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IMPORTANT NOTICE

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1. Terms and Definitions

DELTA	MV3000 DELTA IGBT Module
SKiiP	® Semikron Intelligent Power Module
CDC	Common Drive Controller

2. References & Related Documents

Document Number	Document Title	Notes
T1693	Liquid Cooled DELTA Technical Manual	
DTS-MID0050	Liquid Cooled Delta Module - Data Sheet	

3. Document Purpose and Overview

This guidance note is to assist customers when upgrading obsolete MVDL643 modules with current MVDL800 modules.

4. Introduction

The MVDL643 Liquid Cooled Delta has been obsolete for many years but installations are still operational using inverters based on this model. In the event of failure, the inverter system can be upgraded to use current MVDL800 Delta modules available from Avid Controls. The MVDL800 DELTA modules are the same physical size as the MVDL643 and are designed to fit into the same cubicle system.

Likewise, the AC and DC power connections are in approximately the same location.

The only constraint is that 643A and 800A deltas can not be mixed within the same bridge. So for example, if you have a single Delta system then replacing the 1 x 643A with 1 x 800A is fine. However, if you have say, 2,3 or 4 x 643A Deltas then you need to replace ALL with the 800A model. This is because the current sharing is quite different between the two types (one being SKiiP2 and the other being SKiiP3 technologies)

5. Safety Notice



Delta systems involve the use of high voltages and work should only be attempted by qualified and experienced engineering personnel.

- Replacement of Delta modules should only be done with the system power disconnected and locked off.
- Refer to safety instructions in the Delta Technical Manual ref. T1693.
- Delta modules contained stored energy at 1100V. Wait at least 8 minutes after power disconnection before working on modules to allow the capacitor bank to discharge.
- The modules are heavy ~ 100kg. Use approved lifting tackle.

6. Comparison of MVDL643 & MVDL800

6.1 Electrical Connections and Rating

The MVDL800 provides around 25% more current than the MVDL643, actual ratings are given in Table 1.

Table 1		
Conditions	MVDL643	MVDL800
Continuous AC RMS. current allowing for a 1.5 x overload	471 A	587 A
Continuous AC RMS current allowing for a 1.1 x overload	643 A	800 A

The AC and DC power connections are in the same place and the torque settings are also the same.

6.2 Coolant Connections

The coolant inlet and outlet connections on the MVDL643 are at the bottom and comprise of Staubli self-sealing connectors. Avid provide a range of Delta modules with various options. The two suitable for upgrading the MVDL643 are shown below which have the same cooling connection arrangement.

MVDL800-47931101-A	DELTA MODULE, 800A 690V, LIQUID COOLED, SKIIP-3V3 D+, WITH CAP FANS, STAUBLI CONNECTION, AVID MFG
MVDL800-47931101-REMAN	DELTA MODULE, 800A 690V, LIQUID COOLED, SKIIP-3V3 D+, WITH CAP FANS, STAUBLI CONNECTION, REMANUFACTURED

7. Firmware Issues

Normally, the rating of the Delta is read from the Delta itself by the CDC on power up so the system should recognize the new 800A Deltas.

If the system is set up for P99.01 = Vector Control (Encoder or Encoderless) then no changes should be needed because the Torque settings in Menu 8 are Based on the Motor Set up data in Menu 2.

But if the system is set up for P99.01 = Frequency Control then P3.05 = Fixed Current Limit would have to be changed, using Full Load Amps of the Delta (P9.05) and FLA of the Motor (P2.02). See calculation for P3.05 below.

(Generally, the desired peak current is P2.02)

The current limit value set in P3.05 is simply a percentage of the nominal drive current indicated by P99.05

$$\text{i.e. P3.05 value} = \frac{\text{Desired peak current}}{\text{P99.05 value}} \times 100 \%$$

If in any doubt, consult your MV3000 drives specialist.

8. Checklist

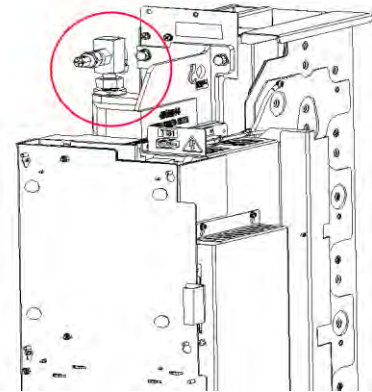
There were several revisions of the MVDL643 and also custom modifications could have been made at the time of the system build. Therefore, the following items should be checked in advance.

Coolant Connections

Verify that the MVDL643 has both hose connections at the bottom and they are of the Staubli self-sealing type.

Vent Valve and Drain Hose

The MVDL800 has a vent valve at the top with a hex adjuster as shown opposite. To the rear of the valve is the connection for the drain hose. Variants of this were seen on the old 643A including T bar handle adjusters, extension bars etc. You may need to adapt to suit.



All Deltas Changed

Remember that all the Deltas in the same bridge need to be of the same type, they can not be mixed.

Finally, consult the Delta Technical Manual ref. T1693 for installation procedures, torque settings and safety procedures.

9. Revision History

Rev.	Date	Author(s)	Changes
00	2 nd Aug 2021	Mark Woods	Document Created with AQS