

Power-Suppress 100 installation and user manual



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Safety and preparations

Important safety instructions

Save these instructions—This manual contains important instructions for the Power-Suppress™ 100 that must be followed during operation of the equipment.

 WARNING

Opening enclosures exposes hazardous voltages. Always refer service to qualified personnel only.

 WARNING

As standards, specifications, and designs are subject to change, please ask for confirmation of the information given in this publication.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

Note: This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at the user's own expense.

Certification standards

- ANSI/IEEE® C57.12.91 transformer test code
- ANSI C62.41 Category B-3
- NFPA® 70—National Electric Code®
- FCC Class A limits, 47 C.F.R. Part 15, Subparts A, B
- UL® listed to Standard 1012, power supplies—general purpose
- cUL® listed to CSA® Standard C22.2, No. 107.1-01
- NEMA® PE 1 (National Electric Manufacturers Association)
- NEMA 250 (National Electric Manufacturers Association)
- Enclosures for electrical equipment (1000V maximum)
- ISO® 9001:2008
- Occupational Safety & Health Administration (OSHA)

 WARNING

To reduce the risk of fire or electric shock, install in a temperature- and humidity-controlled indoor area free of conductive contaminants.

This equipment is intended only for installations in a restricted-access location.

 WARNING

High leakage current. Earth connection essential before connecting supply.

Safety and preparations

Symbol usage

This manual uses three icon symbols with text to convey important information and tips.

 **WARNING**

A potentially hazardous situation which, if not avoided, could result in death or injury.

 **CAUTION**

A potentially hazardous situation which, if not avoided, may result in minor or moderate injury or in property damage incidents.

 **IMPORTANT**

Indicates information provided as an operating instruction or as an operating tip.

This manual also uses a specific type treatment to point out a specific note.

Note: Indicates information provided as an operating tip or an equipment feature.

Disclaimer

The product discussed in this literature is subject to terms and conditions outlined in Eaton selling policies. The sole source governing the rights and remedies of any purchaser of this equipment is the relevant Eaton selling policy.

No warranties, express or implied, including warranties of fitness for a particular purpose or merchantability, or warranties arising from course of dealing or usage of trade, are made regarding the information, recommendations, and descriptions contained herein.

In no event will Eaton be responsible to the purchaser or user in contract, in tort (including negligence), strict liability, or otherwise for any special, indirect, incidental, or consequential damage or loss whatsoever, including but not limited to damage or loss of use of equipment, plant or power system, cost of capital, loss of power, additional expenses in the use of existing power facilities, or claims against the purchaser or user by its customers resulting from the use of the information, recommendations, and descriptions contained herein.

The information contained in this manual is subject to change without notice.

Serial numbers

Record all serial numbers for the Power-Suppress 100 and components.

These serial numbers will be required if your system needs service.

Keep this manual in a place where you can reference the serial numbers if service is required.

Power-Suppress 100 unit serial number: _____

Additional serial numbers:

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Introduction

Introduction

1.0: Scope

Introduction is a general description of system characteristics of the product, its intended use and applicable electrical, mechanical, and environmental specifications, voltage requirements, AC input, and circuit breaker readings.

1.1: Section descriptions

This manual is divided into three sections:

Section 1: Introduction

This section is a general description of the Power-Suppress 100 ultra-isolator. The section includes receiving, electrical and mechanical specifications, and cabinet measurements.

Section 2: Installation

This section guides the user through installation requirements, wiring and circuit diagrams, hardwired connections, and factory configuration ratings for the Power-Suppress 100.

Section 3: Maintenance and troubleshooting

This section contains preventive maintenance for the Power-Suppress 100 unit and a troubleshooting guide to assist the user with any communication or configuration connections.

1.2: Receiving

Before accepting the shipment from the freight carrier, inspect the exterior surfaces of all shipping containers or packaging used, and the equipment for damage that may have occurred during transit. If the shipping containers or equipment shows evidence of damage, note the damage on the receiving document (bill of lading) prior to signing for receipt of equipment.

All claims for shipping damage must be filed directly with the carrier. Replacements for damaged components should be ordered through Eaton.

Check by thorough inspection if any electrical connections have become loose because of vibration during shipment. Check the nameplate to be sure that the voltage and frequency match the available power supply. Under no circumstance should the unit be connected to a power source that does not conform to the nameplate rating.

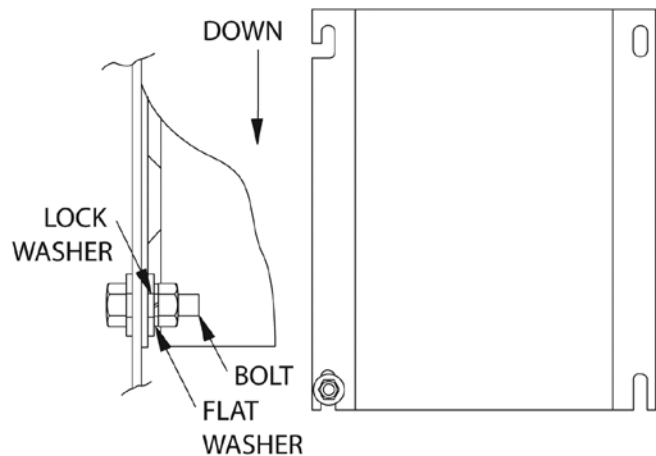
1.2.1: Location and storage

The unit is convection-cooled, with the air vents located on the sides and top of the unit enclosure. Therefore, it should be installed in a clean, dry place with enough clearance to allow a free flow of air. Allow at least four inches of space between the unit and the wall or other equipment for portable units. Allow enough space for maintenance on all four sides on larger units. Never mount one unit over the other; heat rising from the unit may cause premature failure. Never install the unit near a heat source.

