Protective systems against athmospheric discharges and electric discharges

Energy Control designs and manufactures the most advanced and secure protection systems against electrical disturbances and atmospheric discharges.

Protection for critical equipment, creating an electrical noise free environment, avoiding random errors, deprogramming and break downs.

Primary and secondary protective devices applied in:

- Telephony
- Telecommunication
- Electricity
- Industry
- Electromedicine

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Personalized assessment.

Our added value.

Our commitment to serve this industry involves not only that the products are manufactured with the highest levels of quality, but also thanks to the development of international agreements with numerous countries in Latin America, we supply the most comprehensive pre & post sales services. Our technical department is responsible for the audits of facilities, recommendation of necessary protection, and the correct installation of the devices and of the inspections to test the optimal performance of each unit. In Energy Control you will always find answers & solutions.

Technical Information

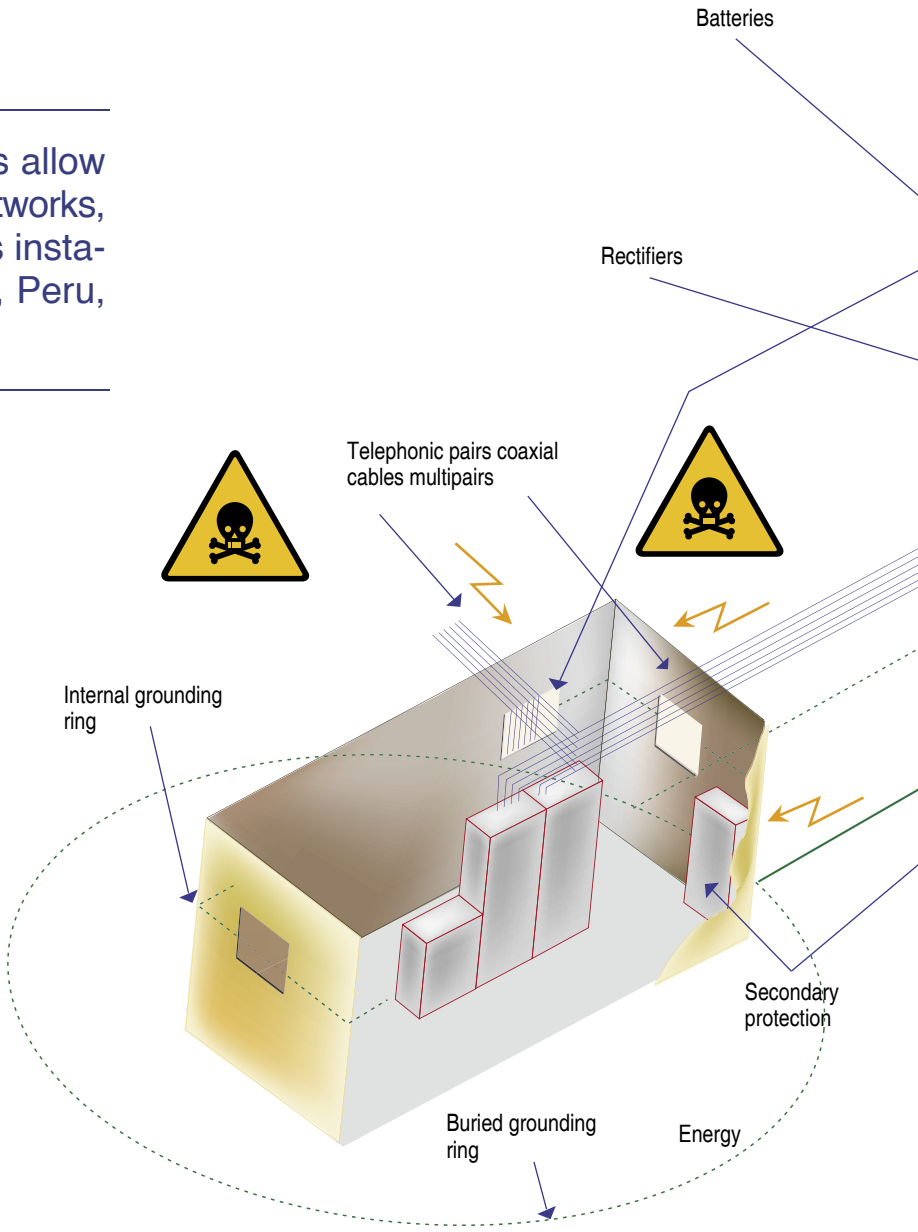
Protection for telecommunications against electric disturbances

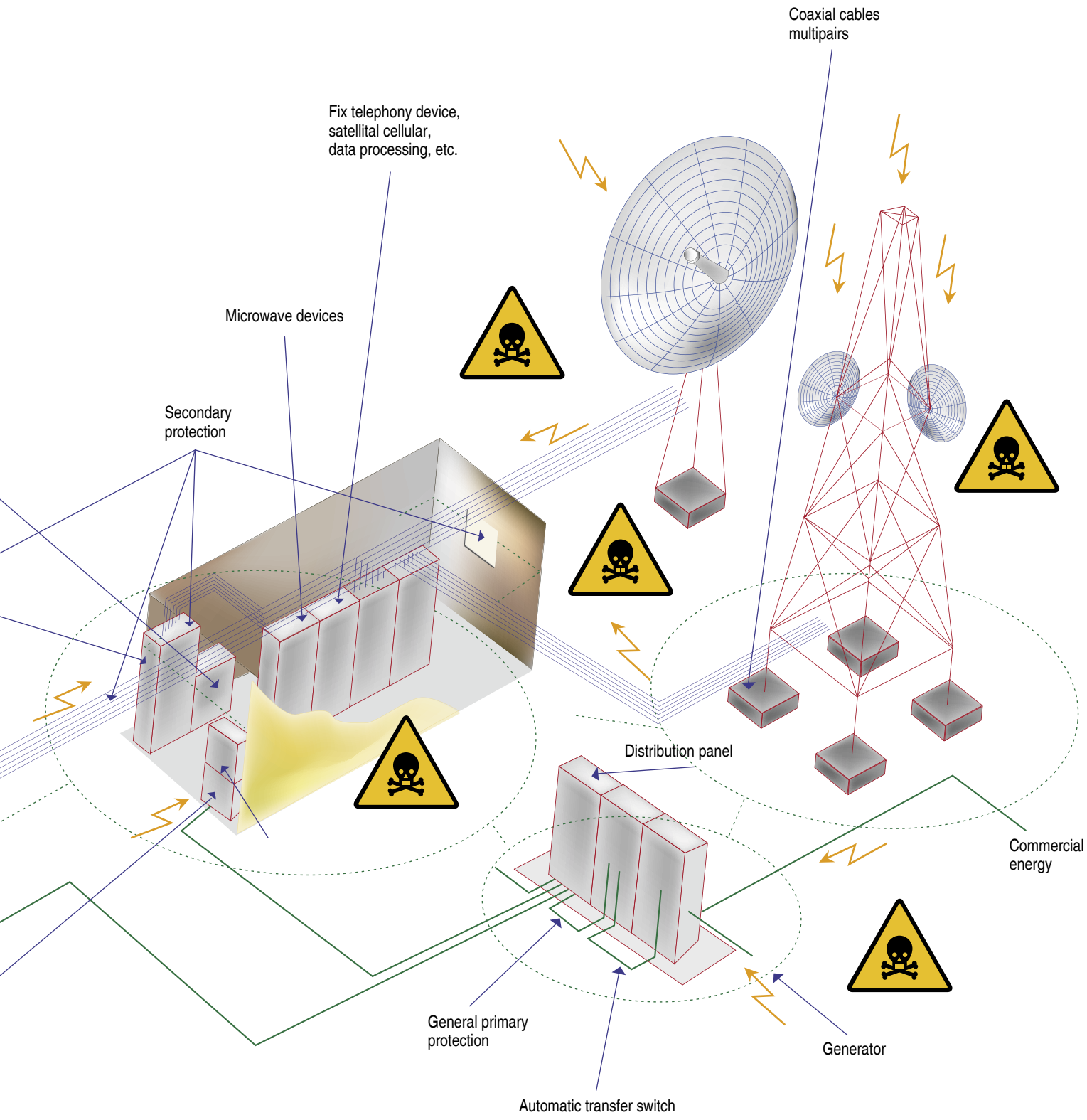
A protection system for telecommunications consists of multiple protective elements, each energy conductor must have a device to deviate the induced energy caused by atmospheric discharges or electric noises generators, that go inside the system through the Ground system.
The correct coordination of the primary, secondary protection and the Ground system will effectively avoid ruptures and erratic behavior of the equipment installed within the site, and also extending its value lives.

Our exclusive Active Line Filters allow an effective protection on your networks, as we proved with 3500 devices installed in Argentina, Bolivia, Brazil, Peru, Uruguay and Venezuela.

:: Reference

- ELECTRIC AND ATMOSPHERIC DISTURBANCE
- GROUNDING SYSTEM
- DATA AND VOICE LINES
- POWER SUPPY LINES
- ELECTRIC DISTURBANCES DANGER ZONES

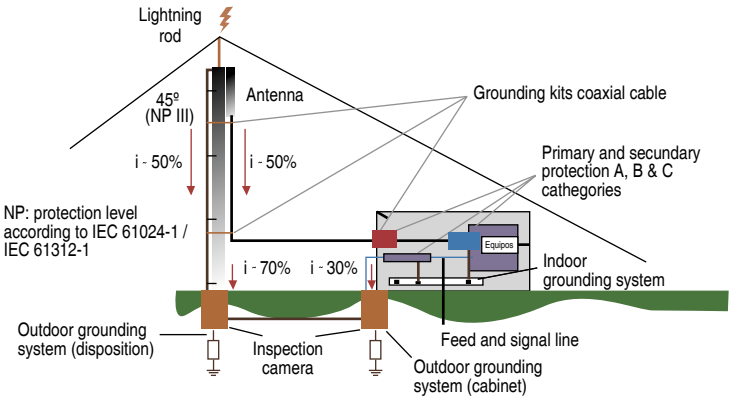



Coaxial cables
multipairs
Fix telephony device,
satellital cellular,
data processing, etc.
Microwave devices
Secondary
protection
Distribution panel
Commercial
energy
General primary
protection
Generator
Automatic transfer switch

Grounding Systems

Energy Control performs audits in order to verify and correct the coordination of every existing ground system and subsystem, both indoors and outdoors, relying on our personnel, highly qualified after 10 years of experience in the industry.
The question of having isolated ground systems or not becomes usual, but the reality tells that it depends on each case, in which the proper system must be applied. Nowadays, simple and concise analysis can be made to determine which configuration my Grounding System should have.
Examples: Electric networks, telecommunication systems, telephony, computer centers, data networks, automation, control, video and alarm systems, and any other service can hold several Grounding systems (i.e. more than 6 systems can co-exist in a single site or location).

