
Polyamide Ø 12 mm.  
Light alloy.



EN 358  
CE

**MO-56009** Weight: 0.75 kg - Length: 2 m

**MO-56010** Weight: 1.000 kg - Length: 3 m

## Safety rope with wear tell tales

Rope: 14 PEPT multi-filament  
(15 mm diam.)  
Two-colour safety rope, 100%  
polyester made of 3 white  
strands with black central  
thread (wear telltale).  
Buckle: Polyamide central lug  
attaches to snap-hook of belt.



EN 354  
CE

**MO-052** Safety rope only - Length: 4 m - 0.76 kg

## Mobile safety line

5 to 20 metres mobile safety  
line with adjustable harness.  
Easy and quick to set up, this  
line can be used by 2 people.  
It is equipped with a tension  
device.  
It has 2 harness rings with screw  
gate karabiners, reference 40.  
This safety line is designed for  
short operations. It takes a few  
minutes to set it up on 2  
attachment points and can withstand a force of 2,000 kg.  
The line is tightened by hand to be taut as possible. The users  
can then hook themselves to the safety line using a fall arrest  
device or a shock absorbing lanyard. When using a shock absor-  
bing lanyard, allow for at least 7 metres clearance.



EN795B  
CE

**MO-53002** Weight: 2.82 kg

# Personal protective equipment



Above 52 kV

Head and eyes protection

Insulating rubber gloves

Insulating mats and boots

Equipment for working on pole

## Anti fall device with automatic release strap

Winder with self-locking strap.  
Length: 2 m.  
Equipped with shock absorber.  
Allows 2 m of movement autonomy around anchoring point.

EN 360

MO-591000 Weight: 1.160 kg



## Constraint tie

Tie in polyamide.

EN 795



MO-52031 Length: 0.8 m - Weight: 0.100 kg

MO-52033 Length: 1.20 m - Weight: 0.135 kg

MO-52034 Length: 1.50 m - Weight: 0.150 kg



## Working on pole kit



| Reference        | Use                                     |
|------------------|-----------------------------------------|
| KIT-HAUT-01-(* ) | To go up a pole with insulating ladders |
| KIT-HAUT-02-(* ) | To go up a pole with spliced ladders    |
| KIT-HAUT-03-(* ) | To go up a catenary                     |
| KIT-HAUT-04-(* ) | To go up on a pylon                     |
| KIT-HAUT-05-(* ) | To go up on a roof                      |
| KIT-HAUT-06-(* ) | To go up using a nacelle                |

| Composition                              | KIT-HAUT- |     |     |                  |     |     |
|------------------------------------------|-----------|-----|-----|------------------|-----|-----|
|                                          | 01*       | 02* | 03* | 04*              | 05* | 06* |
| Harness MO-563                           | n         | n   | n   |                  |     |     |
| Harness MO-565                           |           |     |     | n                |     |     |
| Harness MO-71                            |           |     |     |                  | n   | n   |
| Tether rope MO-52020                     | n         |     |     |                  |     | n   |
| Double tether rope MO-54010              |           | n   |     | n                | n   |     |
| Constraint tie MO-52034                  | n         | n   |     |                  |     |     |
| Constraint tie MO-52031                  |           |     |     | n <sup>(2)</sup> |     |     |
| Tether rope with tension device MO-56009 | n         | n   | n   | n                | n   |     |
| Anti-fall grip MO-68/15                  | n         | n   | n   | n                |     |     |
| Snap hook MO-54                          | n         | n   |     |                  |     |     |
| Carrying bag M-87-295                    | n         | n   | n   | n                | n   | n   |

(\*) add size : M or XL - order example : KIT-HAUT-02-XL.

# Personal protective equipment



Above 52 kV

Head and eyes protection

Insulating rubber gloves

Insulating mats and boots

Equipment for working on pole

## Insulating ladders

A complete range with top quality features: Insulation between two steps: 30000 V (test performed after immersion in water for 24 hours). High mechanical resistance to bending and twisting. Good resistance/weight ratio. High fire resistance. High resistance against bad weather and corrosive elements. Lateral risers in polyester/glass fiber rectangular section 70 x 25 mm. Aluminium alloy rungs with square 29 x 29 mm section and anti-slip coating.



EN 131  
CE

INSULATING 2 SECTION EXTENSION LADDERS,  
HAND OPERATED

| Reference  | Folded length | Extended length | Number of rungs | Weight (kg) |
|------------|---------------|-----------------|-----------------|-------------|
| MP-514/2   | 2.41 (m)      | 4.09 (m)        | 2 x 8           | 13.9        |
| MP-515/2-R | 2.97 (m)      | 5.21 (m)        | 2 x 10          | 17          |

INSULATING 2 SECTION EXTENSION LADDERS,  
ROPE AND PULLEY OPERATED

|          |          |           |        |    |
|----------|----------|-----------|--------|----|
| MP-506/2 | 3.53 (m) | 6.05 (m)  | 2 x 12 | 20 |
| MP-508/2 | 4.66 (m) | 8.30 (m)  | 2 x 16 | 31 |
| MP-510/2 | 5.78 (m) | 10.26 (m) | 2 x 20 | 38 |



Protection against electrical shock  
and flash hazards

## Arc Flash kits



See page 68



# Safety padlocks and warning signs

## Padlocks

Above 52 kV

Padlocks

Warning signs

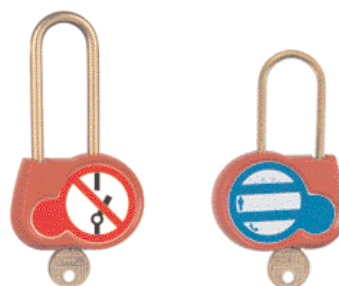
Delineators

A wide range of brass padlocks, in a plastic body.

