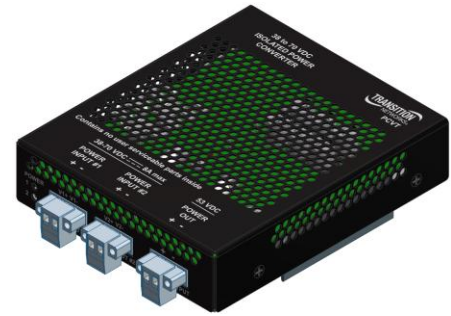


PCVT-48VDC-53VDC Power Converter

Install Guide

- Provides VDC power conditioning and isolation.
- Accepts 38-70 VDC Inputs.
- Provides 53 VDC output.



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Introduction and Description

Transition Networks' PCVT-48VDC-53VDC is a 53 VDC Out Isolated Power Converter that provides:

- Isolation for the connected device from the power source.
- Redundant power inputs.
- Single power output.
- Single mounting option: enclosed in a DIN Rail mountable enclosure.
- Screw terminal power connections.
- Operating temperature -40°C to +70°C.
- UL60950, CE Mark, IEC60068-2-31, IEC60068-2-27, IEC60068-2-6, FCC, and TAA compliance.
- Fixed configuration: no DIP switches or jumpers.
- Laying a PCVT unit upright on a floor or desktop blocks the bottom vents (convection cooling issue). DIN rail mount only.

Model Numbers

Model	Description
PCVT-48VDC-53VDC	Power Converter
WMBD	DIN Rail Mount Bracket Kit (allows stand-alone power converters to be mounted to a Din Rail, common in industrial environments, in a vertical mount in which the converter mounts on its edge).

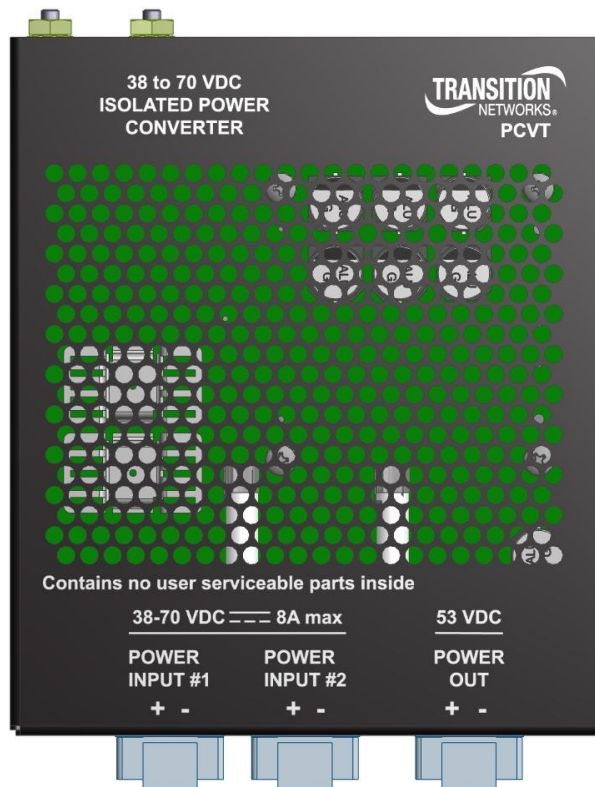


Figure 1: Top View

Safety

Before installing the PCVT, read this section and ensure that the requirements noted are met.

Cautions and Warnings

Definitions

Cautions indicate that there is the possibility of poor equipment performance or potential damage to the equipment. **Warnings** indicate that there is the possibility of injury to a person.

Cautions and Warnings appear here and may appear throughout this manual where appropriate. Failure to read and understand the information identified by this symbol could result in poor equipment performance, damage to the equipment, or injury to persons.

Cautions



Do not ship or store devices near strong electrostatic, electromagnetic, magnetic, or radioactive fields.



Caution: When handling chassis Network Devices observe electrostatic discharge precautions. This requires proper grounding (i.e., wear a wrist strap).



Caution: Copper based media ports, e.g., Twisted Pair (TP) Ethernet, USB, RS232, RS422, RS485, DS1, DS3, Video Coax, etc., are intended to be connected to intra-building (*inside plant*) link segments that are not subject to lightning transients or power faults. They are **not** to be connected to inter-building (*outside plant*) link segments that are subject to lightning.



Caution: **Do not** install the devices in areas where strong electromagnetic fields (EMF) exist. Failure to observe this caution could result in poor device performance.