DISTRIBUTION OF THE LOAD INPUT BY A LIGHTPING WITH ATMOSPHERIC DISCHARGES PROTECTION DEVICES



The grounds need to be totally integrated, becoming a coordinated ground network, which refers to a Coordinated Grounding System (CGS).

The installation of ground systems should cover the following objectives:

a) People's safety

b) Site facilities protection

c) Services continuity and stability

d) The establishment and surveillance of a reference potential

e) Elimination of electric noises

The issue of deciding which systems to use, has a very simple solution, but if not solved, can cause severe and complex damages. This is why it is so necessary to provide integral solutions regarding Grounding Systems, optimizing its design to be used as dispersion system, electric or electronic reference, protection system, etc. Energy Control performs audits in order to verify and correct the coordination of every existing ground system and subsystem, both indoors and outdoors, relying on our personnel, highly qualified after 10 years of experience in

- Technical assessment
- Project development
- Surveying - Auditing
- Quality control and supervision
- Measurements
- Installation
- Maintenance
- Empowerment courses

¿Why should electronic equipment be protected against electrical disturbances?

Just when did the power we've used for years get to be so dirty? The answer is that it's always been that way. But in the past, machines weren't quite so sensitive. Electric motors were simple and rugged enough to run almost endlessly. Electric typewriters could work night and day, unfettered by spikes or other changes in voltage. Electric equipment-from lights to heavy machinery - was unfazed by EMI, short for electro-magnetic interference.

Today, the devices we take for granted - from PCs, mainframes, FAX machines to complex facilities with robotic equipment and more - have become increasingly sophisticated. In addition, new types of electronic products operate at very low voltages and amperage levels. As a result, machines that contain modern, electronic printed circuit boards are very sensitive to power source changes and disturbances. What's more, there are very few electrically based products nowadays which are not controlled by new electronic micro chips and circuit boards.

The nature of electric power, on the other hand, has changed very little in the past few decades. Words like surge, spike, transient suppressing, and fluctuations now pepper our everyday language. But for a user of sensitive computer equipment, for example, any one of these electrical abnormalities can cause disaster. Hard drives can crash from an unexpected voltage surge. Circuits can be damaged. Process control equipment can go down. The list goes on and on.

Fitro activo de línea
EC- 3-470-65 KA

Lightings influence on electronics.

A real nemesis to modern electronic equipment is lightning strikes. These strikes occur worldwide with staggering frequency. In all, there is an average of 1,900 thunderstorms in progress around the world at any given moment. And the impact from lightning can be catastrophic, causing millions of dollars in property damage.
Other sources of power fluctuations can be just as harmful and can occur even more frequently than lightning. These power problems are most noted with equipment that runs in cycles, or has numerous on-off stages. Examples include air conditioners, refrigerators and other high-amperage drawing equipment.
But there is a way to clean up the electricity you use - before it can cause damage. The key is to eliminate the disturbances at the source. Energy Control's broad range of power products makes it easy and cost effective to safeguard electronic equipment from malfunction, downtime or failure. In the 10 years since we first introduced Active Tracking Filters for telecommunications, we've been leading the way in innovative solutions.

Active Filters with integrated primary and secondary stages

EC-Series devices with active filter are composed by two stages of protection, primary and secondary. The type of connection for these devices is series connection.
The first stage consists of shunting, whilst the second one involves active filtering, and it eliminates transients and disturbances both in Normal Mode (disturbances between phases or phase and neutral, also called Differential Mode) and in Common Mode (disturbances between phase and ground or neutral and ground).

"EC-Series" active filters will provide attenuation both for transients and disturbances, as well as constant noise (low values of voltage in high frequency) that pollute the 50Hz or 60Hz sine wave, due to the increase in the loads that generate this effect on Energy lines. Great or minimal disturbances are eliminated with the same efficiency.

It is well known that most electronic equipment do not receive current in sine waves, on the contrary, in general they tend to receive short current impulses. Active line filters "EC-Series" recognize this fact, and due to its very low impedance output, allow this non-linear current to be taken by the equipment without compromising the sine wave integrity (sine wave deformity).

The "Sine Wave Monitoring" allows spurious to be eliminated widely, with disregard of its point of creation within the sine wave.

"EC-Series" active device constantly monitors the sine wave, when it detects a divertion different form its pre-set value (+/- 2V), it triggers itself taking a few nanoseconds to act. In the schematized figure we can appreciate the concept of "EC-Series".
We appreciate a reference signal of 50Hz, obtained from a low pass filter Pi type. The distortion, instantly detected, activates the shunt element that reduces the disturbance reactance to the necessary level to neutralize the transient.

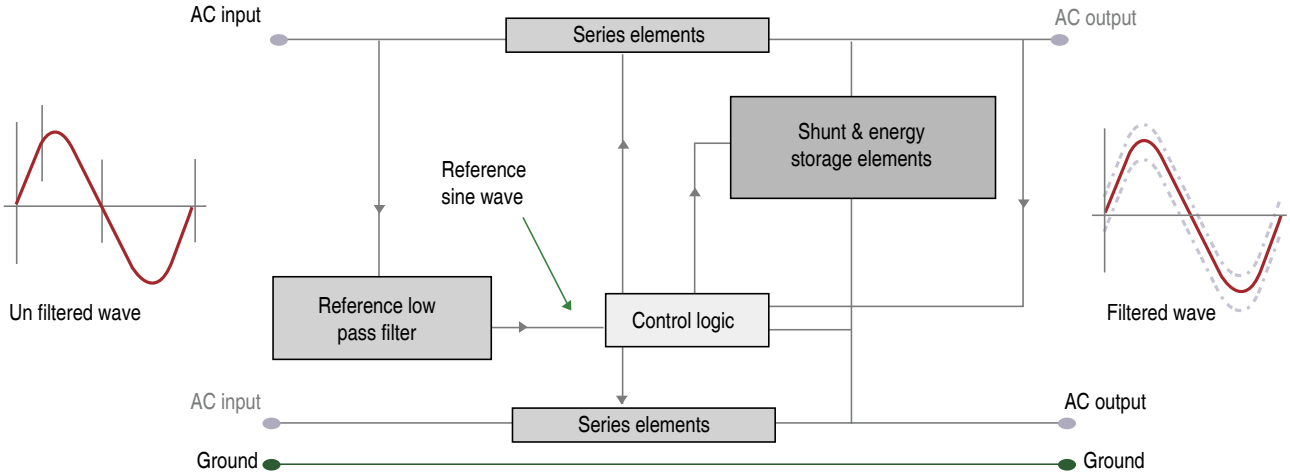
Simultaneously, the stored element restores Energy and fills the vacuum created by the phenomenon.
The parasite impulses, can appear in any point of the sine wave, and can be verified over and below the sine wave.

The over-impulse of the transient is absorbed by the usage of the series and shunt elements.
The fraction of the sub-impulse, on the other hand, responds to a current diminish and it is as destructive as overshoots.

The stored elements of the capacitive system of "EC-Series" filters, supply the energy lost in the negative hemicycle, recomposing the sine wave. This way, the protection against positive and negative impulses is equally effective in every point of the sine wave.

EC- SERIES Active filter
Digital Ready Technology

A,B & C cathegories (According to IEEEC6241)



Series Filters vs Parallel Connected Devices

Among the Protective Devices (Surge Protection Device, or SPD) also called TVSS (Transient Voltage Surge Suppressor) there are two distinct types of configuration: Series Connection and Parallel Connection.

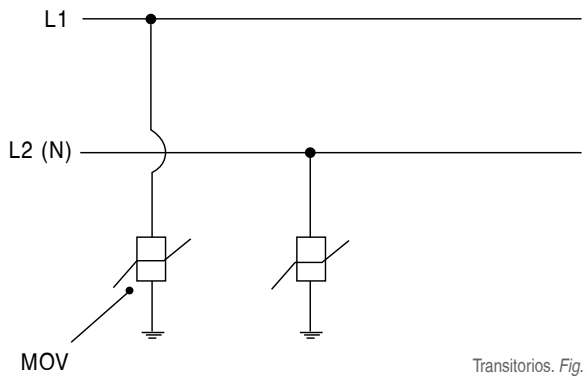
1. PARALLEL CONNECTED DEVICES
These devices include components such as SAD's (Silicon Avalanche Diode) or MOV's (Metal Oxide Varistor) being these the most used elements nowadays.
Fig. 1 shows the connection scheme.

2. SERIES FILTERS
These protective devices are series connected integrated with components, such as inductors and capacitors (L-C Circuit).
These types of devices are connected according to Fig. 6.

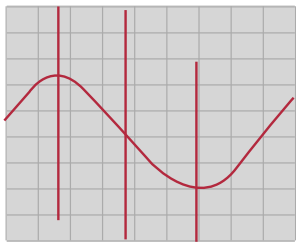
This type of circuit enables the effective attenuation, in a filter that is efficient in the diverse frequencies, that are components of the electrical noise (Ringwave) and the wave peaks caused by atmospheric discharges, but lack of high energy shunt elements.
They are included in the category A, according to IEEE C6241.

3. PARALLEL + SERIES CONNECTED DEVICES
These devices combine both protection systems with a primary stage with MOV's in parallel, and a series circuit, achieving a superior attenuation performance. These types of protectors take advantage of the great shunt capacity of the MOV's and the high efficiency of the series connection. This are included in categories A, B & C, according to IEEE C6241.

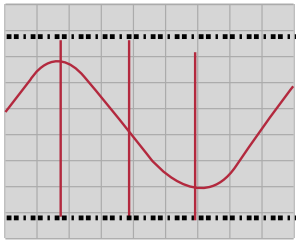
Within the parallel + Series connected devices, we find the Active Filters, which hold the best performance in protecting the critical load. Some examples of application of these devices are as follows, remote telecommunications sites, electromedicine, industrial automation, robotics, aero-space industry, etc.



