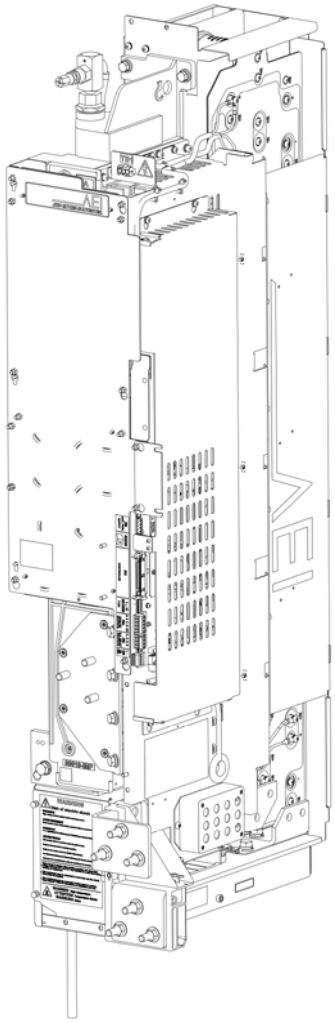
Avid Extreme Inverter – MV3000 Drive Upgrade Installation Instructions



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Avid Controls Inc.
41261 Park 290 Drive, Waller, TX 77484, USA
info@avidcontrolsinc.com
(+1) (281) 640-8600

THIS DATA SHEET CONTAINS AN INSTALLATION CHECKLIST THAT MUST BE COMPLETED AND RETURNED TO INFO@AVIDCONTROLSINC.COM
SEE APPENDIX A

AVID Controls Inc. pursues a policy of continuous product improvement and innovation. This may not be the latest revision of this publication and may not reflect all current product changes. Contact AVID Controls Inc. for the latest revision of this data sheet and information on other product enhancements.

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Contents

1. Introduction 4
2. WARNINGS 4
3. Parts and Equipment 5
   3.1 Avid Extreme Inverter Modules and Auxiliary Power Units 5
   3.2 Upgrade Kit Parts List 5
   3.3 Typical Required Tool List 6
4. Prior to Removal of DELTA Modules 7
5. Installation of AEI Modules 7
6. Label CDC's 8
7. Attach Documents for Reference 9
8. Fit the Upgrade Identification Label 10
9. Restart Drive 10
   9.1 Background 10
   9.2 Flowchart 11
10. Document Revision History 11
11. Appendix A – Installation Checklist 12

1. Introduction

- The following procedures are specific to the installation of the AVID AEI liquid-cooled and air-cooled inverter module when upgrading from Delta modules in an existing MV3000 drive system.
- For all AEI related installation instructions/data sheets please visit: https://avidcontrolsinc.com/product-documentation/.

2. WARNINGS

- Always refer to the Cautions and Warnings in the associated AEI, MV DELTA and MV3000 manuals when installing / commissioning / fault-finding any system containing an AEI module.
- This equipment may be connected to more than one live circuit.
- ***Disconnect all power sources before working on the equipment.***
- ***Wait at least 8 minutes after isolating all power sources and check that the voltage between DC+ and DC- has reduced to a safe level before working on the equipment.***
- Surfaces on the coolant pipes/heat sinks can reach high temperatures and remain hot for some time after power is switched off.
- Ensure that all coolant has cooled to a safe temperature, and the equipment is suitably drained and isolated before disconnecting the pipework from liquid-cooled equipment.
- It is recommended that all DC fuses are replaced during this upgrade.

3. Parts and Equipment

3.1 Avid Extreme Inverter Modules and Auxiliary Power Units

- Each DELTA module and SMPS assembly in the original system will be replaced with an Avid Extreme Inverter plus an Auxiliary Power Unit combination.
- For details of the different options for Avid Extreme Inverters, please refer to the latest revision of Data Sheet DTS-MID0012, available from Avid.
- For details of the APU-G Auxiliary Power Unit, please refer to Avid Data Sheet DTS-02175-ASY-A.
- If you are upgrading using APU-D/E/F auxiliary power modules, the upgrade is considerably more complex and much additional equipment is required – please contact Avid for assistance.

