Railways

Electrical safety equipment

Edition 2009

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

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CATU™ Railway division

GEGERS

Golden Rules

1 First, select the right equipment





2 SEPARATE THE WORK AREA FROM ALL POSSIBLE SOURCES OF POWER-SUPPLY

by opening circuit-breakers, switches…
and lock the links in the open position





3 CHECK THE ABSENCE OF VOLTAGE

at source and on site, on each conductor and apparatus involved

4 APPLY APPROPRIATE SHORT-CIRCUIT AND EARTHING SYSTEMS

in sufficient numbers on the conductors
of your network
where operation is taking place





5 SHOWN, WARN OTHERS AND LIMIT THE WORK AREA

even during the most simple temporary maintenance operation

Railway division

Summary

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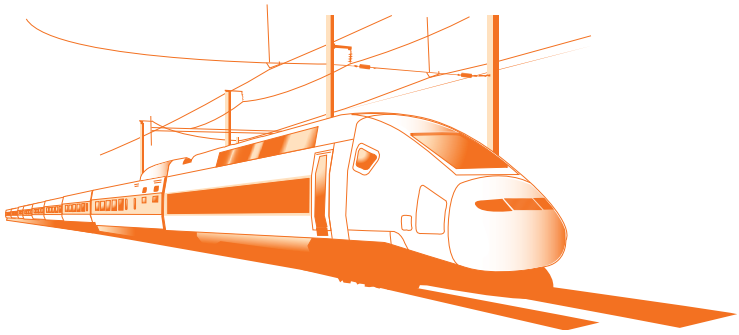
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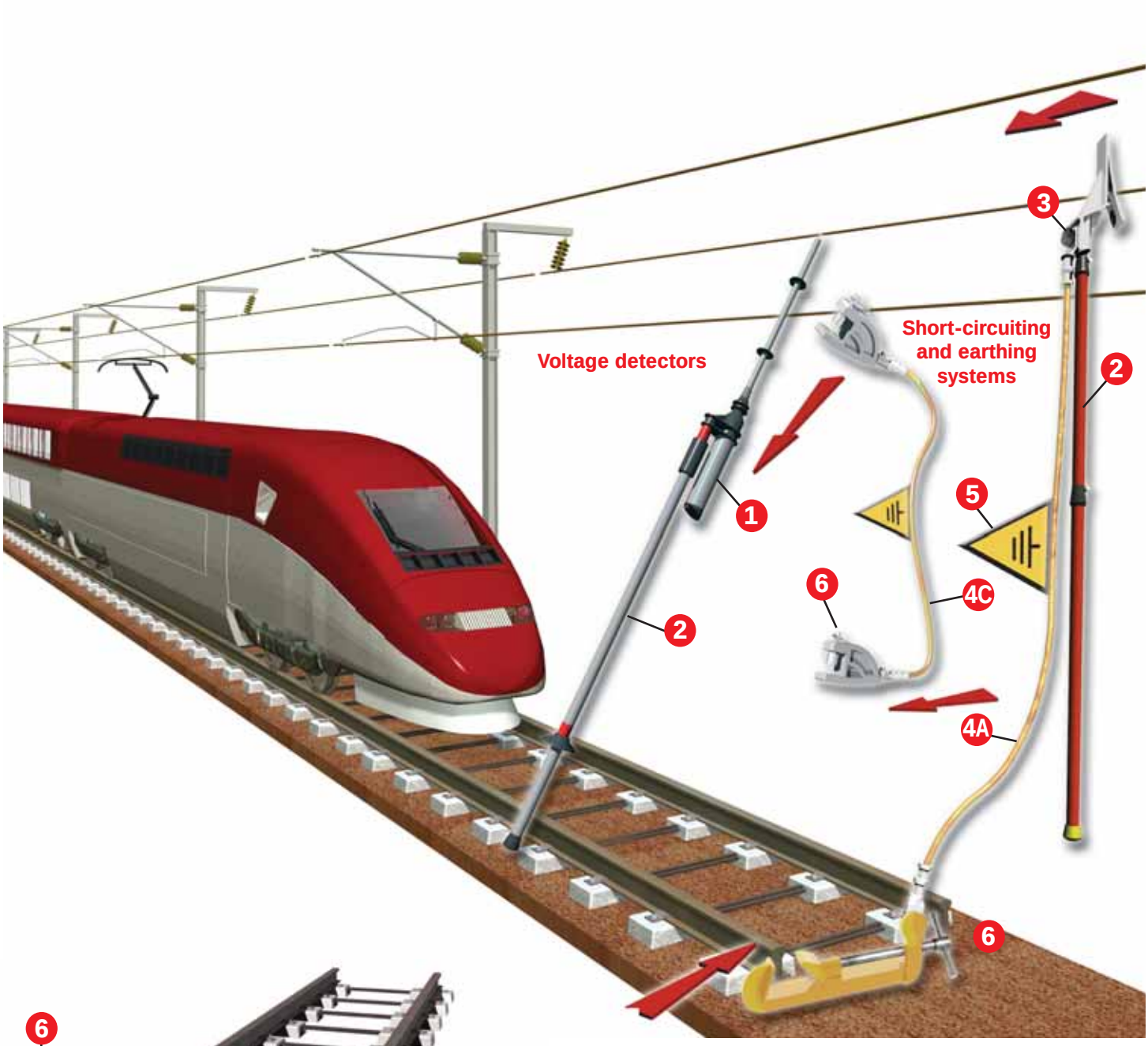
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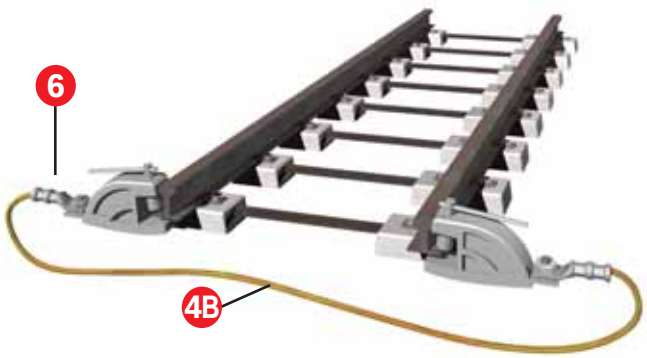
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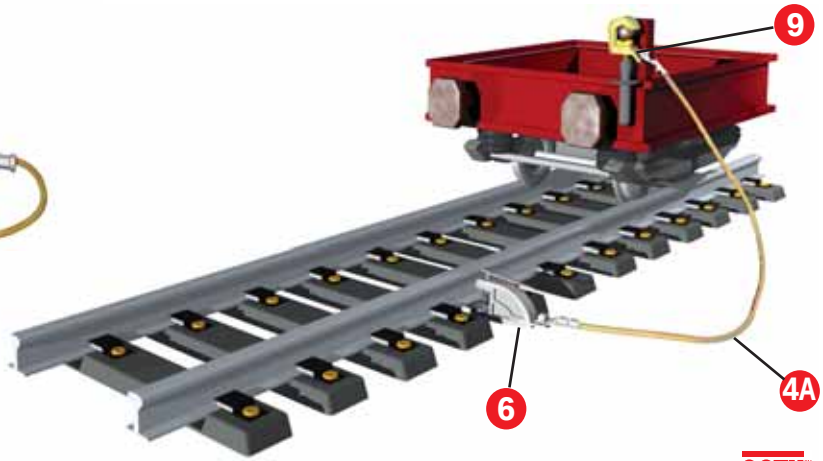
Equipment for intervention on catenaries



COMPLETE EQUIPMENT GUIDE







Equipment for intervention on catenaries



COMPLETE EQUIPMENT GUIDE

**** For other voltages, please consult us***

Voltage detectors*

a.c.

15 kV

1 Electronic voltage detector
15 kV 16 Hz 2/3
reference:
CC-578-15

See page 11

25 kV

Electronic voltage detectors
25 kV 50/60 Hz
references:
CC-875-25-C
CC-875-25-K

See page 12

Railway detector 25 kV Hz
alternative catenary
reference: ZVATDAC 25 SNCF

See page 11

d.c.

1500 V

Electronic voltage detector
600/2000 V
reference: CC-1515-100

See page 13

Electronic voltage detector
750/1500 V
reference: ZVATDC 750/1500 W

See page 14

3000 V

Electronic voltage detector
750/3000 V
reference: CL6-3000

See page 13

Bipolar voltage detector with
discrimination of induced voltage
750/3000 V
reference: ZVAT DC IND

See page 14

Insulating sticks for voltage detectors and short-circuiting systems

2 Insulating sticks with connectable elements
references:
CM-42.... serie
CM-43.... serie
CM-4610.. serie
CM-4615.. serie
CM-4620.. serie
CM-4625.. serie
CM-3000

See page 15

Insulating telescopic sticks
references: CE-5-50-C, CE-5-50-K, ZPTVZCR 5603, ZPTVZCR 5603 B, ZRAVZC 200

See page 16

Accessories
Stick bags references: CM-1.., CM-2.., CM-3.. series

See page 16

Short circuiting and earthing systems

Clamps

3 Universal clamp
references: ZCCVZC 25, ZCCVZC 25 B, ZCCVZC 25 1

See page 17

Clamps for flat and round conductors
references: MT-128, MT-815-E

See page 17/18

Clamps with or without fuse contact wire
references: MT-128, ZEMRC 200 B, ZEMRC 201 B

See page 17/18

Clamps for single or double catenary
reference: ZEMCC-3162-BC, ZEMRC 300 B, ZEMRC 301 B

See page 17/18

Cables with connections

a.c.

15 kV

4A reference: M-24-35-S - 8 kA/1s, section: 35 mm²

4B reference: M-24-40-S - 10 kA/1s, section: 40 mm²

4C reference: M-24-50-S - 12 kA/1s, section: 50 mm²

See page 18

5 Accessory: earth flag reference: AL-58, AL-60

See page 10

25 kV

See page 18

d.c.

1500 V

reference: M-24-70-S - 16 kA/1s, section: 70 mm²

reference: M-24-95-S - 20 kA/1s, section: 95 mm²

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3000 V

Earth clamps

6 Earthing rail clamps
references: MT-848, ZSMT-848/100, ZETMRTO, ZET-62042

See pages 19/20

9 Earth clamps for fixed ball points references: MT-1911, MT-1921, for round and flat conductor: MT-843 for clamping on pole Z-EMCT847 SNCF

See page 20

Equipment for intervention on catenaries



WARNING SIGNS AND DELINEATORS

Warning and specialized 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-49/1*	Aluminium	100 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 on yellow Fixing: 3 holes Ø 4.5 mm

* Pack of 10 units.



AM-49/1



AM-41/1



AM-344-GB



AM-345-GB

Specialized signs

Reference	Type	Dimensions (mm)	Characteristics
AM-20-GB	Aluminium	350 x 250	Blue letters on plain aluminium
AM-20-RM	Aluminium	350 x 500	Blue letters on plain aluminium
AM-61-GB	Aluminium	150 x 200	Black on yellow on plain aluminium



AM-20-GB



AM-20-RM



AM-61-GB

Warning flags



AL-60



AL-58

AL-58	Attached on handle; for work site
AL-60	To be attached 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 chain link delineators (AL-32/05).
Removable foot.
Ø 50 mm.
Length: 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-32/05	Yellow and black - Length: 5 m

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



VOLTAGE DETECTORS

Electronic voltage detector with contact electrode extension 15 kV 16 Hz 2/3

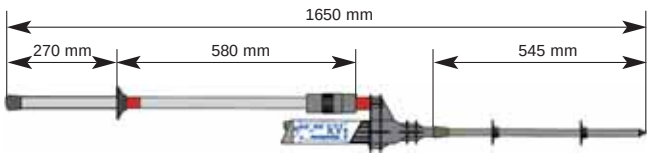
Voltage presence is indicated by: **IEC-61243-I**
DIN VDE 0682-411
- red flashing LED'S (very bright - visible at more than 50 m in direct lighting)
- powerful rated audible signal > 60 dB (A)/2 m

Check of working order:
- by pressing the TEST button:
  - red LED flashes on
  - sound signal is activated
- when TEST button is released:
  - timed green LED lights up. While remaining on, this LED indicates the good working order of the detector. It lights off as soon as the red LED lights up in case of a voltage presence.

This checking validates the good working order of the detector.

Characteristics
Detectors are adjusted, tested and controlled one by one.
Precise and stable operating threshold.
Reduced sensitivity to induced voltages.
Dielectrically tested on substation bars. High environmental resistance (impacts, vibrations, moisture).
Temperature conditions: class N (IEC-1243-1 standard).
storage and operation: -25 / +55 °C.
Robust housing.
Power supply: one 9-V alkaline battery type 6 LR 61.
The voltage detector is always ready for use, since it is on continuous monitoring conditions with almost no battery consumption. Under normal use conditions the batteries last more than a year.
Contact electrode extension fitted to the housing by screwing.
Delivered complete in a bag with insulating stick.
Weight: 1.7 Kg.





Reference	Voltage (kV)	Frequency (Hz)
CC-578-15	15	16-2/3

Electronic voltage detector 25 kV

Operation
Single pole voltage detector used to check the voltage state of a railway electrical catenary system.
The detector must be used with the insulating sticks assembled.

Voltage presence is indicated by:
Bring the hook into contact with the catenary or the feeder:
- The presence of voltage is indicated by illumination of the red diodes and triggering of the sound signal.
- The absence of voltage is confirmed by the green diodes, witch remain illuminated after the contact is established.

Check of working order:
To check for correct operation:
- by pressing the Test button:
  - illumination of the red diodes
  - triggering of the sound signal
- by releasing the test button:
  - illumination of the green diodes for about 2 minutes.

This checking validates the good working order of the detector.

Characteristics
- 1 voltage detector fixed on a 1.5 m stick.
- 1 antenna, length 1.5 m.
- 1 base element sticks, length 1.5 m.
- 2 extension sticks, length 1.5 m each.
- 1 silicone cloth.
- 1 pair of insulating gloves CG-30D (see p 51).
- 1 carrying bag.

Power supply
Power for the appliance is provided by a 9 volt, 6 LR 61 type battery.



Reference	Frequency (Hz)	Operating voltage (kV)	Weight (kg)
ZVATDAC 25 SNCF	50	25	12**

** Total weight with stick, gloves, antenna and detectors.

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

Ultimate technology of voltage detector "Head Capacitive Technology"

IEC-61243-1

CE

Compact and light
It offers:
- a wide band (25 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 rn

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 6 LR 61
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: 1.1 kg
Total size: 340 x 275 x 83 mm
* Specify type of mounting when ordering: C or K.