Note: If the unit is to be mounted vertically, the surface area must be capable of supporting at least four times the unit's weight. (See Table 1-2—page 3) Locate the conduit knockouts at the bottom, with the mounting slots in the mounting brackets facing down. Transfer the hole pattern from the unit to the mounting surface and drill the holes, refer to dimensions for hardwired enclosure (See Figures 1-2 and 1-3—page 4 and Figure 1-6—page 6). Use at least 0.25-inch hardwire (minimum grade 5) to attach the unit to the surface, with 6.00-inch clearance around the unit for air flow.

If the equipment is to be stored prior to installation, it should be stored in a cool, dry, well-ventilated location that is protected from rain, splashing water, chemical agents, etc. The equipment should be covered with a tarpaulin or plastic wrapper to protect it against dust, dirt, paint, or other foreign materials.

Figure 1-1: Vertical mounting drawing



1.3: Prerequisites to installation

An efficient installation depends on careful planning and site preparation. Installation of the equipment must be handled by skilled technicians and electricians familiar with the special requirements of high-voltage electrical equipment. The installation must comply with the requirements of the National Electrical Code (ANSI/NFPA 70, latest issue) and local codes as applicable.

1.4: General description

The overall function of the Power-Suppress 100 is to attenuate transients and noise that originate on incoming power lines and to provide a newly derived, isolated power source.

The Power-Suppress 100 is used to protect sensitive electronic equipment and computers from power-line noise and transients. There are common disturbances on power lines caused by lightning, motor starting and stopping, utility network switching, and general electrical noise, which will adversely affect sensitive electronic equipment, especially computers.

The Power-Suppress 100 utilizes a unique method of shielding and isolation that provides low capacitive coupling between input and output circuits. This low capacitance, together with a highly effective filter circuit, results in ultra-high common mode and normal mode noise attenuation.

1.4.1: Electrical specifications

- **Input voltage**
120, 240, 480 Vac—depending on model.
- **Common mode noise attenuation**
140 dB @ 100 KHz.
- **Normal mode noise attenuation**
65 dB @ 100 KHz.
- **Overload capacity**
600% for 1 cycle, 300% for 30 seconds.
- **Dielectric strength**
2500 Vac minimum.

- **Frequency**
60 Hz \pm 5%.
- **Impedance**
3–6%, depending on size.
- **Efficiency**
93–97%, depending on size.
- **Input voltage range**
Nominal voltage \pm 10%.
- **Load regulation**
2–5%, no load to full load at unity power factor.
- **Harmonic distortion**
Adds less than 1% THD, under linear loading.
- **Coil insulation**
200°C.
- **Temperature Rise**
115°C max rise above a 40°C ambient.
- **Electro-magnetic interference**
Less than 0.2 gauss @ 3 feet.

1.4.2: Environmental specifications

- **Audible noise**
Less than 50 dB measured @ 3 feet.
- **Operating temperature**
0–40°C.
- **Storage temperature**
-20° to +50°C.
- **Operating altitude**
5000 feet (without derating).
- **Operating humidity**
95% relative (non-condensing).

1.4.3: Mechanical specifications

Rating	Input plug	Output receptacles (NEMA)
500 VA–1 kVA	5-15P	5-20R2
1.8 kVA	L5-20P	2 x 5-20R2
2.4 kVA	L5-30P	2 x 5-20R2

1.4.4: Cabinet dimensions

Table 1-1: Cabinet standard dimensions and weights with plugs and receptacles

Catalog number	Input/output voltages ①	Output VA ②	I/O interface (NEMA)	H x W x D, in. (mm)	Weight, lbs (kg)
T100R-0500	120–120	500	5-15P/(1) 5-20R2	6.49 x 6.10 x 12.00 (164.8 x 154.9 x 304.8)	22 (10)
T100R-0750	120–120	750	5-15P/(1) 5-20R2	6.49 x 6.10 x 12.00 (164.8 x 154.9 x 304.8)	28 (13)
T100R-1000	120–120	1000	5-15P/(1) 5-20R2	6.49 x 6.10 x 12.00 (164.8 x 154.9 x 304.8)	31 (14)
T100R-1800	120–120	1800	L5-20P/(2) 5-20R2	10.49 x 11.10 x 17.00 (266.4 x 281.9 x 431.8)	54 (24)
T100R-2400	120–120	2400	L5-30P/(2) 5-20R2	10.49 x 11.10 x 17.00 (266.4 x 281.9 x 431.8)	58 (26)

① Input and output voltages can be field configured for either 120 Vac or 240 Vac, 240 Vac or 480 Vac, as indicated above.

② 500 VA to 7500 VA hardwired models will ship configured to 120V input and output voltage.

Table 1-2: Cabinet standard dimensions and weights, hardwired

Catalog number	Input/output voltages ①	Output VA ②	I/O interface	H x W x D, in. (mm)	Weight, lbs (kg)
T100H-0500	120/240–120/240	500	Hardwired	6.42 x 6.10 x 12.00 (163.1 x 154.9 x 304.8)	22 (10)
T100H-0750	120/240–120/240	750	Hardwired	6.42 x 6.10 x 12.00 (163.1 x 154.9 x 304.8)	28 (13)
T100H-1000	120/240–120/240	1000	Hardwired	6.42 x 6.10 x 12.00 (163.1 x 154.9 x 304.8)	31 (14)
T100H-1800	120/240–120/240	1800	Hardwired	10.28 x 11.10 x 17.00 (261.1 x 281.9 x 431.8)	54 (24)
T100H-2500	120/240–120/240	2500	Hardwired	10.28 x 11.10 x 17.00 (261.1 x 281.9 x 431.8)	58 (26)
T100H-5000	120/240–120/240	5000	Hardwired	10.28 x 11.10 x 17.00 (261.1 x 281.9 x 431.8)	86 (39)
T100H-5001 ③	240/480–120/240	5000	Hardwired	10.49 x 11.10 x 17.00 (266.4 x 281.9 x 431.8)	92 (42)
T100H-7500	120/240–120/240	7500	Hardwired	10.28 x 11.10 x 17.00 (261.1 x 281.9 x 431.8)	116 (53)
T100H-7501 ③	240/480–120/240	7500	Hardwired	10.28 x 11.10 x 17.00 (261.1 x 281.9 x 431.8)	111 (50)

① Input and output voltages can be field configured for either 120 Vac or 240 Vac, 240 Vac or 480 Vac, as indicated above.

