

Data Sheet for Angle Sensors

Optical Encoders

Series MOZ40



- High-quality encoder in metal housing
- 39 mm housing diameter
- Ball bearing
- Shaft diameter: 5 mm, 6 mm, 6.35 mm, 8 mm
- Large selection of resolutions 20..3600 pulses per revolution
- 2 channels + index
- Operating voltage 5 V, 12 V, 24 V
- Many output electronic variants: push-pull (B), voltage output (NPN), PNP, open collector (K, HK), linedriver (N)

The MOZ40 series closes the gap between encoders for common/simple requirements and heavy duty encoders. It offers a choice of a variety of optical resolutions and electrical outputs. The high-quality encoder design makes it particularly interesting where a long service life is required.

Electrical Data	Voltage Output "NPN"	Open Collector "K"	Open Collector "HK"	"PNP"	Push-Pull "B"	Line Driver "N"
Output signal	A, B, Z					-
Number of pulses	20..3600 pulses per rev.					
Output voltage high	V _{cc} -1 min	----		V _{cc} -1 V min	V _{cc} -3 V min	2.5 V min
Output voltage low	0.5 V max			----	3 V max	0.5 V max
Limit frequency	200 kHz			50 kHz	200 kHz	
Supply voltage	4.5..13.2 VDC			10.8..26.4 VDC		4.75..5.25 VDC
Power consumption (no load)	≤ 80 mA	≤ 60 mA		≤ 100 mA	≤ 60 mA	≤ 150 mA
Output capacity	20 mA				40 mA	20 mA
Max. pull-up-voltage	----	50 V		----	----	----
Insulation voltage 1.)	VDC 500 VAC (1 min.)					
Insulation resistance 1.)	50 MOhm @ 500 VDC					
Output electronics	Voltage output	Open Collector		PNP	Push Pull	Line Driver
Switch-on delay	max. 1 µs					max. 200 ns

Mechanical and Environmental Data, Miscellaneous

Mechanical angle of rotation /stroke 1.)	360° without stop
Bearing	Ball bearing
Max. operational speed	5000 rpm.
Shaft acceleration	1x10 ⁻⁵ rad/s ²
Moment of inertia	1.2x10 ⁻⁶ kg • m ²
Operational torque @ ambient temperature 1.) 2.)	≤ 0.049 Ncm
Operating temperature range	-10 °C up to +70 °C
Storage temperature range	-30 °C up to +80 °C
Protection grade (IEC 60529)	IP65
Vibration (IEC 68-2-6, Test Fc)	10..55 Hz (1 min.); 1.5 mm; each 2 h in X, Y, Z
Shock (IEC 68-2-27, Test Ea)	490 m/s ² , each 3 times in X, Y, Z

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Mechanical and Environmental Data, Miscellaneous

Housing diameter	39 mm
Housing depth	40 mm
Shaft diameter	5 mm, 6 mm, 6.35 mm, 8 mm
Shaft type	Solid shaft
Max. radial load	< 19.6 N
Max. axial load	< 9.8 N
Connection type	Round cable 0.5 m
Connection position	Radial
Sensor mounting	Insert nuts 3 x M3 depth 5
Mass	ca. 140 g
Fastening parts included in delivery	None
Material shaft	Stainless steel
Material housing	Aluminium
Material disc	≤ 600 ppr metal, ≥ 800 ppr glass
Immunity ESD, human body model (MIL-STD-883, Method 3015.8)	Contact discharge 8 kV, aerial discharge 15 kV