Brass ring bow 50 or 70 mm. Diameter of the ring bow 4 or 6 mm. Different n° of keys. Colours : red, white, yellow, blue or green.

## Padlocks with warning signs

| Reference       | Ring bow (mm) | Ø (mm) | Weight (kg) |
|-----------------|---------------|--------|-------------|
| AL-230-(*)-EX   | 50            | 6      | 0.170       |
| AL-230-S-(*)-EX | 70            | 6      | 0.190       |
| AL-230-Z-EX     | 50            | 6      | 0.170       |
| AL-230-S-Z-EX   | 70            | 6      | 0.190       |
| AL-240-(*)-EX   | 50            | 4      | 0.170       |
| AL-240-S-(*)-EX | 70            | 4      | 0.190       |
| AL-240-Z-EX     | 50            | 4      | 0.170       |
| AL-240-S-Z-EX   | 70            | 4      | 0.190       |



\* Add n° of key: 111 or 222

"00" n° standard key: n° of key upon request. Z: random n° of key

## Colour padlocks range

| Reference         | Ring bow (mm) | colour | Ø (mm) | Weight (kg) |
|-------------------|---------------|--------|--------|-------------|
| AL-240-B-Z-EX     | 50            | White  | 4      | 0.170       |
| AL-240-B-00-EX    | 50            | White  | 4      | 0.170       |
| AL-240-S-B-00-EX  | 70            | White  | 4      | 0.190       |
| AL-240-J-Z-EX     | 50            | Yellow | 4      | 0.170       |
| AL-240-J-00-EX    | 50            | Yellow | 4      | 0.170       |
| AL-240-S-J-00-EX  | 70            | Yellow | 4      | 0.190       |
| AL-240-BL-Z-EX    | 50            | Blue   | 4      | 0.170       |
| AL-240-BL-00-EX   | 50            | Blue   | 4      | 0.170       |
| AL-240-S-BL-00-EX | 70            | Blue   | 4      | 0.190       |
| AL-240-V-Z-EX     | 50            | Green  | 4      | 0.170       |
| AL-240-V-00-EX    | 50            | Green  | 4      | 0.170       |
| AL-240-S-V-00-EX  | 70            | Green  | 4      | 0.190       |



HIGH VOLTAGE

# Safety padlocks and warning signs

Padlocks

Above 52 kV

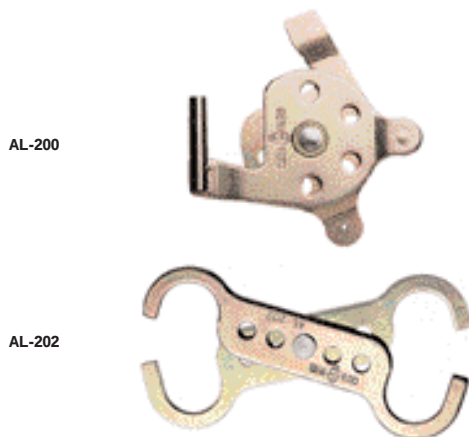
Padlocks

Warning signs

Delineators

## Multiple locking apparatus

Holds up to four padlocks and a sign.



|        |                                     |
|--------|-------------------------------------|
| AL-200 | 100 x 60 x 10 mm - Weight: 0.150 kg |
| AL-202 | 165 x 50 x 12 mm - Weight: 0.200 kg |

## Handle for 10 and 30 padlocks

PVC.  
Shock resistant.  
Ivory colour.  
With holes Ø 9 mm.



|           |                                    |
|-----------|------------------------------------|
| AL-207/10 | For 10 padlocks - Weight: 0.06 kg  |
| AL-207/30 | For 30 padlocks - Weight: 0.130 kg |

## Safety locking badge

Fit with multiple locking apparatus AL-202  
White letters on red aluminium  
Fixing with 1 hole Ø 10 mm.



|           |         |
|-----------|---------|
| AM-467-GB | Ø 80 mm |
|-----------|---------|

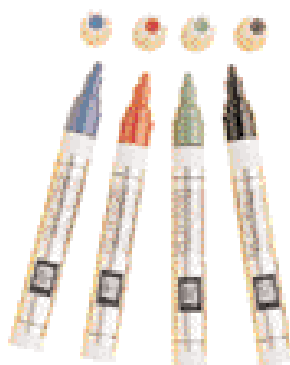
## Handle with 6 padlocks

Handle of moulded plastic for holding up to six padlocks.  
Compartment with transparent cover for key storage.