② 500 VA to 7500 VA hardwired models will ship configured to 120V input and output voltage.

③ Models T100H-5001 and T100H-7501 will ship configured to 240V input and output voltage.

Figure 1-2: 500 VA–1 kVA isolation transformer enclosure, line cord model

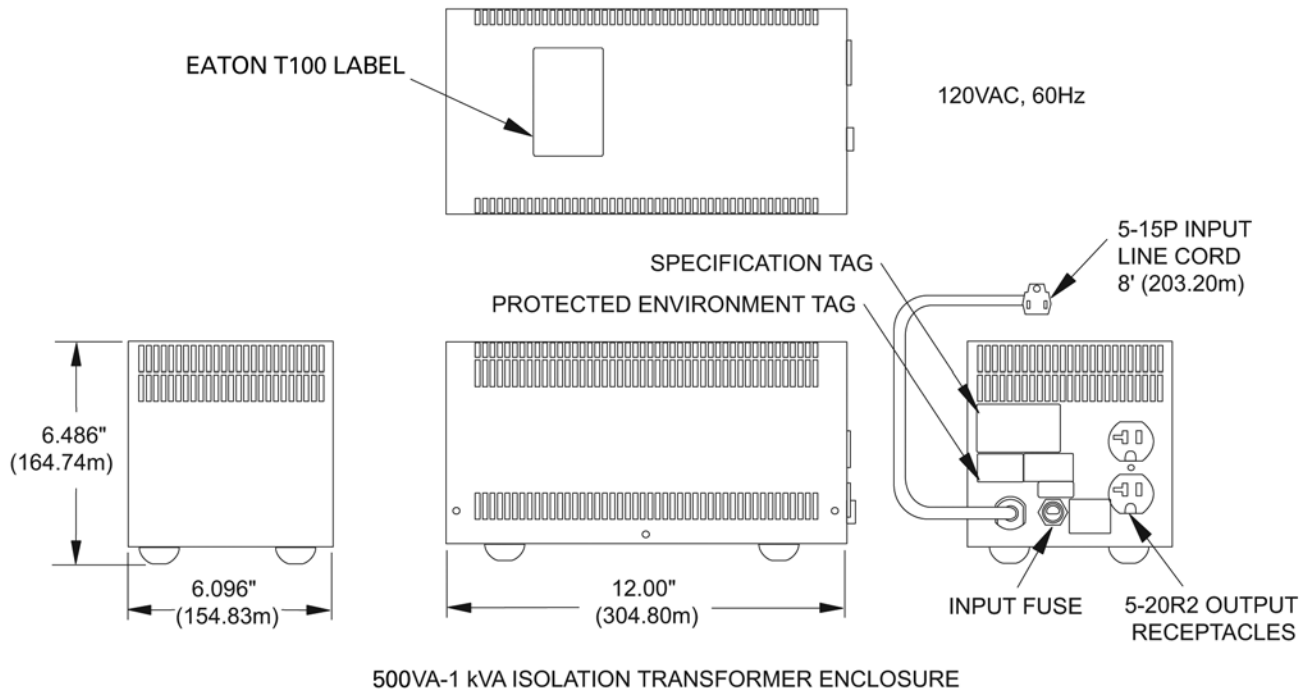
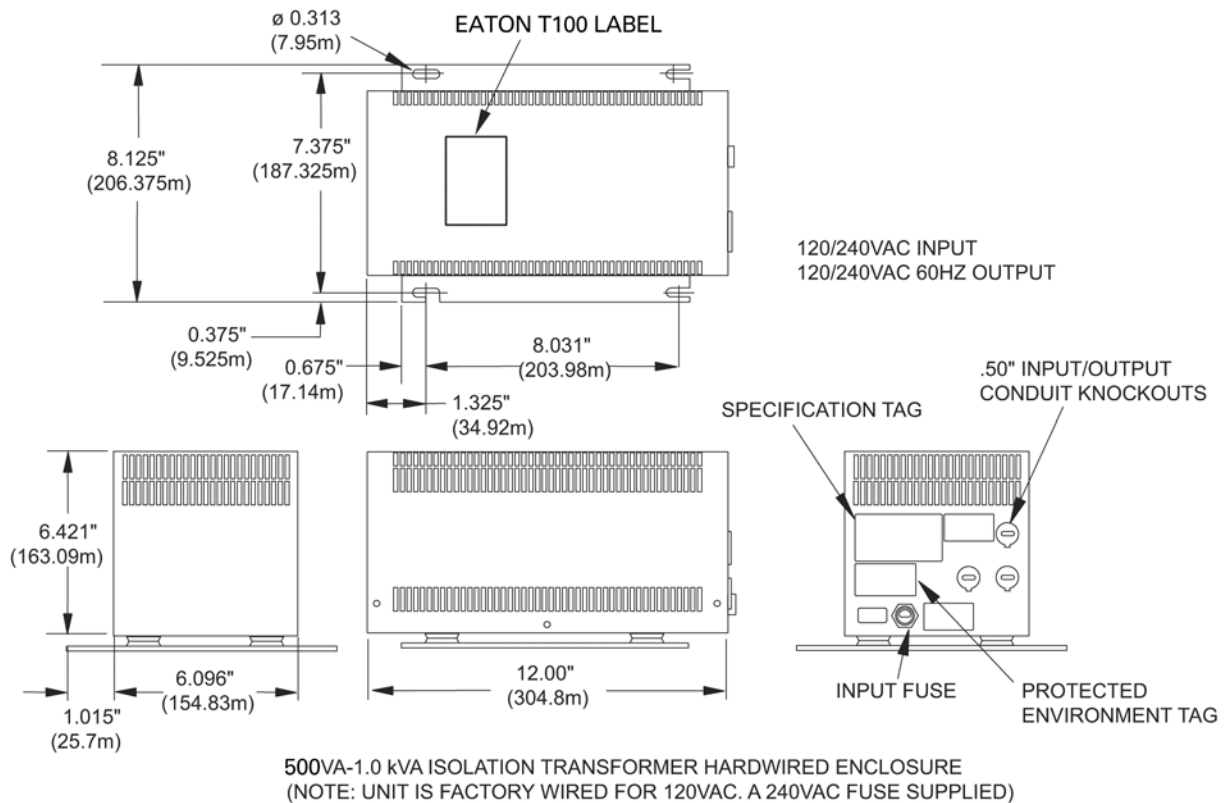