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 <i>options=grey/italic</i>					
Series	MOZ40					
Shaft diameter / shaft length:						
Ø8 x 15 mm		8				
<i>Option Ø6.35 x 15 mm</i>		<i>6,35</i>				
Option Ø6 x 15 mm		6				
<i>Option Ø5 x 15 mm</i>		<i>5</i>				
<i>Option shaft length in mm</i>		<i>Ax,xx</i>				
<i>Option shaft diameter in mm (≤5 mm)</i>		<i>Dx,xx</i>				
Resolution in pulses per revolution:						
<i>Option 20 ppr.</i>				<i>20</i>		
<i>Option 30 ppr.</i>				<i>30</i>		
<i>Option 32 ppr.</i>				<i>32</i>		
<i>Option 40 ppr.</i>				<i>40</i>		
<i>Option 50 ppr.</i>				<i>50</i>		
<i>Option 60 ppr.</i>				<i>60</i>		
<i>Option 100 ppr.</i>				<i>100</i>		
<i>Option 125 ppr.</i>				<i>125</i>		
<i>Option 200 ppr.</i>				<i>200</i>		
<i>Option 250 ppr.</i>				<i>250</i>		
<i>Option 256 ppr.</i>				<i>256</i>		
<i>Option 300 ppr.</i>				<i>300</i>		
360 ppr.				360		
<i>Option 400 ppr.</i>				<i>400</i>		
500 ppr.				500		
<i>Option 512 ppr.</i>				<i>512</i>		
<i>Option 600 ppr.</i>				<i>600</i>		
<i>Option 800 ppr.</i>				<i>800</i>		
<i>Option 900 ppr.</i>				<i>900</i>		
<i>Option 1000 ppr.</i>				<i>1000</i>		
1024 ppr.				1024		
<i>Option 1200 ppr.</i>				<i>1200</i>		
<i>Option 1500 ppr.</i>				<i>1500</i>		
<i>Option 1800 ppr.</i>				<i>1800</i>		
<i>Option 2000 ppr.</i>				<i>2000</i>		
<i>Option 2048 ppr.</i>				<i>2048</i>		
<i>Option 2500 ppr.</i>				<i>2500</i>		
<i>Option 3600 ppr.</i>				<i>3600</i>		
Supply voltage / output:						
Standard: supply voltage 12 V (10.8..26.4 V/DC) & push pull output (B)				1224		B
<i>Option supply voltage 5 V (4.5..13.2 V/DC) & voltage output (NPN)</i>				<i>0505</i>		<i>NPN</i>
<i>Option Supply voltage 5 V (4.5..13.2 V/DC) & open collector output K</i>				<i>0512</i>		<i>K</i>
<i>Option supply voltage 12 V (10.8..26.4 V/DC) & open collector output HK</i>				<i>1224</i>		<i>HK</i>
<i>Option supply voltage 5 V (4.75..5.25 V/DC) & linedriver output (N)</i>				<i>05</i>		<i>N</i>
<i>Option supply voltage 12 V (10.8..26.4 V/DC) & PNP output (PNP)</i>				<i>1224</i>		<i>PNP</i>
Output signal:						
A+B+Z (Z=Index)					BZ	
Electrical connection:						
Round cable 0.5 m						-
<i>Option round cable 1 m</i>						<i>R1</i>
<i>Option round cable 3 m</i>						<i>R3</i>
<i>Option user defined cable length in m</i>						<i>Rx,xx</i>

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Order example MOZ40

Requirement:

Shaft diameter 6 mm, shaft length 15 mm, resolution 360 impulses per revolution , supply voltage 12 V, 2 channels + index, output electronic push pull, round cable 0.5 m

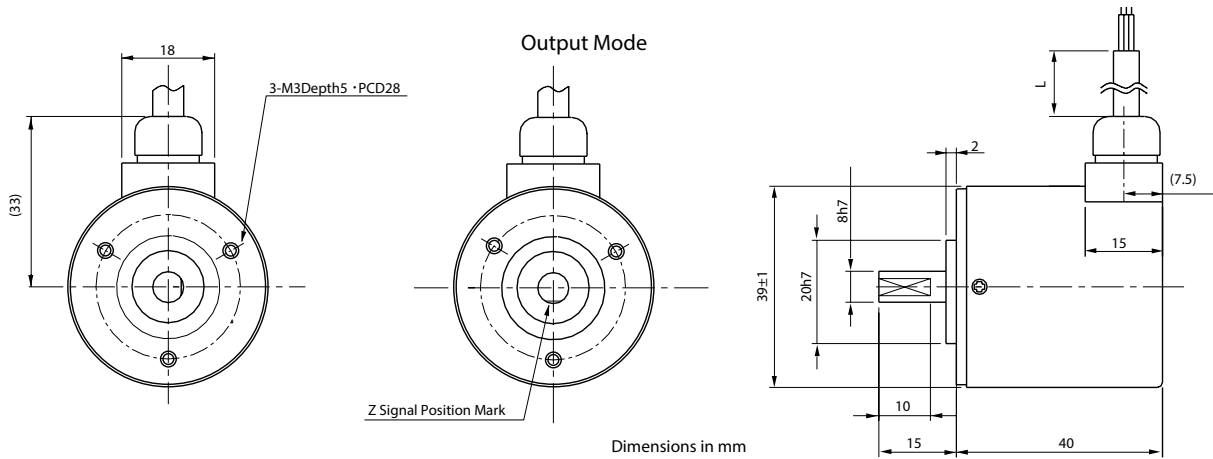
Example for order code: MOZ40 360 1224 BZ B

