

# **ANALYTIC SYSTEMS**

Power Conversion Solutions

## **INSTALLATION & OPERATION MANUAL**

### **VTC605 Series Voltage Converter**



An ISO9001 and AS9100 Registered Company Battery Chargers • Inverters • Power Supplies • Voltage Converters

8128 River Way, Delta B.C. V4G 1K5 Canada T. 604.946.9981 F. 604.946.9983 TF. 800.668.3884 (US/CANADA)

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**ANALYTIC SYSTEMS**  
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# IMPORTANT & SAFETY INSTRUCTIONS

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

## ALL CONVERTERS

1. CAUTION — To reduce risk of injury, charge only lead acid or sealed gel cell type rechargeable batteries. Other types of batteries may burst causing personal injury and damage.
2. Do not expose converter to rain or snow.
3. Use of an attachment not recommended or sold by the converter manufacturer may result in a risk of fire, electric shock, or injury to persons.
4. Do not disassemble converter; take it to a qualified serviceman when service or repair is required. Incorrect reassembly may result in a risk of electric shock or fire.
5. To reduce risk of electric shock, disconnect converter from batteries or other DC supply before attempting any maintenance or cleaning. Turning off controls will not reduce this risk.

## 6. CONVERTER LOCATION

- i. i) Never place converter directly above battery; gases from battery will corrode and damage converter.
- ii. ii) Never allow battery acid to drip on converter when reading gravity or filling battery.

## 7. O/P CONNECTION PRECAUTIONS

8. Connect and disconnect DC output connections only after setting converter switch to off position.

Analytic Systems does not recommend the use of the VTC605 Series Voltage Converters 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), autotransfusion 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.



## Introduction

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Step up a 12 VDC battery to between 13.5 and 17.0 or 24.0 and 27.5 VDC in 0.5 VDC increments (via 3 position DIP switch), or stabilize a 12 or 24 VDC power system. Safety features include reverse input protection, low input voltage alarm, low output voltage alarm, over temperature shutdown and alarm, and output overvoltage crowbar. If the input voltage exceeds the regulated output voltage, the unit simply passes the voltage through with full LC filtering and a single schottky diode drop (0.5 VDC or less). Optional features include a dry contact alarm relay output, and remote panel monitoring with On/Off control.

Applications include temporarily brightening 12 volt headlights or work lights, increasing voltage into an automotive or marine ignition system for hotter spark and/or prevention of failures due to voltage drop during engine start, stabilizing 12 and 24 VDC power systems in marine, automotive or aeronautical environments and more.



# Specifications

Model	VTC605-12-12	VTC605-12-24
Input Voltage	10.5 - 18 VDC	10.5 - 28 VDC
Output Voltage	(Input – 1V) or 13.5 - 17.0 VDC Whichever is greater	(Input – 1V) or 24.0 - 27.5 VDC Whichever is greater
Current Limit	50 Amps In	
Output Crowbar	Programmed Output Volts x (1.3 ± 1%)	
Input Fuse	AGC 30 Amp X 2	
Low Input Voltage Alarm	10.5 VDC	
Low Output Voltage Alarm	Programmed Output Voltage minus 2.5 VDC	
Noise on Input	< 50 milli-volts	
Noise on Output	< 50 milli-volts	
Transient Resp.	< 1V for 30A Surge	
Efficiency	> 90 % @ maximum output	
Temp. Range	-25 to +40 deg° C @ maximum output	
Isolation	Any Input or Output to Case 500VDC Input to Output Common Negative	
Length	9.1 in / 23.1 cm	
Width	7.8 in / 19.8 cm	
Height	4.3 in / 10.8 cm	
Clearance	1 Inch (2.5 cm) all around	
Material	Marine Grade Aluminum	
Finish	Black Powder Epoxy	
Fastenings	18-8 Stainless	
Weight	6.0 lb / 1.8 kg.	

\* Specifications subjects to change without notice.

Designed and manufactured by: **ANALYTIC SYSTEMS WARE (1993) LTD.**

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# Installation

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## MOUNTING

Mount the unit in a DRY location. Allow at least 1 inch of clearance for adequate cooling.

## POWER CONNECTION

The unit is supplied with input power leads 1 meter long. This should normally be adequate to connect to a source of power. If you must extend the cable:

- Use the smallest extension length possible.
- Use no less than 10 gauge conductors.
- Splice and solder the joints.
- Protect the joints with heat shrink tubing.

Connect the wires to a 60 Amp source of power as follows:

- Red to Positive
- Black to Negative

## OUTPUT CONNECTIONS

Two positive output terminals and two negative output terminals are provided. Connect only one wire to each terminal. Ensure that the total average load connected does not exceed the continuous current rating of the unit.

Note that the current specifications are for input current. To obtain the maximum output current capability at any given input voltage, use the following formula:

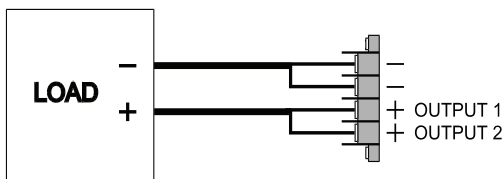
$$\text{Output Current} = \text{Input Volts} / \text{Output Volts} \times 45$$

For example:

10 VDC in and 27 VDC out, the max output current =  $10/27 \times 45 = 16.7$  Amps.

20 VDC in and 27 VDC out, the max output current =  $20/27 \times 45 = 33.3$  Amps

Each output terminal can supply up to 25 Amps, therefore do not connect more than 25 amps of load to either output terminal. If the load exceeds 25 Amps but not the continuous rated output of the unit, do the following: The output terminals must be connected to the load in parallel ensuring that the wiring used has sufficient capacity to handle the current.



