



ANALYTIC SYSTEMS

Power Conversion Solutions

INSTALLATION & OPERATION MANUAL

VCH10W & VCH10Y VOLTAGE CONVERTER





IMPORTANT & SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS — This manual contains important safety and operating instructions for the battery charger.

VOLTAGE CONVERTER PRECAUTIONS

1. Do not expose the voltage converter to rain or snow unless it is a sealed model.
2. Use of an attachment not recommended or sold by the manufacturer may result in a risk of fire, electric shock, or injury to persons.
3. Do not disassemble the voltage converter; return it to the manufacturer or an authorized service center when service or repair is required. Incorrect reassembly may result in a risk of electric shock or fire. Voltages of up to 350 volts are present inside the voltage converter anytime it is connected to input power, even if it is switched off.
4. To reduce risk of electric shock, unplug the voltage converter from the DC power source before attempting any maintenance or cleaning. Turning off controls will not reduce this risk.
5. Never place the voltage converter directly above a battery; gases from battery will corrode and damage the voltage converter.
6. Never allow battery acid to drip on the voltage converter.

Medical Equipment Notice

Analytic Systems does not recommend the use of their products in life support applications where failure or malfunction of this product can be reasonably expected to cause failure of the life support device or to significantly affect its safety or effectiveness. Analytic Systems does not recommend the use of any of its products in direct patient care. Examples of devices considered to be life support devices are neonatal oxygen analyzers, nerve stimulators (whether used for anesthesia, pain relief, or other purposes), auto-transfusion devices, blood pumps, defibrillators, arrhythmia detectors and alarms, pacemakers, hemodialysis systems, peritoneal dialysis systems, neonatal ventilator incubators, ventilators for both adults and infants, anesthesia ventilators, and infusion pumps as well as any other devices designated as “critical” by the U.S. FDA.



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Introduction

The VCH10W Step Down series of Voltage Converters supply up to 10 amps continuous and 12 amps peak current at 12, 24, 36 or 48 volts from any higher voltage between 20 and 80 volts DC in an IP66 rated watertight and EMC shielded enclosure for use in automotive, heavy equipment, marine, industrial, rail or alternative energy environments.

The standard VCH10W model offers a Deutsch connector on a pigtail input/output cable, and is designed to be water resistant to IP66.

The VCH10Y is an upgraded version with the same connections that is individually tested to meet IP67.

The all surface mount high frequency design offers higher reliability, higher efficiency (more than 91%), more power (up to 544 watts at 48 VDC Out and minimum size. Two LED indicators show the presence of input power, and when the output current exceeds the continuous rating.

The unit has reverse input protection, output current limiting, output short circuit protection and output over-voltage protection.



Main Parts



Front Panel

1. Deutsch DT04-4P Input/Output connector on pigtail
2. Input Power Good LED
3. Overload LED



Operation

To turn the unit on, simply turn on your source of power. The Input Power LED will illuminate to indicate the presence of input power. The overload LED will illuminate if the output current exceeds the continuous rating of the unit.

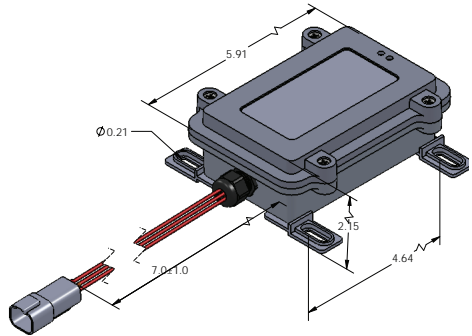
Installation

Mounting

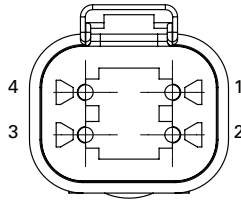
Mount the unit and allow at least 1 inch of clearance for adequate cooling.

Input and Output Connections

This unit is equipped with a watertight gland and short 4 conductor pigtail terminated with a Deutsch DT04-4P connector. The mating connector is also supplied, but without cable. The plug pin out is shown in the table below.