Caution: Read the installation instructions before connecting the chassis to a power source. Failure to observe this caution could result in poor performance or damage to the equipment.



Caution: Only trained and qualified personnel should install or perform maintenance on the PCVT-48VDC-53VDC. Failure to observe this caution could result in poor performance or damage to the equipment.



CAUTION – “Risk of Electric Shock – More than one disconnect switch may be required to de-energize the equipment.

Warnings



Warning: DO NOT connect the power supply module to external power before installing it onto the DIN Rail. Failure to observe this warning could result in an electrical shock or death.



Warning: Do not work on the PCVT-48VDC-53VDC, connect, or disconnect cables during a storm with lightning. Failure to observe this warning could result in an electrical shock or death.



Warning: Disconnect Device – Since the products are evaluated as Permanently Connected Equipment, disconnect devices shall be provided in accordance with sub clause 1.7.2.2. A readily accessible disconnect device shall be incorporated outside the equipment. These devices can be isolating switch, circuit breaker, or equivalent as specified in sub clause 3.4.2 in GB 4943.1-2011 (Safety of Information Technology Equipment). For Permanently Connected Equipment, a readily accessible disconnect device shall be incorporated external to the equipment.

See "[Electrical Safety Warnings](#)" on page 7 for Electrical Safety Warnings translated into multiple languages.

Restricted Access Note



WARNING

Disconnect power before installing and wiring the PCVT-48VDC-53VDC for power. Failure to observe this warning could result in an electrical shock.

Wiring considerations

The following wiring considerations are recommended:

Use separate paths to route wiring for power and device data cables. If power wiring and device data cables must cross, make sure that the wires are perpendicular at the intersection points.

DO NOT run signal or communications wiring and power wiring in the same conduit. To avoid interference, wires with different signal characteristics should be routed separately.

Keep input and output wires separated.

Label the wiring to all devices in the system for clarity.

Grounding

CAUTION

Connect the PCVT-48VDC-53VDC to a well-grounded surface. Failure to observe this caution could result in electromagnetic interference (EMI) problems.

The PCVT-48VDC-53VDC can eliminate the effects of noise due to EMI via proper grounding. Always run the ground connection from the ground screw to the grounded surface before connecting power.

Compliance Information

Declaration of Conformity

<To be supplied. >

UL Component Recognition



The unit must be INSTALLED IN A RESTRICTED ACCESS location, in a UL APPROVED FIREPROOF ENCLOSURE. Components covered under this program are considered incomplete and are intended to be installed into another device, system or end-product. Components covered under UL's Recognition Service are only intended for factory installation, not field installation.

CE Mark

FCC Regulations

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. 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.

Canadian Regulations

This digital apparatus does not exceed the Class A limits for radio noise for digital apparatus set out on the radio interference regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la Class A prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

European Regulations

WARNING:

This is a Class A product. In a domestic environment, this product could cause radio interference in which case the user may be required to take adequate measures.

Achtung !

Dieses ist ein Gerät der Funkstörgrenzwertklasse A. In Wohnbereichen können bei Betrieb dieses Gerätes Rundfunkstörungen auftreten. In diesem Fall ist der Benutzer für Gegenmaßnahmen verantwortlich.

Attention !

Ceci est un produit de Classe A. Dans un environnement domestique, ce produit risque de créer des interférences radioélectriques, il appartiendra alors à l'utilisateur de prendre les mesures spécifiques appropriées.



In accordance with European Union Directive 2002/96/EC of the European Parliament and of the Council of 27 January 2003, Transition Networks will accept post usage returns of this

product for proper disposal. The contact information for this activity can be found in the 'Contact Us' portion of this document.

CAUTION: RJ connectors are NOT INTENDED FOR CONNECTION TO THE PUBLIC TELEPHONE NETWORK. Failure to observe this caution could result in damage to the public telephone network.



Der Anschluss dieses Gerätes an ein öffentliches Telekommunikationsnetz in den EG-Mitgliedstaaten verstösst gegen die jeweiligen einzelstaatlichen Gesetze zur Anwendung der Richtlinie 91/263/EWG zur Angleichung der Rechtsvorschriften der Mitgliedstaaten über Telekommunikationsendeinrichtungen einschliesslich der gegenseitigen Anerkennung ihrer Konformität.

GB 4943.1-2011 (Safety of Information Technology Equipment)

IEC 60950-1 is the International Standard for Safety of Information Technology Equipment. It encompasses under its scope information technology equipment, communications equipment, office appliances and multi-media equipment for use in the home, office, business, school, computer room and similar locations.

