

# M15 Modular Magnetic Encoder

# TIMKEN

Where You Turn

## Specification Overview

### Mechanical

- Dimensions:
  - Outside diameter: 1.61 in. (40.9mm) with or without cap for 1.28 in. (32.5mm) mounting pattern; 2.05 in. (52.1mm) when 1.81 in. (46mm) bolting pattern is used
  - Wire and connector clearance: 1.81 in. (46mm)
  - Height: 0.68 in. (17.3mm) with cap
- Encoder wheel hubs to fit shaft sizes: 1/8 in., 3/16 in., 5 mm, 6 mm, 1/4 in., 5/16 in, 8 mm, 3/8 in., 10 mm
- Encoder wheel hub material: steel with flash nickel plating
- Encoder wheel magnet material: nitrile-bonded ferrite
- Encoder wheel method of attachment: set screw (3mm) aligned with index pulse - if applicable
- Encoder wheel moment of inertia: < 0.125 oz-in sec<sup>2</sup>
- Maximum RPM: 10,000 RPM
- Housing: high temperature glass-filled nylon
- Mounting screws: M2.5 or #2-56 (thread locker recommended)
- Air gap: set by e-z gauge
- Weight: 1.0 oz. (28 grams)

### Electrical\*

- Output: two channels in quadrature with gated index and optional commutation
- Resolution: 100, 125, 128, 160, 200, 250, 256, 320, 400, 500, 512, 640, 800, 1000, 1024, 1280, 2000, 2048 lines per channel
- Commutation: 4/6/8/12 poles †
- Supply voltage: 5VDC ±10%
- Output format: line driver (26C31) or open collector
- Current requirements: 39 mA plus commutation halls and output load (26C31)
- Frequency response: 200 kHz (800 kHz data rate)
- Output terminations: 15-pin

### Environmental

- Enclosure rating: NEMA 1 / IP40 for models with cover with no center hole
- Operating temperature: -40° to 125° C open collector, -40° to 85° C for line driver
- Storage temperature: -55° to 150° C
- Humidity: 98% relative humidity without condensation

\*Consult Timken for other electrical options.

† Consult Timken for other commutation options.



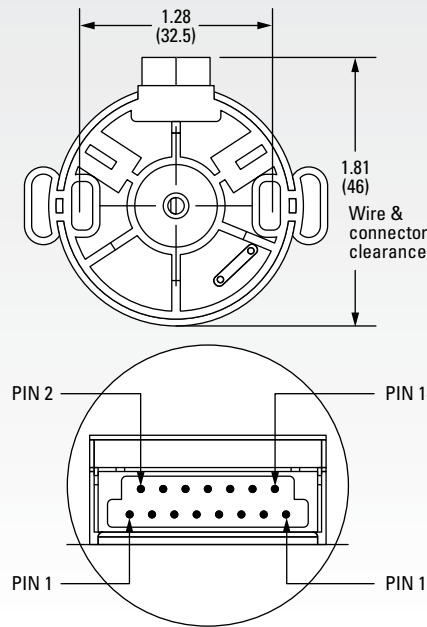
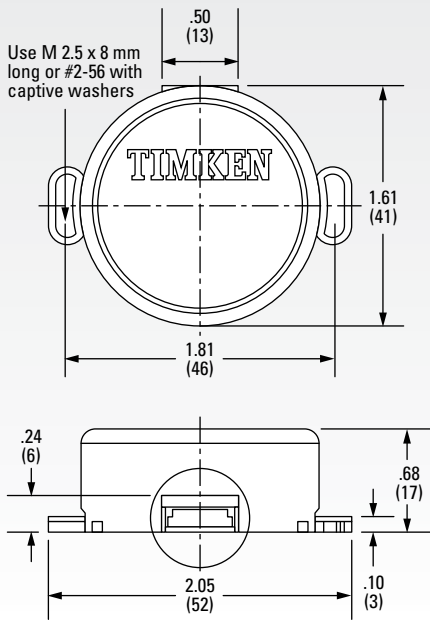
*The Timken M15 Modular Magnetic Encoder provides high resolution output for use in motor control.*

The Timken M15 Modular Magnetic Encoder is a high-resolution modular incremental encoder offering reliable performance at an economical price. Its patented magnetic technology provides operational advantages over conventional optical encoders in high-temperature, shock and vibration environments. The M15 encoder handles a wider range of shaft end play and run out than modular optical encoders and offers more reliability in particulate-laden environments.