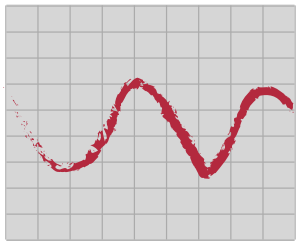
Transitorios. *Fig. 2*



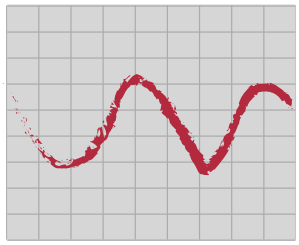
Transitorios. *Fig. 2*



Recorte logrado por Mov. *Fig. 3*



Ringwave. *Fig. 4*



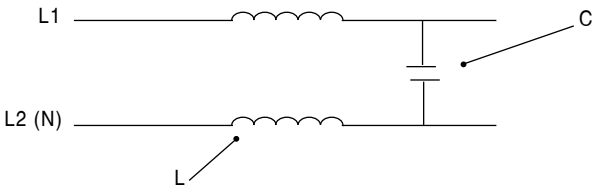
No existe atenuación del Ringwave. *Fig. 5*

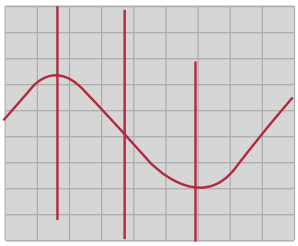
Fig. 1 Displays the typical application circuit of the parallel devices
Fig. 2 Displays a set of transients that normally are present in the sine wave.
Fig. 3 The same transients as in Fig. 2, suppressed by the parallel connected device.
Figs. 4 & 5 recreate the before and after, respectively, the parallel connection (no variation).

The MOV's can be used in high energy applications but with no critical load, due to this devices have a high residual tension. They are included in categories B & C, according to IEEE C6241.

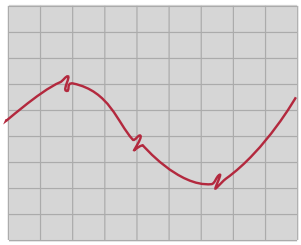
Active Filters with integrated primary and secondary stages

EC-Series devices with active filter are composed by two stages of protection, primary and secondary. The type of connection for these devices is series connection.
The first stage consists of shunting, whilst the second one involves active filtering, and it eliminates transients and disturbances both in Normal Mode (disturbances between phases or phase and neutral, also called Differential Mode) and in Common Mode (disturbances between phase and ground or neutral and ground).

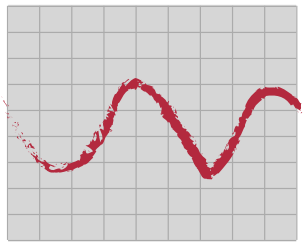




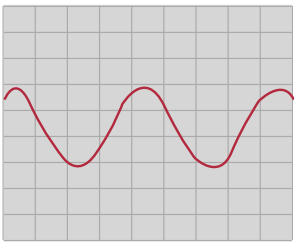
Transitorios. *Fig. 7*



Atenuación lograda por el filtro L-C. *Fig. 8*



Ringwave. *Fig. 9*

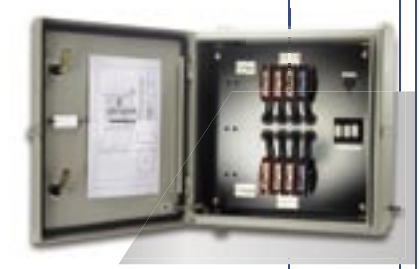


Atenuación lograda por el filtro L-C. *Fig. 10*

Este tipo de circuito permite la atenuación efectiva en un filtro eficiente a las variadas frecuencias, componentes principales del ruido eléctrico (Ringwave) y de los frentes de onda provocados por inducciones en descargas atmosféricas, pero carecen de derivadores para la alta energía. Se encuadran en la categoría A según la IEEE C6241.

Energy Control's catalogue

DIVERTER PROTECTORS. Energy protection
Current deviators capable of deviate great loads of energy, becoming the first stage of protection, cat. B & C according to IEEE EC241.



ACTIVE LINE FILTERS. Energy protection
Exclusive active filter that allows to monitor the wave permanently, eliminating over and sub impulses within the entire sine wave, including passing on zero or crossing points. Its two stages allow to eliminate disturbances & transients of high and low energy.

VOICE, TELEPHONY, DATA AND COAXIAL
Effective protection working on voice, data, telephony, coaxial and Power Over Ethernet lines. Offering the lowest attenuation and maximum performance of protection.

1

DIVERTER PROTECTORS

Energy protection

Primary Protection

Grounding Systems Coordination

ECPD SERIES single phase

Primary protective devices single phase ECPD- Series, diverter type, provide an effective protection against transients and disturbances over the electric power sources, either in Normal Mode (Disturbances between phases or between phase and neutral, also called Differential Mode) or Common Mode (Disturbances between Phase and Ground, and between neutral and Ground). Besides, it attenuates high and low energy transients generated by atmospheric discharges.
ECPD- Series filters act as primary protectors, complying with B and C categories according to IEEE C6241 normative.

Technical Specification

Connection
Parallel

Operating voltage
120 / 220 VCA +/- 20%

Operating frecuency
47- 63 Hz.

120 VCA Models
ECPD-20 - ECPD-40 - ECPD-80

220 VCA models
ECPD-20 - ECPD-40 - ECPD-80

Current discharge capability
20KA - 40KA - 80KA (wave 8/20µsec.)

Response time
<5 nanosecs

Residual voltage for a 5ka discharge
<700 V

Operation temperature
-40 to + 45 C.

Humidity
5% to 85% non condensed

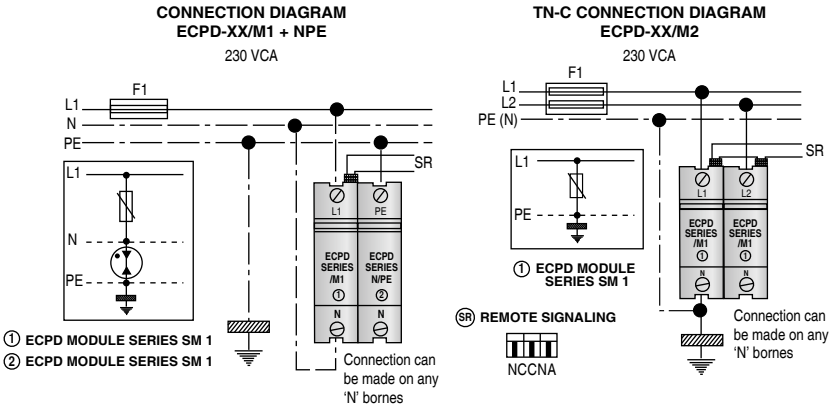
Cabinet
Vacuum impregnated magnetics, epoxy encapsulated, high impact plastic case. Designed for DIN-rail.

Measures
90 x 90 x 18 mm, sin módulo NPE
90 x 90 x 36 mm, con módulo NPE

Characteristics

- Current discharge: from 20 to 80KA wave 8/20µsec.
- Failure and state indicators: State (Blue Led) Optional) / Failure (Red Led)
- Módulos M1 y NPE reemplazables
- Remote alarm: NA/NC Dry contact (Optional)
- Warranty: 5 years

Connection Scheme



ECPD-3 SERIES three phase

Primary protective devices three phase ECPD-3 Series, diverter type, provide an effective protection against transients and disturbances over the electric power sources, either in Normal Mode (Disturbances between phases or between phase and neutral, also called Differential Mode) or Common Mode (Disturbances between Phase and Ground, and between neutral and Ground). Besides, it attenuates high and low energy transients generated by atmospheric discharges. ECPD-3 Series filters act as primary protectors, complying with B and C categories according to IEEE C6241 normative.

Technical Specification

Connection
Parallel

Operation Tension
220 / 380 VCA +/- 20%

Operation frequency
47- 63 Hz.

TN-S models
ECPD-XX/M3+NPE

TN-C models
ECPD-XX/M3

Current discharge capability
(XX) : 20KA - 40KA - 80KA (wave 8/20µseg), per module.
ECPD-20/M3 —> 20KA per module, total 60KA
ECPD-40/M3 —> 40KA per module, total 120KA
ECPD-80/M3 —> 80KA per module, total 240KA

Modules
M1 & NPE are replaceable modules

Response time
<5 nanosecs.

Residual tension for a 5KA discharge
< 700 V

Operation temperature
-40 to + 45 C

Humidity
5% to 85% non condensed

Cabinet
High impact plastic, with a magnetic Epoxi filling.
Designed for DIN rails montage.

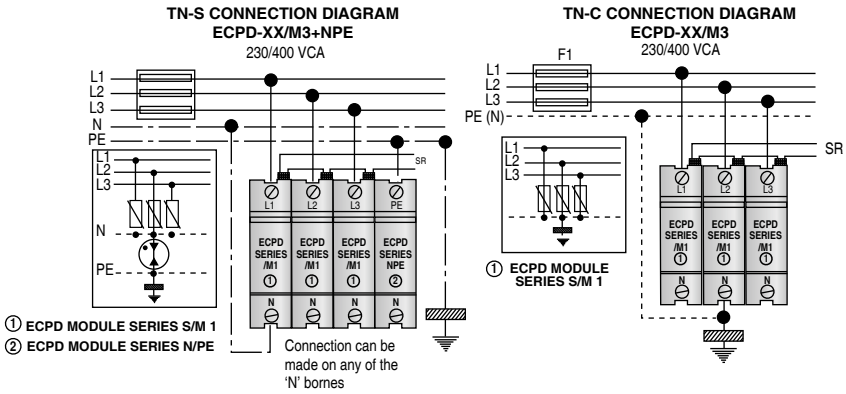
Weight
10 Kg

Measures
90 x 90 x 72 mm, with NPE module
90 x 90 x 54 mm, without NPE module

Characteristics

- Current discharge: From 20 to 400KA (Wave 8/20µsec).
- Status indicators: Status (Blue led) Failure (Red led)
  (Not appliable for Neutral-ground module)
- Remote alarm: Dry contacts NA/NC
  (Not applibe for Neutral-ground module)
- Categories: IEEE C6241, C6211, C6245 y IEC 801.
- Warranty: 5 years

Connection diagram



ECP SERIES single phase

FOR EXPOSED AREAS

Primary protective devices single phase ECP- Series, diverter type, provide an effective protection against transients and disturbances over the electric power sources, either in Normal Mode (Disturbances between phases or between phase and neutral, also called Differential Mode) or Common Mode (Disturbances between Phase and Ground, and between neutral and Ground). Besides, it attenuates high and low energy transients generated by atmospheric discharges. ECP- Series filters act as primary protectors, complying with B and C categories according to IEEE C6241 normative.