3.2 Upgrade Kit Parts List

Item Reference	Qty.	Description
1	2	Bag, Document Envelope, Magnetic, Clear Plastic, 9" X 11.5"
2	2	Label, Upgraded Drive Identification, AEI Upgrade
3	1	Consumable, Clean Room Wipes, 9” X 9”, 70%, IPA, Pack of 50
4	1	Chemical, Torque Marker, Permanent, Orange, 1oz tube
5	1	Hardware, Tie-Wrap, 5.5-in, 18-lb, Black, Bag of 100
6	1	Hardware, Tie-Wrap, 11-in, 18-lb, Black, Bag of 100
7	1	Product Label, for CDC, Warning if CDC is Replaced
8	1	4 Nm Torque Key

3.3 Typical Required Tool List

- The following is a list of typically required tools for the upgrade. Since each system to be upgraded is packaged differently, additional tools/equipment may be needed.

- MV3000 Keypad with Cable
- Torx T25 Driver
- #3 Pozi-drive Screwdriver
- 5mm Socket, 3/8” Drive
- 17mm Socket, 3/8” Drive
- Laptop with Drive Coach and FTDI RS232 adapter
- 8mm ¼” Drive Socket
- Hydrometer Kit
- AEI/Delta Lift Hoist (if available)
- Diagonal wire cutters
- Phillips #2 x 4” Screwdriver
- Socket Wrench, 3/8” Drive
- Socket Extension 10” Long, 3/8” Drive
- 10” ¼” Drive Extension
- Digital Voltmeter (DVM)
- AEI/Delta Installation Dolly (if available)
- Sheet Metal Nibbler (if cabinet modifications are required)
- 8mm crescent wrench
- 3/16” x 4” Slotted Screwdriver
- Torque Wrench, 3/8” Drive
- 10mm Socket, 3/8” Drive
- Adjustable Crescent Wrench, 1” Jaw Capacity
- ¼” Hex to ¼” Drive Socket Adapter
- 8mm Socket, 3/8” Drive

4. Prior to Removal of DELTA Modules

- The removal process of the Delta modules should follow standard on-site processes, including:
  - Power shutdown
  - Draining of liquid coolant (if required)
  - Disconnecting of all electrical power sources
  - Removal of SMPS
  - Removal of the Deltas

- Before removing any connections or components, record the positions of the following.
  - All existing cables
  - Note the position of any relevant tie wraps.
  - Keep all hardware, nuts, bolts, washers, thread protectors, etc.

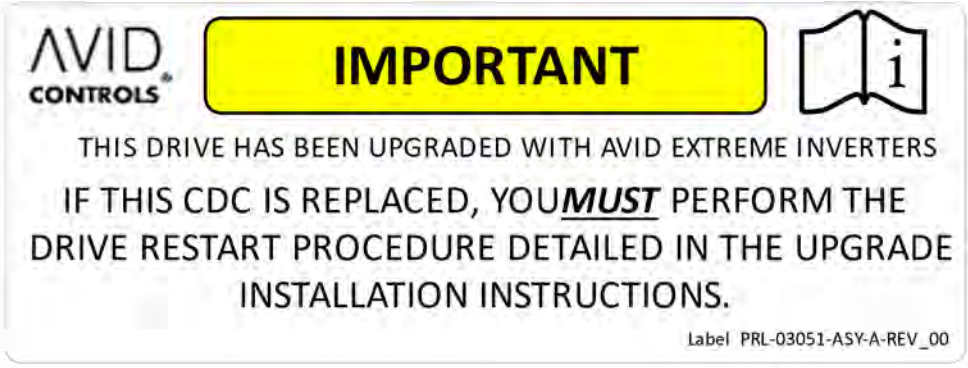
5. Installation of AEI Modules

- The installation process of the AEI modules should follow the reverse of removal of the Delta units:
  - Installation of AEI's
  - Installation of APU's
  - Ensure that all electrical power connections and cooling hose clamps are set to the correct torque and use torque-seal to mark them. See the included checklist (Appendix A) for Avid suggested torques.
  - Re-connection of all ribbon cables and connectors
  - Re-charging of the coolant
  - Initial Start-up

