P3 America, Inc.

Motion Control and Automation Products

Hall Effect Frictionless Encoder with Analog Output — Series MAB22AH

- Supplied magnet attaches to your shaft end
- Recessed housing fits over shaft/magnet
- Fine adjustment by free rotating clamp ring
- Analog voltage or current output
- IP67 protection grade
- 360° measuring angle or any fraction

The series MAB22AH is a frictionless angle sensor capable of true 360° measuring. A provided magnet attaches to your shaft end and housing simply mounts over the magnet. 12 bit resolution and simple interface with analog voltage or current outputs. Suitable for rough environments.

Electrical Data			
Effective electrical angle of rotation	360° or any fraction. Minimum angle 10° (factory set)		
Independent linearity	±0.3%		
Supply voltage	5V ±10%	9..30V	15..30V
Output signal	0..5V ratiometric	0..5V, 0..20mA, 4..20mA	0..5V, 0..10V
Output load	Voltage output: ≥ 5k Ohm	Current output: ≤ 500 Ohm	
Resolution	12 bit (4096 steps)		
Current consumption (no load)	< 20 mA (< 40 mA redundant type)		
Update rate	1 ms		
Insulation voltage	1000 VAC @ 50 Hz, 1 min.		
Insulation reistance	2 MOhm @ 500 VDC, 1 min.		

Mechanical and Environmental Data	
Mechanical angle of rotation	360° (continuous)
Maximum rotational speed	10,000 rpm
Protection class	IP65 (electronics and cable)
Operating temperature	-40°C...+85°C
Storage temperature	-40°C...+90°C
Vibration	20 g (±1.5mm, 10 to 2000 Hz, 16 ycles , 3 axis, (3x4 h)
Shock	50 g (11ms, 18x)
Housing material	Aluminum
Weight	approx. 35 g

Note: Customers should test and verify device performance in any given application. General specifications values are measured at +15°C ~ +35°C. Please consult us if application is in higher or lower temperatures. Shaft modifications are possible, please consult us. Specifications subject to change without notice.

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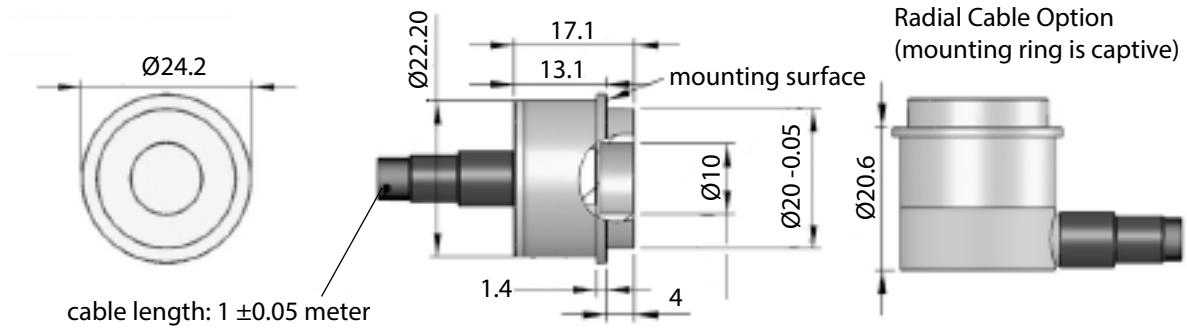
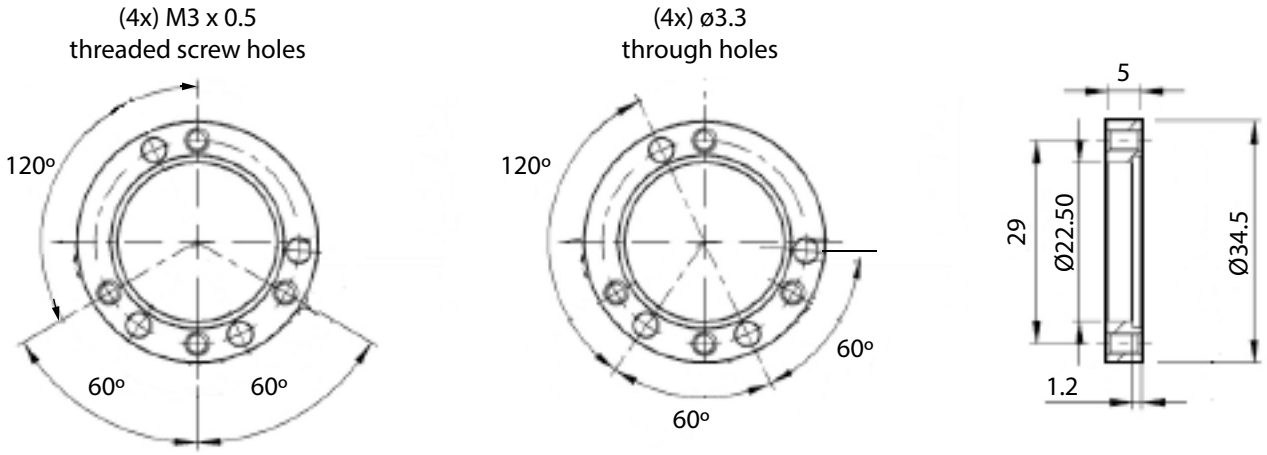
October 2015

