



SM47

**VR33 Series
DC Power Converter**



INSTALLATION AND OPERATION MANUAL

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Periodically NAT will release manual amendments. In order to maintain the most accurate and up to date manual these amendments should be carried out immediately upon receipt and recorded on the following amendment record.

AMENDMENT RECORD				
Amendment Number	Amendment Date	Section(s) Changed	Date Entered	Entered By
<i>Note: Revision 4.00 is the first public release of this document</i>				

Insert any Amendment Instruction sheets after this page.

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Section 1 Description

1.1 Introduction

This manual contains information on the VR33 Series DC Power Converters. Descriptions and information will be given for the VR33-001 and the VR33-002 models. Any differences between the two models will be noted. All derivative products will be covered by manual supplements, which can be obtained from NAT as required.

Information in this section consists of purpose of equipment, features and specifications.

1.2 General

The VR33 is a power conversion device designed to increase the nominal 28 Vdc aircraft voltage to 33 Vdc using high speed switching DC-DC conversion.

When used in conjunction with the NAT PA250/PA700 Series or high power PA amplifiers, the additional available voltage provided by the VR33 significantly increases the available power to the speakers and thus extends the audible range of the system.

1.3 Features

The VR33-001 is used with the PA250-xxx Audio Power Amplifier, and boosts the output power from 250 to 400 Watts.

The VR33-002 provides two outputs, which makes it ideal for use with the PA700-xxx Audio Power Amplifier. It boosts the PA700-xxx output power from 700 to 850 Watts.

1.4 Specifications

1.4.1 Electrical Specifications

Input

Input Power	VR33-001	140 Watts
Input Power	VR33-001	280 Watts
Input Voltage		+28.0 Vdc nominal +21.0 Vdc minimum +32.0 Vdc maximum
Input Current	VR33-001	5.0 Adc + PA250-xxx current (15-20 Adc full load)
	VR33-002	10.0 Adc + PA700-xxx current (35 Adc full load)

Output

Output Power Capacity	100 Watts (each converter)
Output Voltage	Input voltage + 5.0 Vdc (Nominally 28.0 Vdc + 5.0 Vdc = 33.0 Vdc)
Output Current Capacity	20.0 Amps dc (each converter)

1.4.2 Physical Specifications

Height	1.56" (39.6 mm) max excluding connectors
Width	8.75" (222.3 mm) max excluding connectors
Depth	10.00" (254.0 mm) max excluding connectors
Weight	VR33-001 2.7 lbs. (1.23 kg) VR33-002 3.9 lbs. (1.77 kg)
Mounting	Beneath PA250 or PA700 Power Amplifier
Material/Finish	Black Anodized Aluminum
Connectors	VR33-001 One circular crimp bulkhead plug VR33-002 Two circular crimp bulkhead plugs

1.4.3 Environmental Specifications

Operating Temperatures	-40° C to +70° C
Vibration	DO-160C, Sec. 8.0, Cat. N
Altitude	25,000 ft.
Compliance:	DO-160C Env. Cat. B4-XXNXXXXXXXXXXXXXXXXXXXXX.

1.5 Unit Nomenclature

VR33-001	Boosts PA250 to 400 Watts Weight: 2.7 lbs. (1.23 kg)
VR33-002	Boosts PA700 to 850 Watts Weight: 3.9 lbs. (1.77 kg)

End of section 1

Section 2 Installation

2.1 Introduction

Information in this section consists of: unpacking and inspection procedures, installation procedures, post-installation checks, and installation drawings.

2.2 Unpacking and Inspection

Unpack the equipment carefully and locate the warranty card. Inspect the unit visually for damage due to shipping and report all such claims immediately to the carrier involved. Note that each unit should have the following:

- VR33 Series DC Power Converter
- Warranty Card
- Operator's Manual
- Release certification

Verify that all items are present before proceeding and report any shortage immediately to your supplier.

Complete the warranty card information and send it to NAT when the installation is complete. If you fail to complete the warranty card, the warranty will be activated on date of shipment from NAT.

2.3 Installation Procedures

2.3.1 Cabling and Wiring

The VR33-001 is mounted directly beneath the PA250 Power Amplifier, and the VR33-002 is mounted directly beneath the PA700 Power Amplifier, with the VR33 connected in series. No additional cabling is required.

For all other cabling requirements, consult the PA250 and PA700 Series High Power Voice Amplifiers manual, SM44.

