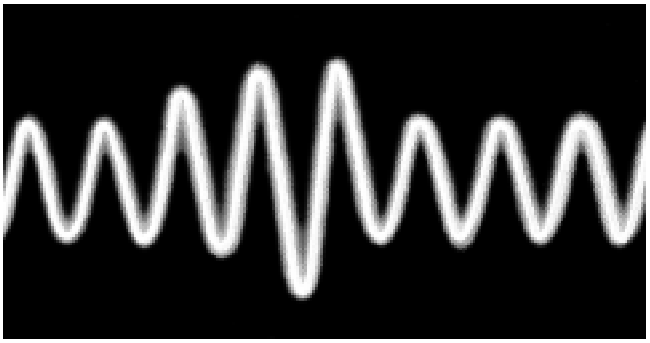
Selecting the Best Power Conditioning Devices/Equipment for Your Applications

Digital weighing indicators utilize an incredibly small signal in their operation. These signals are easily disturbed by any number of voltage distortions. Additionally, many weighing systems are now designed with a complex array of peripheral equipment, including printers and computers. To maintain proper operation and provide maximum protection, Rice Lake Weighing Systems offers this wide variety of power conditioning products as your first line of defense in the battle to improve power problems.

The following is a list of power problems you are likely to experience, with a reference to the equipment we recommend to solve that particular problem. A “quick reference” Power Conditioning equipment chart found on the back of PC-2 is also included for easy reference.

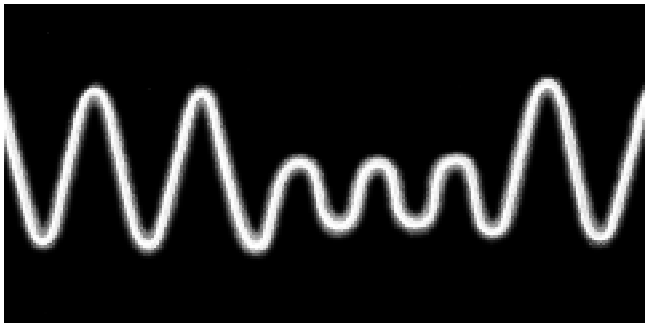
VOLTAGE SURGE

A voltage surge is a temporary rise in voltage level lasting at least one AC cycle (1/60 second). It is typically caused by switching off high-power electric motors (electric welders, compressors, machine tools, conveyors, material handling equipment and power tools), momentarily boosting the line voltage. Regulation of the line to an acceptable voltage level is required to prevent against the damage caused by voltage surges. The SOLA MCR series of voltage regulators, MCR070, MCR150 and MCR250, are designed to keep the voltage level within acceptable and harmless limits.



VOLTAGE DIP

A voltage dip is the opposite of a voltage surge, lasting at least one AC cycle (1/60 second). It is typically caused by a sudden nearby increase in an electrical load, such as turning on high-power electrical motors (electric welders, compressors, machine tools, conveyors, material handling equipment and power tools). During this time, every other piece of operating equipment is forced to make do with the reduced available voltage. Regulation of the line voltage is required to remedy this situation. The SOLA MCR series of voltage regulators, MCR070, MCR150 and MCR250, solve your problem by temporarily boosting the line voltage to within acceptable limits, until the voltage dip condition has corrected itself.



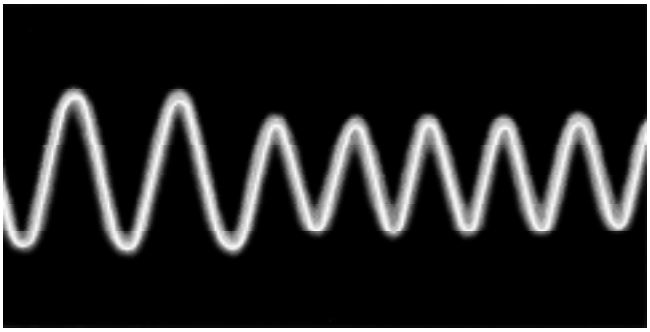
VOLTAGE SPIKES

A voltage spike is a large damaging voltage pulse caused when lightning strikes a powerline, a communications line, a signal or sensing line, or even the ground nearby. Voltage spikes last only a few milliseconds, but can reach a potential of 1000 volts. High-quality protection is the only practical answer. For your load cells, RS-232 or 20 mA communication lines and other DC protection needs, our UJB3T6, LCP-1 and TP-75 are practical solutions. For line-powered equipment, the Tripp-Lite ISOBLOK® and ISOBAR®, or the Rice Lake Weighing Systems EL225 or EL226 are the most effective protection against voltage spikes.

Power Conditioning

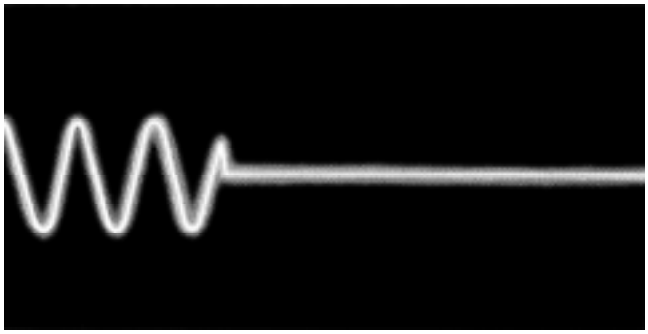
BROWNOUTS

Brownouts are prolonged voltage dips of as much as 15%, lasting from several hours to several days. This condition is initiated by local power companies during hours of unusually high demands. Brownouts create many forms of abnormal behavior. The only way to safeguard the operation of critical equipment is to bring the powerline voltage back up to normal specifications. The SOLA MCR series of line voltage regulators, MCR070, MCR150 and MCR250; or the Best Power™ Patriot® Series 250/425/600VA Uninterruptible Power Systems can eliminate the problems associated with brownout conditions.