Technical Specification

Connection
Parallel

Operating voltage
120 / 220 VCA +/- 20%

Operating frecuency
47- 63 Hz.

120 VCA models
ECP-20, ECP-40, ECP-80, ECP-100

220 VCA models
ECP-20, ECP-40, ECP-80, ECP-100

Current discharge capability
20 - 40 - 80 - 100KA (wave 8/20µseg)

Response time
<5 nanosecs

Operating temperature
-40 to + 45 C

Humidity
5% to 85% non condensed

Cabinet
Vacuum impregnated magnetics, epoxy encapsulated, high impact plastic case

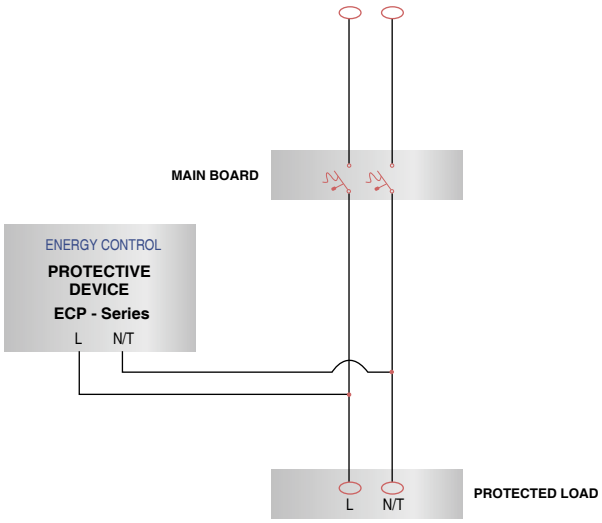
Weight
150 g

Measures
100 x 74 x 32 mm

Characteristics

- Current discharge: from 20 to 100KA wave 8/20µsec
- Failure and state indicators: State (Blue Led) (Optional) / Failure (Red Led)
- Remote alarm: NA/NC Dry contact (Optional)
- Warranty: 5 years

Connection Scheme



ECP-3 SERIES three phase

FOR EXPOSED AREAS

Primary protective devices three phase ECP- Series, diverter type, provide an effective protection against transients and disturbances over the electric power sources, either in Normal Mode (Disturbances between phases or between phase and neutral, also called Differential Mode) or Common Mode (Disturbances between Phase and Ground, and between neutral and Ground). Besides, it attenuates high and low energy transients generated by atmospheric discharges.
ECP- Series filters act as primary protectors, complying with B and C categories according to IEEE C6241 normative.

Technical Specification

Connection
Parallel

Operating voltage
120 / 220 VCA +/- 20%

Operating frecuency
47- 63 Hz.

120 VCA models
ECP-20, ECP-40, ECP-80, ECP-100

220 VCA models
ECP-20, ECP-40, ECP-80, ECP-100

Current discharge capability
20 - 40 - 80 - 100KA (wave 8/20µseg)

Electric configuration
Three phase wye-star type

Response time
<5 nanosecs

Operating temperature
-40 to + 45 C

Humidity
5% to 85% non condensed

Cabinet
Metálico Outdoor apt, reinforced metal cabinet, with door

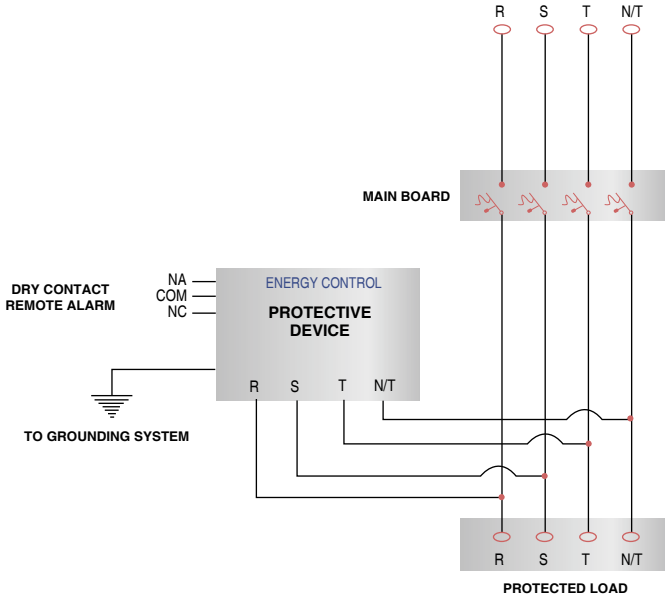
Weight
150 g

Measures
100 x 74 x 32 mm

Characteristics

- Current discharge: from 20 to 100KA wave 8/20µsec.
- Failure and state indicators: State (Blue Led) - (Optional) Failure (Red Led)
- Remote alarm: NA/NC Dry contact (Optional)
- Warranty: 5 Years.

Connection Scheme



EC-GT100KA

GROUNDING SYSTEMS CCORDINATION

The spark coordnation EC-GT100KA is a protective device designed specially to electrically isolate conductors or systems, that need to be separated for functioning reasons. In the happening of atmospheric discharges, the device provides effective temporal coordination in order to avoid damages caused by potential differences. After this, it automatically restores to its normal state of isolation. This device is designed for electric installations and grounding systems, such as mobile telephony cells, communcations, data, energy networks, gasoducts and oilducts.
EC-GT100KA device has automatic restoring to isolation state. Its current discharge capacity is 100ka, for 8/20 & 10/350µseg fronts.
It can be applied in either Outdoor or Indoor installations, the device is completely water proof. Its installation becomes simple due to its flange, manufactred in perforated aluminium.

Technical Specification

Model
EC-GT100KA

Spark over voltage
UAS: <1500V (Wave 1.2/50µs; 6Kv)

Máx. discharge current
Imax: 100KA (8/20µs y 10/350µs)

Response time
< 20nseg

Insulation resistance
>10G Ω

Capacitance
< 4 pF

Technology
Gas Discharge Tube (Auto reset)

Operating temperature
-40 a + 60 C

Humidity
5% to 85% non condensed

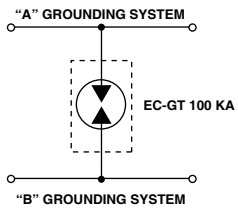
Cabinet
Reinforced aluminium, ready for Indoor & Outdoor installations.

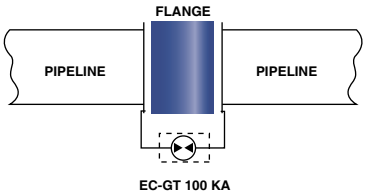
Connection cables
10 or 16 mm2, 25 mm2 optional

Characteristics

- Special for grounding systems coordination.
- Automatic restore.
- Designed for DIN 57185/VDE 0185 normative.
  Designed for DIN 57185/VDE 0150 normative.
  Designed for DIN 57185/VDE 0141 normative.
- Indoor and Outdoor installation.
- Multiple discharge capacity.
- Current discharge: 100 KA wave 8/20µsec y 10/350µsec.
- Warranty: 2 years

Connection Scheme





2

ACTIVE LINE FILTERS

Energy protection

Secondary Protection

Primary + Secondary Protection

ECM SERIES

INDUSTRY APPLICATION

The protective device with active tracking filter ECM - Series offers an efficient protection against transients, spikes and noise that are the electric power feeding lines, either in Normal Mode (Disturbances between phases or between phase and neutral, also called Differential Mode) or Common Mode (Disturbances between Phase and Ground, and between neutral and Ground). The active filter permanently monitors the wave shape instantly responding to the eventual detection of any transient. ECM - Series act as a primary and secondary protector, covering the IEEE C6241 A, B and C categories.

Technical Specification

Connection
Series

Operating voltage
120 / 220 VCA +/- 20%

Operating frecuency
47- 63 Hz.

120 VCA models
ECM-102 - ECM-105 - ECM-107 - ECM-110-
ECM-115 - ECM-120 - ECM-130

220 VCA models
ECM-202 - ECM-205 - ECM-207 - ECM-210-
ECM-215 - ECM-220 - ECM-230

Load current
2A - 5A - 7A - 10A - 15A - 20A - 30A

Load stability
Better than 1% from work without load to maximum load. (+10%, -20% of the line voltage)

Crest factor
The system is appropriate for non-lineal load, with crest factor above 3,0.

Current discharge capability
45KA (wave 8/20µsec)

Response time
<5 nanosecs

Operating temperature
-40 to + 45 C

Humidity
5% to 85% non condensed

Cabinet
Fireproof, high impact plastic Case, epoxy encapsulated

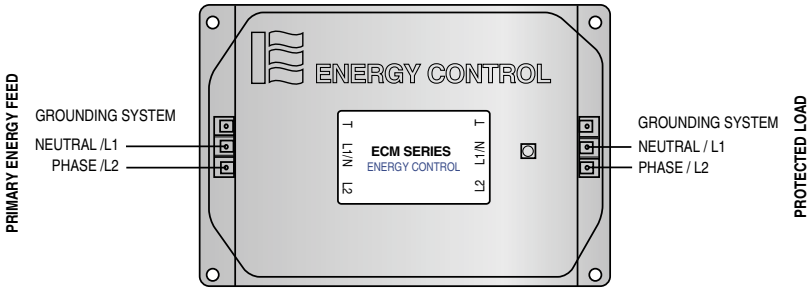
Weight
2,2 Kg

Measures
170 x 70 x 140 mm
210 x 70 x 140 mm
250 x 70 x 140 mm

Characteristics

- Transient reduction: 50dB minimum from the audio médium band, up to 50 Mhz
- Supression performance: +/- 2 volts transients and spikes, at any point of the sine wave
- Current discharge: 45KA (wave 8/20µseg.)
- State indicator: High luminosity (Blue Led)
- Remote alarm: NA/NC Dry contacts (Optional)

Connection Scheme



ECM SERIES: ECM-4804A

HOME AND INDUSTRY APPLICATION

The protective device with active tracking filter ECM – 4804A offers an efficient protection against transients, spikes and noise that are the electric power feeding lines, either in Normal Mode (Disturbances between phases or between phase and neutral, also called Differential Mode) or Common Mode (Disturbances between Phase and Ground, and between neutral and Ground). The active filter permanently monitors the wave shape instantly responding to the eventual detection of any transient.
ECM-4804A acts as a primary and secondary protector, covering the IEEE C6241 A, B and C categories.

