

Encoder Kit Installation Procedure for ABB ACS880-01 demo drive

Use Baldor (grey) motor
(Kit 3AUA0000234592)

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Purpose

The purpose of this document is to identify how to install the encoder option kit to the ABB ACS880 U.S. demo drive. This is specifically designed to fit U.S. ACS880 demo drives that utilize the Baldor (grey) motor. A separate kit and installation document exists for the new U.S. demo units that utilize an ABB (blue) motor. Neither of these kits work on ACS880 demos built outside the U.S.

This encoder kit can be used to accurately close the speed loop of the demo drive. The hardware can also be used to demonstrate the N5700 positioning software. The N5700 software is not included with this kit. Please contact your ABB representative to obtain a copy of this software.

Additional references

For more information on the ACS880-01 drive used in the ACS880-01 demo, refer to the hardware manual 3AUA0000078093. The FEN-01 manual is document number 3AFE68784603. Refer to document 3AXD50000206063 for FETA-01 installation instructions. The encoder data sheet can be found here:

<http://encoder.com/core/files/encoder/uploads/files/datasheet-15th.pdf>

Warnings

This drive has hazardous voltages present that could cause injury or even death. If you are not a qualified electrical professional do not perform this work. Only those qualified and competent on working with higher voltages should install this option kit. Refer to the ACS880-01 Hardware manual for further information.

Tools Required

The following tools are required to add the encoder kit to your ACS880 demo:

Standard #2 Phillips screwdriver

T10 Torx driver

T20 Torx driver

ABB flat screwdriver (3.5mm)

1.5mm Allen Wrench (provided with encoder)

Small rubber mallet

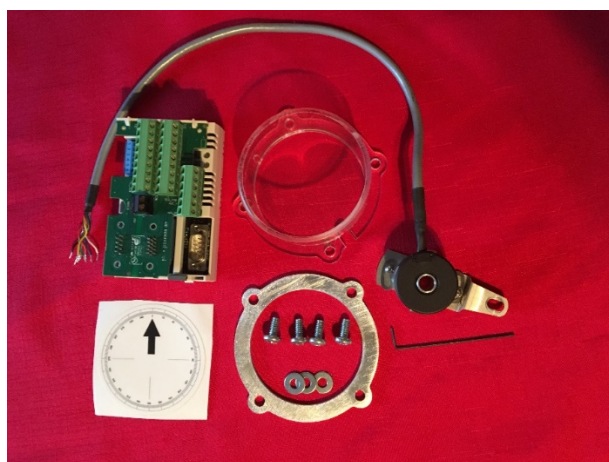
Unpacking

This encoder kit is designed to be used on ABB ACS880 demo drives that were built using a Baldor (grey) motor. If your demo is newer using a blue ABB motor, use kit 3AUA0000234593. This hardware will not fit the blue ABB motors.

Along with these installation instructions, this kit contains:

- 15T-02SF-1024NV1RHV-F02 encoder mounted to bracket (with Allen wrench to secure to shaft)
- Flywheel cover
- Flywheel cover spacer
- 4-Flywheel cover mounting screws
- 3-Flywheel cover washers
- Degree Wheel label for the flywheel
- FEN-01 encoder module
- FETA-01 termination board for FEN-01

Below is a photo of the components. The FETA-01 is sitting on top of the Fen module (actually a FEN-31 for the photo). The FETA shown does not have a cover on it. Units you receive will have a cover as in photos later in this document.



Installation Process

Remove power to the demo unit

Unplug power to the back of the demo and remove any other remote power source that may be connected to the demo.



There are dangerous voltages inside the panel and at the drive terminals. Unplug the unit and wait 10 minutes for capacitances to bleed down before you start installing the encoder kit. Tip: It might be easier to install the kit with the demo unit on its back. The power cord on the back of the unit will limit you from doing this.

Remove the drive cover

Using the T20 torx driver (and following the ACS880-01 hardware manual (3AUA0000078093) if needed, remove the drive cover by loosening the two captive screws and tilting the cover upward.



