ELECTRICOS
INTERNACIONAL SAS

MANUFACTURERS OF:

- Overvoltage
- Overcurrent
- Overhead components

2024
Product Catalog

Stavol®

LUHFSER®

www.electricosinter.com
guycombeau@yahoo.com
gerencia@electricosinter.com
Calle 17 No. 42A - 69
Bogotá D.C. - Colombia

Content

LABORATORY AND CERTIFICATIONS

The excellence of our products

Test reports fuses
Test reports GKS
Accredited laboratory

OVERVOLTAGE

Low voltage protection box
Transfomer secondary protection
Disconnector for arresters
Surge arresters
Drop out surge arresters
Disconnector
Lightning Protection System (LPS)
Telecommunication kits
Kits for distribution lines

OVERCURRENT

Expulsion fuse link Double acting
Expulsion fuse links storm proof
Expulsion fuse links Joule Sentry
Expulsion fuse links
Auxiliary Tubes
Secondary fuses
Coastal fuse cutout
Low voltage fuses
Overhead hookstick switches
Cable clamp connectors

OVERHEAD AERIAL

Cable spacer
Antisway arm support
Bracket
Pin insulator

Who we are

01

100% Colombian company,

We provide security and electrical reliability.

We are leaders in the manufacturing of protective overvoltage, overcurrent and overhead components.

02

We are important allies with utility companies avoiding unnecessary interruptions of electrical systems for unknow causes generating costly losses reflected in important indicators such as SAIFI.

Electricos Internacional S.A.S

40 Años

03

Our products are manufactured with state-of-the-art technology under the most demanding quality standards ISO 9001:2015, ISO 14001:2015 and ISO 45001:2018.

04

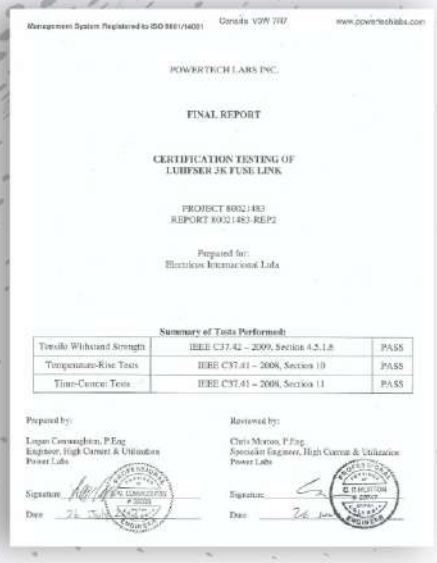
We are present in the Asian and American continet showing our commitment to global energy security.

Test reports fuses

Powertech

The Power of Trust. The Future of Energy.

Universidad Nacional de Río Cuarto



Management System Registered to ISO 9001/14001 — Canada V3W 7R7 — www.powertechlabs.com

POWERTECH LABS INC.

FINAL REPORT

CERTIFICATION TESTING OF
LUHFSER 3K FUSE LINK

PROJECT 80021483
REPORT 80021483-REP2

Prepared for:
Electricos Internacional Ltda

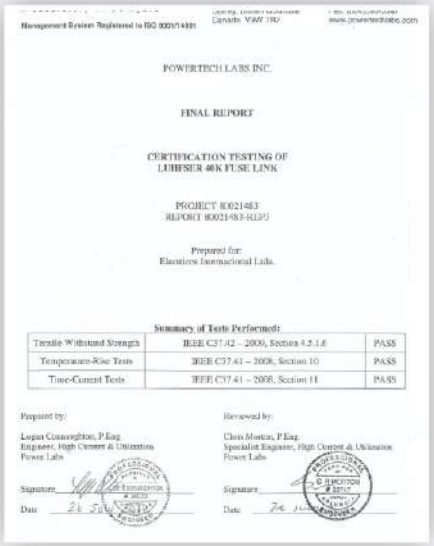
Summary of Tests Performed:

Tensile Withstand Strength	IEEE C37.42 – 2009, Section 4.5.1.6	PASS
Temperature-Rise Tests	IEEE C37.41 – 2008, Section 10	PASS
Time-Current Tests	IEEE C37.41 – 2008, Section 11	PASS

Prepared by: Logan Connaughton, P.Eng. Engineer, High Current & Utilization Power Labs

Reviewed by: Chris Morton, P.Eng. Specialist Engineer, High Current & Utilization Power Labs

Signature / Date



Management System Registered to ISO 9001/14001 — Canada V3W 7R7 — www.powertechlabs.com

POWERTECH LABS INC.

FINAL REPORT

CERTIFICATION TESTING OF
LUHFSER 40K FUSE LINK

PROJECT 80021483
REPORT 80021483-REP3

Prepared for:
Electricos Internacional Ltda.

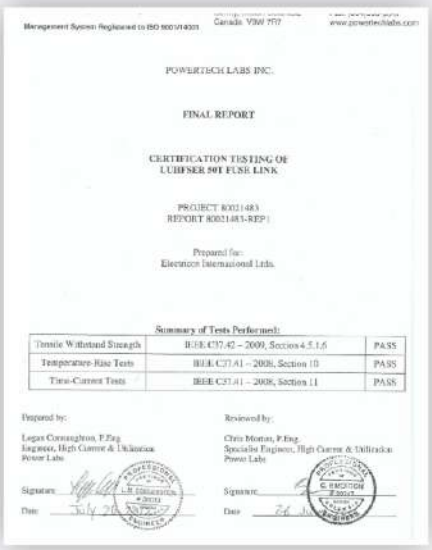
Summary of Tests Performed:

Tensile Withstand Strength	IEEE C37.42 – 2009, Section 4.5.1.6	PASS
Temperature-Rise Tests	IEEE C37.41 – 2008, Section 10	PASS
Time-Current Tests	IEEE C37.41 – 2008, Section 11	PASS

Prepared by: Logan Connaughton, P.Eng. Engineer, High Current & Utilization Power Labs

Reviewed by: Chris Morton, P.Eng. Specialist Engineer, High Current & Utilization Power Labs

Signature / Date



Management System Registered to ISO 9001/14001 — Canada V3W 7R7 — www.powertechlabs.com

POWERTECH LABS INC.