Figure 1-3: 500 VA–1 kVA isolation transformer hardwired enclosure



Introduction

Figure 1-4: 1.8 kVA isolation transformer enclosure, line cord model

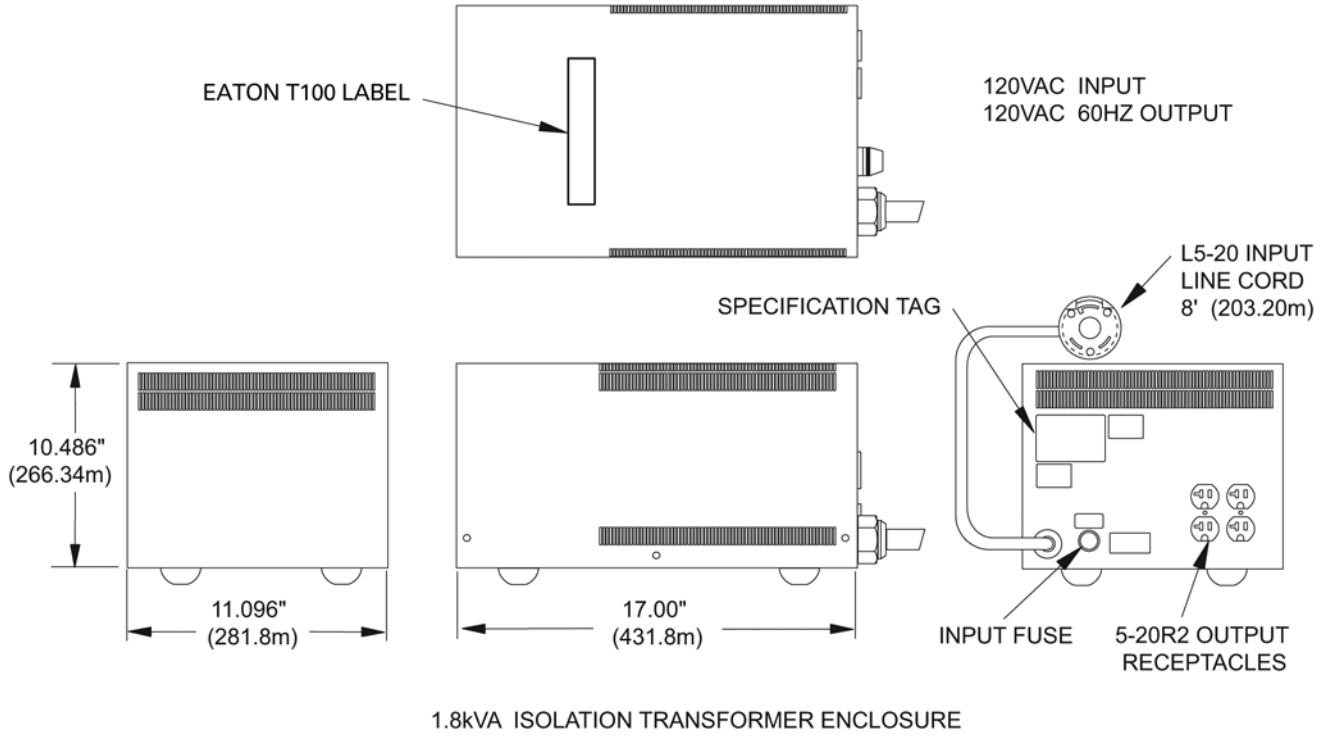


Figure 1-5: 2.4 kVA isolation transformer enclosure, line cord model

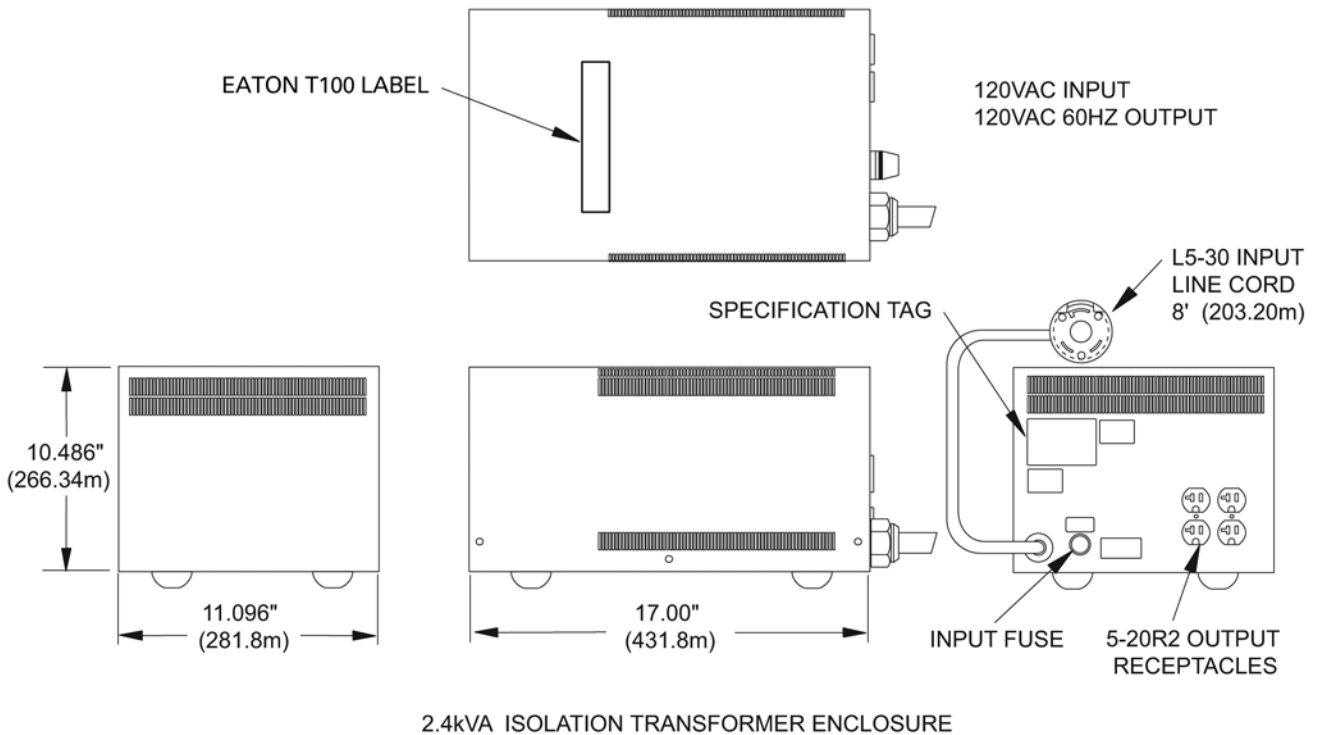
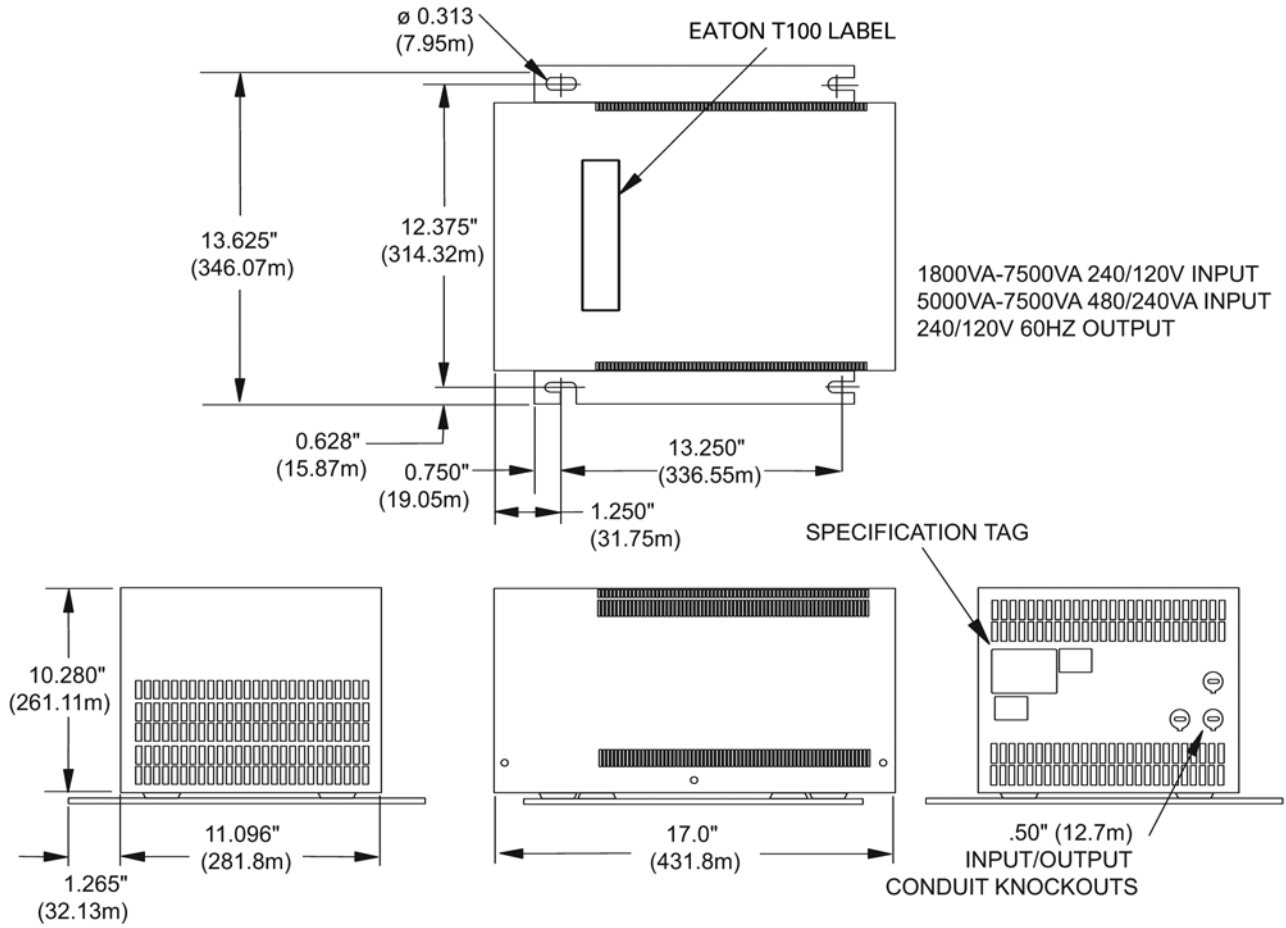


Figure 1-6: 1.8–7.5 kVA isolation transformer hardwired enclosure



1.8 kVA- 7.5 kVA ISOLATION TRANSFORMER HARDWIRED ENCLOSURE

Installation

2.0: Scope

This section guides the user through installation requirements, circuit wiring diagrams, hardwired connections, and factory input/output configurations for the Power-Suppress 100.