Technical Specification

Connection
Series

Operating voltage
-40 a -56 VDC

Load current
4A

Load stability
Better than 1% from work without load to maximum load (+10%, -20% of the line voltage)

Crest factor
The system is appropriate for non-lineal load, with crest factor above 3,0

Current discharge capability
45KA (wave 8/20µseg)

Response time
<5 nanosecs

Operating temperature
-40 to + 45 C

Humidity
5% a 85% Non condened

Installation
The product provides cables with male and female connectors

Cabinet
Fireproof, high impact plastic Case, epoxy encapsulated

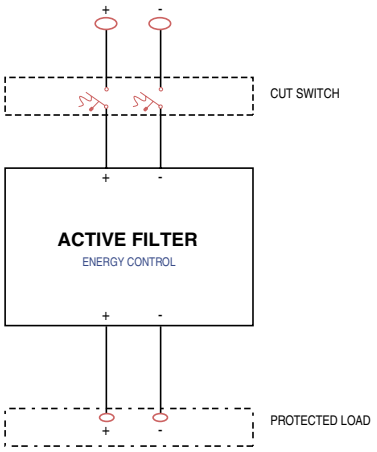
Weight
460g

Measures
110 x 74 x 35 mm

Characteristics

- Transient reduction: 50dB minimum from the audio médium band, up to 50 Mhz.
- Supression performance: +/- 2 volts transients and spikes, at any point of the sine wave.
- Current discharge: 45KA (wave 8/20µseg.)
- State indicator: high luminosity (Blue Led)
- Remote alarm: NA/NC Dry contacts (Optional)

Connection Scheme



ECDC SERIES

DC ACTIVE FILTERS

The protective device with active tracking filter ECDC - Series offers an efficient protection against transients, spikes and noise that are the electric power feeding lines, either in Normal Mode (Disturbances between phases or between phase and neutral, also called Differential Mode) or Common Mode (Disturbances between Phase and Ground, and between neutral and Ground). The active filter permanently monitors the wave shape instantly responding to the eventual detection of any transient. ECDC - Series act as a primary and secondary protector, covering the IEEE C6241 A & B categories.

Technical Specification

Connection
Series

Operating voltage
0 - 100 VDC +/- 20%

Models
ECDC-2, ECDC-5, ECDC-7, EDDC-10, ECDC-15, ECDC-30, ECDC-50, ECDC-100

Load current
2A, 5A, 7.5A, 10A, 15A, 30A, 50A, 100A

Load stability
Better than 1% from work without load to maximum load. (+10%, -20% of the line voltage).

Crest factor
The system is appropriate for non-lineal load, with crest factor above 3,0.

Current discharge capability
45KA (wave 8/20µseg)

Response time
<5 nanosec

Operating temperature
-40 to + 45 C

Humidity
5% to 85% non condensed

Cabinet
Fireproof, high impact plastic Case, epoxy encapsulated. (For models from 2A to 30 A)
Outdoor apt, reinforced metal cabinet with door. (For models from 50A to 100A)

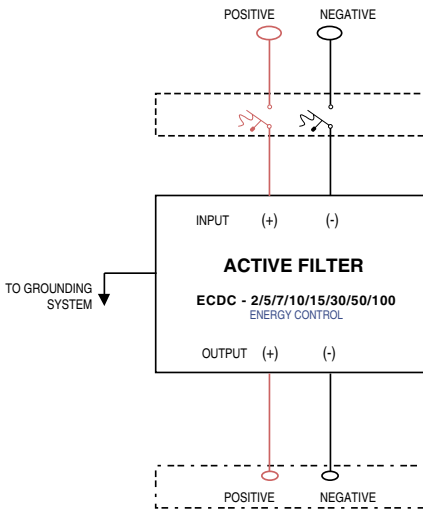
Weight
2,2 Kg & 10 Kg

Measure
177 x 65 x 140 mm
210 x 70 x 140 mm
250 x 70 x 140 mm
300 x 300 x 225 mm

Characteristics

- Transient reduction: minimum 50dB
- Discharge current: 65KA (wave 8/20µseg.)
- State and failure indicator: State (blue led) failure (red led)
- Remote alarm: dry contacts NA/NC
- Warranty: 10 years

Connection Scheme



ACTIVE LINE FILTERS

▸ Primary + Secondary Protection

EC SERIES

ACTIVE TRACKING FILTER

The protective device with active tracking filter, single phase EC- Series offers an efficient protection against
transients, spikes and noise that are the electric power lines, either in Normal Mode (Disturbances between phases or between phase and neutral, also called Differential Mode) or Common Mode (Disturbances between Phase and Ground, and between neutral and Ground). The active filter permanently monitors the wave shape instantly responding to the eventual detection of any transient. EC- Series act as a primary and secondary protector, covering the IEEE C6241 A, B & C categories.

Technical Specification

Connection
Series

Operating voltage
120 / 220 VCA +/- 20%

Operating frecuency
47- 63 Hz.

120 VCA Models
EC-130 - EC-150 - EC-1100

220 VCA Models
EC-230 - EC-250 - EC-2100

Load current
30A - 50A - 100A

Load stability
Better than 1% from work without load to maximum load. (+10%, -20% of the line voltage).

Crest factor
The system is appropriate for non-lineal load, with crest factor above 3,0

Discharge current capability
65KA (wave 8/20µsec)

Response time
<5 nanosecs

Operating temperature
-40 to + 45 C

Humidity
5% to 85% non condensed

Cabinet
Outdoor apt, reinforced metal cabinet with door.

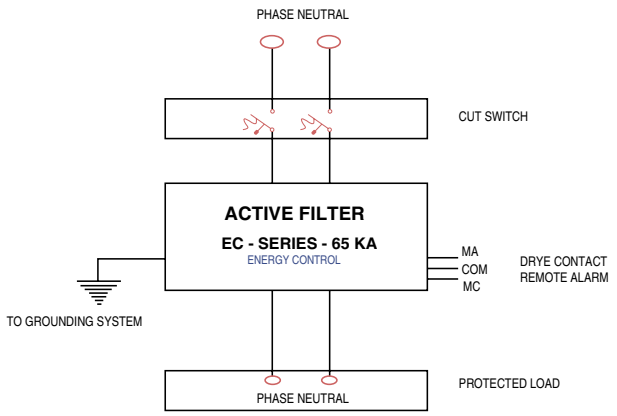
Weight
10 kg

Measures
450 x 450 x 225 (mm)

Characteristics

- Transient reduction: 50dB minimum from the audio médium band, up to 50 Mhz.
- Supression performance: +/- 2 volts transients and spikes, at any point of the sine wave
- Current discharge: 65KA (wave 8/20µsec.)
- State indicator: state (Blue Led) failure (Red led)

Connection Scheme



EC SERIES three phase

ACTIVE TRACKING FILTER

The protective device with active tracking filter, three phase EC- Series offers an efficient protection against transients, spikes and noise that are the electric power lines, either in Normal Mode (Disturbances between phases or between phase and neutral, also called Differential Mode) or Common Mode (Disturbances between Phase and Ground, and between neutral and Ground). The active filter permanently monitors the wave shape instantly responding to the eventual detection of any transient.
EC- Series act as a primary and secondary protector, covering the IEEE C6241 A, B & C categories.

Technical Specification

Connection
Series

Operating voltage
220 / 380 vca +/- 20%

Operating frecuency
47- 63 Hz.

Electrical configuration
Three phase wye-star type

Models
EC-3-430 - EC-3-450 - EC-3-4100 - EC-3-4200

Load current
30A - 50A - 100A - 200A

Load stability
Better than 1% from work without load to maximum load. (+10%, -20% of the line voltage)

Crest factor
The system is appropriate for non-lineal load, with crest factor above 3,0

Current discharge capability
65KA (wave 8/20µsec)

Response time
<5 nanosecs

Operating temperature
-40 to + 45 C

Humidity
5% to 85% non condensed

Cabinet
Outdoor apt, reinforced metal cabinet with door

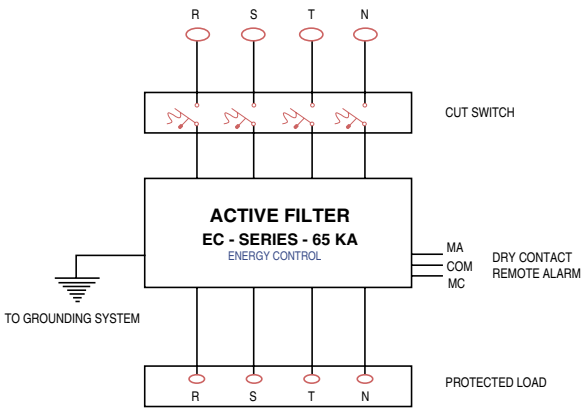
Weight
18 Kg

Measures
450 x 450 x 225 (mm)

Characteristics

- Transient reduction: 50dB minimum from the audio médium band, up to 50 Mhz
- Supression performance: +/- 2 volts transients and spikes, at any point of the sine wave
- Current discharge: 65KA (wave 8/20µsec.)
- State indicator: state (Blue Led) failure (Red led)

Connection Scheme



3

VOICE, TELEPHONY, DATA AND COAXIAL

Telephony & ADSL

Internet

Data Frames E1 at 120 Ω

Power Over Ethernet Protection

Data Frames E1 at 75 Ω

ODU'S & IDU'S

RF Protection

CATV & CCTV

EC-Tel-1 SERIES ADSL

DATA NETWORKS AND WIRED AND WIRELESS TELEPHONY

Secondary protective devices EC-Tel-1 ADSL Series are specifically designed to protect data & voice transport over wired and wireless networks, as UTP structured wirings 5 and 5e categories. The elements that compose the product are designed to offer an effective secondary protection, consisting of solid state components, and two protective stages of great power and of fast response. The devices deviate the random transients, induced over the UTP cables.
RJ-45 connectors for data input and output.
The deviation system consists of a Green/Yellow cable for connection to Ground.