FINAL REPORT

CERTIFICATION TESTING OF
LUHFSER 50I FUSE LINK

PROJECT 80021483
REPORT 80021483-REP1

Prepared for:
Electricos Internacional Ltda.

Summary of Tests Performed:

Tensile Withstand Strength	IEEE C37.42 – 2009, Section 4.5.1.6	PASS
Temperature-Rise Tests	IEEE C37.41 – 2008, Section 10	PASS
Time-Current Tests	IEEE C37.41 – 2008, Section 11	PASS

Prepared by: Logan Connaughton, P.Eng. Engineer, High Current & Utilization Power Labs

Reviewed by: Chris Morton, P.Eng. Specialist Engineer, High Current & Utilization Power Labs

Signature / Date

LEC — Universidad Nacional de Río Cuarto

Informe de Ensayo

Fusibles de expulsión
Pruebas de interrupción

Ref.: IE-1278.09
Emisión: 11-Dic-2009
Página: 1 de 6

Descripción del objeto ensayado	Fusible de expulsión para seccionador autodesconectador
Marca comercial	LUHFSER
Modelo/referencia de tipo	Tipo "K"
Fabricante	CI ELECTRICOS INTERNACIONAL LTDA.
Características nominales	Un: 15 kV, In: 40 A, Velocidad "K"
Responsable de la Función Técnica	Ing. Germán ZAMANILLO
Responsable Gestión de la Calidad	Ing. Gabriel CAMPETELLI
Director	Ing. Daniel H. TOURN
Resultado de los ensayos	Los elementos ensayados cumplen satisfactoriamente los requerimientos de los apartados de la norma de referencia incluidos en este informe.
Lugar del ensayo	Laboratorio de Ensayos y Certificaciones – IPSEP Facultad de Ingeniería Universidad Nacional de Río Cuarto Laboratorio de Ensayo con Sistema de Gestión de la Calidad, implementado según Norma IRAM 301:2005 – ISO/IEC 17025:2005
Dirección	Ruta Nacional 36 – Km. 601. (X5804BYA). Río Cuarto, Córdoba. Argentina.
Cliente	CI ELECTRICOS INTERNACIONAL LTDA.
Dirección	Cra. 31 A. N° 11-40. Bogotá. D.C. - Colombia
Fecha de realización del ensayo	03/04-Dic-2009
Normas	IEEE Standard Design Tests for High-Voltage (>1000 V) Fuses, Fuse and Disconnecting Cutouts, Distribution Enclosed Single-Pole Air Switches, Fuse Disconnecting Switches, and Fuse Links and Accessories Used with These Devices
Base de informe N°	IEEE Std. C37.41-2008
Base originada por	Laboratorio de Ensayos y Certificaciones – IPSEP
Fecha y revisión de la base	07-Dic-2009 Rev: 00
Procedimiento empleado	Verificación conforme a las normas indicadas
Tipo de desviaciones	No hay desvíos
Métodos no normalizados	No se aplicaron

Reproducción parcial prohibida sin previa autorización.

3 RESULTADOS

Los valores registrados se muestran en las Tablas 1 y 2:

Tabla 1

SERIE 4							
Muestra N°	Calibre	Corriente Presunta [A]	Corriente Presunta Cosφ	Tiempo de pearco [ms]	Tiempo total [ms]	Gráfico Anexo I (Oscilograma N°)	Observaciones
1	40K	486	0.28	204,0	240,7	N° 1	Satisfactorio
2	40K	420	0.28	241,0	250,1	N° 2	Satisfactorio

Reproducción parcial prohibida sin previa autorización.

Tabla 2

SERIE 5							
Muestra N°	Calibre	Corriente Presunta [A]	Corriente Presunta Cosφ	Tiempo de pearco [ms]	Tiempo total [ms]	Gráfico Anexo I (Oscilograma N°)	Observaciones
3	40K	177	0.75	8,0	1,39	N° 3	Satisfactorio
4	40K	177	0.75	12,0	1,42	N° 4	Satisfactorio

4 CONCLUSIÓN

De los resultados obtenidos se concluye que las muestras ensayadas superaron exitosamente las pruebas de interrupción (Series 4 y 5) de la Norma de referencia.

Our fuses have passed strict electrical test at recognized international laboratories.

Test report GKS

EATON laboratory at Franksville

THOMAS A. EDISON POWER TEST LABORATORIES
TEST REPORT
Fault Testing
On
Electricos Stainless Grounding Rod and Strap
- Manufactured By -
Electricos International LTDA.
Calle 17 No. 42A-69
Bogota D.C. - Colombia
- Prepared By -
Dan Beffa
Technician, Power Test Laboratories
- Approved By -
Christopher Borck
Christopher Borck
Manager, Power Test Laboratories
Report # PTL21-222-A-ver1
Issued: 7/27/2021
ACCREDITED
Certificate number 1457.01
Performed By:
Thomas A. Edison Power Test Laboratories
11131 Adams Road
Franksville, WI 53126
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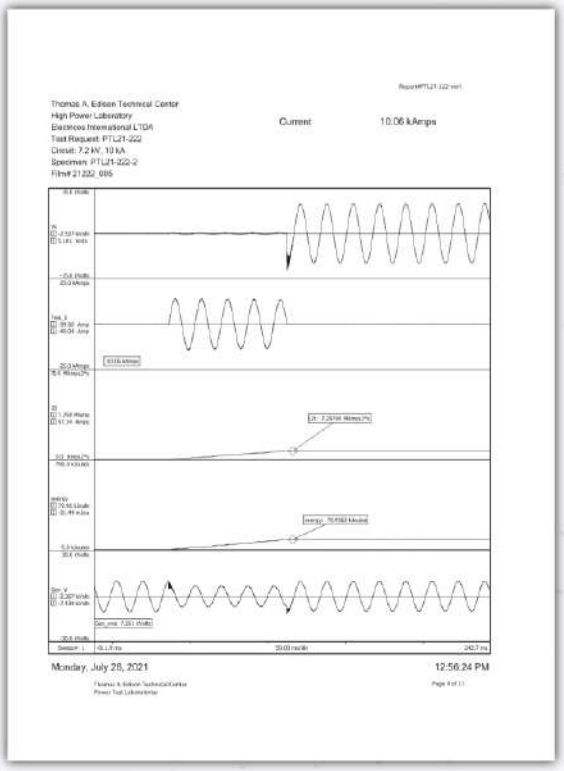