WARNING

High voltage: Only qualified electricians should install or perform maintenance.

2.1: Installation notes

- The Power-Suppress 100 requires ventilation and should not be mounted in a non-ventilated control cabinet.
- After installation is complete, verify that the output voltage is within its rated specifications.
- If the Power-Suppress 100 is overloaded, the output voltage will drop below its rated specifications and the input fusing will clear.
- For installation of conduit, reference NEC Articles 348 and 350 and any applicable local electrical codes.
- Power-Suppress 100 transformer outputs should not be paralleled.

See *Figures 2-1 and 2-2—page 8, Figure 2-3—page 9 and Figure 2-4—page 10*, for typical wiring diagrams of electrical hookup.

2.2: Installation of hardwired models

The Power-Suppress 100 ultra-isolator is shipped from the factory configured for an input and output of 120 Vac, except for 5 kVA and 7.5 kVA models provided with an input of 240/480 Vac, which will be configured for an input of 480 Vac and an output of 120 Vac.

2.2.1: Changing the input or output voltage

Table 2-1: Terminal-block wire range and torque specifications

Rating	Wire range	Tightening torque
500–1000 VA	#20–#10 AWG	7.0 lb in
1800–7500 VA	#18–#6 AWG	17.7 lb in

1. Reconfiguring the Power-Suppress 100 for a different input or output voltage must take place prior to connecting (wiring) the input power source and output (load) conductors. Voltage must not be present at the Power-Suppress 100 unit.
2. Verify that the input source voltage is compatible with the input jumper configuration. If not, change input jumper configuration accordingly.

Note: Changing from an input of 120 Vac to an input of 240 Vac on hardwired models rated at 1000 VA and below requires that the input fuse be changed as indicated. A fuse rated at 240 Vac and the correct amperage has been provided with the Power-Suppress 100 and is located inside the enclosure, labeled “240 Vac fuse”.

In order to access this fuse and configure the Power-Suppress 100 input for 240 Vac, the unit’s cover must be removed. This is accomplished by removing the six screws that hold the cover in place. These screws will be required when re-securing the cover, once the Power-Suppress 100 is properly configured.

3. Verify that the output voltage required by the load is compatible with the output jumper configuration. If not, change output jumper configuration accordingly.
4. Once configured properly, make sure power is “off”, then connect the input source voltage wires to the terminals provided. Verify connections are tight and energize the unit (*see Table 2-1—page 7*).
5. Verify that the output voltage is within nominal specifications.
6. Turn the power “off”. Connect the output (load) wires to the terminals provided. Verify connections are tight, replace the unit’s cover and re-energize the unit (*see Table 2-1—page 7*).
7. 1800–7500 VA models configured for an input of 240 Vac or 480 Vac require a 2-pole input circuit breaker, as specified in *Figure 2-4—page 10*, provided by the customer.
8. All models rated 1000 VA or greater require an input circuit breaker as specified in *Figure 2-4—page 10*, provided by the customer.