Recommended stick:
CE-5-50, see page 16.



CC-875-25*



C K

Frequency 50/60 Hz	
Reference	**Operating voltage (KV)**
CC-875-25*	25

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

For other voltages, please consult us.

d.c. bipolar voltage detector 0.6 to 2 kV

Operation

Two-pole voltage detector for the presence of voltage between the catenary and the rail

- Presence of voltage is indicated by:
  - illumination of 6 red LEDs
  - an audible signal (60 dbA/2 m)
- Correct operation check: Correct operation of the equipment is verified:
  - by pressing the test button which causes:
- Illumination of the 6 red LEDs
- Activation of the audible signal and
  - by releasing the test button which causes: temporary illumination of 6 green LEDs

The correct operation check consists in a built-in device. It checks all of the detector's functions.
Stand-by state
No previous voltage adjustment required
Routine operations in factory to adjust and test the equipment
Detector fixed to stick, attachment to rail by metal spring-contacts
Power supply: 1 x 9V alkaline battery, type 6 LR 61
Stick included in pack: CC-1515-101
Supplied in carrying case: CM-303.



CC-1515-100

Reference	Operating voltage (kV)	Weight (kg)
CC-1515-100	0.6 to 2 d.c.	5.2

Telescopic insulating stick



Telescopic insulating stick, 3 elements, fully folded/extended: 1.65 x 3.95 m, including:

- Regulation piece of intermediary position.

Reference		Voltage (KV)
CC-1515-101	Stick	0.6 - 1.5
CC-1515-102	Antenna	0.6 - 1.5

d.c. voltage detector 0.75 to 3 kV acoustic and optical signal

Operation

Two-pole voltage detector for the presence of voltage equipped with a flexible cable terminated by a contact clamp.

- Presence of voltage is indicated by:
  - illumination of 6 red LEDs
  - an audible signal (60 dbA/2 m)
- Correct operation check:

Correct operation of the equipment is verified:

  - by pressing the test button which causes:
- Illumination of the 6 red LEDs
- Activation of the audible signal

and

  - by releasing the test button which causes: temporary illumination of 6 green LEDs

The correct operation check consists in a built-in device. It checks all of the detector's functions.

- Characteristics:

No previous voltage adjustment required
Routine operations in factory to adjust and test the equipment

- Power supply: 1 x 9V alkaline battery, type 6 LR 61
- Packaging in plastic case
- Weight: 1.5 kg
- Cable lenght: 8 m

Recommended stick: ZPTVZCR 5603 B, see pages: 16/27.



Reference	Field of use	Fitting	Contact-piece	Total lenght (mm)
CL6-3000	750-3000	B	Hook	450



d.c. bipolar voltage detector with discrimination of induced voltage 0.75 to 3 kV

Characteristics:
Two-pole voltage detector to indicate the presence of voltage between the catenary and the rail.
There are a lot of interference voltages on catenary lines which come from other lines situated at proximity. This could create, especially when the weather is humid or when there are air pollution, VERY BIG induced voltage. This detector discriminate the real voltage from the induced one.
10 meters of cable.
Hook for catenary contact.
Magnetized handle for an easy use and connection to the rail.
Voltage presence is indicated by:
• Presence of real voltage indicated by:
  - Illumination of red LEDs with acoustic signal.
• Presence of induced voltage is indicated by:
  - Illumination of green LEDs and flashing of orangous LEDs with acoustic signal.
Checking
Connect the electrode to the rail handle to have a ring contact and the result is satisfactory if:
• When pressing the test button:
  - The red and orangous diodes lighting with acoustic signal sounding.
• When releasing the test button by:
  - Timed green LEDs lights up. It indicate the good working of the detector and it lights off as soon as the red LED lights up in case of a voltage presence or after 2 minutes.
Power supply: 1 x 9 V alkaline battery, type 6 LR 61.
End fittings: round threaded brass M25.00 x 3.5 or other on request.
Packaging: carrying bag.
Weight: 1.5 kg.
Recommended stick: ZPTVZCR 5603, see page 16.
Other models or configurations: contact us.



Reference	Field of use	Contact-piece	Cable lenght (m)
ZVAT DC IND	750-3000	Hook	10

d.c. voltage detector 0.75 to 1.5 kV acoustic and optical signal

Characteristics:
Two-pole voltage detector for the presence of voltage equipped with a flexible cable terminated by a magnetic clamp.
8 meters of cable.
Hook for catenary contact.
Magnetized handle for an easy use and connection to the rail.
Voltage presence is indicated by:
- illumination of 6 red LEDs with accoustic signal.
Checking
Correct operation of the equipment is verified:
• by pressing the test button which causes:
  - illumination of the 6 red LEDs.
  - activation of the audible signal.
• by releasing the test button which causes:
  - temporary illumination of 6 green LEDs.
The correct operation check consists in a built-in device. It checks all of the detector's functions.
No previous voltage adjustment required.
Routine operations in factory to adjust and test the equipment.
Power supply: 1 x 9 V alkaline battery, type 6 LR 61.
Packaging: plastic case.
Weight: 1.5 kg.
Recommended stick: ZPTVZCR 4603 W, see page 25.



Reference	Field of use	Fitting	Contact-piece	Cable lenght (m)
ZVATDC 750/1500W	750-1500	W	Hook	8

Equipment for intervention on catenaries



Insulating sticks for short-circuiting and earthing systems

Made of IEC-60855 foam filled tube, these Ø 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.

IEC-60855

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.

CM4000

Reference	Complete stick length (m)	Length (m)	Weight (kg)
Basic elements			
CM-4610	1		1.35
CM-4615	1.5		1.80
CM-4620	2		2.80
CM-4625	2.5		3.30
Intermediate element			
CM-4610-I	1		1.30
CM-4615-I	1.5		1.70
CM-4620-I	2		2.60
CM-4625-I	2.5		3.10
Terminal elements			
CM-4610-*	1		1.00
CM-4615-*	1.5		1.40
CM-4620-*	2		2.20
CM-4625-*	2.5		2.70
Fixed lenght sticks			
CM-4115-*	1		1.35
CM-4120-*	2		1.80
CM-4125-*	2.5		2.80
CM-4130-*	3		3.30
Intermediate elements with rain			
CM-4600-J	0.36		0.95

* Add end piece C, K, E.

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



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

Set of sticks

Complete sets of sticks for standard applications.

IEC-60855

Reference	Working distance (m)	Composition
CM-4220*	2	2 elements: CM-4610 + CM-4610-*
CM-4230*	3	2 elements: CM-4615 + CM-4615-*
CM-4240*	4	2 elements: CM-4620 + CM-4620-*
CM-4330*	3	3 elements: CM-4610 + CM-4610-I + CM-4610-*
CM-4345*	4.5	3 elements: CM-4615 + CM-4615-I + CM-4615-*
CM-4360*	6	3 elements: CM-4620 + CM-4620-I + CM-4620-*

* Add end piece C, K, E.

For cables < 95 mm² CM-4000 serie is recommended.

Equipment for intervention on catenaries



INSULATING STICKS

Telescopic sticks for voltage detectors

Telescopic stick for use in checking for absence of voltage or electrical operation on installation or equipment **IEC-61235**

• Description:
- 4 yellow epoxy reinforced fibre-glass insulating sections, diameters 28 mm, 33 mm, 37 mm and 43 mm each section is fixed in position by a black plastic, spring-mounted button
- end-fittings: K = Universal (notched type)
  C = Hexagonal (hexagonal with 12 mm/flats)
- button cap: fixed made of elastomer material

Intermediate positions: length = 2.65 m / 3.85 m
Other models or lengths: contact us.



Reference	Fitting	Length extended (m)	Length folded (m)	Weight (Kg)	Elements n°
CE-5-50-C	C	5.03	1.46	1.9	4
CE-5-50-K	K	5.03	1.46	1.9	4

Telescopic sticks

ZPTVZCR 5603 **IEC-61235**

Adjustable multipoint telescopic stick for use in earthing and short-circuiting.
SNCF Symbol 0 392 6977
Description:
- 3 epoxy reinforced fibre-glass isolating sections:
- 1 red terminal tube, diameter 28 mm,
- 1 intermediate tube, diameter 37 mm,
- 1 red base tube, diameter 45 mm, equipped with a screwing attachment at the end protected by a removable cap, which allows the 2 m extension to be attached (reference ZRAVZC 200) each section may be set at the desired length, according to operating height, with lever clamping system using an excentric cam,
- 1 end-fitting: round threaded brass M 25.00 x 3.50 (stick ZPTVZCR 5603) or type B bayonet (stick ZPTVZCR 5603 B),
- button cap: removable made of elastomer material.

Other models or lengths: contact us.

ZRAVZC 200

Lower extension for telescopic sticksserie ZPTVZCR 5603.
Epoxy reinforced fibre glass insulating section Ø 45 mm of red colour.



Reference	Length (mm) extended	Length (mm) folded	Weight (kg)	Elements N°
ZPTVZCR 5403	5.40	2.00	3.6	3
ZPTVZCR 5603	5.60	2.15	3.7	3
ZPTVZCR 5603 B	5.60	2.15	3.7	3
ZRAVZC 200	2.00		1.9	1

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

Stick covers

Can contain 5 simple elements.
Strongly waterproof fabric strap for carrying.



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 2.850
CM-3-06	3.00	0.575 x 3.400



Clamp for single or double catenary

Earthing clamp for single or double catenary, attached by clamping with operating sticks.

- Materials:
  - body: aluminium
  - clamping screw: hardened steel
- Icc: 30 kA/1 s
- Connection: for cables fitted with screw terminal diam.12 mm
- Clamping capacities:
  - double catenary: diam. 12/14 mm, distance between axes 25 mm
  - single catenary or conductors: diam. 5/35 mm, 16/40 mm, 5/40 mm
- End-fitting: bayonet type
- Recommended sticks: CM-46..E connectable ZPTVZCR 5603 B telescopic.



Reference	Weight (kg)	Dimensions (mm)	Conductors (mm)
MT-815-E	0.650	44 x 100 x 180	▬ 16-40 ● 5-35 ▌ 5-40

Clamps for single or double catenary with quick opening and closing

Earthing clamp for single or double catenary, attached by clamping with operating stick.

- Opening and closing in one turn.
- Materials: all the components are in a light alloy.
- Icc: 50kA/25ms
- Clamping capacities:
  - single catenary: diam. 12/15 mm
  - double catenary: diam. 12/15 mm distance between axes: 80 mm maxi
- Connection for earth cable: screw diam.12 mm.
- End fitting: bayonet type.

Recommended stick: ZPTVZCR 5603 B, see pages: 16/27.



Reference	Dimensions (mm)	Weight (kg)	Specifications
ZEMRC 300 B	250 x 220 x 60	1.1	Without fuse contact wire
ZEMRC 301 B	250 x 220 x 60	1.1	With fuse contact wire

Universal clamp for single or double catenary

Earthing clamp for single or double catenary, automatically attached by pressure from operating sticks.

- Materials:
  - body: aluminium
  - contact spring: hardened bronze
- Icc: a.c. = 12 kA/150 ms
  d.c. = 35 kA/25 ms
- Rate of current: 750 A/20 s
- Connection: for cables fitted with screw terminal diam.12 mm
- Clamping capacities:
  - double catenary: diam. 12/14 mm, distance between axes 50 mm
  - single catenary or tube: diam. 10/50 mm
- End-fitting: type round brass M 25.00 x 3.50
- Recommended stick: ZPTVZCR 5603 B
- SNCF symbol: 0.392.6325.



ZCCVZC 25



ZCCVZC 25 1

Reference	Weight (kg)	Dimensions (mm)
ZCCVZC 25	0.75	270 x 200 x 40
ZCCVZC 25 B	0.8	270 x 200 x 40
ZCCVZC 25 1	0.75	270 x 200 x 40

Clamps for single or double catenary

Earthing clamp for single or double catenary, attached by clamping with operating stick
Clamp equipped with a fuse contact wire

- Materials:
  - body: aluminium
  - quick-fix clamping screw: hardened steel
- Icc: 30 kA/1 s
- Connection: for cables fitted with screw terminal diam.12 mm
- Clamping capacities:
  - single catenary: diam. 10/22 mm
- End-fitting: bayonet type
- Recommended sticks: CM-46..E connectable ZPTVZCR 5603 B telescopic



Reference	Weight (Kg)	Dimensions (mm)	Specifications
ZEMRC 200 B	0.9	280 x 125 x 40	Without fuse contact wire
ZEMRC 201 B	0.9	280 x 125 x 40	With fuse contact wire

Equipment for intervention on catenaries



CLAMPS, COPPER CABLES

Clamp for single catenary

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. Manœuvering by 4600 serie insulated stick of appropriate length and characteristics.
Weight: 1.45 kg.
Dimensions: h 200 x L 200 x thickness 50.



ZEMCC-3162-BC

Reference	Clamping capacity (Ø mm)	Rating insulation (kA/1 s)	I asymmetrical (A)	Copper connection		
				Copper cables (mm^2 max.)	Ø range (mm)	Stud or hole
ZEMCC-3162-BC	5-60	40	92	150	45	M 12

Clamps for single or double catenary with fuse contact wire

Earthing clamp for single or double catenary, attached by clamping with operating stick.
Clamp equipped with a fuse contact wire
- Materials:
  - body: aluminium
  - quick-fix clamping screw: hardened steel
- Icc: 30 kA/1 s
- Connection: for cables fitted with screw terminal diam.12 mm
- Clamping capacities:
  - single catenary: diam. 10/22 mm
- End-fitting: bayonet type
- Recommended sticks:
  CM-46..E connectable
  ZPTVZCR 5603 B telescopic.



Reference	Weight (kg)	Dimensions (mm)
MT-128	1.3	260 x 160 x 70

Copper cables

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-61230**



IEC-61230	Rating (kA/1 s)	Cable		Section (mm^2)
		Weight (kg/m)	Ø (mm)	
M-24-35-S	8	0.386	9	35
M-24-40-S	10	0.440	9.5	40
M-24-50-S	12	0.545	10	50
M-24-70-S	16	0.768	12	70
M-24-95-S	20	1.000	14	95

For leads with double-crimped lugs, please consult us.