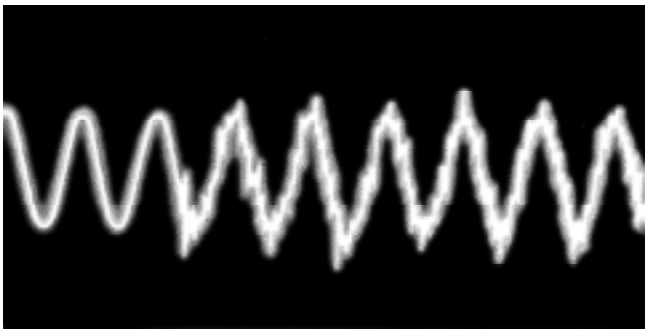
BLACKOUTS

The ultimate power problem! The only way to keep critical electrical equipment running during a blackout is to provide a new supply of power, either from batteries or from mechanical generators. The Best Power™ Patriot® Series 250/425/600VA Uninterruptible Power Systems are our answers to battery-supplied electrical power.



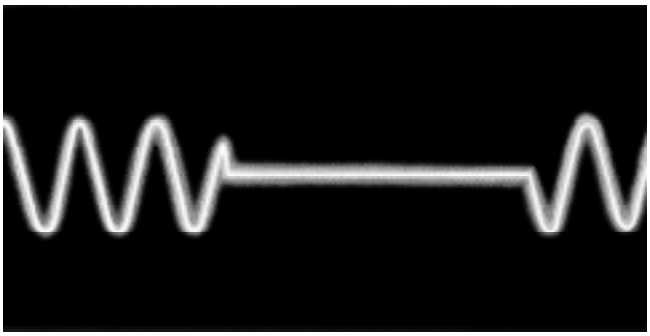
ELECTRICAL NOISE

Noise is a disturbance of electrical power caused by distant lightning, radio transmitters, welding equipment, electrical switching equipment, and poor brush contact on motors and other electronic devices utilizing switching power supplies. One solution is to prevent noise from entering the equipment by filtering the powerline input. The Tripp-Lite ISOBLOK® and ISOBAR®, or the Rice Lake Weighing Systems EL225 or EL226 will effectively filter most electrical noise problems. In severe cases, the use of Uninterruptible Power Systems such as Best Power™ Patriot® Series 250/425/600VA UPS and Sola 2000 Series are recommended.



DROPOUTS

A dropout is a temporary loss of electrical power normally caused by utility and maintenance switching functions where break-before-make switching strategies are used. This simply means that the old source of power is disconnected momentarily prior to the connection of the new power source. Your local utility company may be the most common source of this type of disturbance, causing many problems—notably computer lockups, software errors, equipment resets and diagnostic self-tests. The SOLA MCR series of regulators; MCR070, MCR150 and the MCR250 are available to deal with short-term dropouts (less than 3 milliseconds). For longer-lasting protection, Best Power™ Patriot® Series 250/425/600VA and Sola 2000 Series Uninterruptible Power Systems are recommended.



Transient Protection AC, DC, Series and Parallel

AC PROTECTION

Designed for filtering voltage spikes and electrical noise from AC wall receptacles providing power to sensitive microprocessor-based equipment such as computers, printers and indicators. Clamping voltages typically are set to 140 volts AC rms and peak current handling capacities are near 6000 amperes.

DC PROTECTION

Designed for filtering voltage spikes and electrical noise from load cell cables, and both RS-232 and 20 mA serial communication lines protecting indicators, communications interfaces, and computers.

PARALLEL PROTECTION

Protection is provided by “diverting” or “bypass” elements that attempt to quickly change the direction of the voltage spike, typically toward earth ground. Examples of “diverting” type elements are gas tubes, MOVs and Transzorbs™. In a parallel-type of transient protector, the equipment to be protected is not removed from the line in the event of a protector damaging voltage spike, leaving the possibility of a second catastrophic voltage spike to enter the unprotected equipment.

SERIES PROTECTION

Protection is provided by “blocking” type elements that buffer the equipment to be protected from the line voltage available at the wall receptacle. Examples of “blocking” type protective elements that are used in series-type transient protectors are fuses, circuit breakers, common mode coils and inductors. In addition, series-type protectors will also utilize “diverting” elements used in parallel protectors. In the series type of transient protector, the equipment to be protected is generally removed from the line source in the event of a damaging transient or surge.

Rice Lake Weighing Systems endorses only series type AC and DC transient protectors. The additional performance and protection provided by them are substantial compared to parallel type counterparts.

A WORD ABOUT GROUNDS....

A good ground is essential for any successful transient protection scheme. However, simply driving a copper ground rod is not enough. The conductivity of the soil can vary seasonally, particularly if the local water table rises and falls with the season. An adequate ground in spring, when the water table is high, may not be adequate in late summer when the water table is low (and thunderstorms are common!). Check the resistivity of your ground regularly throughout the year. If problems appear, check with your local utility about alternate grounding techniques.

Power Conditioning

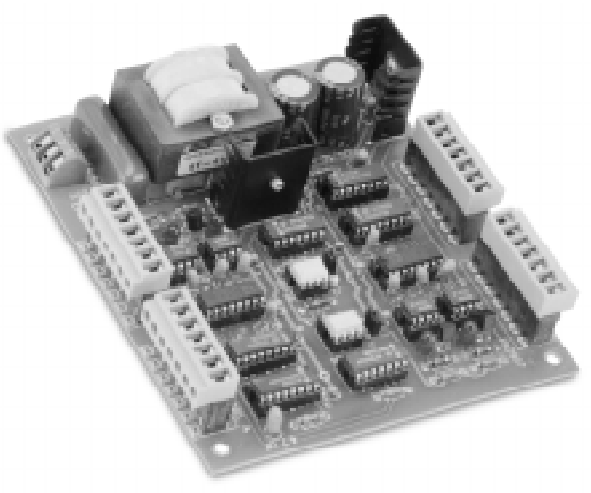
TYPE OF DISTURBANCE	AC Line Disturbance Solutions		
	TRANSIENT PROTECTORS	VOLTAGE REGULATORS	UNINTERRUPTIBLE POWER SYSTEMS
	ISOBLOK®/ISOBAR® *Our Best* -EL225, EL226	MCR Series	Best Power™ Patriot® Series 250/425/600 VA
SURGE	*	✔	✔
DIP		✔	✔
BROWNOUT		✔	✔
DROPOUT		✔	✔
BLACKOUT			✔
SPIKES	✔		✔
NOISE EMI/RFI	✔		✔

** Will provide some protection against surges, however we recommend that transient protectors be used on lines where spikes, noise and interference occur.*

OUR POLICY

Rice Lake Weighing Systems recommends the installation of AC and/or DC transient protection which is effective in significantly reducing both the frequency and degree of damage caused by AC and/or DC transient voltage occurences. However, transient protection devices will not eliminate all damage caused by transient voltage. Rice Lake Weighing Systems does not warrant or guarantee any transient protection device against damage or repair or any scale-related or other electrical/electronic device which is intended to be protected by any transient protection device. No other warranty or guarantees—express or implied—contrary to this written policy are supported or acknowledged by Rice Lake Weighing Systems.

