Environmental Potentials

Power Quality For The Digital Age




PRODUCT CATALOG

COMPREHENSIVE

www.ep2000.com • 800.500.7436

The EP Upgrade for the Electrical Distribution System

The electrical industry has made a significant leap in the last 25 years. Technological advancements have put us on an efficiency path unlike anything seen in the industrialized era. This business revolution is driven by business process automation and is a direct result of these advancements.

Equipment is electrical, electronic, or a hybrid of the two. Equipment is programmable; equipment is sophisticated; equipment is expensive and requires a higher level of maintenance and service.

This difference in equipment means the return on investment is constantly at risk. Operations and maintenance strategies are dynamic planning efforts to drive the critical deliverables of such equipment. Often, the company deploying an automation strategy is going to endure loss of production, increase maintenance costs and have sporadic and abbreviated equipment lifecycles.

Environmental Potentials has built an entire company around the greatest glaring threat that automation promises to deliver. Whether the goal is to optimize production output, squeeze lean operations for efficiency gains, or grow the revenue per employee ratio, one reality remains. The quality of the power delivered to the equipment will significantly affect these goals.

EP provides the first major upgrade to the electrical distribution system in more than 50 years.

Table of Contents

Comprehensive product listings for Distributors, Spec Development, and Manufacturing Reference.

What is Power Quality?

While there are many complex definitions of power quality, a simple one is: the measure of voltage and current waveforms flowing to your electrical equipment. Good power quality is stable voltage and current with undistorted waveforms. Unfortunately, good power quality is rare. Electrical systems are constantly being assaulted by waveform distortions and changing voltages. There are some external threats to power quality such as lightning and transformer failure. However, almost 85 percent of power quality problems are generated inside of your own facility. Poor power quality translates into equipment deterioration, computer crashes, stoppage in assembly lines, equipment malfunction, flickering lights and wasted energy. Since businesses are powered almost entirely by electrical equipment poor power quality significantly reduces productivity.

Waveform Correction Technology

Environmental Potentials' patented waveform correction technology has revolutionized power quality for the past 10 years. Previously, power quality devices focused on protecting equipment from extreme events. Extreme events were defined as more than 20% above or below the peaks of the sine wave. These extreme events are created by events such as lightning, utility switching, transformer failure, and large faults.

However, the proliferation of electronics, computers and digital equipment is creating pollution on the waveform which rarely, if ever, exceeds the 20% "envelope". The processes of rectifying AC to DC, and inverting DC to AC, are responsible for generating 85% of power pollution.

These signal manipulations leave the waveform full of pollution. This pollution equals losses, unreliable performance, decreased asset lifespans, malfunctions, increased maintenance, and downtime.

Environmental Potentials' patented waveform correction technology focuses on tracking the waveform and filtering all of the pollution generated by continuous power conversion. Environmental Potentials converts this pollution into heat within the unit rather than relying on ground, other system conductors, or even loads to provide the required attenuation. This eliminates harmful and unusable energy from your system.

Installing EP ensures the waveform delivered to your expensive equipment is as sinusoidal as possible.

Why EP?

EP provides a systematic approach on two fronts: protection and filtration. While there are companies and products that attempt one of these, EP is the only product that seamlessly merges the two technologies. The unique hybrid design of the EP System provides the most advanced, system wide, power filter/protector the electrical industry has ever seen.

You would never find hydraulic and pneumatic fluid control systems that were not filtered. It would be nearly impossible to find a facility where the water is not filtered. Electrical power rarely gets the same attention, and this is an incredible notion when one considers that the entirety of the global economy relies on the use of power.

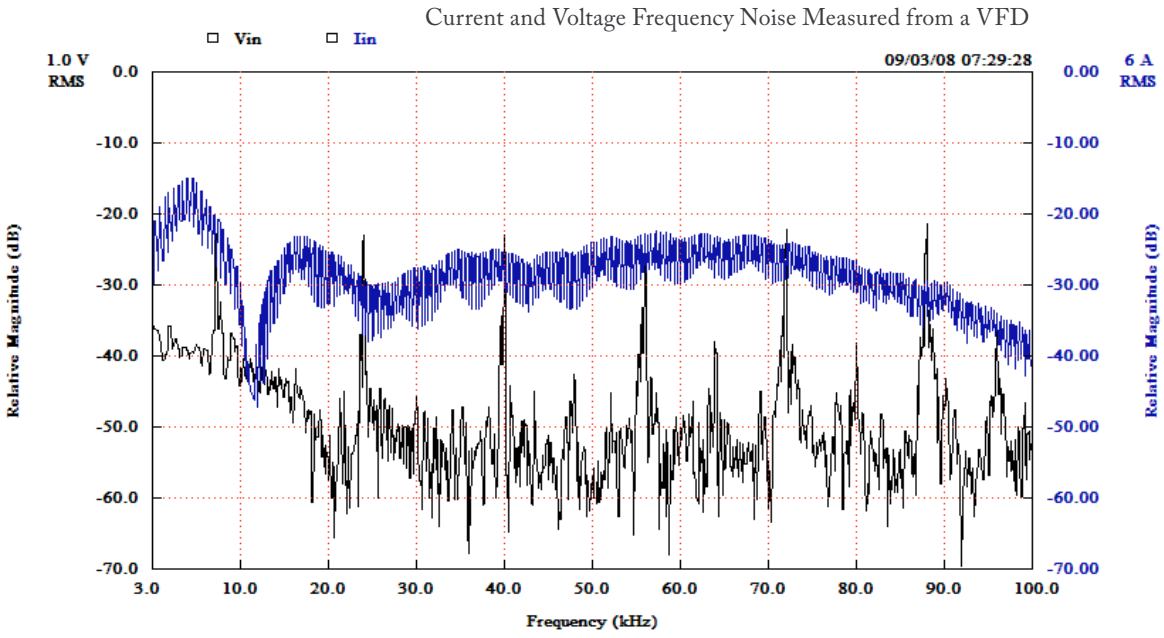
EP's patented waveform correctors can prevent the causes of equipment failures connected with automation. EP lowers the susceptibility of risk, dramatically lowers maintenance costs, while significantly extending the asset lifecycle.

Frequency Noise: 3kHz – 1MHz

Frequency noise between 3kHz and 1MHz is extremely harmful to the electrical system. Frequency noise of transients generated at 5kHz are high in amplitude and have a longer lifespan than transients generated at 100kHz.

The time period of the transient is the reciprocal of its frequency.

$$time\ period = \frac{1}{f}$$



*Note: Meter only measures between 3kHz-100kHz, EP technology filters up to 1MHz

Frequencies between 3kHz-1MHz negatively impact the entire system. It is the cause of skin effect and proximity effect in the wire. It increases eddy currents and hysteresis losses in the magnetic field. All these factors lead to a significant decrease in the performance and efficiency of the system.

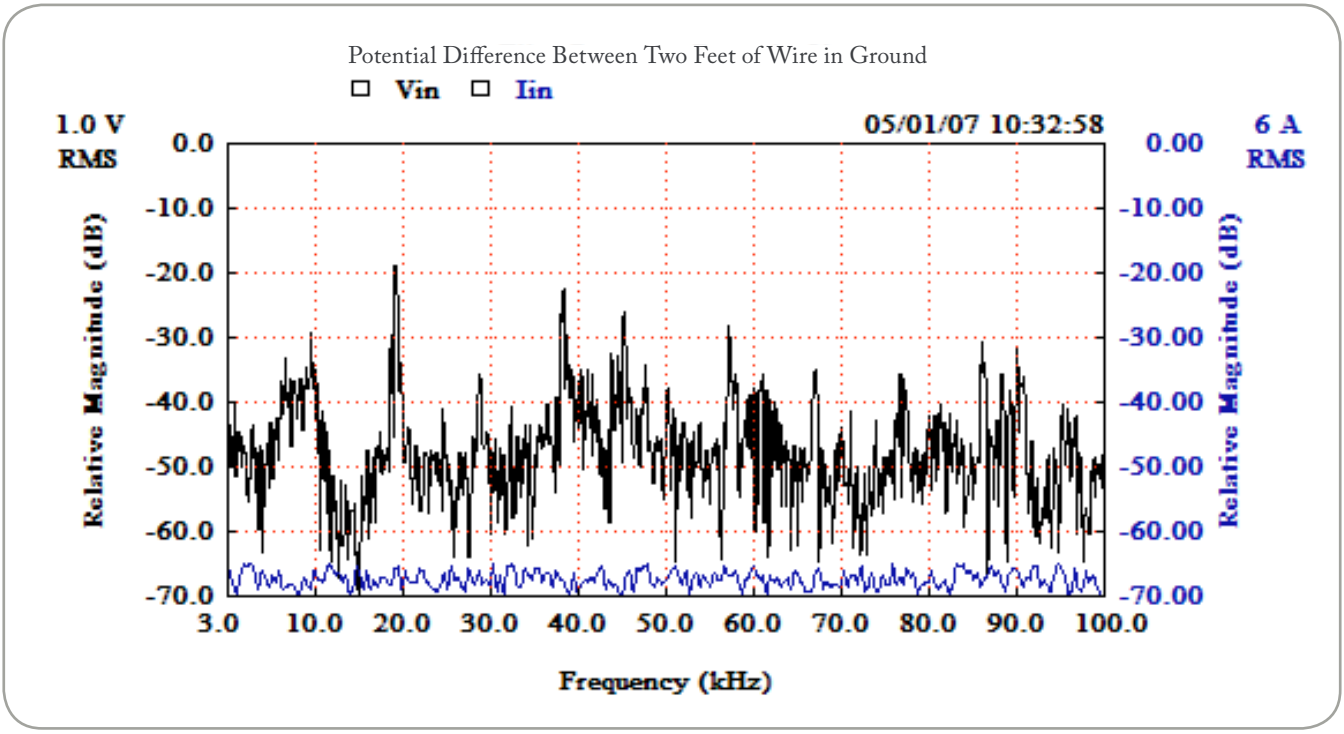
Frequency noise in this range is a major contributor to:

- Printed Circuit Board Burned Out
- Board Component Failures
- Random Memory Wipe
- Corrupted Binary Data Packets
- Overheated Conductors
- Hysteresis Losses In Motors/ Transformers
- UPS Stuck In Bypass
- Ballast Failure And Noise Contribution
- Ground Loops
- PLC/PAC Lockup
- VFD Nuisance Trip
- Skin Effect
- Voltage Flicker
- Power Supply Failure
- Server Room Overheating

Ground

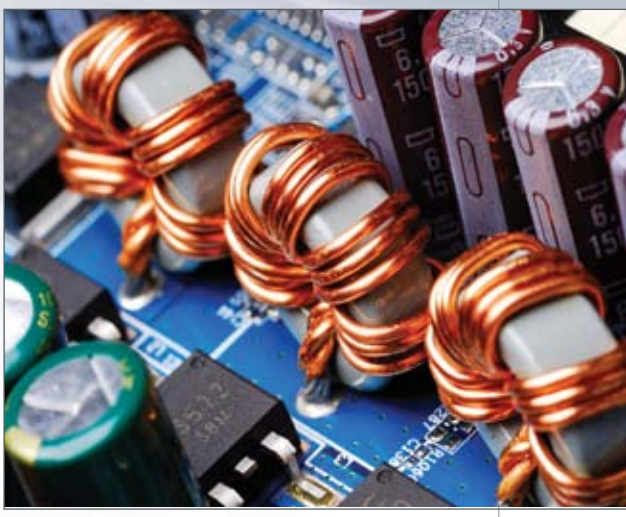
Ground is one of the most important and misused components of the electrical distribution system. More than fifty years ago after many serious injuries and deaths, a new wire "ground" was added to the power distribution. The purpose was to protect personnel and equipment from accidental shorts. Over the years its purpose was extended from important safety feature but also as protection for electronic equipment against high frequency noise.

So what is ground? It is a common electrical point in your facility that is closer to "Earth" resistance and allows equipment to run safely against 60 Hz electricity. This is normally done by driving metal rods directly into the ground and connecting them to building steel or water pipe and bringing these connections to a "Single Point" in your facility. By having all electrical and electronic devices connected to a "Single Point" grounding system, at 60 Hz you should have no voltage potential variances throughout your ground wire in the building. The measurement below clearly shows this is not the case.



Switch-Mode Power Supplies

Technological advancements have revolutionized the workplace. Every employee has a PC. Automated phone systems are a must. Fax machines and copiers are a given. Thanks in part to switched-mode power supplies (SMPS), electronics are smaller, lighter, faster and more efficient than ever before. An SMPS is an electronic power supply unit installed directly into digital equipment. It can convert AC to DC, can change voltage, change frequencies and is highly efficient.



However, SMPS's are also responsible for generating high frequency noise. Noise is the cause of many disturbances within the electrical distribution system, such as computer freezes, network crashes, ballast burnouts, equipment malfunctions and energy losses. All of which equals a significant reduction of return on investment.

Environmental Potentials' patented waveform correction technology filters and eliminate harmful frequency noise from 3kHz-1MHz.

Ground is Not the Answer for Frequency Noise

Because of the natural inductance, capacitance and resistance in all cables, any point more than three feet from the single grounding point has its own electrical characteristic. This problem is exacerbated by an increase in frequency. The sensitive electronic devices prevalent in all facilities produce a tremendous amount of low frequency noise in the 3kHz-1MHz range. This noise will ride on the normal power at 60 Hz and is connected to every piece of equipment through all the phases, neutral and your safety grounds.

A building can appear to have a perfectly grounded facility at 60 Hz, yet at 3000 Hz become noisy and harmful to your equipment. This is clearly explained in the IEEE 1100 Emerald Book. It warns engineers that the concept of ground reference is only applicable to 60 Hz. The higher frequencies become trapped inside the facility and are not eliminated at the local ground connections.

The EP Difference

There are thousands of products that protect facilities against different types of power quality events. One of the most common power quality products on the market, surge protection devices (SPD), also known as transient voltage surge suppressors (TVSS), are designed to equalize any transient voltage between the phase and neutral, or the phase and ground. Based on this assumption, SPD's and TVSS's take transient energy and momentarily provide a low impedance path in parallel to the load. This strategy has worked well for over fifty years when the only concern was protecting electrical devices. However this dated technology only address less than 15% of the power quality events now being recorded in most facilities. An SPD is nothing more than a quick electronic switch between the phase and neutral, and phase and ground, it only reacts to periodic transients. A surge protector will do nothing to eliminate the harmful electronic noise that is trapped inside the facility and floating on the wires twenty four hours a day.

EP is the only manufacturer that actively tracks, filters and eliminates this destructive noise by converting it into heat 24 hours a day, 7 days a week.

It's all About the Wire

Wire is the heart of the distribution system. Wire delivers electricity from panels to assembly lines, compressors, computers, photocopy machines, telephones and lighting. Wire is in the core of motors and transformers. Most commercial facilities have tens of thousands of meters of wire.

Skin effect, proximity effect & eddy currents are power quality problems visible in any electrical environment & all are propagated by wire. All of these combine to significantly increase heat losses and decrease equipment performance.

EP's patented technology removes frequency noise, reduces resistance in wire, eliminates skin effect, proximity effect, eddy currents and reduces wasted energy.

THE 2800 & 2900 SERIES: MODULAR PROTECTION

The newest product line from EP is the 2800 and 2900 series.

The EP-2900/2800 series waveform correctors come in three different sizes with: 2, 4 and 8 optional modules. The 2800/2900 is the only filter/protector in the industry that protects factories against catastrophic surges while also absorbing and dissipating harmful energy generated by electronic devices such as ballasts, computers and industrial control circuits like VFD's.

Modular design provides a cost effective method for meeting current protection needs while also allowing for future growth. This filter/protector is designed for easy installation, typically less than one hour and the modular design means adding new modules can be done in the field in minutes. The 2900 family comes standard with dual surge counters, remote relay status alarm, audible alarm, both system and module status LED's and with a 30A 200kAIC integrated fuseable disconnects allowing direct bus connection with no upstream disconnect required.

The difference between the 2800 and 2900 is the features.

	EP-2800	EP-2900
30Amp 200kAIC Fusing	Yes	Yes
LED Visual Notification	Yes	Yes
Audible Alarm	No	Yes
Dry Contacts/Remote Alarm	No	Yes
Dual Surge Counters	No	Yes

Fusing

The 2900/2800 series come equipped with 30 Amp 200kAIC fuses. The fuses are located in between the modules inside the casing. Removing the fuses renders the unit inoperable. Three phase systems have three fuses while single phase systems have two fuses. If one or all of the fuses blow, the LED notification on the front of the unit will be extinguished.

LED Visual Notification

The 2900/2800 series have green LED lighting on the cover of the unit for visual notification of the unit's status. If the LED lights are on the unit is functioning properly. If any of the lights are extinguished, a module needs to be replaced. Inside the casing, red LED lights will indicate which module needs replacing.

Audible Alarm

The 2900 series are equipped with an audible alarm that will trigger if a unit becomes disabled. There is an ON/OFF switch to disable the alarm. Both the alarm and the switch are located on the outside/front of the unit directly above the surge counters.

Dry Contacts/Remote Relay

Perhaps your electrical room is tucked away in the back of the factory and has little or no foot traffic. The 2900 series offer dry contacts that can connect to your preferred device to provide notification to wherever you would like.

Surge Counters

Want to know how many surge events you are protected from each month? Well, the 2900 series come equipped with dual surge counters. The counters are on the front of the unit. Both counters are equipped with a gray reset button on the lower right hand corner of the surge counter. The reset button for the bottom counter has been disabled.

EP-2900 SERIES WAVEFORM CORRECTOR

THE EP-2900 FEATURES AND BENEFITS:

- Provides 80kA to 640kA per mode single-pulse surge current
- Integrated Dissipation Technology. Energy is absorbed and dissipated within the unit, not shunted to the ground.
- Active Sine Wave tracking filter
- No additive harmonic distortion
- Patented technology of the 2800B module provides industry-superior filter performance
- Patented system protection slows dangerous transient rise times starting at 200 Hz with greater than -40dB at 45kHz to 250 kHz
- Reacts to transient in nanoseconds
- Fail Safe OPEN - Meets new UL 1449 2nd edition Feb 2007
- Status LED Indicators
- Top and Bottom feed
- 10 –Year Warranty

EP-2900 GENERAL SPECIFICATIONS

MAX SURGE CURRENT RATING: 320kA per mode
REPETITIVE SURGE CURRENT RATING: 5000 impulses using IEEE C62.41
PRODUCT DESIGN: Patented Parellel Design with waveform correction absorber and fused MOV
OPERATING FREQUENCY: 45 - 65 Hz
WARRANTY: 10 Years
LISTING: **UL 1449 2nd Edition effective 2/2007**
CSA Standards Class 9091 01 & 9091 81; CSA std. c22.2 No. 8-M1986
SAFETY: Fire Rating 94V-0
COMPLIANCE: NEMA LS-1, NEC Surge Suppression Standards, Electrical Notice 516

EP-2900 ELECTRICAL SPECIFICATIONS

CONNECTION METHOD: Parallel
PROTECTION MODES: L-N, L-L
CONTRACTOR SUPPLIED WIRE: 00 AWG Wire
INTEGRATED FUSEABLE DISCONNECT: 30 A, 200 kaic
STATUS INDICATORS: Local and Remote LED
EMI/RFI FILTER ATTENUATION: MIL Standard 220B

The **EP-2920** can hold up to two modules plus ground filter. Two base module provides 160kA protection.