## Marking

For indelible writing on the warning signs and padlocks, our ALU-SCRIPT™ markers are ideal.



|        |                                                            |
|--------|------------------------------------------------------------|
| AS-404 | 4 markers in assorted colours (red, black, blue and green) |
|--------|------------------------------------------------------------|

| Reference       | Weight (kg) | Handle with 6 padlocks |
|-----------------|-------------|------------------------|
| AL-236-111-EX   | 1.150       | AL-230-111-EX          |
| AL-236-S-111-EX | 1.210       | AL-230-S-111-EX        |
| AL-236-222-EX   | 1.150       | AL-230-222-EX          |
| AL-236-S-222-EX | 1.210       | AL-230-S-222-EX        |

# Safety padlocks and warning signs

## Warning signs

Above 52 kV

Padlocks

Warning signs

Delineators

## Substation signs

### WARNING SIGNS

| Reference | Type      | Dimensions  | Characteristics                                           |
|-----------|-----------|-------------|-----------------------------------------------------------|
| AM-41/1*  | aluminium | 100 mm side | black on yellow<br>fixing: 3 holes<br>Ø 4.5 mm            |
| AM-41/2   | aluminium | 200 mm side | black on yellow<br>fixing: 3 holes<br>Ø 4.5 mm            |
| AM-49/1*  | aluminium | 100 mm side | black on yellow<br>fixing: 3 holes<br>Ø 4.5 mm            |
| AM-49/2   | aluminium | 200 mm side | black on yellow<br>fixing: 3 holes<br>Ø 4.5 mm            |
| AM-344-GB | aluminium | 100 mm side | black letters<br>on yellow<br>fixing: 3 holes<br>Ø 4.5 mm |
| AM-345-GB | aluminium | 100 mm side | black letters<br>fixing: 3 holes<br>Ø 4.5 mm              |
| AM-344/05 | aluminium | 50 mm side  |                                                           |
| AM-344    | aluminium | 100 mm side |                                                           |

\*Pack of 10 units.

### SPECIALIZED SIGNS

| Reference   | Type      | Dimensions   | Characteristics                       |
|-------------|-----------|--------------|---------------------------------------|
| AM-20-GB    | aluminium | 350 x 250 mm | blue letters<br>on plain<br>aluminium |
| AM-20-RM    | aluminium | 350 x 500 mm | blue letters<br>on plain<br>aluminium |
| AM-61-GB    | aluminium | 150 x 200 mm |                                       |
| AM-61-RM    | aluminium | 150 x 200 mm |                                       |
| AM-215-RM   | aluminium | 350 x 250 mm | black on yellow<br>SF6 warning        |
| AM-282/2-RM | aluminium | 200 x 60 mm  |                                       |
| AM-7002     | aluminium | 300 x 200 mm | black on yellow                       |
| AM-33/3     | aluminium | Ø 300 mm     | red-black on alu                      |
| AM-34/2     | aluminium | Ø 200 mm     | red-black on alu                      |
| AM-32/3     | aluminium | Ø 300 mm     |                                       |
| AP-510-GB   | plastic   | 420 x 297 mm | golden rules                          |
| AP-951/2    | plastic   | 200 x 200 mm | red on white                          |



AM-41/1



AM-49/1



AM-344/05 - AM-344



AM-344-GB



AM-345-GB



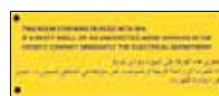
AM-20-GB



AM-20-RM



AP-510-GB



AM-215-RM



AM-282/2-RM



AM-7002



AM-61-GB



AM-61-RM



AP-951/2



AM-33/3



AM-34/2



AM-32/3

For other models, please consult us.

# Safety padlocks and warning signs/Voltage detectors

Warning signs

Delineators

HF Voltage  
comparator

Above 52 kV

Padlocks

Warning signs

Delineators

## Warning sign

Attachment: one hole Ø 10 mm.  
Marking for indelible writing: see page 120.



| Reference | Type    | Ø (mm) |
|-----------|---------|--------|
| AP-499/1  | plastic | 100    |

## Warning flags

Brightly colored ribbon.



| Reference | Dimensions (mm) | Fixing    |
|-----------|-----------------|-----------|
| AL-53     | 650 x 350       | on handle |

## Grounding flags



AL-60



AL-58

|       |                                                                                                                                             |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------|
| AL-58 | Fixing on handle; for work site                                                                                                             |
| AL-60 | Fixing on earthing cable; for immediate identification in open-type switchgears possible inscription: 0 to 99 (by using ALU-SCRIPT markers) |

## Safety boundary post

For temporary installation.  
Used with tough link chain delineators (AL-32/05).  
Removal Foot.  
Ø 50 mm.  
Height: 0.9 m.



AL-316

AL-318

|        |                                   |
|--------|-----------------------------------|
| AL-316 | Red and white - Weight: 4.2 kg    |
| AL-318 | Black and yellow - Weight: 4.2 kg |

## Chain delineators

Polyamide chains.



AL-31/25

AL-32/05

|          |                                |
|----------|--------------------------------|
| AL-31/25 | Red and white - Length: 25 m   |
| AL-31/05 | Red and white - Length: 5 m    |
| AL-32/05 | Black and yellow - Length: 5 m |
| AL-31    | Opening ring for AL-31/25      |

## Delineators

Brightly colored ribbon.  
Snap hook on one ribbon end and another on spool.  
A ring on spool brakes ribbon at desired length.  
wide: 50 mm  
length: 20 m.