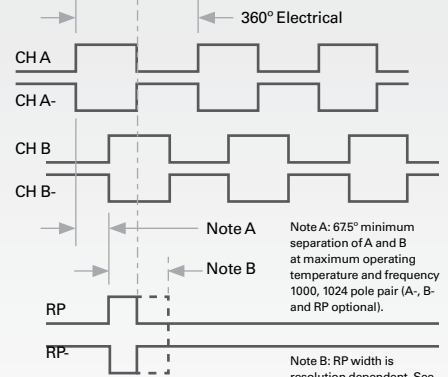
The modular encoder is available in a range of resolutions with 4/6/8/12 pole commutation and reference pulse options. The mechanical design provides for +/- 9 degrees of adjustment of the housing to

align the signal outputs to the shaft position. The magnetic target is index marked for possible shaft positioning alignment. Air gap tolerance makes installation of the hub quick and easy.

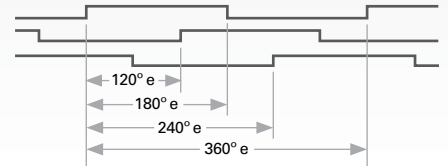
The Modular Magnetic Encoder includes electromagnetic interference (EMI) protection circuitry. A patented differential magnetic sensor circuit design protects it from interfering magnetic fields. The modular unit is well suited for a range of applications, including stepper motor positioning and anti-stall feedback, DC brush-type motor positioning, brushless DC (BLDC) and servo motor control using the commutation options.



#### Incremental A, B, and RP outputs



#### U, V, W outputs



Pin #	1	2 <sup>†</sup>	3	4 <sup>†</sup>	5	6 <sup>†</sup>	7 <sup>*</sup>	8 <sup>††</sup>	9 <sup>*</sup>	10 <sup>††</sup>	11 <sup>*</sup>	12 <sup>††</sup>	13	14	15
Function	A+	A-	B+	B-	RP+	RP-	U+	U-	V+	V-	W+	W-	VCC1	GRND	N/A
Color	Yel	Yel/ Wht	Blu	Blu/ Wht	Orn	Orn/ Wht	Grn	Grn/ Wht	Brn	Brn/ Wht	Wht	Wht/ Gry	Red	Blk	Gry

<sup>†</sup>Output on pins 2, 4, 6, 8, 10, 12 available with line driver option only.

<sup>\*</sup>Output on pins 7-12 available with commutated units only.

## Nomenclature

The part numbering for the Timken Modular Magnetic Encoder provides the information you need to select the best encoder for your needs. Use the chart below to determine the proper part number for your application.

**M15** – \_\_\_\_\_

MODEL	RESOLUTION lines/ch		COMMUTATION	INDEX	HUB	ELECTRICAL	TERMINATION	COVER
M15	100	500	0 = none 4 = 4 pole 6 = 6 pole 8 = 8 pole 12 = 12 pole	0 = none 1 = yes	1 = 1/8 2 = 3/16 3 = 5 mm 4 = 6 mm 5 = 1/4 6 = 5/16 7 = 8 mm 8 = 3/8 9 = 10 mm	1 = open collector 2 = line driver VCC1	1 = 15 pin connector 2 = 15 pin connector with 18 inch mating cable (flying leads) 3 = 15 pin connector with 36 inch mating cable (with 15 pin male connector)	0 = none 1 = cover 2 = cover with center hole

Mating cables for above modular encoders are TKR CBL-018-15-1-A (single connector) or TKR CBL-036-15-2-A (double-ended connector).

### Key Operational Features

- Non-contacting, compact design
- Shock and vibration resistant
- High resistance to dirt and debris
- Rugged electromechanical package
- Range of resolutions
- High degree of programmable functionality
- Integration of full feedback sensing into application

### Key Benefits

- Long operational life
- Consistent performance
- Customized for application
- Confident operation in tough environments

Wherever shafts, gears and wheels turn, Timken provides customers with advanced friction management solutions. These solutions include sensor technologies that help improve performance, extend equipment life and provide precise control in automotive, off-highway and industrial applications. With a large product offering including sensor-equipped bearings, condition monitoring and position sensors, Timken continues to meet motion control needs globally.

Please contact a Timken representative via email at [motioncontrol@timken.com](mailto:motioncontrol@timken.com) for more information.

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