The **EP-2940** can hold up to four modules plus ground filter. Four base module provides 320kA protection.

The **EP-2980** can hold up to eight modules plus ground filter. Eight base module provides 640kA protection.

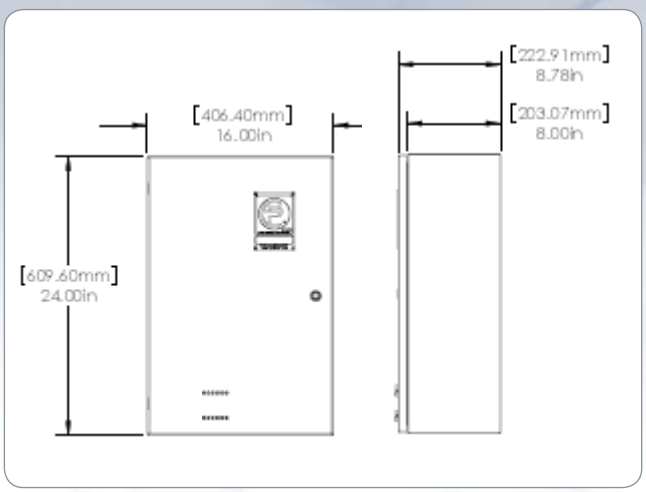
EP-2900B MODULE

- 80kA single impulse surge current
- Integrated filter with sine wave tracking
- Integrated dissipation technology

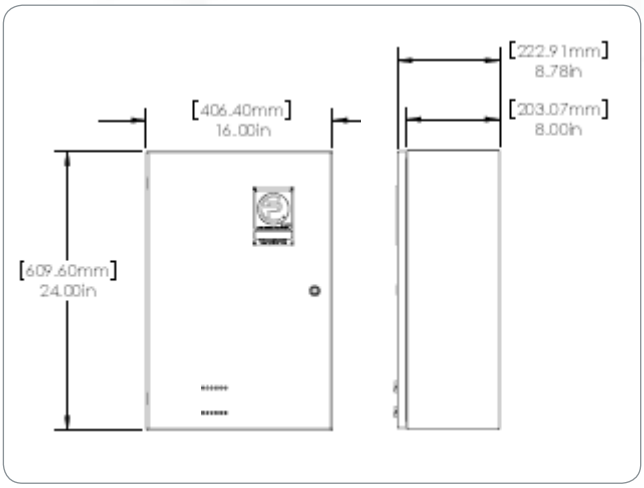
EP-2900F MODULE

- Patented technology provides industry-superior filter performance
- Protected by mandatory base module for consistent filtering
- Integrated dissipation technology

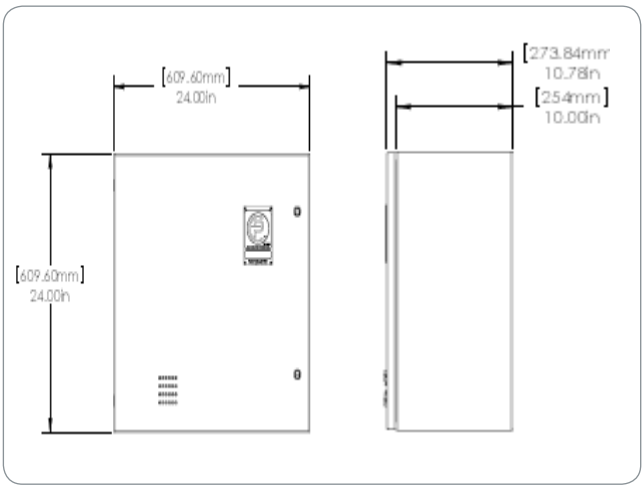
2920



2940



2980

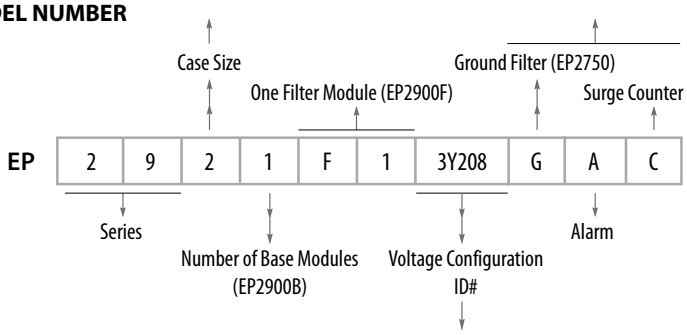


EP-2900 SERIES PRODUCT ORDERING GUIDELINES

CASE SIZE REFERENCE
2 (12 x 18 x 10")
4 (12 x 18 x 10")
8 (24 x 24 x 12")

OPTIONS AVAILABLE
G - 2750 Ground Filter

MODEL NUMBER



VOLTAGE CONFIGURATIONS

SYSTEM VOLTAGE	PROTECT MODE	SYSTEM CONFIGURATION	VOLTAGE ID#	MCOV	SVR
Single Phase 100/200	L-N	3 Wire + G	**1S100**	130V	340V
Single Phase 120/240	L-N L-L	3 Wire + G	**1S240**	150 V 300 V	395 775
Single Leg 120V	L-N	2 Wire + G	**1L120**	150 V	395
Single Leg 240V	L-N	2 Wire + G	**1L240**	300 V	775
3 Phase 120/208	L-N L-L	4 Wire + G	**3Y208**	150 V 300 V	395
3 Phase 277/480	L-N L-L	4 Wire + G	**3Y480**	360 V 720 V	910
3 Phase 347/600	L-N L-L	4 Wire + G	**3Y600**	420 V 840 V	1120
3 Phase 120/240	L-N L-L	4 Wire + G High Leg	**3H240**	150 V 300 V	395 775
3 Phase 480V	L-L	3 Wire + G	**3D480**	575 V	1570
3 Phase 600V	L-L	3 Wire + G	**3D600**	750 V	1980

MECHANICAL SPECIFICATIONS

DIMENSIONS	12 x 18 x 10 inch 30.5 x 35.6 x 20.3 cm
WEIGHT	60 lbs. / 27.27 Kg
ENCLOSURE	NEMA 4x, 12 , Painted Steel
OPERATING TEMPERATURE	-40F to 140F -40C to +60C
NON-CONDENSING HUMIDITY	5% to 95%

*Other voltages and configurations available upon request

EP-2800 SERIES WAVEFORM CORRECTOR

THE EP-2800 FEATURES AND BENEFITS:

- Provides 80kA to 640kA per mode single-pulse surge current
- Integrated Dissipation Technology. Energy is absorbed and dissipated within the unit, not shunted to the ground.
- Active Sine Wave tracking filter
- No additive harmonic distortion
- Patented technology of the 2800B module provides industry-superior filter performance
- Patented system protection slows dangerous transient rise times starting at 200 Hz with greater than - 40dB at 45kHz to 250 kHz
- Reacts to transient in nanoseconds
- Fail Safe OPEN - Meets new UL 1449 2nd edition Feb 2007
- Status LED Indicators
- Top and Bottom feed
- 10 –Year Warranty

EP-2800 GENERAL SPECIFICATIONS

MAX SURGE CURRENT RATING: 320kA per mode
REPETITIVE SURGE CURRENT RATING: 5000 impulses using IEEE C62.41
PRODUCT DESIGN: Patented Parellel Design with waveform correction absorber and fused MOV
OPERATING FREQUENCY: 45 - 65 Hz
WARRANTY: 10 Years
LISTING: **UL 1449 2nd Edition effective 2/2007**
CSA Standards Class 9091 01 & 9091 81; CSA std. c22.2 No. 8-M1986
SAFETY: Fire Rating 94V-0
COMPLIANCE: NEMA LS-1, NEC Surge Suppression Standards, Electrical Notice 516

EP-2800 ELECTRICAL SPECIFICATIONS

CONNECTION METHOD: Parallel
PROTECTION MODES: L-N, L-L
CONTRACTOR SUPPLIED WIRE: 00 AWG Wire
INTEGRATED FUSEABLE DISCONNECT: 30 A, 200 kaic
STATUS INDICATORS: Local and Remote LED
EMI/RFI FILTER ATTENUATION: MIL Standard 220B

The **EP-2820** can hold up to two modules plus ground filter. Two base module provides 160kA protection.

The **EP-2840** can hold up to four modules plus ground filter. Four base module provides 320kA protection.

The **EP-2880** can hold up to eight modules plus ground filter. Eight base module provides 640kA protection.