SER-PRO Serial Protocol Converter



PART # DESCRIPTION

21057 ..... SER-PRO, board only

The SER-PRO is a serial protocol converter, designed to solve communication problems. Most weighmeters use RS-232 or 20 mA current loop and often times don't have enough signal to drive several peripherals in series or cannot transmit the distances required in many installations. SER-PRO provides the signal strength via line drivers, while simultaneously buffering the transmission.

Utilizing two independent channels, oppositely oriented and optically isolated, the SER-PRO provides an efficient, cost effective means to buffer, isolate and convert serial protocols. It accepts any transmitted baud rate and format (start bits, data bits, parity, stop bits, etc.), duplicating them in the outgoing transmission. Offering two channels provides the capability to send different formats on each channel, select different protocols for simultaneous transmission or transmit full duplex.

Where line noise such as EMI or RFI is a problem, SER-PRO effectively isolates and eliminates noise.

Applications

- Converts serial protocol from/to RS-232, 20 mA current loop and RS-422
- Enhances signal strength
- Extends transmission distance
- Filters line noise

Standard Features

- Elevated current loop drive voltage of 13 VDC allows six or more passive devices to be connected in series
- Two independent, optically-isolated channels provide:
  - Full duplex capability or two single channels
  - Transmission in three protocols simultaneously
- Compatible with all devices transmitting in RS-232, 20 mA current loop and RS-422 protocol
- Transmits and receives 20 mA active or passive
- RS-422 differential transceiver channel—supports 50 Kbaud data rates
- RS-422 transmitter is fully buss compatible. Tri-state output accesses the RS-422 buss only when the data source sends data
- Self-contained dual internal power supplies

Options/Accessories

20980 ..... NEMA 4X stainless steel enclosure

Consult Factory for NEMA 7CD, 9EFG Explosion Proof Enclosure

(Specifications on back)

AC INPUT:
117 VAC/60 Hz three wire - approximately 6 watts

FUSING:
On board 1/2 Amp slo-blo

PRIMARY-SECONDARY ISOLATION:
Greater than 2,500 VAC typical

CURRENT LOOP (ACTIVE OR PASSIVE):
Logic Levels: less than 3 mA Logic Low "O" — greater than 12 mA Logic High "1"
Transmission rate up to 20 Kbaud at 1311.5' (400 m)

RS-232 INPUTS AND OUTPUTS:
EIA voltage compliance for inputs and outputs. Output swings are approximately ±10 VDC. Maximum baud rate is 19.2 Kbaud in normal operation.

RS-422 INPUTS AND OUTPUTS:
EIA RS-422 compatible. Outputs are differential with a maximum data transfer rate of greater than 100,000 baud to distances of 1311.5' (400 m). Outputs are Tri-stated and automatically disconnect from the buss when no data is being sent.

OPTICAL ISOLATION (INPUT TO OUTPUT):
1,440 VAC (1 minute) at 1 Mb/second per Ul E55361 dielectric withstand test

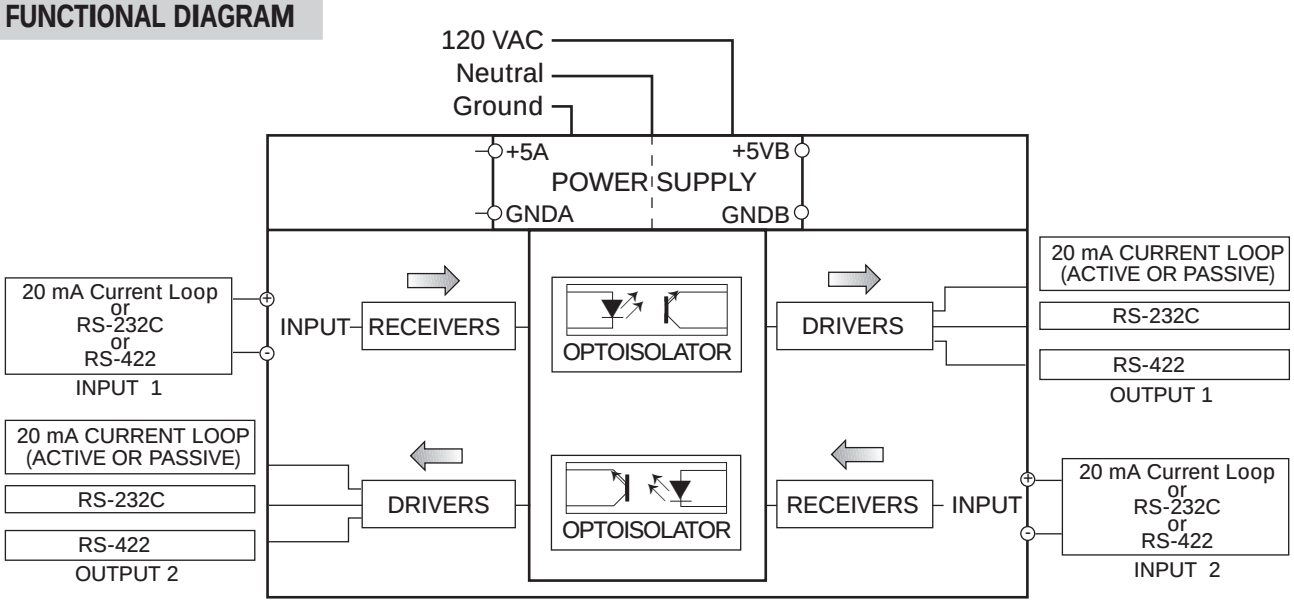
COMMON MODE TRANSIENT IMMUNITY:
1000V/µ second typical

ENCLOSURE:
The following optional enclosures are available:
NEMA 4X stainless steel or
NEMA 7CD, 9EFG Explosion Proof.

