

AS22 Series Miniature Kit Encoder



Introduction

The Broadcom[®] AS22 Series kit encoder solution offers a compact size with an overall diameter of 22 mm and height of 10.9 mm for the space-constrained application.

To meet the growing demand for high-precision application, the AS22 Series offers a wide range of incremental resolution, ranging from 360 to 2048 counts per revolution (cpr).

The encoder provides A and B channel of incremental digital signal output, as well as a digital index pulse per revolution enabling the homing positioning operation. The three-channel solution comes with the optional RS 422 compatible differential output offering the high transmission noise immunity for signal over cable.

To cater to a wide selection of industrial applications, this encoder is design to operate in a robust environment with the operating temperature ranging from -20°C to $+100^{\circ}\text{C}$.

The AS22 Series is designed for ease of use. The kit solution is engineered with the hassle-free installation, eliminating the need for a tedious alignment process.

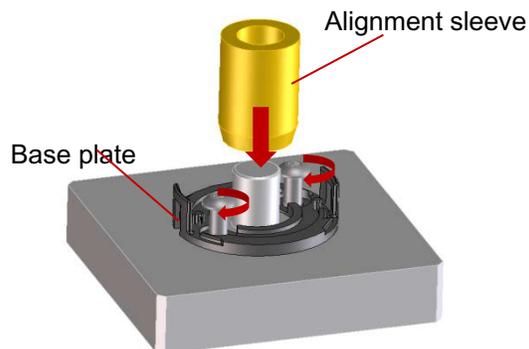
This application note provides step-by-step mounting instructions on how to install the AS22 series encoder onto a motor.

Encoder Mounting and Assembly Instruction

Step 1: Base Plate Centering

Place the base plate over the motor shaft, and make sure it sits flat on the mounting surface. Slide the alignment sleeve to the motor shaft with the taper surface facing the base plate. Ensure the alignment sleeve is aligned to the hole on the base plate. Align the two holes on the base plate to the screw holes on mounting surface. Slightly pressing the alignment sleeve, and tighten the 2x M2.5 screw with 0.10 Nm to 0.23 Nm (0.9 in.lb to 2.0 in.lb) to secure the base plate. It is recommended that you apply adhesive to the screw-baseplate interface to prevent screw loosening due to effects of high temperatures on plastic.

Figure 1: Base Plate Assembly



Step 2: PCB Installation

Remove the alignment sleeve. Align the PCB onto the base plate with the two pins on the base plate. Make sure the connector side of the PCB is aligned with the groove on base plate.

CAUTION! Do not touch optical sensor while handling the PCB.

Figure 2: Align PCB to Pins

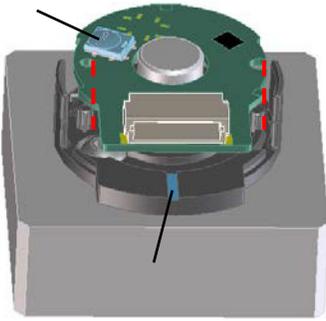
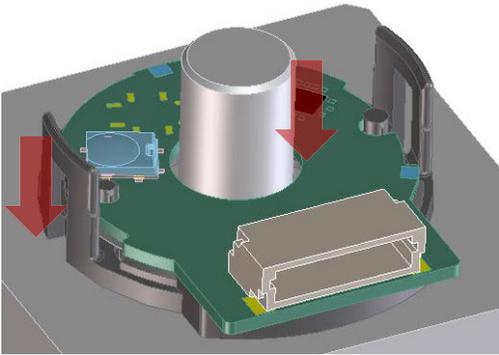


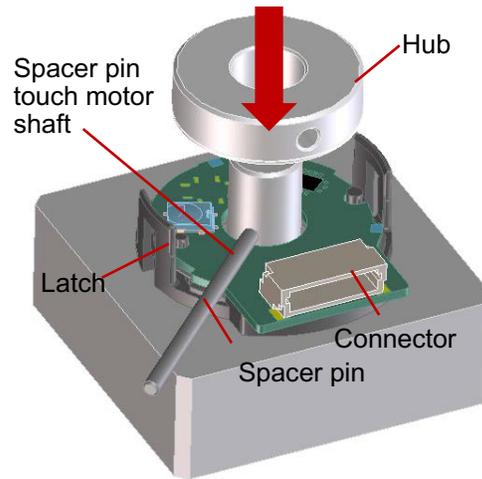
Figure 3: Ensure PCB Fully Seated on Base Plate



Step 3: Codewheel Gap Setting

Slide the spacer pin between the connector and latch until it touches the motor shaft, as shown in Figure 4. Slide the hub to the motor shaft with the code wheel facing the PCB, until the hub flange touches the spacer pin.

Figure 4: Code Wheel Hub Assembly

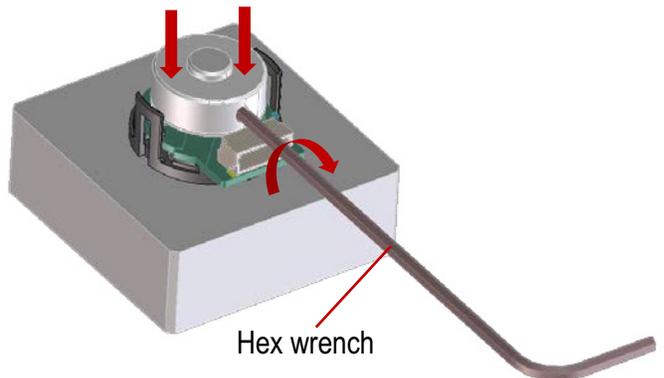


Press down on the hub gently while tightening the set screw with the hex wrench. The recommended torque to tighten the set screw is 0.10 Nm to 0.13 Nm (0.9 in.lb to 1.15 in.lb). A threadlocker can be applied to set the screw threads to prevent the screw from unthreading during operation.