AL-62-A

AL-63-A

|         |               |
|---------|---------------|
| AL-62-A | Red ribbon    |
| AL-63-A | Yellow ribbon |

## Wireless phase comparator

The wireless phase comparator allow to check if the 2 actives conductors' voltage are in phase or not. On electrical networks 50/60Hz from 1kV to 232kV. Distances between both points of measurement until 80m in open field. Wireless and without maximum time measurement. Transmitter, receiver and good radio link between both devices autotest. IEC 61481 (phase comparator). Sound and luminous indication. Green diodes: synchronization (angular difference lower +/-10 %). Red diodes: no synchronization (angular difference superior +/-30 %). Communication frequency 433 MHz. Battery 9V.

| Reference | Voltage (kV) | Length of antenna (m) | Weight (kg) |
|-----------|--------------|-----------------------|-------------|
| CL-12     | 1-232        | 0.6                   | 1.750       |



transmitter

receiver

## Voltage detectors

Designed to give users maximum safety, the DETEX detectors of the CC-245 Series are the result of the most modern developments in electronic research. They offer a number of important properties and advantages.

### Double signalling

Voltage presence indicated at the same time by:

- 4 extremely bright red flashing electro-luminescent diodes (visible at more than 50 meters even in direct lighting),
- a powerful rated acoustic signal (60 dB/2 m).

### Checking

Satisfactory operation of the unit is indicated:

- When pressing the test button, by:

- the red diodes flashing,
- the acoustic signal sounding.

- When releasing the TEST button, by:

- timed green up diodes lighting.

As long as they light, the unit continues its self-testing and the detector is fully operational.

### High specifications

- Detectors are adjusted, tested and controlled one by one.
- Remarkably resistant to impacts, vibrations, extreme temperatures, humidity and sudden changes in the atmosphere (condensation, freezing).

- Precise and stable operating threshold.
- Insensitivity to induced voltages by limiting the operating voltage range.
- Robust housing made from polycarbonate with high mechanical properties and dielectric strength.
- The contact electrodes are simply screwed to the housing and are therefore easily interchangeable.

IEC-61243-1



### Power supply

- One 9 V battery type 6 LR 61.

### End fittings:

- "C" for hexagonal sticks.
- "K" for universal sticks.

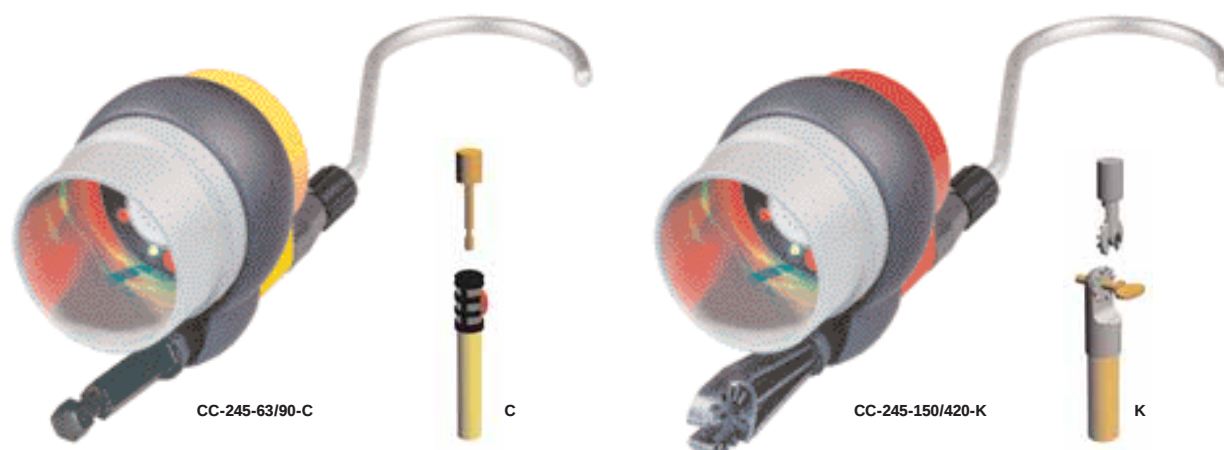
### Weight

650 g (with battery).

### Packaging

Units supplied complete with battery and electrode in a rigid synthetic case with handle.

- Recommended sticks: CM-4000 serie. See page 124.



| Reference                 | Operating voltage (Ph/Ph-kV) | Contact electrode Ø mm | Body colour | Freq. (Hz) |
|---------------------------|------------------------------|------------------------|-------------|------------|
| FRENCH STANDARD NETWORKS  |                              |                        |             |            |
| CC-245-63/90...*          | 63-90                        | 120                    | Yellow      | 50         |
| CC-245-225/420...*        | 225-420                      | 200                    | Red         | 50         |
| British standard networks |                              |                        |             |            |
| CC-245-66/132-K           | 66-132                       | 200                    | Red         | 50         |
| Other models              |                              |                        |             |            |
| CC-245-60/150-K           | 60-150                       | 120                    | Red         | 50         |
| CC-245-63/150-K           | 63-150                       | 120                    | Red         | 50         |
| CC-245-90/225-K           | 90-225                       | 120                    | Red         | 50         |
| CC-245-150/420-K          | 150-420                      | 200                    | Red         | 50         |
| CC-245-225/550-K          | 225-550                      | 200                    | Red         | 50         |

\* Please specify type of mounting when ordering: C or K.