Dimensions (mm), Mounting and Electrical Connections



Mounting Ring (included in delivery)



Cable Specifications
Type: UL/cUL-LIYCY
Style: 2464/1061

	Single Output		Dual Output (redundant)	
Length	1 meter		1 meter	
Outer diameter	4.4 mm		5.2 mm	
Lead diameter	1.0 mm		1.0 mm	
Cross section	(3x) AWG26		(6x) AWG26	
Terminations	VSUP	red	VSUP1	red
	OUT	brown	OUT1	brown
	GND	black	GND1	black
			VSUP2	yellow
			OUT2	green
			GND2	orange

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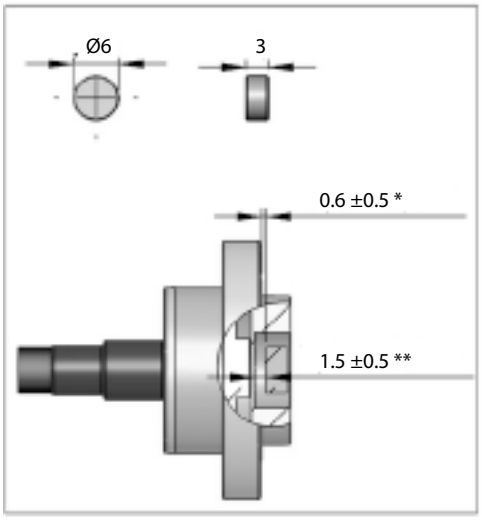
Magnet Dimensions (mm)

Single Output
(magnet included in delivery)

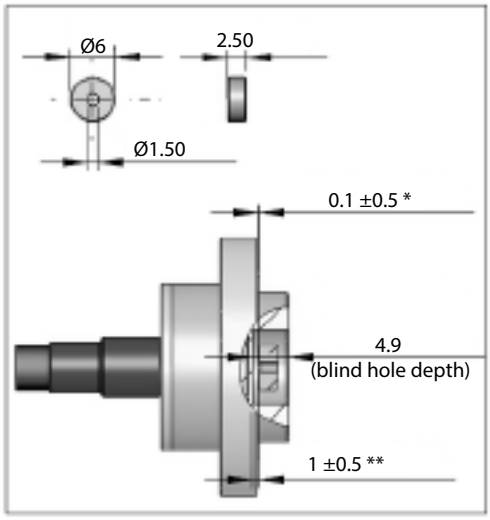


Magnet Eccentricity	
Eccentricity	Max. Variance (360°)
0.5 mm	0.6°
0.75 mm	1.2°
Applies to single and dual output	