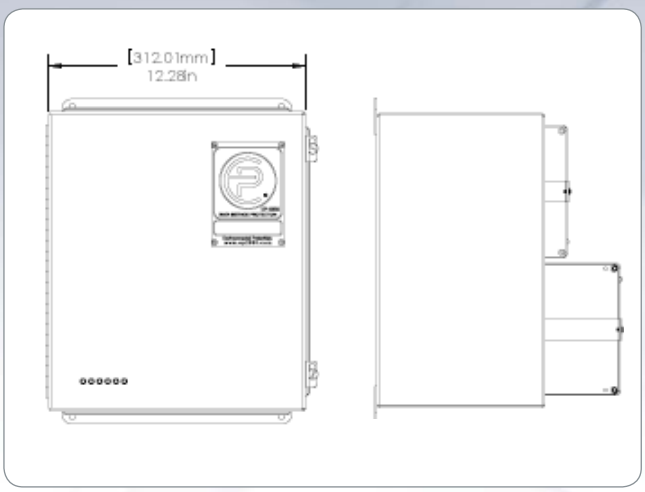
EP-2800B MODULE

- 80kA single impulse surge current
- Integrated filter with sine wave tracking
- Integrated dissipation technology

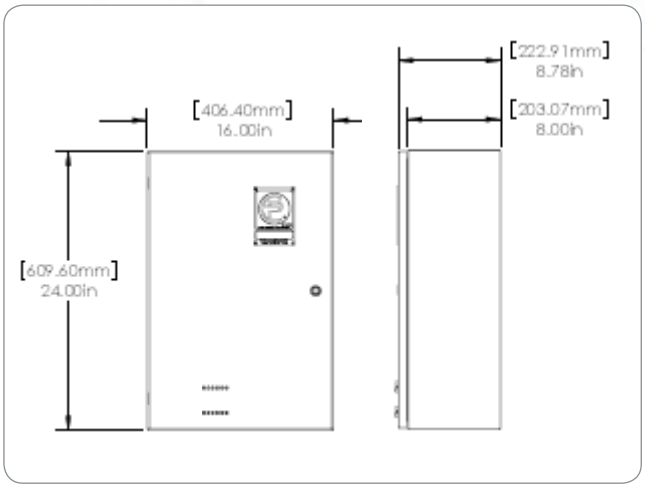
EP-2800F MODULE

- Patented technology provides industry-superior filter performance
- Protected by mandatory base module for consistent filtering
- Integrated dissipation technology

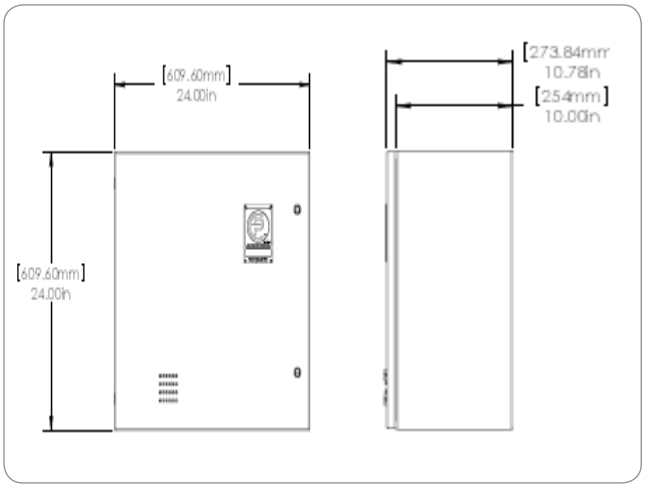
2820



2840



2880



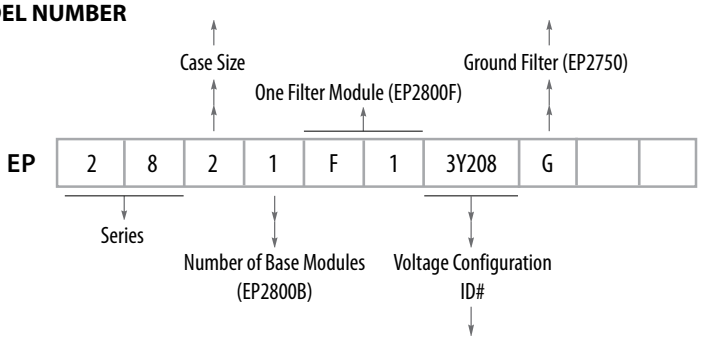
*Other voltages and configurations available upon request

EP-2800 SERIES PRODUCT ORDERING GUIDELINES

CASE SIZE REFERENCE
2 (12 x 14 x 8")
4 (12 x 18 x 10")
8 (24 x 24 x 12")

OPTIONS AVAILABLE
G - 2750 Ground Filter

MODEL NUMBER



VOLTAGE CONFIGURATIONS

SYSTEM VOLTAGE	PROTECT MODE	SYSTEM CONFIGURATION	VOLTAGE ID#	MCOV	SVR
Single Phase 100/200	L-N	3 Wire + G	**1S100**	130V	340V
Single Phase 120/240	L-N L-L	3 Wire + G	**1S240**	150 V 300 V	395 775
Single Leg 120V	L-N	2 Wire + G	**1L120**	150 V	395
Single Leg 240V	L-N	2 Wire + G	**1L240**	300 V	775
3 Phase 120/208	L-N L-L	4 Wire + G	**3Y208**	150 V 300 V	395
3 Phase 277/480	L-N L-L	4 Wire + G	**3Y480**	360 V 720 V	910
3 Phase 347/600	L-N L-L	4 Wire + G	**3Y600**	420 V 840 V	1120
3 Phase 120/240	L-N L-L	4 Wire + G High Leg	**3H240**	150 V 300 V	395 775
3 Phase 480V	L-L	3 Wire + G	**3D480**	575 V	1570
3 Phase 600V	L-L	3 Wire + G	**3D600**	750 V	1980

MECHANICAL SPECIFICATIONS

DIMENSIONS	12 x 14 x 8 inch 30.5 x 35.6 x 20.3 cm
STANDARD WEIGHT **MAXIMUM WEIGHT**	24 lbs. / 10.89 Kg 30 lbs. / 13.61 Kg
ENCLOSURE	NEMA 4x, 12 , Painted Steel
OPERATING TEMPERATURE	-40F to 140F -40C to +60C
NON-CONDENSING HUMIDITY	5% to 95%

REPLACEABLE MODULES FOR **2800** AND **2900** SERIES

EP2800 Base Modules	EP2800 Filter Modules	EP2900 Base Modules	EP2900 Filter Modules
EP2800B1S120	EP2800F1S120	EP2900B1S120	EP2900F1S120
EP2800B1S240	EP2800F1S240	EP2900B1S240	EP2900F1S240
EP2800B1L240	EP2800F1L240	EP2900B1L240	EP2900F1L240
EP2800B3Y208	EP2800F3Y208	EP2900B3Y208	EP2900F3Y208
EP2800B3Y480	EP2800F3Y480	EP2900B3Y480	EP2900F3Y480
EP2800B3Y600	EP2800F3Y600	EP2900B3Y600	EP2900F3Y600
EP2800B3H240	EP2800F3H240	EP2900B3H240	EP2900F3H240
EP2800B3D480	EP2800F3D480	EP2900B3D480	EP2900F3D480
EP2800B3D600	EP2800F3D600	EP2900B3D600	EP2900F3D600

COMMERCIAL PROTECTION

Since approximately 85 percent of power quality problems are generated by electrical equipment inside the facility, protection only at the main gate will not improve power quality. To truly ensure equipment is performing to its maximum capability it is necessary to cover every electrical panel and all large equipment.

Designed for industrial and commercial applications the EP-2500 is perfect for downstream panels in heavy industrial environments and strong enough for the main panel in most commercial facilities. The EP-2000 is perfect for point of equipment applications in heavy industrial environments and in downstream panels in commercial facilities.

More than 10 years after the release of the EP-2000, these waveform correctors continue to lead the industry in improving equipment performance. EP patented waveform correctors provide 24/7 active filtration and protection. Conveniently sized and shaped the EP-2000 and EP-2500 fit into most panels and are designed to handle a diverse range of electrical environments.

EP-2500 WAVEFORM CORRECTOR: MEDIUM PROTECTION

THE EP-2500:

ABSORBS, DISSIPATES & REMOVES
with increased capacity

- Transient voltage surges and spikes
- Frequency Noise Between 3kHz-1MHz
- Ring waves

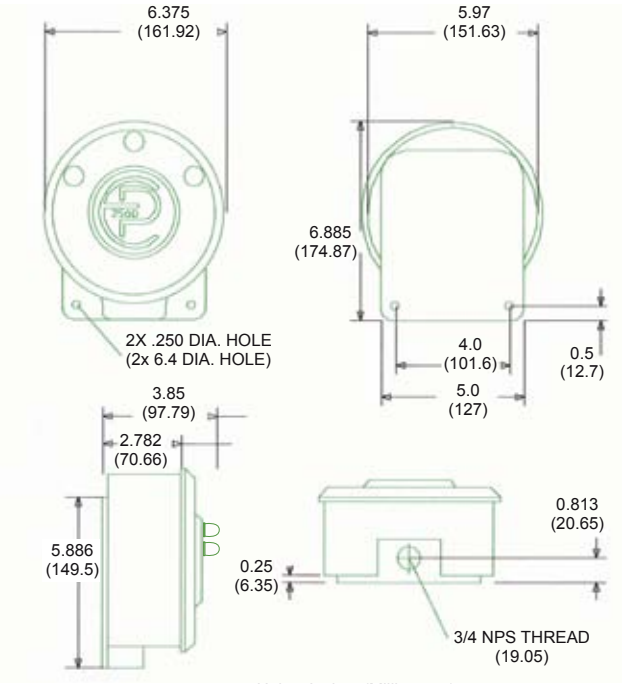
DOES NOT SHUNT ENERGY TO GROUND.
The facility ground is not relied on for performance or survivability.