OPERATING TEMPERATURE RANGE:
14°F to 104°F (-10°C to 40°C) non-condensing

WARRANTY:
One year limited warranty

FUNCTIONAL DIAGRAM



LCP-1 DC Transient Protection

Applications

- Cable extensions
- Protects serial communication lines
- Compatible with a variety of scale indicators and all types of load cells

Standard Features

- Low cost, non-serviceable
- Self-contained; NEMA 1, 2, 3, 11 enclosure
- Effective series protection for strain gauge transducers
- Encapsulated circuitry ensures positive protection against fungus or corrosion on boards
- Two nylon strain reliefs for 0.187"-0.312" (4.7mm-7.9mm) diameter cable

PART # **DESCRIPTION**

21143 ..... LCP-1

UJB3T6 DC Transient Protection

Applications

- Protects load cells from voltage transients
- Compatible with signals down to 1µVgrad
- Installations exposed to significant transients
- Protects serial communication lines

Standard Features

- Factory serviceable
- Full 6-wire with shield protection
- #6 SEMS screw type; accepts spade lugs, tinned leads or bare wires up to #12 AWG
- Up to 8 parallel or summed load cells
- 50 Kbaud maximum transmission frequency
- Up to 6 serial data lines can be protected instead of load cells

Options/Accessories

21135 ..... UJB3T6 DC 6-channel load cell transient protector, board only

PART # **DESCRIPTION**

21134 ..... UJB3T6

TP75 DC Transient Protection

Applications

- Protects load cells and indicators from voltage transients
- Tank, bin, and hopper
- Truck and railroad track scales
- Suitable for outdoor use

Standard Features

- Avalanche diode design
- Full 6-wire with shield protection
- NEMA 4X enclosure
- Unlimited number of parallel load cells; up to 8 in series
- Terminal lugs provided

Options/Accessories

31164 ..... TP75 DC transient protector, board only

PART # **DESCRIPTION**

33185 ..... TP-75

(Specifications on back)

LCP-1, UJB3T6, TP75

Specifications

PROTECTION TYPE:
Four-channel series type with separate shield

MAXIMUM EXCITATION VOLTAGE:
18 VDC or 18 VAC

CLAMPING VOLTAGE:
75 VDC or 75 VAC

CLAMPING TIME:
<100 nanoseconds typical

PEAK SURGE CURRENTS:
5000 amperes any line to ground and 5000 amperes excitation to excitation

MAXIMUM SERIAL TRANSMISSION RATE:
30 Kbaud

GROUNDING:
Through a .25"(6.35mm) lug to a 20' (6.1m) insulated #10 AWG ground wire provided

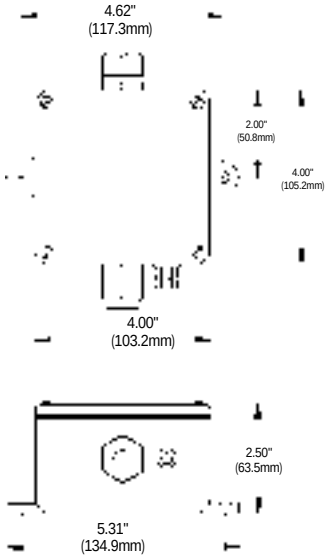
CABLE FITTING:
(2) Standard nylon strain relief for 0.187"-0.312" (4.7mm-7.9mm) diameter cable

ENCLOSURE:
Chemically-resistant PVC. This device, for outdoor or indoor service, is not intended for washdown service (NEMA 4) or for submersion (NEMA 6).
Optional NEMA 4X available

OPERATING TEMPERATURE:
14°F to 104°F (-10°C to 40°C) consistent with NTEP guidelines

LEAKAGE:
7,500 MΩ minimum

DIMENSIONS:
4.0" W x 4.0" H x 2.50" D
(103.2mm W x 103.2mm H x 63.5mm D)



PROTECTION TYPE:
Six-channel series type with separate shield

MAXIMUM EXCITATION VOLTAGE:
20 VDC or 20 VAC

CLAMPING VOLTAGE:
75 VDC or 75 VAC

CLAMPING TIME:
75 VDC Stages <100 nanoseconds typical

PEAK SURGE CURRENTS:
75 VDC Stage - 5000 amperes

MAXIMUM SERIAL TRANSMISSION RATE:
50 Kbaud

SERIES RESISTANCE:
0.219 ohms typical

SERIES INDUCTANCE:
110µh typical

GROUNDING:
20' (6.1m) insulated #10 AWG wire

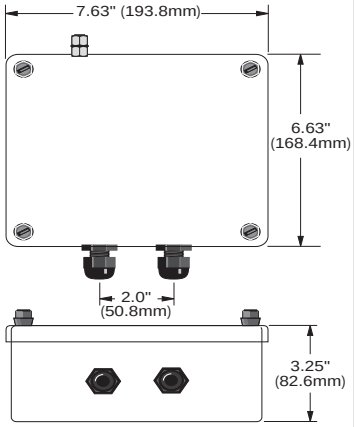
CABLE FITTING:
(2) nylon strain relief for 0.079"-0.236" (2.0-6.0mm) diameter cable

ENCLOSURE:
Fiberglass-Reinforced Polyester (FRP)
NEMA 4X, maximum 40 psi washdown

OPERATING TEMPERATURE:
14°F to 104°F (-10°C to 40°C)

CIRCUIT BOARD:
6.75" x 4.75" (171.5mm x 120.7mm) with anti-fungal coating

DIMENSIONS:
7.63" W x 6.63" H x 3.25" D
(193.8mm W x 168.3mm H x 82.6mm D)



PROTECTION TYPE:
Six-channel series type with separate shield

MAXIMUM EXCITATION VOLTAGE:
22.8 VDC

RESPONSE TIME:
5 nanoseconds

PEAK SURGE CURRENTS:
100 amps

SERIES RESISTANCE:
0.0 ohms

SERIES INDUCTANCE:
0.0 µh

GROUNDING:
10 AWG wire or larger (not provided)

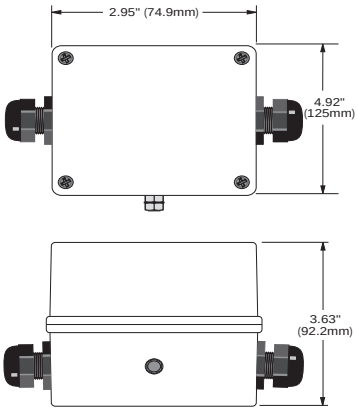
CABLE FITTING:
(2) nylon strain relief for 0.187"-0.312" (4.7mm-7.9mm) diameter cable