Equipment for intervention on catenaries

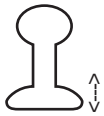


EARTH CLAMPS, EARTHING RAIL CLAMPS

Clamping on the edge

Rail earthing clamp for catenary, attached by manual tightening. Clamp for carrying out continuity shunt during the laying of a section of rail

- Materials:
  - body: aluminium
  - clamping screw: stainless steel
- Rate of current: 750 A/20 s
- Connection: for cables fitted with screw terminal diam.10 mm and diam.12 mm
- Clamping capacities:
  - clamping: clamped by lever. Electrical contact is maintained by spring washers. The contact quality is guaranteed by a plate with "diamond tip" shapes
  - capacities: vertical to the rail flange = 7 to 22 mm.
- SNCF symbol: 0.392.6481.



7 to 22 mm



Reference	Weight (Kg)	Icc	Dimensions (mm)
ZSMT-848/100	1.5	a.c. 15 kA/150 ms d.c. 52 kA/35 ms*	180 x 130 x 50

* x 3 Shocks

Clamping on the top of the rail

Earthing clamp for connection to the top of the rail and attached by manual tightening.

- Materials
- Body & Clamping : aluminium
- Contact : Brass
- Connection for cables fitted with screw terminal diam.12mm

73mm max





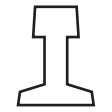
Reference	Icc	Clamping capacities (Ø mm)
ZETMRTO	40 kA/120ms	73

Clamping under the rail

Rail earthing clamp for catenary, attached by manual tightening

- Materials:
  - body: aluminium
  - clamping screw: stainless steel
- Connection: for cables fitted with screw terminal diam.12 mm
- Clamping capacities:
  - clamping: 1: 19 mm spanner used to clamp horizontally to the rail flange
    2: lever used to clamp to the rail flange. Electrical contact is maintained by spring washers
  - capacities: horizontal to the rail flange = 100 to 155 mm max.

Vertical to the rail flange = 7 to 19 mm max.



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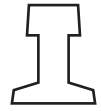


MT-848

Reference	Weight (Kg)	Icc	Dimensions (mm)
MT-848	2.4	30 kA/1 s	320 x 150 x 75

Rail earthing clamp for catenary, attached by manual tightening.

- Materials:
  - body: ZET-62040: aluminium
    ZET-62042: copper-aluminium
  - clamping screw: ZET-62040: stainless steel
    ZET-62042: hardened steel
- Connection: for cables fitted with screw terminal diam.12 mm
- Clamping capacities:
  - clamping: clamped by lever.
  - capacities: horizontal to the rail flange = 100 to 160 mm max.



<—160—>



ZET-62042

Reference	Weight (Kg)	Icc	Dimensions (mm)
ZET-62040	1.680	30 kA/1 s	310 x 90 x 70
ZET-62042	2.0	30 kA/1 s	310 x 120 x 65

Earth clamps

Earthing clamp for connection to rail / poles, attached by manual tightening
- Materials:
  - body: cupro-aluminium
  - clamping screw: stainless steel

Connection: for cables fitted with screw terminal diam.12 mm.



Reference	Rating insulation	Dimensions (mm) Weight (kg)	Connection	Clamping capacity (mm)
MT-843	40 kA/1 s	45 x 106 x 165 0.95	Hole: Ø 13	● Ø 6-35 ▬ Ø 0-35

For fixed ball points



MT-1911
MT-1921

For fixed point

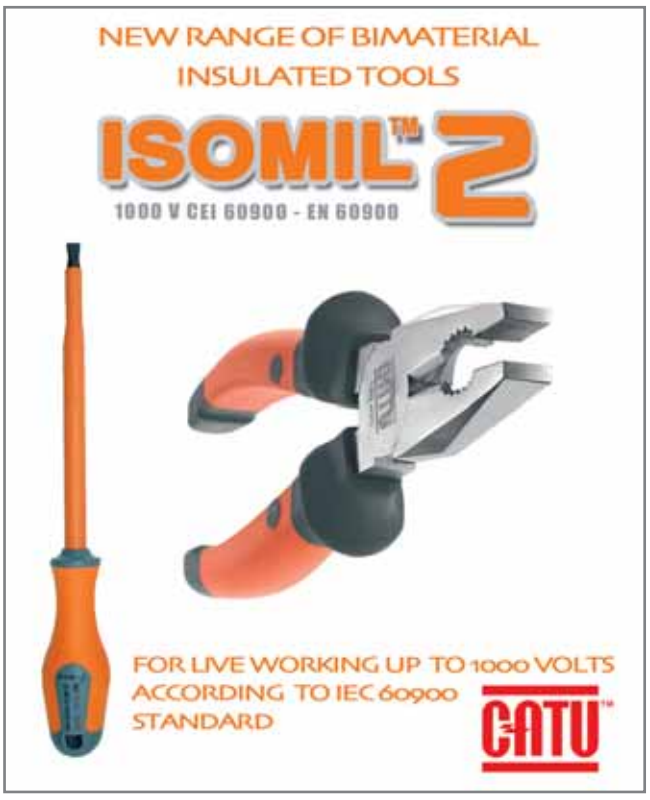
Reference	Weight (kg)	Connection conductors (mm)
MT-1911	0.58 Ø 20 mm	Spheric fixed points MT-2951 Round conductors Ø 8 to 18 mm
MT-1921	0.69 Ø 25 mm	Spheric fixed points MT-3951 Round conductors Ø 10 to 25 mm

Clamping on poles

Earthing clamp for connection to rail or poles and attached by manual tightening.
- Materials
  - Body: cupro-aluminium
  - Clamping : stainless steel
- Connection for cables fitted with screw terminal diam.12mm



Reference	Icc	Clamping capacities (Ø mm)
ZEMCT 847 SNCF	30kA/0.5s	0 to 25 mm





Equipment for intervention on electrical urban transports

COMPLETE EQUIPMENT GUIDE 22

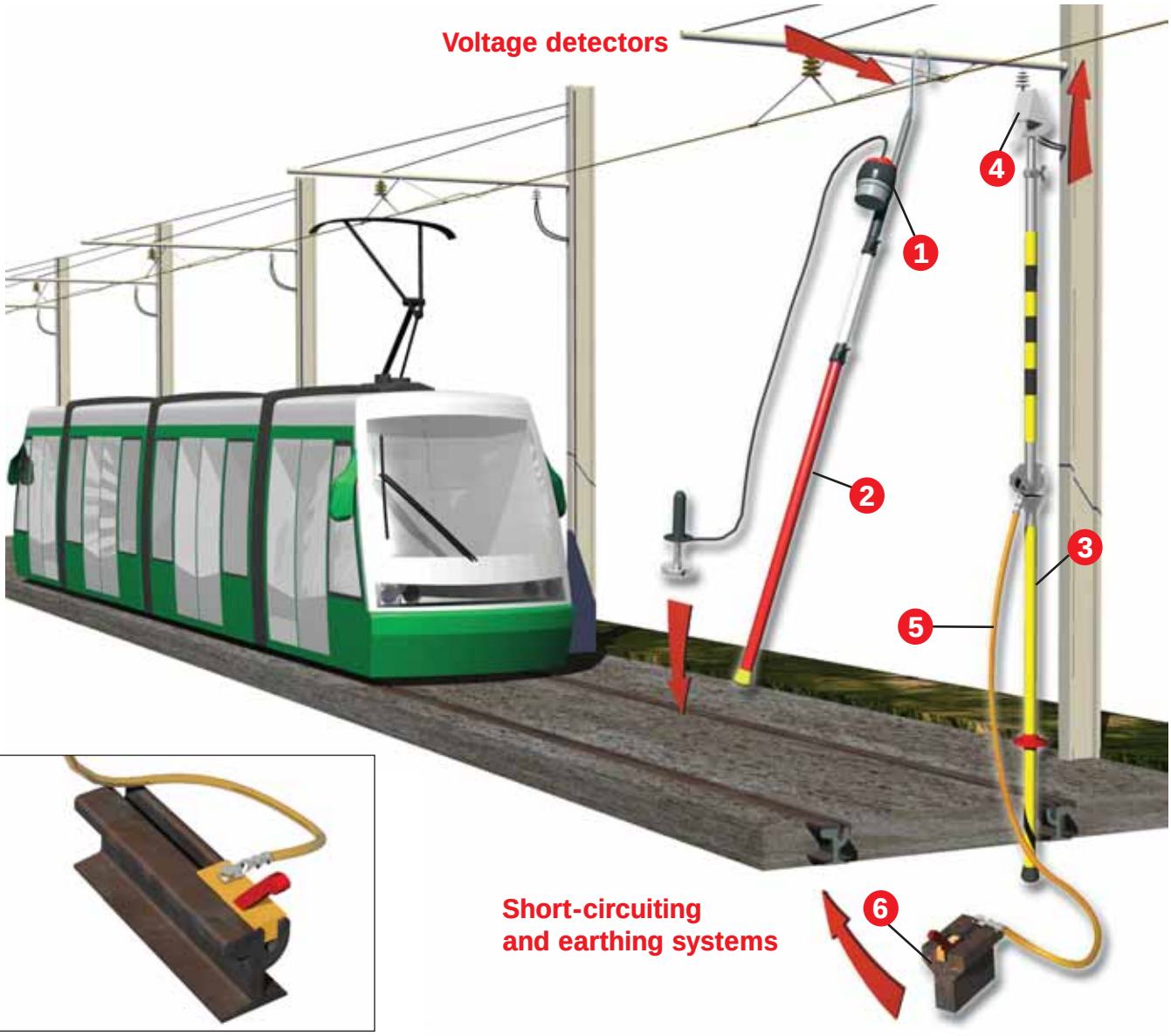
VOLTAGE DETECTORS AND SHORT-CIRCUITING SYSTEM FOR TRAMWAY 25

VOLTAGE DETECTORS AND SHORT-CIRCUITING SYSTEM FOR TROLLEY 27

VOLTAGE DETECTORS AND SHORT-CIRCUITING SYSTEM FOR SUBWAY 28

Equipment for intervention on tramway installations

COMPLETE EQUIPMENT GUIDE



Voltage detectors

d.c.

750/1500 V

1 Bipolar electronic voltage detector
reference: ZVATDC 750/1500 W

See page 25

Insulating sticks

2 For voltage detector reference: ZPTVZCR 4603 W

See page 25

3 For short-circuiting system reference: ZPL7R 120N, ZPTVZCR 5003

See page 26

Short circuiting and earthing systems

Clamp

4 Autoclamping contact clamp
reference: ZEMCC 2160

See page 26

Cables with connections

5 Copper cable with connection - Length: 2 m, section: 35 mm²
reference: ZCESS 35/05 MR

See page 26

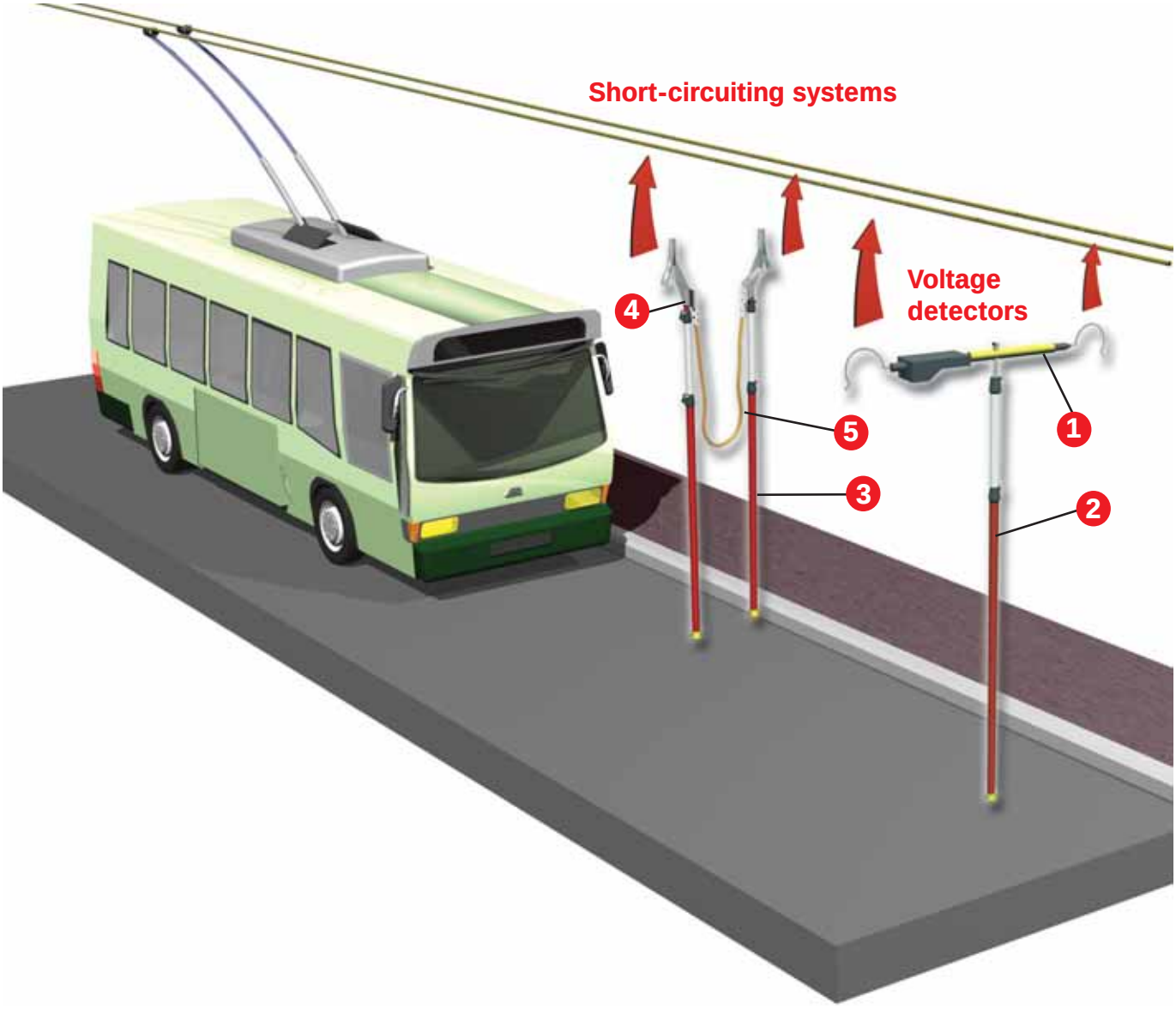
Earth clamps

6 Automatic earth clamps references:
ZETMR 35, ZETRT 35, ZETMR 41, ZETMR RG29, ZETMR UNIV

See page 26

Equipment for intervention on trolley bus installations

COMPLETE EQUIPMENT GUIDE



Voltage detectors

d.c.