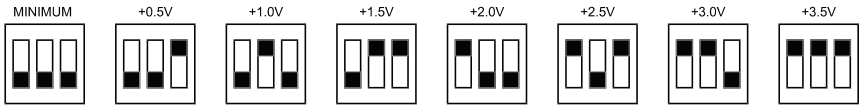


## Operation

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Turn the power switch on the front of the unit on to energize the outputs.

To adjust the output voltage, turn off the power switch. Remove the plate from the top of the box. Reach in with a non-conductive device such as a pencil and open or close the dip switches as shown below to select the desired output voltage. Replace the plate. Turn the power switch on.



BLACK PORTION INDICATES SWITCH IS PUSHED DOWN

## Troubleshooting

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If the load exceeds the continuous rating for too long a period, the internal temperature sensor will cause the unit to stop boosting the input voltage until the unit has cooled down. After the unit has cooled down, normal operation will resume.

If the input voltage drops below the specified minimum input, the unit will sound the alarm.

If the output voltage drops below the specified minimum, the unit will sound the alarm.

If the current demanded by the devices connected to the unit exceed the maximum current rating, the fuse will blow.

If the fuse blows with no load connected, check that the power leads are connected to the battery with the correct polarity; if they are then the unit is damaged and must be returned for repair.









## Special Services & Options

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<b>Conformal Coating</b>	INCLUDED ON ALL UNITS UNLESS REQUESTED NOT TO as of April 1, 2014
<b>Option "c"</b>	Ruggedization Package (EXTRA Conformal Coating and RTV Compound)
<b>Option "v"</b>	Marine / Industrial Pkg (EXTRA Conformal dipping and RTV Compound)
<b>Option "MS"</b>	Military Pkg (incl. Wide Temp Components, Conformal Dipping and RTV Compound)
<b>Option "w"</b>	Wide Temperature Operation (-40 to +55 C, incl)
<b>Option "SM"</b>	High Voltage Protection on the DC Input Side
<b>Option "d"</b>	Paralleling Diodes
<b>Option "FI"</b>	Forklift Modifications
<b>Option "F"</b>	Open Frame - No chassis just heat sink bars (not for all products)
<b>Special Input</b>	There is no charge for nominal output voltages (ie. 12.0, 24.0, 48.0), but this must be noted at the time of order (Contact Factory for details)
<b>Special Output</b>	
<b>Water tight options</b>	IP66, IPS67, IPS68



## Limited Warranty

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1. The equipment manufactured by Analytic Systems Ware (1993) Ltd. (the "Warrantor") is warranted to be free from defects in workmanship and materials under normal use and service.
2. This warranty is in effect for:
  - a. 3 Years from date of purchase by the end user for standard products offered in our catalog.
  - b. 2 Years from date of manufacture for non-standard or OEM products
  - c. 1 Year from date of manufacture for encapsulated products.
3. Analytic Systems will determine eligibility for warranty from the date of purchase shown on the warranty card when returned within 30 days, or
  - a. The date of shipment by Analytic Systems, or
  - b. The date of manufacture coded in the serial number, or
  - c. From a copy of the original purchase receipt showing the date of purchase by the user.
4. In case any part of the equipment proves to be defective, the Purchaser should do the following:
  - a. Prepare a written statement of the nature of the defect to the best of the Purchasers knowledge, and include the date of purchase, the place of purchase, and the Purchasers name, address and telephone number.
  - b. Call Analytic Systems at 800-668-3884 or 604-946-9981 and request a return material authorization number (RMA).
  - c. Return the defective part or unit along with the statement at the Purchasers expense to the Warrantor; Analytic Systems Ware (1993) Ltd., 8128 River Way, Delta, B.C., V4G 1K5, Canada.
5. If upon the Warrantor's examination the defect proves to be the result of defective material or workmanship, the equipment will be repaired or replaced at the Warrantor's option without charge, and returned to the Purchaser at the Warrantor's expense by the most economical means. Requests for a different method of return or special handling will incur additional charges and are the responsibility of the Purchaser.
6. Analytic Systems reserves the right to void the warranty if:
  - a. Labels, identification marks or serial numbers are removed or altered in any way.
  - b. Our invoice is unpaid.
  - c. The defect is the result of misuse, neglect, improper installation, environmental conditions, non-authorized repair, alteration or accident.
7. No refund of the purchase price will be granted to the Purchaser, unless the Warrantor is unable to remedy the defect after having a reasonable number of opportunities to do so.
8. Only the Warrantor shall perform warranty service. Any attempt to remedy the defect by anyone else shall render this warranty void.
9. There shall be no warranty for defects or damages caused by faulty installation or hook-up, abuse or misuse of the equipment including exposure to excessive heat, salt or fresh water spray, or water immersion except for equipment specifically stated to be waterproof.
10. No other express warranty is hereby given and there are no warranties that extend beyond those described herein. This warranty is expressly in lieu of any other expressed or implied warranties, including any implied warranty of merchantability, fitness for the ordinary purposes for which such goods are used, or fitness for a particular purpose, or any other obligations on the part of the Warrantor or its employees and representatives.
11. There shall be no responsibility or liability whatsoever on the part of the Warrantor or its employees and representatives for injury to any person or persons, or damage to property, or loss of income or profit, or any other consequential or resulting damage which may be claimed to have been incurred through the use or sale of the equipment, including any possible failure of malfunction of the equipment, or part thereof.
12. The Warrantor assumes no liability for incidental or consequential damages of any kind



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