Thomas A. Edison Technical Center
High Power Laboratory
Electricos International LTDA
Test Request: PTL21-222
Circuit: 7.2 kV, 10 kA
Specimen: PTL21-222-2
File# 21222_005
Current 10.06 kAmps
Monday, July 26, 2021 12:56:24 PM

Electrical testing compared to other materials

Our material resists short circuit test

Other materials present failures and risk of explosion

Accredited laboratory

We design customized fuses

ELECTRICOS INTERNACIONAL SAS. laboratory provides electrical, mechanical and dielectric capacity testing services to electrical products based on customer requirements under national and international technicals standars. It has properly trained, technical personnel, competent and impartial, familiar with the documentation and committed to implementing the policies and procedures in accordance with ISO 17025.

ONAC ACREDITADO

12-LAB-055

We perform dielectric testing

The top management is committed to good professional practices, the quality of the performmed tests during the service to its customers and compliance with the ISO 17025 standard.

Overvoltage

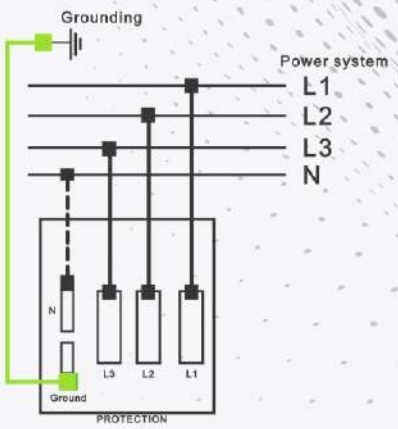
Arresters

Connectors

Conductors

Low voltage protection box

Provides surge protection for your equipment in three-phase low-voltage networks.



Transformer secondary protection

Models:
150V 40Ka & 420V 40Ka
Maximum operating voltage:
150V & 440V
Rated current at 8/20us:
300A
Maximum surge current at 8/20us:
40Ka

Disconnector for arresters

Breaking load:
3000N
Flexural strength:
60Nm
Torsion resistance:
27Nm
Electric resistance N/A:
∞
Electric resistance N/C:
22K Ω

Surge arresters

Distribution class 100kA

3kV to 9 kV

Arrester rating (kV rms)	MCOV (kV rms)	Front-of-wave protection level (kV peak) (Voltage protection)	Height A (mm)	Bil (kV)
3	2.55	10.6	70	64,5
6	5.1	20.7	93	70,5
9	7.65	31.7	137	100

10kV to 24 kV

Arrester rating (kV rms)	MCOV (kV rms)	Front-of-wave protection level (kV peak) (Voltage protection)	Height A (mm)	Bil (kV)
10	8.4	33.7	137	100
12	10.2	41.5	137	100
15	12.7	51.8	137	100
18	15.3	61.6	193	132
21	17	66	213	144
24	19.5	77	235	157,5

27kV to 36 kV

Arrester rating (kV rms)	MCOV (kV rms)	Front-of-wave protection level (kV peak) (Voltage protection)	Height A (mm)	Bil (kV)
27	22	87.2	257	171
30	24.4	97.1	267	174
36	29	116	312	200

Drop out surge arresters (DOSA)

9kV to 15 kV

COMPATIBILITY WITH ARRESTERS FOR:

9 kV 12 kV
10 kV 15 kV

Nominal operating voltage

15kV

Weight: 5.66 Kg

Bil: 110kV

18kV to 24 kV

COMPATIBILITY WITH ARRESTERS FOR:

18 kV 24 kV
21 kV

Nominal operating voltage

24kV

Bil: 200kV

Weight: 11.66 Kg

27kV to 36 kV

COMPATIBILITY WITH ARRESTERS FOR:

27 kV 36 kV
30 kV

Nominal operating voltage

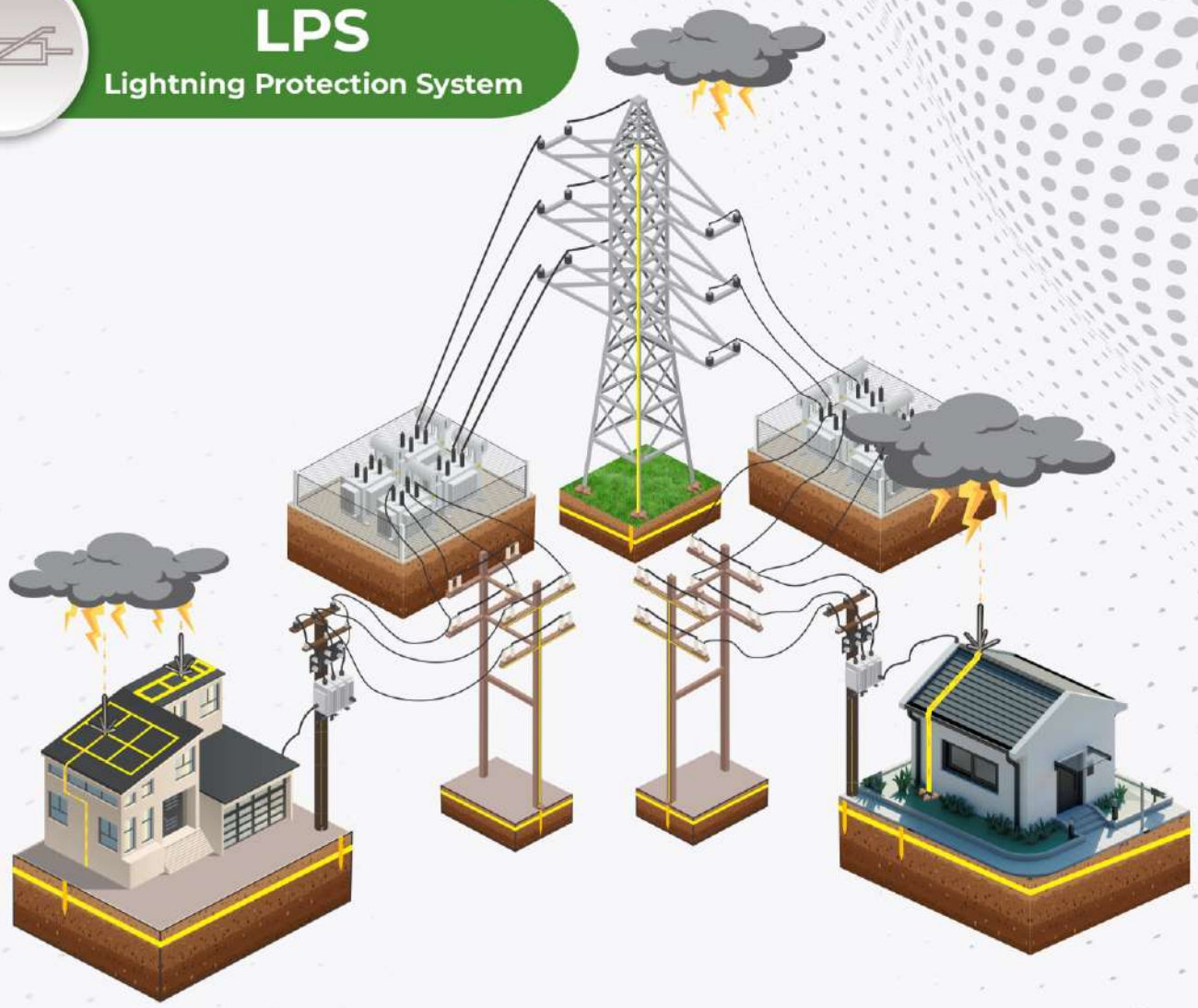
36kV

Bil: 200kV

Weight: 12 Kg

LPS

Lightning Protection System



LPS CONNECTORS

multiple flat conductors

ROD

CONDUCTOR

Multiple flat conductors x3

Crossroad connector

Connector type C

Connector type J

Assembly connector

Type swivel connector

Connector type G

Connector type electrode plate

Connector type M for messenger wire

Type rod cable connector

Connector rod straps

Connector type T

Open cross type connector 3T

Guide clamp

Connector straps-cable

Connector straps-rod 5/8"

Busbar - 100 mm x1/4 200 - 400 - 500 - 600

Busbar type

Self support for straps type 1

Connector type wedge 10mm

Security nut

Connector type U 5/8"

Flat connector for cable

Connector for tube

insulator

Insulator clamping arm with base

Multiple flat conductors 5/8" - 4 plate base for cable

Base franklin rod with strap

Base franklin rod to cable

Base franklin rod 5/8" - 10 mm

Flat connector strap for cable

Connector type J

Connector type J 5/8 3 screws

Connector Type J 1/2 staggered

Connector fixation straps 5/16"

Connector conductor - tube

Connector type bore double perforation 1/4" - 3/16" - 5/16" - 1/2"

Connector type bore 1 1/4" - 3/16" - 5/16" - 1/2"

Connector type bore 3 1/4" - 3/16" - 5/16" - 1/2"

flat connector extender 1 bolt

Flat connector extender 2 bolts

LPS CONDUCTORS

Made of austenitic stainless steel type 304.

CONDUCTOR 25 MM X 2 MM

CONDUCTOR 20 MM X 2.5 MM

CONDUCTOR 25 MM X 2.5 MM

CONDUCTOR 30 MM X 3 MM

FRANKLIN RODS

Rod in stainless steel
10 mm (60 cm to 120 cm)
5/8" (60cm to 120cm)

flat in stainless steel
10 mm (60 cm to 120 cm)
5/8" (60cm to 120cm)

Franklin rod

ELECTRODES

plate in stainless steel
200 mm x 100 mm x 6.35mm

Tube in stainless steel
3/4"

Stainless steel
10 mm (1.50 meter to 2.40 meter)
1/2" (1.50 meter to 2.40 meter)
5/8" (1.50 meter to 2.40 meter)

Electrode rod

STRAPS & BUCKLES

Buckles
3/8" - 1/2" -5/8" - 3/4"

Straps
3/8" - 1/2" -5/8" - 3/4"

Clamps
3/8" - 1/2" -5/8" - 3/4"

MECHANICAL TESTING

The austenitic stainless steel clamp type 304

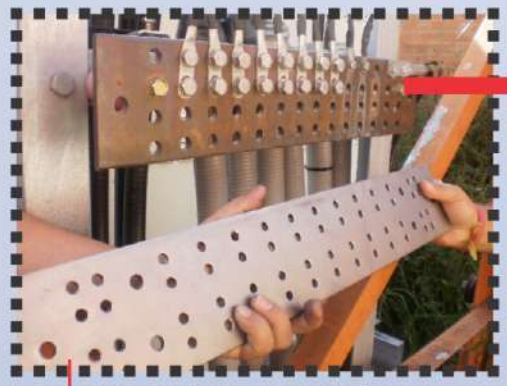
Withstands the value of the maximum force that the assembly must support Eg: 5/8" of 450Kgf

Telecommunication
KITS

PREVENT COPPER THEFT USING AUSTENITIC STAINLESS STEEL 304

1. Outlives the useful life of copper.
2. Avoids feeding into the illegal market.
3. Service is not interrupted as a result of theft.
4. Our material is certified and tested.