IEC 60950-1 is developed/maintained by IEC Technical Committee (TC) 108, Maintenance Team No. 2 (MT2): Safety and Energy Efficiency of Information Technology Equipment. In China, the ITE Standard, formally designated GB 4943.1-2011, is based on the Second Edition of IEC 60950-1, and like its predecessors includes China Deviations to address National requirements not in the base IEC document.



Used only at altitudes not more than 2000m above sea level.

“仅适用于海拔2000m 以下地区安全使用”或类似的警告语句



Used only in non-tropical conditions.

“仅适用于非热带气候条件下安全使用”或类似的警告语句

Disconnect Device – Since the products are evaluated as Permanently Connected Equipment, disconnect devices shall be provided in accordance with sub clause 1.7.2.2. A readily accessible disconnect device shall be incorporated outside the equipment. These devices can be isolating switch, circuit breaker, or equivalent as specified in sub clause 3.4.2. For Permanently Connected Equipment, a readily accessible disconnect device shall be incorporated external to the equipment.

Electrical Safety Warnings

Electrical Safety

IMPORTANT: This equipment must be installed in accordance with safety precautions.

Elektrische Sicherheit

WICHTIG: Für die Installation dieses Gerätes ist die Einhaltung von Sicherheitsvorkehrungen erforderlich.

Elektrisk sikkerhed

VIGTIGT: Dette udstyr skal installeres i overensstemmelse med sikkerhedsadvarslerne.

Elektrische veiligheid

BELANGRIJK: Dit apparaat moet in overeenstemming met de veiligheidsvoorschriften worden geïnstalleerd.

Sécurité électrique

IMPORTANT : Cet équipement doit être utilisé conformément aux instructions de sécurité.

Sähköturvallisuus

TÄRKEÄÄ : Tämä laite on asennettava turvaohjeiden mukaisesti.

Sicurezza elettrica

IMPORTANTE: questa apparecchiatura deve essere installata rispettando le norme di sicurezza.

Elektrisk sikkerhet

VIKTIG: Dette utstyret skal installeres i samsvar med sikkerhetsregler.

Segurança eléctrica

IMPORTANTE: Este equipamento tem que ser instalado segundo as medidas de precaução de segurança.

Seguridad eléctrica

IMPORTANTE: La instalación de este equipo deberá llevarse a cabo cumpliendo con las precauciones de seguridad.

Elsäkerhet

OBS! Alla nödvändiga försiktighetsåtgärder måste vidtas när denna utrustning används

Unpacking

1. Carefully unpack all PCVT contents.
2. Verify receipt of all PCVT components; see “[Ship Kit Contents](#)” below.
3. Place the PCVT and related materials in the desired install location.



Figure 2: PCVT-48VDC-53VDC Unpacking

4. Save the PCVT 10x9x4 Box and Insert for future use.

Ship Kit Contents

The PCVT-48VDC-53VDC is shipped with several standard items. Make sure you have received the following:

- One PCVT-48VDC-53VDC Power Converter
- One DIN Rail Mount Bracket Kit
- One printed Product Documentation postcard

Mounting

The PCVT must be mounted vertically using a DIN Rail mounting bracket. Typically the Terminal Blocks will be facing upward, as shown in the views below.