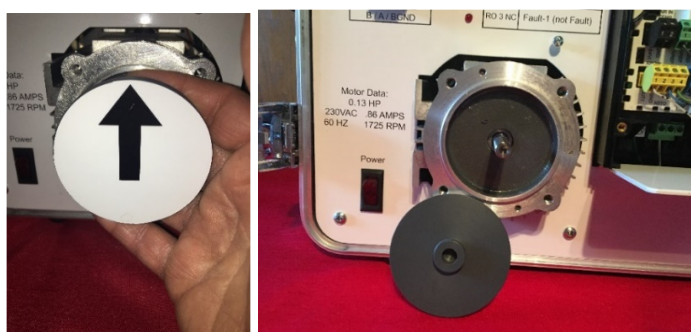
Remove the flywheel cover

Using the Phillips screwdriver remove the 4 screws holding the flywheel cover onto the motor. The cover and screws are replaced in the kit and will not be reused.



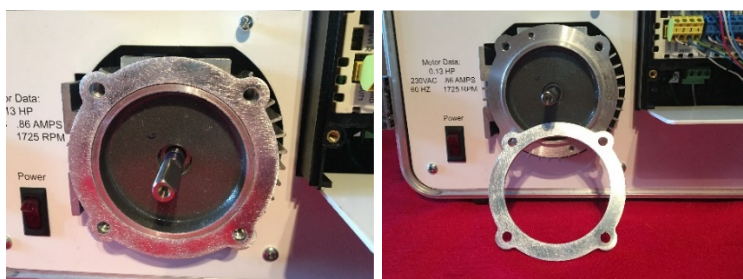
Remove the flywheel

With the flywheel cover removed, grasp the flywheel securely and pull straight off the motor shaft. Do not damage the flywheel or motor and make sure to pull straight else you may elongate the bore of the plastic flywheel making it unusable. This flywheel is a press fit and should not have any screws securing it to the motor.



Mount the flywheel cover spacer

Place the flywheel cover spacer plate on the motor. This plate has no specific orientation. Align the spacer plate holes with the motor C-face mounting holes. Ensure that the spacer is flat against the motor with no gaps. The spacer should fit somewhat loose on the motor face.



Mount the encoder

Warning

The encoder is robust, as is the spring bracket mounted to its back, however, use caution not to bend or over-stress the spring bracket or cable connection at the encoder or damage could occur. Do not put excessive stress on the encoder bearings or damage to the encoder will occur.

Slip-fit encoder to motor

Carefully grasp the encoder and bracket combination and ensure there is a slip fit between the encoder and motor shaft. If there is not a slip fit polish the motor shaft with emery cloth or for large nicks, a fine file, to obtain a slip fit while ensuring no debris/metal filings go into the motor or demo case. (You may want to set the demo case vertically when you polish the motor shaft to help prevent debris from entering the motor bearing or panel.) Do not put excessive stress on the encoder bearings or damage to the encoder could occur.

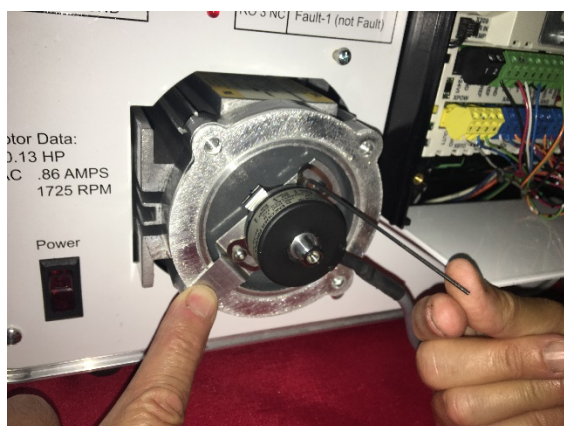
Confirm proper alignment with bracket

This step should be preset from the factory. Note the rotational orientation between the encoder and its bracket in the photo below. The rotational orientation must be approximately as shown for the flywheel cover cable slot to properly align with the encoder cable. If this orientation is not correct, loosen the encoder mounting screws and rotate the encoder CCW w/r to the encoder bracket. Carefully retighten the encoder bracket screws. Turn the encoder over and ensure that there will be clearance between the motor shaft and encoder bracket when the encoder is placed on the motor shaft.