2.3.2 Mechanical Installation

The VR33 is designed for installation directly beneath PA250 or PA700 Power Amplifiers. The VR33 should be mounted to the bulkhead using the mounting-holes (dimensions shown on **Mechanical Installation** drawings VR33\001\922-0 and VR33\002\922-0).

2.3.3 Post-Installation Checks

2.3.3.1 Voltage/resistance checks

Do not attach the VR33 to the PA250 or PA700 until the following conditions are met.

Check the following (one connector for VR33-001, two for VR33-002):

- a) Check J5 and J6 pin for continuity to ground (less than 0.5 Ω).
- b) Check P6 (aircraft power connector) pin <A> for +28 Vdc relative to ground.
- c) Install P6 to J6 (VR33 connector), and then check J5 (PA connector) <A> for +33 Vdc relative to ground.

2.3.3.2 Power On checks

Install the VR33 and power up the system. Verify normal operation of all functions with reference to all system components.

Note: To verify proper operation, all functions and levels should be checked in-flight (if appropriate).

Upon satisfactory completion of all performance checks, make the required log entries and complete the necessary Regulatory Agency paperwork before releasing the aircraft for service.

2.4 Continued Airworthiness

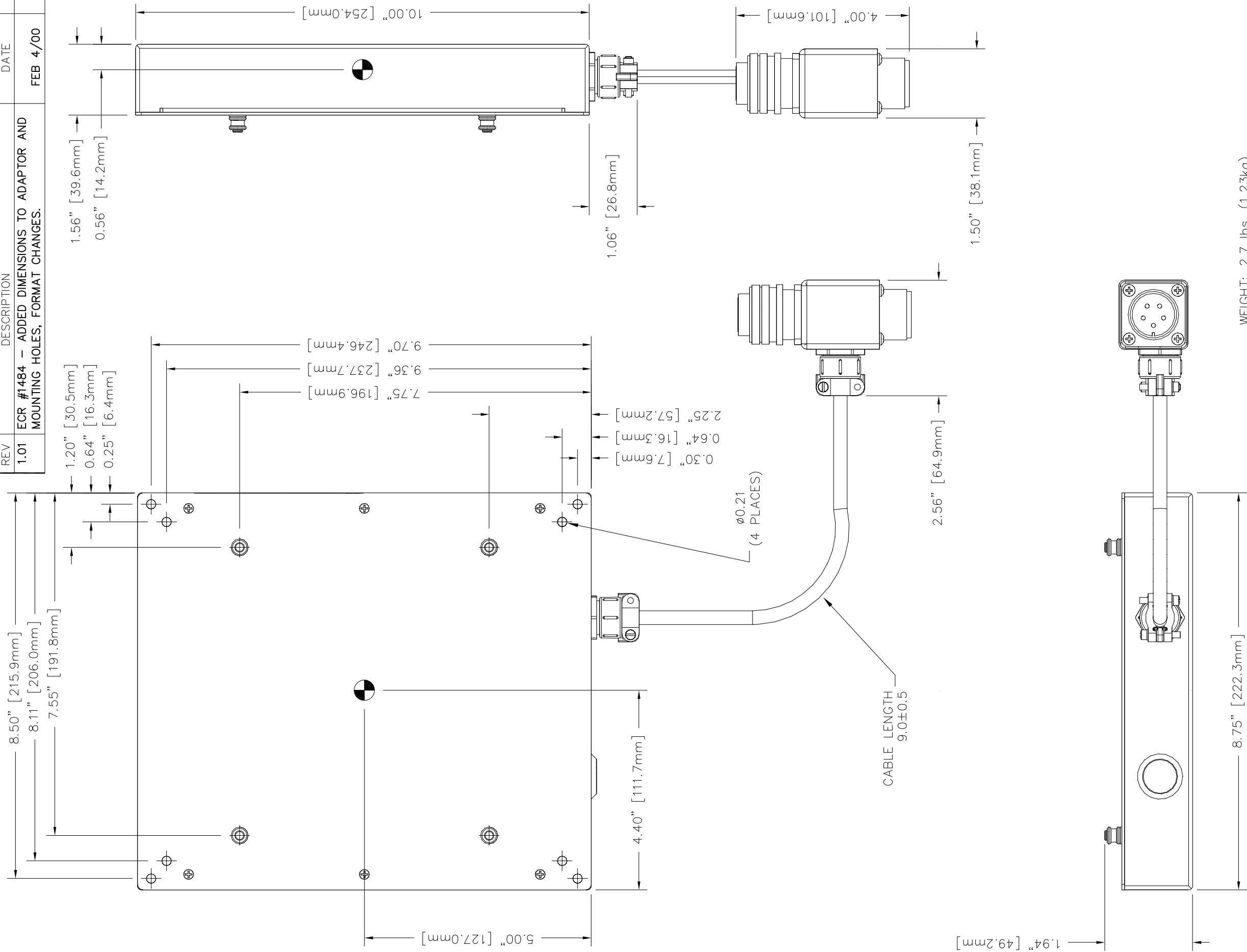
Maintenance of the VR33 is 'on condition' only. Periodic maintenance of this product is not required.