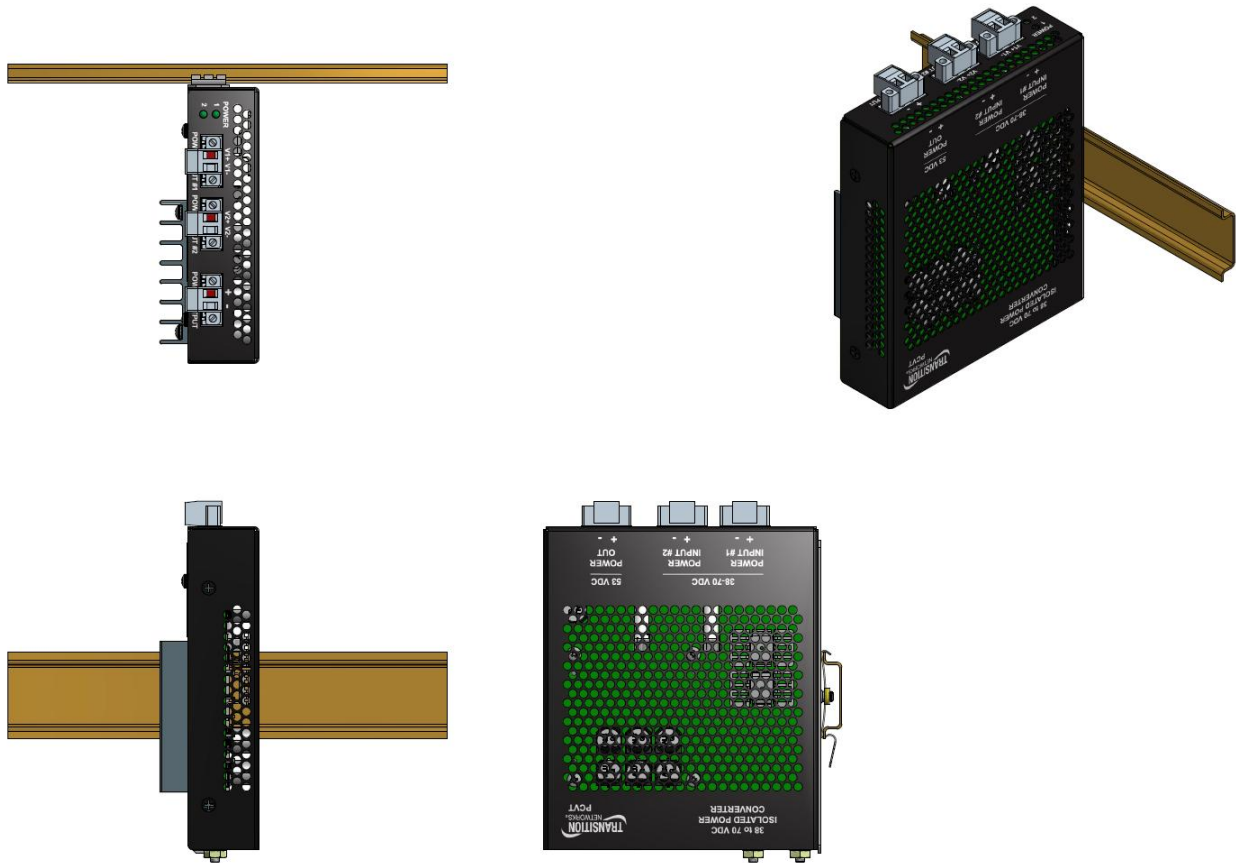


Figure 3: DIN Rail Mounting

Installation

Front Panel

The figure below shows the front panel of the PCVT-48VDC-53VDC power converter.

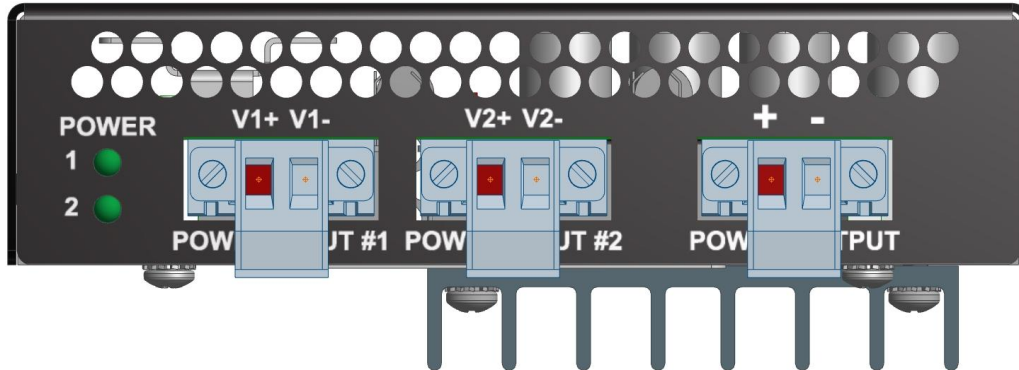


Figure 4: Front Panel

The PCVT front panel provides two power input connectors and one power output connector. Make the power connections as described below.

Connect POWER INPUT #1

1. Connect the wires to the **V1+** and **V1-** connections of the **POWER INPUT #1** terminal block connector (see figure below). See "[Power In Status LEDs](#)" on page 14.
2. Connect the other end of the wires to the first power source, ensuring correct polarity.

Connect POWER INPUT #2

1. Connect the wires to the **V2+** and **V2-** connections of the **POWER INPUT #2** terminal block connector (see figure below). See "[Power In Status LEDs](#)" on page 14.
2. Connect the other end of the wires to the second power source, ensuring correct polarity.

