Title: Renishaw RESOLUTE or EVOLUTE Encoder Set-up Guide

Product(s): Sigma-5, Sigma-7, SigmaWin+ ver. 7, SigmaTrac, SGL Series Linear Motors

DOC. NO.   AN.MTN.08

When installing the Renishaw RESOLUTE or EVOLUTE absolute linear encoders for linear motor applications, the procedure differs from the other Renishaw encoders because there is no serial converter necessary. Follow the steps below to get the linear motor up and running with the Renishaw RESOLUTE or EVOLUTE encoder. The process below requires use of SigmaWin+ ver. 7 which can be downloaded from yaskawa.com. Below is a system diagram depicting the layout of the encoder head, encoder cables, and amplifier.

The table below gives the part numbers for varying lengths of the encoder cable to be used that can be purchased from Renishaw.

Cable length (m)	Nomenclature
0.05	AB-0005-BYX
0.1	AB-0010-BYX
0.25	AB-0025-BYX
0.5	AB-0050-BYX
1	AB-0100-BYX
2	AB-0200-BYX
3	AB-0300-BYX
4	AB-0400-BYX
5	AB-0500-BYX
6	AB-0600-BYX
7	AB-0700-BYX
8	AB-0800-BYX
9	AB-0900-BYX
10	AB-1000-BYX
15	AB-1500-BYX
20	AB-2000-BYX
30	AB-3000-BYX

Application Note

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SigmaWin+ ver. 7

1. When the encoder is powered, ensure that the LED indicator display is green (correct alignment). If not, adjust according to the manufacturer's specification.

2. Once SigmaWin+ is up and running and is connected to the amplifier, import the correct motor parameter file by selecting "Motor parameter scale write" under the "Encoder Setting" menu. Select "OK".
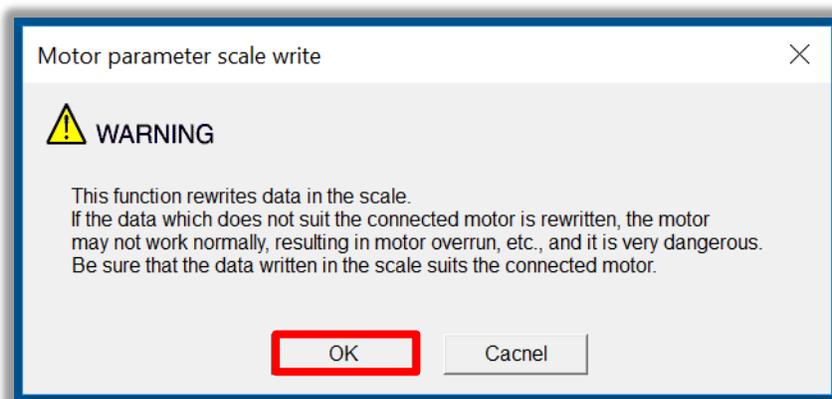
a. Click the "Ref." button, then select the appropriate .mcf file to import based on the connected motor.
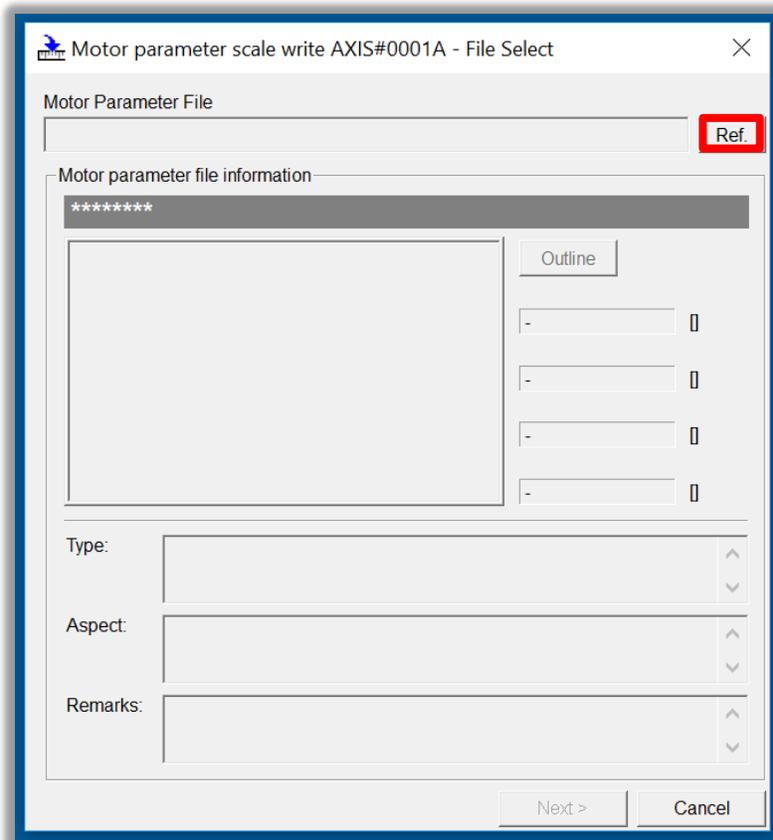
b. Click the "Write" button, Click "Yes" in the Scale write pop-up window, then click the "Complete" button once the parameter write is completed.
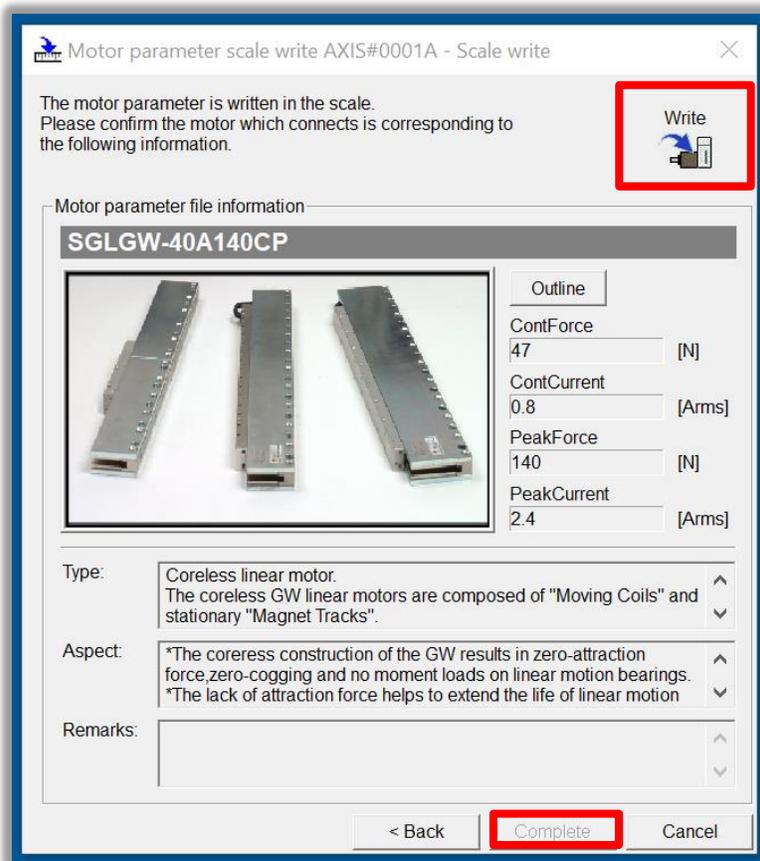
c. Cycle power to the SERVOPACK.