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

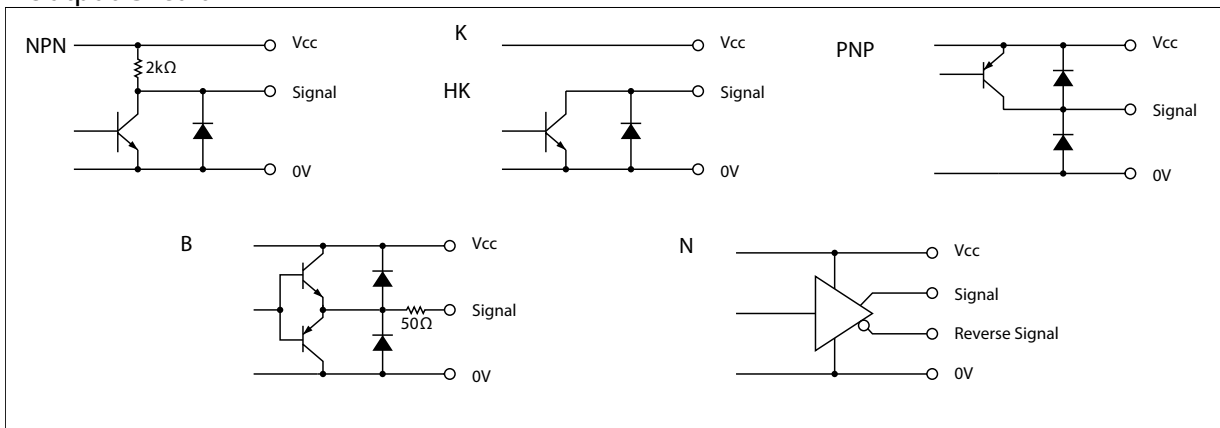
For example:

- Other resolutions
- Specials shaft design
- Special connector and cable design
- Other operational torque

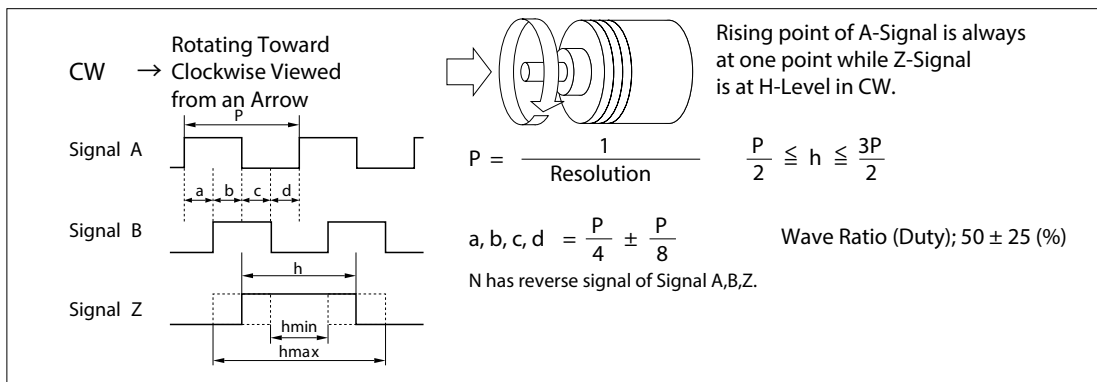
Technical Drawing



Output Circuit



Wave Form



Electrical Connections

	Color	Signal
NPN	Red	Power Supply(Vcc)
K	Black	0V
HK	Green or Blue	Signal A
PNP	White	Signal B
B	Yellow	Signal Z
	Shield	NC

	Color	Signal	Color	Signal
N	Red	Power Supply(Vcc)	White	Signal B
	Black	0V	Gray	Signal B
	Green	Signal A	Yellow	Signal Z
	Blue	Signal A	Orange	Signal Z
	Shield	NC		