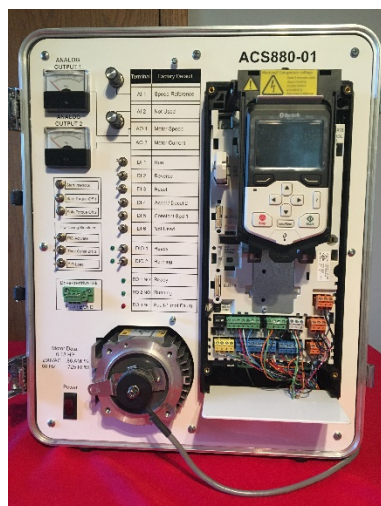
Slip the encoder onto the motor shaft

Once you have a slip fit between the encoder and motor shaft, and the orientation between the encoder and encoder bracket is correct, slide the encoder and bracket onto the motor shaft until the bracket bottoms out against the motor. Do not put excessive pressure on the encoder housing while finding this fit as encoder bearing damage could occur. The encoder must easily slide on the shaft while moving the mounting bracket. Align the encoder cable to approximately the 5:00 position while facing the motor. Grasp the encoder bracket and not the encoder housing and hold it securely to the motor face while tightening the encoder Allen screw. This assures you have a proper fit without stressing the encoder bearings.

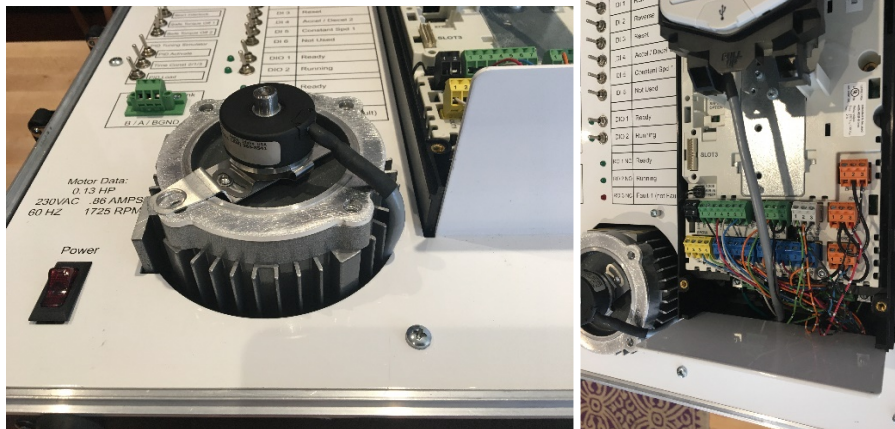


Route the encoder cable

Using the Phillips screwdriver, remove the 8 screws holding the demo panel to the frame. Carefully lift the panel so that the encoder cable can be routed through the gap between the panel and motor.



Route the cable through the motor opening as shown in the photo below and bring it back through the opening in the bottom of the drive. Feed enough cable through the drive so that it can be connected to a FEN module in slot 2.



Secure demo panel to the demo frame

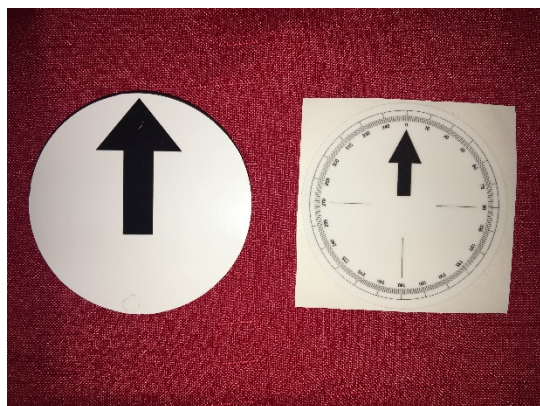
While the demo unit is open, check mounting hardware inside for tightness. The demos take a beating and things can loosen up.

Locate the panel in its original position (confirm cable location between panel and motor) and secure with 8 screws. Use care when tightening the screws so that you don't strip out the holes in the aluminum frame.



Replace the flywheel decal with a 360 degree decal

You have an option to add a decal to the flywheel that has an arrow at 0 degrees and markings around the perimeter. This could be used to track the position of two motor shafts when using positioning software. Remove the existing decal and apply the new one.



