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## 1. Terms and Definitions

DELTA	MV3000 DELTA IGBT Module
AEI	Avid Extreme Inverter Module

## 2. References & Related Documents

Document Number	Document Title	Notes
T1693	Liquid Cooled DELTA Technical Manual	
T1689	Air Cooled DELTA Technical Manual	

## 3. Document Purpose and Overview

This guidance note is to assist customers with regard to long term storage of Delta and AEI products.

## 4. Introduction

If Delta/AEI modules are not intended to be put into service immediately then they should be stored in dry place using original packaging, ideally at room temperature of 5 – 25 C. If the original packaging is not available then a sealed polythene sheet/bag should be used to exclude moisture. The storage life of a variable speed drive is determined by the shelf life of the electrolytic capacitors used in the product. In the case of the Delta/AEI modules these are the main DC Link Capacitors.



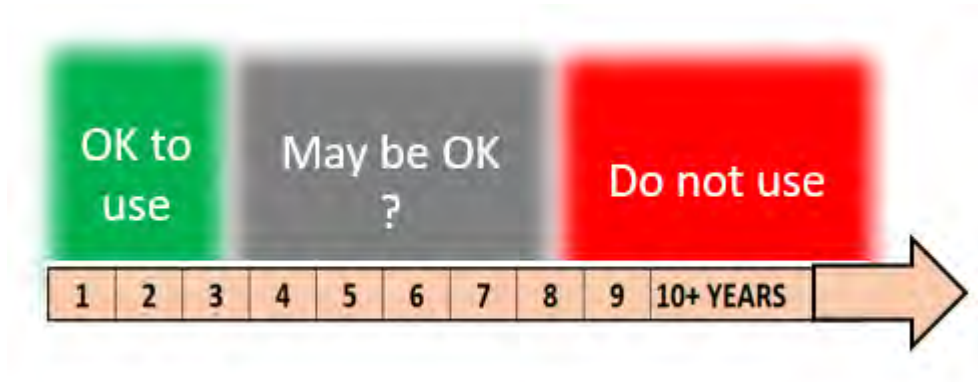
After long periods of storage, these capacitors will eventually 'de-polarize' and become ineffective. The effects of this are difficult to predict as too many variables are involved. However, the symptoms could include random or spurious trips, power supply failures or extreme levels of ripple on the DC bus. Excessive capacitor leakage could also lead to overheating of pre-charge resistors.

The shelf life of the electrolytic capacitors varies with storage temperature. The higher the temperature – the shorter the shelf life.

For DC Link Capacitors.....

- For a 35°C storage temperature the shelf life is approximately 40,000 hours or 4.5 years\*
- For a 25°C storage temperature the shelf life is approximately 80,000 hours or 9 years\*  
[\* Data based on BHC Aluminum Electrolytic capacitors - Long Life Type]

We can approximate a guide as shown below:



### 5. Procedure to Follow After Removing Modules from Long Periods of Storage

For units stored for up to 3 years:

- The drive can be powered up and used as per the manual.

For units stored from 3 to 5 years:

- Power up the drive and leave with the power applied for a period of 4 hours before attempting to use.

For Drives Stored in High Ambient Temperatures for 4 years or More:

It is possible that the main DC Link Capacitors need to be re-formed. This is a specialist task and the primary advice is to return the drive to the factory.

Where this is not practicable then the procedure is to apply a current limited, variable voltage power supply to the DC Link (with the unit isolated from the normal mains supply) and slowly raise the value from zero to the normal working voltage of the DC Link.



This procedure involves the use of high voltages and should only be attempted by qualified and experienced engineering personnel.

The Delta/AEI module has sharing/discharge resistors connected across the DC link and so the power supply needs to be able to supply this load as well as the capacitors. The total series resistance of these resistors is ~6.6k Ohm and so for a 1000V DC supply this would be around 150 to 200 mA.

The reforming time depends on how long the unit has been without power. As a general rule, a time of 1 hour per 1 year of storage should be applied.

## 6. Advice for Spares

Where drives are stored as spares, it is recommended that they be powered up and checked once every 3 years. The period of powering up can be between one and two hours.

## 7. Revision History

Rev.	Date	Author(s)	Changes
00	16 <sup>th</sup> July 2021	Mark Woods	Document Created with AQS