Connect the POWER OUTPUT

1. Connect the wires to the **+** and **-** connections of the **POWER OUTPUT** terminal block connector.
2. Connect the other end of the wires to the powered device, ensuring correct polarity (see figure below).
3. Observe the **POWER 1** and **POWER 2** LEDs.

Optional Terminal Block (Euro Block) Connection

Terminal Block Power Source

Note: It is a good practice to turn OFF input and load power, and unplug the power terminal block before making wire connections. Otherwise, your screwdriver blade can inadvertently short the terminal connections to the grounded enclosure.

- Suitable terminal block wire size is 12, 14, 16, 18, 20, 22, 24, 26 AWG (0.13 - 3.31 mm²). 16 AWG wire typical (or “recommended”); see the [vendor web page](#) for more details.
- The power source must be safety certified.

Connecting power wires to the terminal block:

1. Strip the wires to the proper length.
2. Insert the positive and negative power wires into **V1+** and **V1-** contacts respectively of the terminal block (note polarity on the chassis). Make sure the wires are secure. See Figure 4 on the previous page.
3. Insert the positive and negative power wires into **V2+** and **V2-** contacts respectively into the power source—make sure the wires are secure. See Figure 4 on the previous page.
4. Insert the positive and negative power wires into **+** and **-** contacts respectively into the power source and make sure the wires are secure. See Figure 4 on the previous page.

Reinstalling the terminal block and verifying power wire connections:

1. Reinstall the terminal block into the primary location on the chassis.
2. Tighten the two screws to secure the terminal block to the chassis.
3. Verify that the wiring to the ‘primary’ (+ -) of the PCVT-48VDC-53VDC is connected correctly, as shown in Figure 5 below.