Figure 2-1: Wiring diagram for 500–1000 VA 120 Vac input

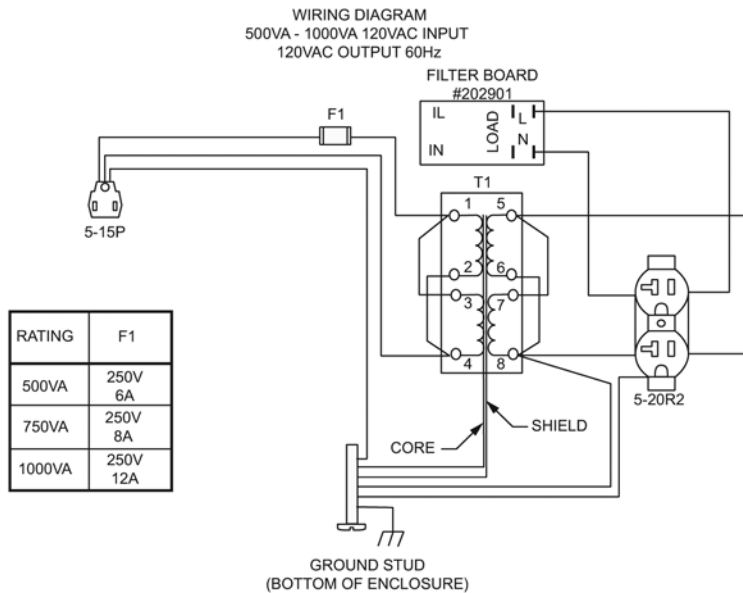


Figure 2-2: Wiring diagram for 1800–2400 VA 120 Vac input