Copper busbar
easy target
for thieves



BUSBAR

AUSTENITIC STAINLESS STEEL 304

The best option
against galvanic
corrosion

WE DESIGN AND
MANUFACTURE

KITS FOR
DISTRIBUTION LINES

HDPE EXTRUDED COVER

SOME APPLICATIONS

Oil rigs
Primary neutral
Secondary neutral
Overhead grounding wire
Distribution Transformer
Surge arresters
Telecontrolled reclosers
Capacitors

GKS
(GROUNDING KIT SYSTEM)

Overcurrent

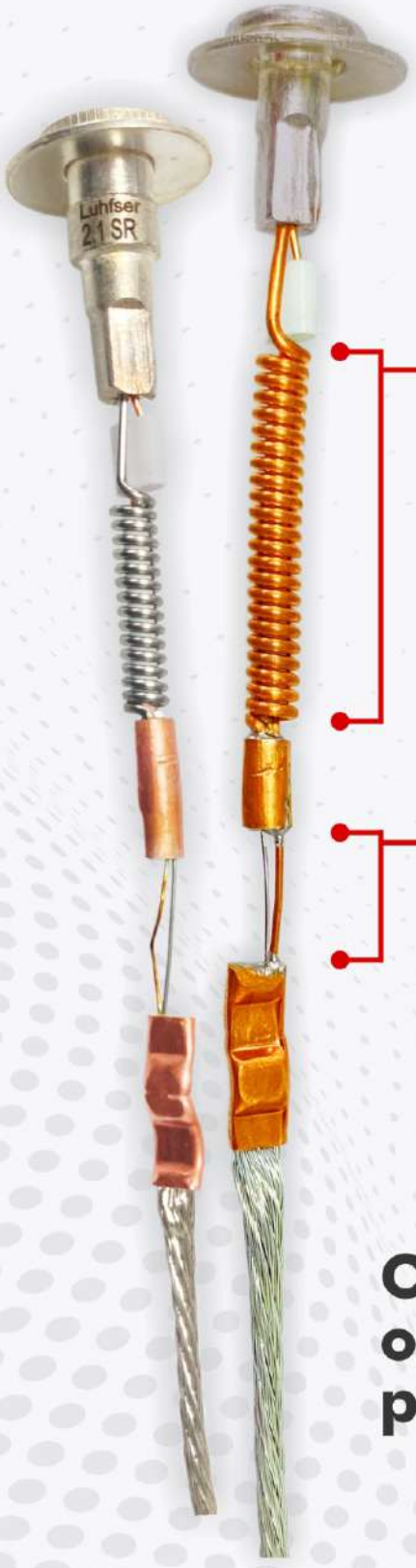
Dropout fuse cutout

Fuse link

Hookstick switch

¿Are you properly protecting your transformer against overcurrent?

Double acting fuse link (SR)



Slow operation

It is a coil wrapped on an insulated tensor wire, both in parallel pressed to the terminal and the other end a small copper juncture.

Quick operation

It has a parallel steel tension wire and a copper wire, similar to a K-type, die-cut to the copper ferrule and juncture.

Our double acting fuse link offers the best protection to the power grid and the transformer

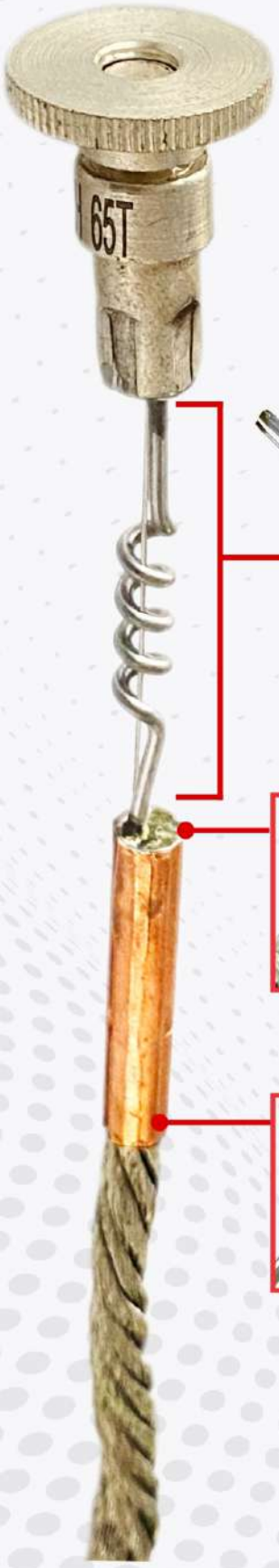
Anti - storm fuse (VS)

The fast section, like the slow section, has four alloyed copper-nickel wires in parallel, pressed on the ferrule and bushing, joined by a soldered juncture.

In VS type fuses when operating with fault currents or overloads they transmit sufficient temperature through the fuse wires to the welded joint causing melting of the weld and opening of the circuit.

VS type fuses are fuses manufactured with fusible wires made of thermosetting alloys specially designed to have a stable electrical behavior with the alterations normally produced by overheating due to overloads. The VS fuse has excellent handling in the overload segment except that it is slower at the high current end. The superior surge resistance makes the probability of lightning damage very small, which makes the VS fuse ideal for the protection of small to medium kVA distribution transformers especially in rural areas.

Joule Sentry®

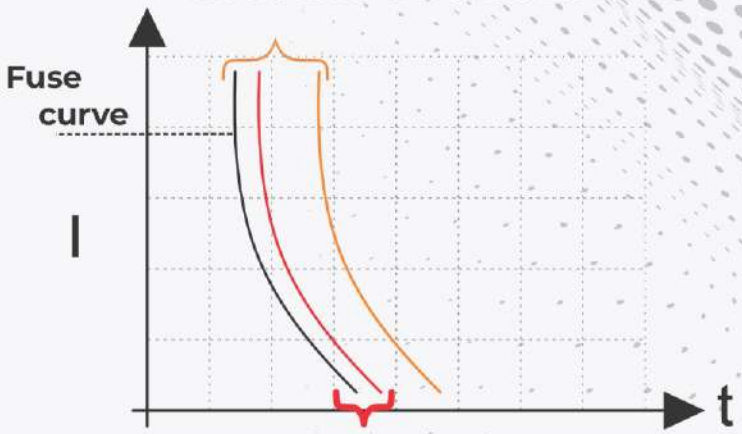


Helicoid wire silver element

Soldered

Pressed

Other fuses operate with the TCC at 25%



Our FUSE LINKS OPERATE with TCC lower than 10%

Cross reference	
Joule Sentry	Positrol
K	K
M	STD
T	T
F	QR

Fuse links expulsion

LUHFSER®

Fuses under technical standards
IEEE STD C37.41:2016 - IEEE STD C37.42:2016
NTC 2132:2006 - NTC 2133:2002