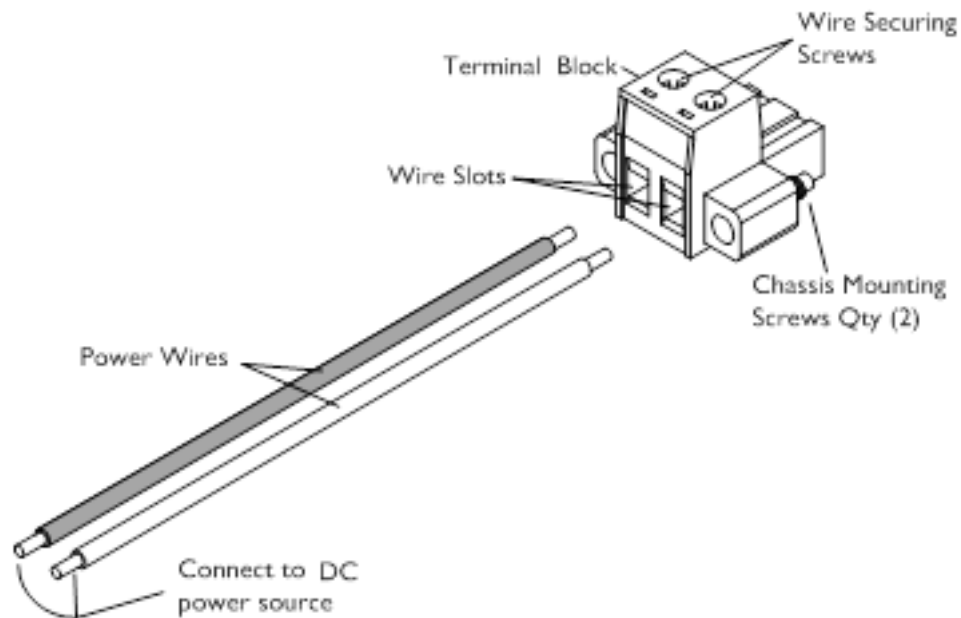


Figure 5: Terminal Block (Euro Block) Connection

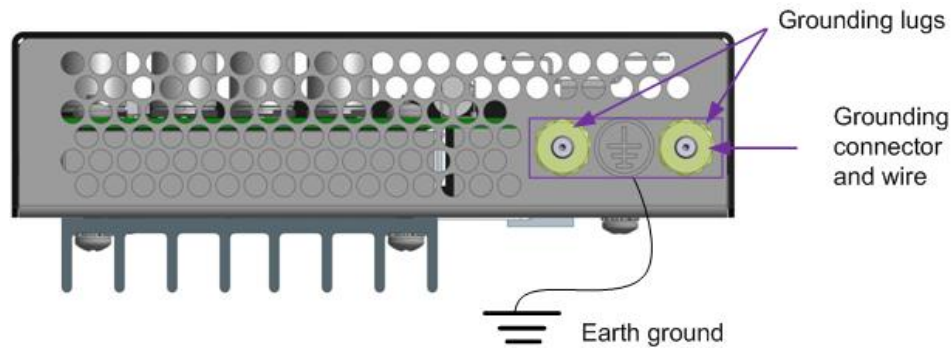
Grounding the PCVT-48VDC-53VDC

The PCVT-48VDC-53VDC comes equipped with grounding lugs located on the back panel. They require a grounding conductor wire terminated with a two-hole, compression-type, grounding connector. The grounding wire -- which must be a copper conductor -- is not included with the PCVT-48VDC-53VDC and must be provided by the customer/installer.

The electrical conducting path from the PCVT-48VDC-53VDC must:

- Flow via the grounding lugs to the common bonding network (CBN) for telecom installations, or to an alternative approved grounding system (if required) for non-telecom installations.
- Be of sufficiently low impedance to conduct fault currents likely to be imposed on the PCVT-48VDC-53VDC, and
- Enable proper operation of any over-current protection devices.

The conductor may be fastened to the grounding lugs with the enclosed antirotation star-washers and lug-nut fasteners. The applied torque required to the connector lug-nut fasteners is specified by the connector's manufacturer (4-5 inch-pounds typical or "recommended"). See the [vendor web page](#) for more details.

**Figure 6: Grounding**

Grounding Procedure

To properly ground the PCVT-48VDC-53VDC:

1. Obtain one (1) grounding conductor (12 AWG copper wire gauge or larger) with a two-hole, compression-type, grounding connector.
2. Attach the grounding conductor to the PCVT-48VDC-53VDC by placing the two-hole connector onto the grounding lugs and fasten with the enclosed lock-washers / lug-nuts at the proper torque (per the manufacturer's specification at the [vendor web page](#)) (4-5 inch-pounds typical or "recommended").
3. Attach the opposite end of the grounding conductor to the common bonding network (CBN) for telecom, or to earth ground (if required) for non-telecom installations.

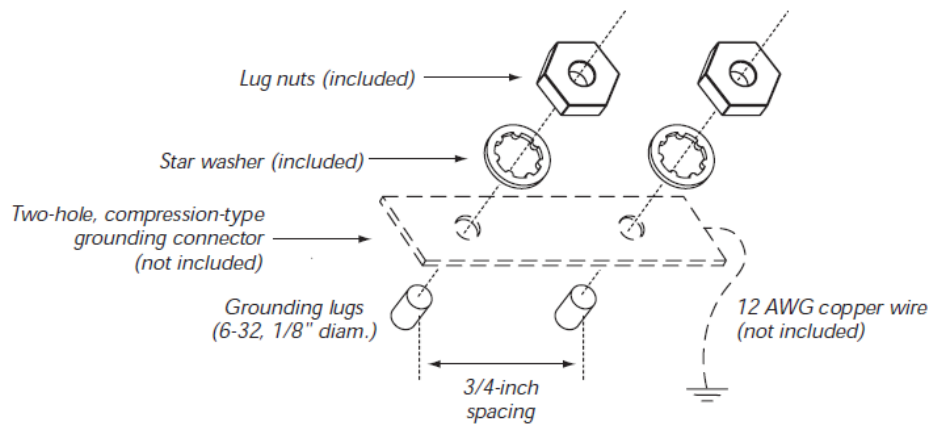


Figure 7: Grounding Conductor

Operation

Power In Status LEDs

Use the LEDs to monitor PCVT Power Input status.