2.5 Installation Drawings

DRAWING	REV.	DESCRIPTION	TYPE
VR33-001			
VR33\001\922-0	1.01	DC Power Converter	Mechanical Installation
VR33-002			
VR33\002\922-0	1.00	DC Power Converter	Mechanical Installation

Section 2 ends after these Drawings

REVISIONS			
REV	DESCRIPTION	DATE	BY
1.01	ECR #1484 - ADDED DIMENSIONS TO ADAPTOR AND MOUNTING HOLES, FORMAT CHANGES.	FEB 4/00	TAT

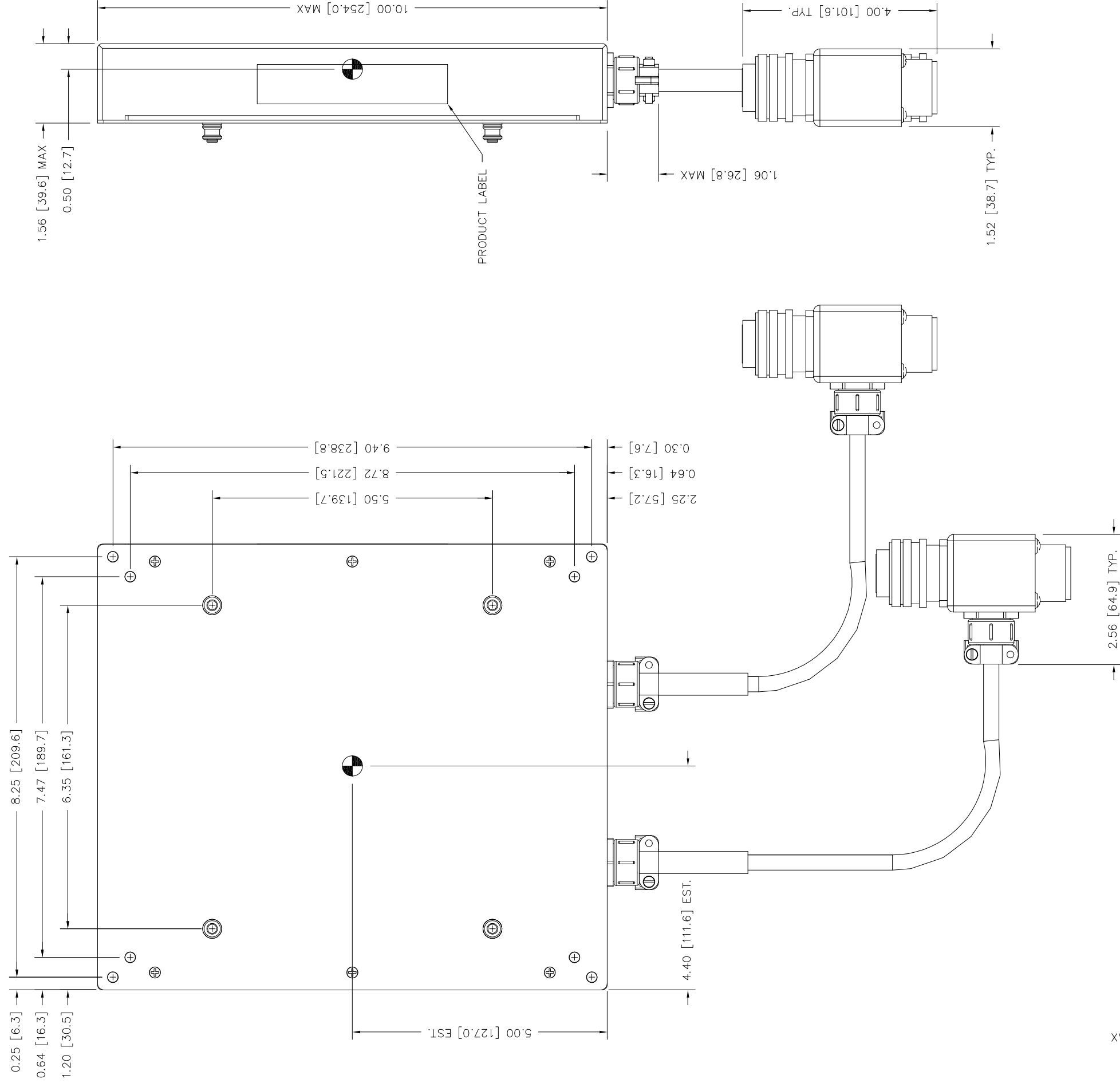


WEIGHT: 2.7 lbs. (1.23kg)
 CENTER OF GRAVITY ±0.05

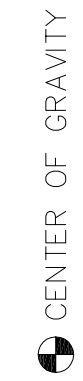
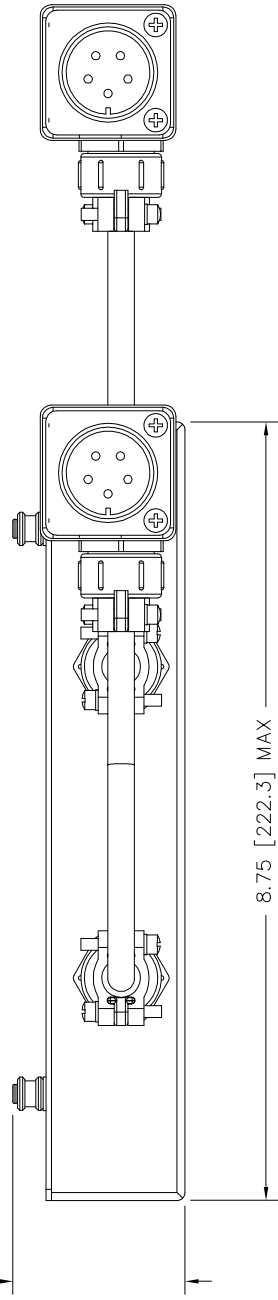
NOTE:
 CENTER OF GRAVITY TEST
 DONE WITHOUT CONNECTOR
 ASSEMBLY.

PROPRIETARY AND CONFIDENTIAL TO NAT LTD.

TOLERANCES UNLESS STATED OTHERWISE		DESIGNED	MWS/TAT	TITLE	
0.X = + / - 0.030		DRAWN		NAT NORTHERN AIRBORNE TECHNOLOGY LTD.	
0.XX = + / - 0.010		DATE	JUL 21/98	DC	
0.XXX = + / - 0.005		CHECKED	NAT NAT 231 223	POWER CONVERTER	
0.XXXX = + / - 0.002		APPROVED	NAT 117	CONVERTER	
ANGLE = + / - 0.5 DEG.				DC	
MATERIAL		SIZE	CAGE CODE	PART NO.	REV.
