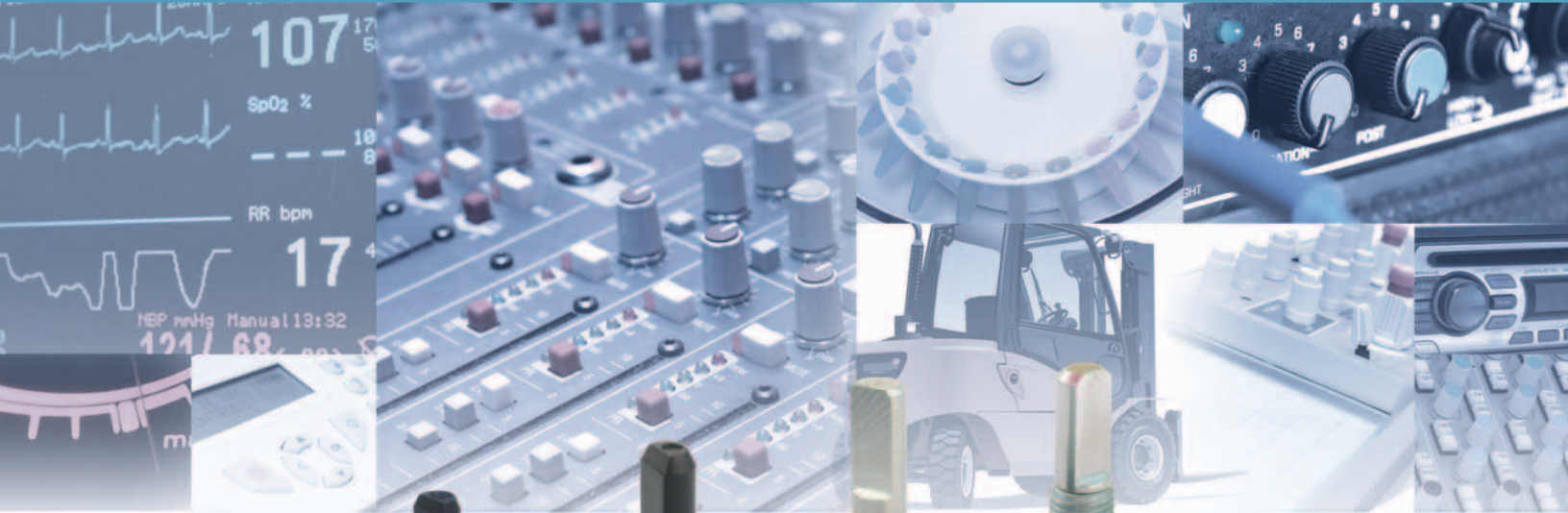


Bourns® Rotary Encoders

Short Form Brochure



BOURNS®

Introduction

Bourns® Sensors Controls Product Line has continued to expand its encoder product offering with a wide variety of models to support our customers' specific applications. Recognized worldwide for supplying standard and custom

solutions as well as providing excellent technical support, Sensors and Controls is committed to providing our customers with reliable rotary encoder solutions.

General Design Consideration

Encoders are the digital version of potentiometers and panel controls. Rather than providing a resistive variable output with rotation of the shaft, encoders simulate an on/off switching digital output. Applied as human-to-machine interface (HMI) devices, encoders are typically used to sense human

adjustment of the device in a clockwise or counter-clockwise direction triggering some action by the digital circuit. Applied as machine-to-machine interface (MMI) devices, encoders are typically coupled to a motor or other mechanical device to sense speed and direction of rotation.

Important Characteristics

In selecting an encoder for your application, the most important characteristics to consider are the type of technology, type of output signal, speed of rotation, expected cycle life and switching capability of the product. There are two basic technology

classifications of encoders: contacting (mechanical) and non-contacting (optical and magnetic). Your application will dictate the type of technology that will be best suited for your design.