**For other voltages, or 60 Hz Frequency detectors (CC-246 Serie) please consult us.**

# Voltage detectors

## Insulating sticks

Above 52 kV

Voltage detectors

Insulating sticks

## Insulating sticks for short-circuiting and earthing systems

These 39 mm dia. elements are assembled using a new safety bayonet system connector in aluminium alloy. They allow construction of a large variety of custom made sticks that meet the most varied conditions of application. Calibrated lengths of 1 to 3 meters (with fraction of 0.50 m) permit a huge number of applications.

This range thus allows a stick-length limitation in case of space requirements and carrying capabilities.

IEC-60855 

For common applications a serie of complete sets including 2 or 3 elements are made to give simple solutions for working distance from 2 to 6 meters.

| Reference                                     | Complete stick length (m)* | Complete stick length (m)** | Insulating length (m) | Weight (kg) |
|-----------------------------------------------|----------------------------|-----------------------------|-----------------------|-------------|
| <b>Basic elements</b>                         |                            |                             |                       |             |
| CM-4610                                       | 1.13                       |                             | 0.08                  | 1.35        |
| CM-4615                                       | 1.63                       |                             | 0.33                  | 1.80        |
| CM-4620                                       | 2.13                       |                             | 0.33                  | 2.80        |
| CM-4625                                       | 2.63                       |                             | 0.83                  | 3.30        |
| <b>Intermediate elements</b>                  |                            |                             |                       |             |
| CM-4610-I                                     | 1.165                      |                             | 0.8                   | 1.30        |
| CM-4615-I                                     | 1.665                      |                             | 1.3                   | 1.70        |
| CM-4620-I                                     | 2.165                      |                             | 1.8                   | 2.60        |
| CM-4625-I                                     | 2.665                      |                             | 2.3                   | 3.10        |
| <b>Terminal elements</b>                      |                            |                             |                       |             |
| CM-4610-*                                     | 1.115                      | 1.21                        | 0.78                  | 1.00        |
| CM-4615-*                                     | 1.615                      | 1.71                        | 1.28                  | 1.40        |
| CM-4620-*                                     | 2.115                      | 2.21                        | 1.78                  | 2.20        |
| CM-4625-*                                     | 2.615                      | 2.71                        | 2.28                  | 2.70        |
| <b>Fixed lenght sticks</b>                    |                            |                             |                       |             |
| CM-4115-*                                     | 1.575                      | 1.675                       | 0.82                  | 1.35        |
| CM-4120-*                                     | 2.075                      | 2.175                       | 1.07                  | 1.80        |
| CM-4125-*                                     | 2.575                      | 2.675                       | 1.32                  | 2.80        |
| CM-4130-*                                     | 3.075                      | 3.175                       | 1.82                  | 3.30        |
| <b>Intermediate elements with rain skirts</b> |                            |                             |                       |             |
| CM-3900-J                                     | 0.36                       |                             |                       | 0.95        |

\* Add end piece C, K, E.

• With the smallest end fitting.  
•• With the biggest end fitting.