EP-2500 GENERAL SPECIFICATIONS

CIRCUIT DESCRIPTION	Internal Circuit Breaker a	Spectrum Multiplier a	Voltage Limit Clamp (MOV) a	Increased Capacity a	Low-Pass Filter a	Dissipative Absorber	(Parallel Operated)

OPERATING FREQUENCY
45 - 65 Hz
FREQUENCY ATTENUATION
-20 dB/decade roll-off starting at 2.5 kHz
MAX SURGE CURRENT
80 kA per mode
MCOV
20% above rated voltage
SAFETY APPROVALS
UL 1449 2nd Edition TVSS Testing
CSA Standards Class 9091 01 & 9091 81; CSA std. c22.2 No. 8-M1986
SAFETY RATINGS
Fire Rating 94V-0
OPERATING ENVIRONMENT
Approximately -25° C to 65° C
RESPONSE TIME
Primary Response Time: Instantaneous Key Event Time: Approx. 1 Nanosecond
COMPLIANCE
NEMA LS-1, NEC Surge Suppression Standards, Electrical Notice 516
CONNECTION
Wire leads. Size: 10 AWG Length: 3'
MATERIALS
Aluminum Housing, LED Indicator Lamps, 10 AWG 600 V rated Wire.
Circuit encapsulated in epoxy to retain integrity of circuitry in failure mode.
ACCESSORIES
Amber LED indicates active phase

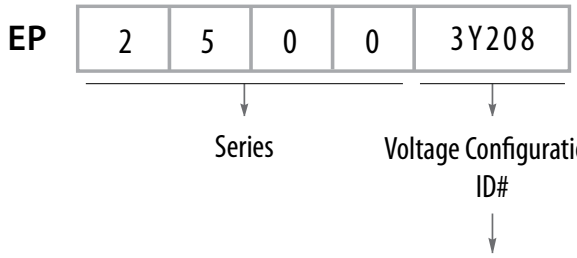
DIMENSIONS & WEIGHT
Diameter: 6.375" Depth: 3.85" Weight: 6 lbs. Compact for easy installation.



Units: Inches (Millimeters)

EP-2500 PRODUCT ORDERING GUIDELINES

MODEL NUMBER



VOLTAGE CONFIGURATIONS

SYSTEM VOLTAGE	PROTECT MODE	SYSTEM CONFIGURATION	VOLTAGE ID#	MCOV	SVR
Single Phase 100/200	L-N	3 Wire + G	**1S100**	130V	340V
Single Phase 120/240	L-N L-L	3 Wire + G	**1S240**	150 V 300 V	395 775
Single Leg 120V	L-N	2 Wire + G	**1L120**	150 V	395
Single Leg 240V	L-N	2 Wire + G	**1L240**	300 V	775
3 Phase 120/208	L-N L-L	4 Wire + G	**3Y208**	150 V 300 V	395
3 Phase 277/480	L-N L-L	4 Wire + G	**3Y480**	360 V 720 V	910
3 Phase 347/600	L-N L-L	4 Wire + G	**3Y600**	420 V 840 V	1120
3 Phase 120/240	L-N L-L	4 Wire + G High Leg	**3H240**	150 V 300 V	395 775
3 Phase 480V	L-L	3 Wire + G	**3D480**	575 V	1570
3 Phase 600V	L-L	3 Wire + G	**3D600**	750 V	1980

*Other voltages and configurations available upon request

EP-2000 WAVEFORM CORRECTOR: P.O.E. PROTECTION

The **EP-2000** is the industry's most advanced power quality solution available. The patented circuit of the **EP-2000** uses innovative technology to increase the efficiency of an electrical distribution system, protecting the connected equipment that drives your process, from home automation to industrial robotics - and everything in between.

THE EP-2000:

ABSORBS, DISSIPATES & REMOVES

- Transient voltage surges and spikes
- Frequency Noise Between 3kHz-1MHz
- Ring waves

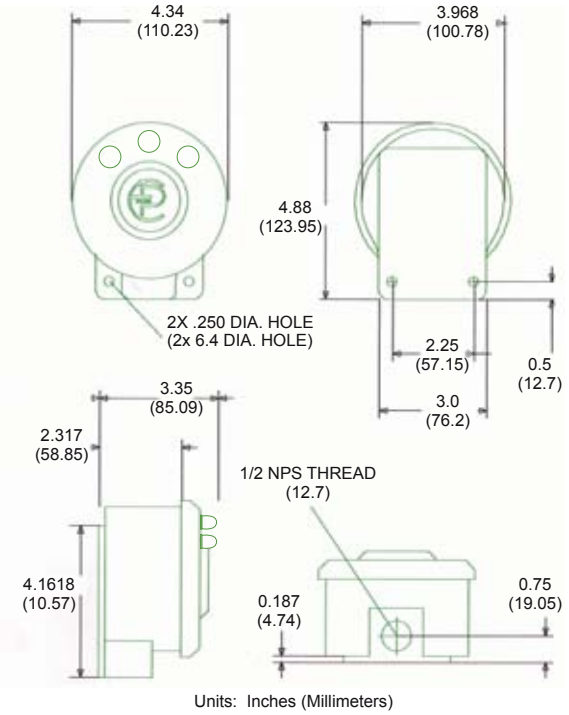
DOES NOT SHUNT ENERGY TO GROUND.
The facility ground is not relied on for performance or survivability.

EP-2000 GENERAL SPECIFICATIONS

CIRCUIT DESCRIPTION	Internal Circuit Breaker	a	Spectrum Multiplier	a	Voltage Limit Clamp (MOV)	a	Low-Pass Filter	a	Dissipative Absorber	(Parallel Operated)

OPERATING FREQUENCY
45 - 65 Hz
FREQUENCY ATTENUATION
-20 dB/decade roll-off starting at 2.5 kHz
MAX SURGE CURRENT
12.5 kA per mode
MCOV
20% above rated voltage
SAFETY APPROVALS
UL 1449 2nd Edition TVSS Testing
CSA Standards Class 9091 01 & 9091 81; CSA std. c22.2 No. 8-M1986
SAFETY RATINGS
Fire Rating 94V-0
OPERATING ENVIRONMENT
Approximately -25° C to 65° C
RESPONSE TIME
Primary Response Time: Instantaneous Key Event Time: Approx. 1 Nanosecond
COMPLIANCE
NEMA LS-1, NEC Surge Suppression Standards, Electrical Notice 516
CONNECTION
Wire leads. Size: 14 AWG Length: 3'
MATERIALS
Aluminum Housing, LED Indicator Lamps, 14 AWG 600 V rated Wire.
Circuit encapsulated in epoxy to retain integrity of circuitry in failure mode.
ACCESSORIES
Amber LED indicates active phase

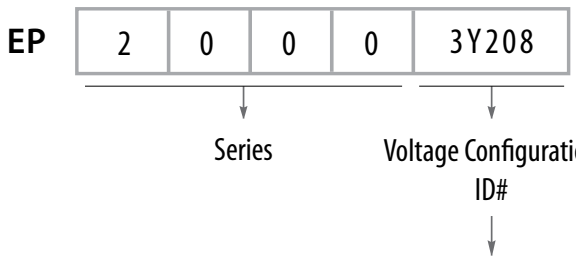
DIMENSIONS & WEIGHT
Diameter: 4.34" Depth: 3.35" Weight: 3 lbs. Compact for easy installation.



Units: Inches (Millimeters)

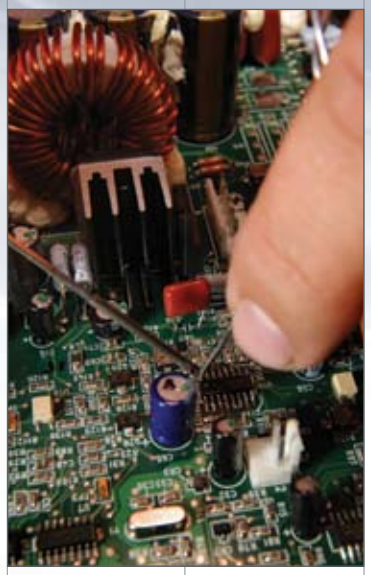
EP-2000 PRODUCT ORDERING GUIDELINES

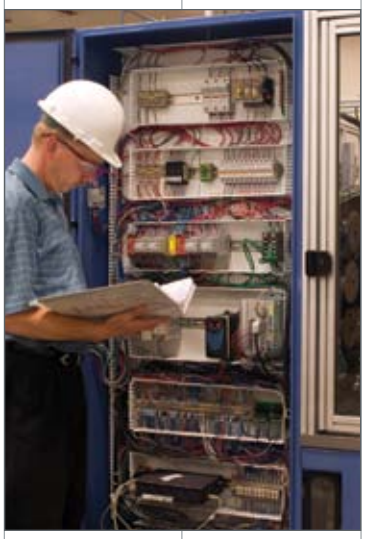
MODEL NUMBER



VOLTAGE CONFIGURATIONS

SYSTEM VOLTAGE	PROTECT MODE	SYSTEM CONFIGURATION	VOLTAGE ID#	MCOV	SVR
Single Phase 100/200	L-N	3 Wire + G	**1S100**	130V	340V
Single Phase 120/240	L-N L-L	3 Wire + G	**1S240**	150 V 300 V	395 775
Single Leg 120V	L-N	2 Wire + G	**1L120**	150 V	395
Single Leg 240V	L-N	2 Wire + G	**1L240**	300 V	775
3 Phase 120/208	L-N L-L	4 Wire + G	**3Y208**	150 V 300 V	395
3 Phase 277/480	L-N L-L	4 Wire + G	**3Y480**	360 V 720 V	910
3 Phase 347/600	L-N L-L	4 Wire + G	**3Y600**	420 V 840 V	1120
3 Phase 120/240	L-N L-L	4 Wire + G High Leg	**3H240**	150 V 300 V	395 775
3 Phase 480V	L-L	3 Wire + G	**3D480**	575 V	1570





*Other voltages and configurations available upon request

EP-2700 HIGH FREQUENCY FILTER

The **EP-2700** is a constantly-on high frequency noise filter. This filter complements the **EP-2000** by supplying additional filtration to environments where there is a high level of high frequency noise pollution.

