

# Data Sheet for Angle Sensors

## Hall-Effect Single-Turn Rotary Encoder with Analog Output

Series MAB12AH



- Only 12.7 mm housing diameter
- Suitable for shaft diameters from 2 mm..6.35 mm
- Mounting ring and push on magnet are part of delivery
- Supply voltage 5 VDC
- Output signal analog absolute or PWM
- Integrated MOLEX connector

Extreme compact Hall Kit Encoder delivered as complete ready to setup package. The Package consisting of the encoder a mounting ring and the matching magnet holder and magnet for the shaft.

With the MOLEX plug-in connection, the encoder could be easy connected to the evaluation unit. This improves the handling during installation and service.

Electrical Data	Analog	PWM	
Effective electrical angle of rotation <sup>1.)</sup>	360°		
Independent linearity (best straight line) <sup>1.)</sup>	± 0.14 % @ 25 °C		
Output signal	0..5 V analog	5 V PWM	
Resolution	10 Bit	10 Bit	12 Bit
Update rate	0.38 ms	1 ms	4.1 ms
Supply voltage	5 V ±10 %		
Power consumption (no load)	≤ 20 mA		
Output load	≥ 10 kOhm		

Mechanical and environmental data, Miscellaneous	
Mechanical angle of rotation <sup>1.)</sup>	360° without stop
Lifetime <sup>2.)</sup>	Mechanically unlimited
Max. operational speed	10.000 rev./min.
Operating temperature range	-40..+125 °C
Storage temperature range	-40..+125 °C
Vibration (IEC 68-2-6, Test Fc)	(5 Hz to 2 kHz) 20 g
Housing diameter	12.7 mm
Housing depth	13.9 mm
Shaft diameter	2..6.35 mm
Shaft type	Push on magnet for solid shafts

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## Mechanical and Environmental Data, Miscellaneous

Connection type	Molex plug on sensor: 53398-0371
Connection position	Axial
Sensor mounting	Mounting ring
Mass	Magnet + magnet holder + kit encoder + mounting ring: app. 20 g
Fastening parts included in delivery	Kit Encoder, mounting ring, push on magnet Not included in delivery: 2 pcs. lens head screws 4-40 1/4" for mounting of the mounting ring
Fastening torque of the mounting screws for mounting ring	0.67 Nm
Material mounting ring	Plastic
Material housing	Plastic
Material magnet holder	Metal

## Immunity

ESD	Human Body Model MIL-STD-883R, Method 3015.7 ± 2 kV
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1.) According IEC 60393

2.) Determined by climatic conditions according to IEC 68-1, para. 5.3.1 without load collectives

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## Order Code

Description	Selection: standard=black/bold, possible options=grey/cursive				
<b>Series:</b>	<b>MAB12AH</b>				
<b>Shaft diameter:</b>					
Option Ø2 mm		2			
Option Ø2.3 mm		2,3			
Option Ø2.5 mm		2,5			
Option Ø3 mm		3			
Option Ø3.17 mm		3,17			
Option Ø4 mm		4			
Option Ø5 mm		5			
<b>Ø6 mm</b>		<b>6</b>			
Option Ø6.35 mm		6,35			
<b>Resolution:</b>					
<b>Supply voltage / Output signal:</b>			<b>0505</b>		
<b>Standard: VSUP=5 V ±10 % / OUT=0...5 V</b>					
(ratiometric resolution 10Bit)					
Option: 1 VSUP=5 V ±10 % / PWM, Resolution 12 Bit			12 05PWM		
Option: 2 VSUP=5 V ±10 % / PWM, Resolution 10 Bit			10 05PWM		
<b>Sense of rotation:</b>					
<b>Standard: CW</b> (output signal (analog) or duty cycle (PWM) increases clockwise)				<b>CW</b>	
<b>Electrical angle:</b>					
<b>Standard: 360°</b>					<b>360°</b>
<b>Electrical connection:</b>					
<b>In sensor housing integrated Molex connector</b>					<b>K</b>

## Order example MAB12AH:

### Requirement:

Shaft diameter 6.00 mm, VSUP=5 V, output signal OUT=0..5 V (ratiometric), sense of rotation CW, effective electrical angle 360°, electrical connection: integrated connector in sensor housing

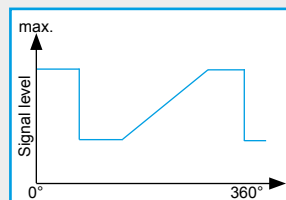
**Example for order code:** MAB12AH 6 0505 CW360 K

## Additional options

**For higher quantities or on-going demand, additional options are available as described below on request**

For example:

- Special cable and connection design
- Sense of rotation CCW
- User defined electrical angle



Customized signal characteristic

For Example:

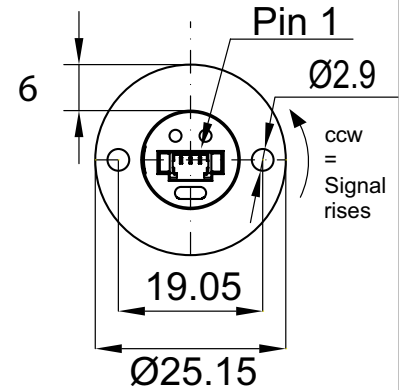
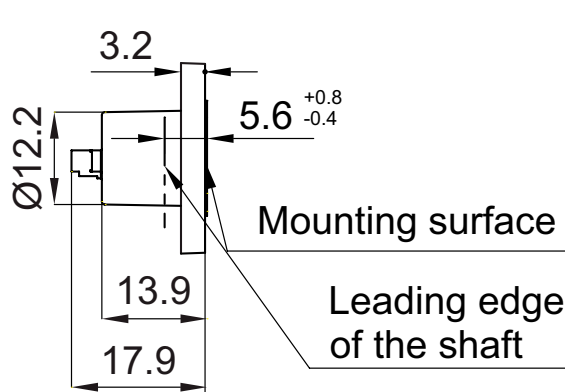
- minimum/maximum signal level
- signal plateaus

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## Technical Drawing



Dimensions in mm

### Terminal lay-out and connector

Pin 1 +5VDC

Pin 2 Analog Out

Pin 3 GND

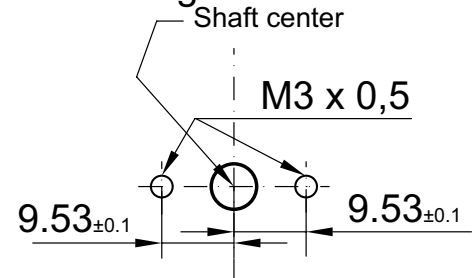
Connector in the sensor: Molex # 53398-0371

Counter connector housing: Molex # 51021-0300

Crimp pins for counter conn.: Molex # 50079-8100

Crimp tools: Molex # 50079

### Mounting sketch



Radial mounting tolerance:  
Eccentricity max. failure / 360°

< 0.25 mm approx. 0.2°

< 0.5 mm approx. 0.6°

< 0.75 mm approx. 1.2°

### Please take care !

**That the max. allowed axial mounting tolerances from the leading edge of the shaft to the mounting surface are 5.6 +0.8/-0.4 mm**

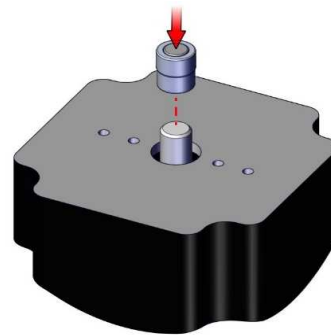
**Leaving the tolerance band lead to signal loss and malfunction of the encoder.**

### Mounting Instruction

**During transport, storage, assembly and operation, it must be followed the ESD guidelines.**

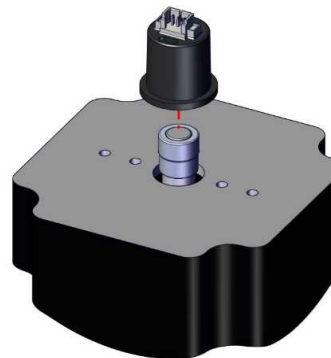
#### Step 1:

Slip push-on magnetic hub over shaft and firmly press down until top of shaft fills cavity of hub.



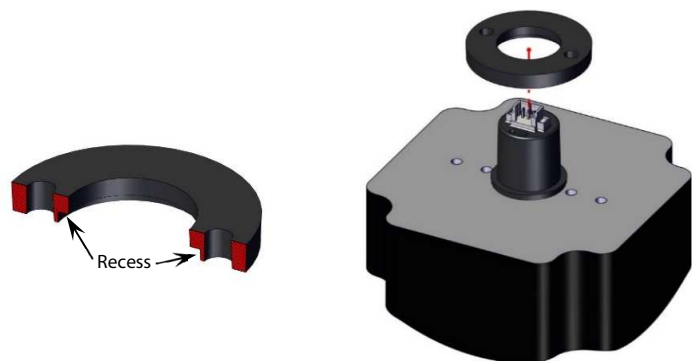
#### Step 2:

Place encoder body over shaft assembly so that it sits on mounting surface.



#### Step 3:

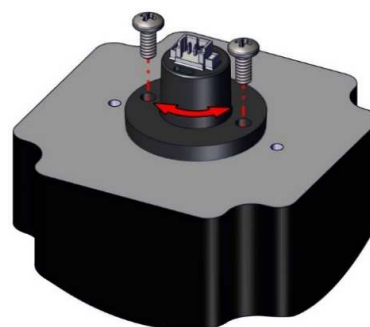
With recess in base facing towards mounting surface, place base over encoder body so that flange of body fits into recess of base.



#### Step 4:

Secure base to mounting surface with two screws (#4 recommended, sold separately).

**Zero positioning:** Prior to fully tightening screws, encoder can be powered and rotated by hand to set absolute zero position, if desired.



Recommendation for mounting screws: 4-40 1/4"  
Max. allowed tightening torque 0.67 Nm.