

TIMKEN

M15 & M15H MODULAR MAGNETIC ENCODERS



A Superior Sensing Solution

Timken® magnetic encoder technology offers clear operational and cost benefits over other commonly used technologies. Our superior sensing products provide reliable speed and position data even in harsh operating environments.

A Superior Sensing Solution from Timken

M15

Timken® M15 high-resolution magnetic encoder technology offers a higher reliability at a comparable cost to optical encoders. The M15 Modular Magnetic Encoder, like all Timken encoders, relies on the interaction between a sensor and magnetic target. This approach doesn't require a clear line of sight between target and sensor like optical encoders.

Durability

As a result, Timken encoders operate reliably even in environments filled with dirt, dust, oil, humidity or other contaminants. A patented differential magnetic sensor circuit design also protects them from interfering magnetic fields. A larger sensor gap allows the M15 encoder to sustain shock loads and vibration that would damage more fragile optical encoders. With its wider gap, the M15 encoder also tolerates more shaft-end play and run-out and installs quickly and easily.

Timken Design

The Timken design combines a direction-sensing Hall Effect encoder with an integrated index pulse and a high-accuracy, resolution-multiplying circuit. The encoder produces and processes the Hall Effect signals to create high-resolution quadrature output signals that provide zero-speed and direction sensing.

Customized Solutions

Customers interested in a customized solution can rely on Timken application engineers to provide expertise and experience. They can help customers tailor the electronic aspects and physical configuration of the encoder to enhance both function and performance for end users.

Why Magnetic Encoders

- Highly resistant to liquid or solid particulate in gap between sensor and target
- Non-contacting design resists damage from shock or vibration
- Features Polymer-bonded multi-pole magnets
- High accuracy - less than 10 arc minutes
- Compact, low-cost and rugged, without a bulky outer shell
- Can be customized as a replacement part or customized to fit new designs
- No moving parts

M15H

The Timken M15H High Resolution Modular Magnetic Encoder takes the standard M15 to new heights.

Sharing the M15's durability and design features, the M15H offers reliable performance at an economical price with resolutions up to 8192 PPR. The M15H is available in a range of resolutions, index pulse and commutation capability. The mechanical design provides for +/- 9 degrees of adjustment of the housing to align the signal outputs to the shaft position.



M15 + M15H

Optimum Applications

- Servo motor control using the commutation options
- Stepper motor positioning and anti-stall feedback
- DC brush-type motor positioning
- Brushless DC (BLDC) motor control using the commutation options

Specifications and Features

Mechanical

- Encoder wheel hub material: 400 Series stainless steel/ Nickel plated steel
- Encoder wheel magnet material: Nitrile-bonded ferrite
- Encoder wheel method of attachment: Set screw (3mm) aligned with index pulse (if applicable)
- Maximum RPM: 10,000 RPM
- Housing: High-temperature glass-filled nylon

- Mounting screws: M2.5 or #2-56
- Air gap: Set by e-z gauge
- Weight: 28 grams (1.0 oz.)

Electrical*

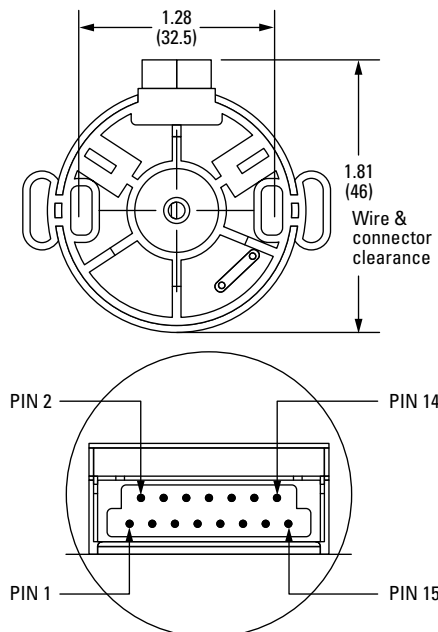
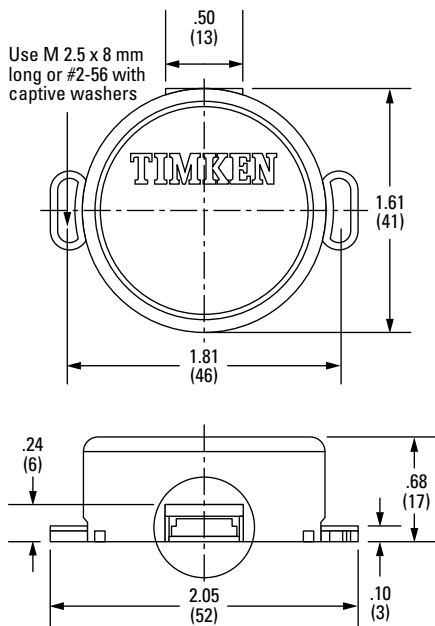
- Output: Two channels in quadrature with gated index and optional commutation
- Commutation: 0/4/6/8/10/12 (Other options available)
- Output Terminations: 15 Pin
- Current Requirements:
 - M15: 39mA plus commutation Halls and output load
 - M15H: 70mA plus commutation Halls and output load
- Resolution: 100PPR to 8192PPR, see last page for complete listing
- Data Rate:
 - M15: 200kHz (800 kHz combined)
 - M15H: 2.4mHz (9.6mHz combined)