750 V

1 Bipolar electronic voltage detector
reference: ZVDCAL 750 TROL

See page 27

Insulating sticks

2 For voltage detector
reference: ZPTVZCR 5603 B

See page 27

3 For short-circuiting system
reference: ZPTVZCR 5603

See page 27

Short circuiting systems

Clamp

4 Autoclamping contact clamp
reference: ZCCVZC 25

See page 27

Cables with connections

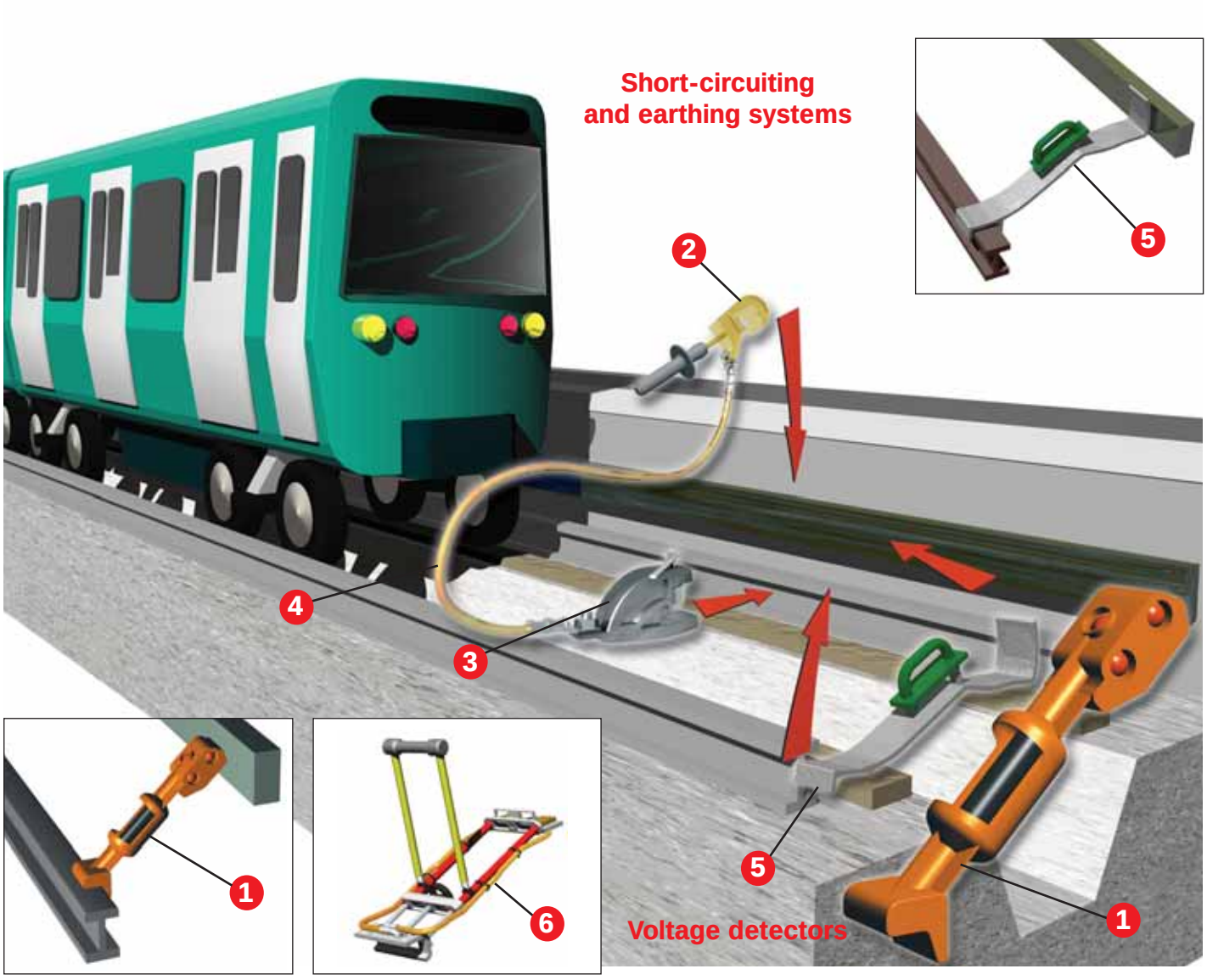
5 Copper cable

See page 27

Equipment for intervention on subway installations



COMPLETE EQUIPMENT GUIDE



Voltage detectors

d.c.

750 V

1 Bipolar electronic voltage detector
reference: CL-1607/1, CL-1607/ML

See page 28

Earthing equipement

5 Earthing clamp for connection to the third rail
reference: ZET 3R

See page 28

6 Earthing rail equipment for third rail configuration
reference: MT-300

See page 28

Short circuiting and earthing systems

Clamp

2 Clamp for side conductor
references: MT-1921

See page 28

Cables with connections

4 Copper cable with connection
reference: ZCESS-50-03 - Length: 3 m, section: 50 mm²

See page 28

Earth clamps

3 Earth clamp for rail
references: ZSMT 848/100

See page 28



d.c. voltage detector 0.75 to 1.5 kV acoustic and optical signal

Two-pole voltage detector for the presence of voltage equipped with a flexible cable terminated by a magnetic clamp.

- Presence of voltage is indicated by:
  - illumination of 6 red LEDs
  - an audible signal (60 dbA/2 m)
- Correct operation check:

Correct operation of the equipment is verified:

- by pressing the test button which causes:
- Illumination of the 6 red LEDs
- Activation of the audible signal

and

- by releasing the test button which causes:
  temporary illumination of 6 green LEDs

The correct operation check consists in a built-in device. It checks all of the detector's functions.

- Characteristics:

No previous voltage adjustment required
Routine operations in factory to adjust and test the equipment

- Power supply: 1 x 9V alkaline battery, type 6 LR 61
- Supplied in plastic case
- Total weight with case and magnetic clamp: 1,5 kg
- Cable lenght: 8 m

Recommended stick: ZPTVZCR 4603 W, see page 25.



Reference	Field of use	Fitting	Contact-piece	Total lenght (m)
ZVATDC 750/1500W	750-1500	W	Hook	8



Telescopic sticks

ZPTVZCR 4603 W

Adjustable multipoint telescopic stick for use in earthing and short-circuiting.

IEC-61235

Description:

- 3 epoxy reinforced fibre-glass isolating sections:
- 1 red terminal tube, diameter 28 mm,
- 1 intermediate tube, diameter 37 mm,
- 1 red base tube, diameter 45 mm, equipped with a screwing attachment at the end protected by a removable cap, which allows the 2 m extension to be attached each section may be set at the desired length, according to operating height, with lever clamping system using an excentric cam,
- 1 end-fitting: type W,
- button cap: removable made of elastomer material.
- delivered in a stick bag.



Reference	Length (m) extended	Length (m) folded	Weight (kg)	Elements N°
ZPTVZCR 4603 W	4.70	1.90	2	3

Earthing rail equipment

Clamps

Auto clamping contact clamp for catenary wire, fixed on top of a telescopic two elements metallic stick.
Folded / extended length: 1.80 / 3.25 m.
Bottom of metallic stick has a pin to be fixed on insulating stick.
Also on bottom a grounding braid clamp.

Reference	Weight (kg)	Length (m)
ZEMCC 2160	1.20	1.80 / 3.25

Insulating sticks

One part insulating stick, length 2 m.
Equipped on top with a “tulip” connector for ZEMC 2160 clamp.

Reference	Weight (kg)	Length (m)
ZPL7R 120N	2.00	2
ZPTVZCR 5003	2.00	1.80 / 5.00

Earthing rail clamps

Rail earthing clamp for 35 GTF rail (buried rail - streetcar).
Rail earthing clamp for catenary, attached by manual tightening.

- Materials:
  - body: copper-aluminium,
  - clamping screw: hardened steel 240 kg/mm.
- Connection: for cables fitted with screw terminal diam.12 mm.
- Clamping capacities:
  - clamping: clamped by 1/4 turn lever. Electrical contact is maintained by an excentric cam,
  - capacities: clamps to the neck of rail type 35 GTF.

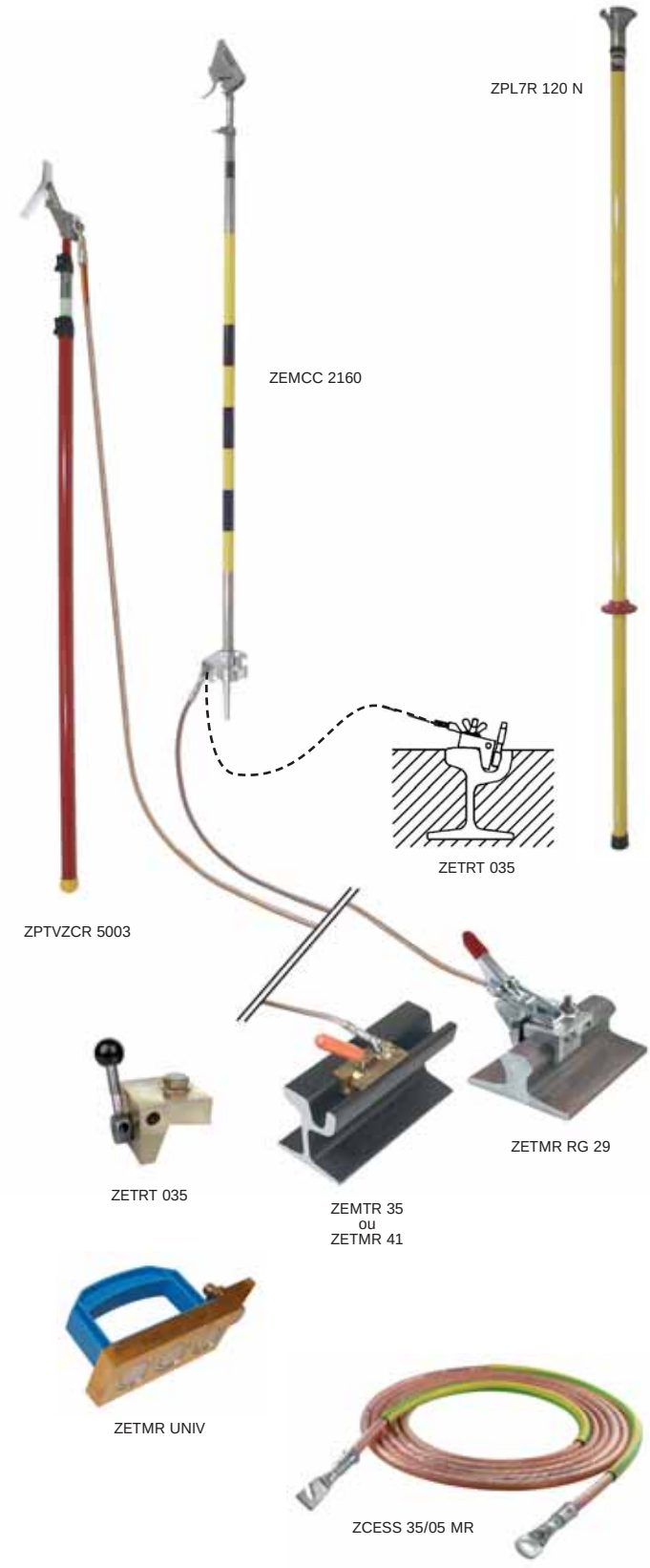
Reference	Weight (kg)	Icc	Rail type	Dimensions (mm)
ZETMR 35	1.2	8 kA/1 s	GTF 35	115 x 63 x 40
ZETMR 41	1.3	8 kA/1 s	GP 41 GPI 41	115 x 63 x 40
ZETRT 35	0.8	8 kA/1 s	GTF 35 GPI 41 RI 59	85 x 70 x 50
ZETMR RG 29	0.7	8 kA/1 s	RG 29	190 x 85 x 80
ZETMR UNIV	0.7	8 kA/1 s	ALL*	100 x 85 x 50

* Magnetic clamping.

Copper cables

Flexible copper braid, silicon sheath (IEC-61230), with terminals.

Reference	Weight (kg)	Section (mm²)	Length (m)
ZCESS-35/05 MR	2.00	35	2



d.c. voltage detector 750 V

Two-pole voltage detector for presence of voltage between positive line and negative line, installation with a telescopic stick.

• Presence of voltage is indicated by:
- illumination of 6 red LEDs
- an audible signal (60 dbA/2 m)

• Correct operation check:

Correct operation of the equipment is verified:
- by pressing the test button which causes:

• Illumination of the 6 red LEDs
• Activation of the audible signal

and
- by releasing the test button which causes:
temporary illumination of 6 green LEDs.

The correct operation check consists in a built-in device. It checks all of the detector's functions.

• Characteristics

Operating voltage: 750 V d.c.
Stand-by state.
No previous voltage adjustment required, any polarity.
Routine operations in factory to adjust and test the equipment.
Distance between line axes: 700 mm.

• Power supply: 1 x 9 V alkaline battery, type 6 LR 61.

Recommended stick: PTVZCR 5603 B.
Supplied in carrying case.

• Telescopic stick: ZPTVZCR 5603 B.

Other models or configurations: contact us.



ZVDCAL 750 TROL	Weight: 2.5 kg

Earthing rail equipment

• Universal earth clamp.

Icc = 35 kA / 50 ms.
For catenaries diameter 10 to 50 mm. see page 17

Reference	Weight (kg)	Dimensions (mm)
ZCCVZC 25	0.75	270 x 200 x 40



• Copper cables, flexible copper braid, silicon sheath (IEC-61230). See page 18.

• Telescopic stick. see page 14

Reference	Weight (kg)	Length (m)
ZPTVZCR 5603	3.7	2.15 / 5.60
ZPTVZCR 5603 B	3.7	2.15 / 5.60

Equipment for intervention on subway installations



VOLTAGE DETECTORS, EARTHING RAIL EQUIPMENT

d.c. voltage detector 750 V

Bipolar detector for d.c. networks:
- Built in testing device.
- Presence of d.c. voltage indicated by 5 red LED'S.
- Contact piece on rail: 3 contacts.
- Battery 4.5 V type 3 LR 12.