FINISH		B	3AB01	VR33-001	1.01
		FILE	922-0101.DWG	MECH. INSTALLATION	DWG. NO.
					VR33\001\922-0



1.94 [49.2] MAX



- NOTES:
 1. DIMENSIONING AND TOLERANCING IN ACCORDANCE WITH ASME Y14.5M-1994.
 2. CENTER OF GRAVITY TEST DONE WITHOUT CONNECTOR ASSEMBLIES.

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DIMENSIONS ARE INCHES [mm]	DESIGNED	MWS	TITLE		REV.	SHEET
	DRAWN		DC POWER CONVERTER			
THIRD ANGLE PROJECTION	DATE	JUN 09/04	DC POWER CONVERTER		PART NO.	
MASS: 3.9 lbs. (1.77 kg)	CHECKED	NAT NAT 225 249	DC POWER CONVERTER		VR33-002	
MATERIAL	APPROVED	NAT 123	SIZE	CAGE CODE	3AB01	
FINISH	FILE	922-0.DWG	DWG. TYPE	MECH. INSTALLATION	DWG. NO.	VR33\002\922-0

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Section 3 Operation

3.1 Introduction

Information in this section consists of the functional and operational procedures for the VR33 Series DC Power Converter.

3.2 General

The VR33 Series DC Power Converter has no operator accessible controls.

End of section 3