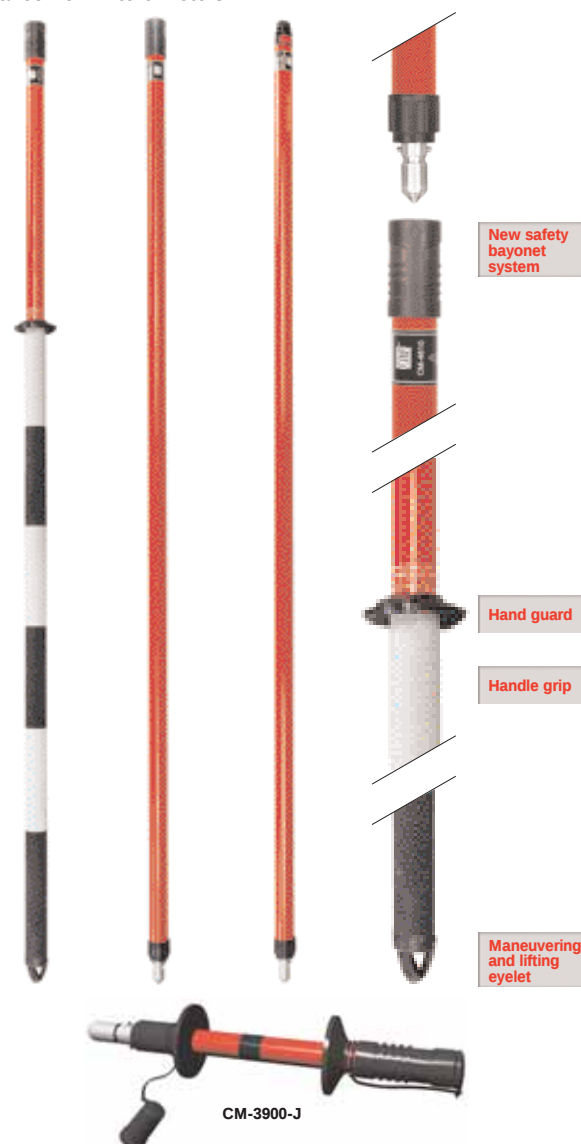
## Set of sticks

Complete sets of sticks for standard applications. IEC-60855 

| Reference | Working distance (m) | Composition                                |
|-----------|----------------------|--------------------------------------------|
| CM-4220*  | 2                    | 2 elements:<br>CM-4610+CM-4610-*           |
| CM-4230*  | 3                    | 2 elements:<br>CM-4615+CM-4615-*           |
| CM-4240*  | 4                    | 2 elements:<br>CM-4620+CM-4620-*           |
| CM-4345*  | 4.5                  | 3 elements:<br>CM-4615+CM-4615-I+CM-4615-* |
| CM-4360*  | 6                    | 3 elements:<br>CM-4620+CM-4620-I+CM-4620-* |

\* Add end piece C, K, E.

**For cables < 95 mm<sup>2</sup> CM-4000 serie is recommended.**



## Carrying and storage stick case

Case especially designed for Ø 39 mm new range sticks. Carrying capacity: 3 elements.



CM-3000

480 x 330 x 120 mm - Weight: 1.2 kg

# Short-circuiting and earthing systems

Clamps

Insulating sticks and earth clamps

Fixed points and cables

Accessories

Above 52 kV

## HV and EHV clamps manoeuvrable by insulating stick

Body in aluminium alloy with trapezoidal threaded screw. Interposed elastic washers in the clamping system improve efficiency and insure a higher withstand in case of electrodynamic shock. Manoeuvring by CM-6 insulated stick of appropriate length and characteristics.

  
MT-731

  
MT-732

  
MT-734  
IEC-61230

  
MT-735  
IEC-61230

  
MT-737-H  
IEC-61230

  
MT-732-A  
MT-731-A

  
MT-732-B  
MT-731-B

  
MT-732-E  
MT-731-E

  
MT-732-H  
MT-731-H

  
MT-734  
MT-735

  
MT-734-A  
MT-735-A

  
MT-734-B  
MT-735-B

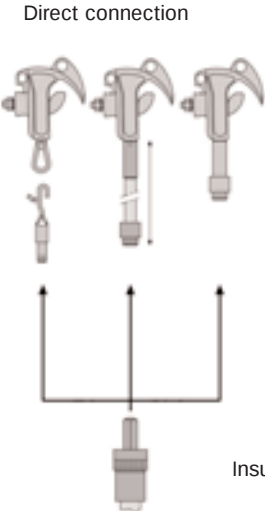
  
MT-734-E  
MT-735-E

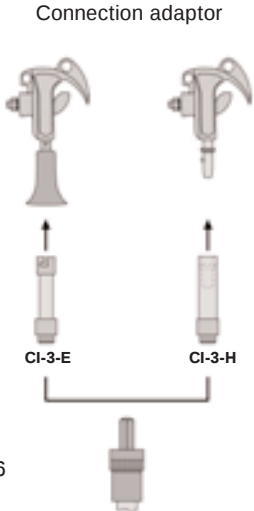
  
MT-734-H  
MT-735-H

| Reference | Clamping capacity<br>(Ø mm) | Test current<br>(kA/1s) | Copper connection           |                             |                 | Weight<br>(Kg) | Dimensions<br>(mm)<br>h x L x thickness |
|-----------|-----------------------------|-------------------------|-----------------------------|-----------------------------|-----------------|----------------|-----------------------------------------|
|           |                             |                         | Copper cables<br>(mm² max.) | Contact range<br>width (mm) | Stud or<br>hole |                |                                         |
| MT-731*   | 5-60                        | 40                      | 150                         | 45                          | M 12            | 1.45           | 200 x 200 x 50                          |
| MT-732*   | 40-120                      | 40                      | 150                         | 45                          | M 12            | 1.45           | 200 x 200 x 50                          |
| MT-734*   | 5-40                        | 40                      | 150                         | 40                          | M 12            | 0.8            | 145 x 125 x 52                          |
| MT-735*   | 15-60                       | 40                      | 150                         | 40                          | M 12            | 0.8            | 195 x 135 x 45                          |
| MT-737*   | 20-120                      | 40                      | 150                         | 40                          | M 12            | 1.35           | 340 x 200 x 55                          |

\* Add type of connection A - B - E - H.

Attachment of MT-734/MT-735 clamps with MT-717-3-B hook.

  
Direct connection

  
Connection adaptor  
CI-3-E CI-3-H



Insulated sticks CM-6  
see page 126.

# Short-circuiting and earthing systems



Above 52 kV

Clamps

Insulating sticks and earth clamps

Fixed points and cables

Accessories

## Insulating sticks for short circuiting and earthing systems

- 46 mm dia. single type elements, yellow colour, with superior characteristics, they are connected between them without any prior order of assembly.
- These elements allow "long length" assemblies which can support short-circuit systems with large cross-section cables.
- Shockproof guard and pole end cap.

| Reference | Length (mm) | Weight (Kg) |
|-----------|-------------|-------------|
| CM-6-15   | 1.5         | 2.40        |
| CM-6-20   | 2.0         | 3.20        |
| CM-6-25   | 2.5         | 4.00        |
| CM-6-30   | 3.0         | 4.80        |



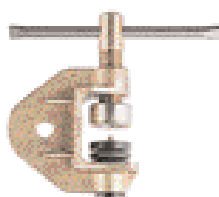
**For cables  $\geq 95 \text{ mm}^2$  CM-6 series is recommended.**

## Earth clamps

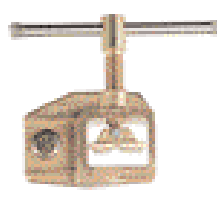
Copper aluminium bronze earth clamps.