ENCLOSURE:
Impact-resistant polycarbonate
NEMA 4X, maximum 40 psi washdown

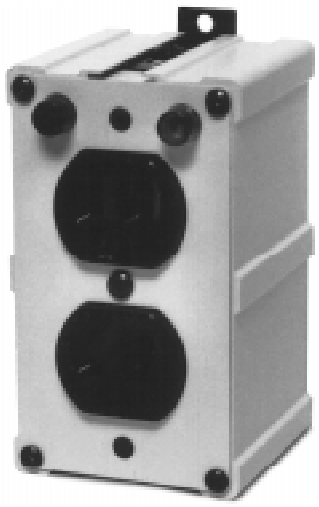
OPERATING TEMPERATURE:
4°F to 121°F (–20°C to 85°C)

CIRCUIT BOARD:
2.22" x 2.22" (56.4mm x 56.4mm)

DIMENSIONS:
4.38" W x 3.15" H x 3.38" D
(111.1mm W x 80mm H x 85.9mm D)



ISOBLOK® AC Transient Protector



PART # **DESCRIPTION**
21145 ..... Isoblok

Applications

- Protects electronic equipment such as digital weight indicators, printers and computers
- Protects against AC spikes and short-duration AC surges while providing RFI/EMI suppression

STANDARD FEATURES

- 2 outlets, direct plug-in
- LED indicator for power on
- LED indicator for protection circuitry
- UL1449 listed at 330 volts
- Mounting clamp assures positive connection

ISOBAR® AC Transient Protector

PART # **DESCRIPTION**
21146 ..... Isobar, 115 VAC
36663 ..... Isobar, 230 VAC

Applications

- Protects electronic equipment such as digital weight indicators, printers and computers
- Computer protection, prevents loss of data, disk skips, component damage, false printouts and monitor distortion

Standard Features

- 4 outlets
- 6-foot cord with grounded 3-prong plug
- Lighted on/off switch
- Circuit breaker protected
- Multiple filter design prevents the different components of your system from interfering with each other
- UL1449 listed at 330 volts
- Exclusive isolated filter banks prevent equipment interaction
- ISOBAR's cascade circuitry allows you to choose more protection for your most sensitive equipment, and a lesser degree of protection for equipment that's more tolerant

(Specifications on back)

ISOBLOK

Specifications

CLAMP VOLTAGE:
140 V rms

PEAK SURGE CURRENT:
6,500 Amps

CLAMPING TIME:
<5 nanoseconds

INPUT VOLTAGE:
120 VAC

MAXIMUM CURRENT:
15 Amps

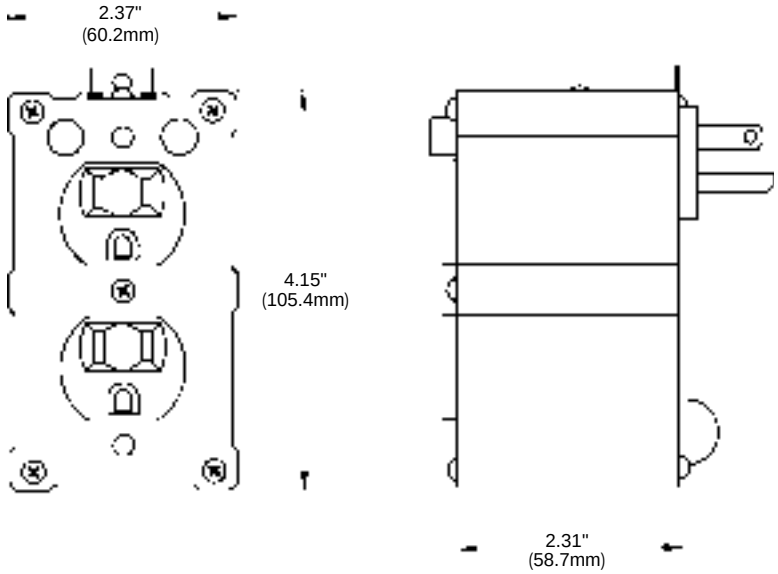
MAXIMUM POWER:
1875 Watts

NOISE SUPPRESSION:

FREQUENCY	ATTENUATION
50KHz	>20 db
150KHz	>40 db
1MHz	>80 db
>6MHz	>30 db

DIMENSIONS:
2.37" W x 4.15" H x 2.31" D
(60.2mm W x 105.4mm H x 58.7mm D)

WEIGHT:
Approximately 1 lb (0.45 kg)



ISOBAR

Specifications

CLAMP VOLTAGE:
140 V rms

PEAK SURGE CURRENT:
13,000 Amps

CLAMPING TIME:
<5 nanoseconds

INPUT VOLTAGE:
120 VAC

MAXIMUM CURRENT:
15 Amps

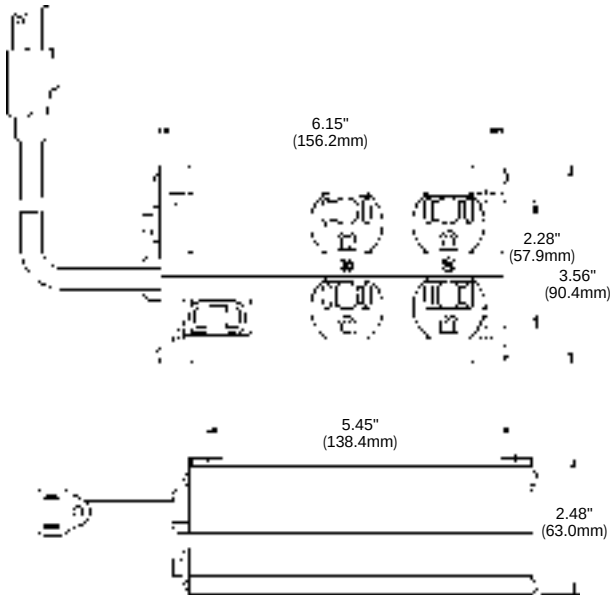
MAXIMUM POWER:
1875 Watts

NOISE SUPPRESSION:

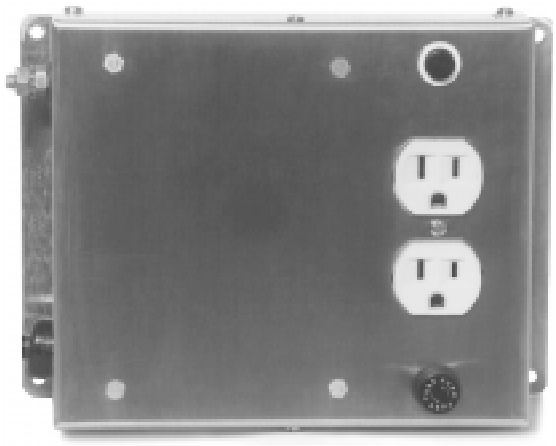
FREQUENCY	ATTENUATION
50KHz	>20 db
150KHz	>40 db
1MHz	>80 db
>6MHz	>30 db

DIMENSIONS:
6.15" W x 3.56" H x 2.48" D
(156.2mm W x 90.4mm H x 65.0mm D)

WEIGHT:
Approximately 2` lb (0.91 kg)



EL226 AC Transient Protector



PART # **DESCRIPTION**

21136 ..... EL226

Applications

- Protects electronic equipment such as digital weight indicators, printers and computers
- Protects against spikes and short-duration surges while providing RFI/EMI suppression

Standard Features

- Duplex receptacle
- 20' (6.1m) ground cable
- Factory serviceable
- 9' (2.7m) cord with 3-prong plug
- Stainless steel industrial enclosure
- Plugs into any grounded 3-prong outlet
- Indicator light shows protection is secure
- Excellent as a prefilter for voltage regulators
- Reliability and quality top-of-the-line performance
- Shielded line cord for protection against induced transients
- Positive proven protection for scales, computers, and printers
- Convenient mounting holes; can be mounted on any surface

The EL226 EMI/RFI protection circuits consist of a three-stage filter that removes high, low, and mid-range frequency transients, but passes 50/60 Hz power including voltage transients. But a transient that trips the first stage of the frequency transient filter also brings the two-stage inductive filters into action to remove the voltage transients.

The inductive filters slow the rise/fall time of the transient voltage. Since the filter coils are wound in opposite directions, a near-zero magnetic condition is created that cancels the transient. Therefore, clamping time becomes less critical because the circuit "slows" the surge before capture and dissipation. The frequency component of the transient itself actually helps protect against the voltage component! The design is bidirectional, removing the noise generated by printer heads, solenoids and relays so they will not be dumped back into the power line. You're protected coming and going!

EL225-4 Dedicated In-Line Instrument Transient Protection System

PART # **DESCRIPTION**

21142 ..... EL225-4 AC transient protector (chassis mount)

Applications

- Easy-to-use signal conditioning transient protection system
- Designed for installation in control panels or enclosures

Standard Features

- Dedicated series transient protection
- Bidirectional design reduces noise on surrounding lines

(Specifications on back)

EL226 Specifications

OPERATING VOLTAGE:
120 VAC 50/60 Hz, nominal

MAXIMUM CURRENT:
10 A rms instantaneous, 7.5 A rms continuous

CLAMPING TIME:
Less than 3-5 nanoseconds

EMI/RFI PROTECTION:
13 stages

PROTECTION TYPE:
Thirteen-stage series type filters out both common and normal mode transients

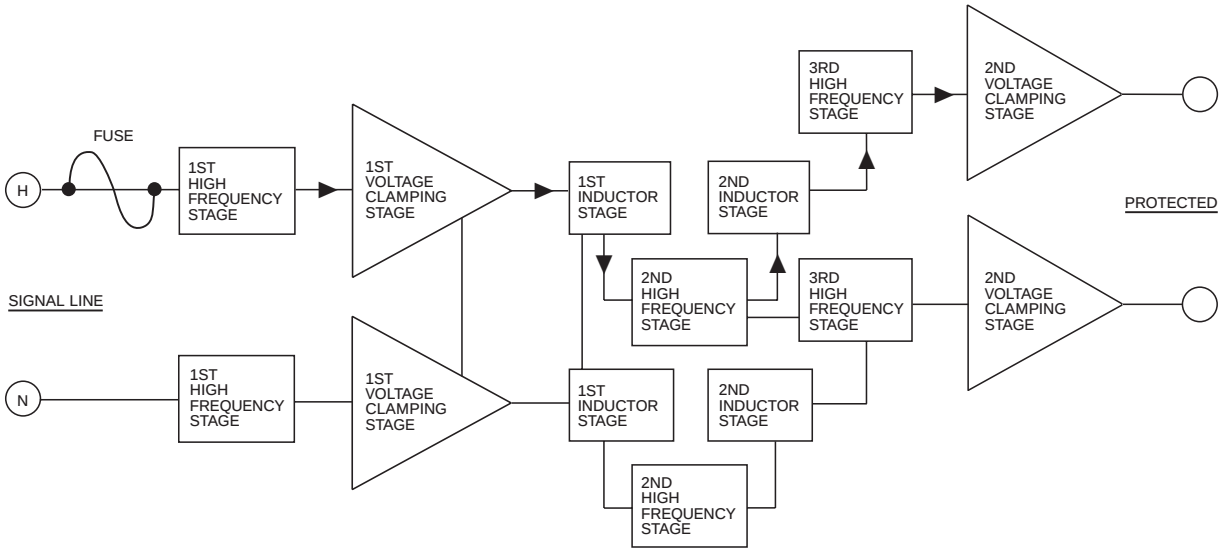
GROUNDING:
20' (6.1m) insulated #10 AWG wire provided

ENCLOSURE:
Stainless steel

OPERATING TEMPERATURE:
14°F to 104°F (-10°C to 40°C)

CIRCUIT BOARD:
Fiberglass-reinforced 4-glass epoxy

DIMENSIONS:
8.00" W x 6.00" H x 2.50" D
(203.2mm W x 152.4mm H x 63.5mm D)



EL225-4 Specifications

OPERATING VOLTAGE:
117 VAC 50/60 Hz, nominal

MAXIMUM CURRENT:
2 Amp continuous

CLAMPING TIME:
Less than 5 nanoseconds

EMI/RFI PROTECTION:
9 stages

PROTECTION TYPE:
Nine-stage series type filters out both common and normal mode transients

GROUNDING:
20' (6.1m) insulated #10 AWG wire provided

OPERATING TEMPERATURE:
14°F to 104°F (-10°C to 40°C)

Sola MCR Series

Mini/Microcomputer AC Power Regulators

PART #	DESCRIPTION
21155	Sola MCR 070
21156	Sola MCR 150
21157	Sola MCR 250

The Sola MCR Mini/Microcomputer AC Power Regulators are designed to protect you from problems resulting from voltage dips, surges, dropouts, and brownouts. The MCR design uses Sola's ferroresonant constant voltage sinusoidal transformer, which is proven both reliable and durable by more than 50 years of service. The MCR can be operated under high ambient temperatures.