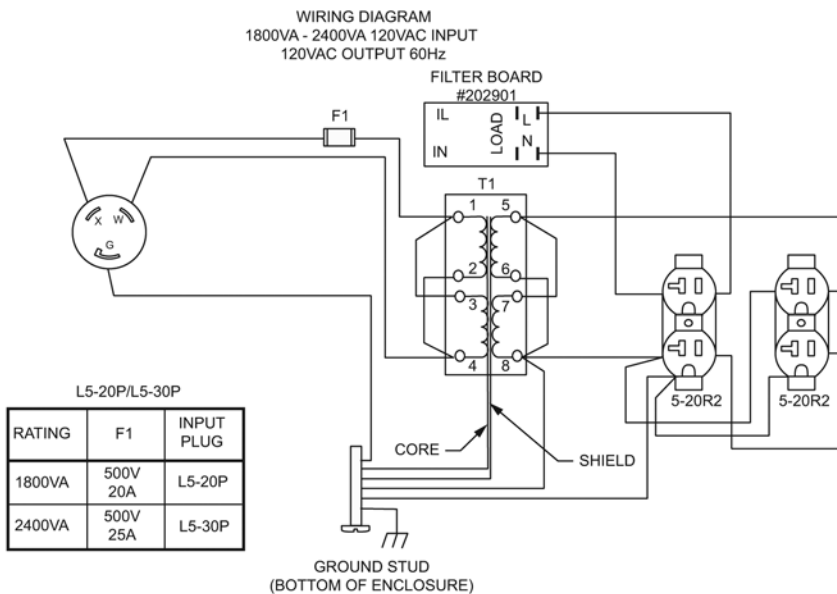
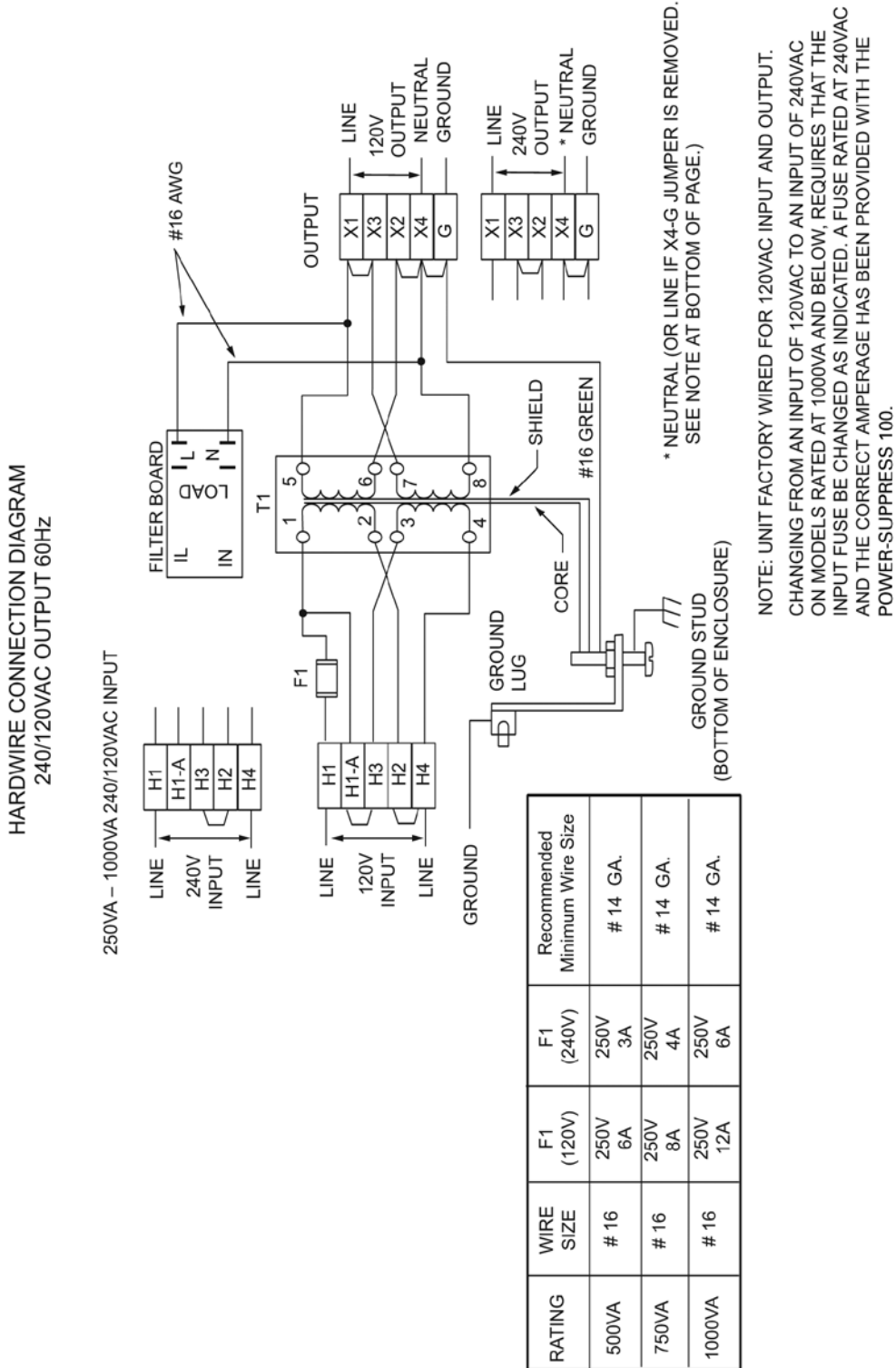
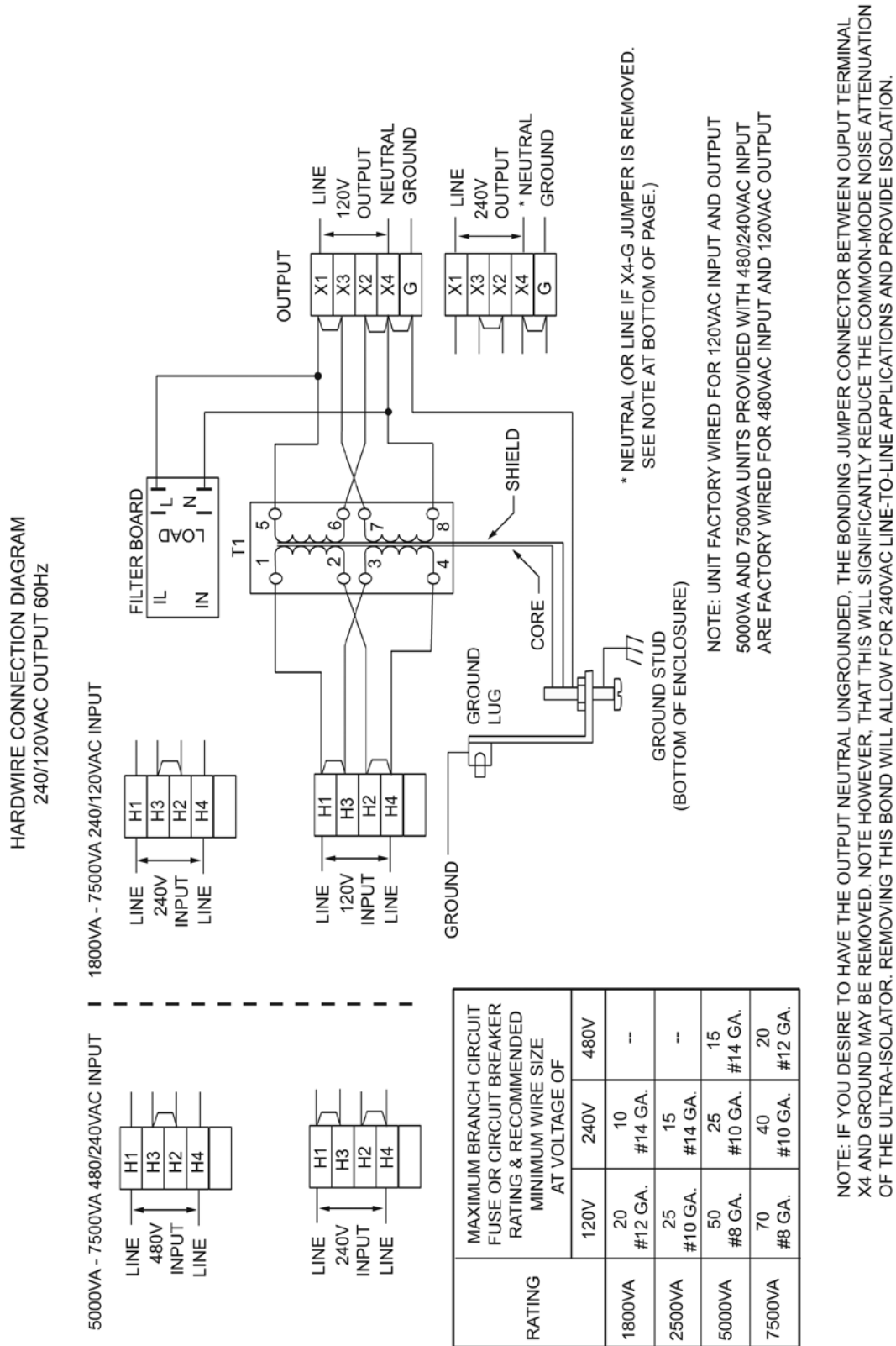