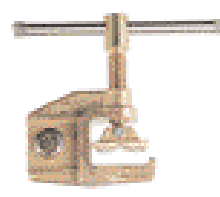
MT-843



MT-847



MT-852



MT-853

| Reference | Test current | Dimension (mm)<br>Weight (kg) | Connection       | Clamping<br>capacity (mm) |
|-----------|--------------|-------------------------------|------------------|---------------------------|
| MT-843    | 40 kA/1 s    | 45 x 106 x 165<br>0.95        | hole:<br>Ø 13 mm | ● Ø 6-35<br>■ 0-35        |
| MT-847    | 30 kA/0.5 s  | 45 x 106 x 170<br>1.00        | hole:<br>Ø 13 mm | ■ 0-25                    |
| MT-852    | 40 kA/1 s    | 70 x 125 x 155<br>1.40        | hole:<br>Ø 13 mm | Fixed<br>points           |
| MT-853    | 40 kA/1 s    | 65 x 130 x 135<br>1.00        | hole:<br>Ø 13 mm | Fixed<br>points           |

# Short-circuiting and earthing systems



Above 52 kV

Clamps

Insulating sticks and earth clamps

Fixed points and cables

Accessories

## Adjustable fixed points

For large vertical or oblique heavy duty conductors.

| Reference | Rating insulation (kA/1s) | Weight (kg) | Dimensions L x W x T (mm) | Conductors |        | Description |
|-----------|---------------------------|-------------|---------------------------|------------|--------|-------------|
|           |                           |             |                           | Type       | Ø (mm) |             |
| MT-790    | 30                        | 1.400       | 255 x 105 x 50            | copper     | 12-60  | arm Ø 18 mm |
| MT-792    | 30                        | 0.855       | 270 x 105 x 60            | aluminium  | 12-60  | arm Ø 20 mm |
| MT-797    | 20                        | 1.200       | 240 x 170 x 60            | aluminium  | 60-120 | arm Ø 20 mm |



## Copper and aluminium cables

### Copper cables

Extra flexible braided multi-strand cables.

**A** Transparent PVC sheath, with cable section identification.

**B** Transparent silicon sheath according to IEC-61230. Resistant to temperature variations (-40 °C to +70 °C) with double IEC triangle marked on cable section.

IEC-61481



### Aluminium cables

Extra flexible braided multi-strand cables.

Transparent PVC sheath, with cable section identification.



| A        | B<br>IEC-61481 | Rating (kA/1s) | Cable         |        | Section (mm²) |
|----------|----------------|----------------|---------------|--------|---------------|
|          |                |                | Weight (kg/m) | Ø (mm) |               |
| M-24-70  | M-24-70-S      | 16             | 0.768         | 12     | 70            |
| M-24-75  |                | 20             | 0.800         | 12     | 75            |
| M-24-95  | M-24-95-S      | 20             | 1.000         | 14     | 95            |
| M-24-120 | M-24-120-S     | 30             | 1.280         | 17     | 120           |
| M-24-150 | M-24-150-S     | 36             | 1.630         | 19     | 150           |

| Reference | Rating (kA/1s) | Cable         |        | Section (mm²) |
|-----------|----------------|---------------|--------|---------------|
|           |                | Weight (kg/m) | Ø (mm) |               |
| M-28-70   | 10.0           | 0.240         | 13.4   | 70            |
| M-28-120  | 17.5           | 0.430         | 19.00  | 120           |
| M-28-150  | 20.0           | 0.510         | 21.00  | 150           |

## Earthing kit support

Welded steel assembly with galvanization surface treatment. Writing zone available.



MT-895 230 x 230 x 150 mm - Weight: 0.9 kg

## Jumper cables realisation specially manufactured items



Quotations in accordance with faisability.

For all details:

Tel.: 33 1 42 31 46 24 / [www.catuelec.com](http://www.catuelec.com)

HIGH VOLTAGE

# Short-circuiting and earthing systems

## Accessories

Above 52 kV

Clamps

Insulating sticks and earth clamps

Fixed points and cables

Accessories

## Rope operated clamp

### Description

V-shaped aluminium body.

Spring operated swinging jaw with pre-set.

### Operation

Attachment and removal is carried out from the ground or from the cross-arm, using a rope passed previously over the conductor to be earthed.

- Attachment: the clamp is pulled up by the rope. Pulling on the rope triggers the spring and closes the jaw.
- Removal: pulling on the rope attached to the hinged saddles causes the clamp to pivot and free the jaw.