* relative to mounting surface

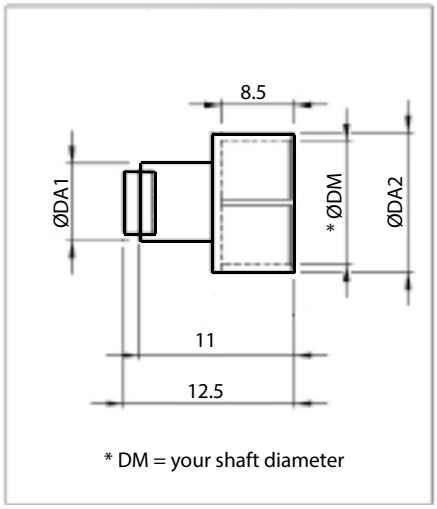
** relative to bottom of blind hole

Dual Output (redundant)
(magnet included in delivery)

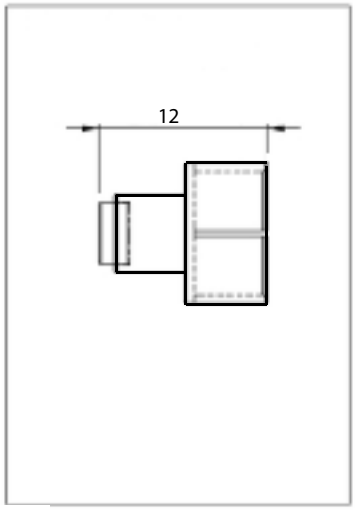


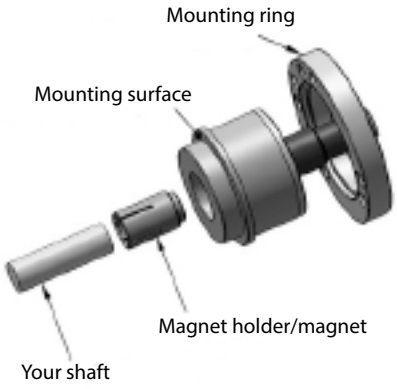
Note: If your shaft is magnetic, a minimum distance of > 1mm must be maintained from end of shaft to magnet.

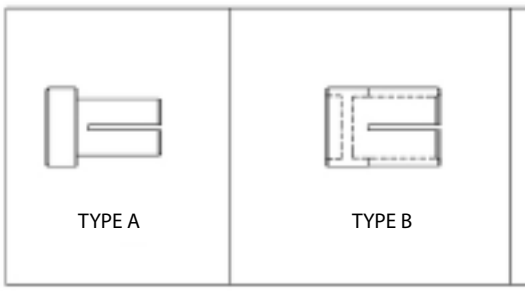
Optional Push-On Magnet Holder Dimensions (mm)



* DM = your shaft diameter







TYPE	* DM	DA1	DA2
A	3	7.5	4.5
	3.175	7.5	4.5
	4	7.5	5.5
B	6	7.5	7.5
	6.35	7.5	7.5
	8	9.5	9.5
	10	11.5	11.5

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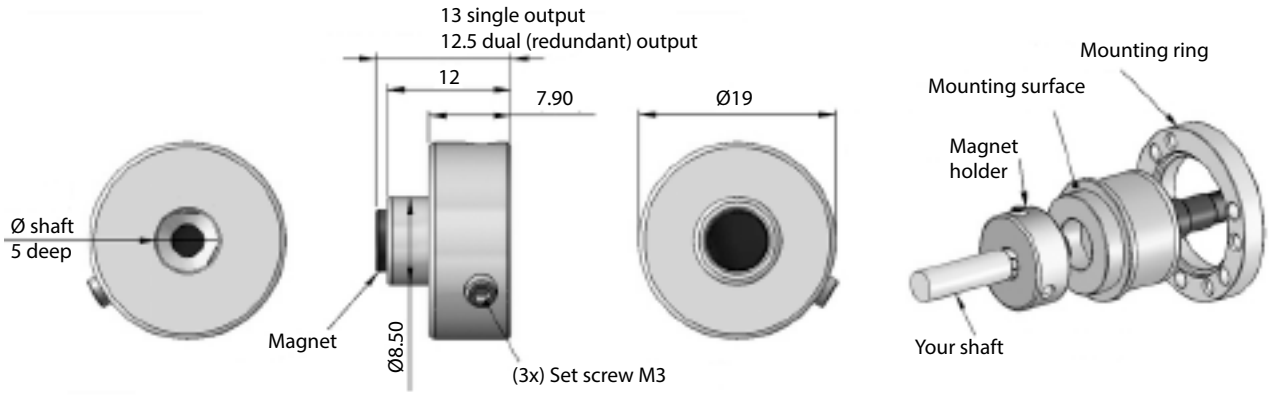
Optional Set Screw Magnet Holder Dimensions (mm)



Note: If your shaft is magnetic, a minimum distance of > 1mm must be maintained from end of shaft to magnet.