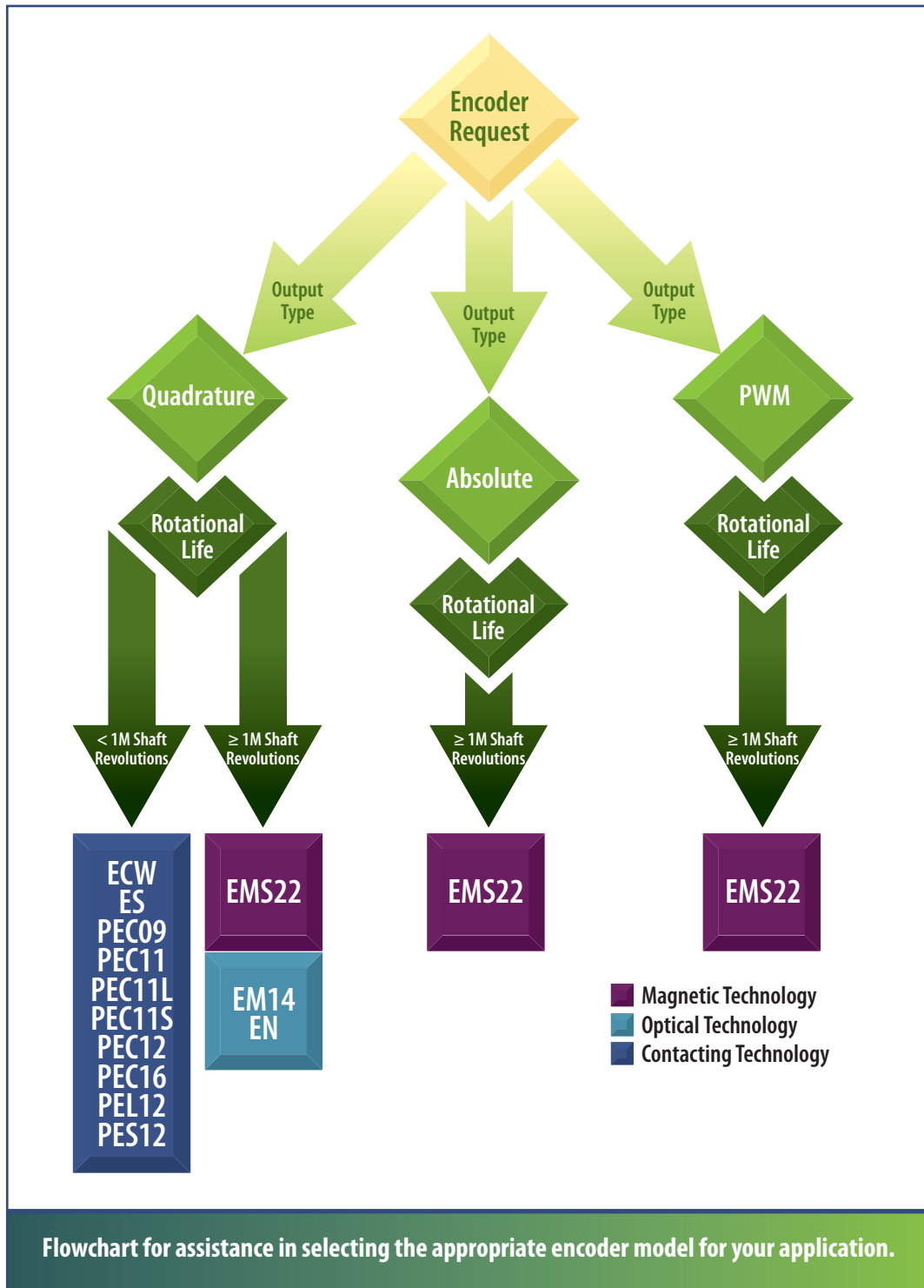
Custom Solutions

A wide range of "value-added" enhancements are available to provide our customers with cost-effective solutions. Bourns' capability to develop custom encoder solutions and modifications includes the following:


- Cable harness/lead wires
- Detents
- Custom output
- Seal
- Torque
- Special packaging
- Terminal configurations
- Hardware
- Marking
- Mechanical stops
- Mounting brackets
- Special test requirements
- Customized shaft options


For additional information on value-added enhancements, please contact your local Bourns Sales Representative.