For conductors reached from the ground:

- up to 10 m: by using MT-709-B reel launcher placed on a CM-6 SERIE Stick (see page 96) that passes the rope over the conductor;
- up to 20 m: by using a MF-60 wire projector. This projector fires an arrow carrying a braided nylon wire which sets the rope. The clamp is then fixed to the rope and attached onto the conductor.
- Earthing cable with ranger (mm<sup>2</sup>): 2 x 120.
- Cable connection crimped log hole: M 12.



| Reference | Clamping capacity<br>(Ø mm) | Rating insulation<br>(kA/1s) | I asymmetrical<br>(A) | Dimensions (mm)<br>h x L x thickness | Weight (Kg) |
|-----------|-----------------------------|------------------------------|-----------------------|--------------------------------------|-------------|
| MT-701/1  | 12-48                       | 30                           | 72                    | 195 x 120 x 175                      | 2.00        |

## Cable-launcher projector

Used to fire the insulating rope for setting the MT-701/1 clamp, this wire-projector may also be used for checking the absence of voltage from the ground by throwing a very light fuse wire over the conductor (in case of voltage, arcing will occur to warn the operator).



|       |                             |
|-------|-----------------------------|
| MF-60 | Wire-projector              |
| MF-61 | Spare arrow                 |
| MF-62 | Spool of 30 m of fuse wire  |
| MF-63 | Spool of 100 m of fuse wire |
| MF-66 | Spool of 30 m of nylon lead |

## Reel launcher and insulated rope reel

This device contains a shaft on which the rope reel is engaged, and a spring system which triggers ejection of the reel when it comes in contact with the conductor. To be fixed on a MAJOR SERIE Stick, depending on the height of the conductor to be reached.



MT-709-B

MT-708-40

|           |                                                                                                   |
|-----------|---------------------------------------------------------------------------------------------------|
| MT-709-B  | Aluminium alloy launcher - Weight: 0.310 kg                                                       |
| MT-708/40 | Special quality nylon on shock proof reels; equipped with 2 snaps.<br>Rope Ø 6 mm - Length: 40 mm |

## Short-circuiting and earthing systems carrying bags

Strong water proof canvas. Reinforced bottom.



M-87-295

M-87-53

|          |                                             |
|----------|---------------------------------------------|
| M-87-53  | 380 x 250 - Height: 400 mm - Weight: 2 kg   |
| M-87-153 | 380 x 250 - Height: 600 mm - Weight: 2.5 kg |
| M-87-295 | 550 x 300 x 300 mm - Weight: 2 kg           |

# Specification for short-circuiting and earthing systems



## A Network, electrical installation character-

Network voltage: \_\_\_\_\_ kV

Max. short-circuiting current (1s): \_\_\_\_\_ kA

Nature of the conductive materials: Basis Al ☐ Basis Cu ☐

### Overhead lines ☐

- Dia. or section of the conductors: min. \_\_\_\_\_  
max. \_\_\_\_\_

### Switchboard or substation ☐

- Round bars dia. (mm): mini. \_\_\_\_\_ maxi. \_\_\_\_\_  
Length = \_\_\_\_\_
- Flat bars
  - H type ☐ Thickness = \_\_\_\_\_
  - V type ☐ Length = \_\_\_\_\_  
Thickness = \_\_\_\_\_
- Fitting on edge face ☐ Fitting on side face ☐

## B Characteristics of the earthing system

- Selected sketch (out of the three standard types shown below)
- Distance between live conductors (m): \_\_\_\_\_, between live conductors and grounding point (m) \_\_\_\_\_
- To place the clamps in position, the operator will stand: above the conductors ☐ under the conductors ☐  
at the conductors level ☐
- For cable sections, please indicate max.  $\Delta T$  or min. dia. of the conductor \_\_\_\_\_

## C Earthing connection point

- Earth rods: dia. or thickness on side face (mm): \_\_\_\_\_ Flat bar, angle-bar, thickness (mm): \_\_\_\_\_
- Round conductor dia. (mm): \_\_\_\_\_

## D Operating stick

- Insulating stick: total length \_\_\_\_\_ Fixed ☐ Connectable stick ☐ Telescopic ☐

## Characteristics

- Selected connection type: Sketch n° \_\_\_\_\_
- Contact clamps (type MT- \_\_\_\_\_)
- Short-circuiting cable
  - Length (m) \_\_\_\_\_
  - Dia. or section (mm, mm<sup>2</sup>) \_\_\_\_\_
- Grounding cable
  - Length (m) \_\_\_\_\_
  - Dia. or section (mm, mm<sup>2</sup>) \_\_\_\_\_
- Connection of cables on clamps, earth clamps, trifurcation
  - Direct connection by screw and nut ☐
  - Connection by means of crimped lugs ☐
- Earth clamp, type \_\_\_\_\_
- Presence of a reel \_\_\_\_\_
- Insulating stick, type \_\_\_\_\_

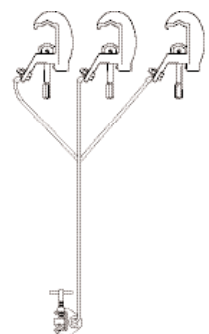
Sketch N°1



Sketch N°2



Sketch N°3



### Accessories

- Carrying bag for sticks ☐
- Canvas bag for equipment ☐
- Carrying case for equipment ☐
- Cable reel ☐

# Railways

## Electrical safety equipment



**CATU™**



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