- Output format: Line driver (26C31) or open collector
- Supply voltage: 5 VDC $\pm 10\%$

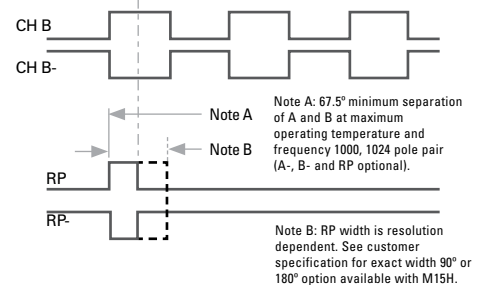
Environmental

- Enclosure rating: NEMA 1/IP40 for models with cover
- Operating temperature: -40° to 125° C (-40° to 255° F) open collector, -40° to 85° C (-40 to 185° F) for line driver
- Storage temperature: -55° to 150° C (-67° to 302° F)
- Humidity: 98% relative humidity without condensation
- RoHS Compliant

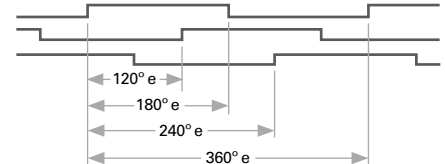
**Consult Timken for other electrical options.*



Incremental A, B, and RP outputs



U,V,W outputs



Mating Connector: FI-W15S JAE

Pin #	1	2†	3	4†	5	6†	7*	8*†	9*	10*†	11*	12*†	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

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

*Output on pins 7-12 available with commutated units only.

To Order

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

M15 – _ _ _ _ _ - _ _ _ - _ _ _ - _ _ _ - _ _ _

MODEL	RESOLUTION (PPR)		COMMUTATION	INDEX	HUB	ELECTRICAL	TERMINATION	COVER
M15	100	500	0 = none	0 = none	1 = 1/8 in.	1 = open collector	1 = 15 pin connector	0 = none
	125	512	4 = 4 pole	1 = yes	2 = 3/16 in.	2 = line driver 26C31	2 = 15 pin connector with 17.5 in. mating cable and flying leads	1 = cover
	128	640	6 = 6 pole		3 = 5 mm		3 = 15 pin connector with 36 in. mating cable and 15 pin mating connector	2 = cover with center hole
	160	800	8 = 8 pole		4 = 6 mm			
	200	1000	10 = 10 pole		5 = 1/4 in.			
	250	1024	12 = 12 pole		6 = 5/16 in.			
	256	1280			7 = 8 mm			
	320	2000			8 = 3/8 in.			
	360	2048			9 = 10 mm			
	400				10 = 1/2 in.			

*2 pole communication available with the following resolutions: 1000, 800, 500, 400, 250, 200, 120, 100

M15H – _ _ _ _ _ - _ _ _ - _ _ _ - _ _ _ - _ _ _

MODEL	RESOLUTION (PPR)		COMMUTATION	INDEX	HUB	ELECTRICAL	TERMINATION	COVER
M15H	1250		0 = none	0 = none	1 = 1/8 in.	1 = open collector	1 = 15 pin connector	0 = none
	2000		4 = 4 pole	1 = yes, 90°	2 = 3/16 in.	2 = line driver 26C31	2 = 15 pin connector with 17.5 in. mating cable and flying leads	1 = cover
	2048		6 = 6 pole	3 = yes, 180°	3 = 5 mm		3 = 15 pin connector with 36 in. mating cable and 15 pin mating connector	2 = cover with center hole
	2500		8 = 8 pole		4 = 6 mm			
	3200		10 = 10 pole		5 = 1/4 in.			
	3600		12 = 12 pole		6 = 5/16 in.			
	4000				7 = 8 mm			
	4096				8 = 3/8 in.			
	5000				9 = 10 mm			
	8192				10 = 1/2 in.			

More details regarding specifications, installation and instructions available at www.timkenencoders.com

TIMKEN

The Timken team applies their know-how to improve the reliability and performance of machinery in diverse markets worldwide. The company designs, makes and markets high-performance mechanical components, including bearings, gears, belts, chain and related mechanical power transmission products and services.

Stronger. Commitment. Stronger. Value. Stronger. Worldwide. Stronger. Together. Stronger. By Design.

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