Technical Specification

Connection
Series

Nominal breakdown voltage
15V(sin ring) 210V(ring)

Max. Peak pulse current
(20x 1000ms) 15A

Max. peak signal voltage
20V (sin ring)
200V (ring)

Current discharge capability
1500A (wave 8/20µseg)

Input and output protected
Pins 4 & 5

Response time
<2 nanosecs

Operating temperature
-40 to + 45 C

Humidity
5% to 85% non condensed

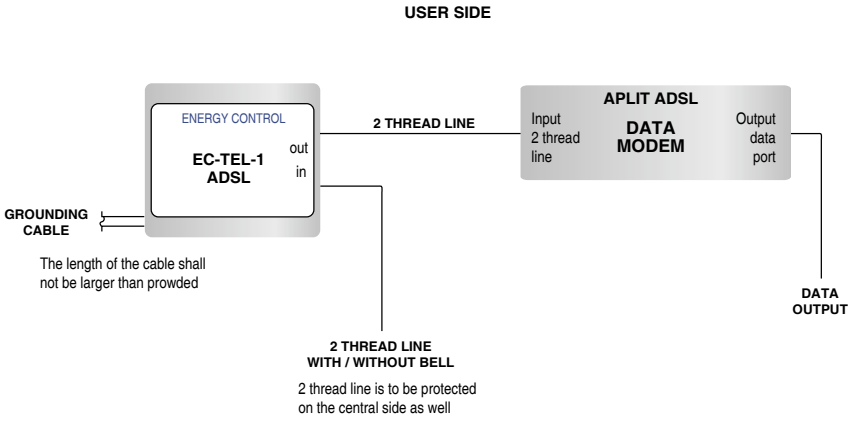
Cabinet
High impact plastic case

Measures
80 x 55 x 32 mm

Characteristics

- Two ultra fast protection stages: Special for wired or wireless data networks and telephony
- Discharge current: 1500A (wave 8/20µseg.)
- Connector type: RJ-45 (input and output). Specially designed for ADSL data modems
- Warranty: 5 years

Connection Scheme



EC-Netel SERIES

DATA NETWORKS, WIRED AND WIRELESS TELEPHONY

Secondary protective devices EC-Netel Series are specifically designed to protect data and telephony transport over wired and wireless installations, as UTP structured wirings 5 and 5e categories. The elements that compose the product are designed to offer an effective secondary protection, consisting of solid state components, and two protective stages of great power and of fast response. The devices deviate the random transients, induced over the UTP cables. RJ-45 connectors for data input and output. The deviation system consists of a Green/Yellow cable for connection to Ground.

Technical Specification

Connection
Series

Nominal breakdown voltage
15V (data) 210V (ring)

Max. Peak pulse current
(20x 1000ms) 15A.z.

Max. Peak signal voltage
20V (data) 200V (ring)

Current discharge capability
1500A (wave 8/20µseg)

Protected data
Pins 1 to 8

Response time
<2 nanosecs

Operating temperature
-40 to + 45 C

Humidity
5% a 85% non condensed

Cabinet
High impact plastic case

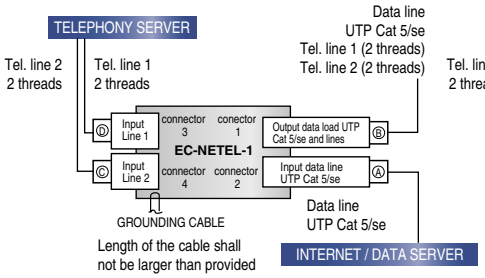
Measures
80 x 55 x 32 mm

Characteristics

- Two ultra fast protection stages. Special for data networks, wired and wireless telephony
- Current discharge: 1500A wave (8/20µsec)
- Connectors type: RJ-45 (input and output)
- It compiles with EIA/TIA 568A/B and 5 y 5e categories noramtive
- Warranty: 5 years

Connection Scheme

SERVER SIDE EQUIPMENT



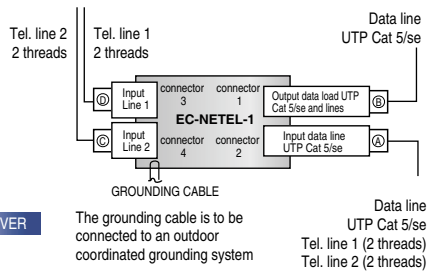
Ⓐ UTP Data line cable Cat 5/5e
Use RJ-45 connector pins nº 1, 2, 3 & 6

Ⓑ 2 Thread telephone line with bell
Use RJ-11 6 RJ-45 pins nº 4 & 5

Ⓒ 2 Thread telephone line with bell
Use RJ-11 6 RJ-45 pins nº 4 & 5

Ⓓ UTP Data line cable Cat 5/5e pins nº 1, 2, 3 & 6
2 Thread telephone line - L1 pins nº 4 & 5 - L2 pins nº 7 & 8

USER SIDE



Ⓐ UTP data line cable Cat 5/5e
2 thread telephone line - L1 pins nº 4 & 5 - L2 pins nº 7 & 8

Ⓑ 2 Thread telephone line with bell
Use RJ-11 6 RJ-45 pins nº 4 & 5

Ⓒ 2 Thread telephone line with bell
Use RJ-11 6 RJ-45 pins nº 4 & 5

Ⓓ UTP data line cable Cat 5/5e
Use RJ-45 connector pins nº 1, 2, 3 & 6

EC-Tel SERIES

WIRED AND WIRELESS DATA AND TELEPHONY

Secondary protective devices EC-Tel Series are designed to protect data and voice transport over wireless and wired networks, 2 thread wirings, for pabx, modem, tel.
The elements that compose the product are designed to offer an effective secondary protection, consisting of solid state components, and two protective stages of great power and of fast response.
The devices deviate the random transients, induced over the 2 thread line cables.
RJ-11 connectors for data input and output. The deviation system consists of a Green/Yellow cable for connection to Ground.

Technical Specification

Connection
Series

Nominal breakdown voltage
210V (ring)

Max. peak pulse current
(20x 1000ms) 15A

Max. peak pulse voltage
200V (ring)

Current discharge capability
1500A (wave 8/20µsec)

Protected Input & Output
RJ-11 connectors

Response time
<2 nanosecs

Operating temperature
-40 to + 45 C

Humidity
5% to 85% non condensed

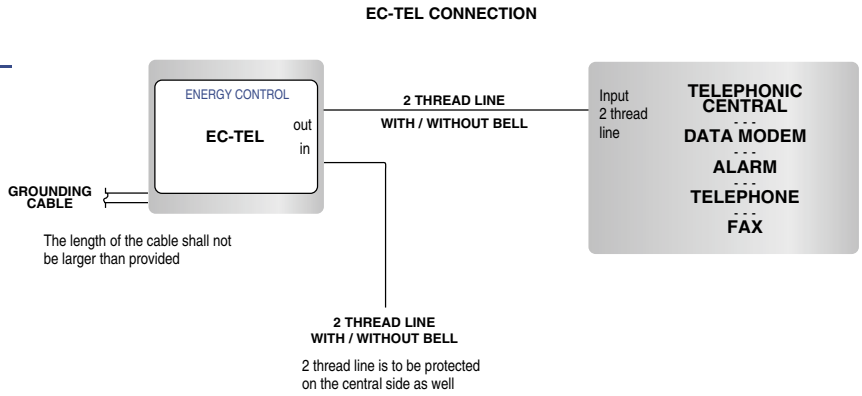
Cabinet
High impact plastic

Measures
60 x 43 x 25 mm

Characteristics

- Ultrafast two staged protection. Special for data & telephony networks, wired & wireless.
- Current Discharge: 1500A (wave 8/20µsec.)
- Garantía: 1 año
- Connector type: RJ-11 Input & Output
  Special for telephone centrals, pabx, data modems, fix telephones, wireless and alarms, fax, etc.
- Warranty: 1 year

Connection Scheme



EC-5Pin-MPE / ADSL

C-318 BLOCK - TELEPHONY & DATA PROTECTION

EC-ADSL & EC-MPE primary and secondary protective devices are designed for telecommunication systems, applied to voice transport lines and with ADSL, ADSL2+, VDSL, ISDN & High speed Ethernet. The electronic modules consist of two stages, combining tripolar gas microcapsules (primary stage) and current limiters with automatic restore (PTC's for the secondary stage). The tripolar gas microcapsule deviates every single rapid grow transient impulse on each wire connected to the device. The Polyswitch reseteable fuses – PTCs work by changing from high impedance to extreme low impedance when it detects the presence of any electric disturbance, until it addresses it to Ground. Then it changes back to the initial state, when the disturbance has ceased.
The packaging has been developed to fit the C-318 block as a standard base, replacing the bridging clips.

Technical Specification

Two staged model
EC-ADSL

Nominal current
230 V ± 20%

Insertion loss
0,2 db

Return loss from 20 to 100mhz
Minimum 14 db

Limiters operating times

Current	Max
120 mA	should not operate
250 mA	210 sec.
1000 mA	5 sec.

Crash Current
<550 V (1Kv / µs)

Current discharge capability
10KA (wave 8/20µsec)

Response time
<30 nanosecs

Operating temperature
-40 to +45º C

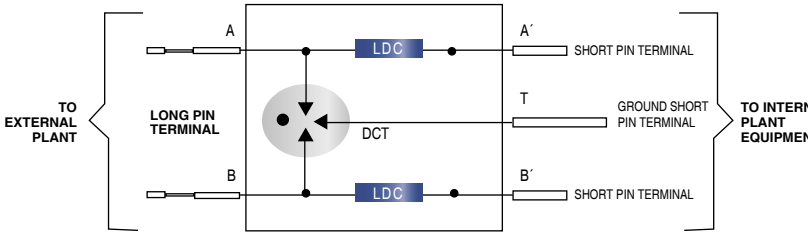
Humidity
5% to 85% non condensed

Gabinet
HIgh impact plastic

Characteristics

- Special for data & voice lines, with ADSL and ADSL 2+ technology. Two stages primary and secondary protection.
- Tripolar gs microcapsules.
- Current limiters.
- Designed for C-318 type Blocks.
- Current Discharge: 5 to 10KA (Wave 8/20µsec.)
- Warranty: 1 year

Connection diagram



DGT: Tripolar gas discharger
LDC: Serie resettable device

EC-Net-1 SERIES

WIRED AND WIRELESS DATA NETWORKS

Secondary protective devices EC-Net-1 Series are specifically designed to protect data transport over wired and wireless networks, as UTP structured wirings 5 and 5e categories.
The elements that compose the product are designed to offer an effective secondary protection, consisting of solid state components, and two protective stages of great power and of fast response.
The devices deviate the random transients, induced over the UTP cables.
RJ-45 connectors for data input and output.
The deviation system consists of a Green/Yellow cable for connection to Ground.