Reference	Dimensions (mm)	Weight (kg)
CL-1607/1	500	1.350
CL-1607/ML	535	1.900

Other models or configurations: contact us.

Earthing rail equipment for third rail configuration

This equipment is designed to permit safe earthing and short-circuiting between the running rail and the railway lateral current rail.
- Materials
  - Aluminium contact block for current rail with guiding magnet and brass plate



Reference	Weight (Kg)	Icc	Dimensions (mm)
MT-300	10	85 kA/30 ms	900 x 300 x 125

Earthing clamp for connection to the third rail

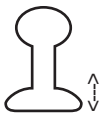
This equipment is designed to permit short-circuiting between the running rail and the railway lateral current rail.



Reference	
ZET 3R	Body: steel

Clamping on the rail

- Rail earthing clamp for catenary, attached by manual tightening. Clamp for carrying out continuity shunt during the laying of a section of rail.
- Materials:
  - body: aluminium,
  - clamping screw: stainless steel.
- Rate of current: 750 A/20 s.
- Connection: for cables fitted with screw terminal diam.10 mm and diam.12 mm.
- Clamping capacities:
  - clamping: clamped by lever. Electrical contact is maintained by spring washers. The contact quality is guaranteed by a plate with "diamond tip" shapes,
  - capacities: vertical to the rail flange = 7 to 22 mm.
- SNCF symbol: 0.392.6481.



7 to 22 mm



Reference	Weight (Kg)	Icc	Dimensions (mm)
ZSMT 848/100	1.5	a.c. 12 kA/150 ms d.c. 52 kA/35 ms*	180 x 130 x 50

* x 3 shocks

Earth clamp

For fixed point.



Reference	Weight (kg)	Connection conductors
MT-1921	0.69	Flat 18 mm - Ø 25 mm

Copper cables

Flexible copper braid, silicon sheath (IEC-61230).
See page 18.





Equipment for lines, substations and installations

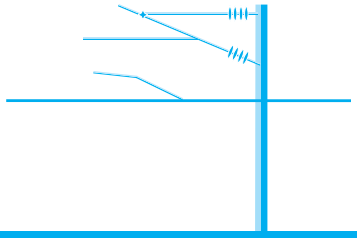
SAFETY EQUIPMENT 30

LOW VOLTAGE DETECTORS AND SHORT-CIRCUITING SYSTEMS 32

HIGH VOLTAGE DETECTORS AND SHORT-CIRCUITING SYSTEM 34

VOLTAGE DETECTORS AND SHORT-CIRCUITING SYSTEM 41

ACCESSORIES 43



Warning flags


AL-60


AL-58

AL-58	Attached on handle; for work site
AL-60	to be attached on earthing cable; for immediate identification inopen-type switchgears possible inscription: 0 to 99 (by using ALU-SCRIPT markers)

Safety boundary post

For temporary installation.
Used with tough chain link 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-32/05	Yellow and black - Length: 5 m

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

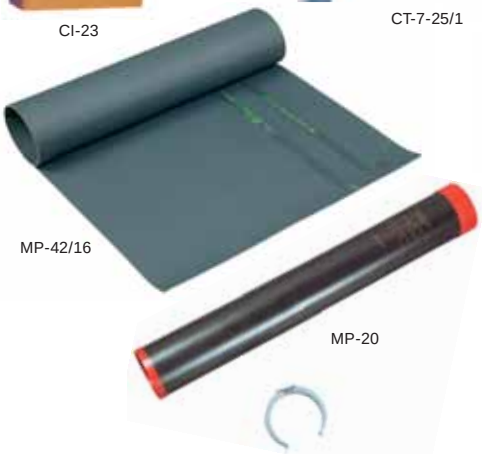
Intervention kits


CG-35/1


CG-30 (IEC 60903)


CI-23


CT-7-25/1


MP-42/16 MP-20


CS-45

Composition of the kits

Reference	Composition	Characteristics	Dimensions
CG-30-C	Insulating rubber gloves	26 500 V max	size 10
CG-35/1	Rubber gloves storage box with window		60 x 210 x 460 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

Extinguishers

Carbon dioxide for B and C type fires.





CD-302	Capacity: 2.68 L - 290 x 615 mm Weight full: 5.4 kg
CD-306	Capacity: 8.04 L - 320 x 870 mm Weight full: 14 kg

Safety lamps

Emergency mobile lighting for MV indoor substations, rechargeable on 220 V.



CD-122



CD-124

CD-122	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

Intrinsically safe torch light

Protection mode EEx iae IIc T6
(suitable for all areas and gases).
Appropriate certificates for Merchant Marine and VERITAS.
Power supply by 1.5 V LR 20 batteries (x 2).
Fixed light or intermittent optical signals.
Double optical systems.



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

Life saving kits for M.V. substations

Wall mounted KIT

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 or 36 kV high voltage Insulating gloves, insulating boots
Safety instructions on the plastic board
1 talcum powder can.

Closed



Opened



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

Voltage multi-tester DETEX™ 911-EX

IEC-61243-3
EN 50110-1
CE

The DETEX 911-EX has been designed in accordance with IEC 61243-3 and EN 50110-1 standards.
The DETEX 911-EX is a voltage detector which checks the absence of voltage (a.c. or d.c.) and a multitester.
It enables you to: check the voltage levels from 6 to 600 volts; check the continuity of a disconnected electric circuit; find phase or neutral (by single pole method) determine polarities. It is equipped with 2 test probes and an integrated correct operation test.
Features: Field of use: from 6 to 690 V =/~
Frequency: 50/60 Hz +/- 10%
Operating Temperature: -10°C / +55°C
Protection level: IP54 / IK06
Double insulation class II.





MS-911-EX	Delivered with power supply Weight: 0.370 kg

Voltage multi-tester DETEX™ 911/BR

The DETEX 911/BR has been designed in accordance with IEC 61243-3 and EN 50110-1 standards.
The DETEX 911/BR is a voltage detector which checks the absence of voltage (a.c. or d.c.) and a multitester.
It enables you to: check the voltage levels from 24 to 900 volts; check the continuity of a disconnected electric circuit; find phase or neutral (by single pole method) determine polarities. It is equipped with IP2X safety test probes and an integrated correct operation test.
Features: Field of use: from 24 to 900 V =/~
Frequency: 50/60 Hz +/- 10%
Operating Temperature: -10°C / +55°C
Protection level: IP54 / IK06
Double insulation class II.

MS-911/BR	Delivered with power supply Weight: 0.370 kg

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

IEC-61243-3
EN 50110-1
CE

The DETEX 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.

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





MS-911/2	Delivered with power supply Weight: 0.370 kg

Accessories for MS-911 serie

M-87369	Storage Bag

CONSUMERS UNITS SYSTEM, JUMPER CABLES

Short-circuiting system for underground networks

Icc = 4kA / 1 s.
Short-circuiting system for low voltage consumer unit especially designed for underground networks including:

- copper braids with 4 or 5 insulated conductors 25 mm² H07RNF type interconnected by an overmolded insulation brass contact piece.
- revolving extra small size contact clamps
- fork type adapters to fit fixed jaws in a fuse box or cabinet.
- Threaded adapters M6, M8, M10, M12 to fit threaded stems.
- Insulated spanner to tighten the extra small size clamps and equipped with a neon detector to verify voltage absence.
- insulating box spanner (10 / 17) to install threaded adapters.
- insulated eye spanner (13 / 14 / 17) for tightening of terminal pads.



MC-244/1	System with 4 cables
MC-245/1	System with 5 cables

Short-circuiting and earthing systems

Earthing clamp for connection to circular diameter and attached by stick tightening.
The connecting set formed by extra multi strand copper cables 16mm≤ with silicon sheath according IEC61230.

- Materials:
  - Body: Aluminium.
  - Screw: stainless steel.
  - Lg: 3 x 0.75 m / 1 x 2 m.

Connection for cables fitted with screw terminal diam.8 mm. End fitting: “C” type.

- One equipment includes:
  - 2 set of 4 clamps with cables,
  - 1 stick,
  - Notice and carrying bag.



Reference	ICC	IEC	Clamping capacities
ZEMCT 32 SNCF PS	4kA/1s	61230	diam. 6 to 30mm

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/1 s).
Continuous rating 75 A.
1 insulated cable 25 mm² section.



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

Bayonet earthing connection

Earthing connection to screwed on earthing bar or on earthing platform on one side and to connect on a lug equipped with cable and clamp on the other side.

- Materials
  -Body: brass

Connection for cables fitted with screw terminal diam.12mm



Reference	Materials
ZEMCT NAC 01	Body: brass

Electronic voltage detectors with contact electrode extension

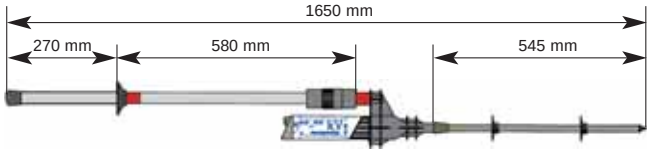
Voltage presence is indicated by: **IEC-61243-1**
- red flashing LED'S (very bright - visible at more than 50 m in direct lighting)
- powerful rated audible signal > 60 dB (A)/2 m

Check of working order:
- by pressing the TEST button:
  - red LED flashes on
  - sound signal is activated
- when TEST button is released:
  - timed green LED lights up. While remaining on, this LED indicates the good working order of the detector. It lights off as soon as the red LED lights up in case of a voltage presence.

This checking validates the good working order of the detector.

Characteristics
Detectors are adjusted, tested and controlled one by one.
Precise and stable operating threshold. Reduced sensitivity to induced voltages.
Dielectrically tested on substation bars. High environmental resistance (impacts, vibrations, moisture).
Temperature conditions: class N (IEC-61243-1 standard).
storage and operation: -25 / +55 °C
Robust housing.
Power supply: one 9-V alkaline battery type 6 LR 61.
The voltage detector is always ready for use, since it is on continuous monitoring conditions with almost no battery consumption. Under normal use conditions the batteries last more than a year.
Contact electrode extension fitted to the housing by screwing.
Delivered complete in a bag with insulating stick.





Reference	Voltage (kV)	Frequency (Hz)	LG (mm)	LH (mm)	LI (mm)	LA (mm)	Weight (Kg)
CC-575-5/15-BS	5-15	50	1.485	200	525	650	1.70
CC-575-10/20-BS	10-20	50	1.485	200	525	650	1.70
CC-575-10/30-BS	10-30	50	1.645	200	525	810	1.80
CC-578-15	15	16 2/3	1.650	970	580	545	1.95
CC-577-10/17.5	10-17.5	50	1.790	400	525	700	1.95

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.
Pivoting contact electrode enabling wire contact at any angle.
Telescopic insulating stick.



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

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

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

Ultimate technology of voltage detector "Head Capacitive Technology"

IEC-61243-1

CE

Compact and light
It offers:
- a wide range
- 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 rn

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 9 V alkaline battery type 6 LR 61
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: 1.1 kg
Total size: 340 x 275 x 83 mm
* Specify type of mounting when ordering: C or K.

Recommended stick:
CE-4-21. See page 48.



CC-875-10/36*



For other voltages, please consult us.

Frequency 50/60 Hz

Reference	Operating voltage (KV)
CC-875-5,5/20	5.5-20
CC-875-10/36*	10-36
CC-875-11/33*	11-33
CC-875-25	25 with hook

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

d.c. voltage detector acoustic and optical signal

Two-pole voltage detector for the presence of voltage equipped with a flexible cable terminated by a contact clamp.

- Presence of voltage is indicated by:
  - illumination of 6 red LEDs
  - an audible signal (60 dbA/2 m)
- Correct operation check:

Correct operation of the equipment is verified:

- by pressing the test button which causes:
- illumination of the 6 red LEDs
- activation of the audible signal

and

- by releasing the test button which causes:
  temporary illumination of 6 green LEDs

The correct operation check consists in a built-in device. It checks all of the detector's functions.

- Characteristics:

No previous voltage adjustment required
Routine operations in factory to adjust and test the equipment

- Power supply: 1 x 9 V alkaline battery, type 6 LR 61
- Supplied in plastic case
- Weight: 1.5 kg
- Cable lenght: 8 m
- Clamping capacity: 5-33 mm



Reference	Field of use	Fitting	Contact-piece	Total lenght (mm)
ZVATDC 2000 HS	600-2000	H	ANTP	415
ZVATDC 2000 RS	600-2000	R	ANTP	485
ZVATDC 3000 HS	750-3000	H	ANTP	415
ZVATDC 3000 RS	750-3000	R	ANTP	485
ZVATDC 4000 HS	1500-4000	H	ANTP	415
ZVATDC 4000 RS	1500-4000	R	ANTP	485

d.c. voltage detector acoustic and optical signal

Two-pole voltage detector for the presence of voltage equipped with
two insulating sticks.

- Presence of voltage is indicated by:
  - illumination of 6 red LEDs
  - an audible signal (60 dbA/2 m)
- Correct operation check:

Correct operation of the equipment is verified:

- by pressing the test button which causes:
- illumination of the 6 red LEDs
- activation of the audible signal

and

- by releasing the test button which causes:
  temporary illumination of 6 green LEDs

The correct operation check consists in a built-in device. It checks all of the detector's functions.

- Characteristics:

No previous voltage adjustment required
Routine operations in factory to adjust and test the equipment

- Power supply: 1 x 9 V alkaline battery, type 6 LR 61
- Supplied in plastic case
- Weight: 6 kg
- Cable lenght: 2 m



Reference	Field of use	Contact-piece	Total lenght (mm)
ZVATDC 3000 PS	750-3000	ANTP	910

Contact-pieces



ZANTP M8 ZANTC M8 ZANTCT M8 ZANTD M8 ZANTV M8

Reference	Dimensions (mm)	Reference	Dimensions (mm)
ZANTC M8	Ø 70	ZANTV M8	-
ZANTCT M8	Ø 70	ZANTD M8	-
ZANTP M8	-		

Two-pole phase comparator for indoor and outdoor use (a.c./d.c.)

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.