POWER 1 LED Lit = Connected to POWER INPUT # 1

POWER 2 LED Lit = Connected to POWER INPUT # 2

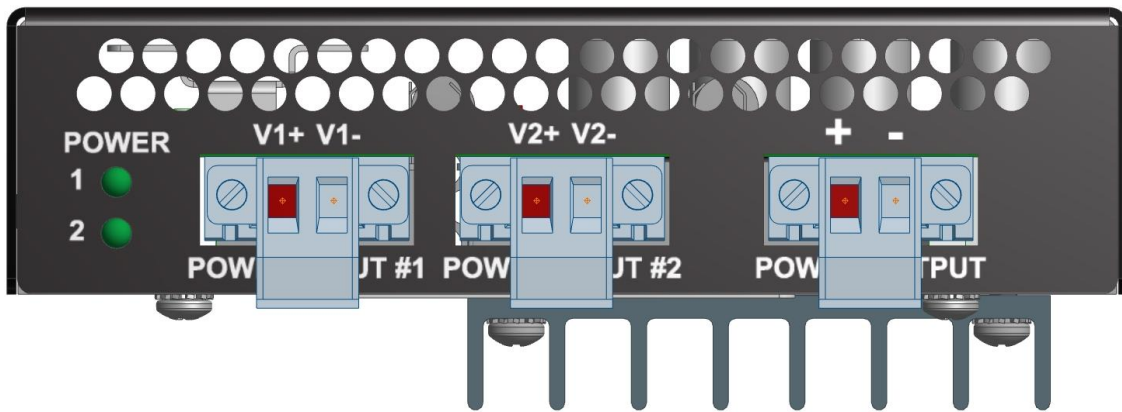


Figure 8: Front Panel

Technical Specifications and Standards

The Transition Networks PCVT48-53VDC is designed to these specifications and standards.

EMC Emission	FCC Class A; EN55022
EMC Immunity	EN55024
Safety	CE Mark, UL 60950, TUV EN60950-1
Vibration:	IEC60068-2-6
Free Fall:	IEC60068-2-31
Shock:	IEC60068-2-27
Dimensions:	5.54 x 4.38 x 1.58" (140.71 x 111.25 x 40.13 mm) (see Figure 9 below)
Weight:	1.25 lbs. (0.57 kg) approx.
Power consumption:	Up to 260 Watts
Power sources:	38-70 VDC
MTBF*:	MTBF: Greater than 400,000 hours ((MIL-HDBK-217F) at 25°C Greater than 1,103,000 hours (Bellcore7 V5.0) at 25°C
Environment:	Tmra**:
Operating Temp	-40°C to +70°C @ 200 Watts -40°C to +60°C @ 260 Watts
Storage Temp:	-40°C to +85°C
Operating Humidity:	10 % to 90 %, non-condensing
Altitude:	-500 to 10,000 H
Output:	
Output Voltage:	53 VDC
Current Rating:	4.9A
Power Rating:	260 Watts
Ripple & Noise Max.:	200mV Maximum
Voltage Tolerance:	± 0.6%
Line Regulation:	± 0.6%
Load Regulation:	± 0.6%
Setup, Rise Time:	100 mSec
Hold Up Time:	100 µSec
Input:	
Voltage Range:	38-70 VDC
Efficiency:	80+%
MAX Current (Typical):	7.5A @ 48 VDC
Inrush Current (Cold):	10A @ 48 VDC
Protection against:	Short Circuit, Overload (105-150%), OverVoltage (75%), and OverTemp (70°C)
Warranty:	Lifetime

* MTBF (*Mean Time Between Failure*) is estimated using the predictability method. The computation is based on the MIL-HDBK-217 F and Bellcore standards.

**Manufacturer's rated ambient temperature.

WARNING: Use of controls, adjustments, or the performance of procedures other than those specified herein could result in hazardous radiation exposure. The information in this user's guide is subject to change. For the most current information, view the online user guide at www.transition.com and the click on *Product/Product Finder*.