Type H — 1 to 100 A

Fuse element:
Copper
Speed ratio:
4,7 a 7,1

Type K — 1 to 200 A

Fuse element:
Tin or Silver alloy
Speed ratio:
6 a 8,1

Type T — 1 to 200 A

Fuse element:
Tin or Silver alloy
Speed ratio:
10 a 13,1

Type NS — 1 to 100 A

Fuse element:
Silver alloy
Speed ratio:
7 a 8,5

Type VS® — 1 to 100 A

Fuse element:
CuNi & CrNi
Speed ratio:
18 a 24,3

Type SR® — 0.2 to 46 A

Fuse element:
CuNi & CrNi
Speed ratio:
13 a 30

Removable head

Button head

AUXILIARY TUBES

Manufactured in vulcanized fiber with the appropriate technical specifications that guarantee compliance whit the ASTM D-635 flammability standard

Damage fuse holders

Generate fires

Burn electrical contacts

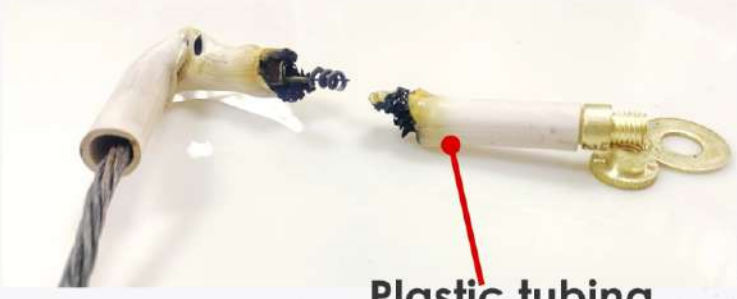
SHORT CIRCUIT

Our fuses OPERATE when they are supposed to, and our tubes maintain their integrity to prevent arcing.

OVERLOAD

No matter how many users are connected to the network, our VULCANIZED FIBER TUBES will NOT burn out.

This happens when the right materials are not used.



Plastic tubing
WITHOUT vulcanized fiber

Secondary fuses

- High cost
- When the fuse melts. Its does not eject, its indicator LED bulb is difficult to read.
- There are not enough fuse sizes on the market to coordinate with the fuse link on the primary transformer.

SWITCH

- Low cost.
- Eject indicator for easy identification of a damaged fuse causing the fuse holder to open and drop.
- The fuse is installed inside a fuse holder with arc-extinguishing properties, producing a gas that eliminates the arc when fuse element failure occurs.

THREE PHASE TRANSFORMERS					
KVA	PRIMARY			SECONDARY	
	Nominal current (A)		Fuse type DUAL reference	Nominal current (A)	Recommended Expulsion Fuse to be used with output switch
	11,4 kV	13,2 kV		208/120 V	
15	0,75	0,65	0,4	42	40 Exs
30	1,52	1,31	1,0	83	80 Exs
45	2,28	1,97	1,4	125	125 Exs
75	3,80	3,28	2,1	208	200 Exs

SINGLE PHASE TRANSFORMERS				
KVA	PRIMARY		SECONDARY	
	Nominal current (A)	Fuse type DUAL reference	Nominal current (A)	Recommended Expulsion Fuse to be used with output switch
	13,2 kV		120 V	
5	0,37	0,4	41	40 Exs
10	0,76	0,6	83	80 Exs
15	1,13	1,0	125	125 Exs

Coastal fuse cutout

Coastal areas or high pollution

Technical standards:
IEEE Std C37.41:2016/ IEEE Std C37.42:2016
austenitic stainless steel fittings type 304
Operating voltage: 15 kV
Continuos Operation: 100 A
Interrupting capability: Symmetrical: 7.1 kA – Asymmetric 10 kA
BIL: 110 kV
Creepage distance: 800 mm
Fastening hardware: Desing under the compliance with the standard IEEE C37.42
Hooks opening under load: Compatible with LoadBuster
Weight: Approximate 5.5 Kg

Low voltage fuses

FUSE
CBO (250 V)
for street lights

Technical standards:
UL 248 - 1 / UL 248-4
Voltage: 250v
0 - 30 A

FUSE
QSQ (600 V)
for street lights

Technical standards:
UL 248 - 1 / UL 248-4
Voltage: 600v
0 - 30 A

SINGLE FUSE HOLDER BASE FOR STREET LIGHTS

Technical standards:
UL 4248 - 1 / UL 4248-4
BASE : Molded in polycarbonate
Terminals : Galvanized steel screws and nickel-plated copper alloy contact clips
RANGE: 30 Amps - 600 Volts
FOR CONDUCTORS OF :
1.5 - 6 mm2

DOUBLE FUSE HOLDER BASE FOR STREET LIGHTS

Technical standards:
UL 4248 - 1 / UL 4248-4
BASE : Molded in polycarbonate
Terminals : Galvanized steel screws and nickel-plated copper alloy contact clips
RANGE: 30 Amps - 600 Volts
FOR CONDUCTORS OF :
1.5 - 6 mm2

Overhead hookstick switches

24kV to 27 kV

	Silicone insulator	Ceramic insulator
Leakage distance (mm)	845	400
Rated current (A)	630	630
Short duration current	25KA at 1s	25KA at 1s
Frequency	50-60 Hz	50-60 Hz

36kV to 38 kV

	Silicone insulator	Ceramic insulator
Leakage distance (mm)	845	740
Rated current (A)	630	630
Short duration current	25KA at 1s	25KA at 1s
Frequency	50-60 Hz	50-60 Hz

15.5kV to 17.5 kV

	Silicone insulator	Ceramic insulator
Leakage distance (mm)	420	432
Rated current (A)	630	630
Short duration current	25KA at 1s	25KA at 1s
Frequency	50-60 Hz	50-60 Hz

Cable clamp connectors

Stainless steel bolts & nuts	1/2"
Tightening torque	54.2 N*m (480 lb*in)
Standard	NTC 2155, NEMA
Type of cable	ACSR (336.4 - 477 Kcmil) Aluminum and copper (350 - 600 Kcmil)

Terminal made of high-strenght aluminum casting for a wide range of cables with high electrical conductivity and connection by clamping or pressure.