Technical Specification

Connection
Series

Nominal breakdown voltage
15V

Max. Peak pulse current
(20x 1000ms) 15A

Max. Peak signal voltage
20V

Current discharge capability
1500A (wave 8/20µseg)

Protected data
Pins 1 to 8

Response time
<2 nanosecs

Operating temperature
-40 to + 45 C

Humidity
5% a 85% non condensed

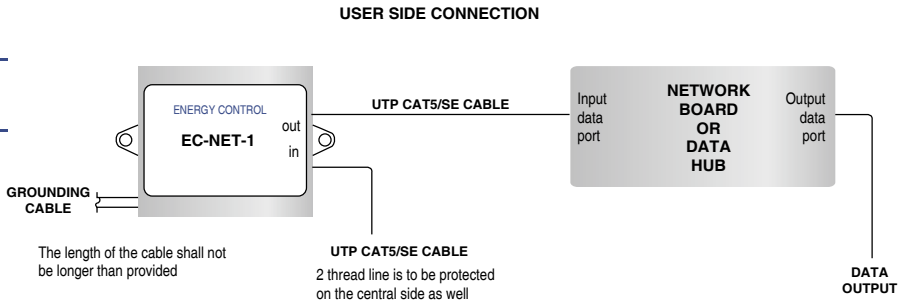
Cabinet
High impact plastic case

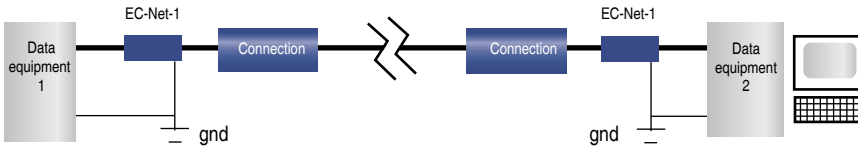
Measures
80 x 55 x 32 mm

Characteristics

- Two ultra fast protection stages. Special for wired and wireless data networks. Compiles with EIA/TIA 568A/B and 5 y 5e categories normative.
- Discharge current: 1500A wave 8/20µseg
- Connector type: RJ-45 (input and output)
- Warranty: 5 years

Connection Scheme





EC-Net-4 SERIES

Secondary protective devices EC-Net-1 Series are specifically designed to protect data transport over wired and wireless networks, as UTP structured wirings 5 and 5e categories.
The elements that compose the product are designed to offer an effective secondary protection, consisting of solid state components, and two protective stages of great power and of fast response.
The devices deviate the random transients, induced over the UTP cables.
RJ-45 connectors for data input and output. Cabinet with 4 units. The deviation system consists of a Green/Yellow cable for connection to Ground.

Technical Specification

Connection
Series

Nominal breakdown voltage
15V

Max. peak pulse current
(20x 1000ms) 15A

Max. peak signal voltage
20V

Current discharge capability
1500A (wave 8/20µseg)

Protected data
All pins, from 1 to 8

Response time
<2 nanosecs

Operation temperature
-40 to + 45 C

Humidity
5% to 85% non condensed

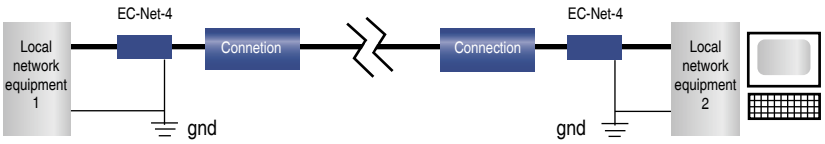
Cabinet
4 protectors in one high impact plastic cabinet

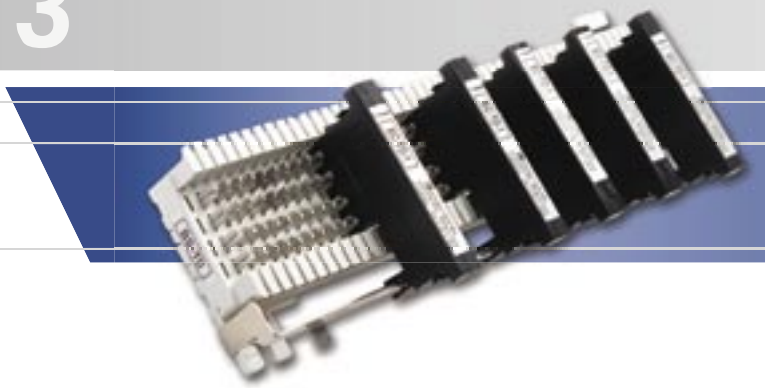
Measures
80 x 55 x 32 mm

Characteristics

- Ultrafast two-staged protection.
- Special for wired & wireless data networks.
- Current discharge: 1500A wave 8/20µseg.
- Four protectors: Integrated in ONE Cabinet
- Warranty: 5 Years

Connection diagram





EC-TD1 SERIES

SPECIAL FOR DATA AND VOICE LINES

Secondary protective devices EC-TD1, bare primary and secondary protection, and its used for telecommunications, applied to digital data frames, data transport, and telephone lines.
The protection consists of three stages, gas microcapsules (primary protection), solid state fuses (secondary protection), and solid state semiconductors (Silicon Avalanche technology).
The Polyswitch reseteable fuses – PTCs work by changing from high impedance to extreme low impedance when it detects the presence of any electric disturbance, until it addresses it to Ground. Then it changes back to the initial state, when the disturbance has ceased.
The packaging has been developed to fit the M1-50 split block as a standard base, replacing the bridging clips.
The Ground kit (rail) needs to be added for each M1-50 base that will be used.

Technical Specification

Protection mode
Line - Line / Line - Ground

Nominal breakdown voltage
15, 30, 48, 60, 250V

Max. Continuous current
150mA

Max. Peak signal voltage
12, 24, 42, 52, 200V

Typical capacitance
51pf

Nominal series resistance
5,5 Ohms.

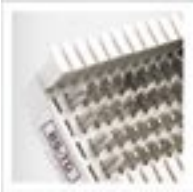
Current discharge capability
5KA (wave 8/20µseg).

Response time
<1 nanosecs

Operating temperature
-40 to + 45 C

Humidity
5% to 85% non condensed

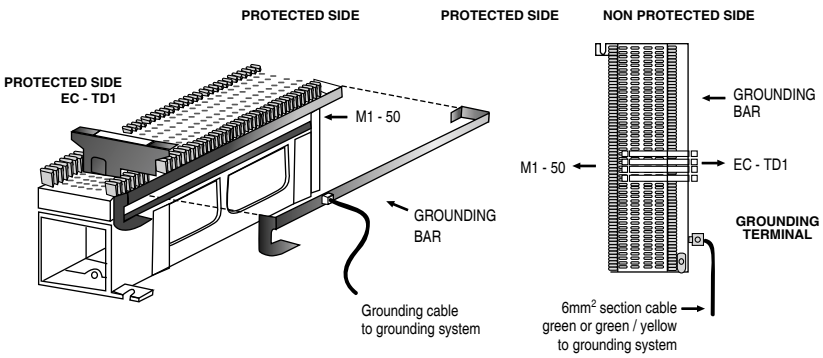
Cabinet
High impact plastic case



Characteristics

- Special for data frames, voice lines, data lines, telephony, alarms.
- Components performance does not decay with time.
- Three stage primary and secondary protection.
- Reseteable Polyswitches. PTCs Over-Current Protection
- Apt for M1-50 base assembly
- Current discharge: 5 KA wave 8/20µseg.
- Warranty: 5 years

Connection Scheme



EC-POENet-1 SERIES

WIRED AND WIRELESS DATA NETWORKS

Secondary protective devices EC-POENet-1 Series are designed to protect data transport and power source over Power Over Ethernet networks, as UTP structured wirings 5 and 5e categories, according to the EIA/TIA 568 A/B normative. The elements that compose the product are designed to offer an effective secondary protection, consisting of solid state components, and two protective stages of great power and of fast response, and a special protection over Vcc. The devices deviate the random transients, induced over the UTP cables. RJ-45 connectors for data input and output. The deviation system consists of a Green/Yellow cable for connection to Ground.

Technical Specification

Connection
Series

Protected data
Pines del 1,2,3 & 6

Nominal breakdown voltage
15V

Max. Peak pulse current
(20x 1000ms) 15A

Max. Peak signal voltage
20V

Current discharge capability (data)
1500A (wave 8/20µseg)

Response time
<2 nanosecs

Protected feeding
Pines 4,5,7 & 8

Power voltage
12 / 24 / 48Vcc

Current discharge capability
20KA (wave 8/20µseg). (VCC Power source)

Operating temperature
-40 to + 45 C

Humidity
5% to 85% non condensed

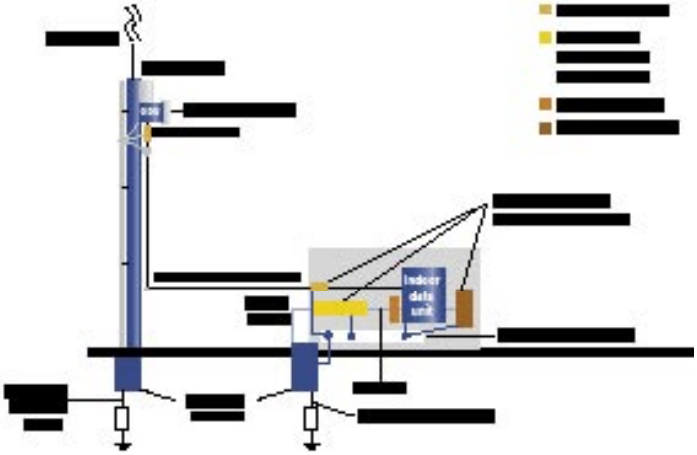
Cabinet
High impact plastic case

Measures
80 x 55 x 32 mm - Indoor model
80 x 60 x 31 mm - Outdoor model

Characteristics

- Two ultra fast protection stages
- Special protection over Vcc Pairs
- Special for Power Over Ethernet data systems
- Current discharge: 1500A wave 8/20µseg.- Data / 20KA onda 8/20µseg.- Vcc power source
- Connector type: RJ-45 (input and output). Compiles with EIA/TIA 568A/B normatives and 5 y 5e categories normative
- Warranty: 5 years

Connection Scheme



EC-CXTD-1 SERIES

ESPECIAL FOR DATA FRAME

Secondary protective devices EC-CXTD-1 are coaxial protectors, developed to offer an effective protection over digital data frames.
EC-CXTD-1 have automatic recovery, and operate by deviating to Ground the transients that are induced over the coaxial cables, avoiding the disturbances to affect the electronic equipment.
The product presentation was specially developed for an easy installation, due to a perforated aluminum flange.
Provides Ground connection, a special screw allows to connect a Ground terminal.