3. Since this encoder does not use hall sensors, change parameter Pn080.0 selection to "1: Disables selection" and write the parameter to the SERVOPACK.

Pn080.0	Hall Sensor Selection	−	1：Disables selection

a. Cycle power to the SERVOPACK or perform software reset.

4. Linear encoder pitch should be detected automatically. Open up the "Product Information" tab under the "Basic Functions" menu to confirm that the encoder resolution was detected. For example, the resolution detected was 0.5 [um/Pulse].

Motor		Model/Type	Number	Manufacturing Date	SW Ver.	Remarks
1	Motor	SGLGW-40A140CP		1995.95		[Resolution]：0.500000 [um/Pulse] [Encoder type]：absolute
	Encoder	JZDP-Y903-252		2000.01	0001	

5. Run "Polarity detection" under the "Encoder Setting" menu. If the Polarity detection option is grayed out, disconnect and search again for the SERVOPACK. Then reconnect with SigmaWin+ and the "Polarity detection" menu option should be available. Click "Continue" in the pop-up window.
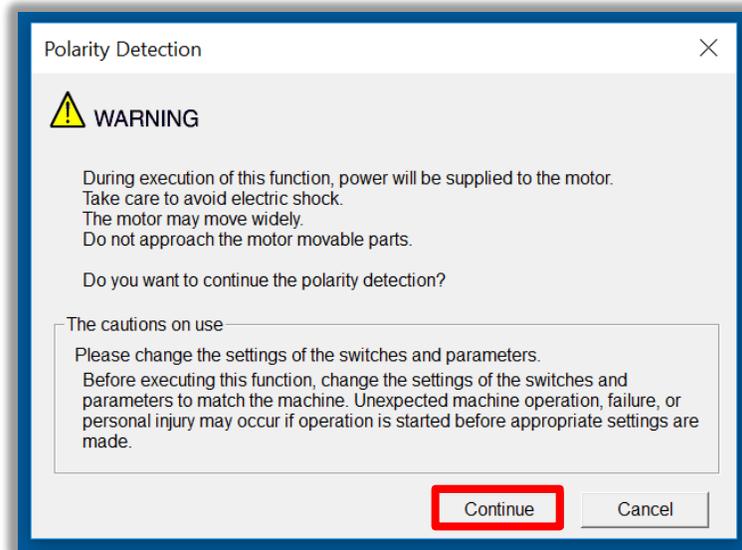
Polarity Detection