It can be used in medium and high voltage substations in switchgear connections.

Nuts & bolts manufactured in stainless steel Austenitic AISI/SAE 304.

Surface treatment for use in areas with high corrosion levels.

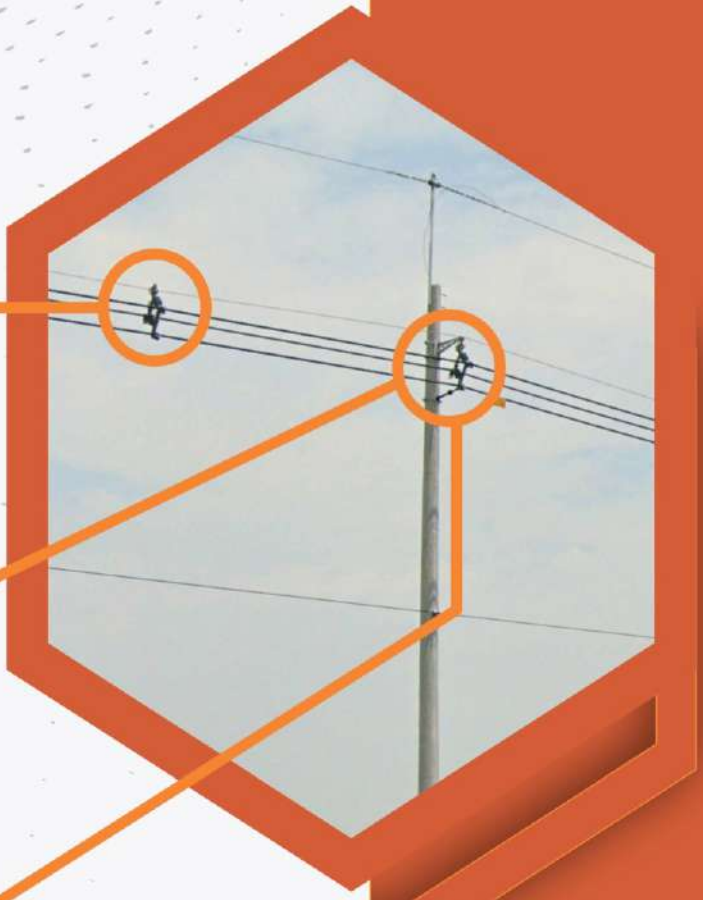
Overhead components

Cable spacer

Brackets

Antisway bracket

Pin insulator



Cable spacer

1. We ensure the insulation of the network, using our clamp type spacer, made of high density polyethylene (HDPE) providing a high resistance to impacts and loads generated by the power line.

2. Resistant to erosion and tracking formation due to weather exposure and resistance to UV rays incidence.

POLYMERIC SPACER FOR COMPACT NETWORKS 15kV				
Voltage (kV)	Height	width	Weight (grams)	Minimum leakage distance
15	18.4"	13.7"	842	11.02"

Nominal voltage (kV)	15
Weight (lb/ft), assuming 30 ft of separation	0.614
Short circuit rating (kA)	13.5
Voltage withstand at industrial frequency under rain (1 min)	34

Antisway arm support

It has a self-locking pin for assembly together with the pin

Decreases cable sway in the spacer, reducing stress and wear

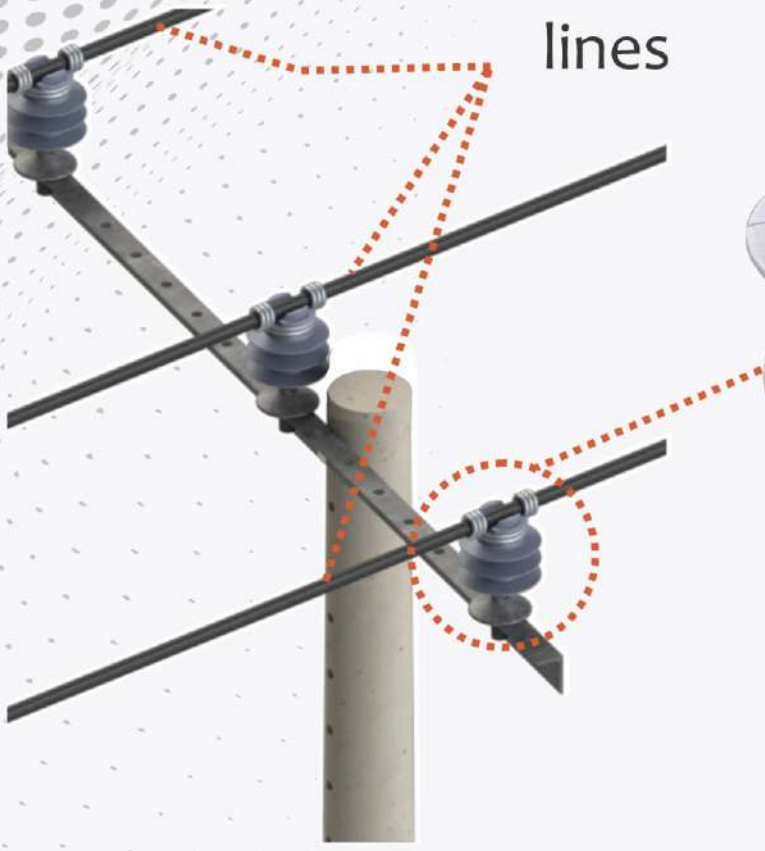
Maintains spacer distance from the pole

Produced in high density polyethylene (HDPE) for 15KV voltages.