PIN NAME	DESCRIPTION
1	POSITIVE INPUT (red)
2	NEGATIVE INPUT (black)
3	NEGATIVE OUTPUT (black)
4	POSITIVE OUTPUT (orange)



Connect the input pins to the power source, and the output pins to the load, making sure to observe the correct polarity of the connections. If the input is connected in reverse, the protection fuse will blow, and must be replaced by the dealer or an electronics technician.



Load Share Option (D Option)

Two or more units may be configured for load sharing if they are equipped with the optional output isolation diodes. The output current is reduced to the Continuous rating for units with the D option.

ROHS (European) Option (E Option)

Consistent with military standards, this unit is normally manufactured using lead based solder. However, this unit can be built to ROHS lead free standards, identified internally by a red colored printed circuit board by adding the E option. This is a no charge option, but can add 2-4 weeks to the delivery of an order.

IP67 (Waterproof Tested) Option (Y Option)

This is the same unit as the VHC10W, except each unit is individually tested to comply with the IP67 rating of withstanding 1 meter immersion for 30 minutes with no ingress of moisture.



Troubleshooting

This unit has 2 LED indicators to help diagnose simple problems.

INPUT POWER

Indicates that power is being received by the unit

If the LED is not on, check with a voltmeter that there is power at the connections.

Check that the polarity is correct, Positive to Pin 1 and Negative to Pin 2. If the power is reversed, the unit is not damaged, but the input fuse must be replaced by a service technician experienced in Surface Mount Technology.

OVERLOAD

Indicates that the output current exceeds the continuous rating of the unit:

If this happens frequently, reduce the load connected to the unit.



Specifications

Input Voltages					
MODEL	VCH10W(Y)-12	VCH10W(Y)-24	VCH10W(Y)-32	VCH10W(Y)-36	VCH10W(Y)-48
Input Volts	20 - 80 VDC	30 - 80 VDC	40 - 80 VDC	45 - 80 VDC	60 - 80 VDC
Output Voltages					
Output Volts Nominal	12 VDC	24 VDC	32 VDC	36 VDC	48 VDC
Actual Volts	13.6 VDC	27.2 VDC	36.3 VDC	40.8 VDC	54.4 VDC
Output Amps	10 Amps Continuous, 12 Amps Peak				
Dissipation	12 Watts				
Efficiency	91.9%	95.8%	96.8%	97.1%	97.8%
Electrical					
Input Ripple and Noise	<100 mV Peak to Peak				
Output Ripple and Noise	< 50 mV Peak to Peak				
Transient Response	<300 mV for 50% Load Step Change				
Regulation (Line & Load)	< +/- 0.5%				
Emissions	Meets MIL-STD-461F				
Mechanical					
Dimensions	6.20 in / 15.8 cm Long x 4.91 in / 12.5 cm Wide x 2.15 in / 5.5 cm High				
Clearance	1.0 in / 2.5 cm all around				
Weight	0.62.0 lb / 0.28 kg				
Material and Finish	Diecast Aluminum with O-Ring and EMC Gaskets, Black Powder Coat Finish				
Mounting	Wall or shelf mount				
Connections	VCHW - Deutsch DT04-4P on 15cm Pigtail; Mating Connector Included				
Shock and Vibration	Designed to meet MIL-STD-810G				
Environmental and Safety					
Operating Temperature Range	-40°C to +55°C @ maximum output				
Humidity	0 - 95% Relative Humidity (non-condensing) with standard conformal coating				
Ingress Protection	W versions - Built to meet IP66, Y versions - tested to meet IP67				
Audible Noise	NONE 0db @ 3ft				
Typical Service Life	> 10 years (87,600 hrs)				
Isolation	Input - Case and Output - Case 1500 VDC Input - Output - common negative				
Warranty	TWO years parts and labor				
Safety	Built to meet CSA 22.2.107.1 & UL458				