THE EP-2700:

- Has a greater than -30 dB reduction from 5 kHz to 2 MHz
- Has a maximum attenuation of greater than -40 dB from 45 kHz to 250 kHz
- Absorbs and dissipates energy within the unit. Energy is not shunted to the ground. Case ground only.
- This unit will not work on the output of a VFD; it will attenuate the control frequency.

EP-2700 GENERAL SPECIFICATIONS

CIRCUIT DESCRIPTION	Internal Circuit Breaker	a	High Frequency Filter	a	Dissipative Absorber	(Parallel Operated)

OPERATING FREQUENCY
45 - 65 Hz
FREQUENCY ATTENUATION
-30 dB reduction from 5 kHz to 2 MHz
SAFETY RATINGS
Fire Rating 94V-0
OPERATING ENVIRONMENT
Approximately -25° C to 65° C
APPLICATION ENVIRONMENT
Subpanel Distribution, PLC Protection, Buss Plug, Machine Feed,
VFD Input Power (Must be used in combination with either EP-2000 or EP-2500)
COMPLIANCE
NEMA LS-1, Electrical Notice 516

CONNECTION
Wire leads Size: 14 AWG Length: 3'
DIMENSIONS & WEIGHT
Three-Phase: Length: 6.25" Width: 6.25" Height: 4" Weight: 8 lbs.
Mounting Plate: 8.25 x 6.25 x .25"
Single-Phase: Length: 4.75" Width: 4.75" Height: 3.75" Weight: 5 lbs.
Mounting Plate: 6.75 x 4.75 x .25"
MATERIALS
Aluminum Housing, 14 ga 600 V rated Wire.
Circuit encapsulated in epoxy to retain integrity of circuitry in failure mode.
ACCESSORIES
Red LED Indicator Lights = Failure Mode

EP-2700 PRODUCT LIST

VOLTAGE	CONFIGURATION	PRODUCT NUMBER
≤ 277 V	(1) Wye	**EP270011**
	(2) Delta	**EP270012**
	(4) Wye	**EP270014**
	(5) Single Line	**EP270015**
278 - 480 V	(1) Wye	**EP270021**
	(2) Delta	**EP270022**

EP-2750 & 2775 GROUND FILTERS

The **EP-2750** and **EP-2775** remove high frequency resonance in the grounding system.

THE EP-2750 AND EP-2775:

- Remove high frequency resonance in the grounding system
- Allow for greater leverage of ground system to dissipate events
- Add filtering to prevent ground loops
- Reduce feedback to sensitive electronics and instrumentation from ground
- Reduce the chance of equipment damage caused byflashover and near-strike lightning.

EP-2750 & EP-2775 GENERAL SPECIFICATIONS

OPERATING FREQUENCY
45 - 65 Hz

FREQUENCY ATTENUATION
Noise attenuation starting at 15 kHz and attenuation of -30 dB at 1.5 MHz

SAFETY RATINGS
Fire Rating 94V-0

OPERATING ENVIRONMENT
Approximately -25° C to 65° C

APPLICATION ENVIRONMENT
Subpanel Distribution, PLC Protection, Buss Plug, Machine Feed

CONNECTION
Wire Leads Length: 2'
EP-2750 Size: 10 AWG Wire EP-2775 Size: 3 AWG Wire

2750 DIMENSIONS & WEIGHT
Length: 4" With mounting tabs: 4.75" Width: 2" Height: 1.5" Weight: 10 oz.
Compact size for easy installation.

2775 DIMENSIONS & WEIGHT
Length: 4.75" With mounting tabs: 6" Width: 4.75" Height: 3.75"
Weight: 5.5 lbs. Compact size for easy installation.

MATERIALS
Plastic Housing, 10 AWG Wire for 2750, 3 or 6 AWG wire for 2775.
Circuit encapsulated in epoxy to retain integrity of circuitry in failure mode.

COMPLIANCE
NEMA LS-1, Electrical Notice 516

GROUND FILTER PRODUCT LIST

PRODUCT	WIRE OPTIONS	PRODUCT NUMBER
EP-2750	10 AWG	EP2750-10
EP-2750	12 AWG	EP2750-12
EP-2775	3 AWG	EP2775-3
EP-2775	6 AWG	EP2775-6

POWER SUPPLIES

Businesses rely on power for critical operations. Technological advancements made electronic equipment smarter, faster and more sophisticated than ever before. However, power disturbances and poor power quality can significantly reduce the return on investment for these expensive and critical assets.

Clean power will extend the lifecycle and increase the performance and efficiency of expensive electrical and electronic equipment. Environmental Potentials designed its line of power supply products to provide businesses, medical facilities and residences with EP's industry changing waveform correction technology in a convenient, portable plug-in case.

Environmental Potentials' power supplies integrate EP's patented waveform correction technology, additional noise filtration and protection from extreme events

EP-2400 RACK MOUNTED POWER SUPPLY

The **EP-2400** is a unique industrial rack mounted power supply featuring the superior benefits of EP technology. It is conveniently sized to integrate with industry-standard equipment, and designed for ease of installation, portability and commercial-grade use.

THE EP-2400 PROVIDES:

- EP-2500 Lightning Protection
- EP-2700 High Frequency Filtering
- EP-2750 Ground Filtering
- EP-2275 Ethernet Protection
- 20 Amp Breaker Protection
- Outlet panel for Power Access

EP-2400 GENERAL SPECIFICATIONS

MAX SURGE CURRENT
80 kA

SAFETY RATINGS
Fire Rating 94V-0

SAFETY APPROVALS
UL 1449 2nd Edition TVSS Testing (EP-2500)
CSA Std. Class 9091 01 & 9091 81; CSA Std. c22.2 No. 8-M1986 (EP-2500)

OPERATING ENVIRONMENT
Approximately -10° C to 65° C

APPLICATION ENVIRONMENT
Commercial

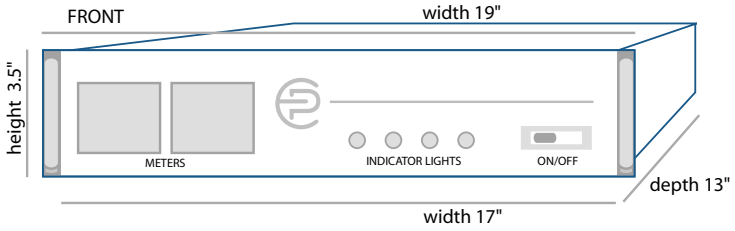
CONNECTION
IEEE C14 plug, 5.5' cord length

MATERIALS
Aluminum Housing, LED Indicator Lamps. Circuit encapsulated in epoxy to retain integrity of circuitry in failure mode.

ACCESSORIES
Analog voltage and amperage meters, LEDs indicate active phase, Commercial grade vertical handles, Electrical panel, Ethernet ports, Rubber base pads

COMPLIANCE
NEMA LS-1, NEC Surge Suppression Stds., Electrical Notice 516

DIMENSIONS & WEIGHT
Height: 3.5" Width: 17" (19" at front with handles)
Depth: 13" Weight: 9 lbs
Industry standard size for integration with other equipment



EP-2400 PRODUCT LIST		
VOLTAGE	SOCKET TYPE	PRODUCT NUMBER
120 V	A	**EP24001A**
	B	**EP24001B**
	C	**EP24001C**
	D	**EP24001D**
	E	**EP24001E**
	F	**EP24001F**
	G	**EP24001G**
	H	**EP24001H**
	I	**EP24001I**
	J	**EP24001J**
	K	**EP24001K**
	L	**EP24001L**
	M	**EP24001M**
220 V	A	**EP24002A**
	B	**EP2400SB**
	C	**EP24002C**
	D	**EP24002D**
	E	**EP24002E**
	F	**EP24002F**
	G	**EP24002G**
	H	**EP24002H**
	I	**EP24002I**
	J	**EP24002J**
	K	**EP24002K**
	L	**EP24002L**
	M	**EP24002M**

OPTION A for CUSTOMIZED EP-2400:

- Analog Voltage and Amperage Meters
- 12 in/12 out Standard Ethernet Ports
- 8 Single-phase Electrical Receptacle

OPTION B for CUSTOMIZED EP-2400:

- Analog Voltage and Amperage Meters
- 6 International Receptacles

OPTION C for CUSTOMIZED EP-2400:

- Analog Voltage and Amperage Meters
- 10 US Receptacles

EP-2450 HOME THEATER POWER SUPPLY

The **EP-2450** is a unique residential power supply, combining several EP product features to provide an all-in-one protection unit. It is conveniently sized for use with standard home entertainment equipment, but can be used in various situations where a protected power supply is beneficial.