Maximum operation voltage (kV)	Maximum installation angle	Tensile strength (lbf)	Compression without deformation (lbf)	Stress without deformation (lbf)	Lateral stress (lbf)
15	6°	278	278	397	110

Pin insulator

Power distribution lines



Creepage distance	310 mm
Dry arcing distance	172mm
Cantilever mechanical resistance	13 kN
Wet Power Frequency Voltage	40 kV
Perforation voltage	95 kV
Maximum Operating Voltage	15 kV

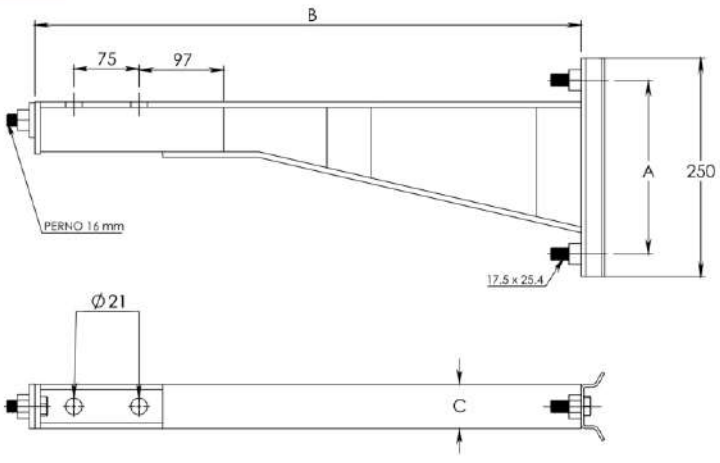
Provides a rigid mechanical support to the electrical conductors and at the same time insulates the pole structure.

Manufactured in high density polyethylene HDPE. It has great resistance to impact and mechanical loads.

TRACKING TESTING

We perform tracking tests on all batches of our HDPE material to ensure its electrical properties.

Bracket



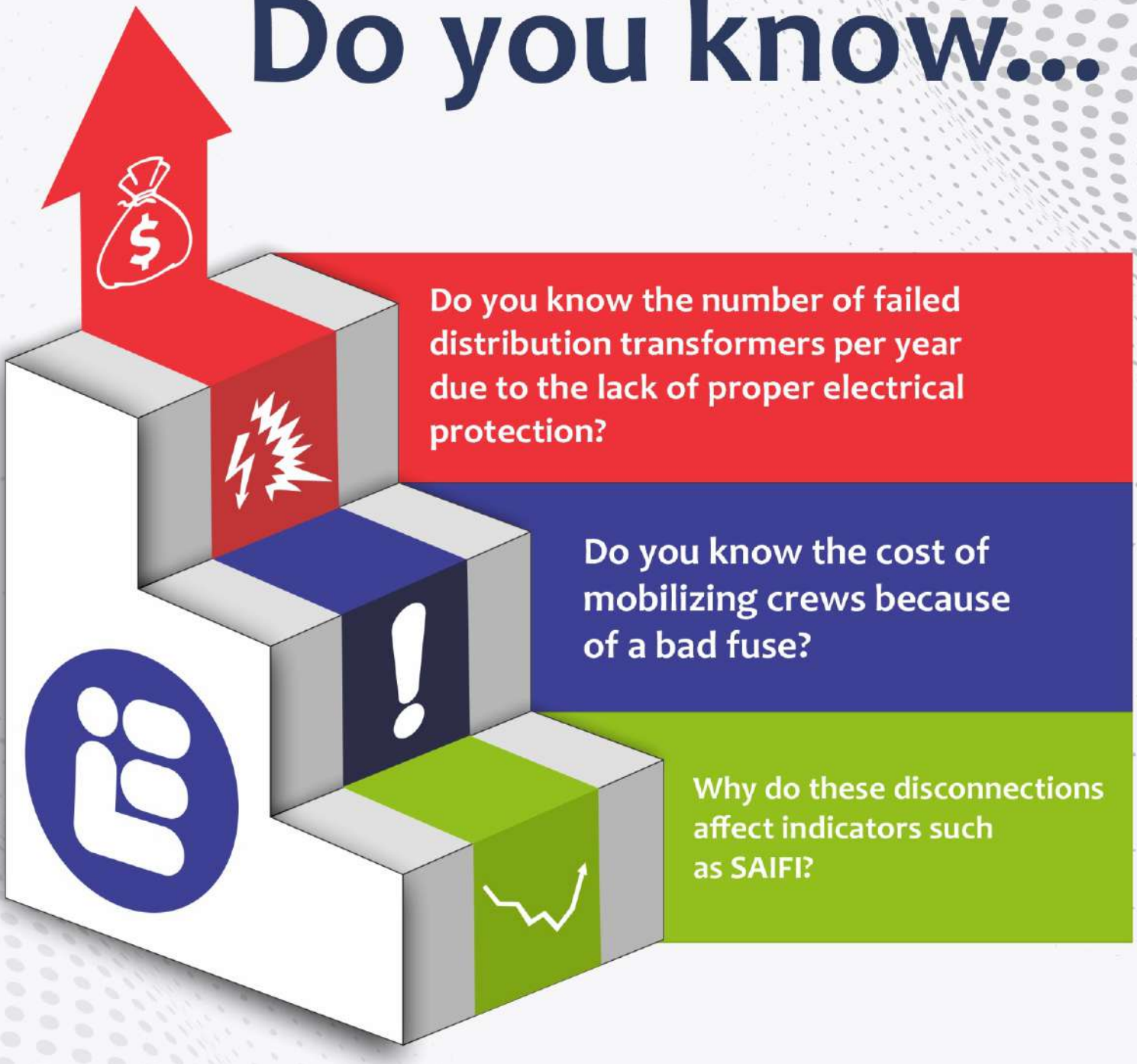
Features:

Fitting used for the support of the aerial cable of the 15kV ecological network.

Manufactured in structural steel. It is composed of a body and a cable gland assembly. All elements are hot-dip galvanized.

NOTE: Galvanized according to NTC 2076 standard. The connector is made of nodular cast iron.

Do you know...



Do you know the number of failed distribution transformers per year due to the lack of proper electrical protection?

Do you know the cost of mobilizing crews because of a bad fuse?

Why do these disconnections affect indicators such as SAIFI?

We are committed to energy quality

ELECTRICOS
INTERNACIONAL SAS

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