Remove the hex wrench and spacer pin.

CAUTION! DO NOT touch the code wheel pattern during installation.
DO NOT scratch the code wheel during spacer pin removal.

Figure 5: Tighten Set Screw on Hub



Step 4: Cover Installation

Snap the cover down onto the base plate. Make sure the two latches on base plate are fully engaged with the cover. A click sound should be heard indicating the cover is engaged properly.

Figure 6: Cover Installation

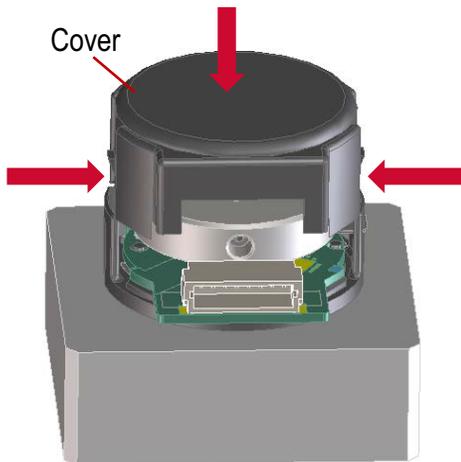
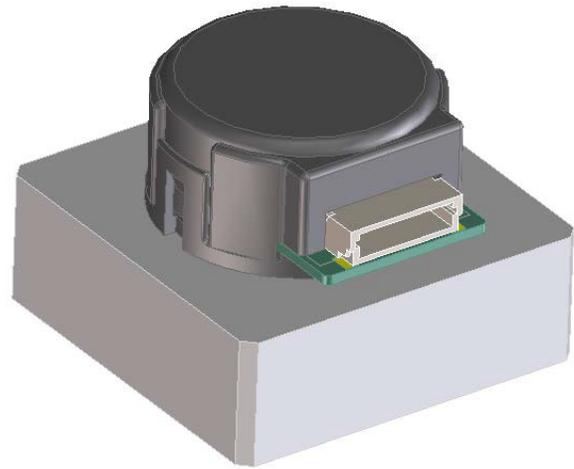


Figure 7: Complete Assembly of Encoder

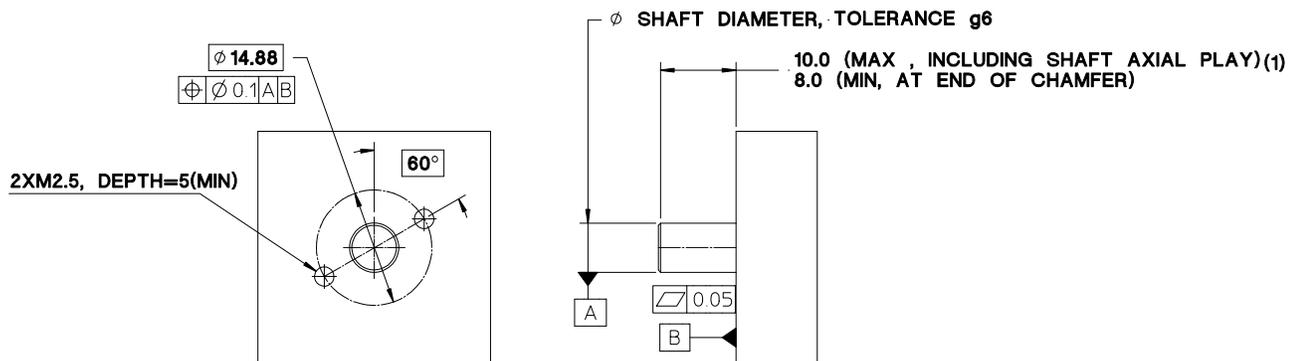


The complete encoder assembly is shown in [Figure 7](#). It is now ready for cable attachment and operation.

Recommended Enclosure

AS22 is an optical encoder and sensitive to contamination. It is recommended that you install it inside an enclosure with minimum IP5x.

Mounting Consideration



All dimensions are in mm.

NOTE: 1. No maximum shaft length limit for cover with hole option.

Installation Precautions

1. Wear finger cots during installation.
2. DO NOT touch the code wheel pattern as it might cause contamination or scratches to code wheel.
3. DO NOT touch the optical sensor during PCB installation.
4. Be careful during spacer pin removal. Do not let the spacer touch the code wheel as it might scratch the code wheel.
5. Clean the code wheel with delicate task wipers with IPA. Do not use cotton buds (non lint free) as it will cause scratches to the codewheel.

Troubleshooting Guide

ID	Issue	Cause	Countermeasure
1	Double/multiple index,encoder performance exceeds data sheet specs limit	Contamination on code wheel	Clean code wheel with delicate task wipers with IPA.
		Base plate mounting exceeds recommended tolerance	Realign base plate using alignment sleeve.
		Code wheel gap not within recommended tolerance	Realign code wheel gap using spacer pin.
		Shaft TIR exceeds recommended tolerance	Reduce shaft TIR to within recommended tolerance.
2	Encoder current consumption out of spec	Detector IC faulty/shorted	Consult factory.
3	No signal output	Encoder power supply too low	Check if Vcc versus ground is within 4.5V ~ 5.5.
		Poor connectivity between encoder output pin and connector	Check pin and connector connectivity.
		Wrong power supply polarity connection	Check connector wire connection for Vcc and ground is per the Pin Configuration table in the data sheet.
		Detector IC faulty	Consult factory.

For more information about the product specifications, refer to the product data sheet, *AS22 Series Miniature Kit Encoder Data Sheet*, AS-22-Kit-Encoder-DS100.

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