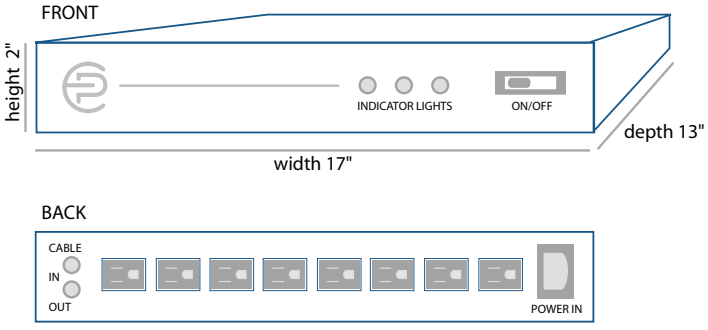
THE EP-2450 PROVIDES:

- EP-2000 Surge Protection
- EP-2250 Cable Suppression & Filtering
- EP-2700 High Frequency Filtering
- EP-2750 Ground Filtering
- 15 Amp Breaker Protection
- Eight-Receptacle Electrical Panel for Power Access Industry standard-sized case

EP-2450 GENERAL SPECIFICATIONS

MAX SURGE CURRENT
12.5 kA
SAFETY RATINGS
Fire Rating 94V-0
SAFETY APPROVALS
UL 1449 2nd Edition TVSS Testing (EP-2000)
CSA Std. Class 9091 01 & 9091 81; CSA Std. c22.2 No. 8-M1986 (EP-2000)
OPERATING ENVIRONMENT
Approximately -10° C to 65° C
APPLICATION ENVIRONMENT
Home Theater, Computers and Servers, Audio Equipment
CONNECTIONS
IEEE C14 plug, 5.5' cord length
In/Out F-type Cable Connections
MATERIALS
Aluminum Housing, LED Indicator Lamps. Circuit encapsulated in epoxy to retain integrity of circuitry in failure mode.
ACCESSORIES
LEDs indicate active phase, Eight-outlet electrical panel, Rubber base pads
COMPLIANCE
NEMA LS-1, NEC Surge Suppression Stds., Electrical Notice 516

DIMENSIONS & WEIGHT
Height: 2" Width: 17"
Depth: 13" Weight: 6 lbs
Industry standard size for integration with other equipment



EP-2450 PRODUCT LIST		
VOLTAGE	SOCKET TYPE	PRODUCT NUMBER
120 V	A	**EP24501A**
	B	**EP24501B**
	C	**EP24501C**
	D	**EP24501D**
	E	**EP24501E**
	F	**EP24501F**
	G	**EP24501G**
	H	**EP24501H**
	I	**EP24501I**
	J	**EP24501J**
	K	**EP24501K**
	L	**EP24501L**
	M	**EP24501M**
220 V	A	**EP24502A**
	B	**EP2450SB**
	C	**EP24502C**
	D	**EP24502D**
	E	**EP24502E**
	F	**EP24502F**
	G	**EP24502G**
	H	**EP24502H**
	I	**EP24502I**
	J	**EP24502J**
	K	**EP24502K**
	L	**EP24502L**
	M	**EP24502M**

EP-2460 MEDICAL POWER SUPPLY

The **EP-2460** is a unique medical power supply, combining several EP product features to provide an all-in-one protection unit. It is conveniently sized for use with standard medical equipment, but can be used in various situations where a protected power supply is beneficial.

THE EP-2460 PROVIDES:

- EP-2000 Surge Protection
- EP-2700 High Frequency Filtering
- EP-2750 Ground Filtering
- 15 Amp Breaker Protection
- Eight Medical Grade Receptacles Electrical Panel for Power Access Industry standard-sized case
- Medical Grade Input Cord

EP-2460 GENERAL SPECIFICATIONS

MAX SURGE CURRENT
12.5 kA

SAFETY RATINGS
Fire Rating 94V-0

SAFETY APPROVALS
UL 1449 2nd Edition TVSS Testing (EP-2000)
CSA Std. Class 9091 01 & 9091 81; CSA Std. c22.2 No. 8-M1986 (EP-2000)

OPERATING ENVIRONMENT
Approximately -10° C to 65° C

APPLICATION ENVIRONMENT
Medical Equipment, Computers and Servers

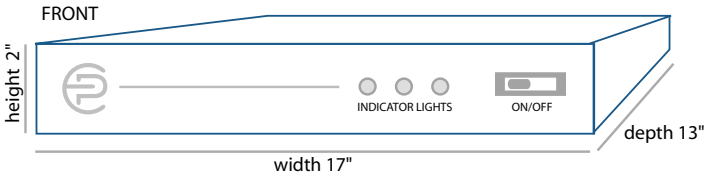
CONNECTIONS
NEMA 5-15

MATERIALS
Aluminum Housing, LED Indicator Lamps. Circuit encapsulated in epoxy to retain integrity of circuitry in failure mode.

ACCESSORIES
LEDs indicate active phase, Eight-outlet electrical panel, Rubber base pads

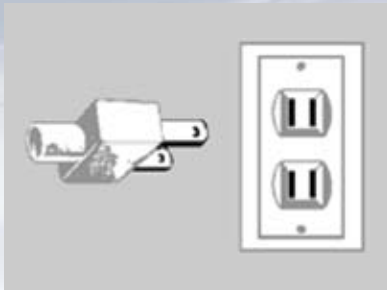
COMPLIANCE
NEMA LS-1, NEC Surge Suppression Stds., Electrical Notice 516

DIMENSIONS & WEIGHT
Height: 2" Width: 17"
Depth: 13" Weight: 6 lbs
Industry standard size for integration with other equipment

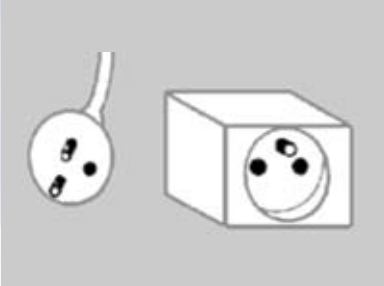


ELECTRICAL REFERENCE ELECTRICAL PLUG CONFIGURATIONS

PLUG A



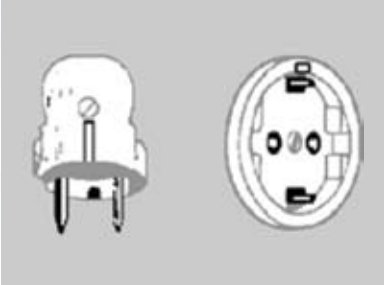
PLUG E



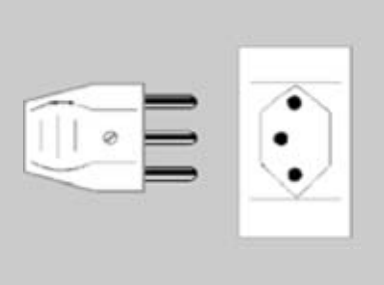
PLUG I

PLUG B

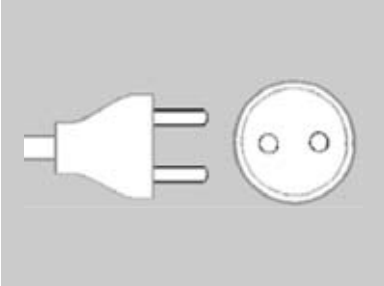
PLUG F



PLUG J

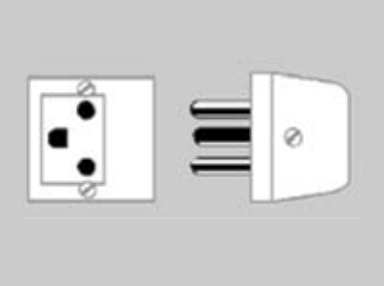


PLUG C

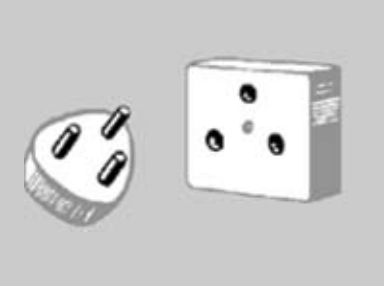


PLUG G

PLUG K

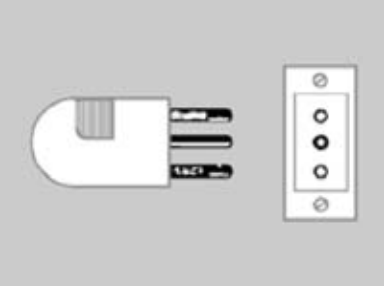


PLUG D



PLUG H

PLUG L



EP PRODUCT NOTES: EP Products are protected by both U.S. Design and Product Patents.

Product Specifications: Pictures and art work shown are only representative and may vary from the actual products. EP reserves the right to make, without notice, modifications of the products described in this catalog without effecting the right to sell such products under orders based on the catalog description, if the modifications shall not materially effect performance. We also reserve the right to withdraw from sale, without notice, any items described in our catalogs.

RESIDENTIAL

The digital age has not just revolutionized business; it has also brought dramatic increases in home offices and expensive home equipment. A typical home can have tens of thousands of dollars worth of electrical appliances, computers, printers, fax machines and televisions. All of this equipment generates transient energy and frequency noise and ironically all of this equipment is more sensitive to poor power quality.

Now you can protect your expensive televisions, computers and appliances using industrial strength waveform correctors, without the industrial price tag.

EP-2050 RESIDENTIAL PROTECTION

The **EP-2050** is an industrial electrical surge and noise filtration system adapted for the residential marketplace. The EP-2050 eliminates detrimental power disturbances that permeate the residental electrical distribution system. The compact unit provides automatic protection for industrial, residential and marine electrical distribution systems.

THE EP-2050:

ABSORBS, DISSIPATES & REMOVES

- Transient voltage surges and spikes
- Frequency Noise Between 3kHz-1MHz
- Ring waves

DOES NOT SHUNT ENERGY TO GROUND.
The facility ground is not relied on for performance or survivability.