Encoder Selection Guide Flowchart





Bourns® Encoders


ECW	Rotational Life	Types of Output	Resolution Options (PPR)	Operating Temp. Range	Contact Rating	Detent Option	Technology	Features
	200,000 shaft revolutions	Quadrature	6, 9, 12, 24, 36	-40 °C to +85 °C	10 mA @ 10 VDC	Yes	Contacting	<ul style="list-style-type: none"> • Exceptionally long operating life • Sturdy construction • Bushing mount • Available with PC board mounting bracket • RoHS compliant version available* • Recommended for HMI applications


ES	Rotational Life	Types of Output	Resolution Options (PPR)	Operating Temp. Range	Contact Rating	Detent Option	Technology	Features
	200,000 shaft revolutions	Quadrature	6, 9, 12, 24	-40 °C to +85 °C	10 mA @ 10 VDC	Yes	Contacting	<ul style="list-style-type: none"> • Snap-in shaft flexibility - top or bottom • Snap-in PC board mount • Long operating life • Up to 24 full quadrature outputs per revolution • RoHS compliant version available* • Recommended for HMI applications


PEC09	Rotational Life	Types of Output	Resolution Options (PPR)	Operating Temp. Range	Contact Rating	Detent Option	Technology	Features
	60,000 shaft revolutions	Quadrature	24	-10 °C to +65 °C	1 mA @ 5 VDC	Yes	Contacting	<ul style="list-style-type: none"> • Compact design • Long life and high reliability • Shaftless • Detent option • RoHS compliant* • Recommended for HMI applications


PEC11	Rotational Life	Types of Output	Resolution Options (PPR)	Operating Temp. Range	Contact Rating	Detent Option	Technology	Features
	30,000 shaft revolutions	Quadrature	12, 18, 24	-30 °C to +70 °C	1 mA @ 5 VDC	Yes	Contacting	<ul style="list-style-type: none"> • High reliability • RoHS compliant* • Momentary push switch option • Compact, rugged design • Metal bushing/shaft • Recommended for HMI applications

PEC11S	Rotational Life	Types of Output	Resolution Options (PPR)	Operating Temp. Range	Contact Rating	Detent Option	Technology	Features
	60,000 shaft revolutions	Quadrature	24	-10 °C to +65 °C	1 mA @ 5 VDC	Yes	Contacting	<ul style="list-style-type: none"> • Compact design • Long life and high reliability • Shaftless • Detent option • RoHS compliant* • Recommended for HMI applications


PEC12	Rotational Life	Types of Output	Resolution Options (PPR)	Operating Temp. Range	Contact Rating	Detent Option	Technology	Features
	30,000 shaft revolutions	Quadrature	12, 24	-30 °C to +70 °C	1 mA @ 5 VDC	Yes	Contacting	<ul style="list-style-type: none"> • Compact design • RoHS compliant* • Long life and high reliability • Momentary push switch option • Rear and side mount versions • Recommended for HMI applications


PEC16	Rotational Life	Types of Output	Resolution Options (PPR)	Operating Temp. Range	Contact Rating	Detent Option	Technology	Features
	100,000 shaft revolutions	Quadrature	12, 24	-30 °C to +70 °C	1 mA @ 5 VDC	Yes	Contacting	<ul style="list-style-type: none"> • Compact design • RoHS compliant* • Long life and high reliability • Momentary push switch option • Rear and side mount versions • Recommended for HMI applications


PEL12	Rotational Life	Types of Output	Resolution Options (PPR)	Operating Temp. Range	Contact Rating	Detent Option	Technology	Features
	60,000 shaft revolutions	Quadrature	24	-10 °C to +65 °C	1 mA @ 5 VDC	Yes	Contacting	<ul style="list-style-type: none"> • Compact design • Long life and high reliability • Shaftless • Detent option • RoHS compliant* • Recommended for HMI applications

PES12	Rotational Life	Types of Output	Resolution Options (PPR)	Operating Temp. Range	Contact Rating	Detent Option	Technology	Features
	60,000 shaft revolutions	Quadrature	24	-10 °C to +65 °C	1 mA @ 5 VDC	Yes	Contacting	<ul style="list-style-type: none"> • Compact design • Long life and high reliability • Shaftless • Detent option • RoHS compliant* • Recommended for HMI applications