⚠ WARNING

During execution of this function, power will be supplied to the motor.
Take care to avoid electric shock.
The motor may move widely.
Do not approach the motor movable parts.

Do you want to continue the polarity detection?

The cautions on use
Please change the settings of the switches and parameters.
Before executing this function, change the settings of the switches and parameters to match the machine. Unexpected machine operation, failure, or personal injury may occur if operation is started before appropriate settings are made.

[Continue]   [Cancel]

a. Click the "Start" button to begin polarity detection.
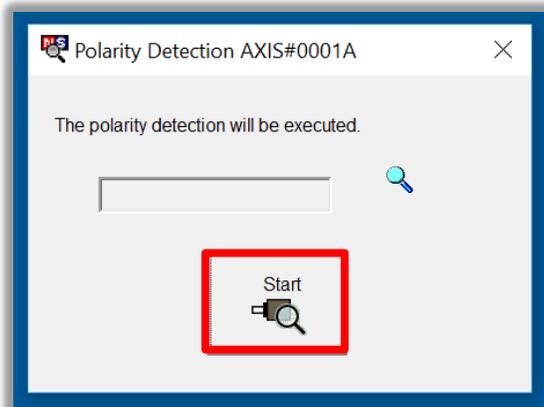
b. **Immediately** hard power cycle the SERVOPACK after polarity detection is completed. If the motor is jogged before cycling power, an A.C22 alarm will appear after a power cycle and polarity detection will need to be executed again.
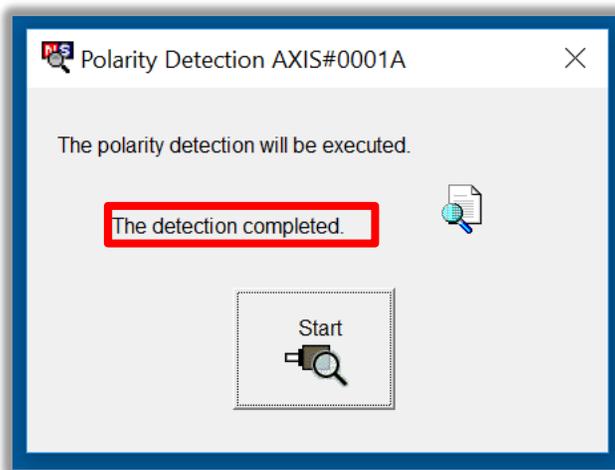
Note: Physical power must be cycled by disconnecting power from the SERVOPACK control power terminals. If software reset is executed before physical power cycle, polarity detection must be executed again.

Note: If Pn080.1 (leading phase) is written to, Pn587 will need to be set to 1 to enable re-detecting polarity otherwise an A.C22 alarm will occur upon power cycle of the drive.

Note: If the motor moves abnormally such as the motor can't move well between magnets, change the UVW phase order with Pn080.1, then perform polarity detection again.

6. The motor and encoder should be operating properly. If any issues occur, be sure to check the troubleshooting appendix at the end of this document for more information.

Appendix: Troubleshooting

- **A.070** alarm: Run the "Reset Motor Type Alarm" function under the "Troubleshooting" menu. Run a Software Reset after resetting the motor type alarm

- **A.040** alarm: The drive requires a motor parameter file to be imported. Import motor parameter following the instructions in **step 2** of the instructions above.

- **A.041** alarm: Set Pn281 and Pn385 to appropriate values to clear the alarm using the equation below. See the Sigma-7 series AC Servo Drive Product Manual for further details.

  The setting range depends on the Servomotor's maximum speed (Pn385) and the linear scale pitch (Pn282).* You can calculate the upper limit of the setting of Pn281 with the following formula.

  $$\text{Upper limit of Pn281} = \frac{\text{Linear Encoder Pitch*}/100}{\text{Pn385}} \times 72$$

- **A.C21** alarm: Follow the instructions given in **step 3** above.

- **A.C22** alarm: Run "Polarity detection" as described in **step 5** above.