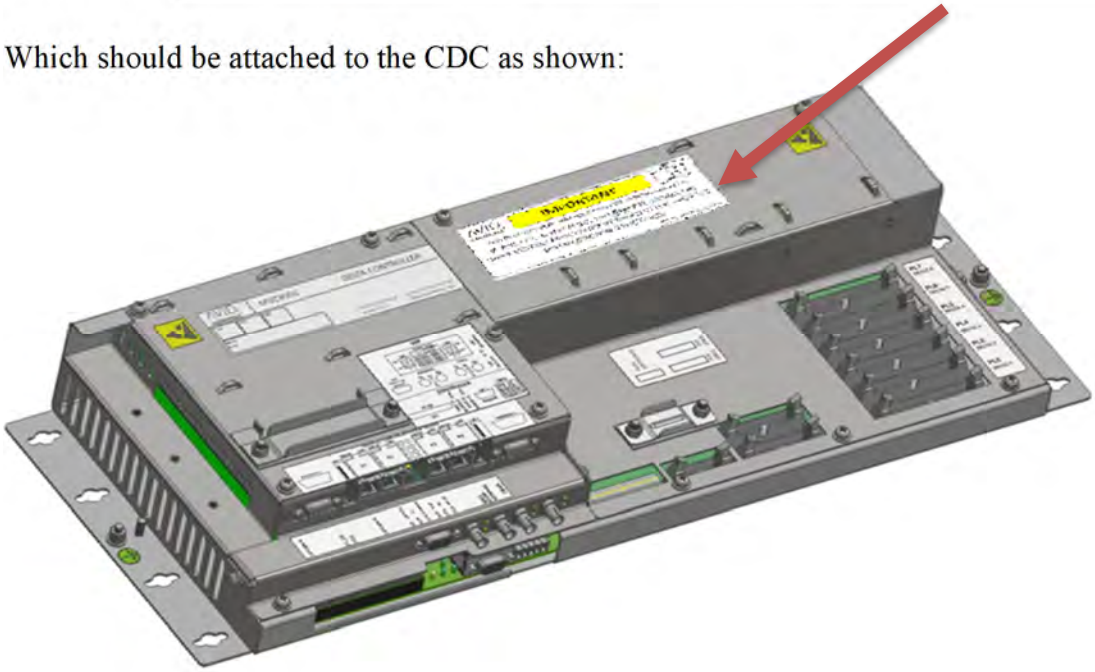
6. Label CDC's

- If at any time a CDC module needs to be replaced with either a brand-new unit, or one that has previously operated with Delta modules, ***IT IS CRITICAL THAT THE PROCEDURE IS FOLLOWED FOR THE REPLACEMENT CDC AS PER SECTIONS 0 AND 9 OF THIS DOCUMENT***.

- To help ensure this happens, the upgrade kit includes several copies of this label:



- Which should be attached to the CDC as shown:



- ***<u>Also, temporarily remove the CDC and attach another copy of this label to the cabinet back-panel underneath the CDC so that it will be visible whenever the CDC is removed.</u>***

- A total of eight copies of this label are provided in the upgrade kit (peelable from a single sheet). Place the sheet with the spare labels into the magnetic envelope provided so that they are available if the CDCs are replaced in the future.

7. Attach Documents for Reference

- Locate the magnetic clear plastic envelopes supplied with the upgrade kit.
- Place one copy of all the documents associated with the AEI upgrade inside.
- Attach the envelope to the inside of the control cabinet door:

8. Fit the Upgrade Identification Label

- The upgrade kit includes two weather-proof self-adhesive labels (Item 2) that may be applied to the drive cabinet to clearly indicate that it has been upgraded with Avid Extreme Inverters:

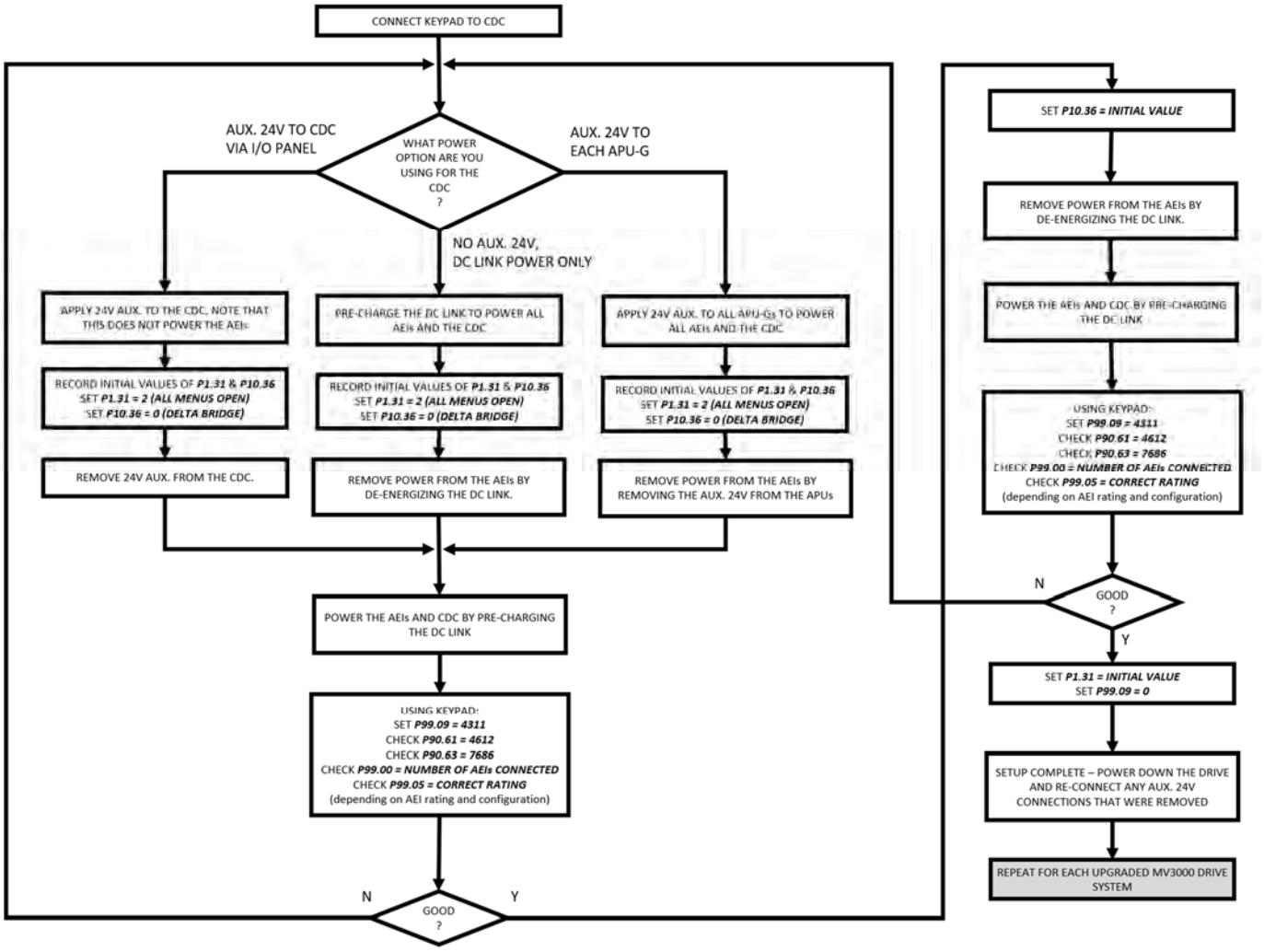
- These may be applied on the interior or exterior of the drive package as per customer preference (e.g. on the drive cabinet door).
- Surface preparation wipes are also included in the kit.

9. Restart Drive

9.1 Background

- When operating with original MVDL units, the CDC controllers may be powered by the auxiliary 24V supply before the main DC link is energized (hence the Delta modules are not powered). This means that the CDC cannot identify the Delta modules, leading to faults that interfere with the control system. To avoid these faults, P10.36 may be set to instruct the CDC not to read data from the Deltas but to remember the previously identified values.
- After changing from Deltas to AEIs, it is necessary to perform at least one power cycle with P10.36 set to “Delta Bridge”. This causes the CDC to read the new information from the AEIs. After this has been successfully achieved, P10.36 can be returned to its normal position to avoid the faults prior to charging the DC link.
- It is also necessary to set the active-sharing parameters for the AEI drives to their default values in case they have been changed for the Delta system.
- This procedure will need to be repeated for each CDC if replaced at a future date.

9.2 Flowchart



10. Document Revision History

Rev.	Date	Author	Changes
00	September 26, 2023	C. Stominski	Initial Release
01	Dec 12 2023	G. Pace	Added instruction to place label on cabinet back-panel behind the CDCs
02	April 26, 2024	C. Stominski	Label text corrected & removed references to P35.18/19

11. Appendix A – Installation Checklist

CUSTOMER:		SITE NAME:	
IDENTITY NUMBER:		AVID TECHNICIAN (or N/A):	
CUSTOMER LEAD TECHNICIAN:		DATE:	

Before Going to Drive Location

All Tools Available:

Item	Initial
MV3000 Keypad with Cable	
Torx T25 Driver	
#3 Pozi-drive Screwdriver	
5mm Socket, 3/8" Drive	
17mm Socket, 3/8" Drive	
Laptop with Drive Coach and RS232	
8mm ¼" Drive Socket	
Hydrometer Kit	
AEI/Delta Lift Hoist (if available)	