Figure 2-3: Circuit diagram for 500–1000 VA 240/120 Vac input



NOTE: IF YOU DESIRE TO HAVE THE OUTPUT NEUTRAL UNGROUNDED, THE BONDING JUMPER CONNECTOR BETWEEN OUTPUT TERMINAL X4 AND GROUND MAY BE REMOVED. NOTE HOWEVER, THAT THIS WILL SIGNIFICANTLY REDUCE THE COMMON-MODE NOISE ATTENUATION OF THE ULTRA-ISOLATOR. REMOVING THIS BOND WILL ALLOW FOR 240VAC LINE-TO-LINE APPLICATIONS AND PROVIDE ISOLATION.

Figure 2-4: Circuit diagram for 1800–7500 VA 240/120 Vac input



NOTE: IF YOU DESIRE TO HAVE THE OUTPUT NEUTRAL UNGROUNDED, THE BONDING JUMPER CONNECTOR BETWEEN OUTPUT TERMINAL X4 AND GROUND MAY BE REMOVED. NOTE HOWEVER, THAT THIS WILL SIGNIFICANTLY REDUCE THE COMMON-MODE NOISE ATTENUATION OF THE ULTRA-ISOLATOR. REMOVING THIS BOND WILL ALLOW FOR 240VAC LINE-TO-LINE APPLICATIONS AND PROVIDE ISOLATION.

Maintenance

3.0: Scope

This section contains preventive maintenance for the Power-Suppress 100 units and troubleshooting to assist the user with any communication or configuration connections.

WARNING

High voltage: All power must be “off” prior to any maintenance. Only qualified electricians should perform maintenance or troubleshooting.

3.1: Preventive maintenance

To ensure longer component life and trouble-free operation, minor preventive maintenance procedures should be performed at regular intervals, for example, once every year. More frequent inspection intervals would be needed for more severe operation conditions.

At each service inspection, remove any dust, dirt, or foreign particles. A slight tug should be used to test if there are any loose electrical connections.

3.2: Troubleshooting

Corrective maintenance might have to be performed on any of the three main components in the Power-Suppress 100 ultra-isolator: transformer, filter card, or input fuses.

1. **Transformers:** The transformer is designed with a considerable safety margin. Normally, the only malfunction that can take place is a short to the core. It can be checked easily with an ohmmeter.
2. **Filter card:** MOVs can fail open or capacitors can be defective in the open or shorted mode. These can be checked easily with an ohmmeter. Visual inspection may also allow detection of failed components.
3. **Input fuse:** The unit’s input fuse can clear (open) due to a fault or overload condition at the output of the unit or in the rare case of a transformer failure. A fuse is easily replaced via the flush-mounted fuse holder located on the back of the enclosure. Before replacing a fuse, the load should be removed or disconnected from the unit and a visual inspection inside the unit should take place.

Eaton is dedicated to ensuring that reliable, efficient and safe power is available when it's needed most. With unparalleled knowledge of electrical power management across industries, experts at Eaton deliver customized, integrated solutions to solve our customers' most critical challenges.

Our focus is on delivering the right solution for the application. But, decision makers demand more than just innovative products. They turn to Eaton for an unwavering commitment to personal support that makes customer success a top priority. For more information, **visit Eaton.com/powerquality**.

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