CL-5-36
CL-5-03

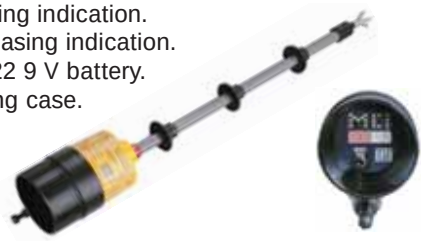


CL-5-33-GB

Reference	Voltage (kV)	Dial scale (kV)	Observations
			Phase tester
CL-5-33-GB	11-33	11-33 A. C/D. C	Straight & 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

Single pole phase comparator for indoor and outdoor use (a.c.)

Frequence and voltage phase memory.
Integrated TEST push-button.
Orange LED = indication that frequence and voltage are in memory.
Green LED = phasing indication.
Red LED = non-phasing indication.
Powered by a LF 22 9 V battery.
Delivered in carrying case.



Reference	Voltage (kV)	Length of antenna (m)
CL-7-06/18*	6-18	0.85
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.

For other voltages, please contact us.

d.c. bipolar voltage detector 0.6 to 2 kV

Operation
Two-pole voltage detector for the presence of voltage between the catenary and the rail
• Presence of voltage is indicated by:
  - illumination of 6 red LEDs
  - an audible signal (60 dbA/2 m)
• Correct operation check: Correct operation of the equipment is verified:
  - by pressing the test button which causes:
• illumination of the 6 red LEDs
• activation of the audible signal
and
  - by releasing the test button which causes:
    temporary illumination of 6 green LEDs
The correct operation check consists in a built-in device. It checks all of the detector's functions.
Stand-by state
No previous voltage adjustment required
Routine operations in factory to adjust and test the equipment
Detector fixed to stick, attachment to rail by metal spring-contacts
Power supply: 1 x 9V alkaline battery, type 6 LR 61
Stick included in pack: CC-1515-101
Supplied in carrying case: CM-303.



CC-1515-100

Reference	Operating voltage (kV)	Weight (kg)
CC-1515-100	0.6 to 2 d.c.	5.2

Telescopic insulating stick



Telescopic insulating stick, 3 elements, fully folded/extended: 1.65 x 3.95 m, including:
• Regulation piece of intermediary position.

Reference		Voltage (KV)
CC-1515-101	Stick	0.6 - 1.5
CC-1515-102	Antenna	0.6 - 1.5

Clamps for MV installations and substations

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.


MT-812-C


MT-817-C


MT-813-C


MT-814/2
MT-814/3


MT-815-C


MT-815-S1


MT-1911-E
MT-1921-E


MT-1911-S1
MT-1921-S1



Reference	Weight (kg)	Dimensions (mm)	Conductors (mm)	Test current (kA/1s)
MT-812-C	0.320	35 x 79 x 143	● Ø 5-16 ▬ 0-16	21
MT-813-C	0.330	35 x 79 x 169	▌ 40 x 16	21
MT-814/2-C	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 ▌ 40 x 16	21
MT-814/3-C	0.620	85 x 56 x 195	● Ø 18-33	14.5
MT-815-C MT-815-E MT-815-S MT-815-S1	0.650	44 x 100 x 180	● 5-35 ▬ 16-40 ▌ 5-40	30
MT-1911-E MT-1911-S1	0.580	For permanent fixed point Ø 20 mm and round conductors Ø 8 to 18 mm		20
MT-1921-E MT-1921-S1	0.69	For permanent fixed point Ø 25 mm and round conductors Ø 10 to 25 mm		30

Earth clamps

Copper aluminium bronze earth clamps.


MT-840/1


MT-841


MT-1911
MT-1921

For bare conductors

Reference	Weight (kg)	Dimensions (mm)	Conductors (mm)	Test current (kA/1s)
MT-840/1	0.48	Connector: TO-08 - 35 mm²	● Ø 6-25 ▬ 0-25	20
MT-841	0.48	Connector: ≤ 50 mm²	● Ø 6-25 ▬ 0-30	30

For fixed point

Reference	Weight (kg)	Connection conductors (mm)	Test current (kA/1s)
MT-1911	0.58	Spheric fixed points MT-2951 Ø 20 mm Round conductors Ø 8 to 18 mm	20
MT-1921	0.69	Spheric fixed points MT-3951 Ø 25 mm Round conductors Ø 10 to 25 mm	30

Fixed points

IEC-61230

MT-2951
MT-3951
MT-3952





MT-2951/1
MT-2951/2
MT-3951/1
MT-3952/1

For flat conductors

Reference	Sphere dim. (mm)	Weight (g)	Fixing	Test current (kA/1s)
MT-2951	Ø 20	130	Thread: M 12	20
MT-2951/1	Ø 20	180	Bolt: M 12 - L = 35 mm	20
MT-2951/2	Ø 20	200	Bolt: M 12 - L = 45 mm	20
MT-3951	Ø 25	240	Thread: M 12	30
MT-3952	Ø 25	240	Thread: M 16	30
MT-3951/1	Ø 25	300	Bolt: M 12 - L = 45 mm	30
MT-3952/1	Ø 25	350	Bolt: M 16 - L = 45 mm	30

IEC short-circuiting and earthing systems for MV substations

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

IEC-61230

Installation on permanent fixed points





Plastic case
M-78665 included



MT-1910
MT-1920



CF-5-40-E

Reference	MT-1910	MT-1920
Icc (kA/1 s)	20	30
Installation on fixed points	Ø 20 mm MT-2951 range	Ø 25 mm MT-3951 range
Composition	3 clamps MT-1911-E 1 MT-1911	3 clamps MT-1921-E 1 MT-1921
Connection set	3 cables 95 mm² 1 earth cable 35 mm²	3 cables 150 mm² 1 earth cable 50 mm²
Sticks**	CF-5-40-E	CF-5-40-E

** Stick to be ordered separately.

For earthing systems to your own specifications, please see page 69.

Installation on bare conductors





Plastic case
M-78665 included



MT-5805



CF-4-21-C

Reference	MT-5805	MT-9801
Icc (kA/1 s)	20	10
Conductors (mm)	● Ø 5-35 ▬ 16-40 ▌ 5-40	● Ø 5-16 ▬ 0-16 ▌ 40-16 ● Ø 5-28
Composition	3 clamps MT-815-C 1 earth clamp MT-840/1	3 clamps MT-817-C 3 clamps MT-814/2 1 earth clamp MT-840/1
Connection set	3 cables 95 mm² 1 earth cable 35 mm²	3 cables 50 mm² 1 earth cable 25 mm²
Sticks**	CE-4-21-C	CE-4-21-C

Short-circuiting and earthing systems for switchgear and metalclad switchgear



Short-circuiting and earthing systems for 250 A separable connectors

Rating = 12.5 kA/1 s.
Equipment consisting of:
3 terminals, each fitted with a “handarff device” for locking.
1 terminal connecting kit, with double-crimped connectors
- 3 copper cables, 70 mm² section, length ~ 0.70 m
- 1 copper cable, section 35 mm², length ~ 2 m
- 1 earthing clamp MT-840/1

3 padlocks AL-230-S.



MT-8612	Delivered in metal box 620 x 195 x 150 mm - Weight: 7.6 kg

Stand by devices

Allows the supply under voltage
Equipment composition:
3 insulating “EPDM” interfaces
3 padlocks.



MT-8601 MT-8602

For 250 A separable connectors

MT-8601	Delivered with 3 padlocks AL-230 in metal case 315 x 160 x 150 mm - Weight: 4 kg

For 400 A separable connectors

MT-8602	Delivered with 3 padlocks AL-230 in metal case 315 x 160 x 150 mm - Weight: 5.8 kg

Short-circuiting and earthing systems for 400 A separable connectors

Rating = 12.5 kA/1 s
Equipment consisting of:
3 terminals, each fitted with a bolted stirrup for locking.
1 terminal connecting kit, with double-crimped connectors
- 3 copper cables, 70 mm² section, length ~ 0.40 m
- 1 copper cable, section 35 mm², length ~ 2 m
- 1 earthing clamp MT-840/1

3 padlocks AL-230-S.



MT-8614	Delivered in metal box 480 x 340 x 195 mm Weight: 13.5 kg

63 to 550 kV electronic voltage detectors for indoor and outdoor use

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.

Power supply
- One 9 V battery type 6 LR 61.

End fittings:
- “C” for hexagonal sticks.
- “K” for universal sticks.

Weight

500 g (with battery).

Packaging

Units supplied complete with battery and electrode in a rigid synthetic case with handle.

- Recommended sticks: CM-46... serie. See pages 15/43.





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-248-110-K	110	120	Red	16 2/3
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.

HV and EHV clamps manœuverable 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. Manœuvering by **CM-6** insulated stick of appropriate length and characteristics.



MT-731



MT-732



MT-734



MT-735



MT-737-H



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-B | MT-734-B MT-735-B | MT-734-E MT-735-E | MT-734-H MT-735-H

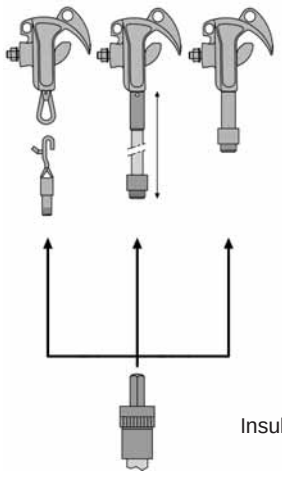
Reference	Clamping capacity (Ø mm)	Rating insulation (kA/1 s)	I asymmetrical (A)	Copper connection			Weight (Kg)	Dimensions (mm) h x L x thickness
				Copper cables (mm^2 max.)	Ø range (mm)	Stud or hole		
MT-731*	5-60	40	92	150	45	M 12	1.45	200 x 200 x 50
MT-732*	40-120	40	93	150	45	M 12	1.45	200 x 200 x 50
MT-734*	5-40	40	92	150	45	M 12	0.8	145 x 125 x 52
MT-735*	15-60	40	92	150	58	M 12	0.8	195 x 135 x 45
MT-737-H	20-120	40				M 12	1.35	340 x 200 x 55

* Add type of connection A - B - E - H.

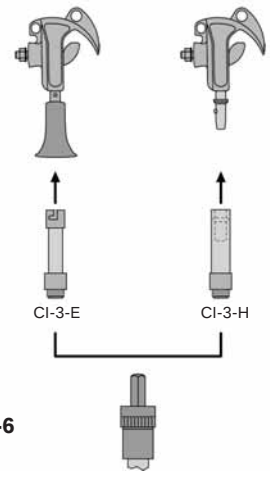
Attachment of **MT-734/MT-735** clamps with **MT-717-3-B** hook.



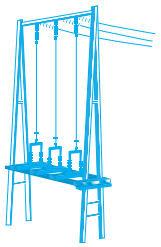
Direct connection



Connection adaptor



Insulated sticks **CM-6** see page 44.



Insulating sticks for short-circuiting and earthing systems

Made of IEC-60855 orange foam filled tube, these Ø 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.

IEC-60855

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.

CM4000

Reference	Complete stick length (m)•	Complete stick length (m)••	Insulating length (m)	Weight (kg)
Basic elements				
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
Intermediate element				
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
Terminal elements				
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
Fixed lenght sticks				
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
Intermediate elements with rain skirts				
CM-4600-J	0.36			0.95

* Add end piece C, K, E.

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



CM-4600-J

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

Set of sticks

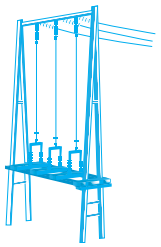
Complete sets of sticks for standard applications.

IEC-60855

Reference	Working distance (m)	Composition
CM-4220*	2	2 elements: CM-4610 + CM-4610-*
CM-4230*	3	2 elements: CM-4615 + CM-4615-*
CM-4240*	4	2 elements: CM-4620 + CM-4620-*
CM-4330*	3	3 elements: CM-4610 + CM-4610-I + CM-4610-*
CM-4345*	4.5	3 elements: CM-4615 + CM-4615-I + CM-4615-*
CM-4360*	6	3 elements: CM-4620 + CM-4620-I + CM-4620-*

* Add end piece C, K, E.

For cables < 95 mm² CM-4000 serie is recommended.



INSULATING STICKS, 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.



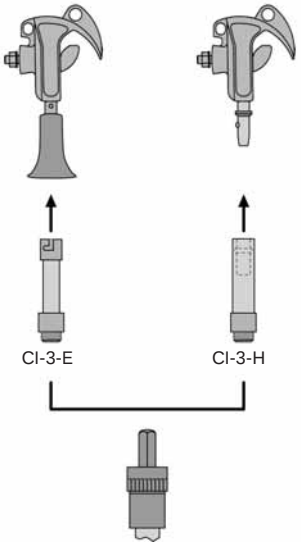
CM-6-15 CM-6-20 CM-6-25

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 ≥ 95 mm² CM-6 series is recommended.

Connection adaptors for insulating sticks

- For earthing systems



- For voltage detectors

	E	C
Accessories		
Connection adaptors	 CI-7-E	 CI-6-C
Sticks	 K	 K

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

Short-circuiting and earthing systems carrying bags

Strong water proof canvas. Reinforced bottom.

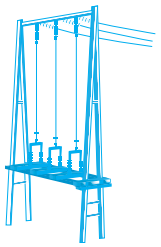
M-87-53	380 x 250 - Height: 400 mm - Weight: 2 kg
M-87-153	380 x 250 - Height: 600 mm - Weight: 2.5 kg
M-87-295	550 x 300 x 300 mm - Weight: 2 kg



M-87-295



M-87-53

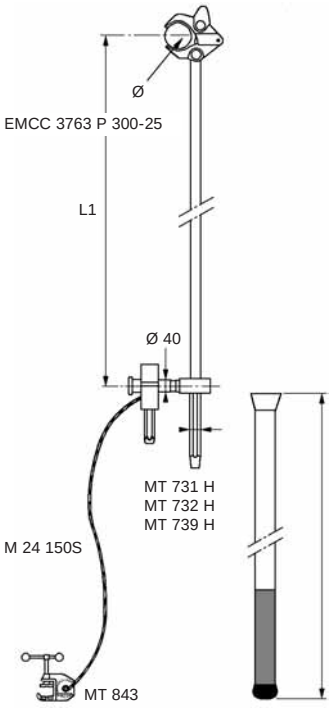


EXTENDED CLAMPS FOR HIGH LEVEL BUSBAR IN HV SUBSTATIONS

Extended clamps for high level busbar in HV substations

Assembly includes:

- One aluminium alloy electrical tube (Icc = 25 kA / 1 s), on top of which is an aluminium alloy contact clamp and on bottom an access point on which will be installed the grounding clamp.
- In the inside of the previous tube is a second one allowing the clamp to be tightened over busbar conductor or pipe by means on the bottom side of a rod connector type FL so that the assembly can be installed with an insulating stick ref. ZPL9R FL.