EP-2050 GENERAL SPECIFICATIONS

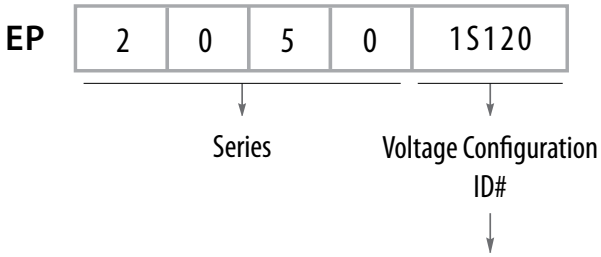
CIRCUIT DESCRIPTION	Internal Circuit Breaker	a	Spectrum Multiplier	a	Voltage Limit Clamp (MOV)	a	Low-Pass Filter	a	Dissipative Absorber	(Parallel Operated)

OPERATING FREQUENCY
45 - 65 Hz
FREQUENCY ATTENUATION
-20 dB/decade roll-off starting at 2.5 kHz
MAX SURGE CURRENT
12.5 kA per mode
MCOV
20% above rated voltage
SAFETY APPROVALS
UL 1449 2nd Edition TVSS Testing
CSA Standards Class 9091 01 & 9091 81; CSA std. c22.2 No. 8-M1986
SAFETY RATINGS
Fire Rating 94V-0
OPERATING ENVIRONMENT
Approximately -25° C to 65° C
RESPONSE TIME
Primary Response Time: Instantaneous Key Event Time: Approx. 1 Nanosecond
COMPLIANCE
NEMA LS-1, NEC Surge Suppression Standards, Electrical Notice 516
CONNECTION
Wire leads. Size: 14 AWG Length: 3'
MATERIALS
Aluminum Housing, LED Indicator Lamps, 14 AWG 600 V rated Wire.
Circuit encapsulated in epoxy to retain integrity of circuitry in failure mode.
ACCESSORIES
Amber LED indicates active phase

DIMENSIONS & WEIGHT
100-127 V Units: Diameter: 3" Depth: 2.5" Weight: 1.5 lbs.
Compact for easy installation.
200-250 V Units: Diameter: 4.34" Depth: 3.35" Weight: 3 lbs.
Compact for easy installation.

EP-2050 PRODUCT ORDERING GUIDELINES

MODEL NUMBER



VOLTAGE CONFIGURATIONS

SYSTEM VOLTAGE	PROTECT MODE	SYSTEM CONFIGURATION	VOLTAGE ID#	MCOV	SVR
Single Phase 100/200	L-N	3 Wire + G	**1S100**	130V	340V
Single Phase 120/240	L-N	3 Wire + G	**1S120**	150 V	395
Single Phase 240V	L-N	3 Wire + G	**1S240**	300 V	775

*Other voltages and configurations available upon request

EP DIGIPLUG PORTABLE PLUG-IN PROTECTION

The **EP DigiPlug** uses the same circuit as the industry's most advanced power performance solution available: The EP-2000. The **EP DigiPlug** provides the innovative, patented circuit of the EP-2000 in a portable device to increase the efficiency of smaller electrical equipment. The **EP DigiPlug** protects the technology that drives your process, from lap tops to refrigerators - and everything in between.

THE EP DIGIPLUG:

ABSORBS, DISSIPATES & REMOVES

- Transient voltage surges and spikes
- High frequency noise
- Ring waves

DOES NOT SHUNT ENERGY TO GROUND.
The facility ground is not relied on for performance or survivability.

EP DIGIPLUG GENERAL SPECIFICATIONS

CIRCUIT DESCRIPTION	Internal Circuit Breaker ⇨	Spectrum Multiplier ⇨	Voltage Limit Clamp (MOV) ⇨	Low-Pass Filter ⇨	Dissipative Absorber	(Parallel Operated)

OPERATING FREQUENCY
45 - 65 Hz
FREQUENCY ATTENUATION
-20 dB/decade roll-off starting at 2.5 kHz
MAX SURGE CURRENT
12.5 kA per mode
MCOV
20% above rated voltage
SAFETY APPROVALS
Circuit is built to meet Safety Standards: UL 1449 2nd Edition TVSS Testing;
CSA Standards Class 9091 01 & 9091 81; CSA std. c22.2 No. 8-M1986
SAFETY RATINGS
Fire Rating 94V-0
OPERATING ENVIRONMENT
Approximately -25º C to 65º C
RESPONSE TIME
Primary Response Time: Instantaneous Key Event Time: Approx. 1 Nanosecond
CONNECTION
Plug in
MATERIALS
Black ABS 94V-0, LED Indicator Lamps
Circuit encapsulated in epoxy to retain integrity of circuitry in failure mode.
ACCESSORIES
Red LED indicates active phase

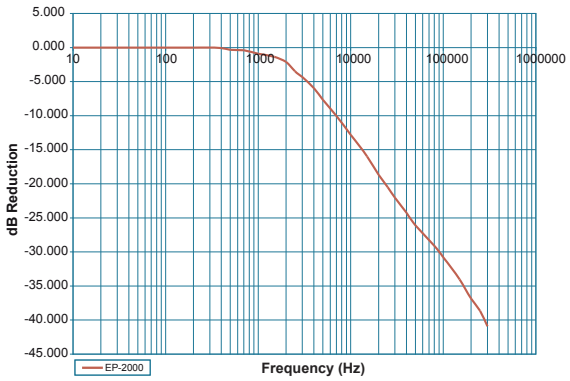
RECEPTABLE RATED
15 Amps
DIMENSIONS & WEIGHT
Dimensions: 4 x 2.25 x 2.75" Weight: 8 oz. Compact for easy installation.

PRODUCT PERFORMANCE

The EP DIGIPLUG absorbs, dissipates and removes transient voltage surges and spikes, high frequency noise and ring waves.

- Noise Attenuation starting at 2.5 kHz
- Max Attenuation of greater than -35 dB from 150 - 500 kHz

DIGIPLUG Frequency Response



Note:
Comparison charts are unavailable as Legacy TVSS or SPD's do not provide this functionality.

EP DIGIPLUG STATIONARY PLUG-IN PROTECTION

The **EP DigiPlug Stationary** uses the same circuit as the industry's most advanced power performance solution available: The **EP-2000**. The **EP DigiPlug Stationary** provides the innovative, patented circuit of the **EP-2000** in a convenient flush mounted socket to increase the lifespan and performance of high end home electronics. The **EP DigiPlug Stationary** will efficiently filter all power pollution threatening your equipment.

THE EP DIGIPLUG:

ABSORBS, DISSIPATES & REMOVES

- Transient voltage surges and spikes
- High frequency noise
- Ring waves

DOES NOT SHUNT ENERGY TO GROUND.
The facility ground is not relied on for performance or survivability.

EP DIGIPLUG GENERAL SPECIFICATIONS

CIRCUIT DESCRIPTION	Internal Circuit Breaker ⇨	Spectrum Multiplier ⇨	Voltage Limit Clamp (MOV) ⇨	Low-Pass Filter ⇨	Dissipative Absorber	(Parallel Operated)

OPERATING FREQUENCY
45 - 65 Hz
FREQUENCY ATTENUATION
-20 dB/decade roll-off starting at 2.5 kHz
MAX SURGE CURRENT
12.5 kA per mode
MCOV
20% above rated voltage
SAFETY APPROVALS
Circuit is built to meet Safety Standards: UL 1449 2nd Edition TVSS Testing; CSA Standards Class 9091 01 & 9091 81; CSA std. c22.2 No. 8-M1986
SAFETY RATINGS
Fire Rating 94V-0
OPERATING ENVIRONMENT
Approximately -25º C to 65º C
RESPONSE TIME
Primary Response Time: Instantaneous Key Event Time: Approx. 1 Nanosecond
CONNECTION
Plug in
MATERIALS
Black ABS 94V-0, LED Indicator Lamps
Circuit encapsulated in epoxy to retain integrity of circuitry in failure mode.
ACCESSORIES
Red LED indicates active phase

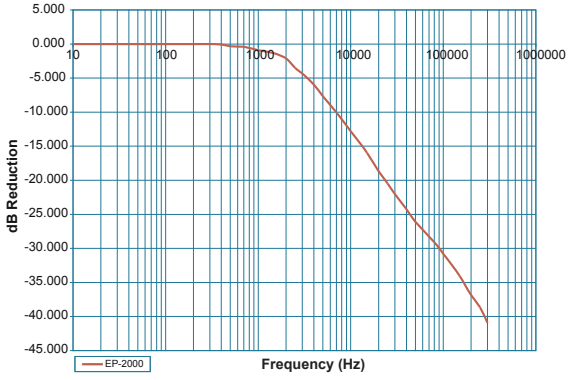
RECEPTABLE RATED
15 Amps
DIMENSIONS & WEIGHT
Dimensions: 4" X 1.4" X 1.25" Weight: 8 oz. Compact for easy installation.

PRODUCT PERFORMANCE

The EP DIGIPLUG absorbs, dissipates and removes transient voltage surges and spikes, high frequency noise and ring waves.

- Noise Attenuation starting at 2.5 kHz
- Max Attenuation of greater than -35 dB from 150 - 500 kHz

DIGIPLUG Frequency Response



Note:
Comparison charts are unavailable as Legacy TVSS or SPD's do not provide this functionality.

Environmental Potentials

1802 N. Carson Street, Suite 108-2987
Carson City, NV 89701

1-800-500-7436
info@ep2000.com
www.ep2000.com