The MCR also provides some spike protection. A special spike protection suppression module withstands a 6000 volt, 100 KHz ringwave to maintain better transient protection than other ferroresonant power conditioners. A side benefit of the MCR's ferroresonant technology is automatic overload protection. If the load exceeds the overload rating of the ferroresonant transformer, the output voltage quickly decreases, thereby protecting the MCR and the connected load.

Applications

- Portable and free standing
- Operates under high ambient temperatures
- Protects computers, printers, weight indicators and other sensitive equipment from voltage dips, surges, dropouts, and brownouts

Standard Features

- UL listed, CSA certified
- Automatic overload protection
- Convenient lighted on/off switches
- Available in 70, 150 and 250 VA outputs
- Offered in standard 120 volt, 60 Hz models
- Two duplex receptacles to allow several pieces of equipment to economically share the same source of regulated power

(Specifications on back)

INPUT:

VOLTAGE: 120 V

INPUT VOLTAGE RANGE: +10% to -20% of input nominal voltage

CONTROL: Lighted enable switch

OUTPUT:

VOLTAGE: 120 V

VOLTAGE REGULATION: ±3% for an input line variation of +10% to -20%. Output will remain within NEMA voltage specifications for input voltages as low as 65% of nominal. No loss of output for line loss of 3 milliseconds.

HARMONIC DISTORTION: Less than 3% total RMS content at full load

NOISE REDUCTION:

Common mode noise rejection exceeds 120 dB (DC to 1 MHz). Transverse mode noise rejection exceeds 60 dB (10 KHz to 1 MHz)

PROTECTION:

INPUT: Surge suppression module

OUTPUT: Surge suppression module and ferroresonant technology suppresses ANSI/IEEE C62.41-1980 Class A and B waveforms to safe levels (formerly IEEE 587-1980)

EFFICIENCY:

90% at full load (typical)

RELIABILITY:

25-year continuous life, average

OPERATING TEMPERATURE:

-4°F to 122°F (-20°C to 50°C)

CONSTRUCTION:

Cruciform-type construction with precision die-cut shunts, gaps, and spacing between windings

APPROVALS:

UL listed to UL1012; CSA certified to CSA C22.2-66

DIMENSIONS:

70, 150 & 250 VA - 6.75" W x 6.25" H x 9.25" D (171.5mm W x 158.8mm H x 235.0mm D)

WEIGHT:

70 VA - Approximately 16 lb (7.3 kg)
150 VA - Approximately 21 lb (9.5 kg)
250 VA - Approximately 26 lb (11.8 kg)

Tripp-Lite Powerverter

PV Series Power Inverters

PART #	DESCRIPTION
21147	PV-200, 200VA
21148	PV-400, 400VA
40763	PV-500FC, 500VA*

** Frequency controlled*

The PV Series inverters come complete with 115 VAC outlet and convenient on/off switch. The device is ideal for locations where AC power is not available and you wish to run 115 VAC powered equipment from a 12 VDC battery.

The battery connects to the inverter terminals with convenient wing nuts. The PV Series inverters are available in 200, 400 and 500 load watt ratings.

Square wave output voltage varies directly with input voltage and is inversely proportional to load. Select the inverter with the wattage rating equal to or greater than the wattage required to power devices.

Applications

- Highly portable
- Ideal for remote locations where AC power is not available
- On-board vehicle scales
- Changes 12 VDC power to 115 VAC power
- Allows equipment to be isolated from building power and ground

Standard Features

- 3 conductor outlet
- Convenient on/off switch
- 20 Amp circuit breaker
- 115 VAC 60 Hz square wave output
- Available in 200, 400 and 500 watt ratings
- Transistorized and solid state for long life and quiet operation
- Packaged in a compact, rugged aluminum case

(Specifications on back)

INPUT VDC:
- PV-200—12 V
- PV-400—12 V
- PV-500FC—12V

OUTPUT VAC:
- PV-200—115 VAC
- PV-400—115 VAC
- PV-500FC—115 VAC

FREQUENCY HZ:
- PV-200—60 Hz
- PV-400—60 Hz
- PV-500FC—60 Hz

MAXIMUM OUTPUT CONTINUOUS:
- PV-200—200 watts
- PV-400—400 watts
- PV-500FC—500 watts

MAXIMUM OUTPUT INTERMITTENT:
- PV-200—220 watts
- PV-400—440 watts
- PV-500FC—1000 watts

INPUT AMP - NO LOAD:
- PV-200—3.5 amps
- PV-400—3.5 amps
- PV-500FC—2.2 amps

INPUT AMP - FULL LOAD:
- PV-200—18 amps
- PV-400—36 amps
- PV-500FC—50 amps

ENCLOSURE:
- Non-sealed aluminum

DIMENSIONS:
- 3.875" W x 4.50" H x 6" D
- (98.4mm W x 114.3mm H x 152.4mm D)

Patriot® 250/425/600VA Uninterruptible Power Supply

PART #	DESCRIPTION
49916	Patriot 250VA, 115 VAC
49919	Patriot 250VA, 230 VAC
49917	Patriot 425VA, 115 VAC
49920	Patriot 425VA, 230 VAC
49918	Patriot 600VA, 115 VAC
49921	Patriot 600VA, 230 VAC

Applications

- Excellent system protection from lightning, brownouts and blackouts
- Stable, clean power for weighing instrumentation, computers, printers and sensitive electronics
- Noise (RF) isolation

Standard Features

- UL listed, C-UL listed to Canadian standards
- Quiet, compact and lightweight
- Advanced microprocessor design increases system reliability
- Front-panel LED low-battery and overload indicators
- Audible alarms for backups, low runtime, and shutdown
- Sophisticated power management extends battery life

Sola 2000 Uninterruptible Power System

NEW! Product!