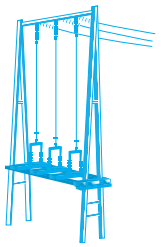
Reference	L 1 (m)	Ø (mm)	Icc (kA / 1 s)
ZEMCC 3763 P 300-25	3.00	40 - 120	25

Switch clamps

- ZPL9R FL: insulating sticks ø 47 mm of yellow colour, length 3 or 4 m, equipped on one end with a hex female connector 26 mm on flat and on the other side with a rubber cap handle to ensure a firm grip.



Reference	L 2 (m)
ZPL9R 130 FL	3.00



Copper cables

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-61230**

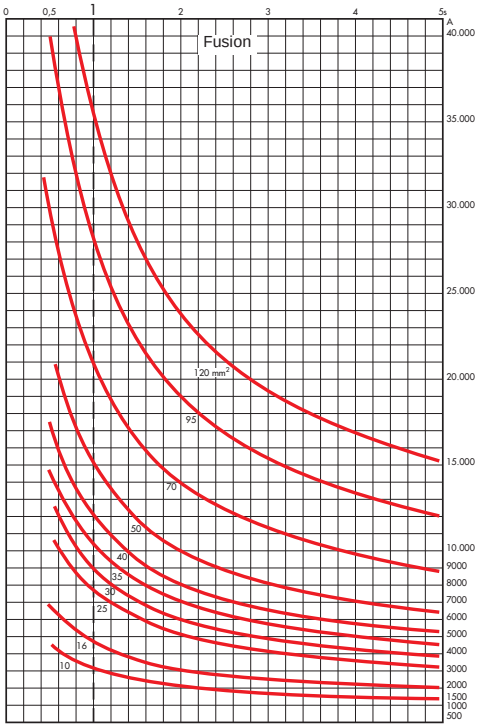


IEC-61230	Rating (kA/1 s)	Cable Weight (kg/m)	Cable Ø (mm)	Section (mm²)
M-24-50-S	12	0.545	10	50
M-24-70-S	16	0.768	12	70
M-24-95-S	20	1.000	14	95
M-24-120-S	30	1.280	17	120
M-24-150-S	36	1.630	19	150

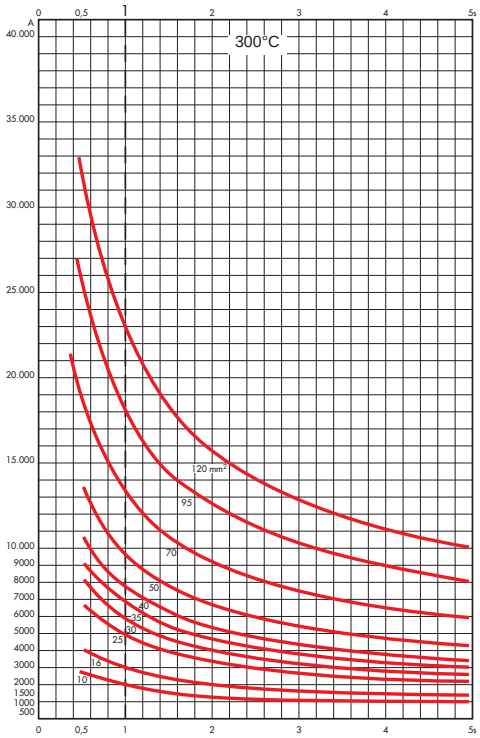
For leads with double-crimped lugs, please consult us.

To indicate your short-circuiting and earthing system, use warning earth flag and for definition of your working zone: see page 10.

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



Copper cables only:
Heating curves - 300 °C



Earth clamps

Copper aluminium bronze earth clamps.



MT-843



MT-847

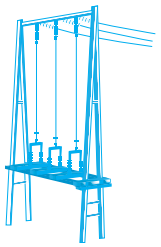


MT-852



MT-853

Reference	Rating insulation	Dimension (mm) Weight (kg)	Connection	Clamping capacity (mm)
MT-843	40 kA/1 s	45 x 106 x 165 0.95	Hole: Ø 13 mm	● Ø 6-35 ▬ 0-35
MT-847	30 kA/0.5 s	45 x 106 x 170 1.00	Hole: Ø 13 mm	▬ 0-25
MT-852	40 kA/1 s	70 x 125 x 155 1.40	Hole: Ø 13 mm	Fixed points
MT-853	40 kA/1 s	65 x 130 x 135 1.00	Hole: Ø 13 mm	Fixed points



Adjustable fixed points

For large vertical or oblique heavy duty conductors.



Reference	Rating insulation (kA/1 s)	Weight (kg)	Dimensions L x W x T (mm)	Conductors Type	Conductors Ø (mm)	Description
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

Access points

All our saddles are delivered with copper-aluminium bolt, screw, nut and lock nut.
On request, earthing clamps can be supplied with bi-metallic plate and washer.



ZSTA1



ZSTDA1

Single access points (single or double)

Reference	Cable area (mm²)	HR Bronze bolt	Short circuit value	Base A to B
ZSTA 1-75	75	12 x 50	20 000 A / 1 s	50 x 30
ZSTDA 1-75	75	12 x 70	20 000 A / 1 s	50 x 30



ZSTN147



ZSTDN75



ZSTA2



ZSTDA2

Access points (single or double)

Reference	Cable area (mm²)	HR Bronze bolt	Short circuit value	Base A to B
ZSTN 75-116	75-116	12 x 50	30 000 A / 1 s	50 x 30
ZSTN 147	147	14 x 50	40 000 A / 1 s	50 x 30
ZSTN 181	181.6	16 x 50	63 000 A / 0,5 s	54 x 31
ZSTDN 75-116	75-116	12 x 70	30 000 A / 1 s	50 x 30
ZSTDN 147	147	14 x 70	40 000 A / 1 s	50 x 30
ZSTDN 181	181.6	16 x 80	63 000 A / 0,5 s	54 x 31

Double access points (single or double)

Reference	Cable area (mm²)	HR Bronze bolt	Short circuit value	Base A to B
	Single or double			
ZSTA 2-116	75-116	12 x 50	30 000 A / 1 s	50 x 30
ZSTA 2-147	147	14 x 50	40 000 A / 1 s	50 x 30
ZSTA 2-181	181.6	16 x 60	63 000 A / 0.5 s	54 x 31
ZSTDA 2-116	75-116	12 x 70	30 000 A / 1 s	50 x 30
ZSTDA 2-147	147	14 x 70	40 000 A / 1 s	50 x 30
ZSTDA 2-181	181.6	16 x 80	63 000 A / 0.5 s	54 x 31
Double position (type CRTT)				
ZSTA 2-147 DP	75-147	12 x 50 1 cable		
ZSTDA 2-147 DP	75-147	12 x 70 2 cables		
ZSTA 2-116 USI	75	12 x 50	30 000 A / 1 s	50 x 30
ZSTA 2-147 USI	75	14 x 50	40 000 A / 1 s	50 x 30

Telescopic sticks

Telescopic sticks for voltage detectors and earthing systems for use in dry and wet conditions Telescopic stick contains 2 elements made of polyester/fiberglass foam filled tube, which slide together and are equipped with a push button lock.

IEC-61235

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

* Add end-piece C or K.



CE-4-21-C



CF-5



CM-7-10-A



MG-115/1-S

Fixed length stick for use in dry and wet conditions

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

IEC-61235

	Rated insulation	Ø (mm)	Overall length (m)	Weight (kg)
CE-5-40*	40	36	1.50	1.15

* Add end-piece C, K or E.

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

Insulating clampstick

Reference	Length (m)	Weight (kg)
MG-115/1-S	1.5	2.80

Wall mounted supports

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

	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.
ZAPSP 08	Ø 46 mm	Ø 46 mm max.



Top

Bottom





Personal protective equipment

HEAD AND EYES PROTECTION 50

INSULATING RUBBER GLOVES 51

INSULATING PLATFORMS 53

INSULATING MATS AND BOOTS 54

Personal protective equipment



HEAD AND EYES PROTECTION

ABS helmet

Electrically insulating helmets for use on low 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 397
EN 50365
ANSI 789.1/1986
20000 V
CE



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

Polycarbonate helmet

Polycarbonate helmet.
Shock and wear resistant, confortable.
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. Protection against electric arcs of short -circuits. Chinstrap (with Velcro fastening) Head fit adjustment by milled wheel.

EN 166/EN 170/EN 397
CE



MO-185-BL	Single size - Weight: 0.270 kg
M-881622	Spare face shield for MO-185-BL

Face shield

Face shield adjustable on MO-182 helmet.
100% UV protection.
Weight: 0.170 kg.
Caution: Do not use for welding operations.

EN 166/EN 170
CE



MO-184	Single size, adjustable by rubber band

Face shield

Polycarbonate face shield adjustable on the head by milled wheel. Protection against electric arcs of short-circuits. Anti-condensation treatment.
Caution: Do not use for welding operations.

EN 166/EN 170
CE



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

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.
Caution: Do not use for welding operations.

EN 166/EN 170
CE



MO-11000 MO-11001 MO-11003

MO-11000	Clear lenses, delivered in pouch
MO-11001	Tinted lenses, delivered in pouch
MO-11003	Tinted lenses, delivered in pouch

Overglasses

Polycarbonate overglasses. Protection against UV radiation and ejections of solid particles.
Caution: Do not use for welding operations.

EN 166/EN 170
CE



MO-11010 MO-11011

MO-11010	Clear lenses
MO-11011	Green tinted lenses



HEADLAMP, INSULATING RUBBER GLOVES

Headlamp with adjustable focus

Can be carried either on the head or any type of helmet.
Lighting control and beam adjustment with one movement, even wearing gloves.
Adjustable lamp height angle.
Locking of switch into off position. Sealed against rain.
Polyamide box, unbreakable polycarbonate glass, shielded cable.
Incorporated replacement bulb.
Powered by 4.5 V battery (3 LR 12) or with 3 batteries (LR 6) and adaptor.



MS-118	Headlamp, weight: 0.145 kg
M-95-865	Halogen bulb
M-95-864	Hooks set for helmet

LED's Headlamps

Can be carried either on the head or any kind of helmet.
- Lighting by 4 high performance LEDs.
- 3 lighting levels + 1 flash mode
- Adjustable lamp height angle.
- Very light, waterproof IP65.
- Range: 10 to 15 meters.
- Powered by 3 batteries LR 03 (AAA).
- Autonomy: 90 hours.







Fig. 1*



Fig. 2

* the support of the lamp is to be glue on the helmet. The lamp is clipsed on the support.

MS-122	Delivered with batteries and a carrying bag Weight: 0.09 kg

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



Lighting by 5 white new generation LEDs
5 light modes: Red on, Power save, Medium, Bright, Blinking.
Can be carried either on the head or any type of helmet.
Powered by 4 batteries LR 06 (AA).
Range: 30 meters.
Autonomy: 100 hours.
IPX6.





MS-127	Delivered with batteries and a carrying bag Weight: 0.226 kg
M-95-864	Hooks set for helmet

Reference	Class	Voltage (V)	Thickness (mm)	Designation	Weight (g)
CG-02 (*)	00	500	1.7	orange composite gloves with mechanical properties	270
CG-05 (*)	00	500	0.5	Latex	90
CG-10 (*)	0	1 000	1.0	Latex	200
CG-12 (*)	00	1 000	2.3	orange composite gloves with mechanical properties	450
CG-15 (*)	1	7 500	1.5	Latex	270
CG-20 (*)	2	17 000	2.3	Latex	450
CG-30 (*)	3	26 500	2.9	Latex	560
CG-40 (**)	4	36 000	3.6	Latex	800

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

Personal protective equipment



INSULATING RUBBER GLOVES

Undergloves

Cotton undergloves.
To be used with insulating rubber gloves.

CE



CG-80 (**)	** H: men / F: women

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.
Insulating material, shock resistant, yellow colour.
Transparent window (enables to check gloves presence).
Bottle of talc included.
Attachment: 4 holes 3.5 mm dia., centre distances 155 x 345 mm.
U.V. protection window.



CG-35/1	60 x 210 x 460 mm - Weight: 0.730 kg

Working gloves

Handling leather and cotton gloves. Docker type.

EN 388

CE



CG-96 (*)	Weight: 0.115 kg

(*) Add size: A, B, C, D.

Carrying box

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



CG-36	60 x 180 x 400 mm - Weight: 0.120 kg

Overgloves

Used as outer glove.
Silicon grain leather, very flexible.
Large protective cuff in chrome tanned hide.
Adhesive strap.

CE



CG-98 (*)	Weight: 0.170 kg

(*) Add size: A, B, C, D.



INSULATING PLATFORMS, RESCUE STICKS

Insulating platform (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 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	515	3.35

Insulating platform (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
CT-9-63	63 000	4	515	7.00

Rescue stick

Insulating stick ended by a large hook in order to rescue quickly an electrified victim in case of accident.



CS-45*	Length: 1.65 m - Rated insulation: 45 kV
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.

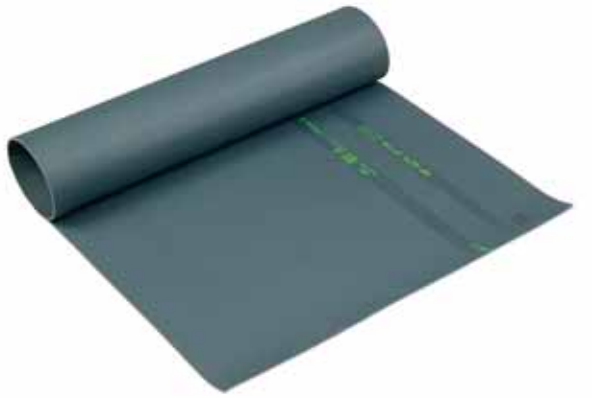


INSULATING MATS, INSULATING BOOTS

Insulating mats

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

***IEC-61111**
EN 61111



Individual models

Reference	Thickness (mm)	Voltage (kV)	Dimensions (m)
MP-42/11*	3	≤ 33	1 x 1
MP-42/16*	3	≤ 33	0.6 x 1
MP-42/66	3	≤ 20	0.6 x 0.6

* IEC - 61111.

