

Group	Drives and Motors	Date	6/16/2002
Series	CD Series and AKM motors	Revised	7/11/2007
Element Group	Feedback	Revision	3
Element	Sine Encoder	Author	B. Kay/ J. Coleman/ T. Lineberry
		# Of Pages	3

Zeroing Sine Encoder AKM motors to CD Series Drives

Languages	Target Group	Status	Usage	International Restrictions
<input checked="" type="checkbox"/> English	<input type="checkbox"/> Basic	<input checked="" type="checkbox"/> In Process	<input type="checkbox"/> Internal	<input checked="" type="checkbox"/> Citizens / Nationals of U.S.
<input type="checkbox"/> German	<input checked="" type="checkbox"/> Normal	<input type="checkbox"/> Completed	<input checked="" type="checkbox"/> Public	Non-Restricted Countries, End
<input type="checkbox"/>	<input type="checkbox"/> Specialist			<input checked="" type="checkbox"/> Uses, and End Users (www.bis.doc.gov)

About the Content:

This document explains how to compensate for the settings and offsets between the sine encoder (and EnDat sine encoder) AKM motors and CD Series Drives.

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Scope:

The motor position feedback devices used in the AKM Series motors are factory aligned to the motor per electro-mechanical standards. The alignment standards used in the AKM motor are different from the conventions for the ServoStar CD Series.



The CD Series 2 is not recommended for use with the AKM motor series. Encoder units will run but they *will have problems*.

Phase Nomenclature:

The CD Series motor phases are designated with the letters A, B, and C. The AKM motors are labeled U, V, and W. The relationship of these signals is shown in the following table.

AKM Nomenclature	CD Series Nomenclature
Phase U	Phase C
Phase V	Phase B
Phase W	Phase A

MOTORTYPES:

The CD Series drives have two MOTORTYPEs that are compatible with the AKM motors, MOTORTYPE 0 and 3. MOTORTYPE 3 was established to automatically compensate for the offsets between the CD series and the AKM motors. However, MOTORTYPE 3 cannot be used with the CD 2 Series.



CD Series 2 does not support MOTORTYPE 3

MOTORTYPE=0 Does not compensate for the offsets in commutation angles due to the AKM motor alignment standards. MOTORTYPE=0 is available for use on all CD Series drives, however, the variable MPHASE must be set to accommodate for this difference.

MOTORTYPE=3 Automatically compensates for factory encoder alignment. MOTORTYPE=3 was established with the release of the CD Series 5 drives and can only be used with the CD Series 5 and CD SynqNet drives.

Sine Encoder Alignment Details:

Zero for the Sine encoder has an inherent -60° commutation offset. The variable MPHASE must be set to compensate for this difference. MPHASE is based on the number of pole-pairs in the motor. The following chart is provided as quick reference for MPHASE and is followed by the formula to find MPHASE.

MPHASE Settings	
Number Of Pole Pairs	MPHASE
3	340
4	345
5	348
6	350

The number of pole pairs for the AKM motor is found on its data sheet.

$$\text{MPHASE} = 360 - (60/\text{pole-pairs})$$

The ZERO command, when applied on EnDat feedback, finds MPHASE automatically.



NOTE

When resetting MPHASE you must in addition to the SAVE command, perform the HSAVE command. If you fail to perform the HSAVE command, you will have to reset the MPHASE upon the next power-up.