PART #	DESCRIPTION
65422	Sola 350VA, 115 VAC
65423	Sola 470VA, 115 VAC
65424	Sola 700VA, 115 VAC
65425	Sola 350VA, 230 VAC
65426	Sola 470VA, 230 VAC
65427	Sola 700VA, 230 VAC

Applications

- Computers
- Workstations
- PLCs
- Computer peripherals

Standard Features

- Off-line with Automatic Voltage Regulation (AVR) topology
- Protects against most adverse power conditions, including: frequency variations, surge, noise, blackouts, lightning, spike, brownouts, and over and under voltages
- Data-line surge proection for phone or network included on every unit
- Greater uptime with intelligent power management, full-sequence battery testing, and two-level overload protection
- Small, lighweight design perfect for desktop use

(Specifications on back)

Patriot 250/425/600VA Specifications

LIGHTNING & SURGE PROTECTION:
Passes ANSI/IEEE C62.41 Category A testing

SAFTEY COMPLIANCE:
115 VAC: UL listed to UL1778, CSA certified to CSA C22.2
230 VAC: TUV/GS listed

EMC COMPLIANCE:
115 VAC: FCC Class B
230 VAC: CISPR 22 Class B, Vfg 243-91/46-92 B, EN55022, CE Marking Directive 93/68/EEC, low voltage directive 73/23/EEC

NOISE (RF) SUPPRESSION:
Full-time EMI/RFI filtering

EFFICIENCY:
>95% online

VOLTAGE RANGE:
115 VAC: 100-142 VAC on utility; operating on battery 0-100 VAC and 142-150 VAC
230 VAC: 192-278 VAC, on utility; operating on battery 0-192 VAC and 278-300 VAC

FREQUENCY:
50/60 Hz auto-sensing 57-63 Hz (60 Hz); 47-53 Hz (50 Hz)
(50/60 Hz ± 1 Hz on battery)

TRANSFER TIME:
4 MS typical

BATTERY:
Sealed, maintenance-free, valve-regulated, UL 924 recognized
250VA models: One 12V or two 6V, 4.2 AH batteries, 12 VDC
425VA models: One 12V 7.0 AH battery, 12 VDC
600VA models: One 12V 9.0 AH battery, 12 VDC

BATTERY RECHARGE TIME:
8 hours with output fully loaded

OPERATING TEMPERATURE:
32°F to 104°F (0°C to 40°C)

***STORAGE TEMPERATURE:**
5°F to 122°F (-15°C to 50°C)
Battery life is reduced above 77°F (25°C)

** If the Patriot unit is stored, the batteries should be recharged every 6 months. If stored above 77°F (25°C), recharge the batteries more often.*

MODEL	CAPACITY (VA/WATTS)	DIMENSIONS	WEIGHT	OUTPUT RECEPTACLES QUANTITY	OUTPUT RECEPTACLES TYPES
115 VAC:					
250VA	250/168	5.9" H X 2.3" W X 15.5" D (150mm X 59mm x 393mm)	6.6 lb (3.0 kg)	4 (UPS & Surge) 2 (Surge only)	NEMA 5-15R, cord attached
425VA	425/285	6.8" H x 3.1" W x 14.8" D (172mm x 79mm x 376mm)	9.2 lb (4.2 kg)	4 (UPS & Surge) 2 (Surge only)	NEMA 5-15R, cord attached
600VA	600/400	6.8" H x 3.1" W x 14.8" D (172mm x 79mm x 376mm)	9.4 lb (4.3 kg)	4 (UPS & Surge) 2 (Surge only)	NEMA 5-15R, cord attached
230 VAC:					
250VA	250/168	5.9" H X 2.3" W X 15.5" D (150mm X 59mm x 393mm)	6.6 lb (3.0 kg)	4 (UPS & Surge) 2 (Surge only)	CEE 22, recessed plug
425VA	425/285	6.8" H x 3.1" W x 14.8" D (172mm x 79mm x 376mm)	9.2 lb (4.2 kg)	4 (UPS & Surge) 2 (Surge only)	CEE 22, recessed plug
600VA	600/400	6.8" H x 3.1" W x 14.8" D (172mm x 79mm x 376mm)	9.4 lb (4.3 kg)	4 (UPS & Surge) 2 (Surge only)	CEE 22, recessed plug

PATRIOT RUNTIMES FOR TYPICAL APPLICATIONS IN MINUTES

Load	75VA	110VA	120VA	160VA	200VA	250VA	310VA	360VA	400VA	450VA	500VA	550VA	600VA
250VA	35	19	17	10	7	3.5	-	-	-	-	-	-	-
425VA	55	36	32	20	15	10	7	5	4	-	-	-	-
600VA	70	46	42	30	21	15	11	9	7.5	6	5	4.5	3.5

Sola 2000 Specifications

INPUT VOLTAGE RANGE:
Input: 90-5 VAC, single phase, 2-wire plus ground

COMMUNICATIONS:
SiteNet® 1 shutdown interface

APPROVALS:
UL & C-UL listed, CE marked

WARRANTY:
Two year limited warranty

MODEL	CAPACITY (VA/WATTS)	VOLTS, FREQUENCY IN/OUT	TYPICAL RUNTIME*	INPUT PLUG/ OUTPUT RECEPTACLE	WEIGHT
115 VAC:					
350VA	350/210	115/115, 50/60 Hz	5/15	5-15/(4) 5-15	13.2 lb (6.0 kg)
470VA	470/282	115/115, 50/60 Hz	5/12	5-15/(4) 5-15	15.4 lb (7.0 kg)
700	700/420	115/115, 50/60 Hz	5/13	5-15/(4) 5-15	22 lb (10.0 kg)
230 VAC:					
350VA	350/210	230/230, 50/60 Hz	5/15	EN60320-C14/(4) EN60320-C13	13.2 lb (6.0 kg)
470VA	470/282	230/230, 50/60 Hz	5/12	EN60320-C14/(4) EN60320-C13	15.4 lb (7.0 kg)
700	700/420	230/230, 50/60 Hz	5/13	EN60320-C14/(4) EN60320-C13	22 lb (10.0 kg)

* Full/half load (in minutes)

Air around the above units must be free of dust, chemicals, or other materials that corrode or contaminate