Center the decal as well as you can and starting at one side apply the decal while working out air bubbles as you move across the flywheel. The decal is slightly larger than the flywheel. Use a razor blade or other sharp device to trim the perimeter of the decal once it is installed.

Mount the flywheel to the motor shaft

The flywheel is strictly a press fit onto the motor shaft. To secure the flywheel to the motor shaft, carefully align the flywheel to the shaft and gently tap the center of the flywheel with a rubber mallet. (You may want to put a couple layers of masking tape or a small piece of cloth to protect the decal first, depending upon your mallet.) Rotate the motor shaft while tapping to ensure the flywheel is going on straight. Keep tapping and rotating until the flywheel bottoms out on the motor shaft (about $\frac{1}{4}$ "). If the flywheel is not pressed on straight the flywheel bore could become elongated and will no longer fit tightly to the motor shaft. (You might want to use a smaller mallet. This is all I had.)



Mount the flywheel cover to the motor

Use the new longer flywheel cover screws and the three washers included in the kit to secure the flywheel cover to the motor. Place the three washers over the three motor holes (not over the encoder bracket hole), route the encoder cable through the slot in the flywheel cover, and align with the motor holes. The washers make up the difference in height for the encoder bracket arm.



Place the four cover screws thru the cover and secure with the Phillips screwdriver while making sure the encoder cable fits loose in the flywheel cover. This will securely capture the encoder housing and bracket. Below is a finished view.



Mount the FEN-01 module

If you need to, refer to the FEN-01 manual (3AFE68784603) for additional instructions. Mount the FEN module in slot 2 or any other desired slot (parameter list below reflects slot 2 mounting). Secure the module with the push tab and the T10 Torx grounding screw.



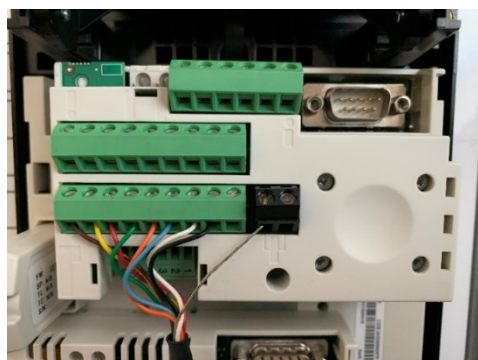
Mount the FETA-01 adapter

Using the installation instructions (3AXD50000206063), secure the FETA-01 adapter card to the FEN-01 module.

Wire the encoder to the FETA-01 module

The encoder module wiring is defined in the table below. Connect the color codes correctly to the FETA-01 using the 3.5mm flat screwdriver. Encoder leads are tinned for your convenience.

Signal	A	A'	B	B'	Z	Z'	+V	Com	Shield
Wire Color	Brown	Yellow	Red	Green	Orange	Blue	White	Black	None
FETA-01 X41Terminal	1	2	3	4	5	6	7	8	Black term block



Terminal numbers on the FETA-01 are difficult to see. Note that X41 is the terminal wired and that 1 is on the left with the brown wire.

Mount the drive cover.

Wiring is complete and you can install the cover on the drive.



Power the drive

Plug the power cable into the back of the demo and turn on power.

Program the FEN-01 module

The following parameters are used to program the FEN-01 module in Slot 2:

Parameter	91.11	91.12	92.1	92.10	92.12
Name	Module 1	Module 1	Encoder 1	Pulses per	Speed Calculation
	Type	Location	Type	Revolution	Mode
Value	FEN-01	Slot 2	TTL	1024	A&B all

Refresh the drive parameters using parameter 91.10 Encoder Parameter Refresh or cycle power.

Make sure the motor and encoder electrically are in the same direction

- Run the drive in the positive direction. This should be clockwise as you face the drive shaft end. If turning the opposite, reverse two motor leads. Be careful to pull the power on the drive demo and wait 10 minutes for the bus to discharge before removing the drive cover.
- Observe Parameter 1.04 Encoder 1 speed filtered to see if the encoder speed is positive. If not either reverse A and B channels on the encoder.
- Restart the drive and confirm the motor and encoder are both in the same direction.

Close the speed loop on the drive

If at this time you want to close the drive speed loop, set parameter 90.41 to Encoder 1.

Backup drive parameters

Backup the parameters and the installation is complete.