The REV Through Bore Encoder is specifically designed with the end user in mind, allowing teams to place sensors in the locations closest to the rotation that they wish to measure. This rotary sensor measures both relative and absolute position through its ABI quadrature output and its absolute position pulse output.

SPECIFICATIONS

Electrical/Mechanical	
Input Voltage	3.3V – 5.0V
Logic Level	3.3V (5V tolerant)
Connector	JST-PH 6-pin
Mounting Holes	#10 Clearance
Maximum RPM	10000 RPM
Incremental Output	
Quadrature Resolution	2048 Cycles per Revolution (8192 Counts per Rev.)
Index Pulse Width	90°e
Index Pulse Frequency	Once per Revolution
Absolute Pulse Output (Duty Cycle)	
Period	1025µs
Frequency	975.6 Hz
Minimum Pulse (0°)	1µs
Maximum Pulse (360°)	1024µs
Pulse Resolution	10-bit

APPLICATION INFORMATION

The REV Through Bore Encoder uses the Broadcom AEAT-8800-Q24 magnetic rotary sensor to measure the rotation of a magnet embedded and geared to the through bore shaft hole. The AEAT-8800-Q24 uses hall effect technology to measure changes in the magnetic field as the shaft and magnet rotates.

A major benefit of the REV Through Bore Encoder is the flexibility of measuring any shaft in your system. Directly measuring the rotation of an output shaft allow users to read encoders without having to calculate gear ratios.
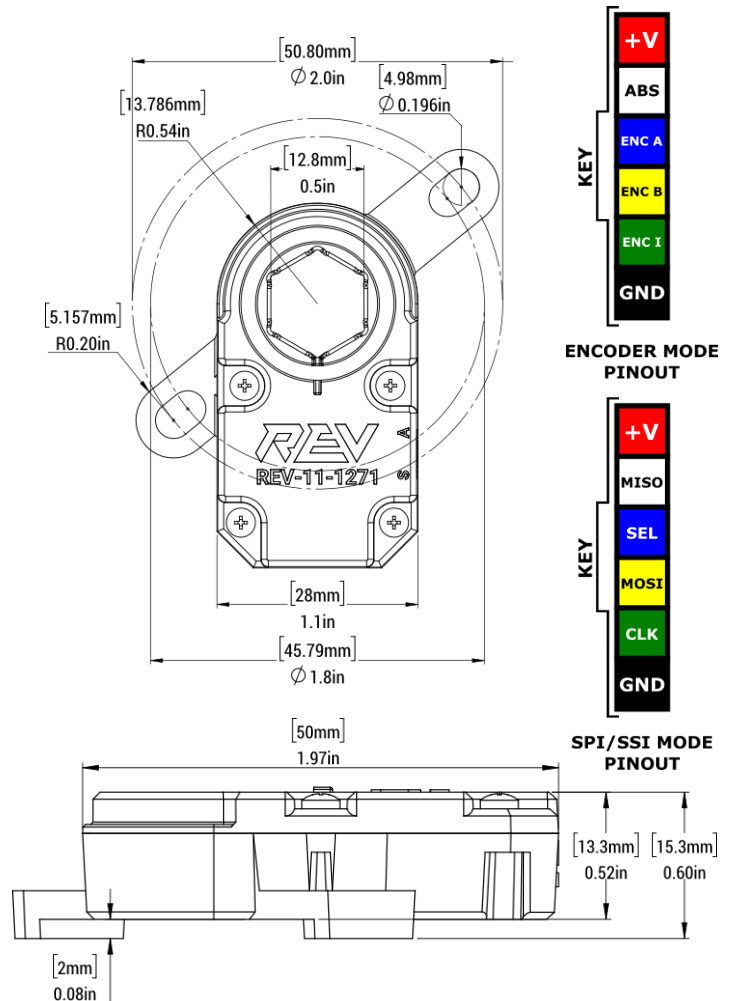
ADDITIONAL RESOURCES

Additional information about the AEAT-8800-Q24, its capabilities, and its features can be found in the following datasheet:

- AEAT-8800-Q24 Datasheet

MECHANICAL DRAWINGS

Note: **The FTC Control System** (Expansion Hub and Control Hub) **only supports incremental encoder input** through the motor encoder ports at this time. Absolute pulse input is not supported.
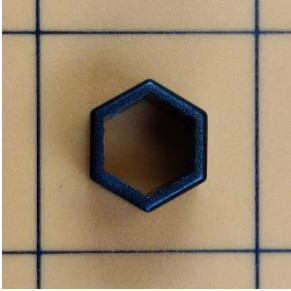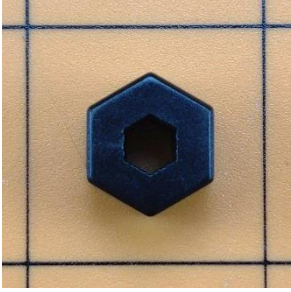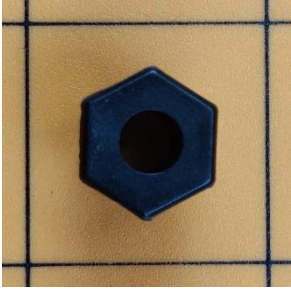
CABLE OPTIONS

Cable	Output Connector	Intended System	Output Signals
REV-11-1275	6-Pin JST PH	SPARK MAX Brushed Motor Mode	A, B, I, ABS
REV-11-1817	3-pin 0.1" Connector (PWM/Dupont) (4x)	roboRIO DIO	A, B, I, ABS
REV-31-1815	4-Pin JST PH	Control/Expansion Hub Encoder Port	A, B

SHAFT OPTIONS

Configuration	Shaft Diameter	Notes
	1/2" Hex	This is the default shaft configuration that comes with the encoder out of the box.
	3/8" Hex	When using the 3/8" Hex insert, press the insert into the 1/2" Hex hole. If you are having difficulty pressing the insert into the encoder, try flipping the insert over and press it in. There is a slight taper in the insert, so it is recommended to press the insert with the smaller end first. When removing, it is recommended to push the insert out in the reverse order (larger end first).
	5mm Hex	When using the 5mm Hex insert, press the insert into the 1/2" Hex hole. If you are having difficulty pressing the insert into the encoder, try flipping the insert over and press it in. There is a slight taper in the insert, so it is recommended to press the insert with the smaller end first. When removing, it is recommended to push the insert out in the reverse order (larger end first).
	1/4" Round	When using the 1/4" round insert, press the insert onto the shaft first and then place the encoder onto the insert. This adapter fits the encoder shaft on common gearboxes like the Toughbox Mini, which is traditionally included in the FRC Kit of Parts Chassis.

SWITCH OPTIONS

There is a switch on the side of the encoder and with two options: 'A' and 'S'. 'A' is the ABI encoder output mode which outputs the incremental and absolute encoder signals. 'S' is the SSI/SPI mode used in the manufacturing stage and potential future features. Currently, only the 'A' mode is supported. Make sure that the switch is in the 'A' position when using this encoder.

DOCUMENT VERSION HISTORY

Version	Date	Change
REV-11-1271-DS-00	10/04/2019	Initial release.
REV-11-1271-DS-03	12/12/2019	Updated with shaft insert information.
REV-11-1271-DS-04	01/02/2020	Fixed PWM output resolution specification.
REV-11-1271-DS-05	01/14/2020	Added maximum RPM specification.
REV-11-1271-DS-06	1/27/2020	Changed absolute signal term from "Absolute PWM Output" to "Absolute Pulse Output (Duty Cycle)" to clarify output signal type.