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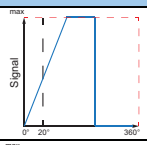
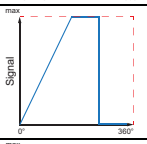
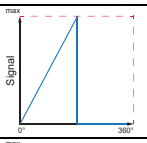
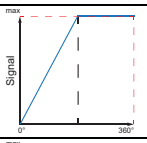
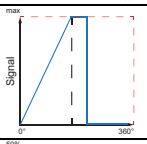
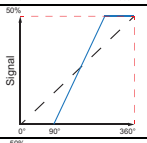
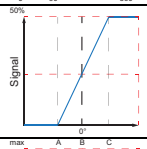
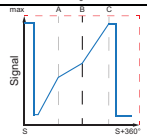
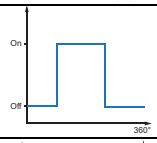
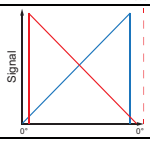
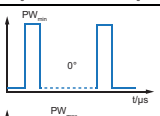
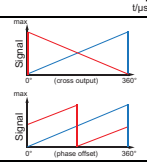
Single Turn Hall Effect - Analog — *Series MAB22AH*

Electrical Options		
Modified effective electrical angle The measuring range can be programmed from 0-20° to 0-360°. In the basic type with stop, the zeropoint is always at CCW position. If not specified, the signal level is programmed according EA1A. On request it is also possible to set the zeropoint at CW position.	CWxxx / CCW xxx	
Electrically non effective angle - Delta 1/2 If the electrical angle is programmed below 360°, the remaining electrically non effective angle is divided in two equal parts: High level & Low level (Delta 1⁄2).	EA1A	
Electrically non effective angle - Low-Level If the electrical angle is programmed below 360°, the signal fall low after reaching the maximum level.	EA1b	
Electrically non effective angle - High-Level If the electrical angle is programmed below 360°, the signal level remains high after reaching the maximum level.	EA1c	
Electrically non effective angle - Variable Level If the electrical angle is programmed below 360°, the remaining electrical non effective angle can be divided into high and low level in any ratio according to customer request.	EA1d	
Zero point positioning The mechanical zero point is aligned with the marking on the sensor housing. The electrical zeropoint can be alligned to the mechanical zeropoint. Zeropoint can be programmed at any offset.	EA2	
Center Position The effective electrical angle is aligned with the mechanical zero point in such a way that equal effective angles in both rotating directions are acheived. Center point can be programmed at any offset.	EA3	
Multipoint programming Allows output characteristics which consists of 3 to 6 rising or falling linear segments. Minimum and maximum signal levels can be defined within the total electrical angle. First and last linear segment (min/max) is always horizontal. Within maximum and minimum position, 1 to 3 calibration points can be set.	EA4	
Software switching function (Ø28mm housing or larger) Switching function can be assigned to any angular position by one potential free relay output (open/ close 60V/ 200 mA RON=0.85 Ω are available. For housing Ø bigger than 36 i.e. MAB36, a second switching function is possible. For each switching function, both edges, rising and falling can be positioned on custom specific angle.	EA5	
Rotational direction The standard direction of rotation is Clockwise (CW). It is also possible with this option to change the direction from Clockwise(CW) to Counterclockwise (CCW).	CW / CCW	
PWM - Pulse width modulation PWM provides a constant carrier frequency which defines High to Low ratio. Ratio between high and low corresponds to the signal characteristics. It is in a fixed relation to the angle.	PWM	
PWM frequency can be choosen between 100 Hz and 1 kHz. The duty cycle can be also defined.	EA7	
2-channel-output This is made up of a hall sensor chip consisting of 2 galvanically separated sensing elements.One magnet provides a magnetic field simultaneously for both elements. Both elements can be programmed identically or independently.	MAB...X	

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