Technical Specification

Current
2ADC

Insertion loss
= 0.3dB

Frecuency range
0-30 Mhz

Operating voltage
± 6 Volts

Impedance
75 Ω

Protected side connector
BNC Male/Female

Non protected side connector
BNC Male/Female

Throughput energy
= 103µJ por 3KA@ 8/20 µs waveform

Throughput voltage
± 2.3 volts

Voltage standing wave ratio
1.1:1

Response time
<1 nanosec

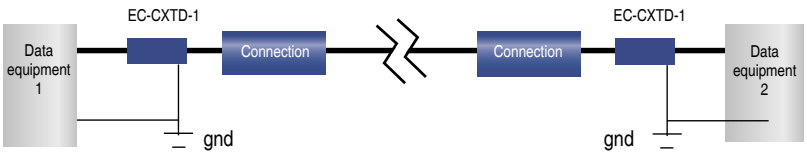
Current discharge capability
20KA

Installation
Aluminum

Characteristics

- Special for digital data frames
- Components performance does not decay with time
- Manufactured under IEEE 802.3 normative
- Low insertion loss
- Multiple discharge capability
- Discharge current: 20 KA wave 8/20µsec.
- Warranty: 1 year

Connection Scheme



EC-CX-IODU SERIES

SPECIAL FOR TELECOMMUNICATION SYSTEMS

Secondary protective devices EC-CX-IODU are coaxial protectors designed to offer an effective protection over communication systems with ODUs and IDUs (Outdoor and indoor units).
EC-CX-IODU devices automatically recover from an event, and operate by deviating to Ground the transients that are induced over the coaxial cables, avoiding the disturbances to affect the ODUs and IDUs.
The product presentation was specially developed for an easy installation, due to a perforated aluminum flange.
Provides Ground connection, a special screw allows to connect a Ground terminal.

Technical Specification

Frecuency range
0 - 500Mhz

Insertion loss
0.1dB @ 500Mhz

Voltage standing wave ratio
= 1.2:1.

Operating voltage
-48VCC ±10%

Impedance
50 Ω

Protected side connector
N Male/Female

Non protected side connector
N Male/Female

Optional connectors
Under request

Admissible power
200 Watts maximum

Response time
100 nsec. @ 10Kv/µs

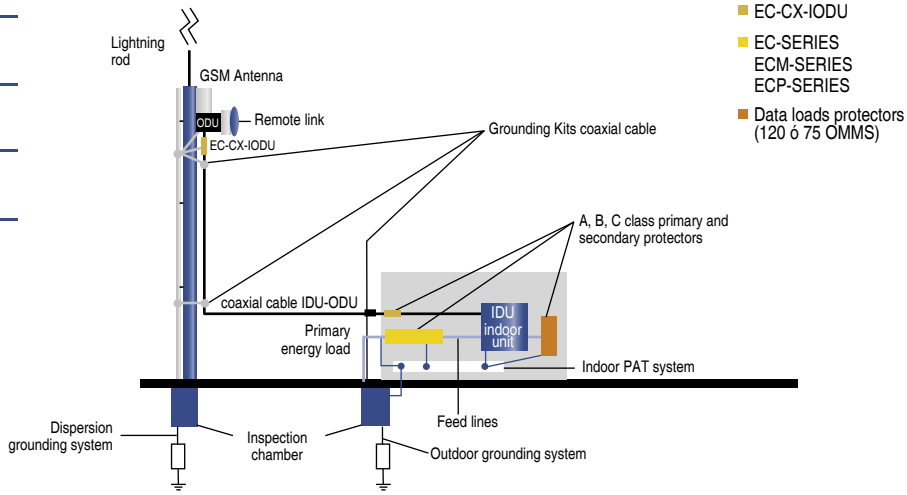
Current discharge capability
20KA (8/20µs)

Installation
Aluminum flange

Characteristics

- Special for ODUs and IDUs equipment
- Automatic recovery
- Manufactured under IEEE 802.3 normatives
- Low insertion loss
- Multiple discharge capability
- Discharge current: 20 KA wave 8/20µseg
- Warranty: 1 year

Connection Scheme



EC-CXN SERIES

SPECIAL FOR TELECOMMUNICATION EQUIPMENT

Secondary protective devices EC-CXN, EC-CXU, are coaxial protectors developed to offer an effective protection over the communication equipment.
EC-CXN and EC-CXU have automatic recovery, and operate by deviating to Ground the transients that are induced over the coaxial cables, avoiding the disturbances to affect the equipment.
The product presentation was specially developed for an easy installation, due to a perforated aluminum flange.
Provides Ground connection, a special screw allows to connect a Ground terminal.

Technical Specification

Frecuency range
De 0 a 1Ghz

Insertion loss
0.1dB @ 1Ghz. (EC-CXN)
0.1dB @ 500Mhz

Voltage standing wave ratio
= 1.2:1

Impedance
50 Ω

Protected side connector
N Male/Female

Non protected side connector
N Male/Female

Optional connectors
UHF Male/Female (EC-CXU)

Admissible power
200 Watts maximum

Response time
100 nseg @ 10Kv/µs.

Current discharge capability
20KA (8/20µs)

Installation
Aluminum flange

Characteristics

- Special for communication equipment
- Automatic recovery
- Manufactured under IEEE 802.3 normatives
- Low insertion loss
- Multiple discharge capability
- Discharge current: 20 KA wave 8/20µsec
- Warranty: 1 year

EC-CXCTV SERIES

VIDEO NETWORK

Secondary protective devices EC-CXTV Series are specifically designed to protect video signal transport over wired and wireless installations, as: CATV, CCTV, Data and Voice transmission networks.
The elements that compose the product are designed to offer an effective secondary protection, consisting of two protective stages, one of great power and another of fast response.
The devices deviate the random transients, induced over the coaxial cables.
The deviation system consists of a special screw or even the aluminium flange, to be connected to Ground.

Technical Specification

Connection
Series

Frecuency range
0 a 1Ghz.

Attenuation
< 0.1dB @ 500Mhz. < 0.2dB @ 750Mhz

Over voltage impulse (spark)
700V (@100v/µs)
800V (g 1Kv/µs)

Current discharge capacity
20KA (g 1Kv/µs)
20KA (8/20µs)

AC current discharge
20A (50 Hz)

Response time
100ns@10Kv/µs.

Isolation
< 1 pF

Impedance
75 Ω

Protected side connector
F or BNC Male/female

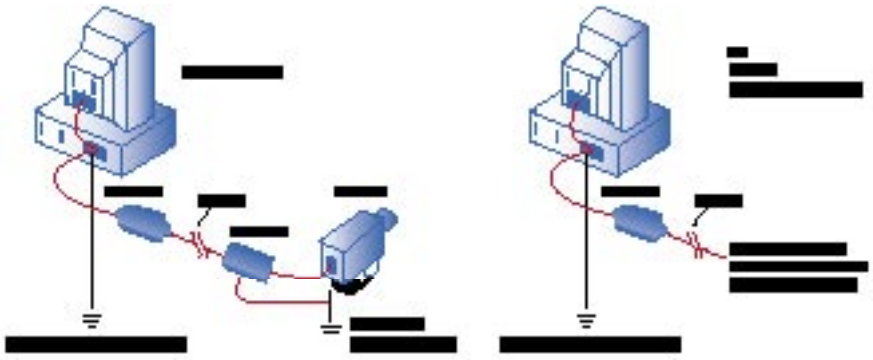
Non protected side
F or BNC Male/Female

Installation
Aluminium flange

Characteristics

- Special for video signal
- Manufactured under IEEE 802.3 normative
- Components performance does not decay with time
- Automatic Recovery
- Low insertion loss
- Multiple Discharge capability
- Discharge current: 20 KA wave 8/20µsec
- Warranty: 1 year

Connection Scheme



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AMX Argentina S.A

Aproagro, Empresa del grupo cooperativo Sancor

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Atanor S.A.

Automóvil Club Argentino

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Comsys Argentina

Comunitel

Confab Industrial-Brasil

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Coop. Eléctrica de Bengolea - CEB

Coop. Eléctrica de Intendente Alvear COSERIA

Coop. Eléctrica de Morteros - CEM

Coop. Eléctrica de Wheelwright - CEW

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Coop. Telefónica de Fray Luis Beltrán

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Coop. Telefónica de S. M. de los Andes - COTESMA

Coop. Telefónica de Villa Gdor. Gálvez COOPVGG

Red de Coop. de la Pcia. de Bs. As. NODOCOOP

Cotas (Bolivia)

CrossFone

CTI Compañía de Teléfonos del Interior S.A.

CTI PCS S.A.

Datalab - Paraguay

Dirección de Abastecimiento Naval

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ECYMCO S.R.L.

EDESE - Santiago del Estero

Emerson Network Power

Flygt Argentina S.A.

Frigorífico Paladini

Fuerza Aérea Argentina

Grupo Servicios Junín

Grupo Tenaris (Siderca, Siderar, Techint)

Heinz Loos

Impripost Tecnologías S.A.

Impsat (Perú)

INTA - Centro Regional Catamarca, La Rioja

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Lever de Brasil

MACO S.A.

Madacom - Video Cable Magdalena

Mastellone Hnos. S.A.

McCain Argentina S.A.

Mecatrón S.A.

Mercury Communications

Millicom Argentina S.A. - ERTACH

Movilnet (Venezuela)

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Municipalidad de Los Cocos

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Repsol YPF - Estaciones de Servicios

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Vinccler (Venezuela)

Wireless Solutions

Quality Policy

Our quality policy has as primary objective the fulfillment of the commitments settled along with the customers, not only in reference to the products but also to times of delivery, cost and assessment provided. Our intention is that the company is regarded as synonym of reliability, in order to achieve that we embrace the responsibility of continuous enhancement, working systematically in the constant improvement of our processes and procedures.

We are certain that through this path we assure our customers full satisfaction.

We know that this factor is decisive to determine our position in the market.

We project our national leadership in electrical systems protection to every country in Latin America in systematic and programmed stages, with the Active Line Filter as the key product.

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