Dimensions

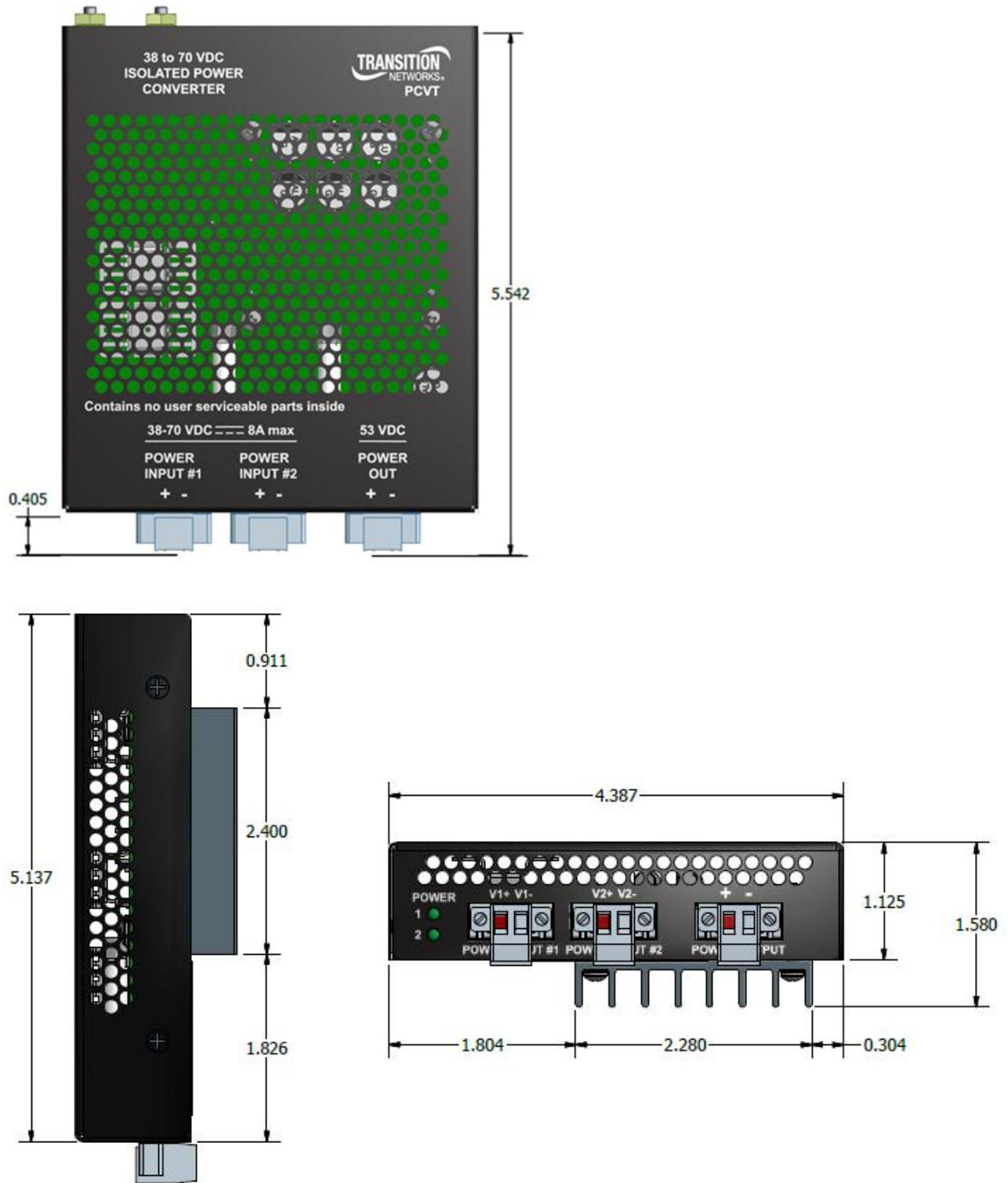


Figure 9: Dimensions

Troubleshooting

If the PCVT fails, isolate and correct the failure by determining the answers to the following questions, and then taking the indicated action:

1. Is the PCVT **POWER 1** LED lit?

NO

- Is there a power connector plugged into the POWER 1 terminal block?
- Is the VDC power source operating correctly?
- Is there voltage in the range of 38-70 VDC present at the terminal block connector on the PCVT?
 - Check the fuse. Contact Technical Support: US/Canada: 1-800-260-1312, International: 00-1-952-941-7600. See the “[Maintenance](#)” section on page 18.

YES

- Proceed to step 2 below.

2. Is the PCVT **POWER 2** LED lit?

NO

- Is there a power connector plugged into the POWER 2 terminal block?
- Is the VDC power source operating correctly?
- Is there voltage in the range of 38-70 VDC present at the terminal block connector on the PCVT?

YES

- Check if the fuse is OK.

NO

- The fuse is not field replaceable. Contact Technical Support: US/Canada: 1-800-260-1312, International: 00-1-952-941-7600. See the “[Maintenance](#)” section on page 18.

YES

- Proceed to step 3 below.

3. Is there 53 VDC present at the terminal block connector?

NO

- Check the power wiring for proper connection.
- Contact Technical Support: US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

YES

- Continue operation.

Maintenance

Observe ESD Precautions

The PCVT has no user accessible electronics. The fuse (12 Amp 5.3 x 32 mm 125 V or greater) is not field replaceable.

Contact Us

Technical support

Technical support is available 24-hours a day

US and Canada: 1-800-260-1312

International: 00-1-952-941-7600

Transition now

Chat live via the Web with Transition Networks Technical Support.

Log onto www.transition.com and click the **Transition Now** link.

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Log onto www.transition.com and click the **Learning Center** link.

E-Mail Ask a question anytime by sending an e-mail to our technical support staff.

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Record of Revisions

Rev	Date	Notes
A	02/05/14	Initial release.

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