For placing in front of panels

Reference	Thickness (mm)	Voltage (kV)	Dimensions (m)
MP-60/03-5	3	≤ 26.5	0.6 x 5
MP-60/03-10	3	≤ 26.5	0.6 x 10
MP-100/03-5	3	≤ 26.5	1 x 5
MP-100/03-10	3	≤ 26.5	1 x 10
MP-100/04-5	4	33	1 x 5
MP-100/04-10	4	33	1 x 10
MP-60/05-5	5	≤ 36	0.6 x 5
MP-60/05-10	5	≤ 36	0.6 x 10
MP-100/05-5	5	≤ 36	1 x 5
MP-100/05-10	5	≤ 36	1 x 10
MP-100/10-5	10	> 80	1 x 5
MP-100/10-10	10	> 80	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 boots

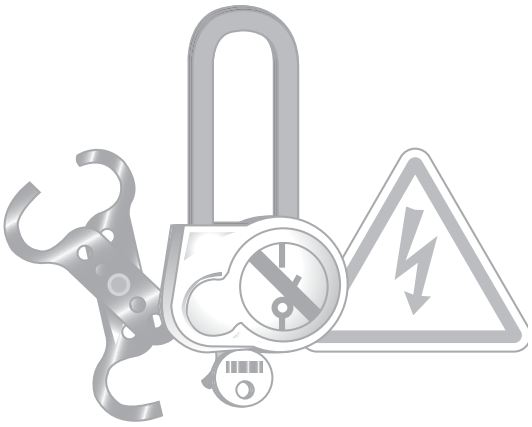
Made from elastomer with canvas support,
very flexible and resistant.
Anti-perforation stainless steel sole and shell.
Anti-slip sole.
Protection against step and touch hazardous potential gradients.

EN 345
CE



MV-135*	60 x 210 x 460 mm - Weight: 0.730 kg

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



Padlocks and warning signs

PADLOCKS 56

SELF ADHESIVE SIGNS 57

WARNING SIGNS 58

Padlocks and warning signs



Padlocks with warning signs

Brass ring bow 50 or 70 mm.
Diameter of the ring bow 4 or 6 mm.



Reference	Ring bow (mm)	Ø (mm)	Weight (kg)
AL-230-111-EX	50	6	0.170
AL-230-S-222-EX	70	6	0.190
AL-240-111-EX	50	4	0.170
AL-240-S-222-EX	70	4	0.190

Differents colours available on request.

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-E
AL-236-222-EX	1.150	AL-230-222-EX
AL-236-S-222-EX	1.210	AL-230-S-222-EX

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

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).





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



Self adhesive warning signs



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-66/1	100 mm side	Self adhesive PVC	10
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



Padlocks and warning signs



Warning and specialized 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-49/1*	Aluminium	100 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 on yellow Fixing: 3 holes Ø 4.5 mm

* Pack of 10 units.



AM-49/1



AM-41/1



AM-344-GB



AM-345-GB

Specialized signs

Reference	Type	Dimensions (mm)	Characteristics
AM-20-GB	Aluminium	350 x 250	Blue letters on plain aluminium
AM-20-RM	Aluminium	350 x 500	Blue letters on plain aluminium
AM-61-GB	Aluminium	150 x 200	Black on yellow on plain aluminium



AM-20-GB



AM-20-RM



AM-61-GB

Warning flags



AL-60



AL-58

AL-58	Attached on handle; for work site
AL-60	To be attached 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 chain link delineators (AL-32/05).
Removal foot.
Ø 50 mm.
Length: 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-32/05	Yellow and black - Length: 5 m

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



General tools

EQUIPMENT FOR WORKING ON POLE 60

ACCESSORIES 64



EQUIPMENT FOR WORKING ON POLE

Arc flash face shield kit (10 cal/cm²)

Composition of the kit:

CE

1 Face shield with chin cup 10cal/cm², 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: 2.1 kg

Arc flash protective coverall kit (11 cal/cm²)

Composition of the kit:

1 Face shield with chin cup 11cal/cm², absorbs> 99.9% of harmful UV radiation, tested to ASTM F2178 specifications

1ABS helmet electrically insulated EN397, EN 50365, ANSI Z89.1, 20kV.

1 safety glasses EN 166/EN 170

1 arc flash protective Hood (15 cal/cm²)

1 protective coverall 11cal/cm² (size L*), ASTM F1506 and NFPA 70E Standards

1 carrying bag for face shield and helmet

1 all kit carrying bag



KIT-ARC-03	Weight: 4.03 kg

* Size US: L
Other size on request.

Arc flash jacket kit (11 cal/cm²)

Composition of the kit:

1 Face shield with chin cup 10cal/cm2, 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 jacket 11cal/cm2 (size L*), ASTM F1506 and NFPA 70E Standards1 carrying bag for face shield and helmet

1 all kit carrying bag



KIT-ARC-02	Weight: 4.15 kg

Arc flash protective hood kit (40 cal/cm²)

Composition of the kit:

1 arc flash protective hood with an integrated face shield 40cal/cm², ASTM F2178 and NFPA 70E Standards

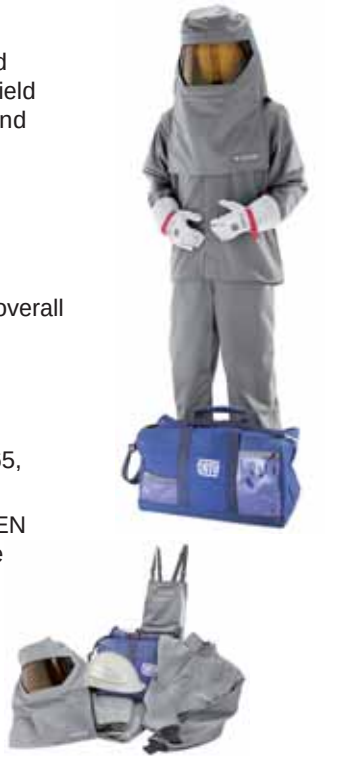
1 arc flash protective coat 40cal/cm², (size L*), ASTM F1506 and NFPA 70E Standards

1 arc flash protective bib overall 40cal/cm²,(size L*), ASTM F1506 and NFPA 70E Standards

1ABS helmet electrically insulated EN397, EN 50365, ANSI Z89.1, 20kV.

1 safety glasses EN 166/EN 1701 carrying bag for face shield and helmet

1 all kit carrying bag



KIT-ARC-04	Weight: 6.7 kg



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(*)	* add size: S/M/XL S = small M = medium XL = large

Pro electric full body fall arrest harness

4 fall arrest attachment point : one dorsal point, two sternal points by two metallic D rings, a sternal point by strap. A ventral attachment point for a descender and / or lanyard. Automatic buckles of leg loops. 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: 2.9 kg.

EN 358
EN 361
EN 813
CE



MO-564(*)	* add size: S/M/XL S = small M = medium XL = large

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

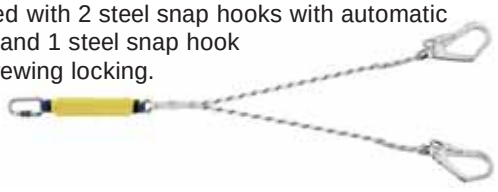


MO-52020	Length: 1.50 m
MO-52021	Length: 2.00 m

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



EQUIPMENT FOR WORKING ON POLE

Snap hooks (stainless steel)



MO-54

EN 362

CE

MO-54	Locks with threaded ring - Opening: 15 mm 105 x 58 mm - 0.154 kg



MO-55/1

EN 362

CE

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

EN 362

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



MO-54004

EN 362

CE

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

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 tensionning and return facility. Galvanized cable Ø 4 mm. Strength: 1 200 daN. Delivered with a screw crab. Max. length: 10 m.



EN 360

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.
Static resistance: 15 kN.
Polyamide Ø 15 mm.



EN 358

CE

MO-56009	Weight: 1.425 kg - Length: 3 m
MO-56010	Weight: 1.600 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 358

CE

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

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



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



MO-54005



CE-5-90-C

Reference	Characteristics
MO-54005	Opening: 50 mm - Weight: 0.500 kg
CE-5-90-C	Length: 9 m max. - Weight: 4 kg

Working on pole kit



Reference	Use
KIT-HAUT-01-(*)	To go up a pole with insulating laddess
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

	KIT-HAUT-					
Composition	01-(*)	02-(*)	03-(*)	04-(*)	05-(*)	06-(*)
Harness MO-563	■	■	■			
Harness MO-564				■		
Harness MO-71					■	■
Tether rope MO-52020	■					■
Double tether rope MO-54010		■		■	■	
Constraint tie MO-52034	■	■				
Constraint tie MO-52031				■ (2)		
Tether rope with tension device MO-56009	■	■	■	■	■	
Anti-fall grip MO-68/15	■	■	■	■		
Snap hook MO-54	■	■				
Carrying bag M-87-295	■	■	■	■	■	■

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

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

Insulating 2 section extension ladders, rope and pulley operated

Reference	Folded length (m)	Extended length (m)	Number of rungs	Weight (kg)
MP-506/2	3.53	6.05	2 x 12	20
MP-508/2	4.66	8.30	2 x 16	31
MP-510/2	5.78	10.26	2 x 20	38



MP- 506...

MP- 514...

Forged steel climbers for round pole

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



MO-35



MO-24/25/26

Reference	Folded length (cm)	Weight (kg)	
MO-24	Ø 20	2.6	Pair of climbers
MO-25	Ø 25	2.8	Pair of climbers
MO-26	Ø 30	3	Pair of climbers
MO-35	Ø 35	3.2	Pair of climbers

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

Reference	Weight (kg)	
MO-17-A	9	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.



Reference	Weight (kg)	
MO-16-A	6.5	Pair of climbers

Climbers

For H profile metallic poles.
Hard forged steel.



Reference	Weight (kg)	
MO-23	5.10	Pair of climbers



Compact carrying KIT

This compact kit is design 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 talk 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 with instructions in English

Connection adaptors

For insulating sticks	Accessories	E	C
For voltage detectors	Connection adaptors	CI-7-E	CI-6-C
	Sticks	K	K

Signal for working sites

Field of use.
To remotely signal the presence of a working site by red color emission.
Characteristics:
Light distance: Visibility of the luminous signal at a distance of 300 m (with ambiant luminancy of 200LUX).
Discharge time: 24h at 20°C.
Rechargeable on power supply 230-50 Hz.
IK 43/IK08.



CD-140	105 x 130 x 170 mm - Weight: 1.5 kg

Signal for working sites

Self-contained torch and safety lamp, including:
- White lighting optic.
- Signalisation optical, including three colours luminous signal: red, orange and green.
- To light-up in chronological order above, push successively on run button.
- Feeding by NiCd 12 V, 1 200 m/Ah battery.

Recharge by mains.
- Lighting autonomy 5 hours.
- Standby autonomy 10 hours.

- Load check by luminous indicator.
- Luminous signal to remember color signal.



CD-130	220 x 195 x 95 mm - Weight: 1.870 Kg

Earthing roller

Equipotential connections.
Protection against the electrostatic loads and the shock waves consecutive to the lightnings.

- Steel strong construction stamped.
- Reel mounted on two waterproof bearings.
- Movements automatic reminder by spring with spiral blade.
- Supplied with HO7VK green yellow cable and crocodile clamp.
- Guide of the flexible hose by autolubricating pulleys.
- Directional on 180 degrees.
- Body without crankcase. Conception allowing the exchange of the flexible hose or the spring.
- Equipped normally with a pawl of stop.
- Epoxy paint.



Reference	Section and lenght				
	6 mm²	10 mm²	16 mm²	25 mm²	35 mm²
ENR-4006	40 m				
ENR-1510		15 m			
ENR-2510		25 m			
ENR-1516			15 m		
ENR-2516			25 m		
ENR-1525				15 m	
ENR-2525				25 m	
ENR-1535					15 m
ENR-2535					25 m



Camerov® VISIOCAT

Catenary inspection equipement electric traction installation.

- Colour camera
  - High resolution CCD sensor
  - Remote controlled 10 x optical zoom
  - White LEDs lights
  - Remote controlled tilt movement
  - HF transmitter
  - 4 hours autonomy
  - Weight: 600 g
  - Isolating telescopic pole reaching 11 meters
- Portable video control unit
  - hardened laptop Panasonic Toughbook
  - Touchscreen
  - HF transmitter
  - Optional GPS
  - 4 hours autonomy
  - Dim.: L x W x H = 41 x 37 x 18 cm
  - Weight: 6kg
- Soft-cat inspection reports generator software
  - Camera control (zoom, focus, tilt, lighting...)
  - 768 x 576 pixels snapshots
  - 640 x 480 pixels video clips recording
  - Inspected elements measurement with 1/10ème mm reliability reporting edition wizard
  - Multimedia CD or DVD production
  - Files and report custom design
  - Anomaly library





ZVISIOCAT	Colour camera + portable video + software

NEW RANGE OF BIMATERIAL INSULATED TOOLS

ISOMIL™ 2

1000 V CEI 60900 - EN 60900

FOR LIVE WORKING UP TO 1000 VOLTS ACCORDING TO IEC 60900 STANDARD



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

CATU™

Specification for short-circuiting and earthing systems

A Network, electrical installation characteristics

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. _____
- Flat bars
  - H type ☐ Length = _____ 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. Δ 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 ☐

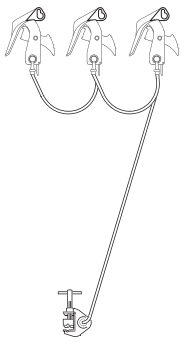
Characteristics

- Selected connection type: Sketch n° _____
- Contact clamps (type MT- _____)
- Short-circuiting cable
  - Length (m) _____
  - Dia. or section (mm, mm²) _____
- Grounding cable
  - Length (m) _____
  - Dia. or section (mm, mm²) _____
- 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 _____

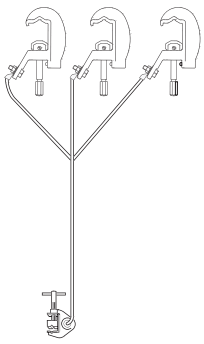
Sketch N°1



Sketch N°2



Sketch N°3



Accessories

- Carrying bag for sticks ☐
- Canvas bag for equipment ☐
- Carrying case for equipment ☐
- Cable reel ☐





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