Bourns® Encoders

EM14	Rotational Life	Types of Output	Resolution Options (PPR)	Operating Temp. Range	Contact Rating	Detent Option	Technology	Features
	Non-detent: 1,000,000 cycles With detents: 100,000 cycles	Quadrature	8, 16, 32, 64	-40 °C to +70 °C	TTL, CMOS, HCMOS	Yes	Optical	<ul style="list-style-type: none"> • Compact package size • Bracket option • High rotational cycle life • RoHS compliant* • Standard and high force push switch option • Splash proof shaft seal • Recommended for HMI applications • Cable & connector option • Sealed to IP 54

EN	Rotational Life	Types of Output	Resolution Options (PPR)	Operating Temp. Range	Contact Rating	Detent Option	Technology	Features
	Standard: 10 million shaft revolutions With ball bearings: 200 million shaft revolutions	Quadrature	25, 50, 64, 100, 125, 128, 200, 256	-40 °C to +85 °C	TTL, CMOS, HCMOS	No	Optical	<ul style="list-style-type: none"> • Bushing or servo mount • Index channel available • High rotational cycle life • High operating speed • RoHS compliant version available* • Recommended for HMI and MMI applications

EMS22	Rotational Life	Types of Output	Resolution Options (PPR)	Operating Temp. Range	Contact Rating	Detent Option	Technology	Features
	100 million shaft revolutions	Quadrature, Absolute and PWM	32, 64, 128, 256, 512/1024	-40 °C to +125 °C	TTL, CMOS	No	Magnetic	<ul style="list-style-type: none"> • Extremely long life • RoHS compliant* • High operating speed • Bushing or servo mount • 3.3 and 5 VDC voltage supply options • 1 or 3 index channels (quadrature output only) • Sealed to IP 65 with option of IP 67 • Recommended for HMI & MMI applications

Bourns® Encoder Applications

Professional and Consumer Audio Applications

- Studio recording equipment
- Digital mixing consoles
- Digital broadcast equipment
- Professional sound systems
- Digital amplifiers
- Digital car audio

Industrial/Factory Automation Applications

- Robotics
- Material handling
- Forklift trucks
- Machine tools
- Automated gates/doors
- Fluid measurement

Popular Medical Product Applications

- Blood / chemical analyzers
- Centrifuge equipment
- Blood monitors
- Computer Assisted Tomography (CAT) equipment
- Electrosurgical equipment
- Dialysis equipment
- Incubators
- Lasers
- Magnetic Resonance Imaging (MRI) equipment
- Medical meters
- EKG, EEG, heart monitors
- Temperature and respiratory monitors
- Insulin and infusion pumps
- Radiographic equipment
- Strip charts
- Respirators
- Ventilators

Popular Test and Measurement Product Applications

- Oscilloscopes
- Logical and spectrum analyzers
- Signal level testers
- Weather instruments
- Digital monitors
- Board in-circuit testers
- Calibration equipment
- Counters
- Timers
- Cycle testers
- Distortion testers
- Electrostatic testers
- Environmental chambers and testers

Popular Portable Electronics Product Applications

- Data communication testers
- Appliances
- Intercom systems
- Irrigation controllers
- Measuring equipment
- Power generators, radio systems
- Portable monitoring equipment
- Portable test equipment
- Portable weather stations and systems
- Scanners
- Copiers
- Multimeters

Note: Bourns® Encoders are not recommended for critical life support applications.

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Japan:	+81 49 269 3204	+81 49 269 3297
Singapore:	+65 6348 7227	+65 6348 1272
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Other Asia-Pacific Countries:	+886 2 25624117	+886 2 25624116

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Americas:	+1-951-781-5500	+1-951-781-5700

www.bourns.com

Bourns® products are available through an extensive network of manufacturer's representatives, agents and distributors. To obtain technical applications assistance, a quotation, or to place an order, contact a Bourns representative in your area.

Specifications subject to change without notice. Actual performance in specific customer applications may differ due to the influence of other variables. Customers should verify actual device performance in their specific applications.

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