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Incremental 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.
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<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 Incremental Encoder AKM motors and CD Series Drives. It includes phase nomenclature as well as MOTORTYPES, setting MENCOFF, MPHASE and MHINVx for MOTORTYPE 0.

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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 labels is shown in the following table.

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

This translation is important to both the motor lead connections and the hall sensor connections as they relate to the commutating encoder versions of the AKM motor series.

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 Series 2.



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 MENCOFF 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. (Command: ENCINIT -> FIND MARKER)

Incremental Encoder Alignment Details:

Kollmorgen AKM cable sets function as designed. The following information is provided for those desiring to design their own cable connections.

The stated encoder phasing for the A and B channels, if wired per the signal names, will result in the encoder counting direction 180° out of phase. Reverse A and \bar{A} encoder signals to correct this.

When deciding how to wire hall channels from a commutation encoder remember the phase changes described above.

Setting MENC OFF

The CD Series 2 is not recommended for use with the AKM motors, but if you choose to do so, MOTORTYPE 0 must be used. CD Series 5 and CD SynqNet both support MOTORTYPE 3 and should be used as the preferred MOTORTYPE. If you find that you must use MOTORTYPE=0, the CD variable 'MENC OFF' must be set to accommodate for the encoder alignment position in the AKM motors. MENC OFF is based on the number of poles in the motor. The following chart is provided as quick reference for MENC OFF and is followed by the formula to find MENC OFF.

MENC OFF Settings For MOTORTYPE=0		
Number Of Poles	MENC OFF (1024 RES)	MENC OFF (2048 RES)
6	910	1820
8	682	1365
10	561	1092
12	455	910

The number of poles (pole-pairs X 2) for the AKM motor is found on its data sheet.

$$MENC OFF = \frac{MENCRES * 8}{MPOLES} * \frac{2}{3}$$

Round to the nearest whole number.

Setting M PHASE and M HIN Vx

If you find that you must use MOTORTYPE=0, the CD variable called 'M PHASE' and M HIN Vx (M HIN VA, M HIN VB, M HIN VC) must be set to accommodate for the encoder alignment position in the AKM motors. Following are the settings to use.

Recommended: M PHASE=0, M HIN Vx=0
(MENC OFF from formula or table above.)

Optional: M PHASE=180, M HIN Vx=1
(Must set MENC OFF using the EncINT/Find Marker feature in the MotionLink software.)