Item	Initial
Diagonal wire cutters	
Phillips #2 x 4" Screwdriver	
Socket Wrench, 3/8" Drive	
8mm Socket, 3/8" Drive	
Socket Extension 10" Long, 3/8" Drive	
10" ¼" Drive Extension	
Digital Voltmeter (DVM)	
AEI/Delta Installation Dolly (if available)	
Sheet Metal Nibbler	

Item	Initial
8mm crescent wrench	
3/16" x 4" Slotted Screwdriver	
Torque Wrench, 3/8" Drive	
10mm Socket, 3/8" Drive	
Adjustable Crescent Wrench, 1" Jaw Capacity	
¼" Hex to ¼" Drive Socket Adapter	
4 NM Torque Key	

CUSTOMER:		SITE NAME:	
IDENTITY NUMBER:		AVID TECHNICIAN (or N/A):	
CUSTOMER LEAD TECHNICIAN:		DATE:	

AEI Upgrade Kit Complete

Refer to the upgrade kit parts lists in Section 3 of this Data Sheet.

Item	Initials
All items in parts list correctly received	

Item	Initials
All documents in document list correctly received	

Drive History

Was drive in running condition before AEI upgrade ?: _____

If the drive was not in running condition, please attach all available fault history (from SCADA or Drive Coach) and describe all known details of the fault / problem.

Description of attachments:

_____

_____

_____

_____

_____

_____

_____

CUSTOMER:		SITE NAME:	
IDENTITY NUMBER:		AVID TECHNICIAN (or N/A):	
CUSTOMER LEAD TECHNICIAN:		DATE:	

At Drive, Before Removing Deltas

Status of Drive:
(blown fuses, tripped breakers, system fault codes etc.):

_____

_____

_____

Visible Damage (Before Removing Deltas)
(Damaged cables or ribbons, missing hardware, coolant leaks etc.) :

_____

_____

_____

Check coolant with hydrometer and record result.
If out of specification, coolant must be replaced before installation of AEI units:

Hydrometer Reading: _____ Units:_____ In Spec ?:_____

Customer Lock-out Tag-Out Procedures complete: _____

System safe voltage checks AC & DC complete: _____

Position of all cables, ribbons, tie-wraps etc. recorded: _____

CUSTOMER:		SITE NAME:	
IDENTITY NUMBER:		AVID TECHNICIAN (or N/A):	
CUSTOMER LEAD TECHNICIAN:		DATE:	

After Installation, Before Power-On:

CHECK ITEM		Drive Position 1	Drive Position 2	Drive Position 3	Drive Position 4	Drive Position 5	Drive Position 6
AEI Serial #							
APU Serial #							
Power Terminal Torque set to 35Nm and sealed	Aph #1						
	Aph #2						
	Aph #3						
	Bph #1						
	Bph #2						
	Bph #3						
	Cph #1						
	Cph #2						
	Cph #3						
	DC+ #1						
	DC+ #2						
	DC+ #3						
	DC- #1						
	DC- #2						
	DC- #3						
Pull-test control wires							
DC fuses replaced							
Ribbon clamps secure and not damaging insulation							
Coolant hoses torqued to 4 Nm using torque-key							
All wires/cables correctly tie-wrapped							

CUSTOMER:		SITE NAME:	
IDENTITY NUMBER:		AVID TECHNICIAN (or N/A):	
CUSTOMER LEAD TECHNICIAN:		DATE:	

Drive Restart Checklist:

All air purged from cooling system: _____ No coolant leaks detected: _____

Check and record the final values of the following parameters etc. for the Drive CDC:

Parameter Etc.	Expected Value	Drive Value	Notes
P10.36	Customer Preference		
P99.09	0		Return to zero ***after*** restart procedure
P1.32	Customer Preference		Return to its original value ***after*** restart procedure
CDC Part Number			
CDC LED Shape	Round or Square [R/S]		
CDC Firmware Version			
Parameter Set File			

List and Describe any Faults During Re-Start:

CUSTOMER:		SITE NAME:	
IDENTITY NUMBER:		AVID TECHNICIAN (or N/A):	
CUSTOMER LEAD TECHNICIAN:		DATE:	

Confirm document envelope and all contents (see section 5) installed in cabinet: _____

Record the 2-digit display readouts on each AEI:

AEI #1: _____ AEI #2: _____

AEI #3: _____ AEI #4: _____

AEI #5: _____ AEI #6: _____

Additional Information:

_____

_____

_____

_____

_____

_____

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_____

_____

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_____

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