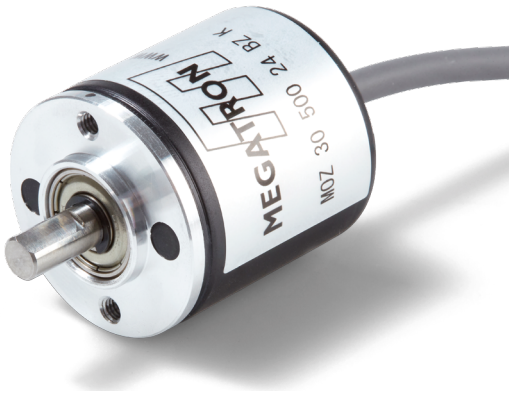
Data Sheet for Angle Sensors

Optical Encoders — Series MOZ30



- High-quality encoder in metal housing
- 28mm housing diameter
- Ball bearing
- 5mm shaft diameter
- 36...1500 pulses per revolution
- 2 channels + index
- Operating voltage 5 V, 12 V, 24 V
- Output electronics: push-pull, voltage-output, open collector, line-driver

The high quality encoder is based on his compact housing dimensions and the variety of electrical outputs suitable for a wide range of applications. The robust metal housing in combination with a ball bearing warrant a long life span.

Electrical Data	Voltage Output "NPN"	Open Collector "K"		Line Driver "N"
Output signal	A, B, Z			A, /A, B, /B, Z, /Z
Number of pulses	36..1500 pulses per rev.			
Output voltage high	Vcc-1 min	----		2,5V min
Output voltage low	0,5 V max			
Limit frequency	150 kHz			
Supply voltage	5 V ±10 % 12 V ±10 %		24 V ±10 %	5 V ± 5 %
Power consumption (no load)	≤ 80 mA	≤ 60 mA		≤ 150 mA
Output capacity	20 mA			
Max. pull-up voltage		50 V		
Insulation voltage 1.)	500 VAC, 1 min			
Insulation resistance 1.)	50 MOhm @ 500 VDC			
Output electronics	Voltage output	Open Collector		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	6000 rpm
Shaft acceleration	$1x10^{-5}$ rad/s²
Moment of inertia	$2x10^{-7}$kg • m²
Operational torque @ ambient temperature1.) 2.	≤ 0.98 Ncm
Operating temperature range	-10..+70 °C
Storage temperature range	-30..+80 °C
Protection grade (IEC 60529)	IP50
Vibration (IEC 68-2-6, Test Fc)	10..55 Hz / 1,5 mm; X, Y, Z, each 2h
Shock (IEC 68-2-27, Test Ea)	490 m/s², 11ms, X, Y, Z, each 3x

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Mechanical and Environmental Data, Miscellaneous		
Housing diameter	28 mm	
Housing depth	Voltage output (NPN), Open Collector output (K) 30 mm	Linedriver (N) 35 mm
Shaft diameter	5 mm	
Shaft type	Solid shaft	
Max. radial load	< 9.8 N	
Max. axial load	< 4.9 N	
Connection type	Round cable 0.5 m	
Connection position	Axial	
Sensor mounting	Insert nuts 2 x M3 depth 4	
Mass	ca. 60 g	
Fastening parts included in delivery	None	
Material shaft	Stainless steel	
Material housing	Aluminium	
Material disc	Metal	
Immunity ESD, human body model (MIL-STD-883, Method 3015.8)	±4 kV (contact) ±8 kV (air)	

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						
Series	**MOZ30**						
Shaft diameter, shaft length:							
Standard: Ø5 x 12 mm		**-**					
Option shaft length in mm		*Ax,xx*					
Option shaft diameter in mm (≤5 mm)		*Dx,xx*					
Resolution in pulses per revolution:							
Option 36 ppr.			*36*				
Option 50 ppr.			*50*				
Option 60 ppr.			*60*				
Option 100 ppr.			*100*				
Option 150 ppr.			*150*				
Option 200 ppr.			*200*				
Option 250 ppr.			*250*				
Option 300 ppr.			*300*				
Standard: 360 ppr.			**360**				
Option 400 ppr.			*400*				
Standard: 500 ppr.			**500**				
Option 512 ppr.			*512*				
Option 600 ppr.			*600*				
Option 800 ppr.			*800*				
Option 1000 ppr.			*1000*				
Standard: 1024 ppr.			**1024**				
Option 1500 ppr.			*1500*				
Supply voltage:							
Option supply voltage 5 V ±10 % & voltage output (NPN)				*5*		*NPN*	
Option supply voltage 12 V ±10 % & voltage output (NPN)				*12*		*NPN*	
Option supply voltage 5 V ±10 % open collector output (K)				*5*		*K*	
Option supply voltage 12 V ±10 % & open collector output (K)				*12*		*K*	
Standard: Supply voltage 24 V ±10 % & Open Collector output (N)				***24***		**K**	
Option supply voltage 5 V ±5 % & linedriver output (N)				*5*		*N*	
Output signal:							
Standard: A+B+Z (Index)					**BZ**		
Electrical connection:							
Standard: Round cable 0.5 m							**-**
Option round cable 1 m							*R1*
Option round cable 3 m							*R3*
Option user defined cable length in m							*Rx,xx*

Order example MOZ30

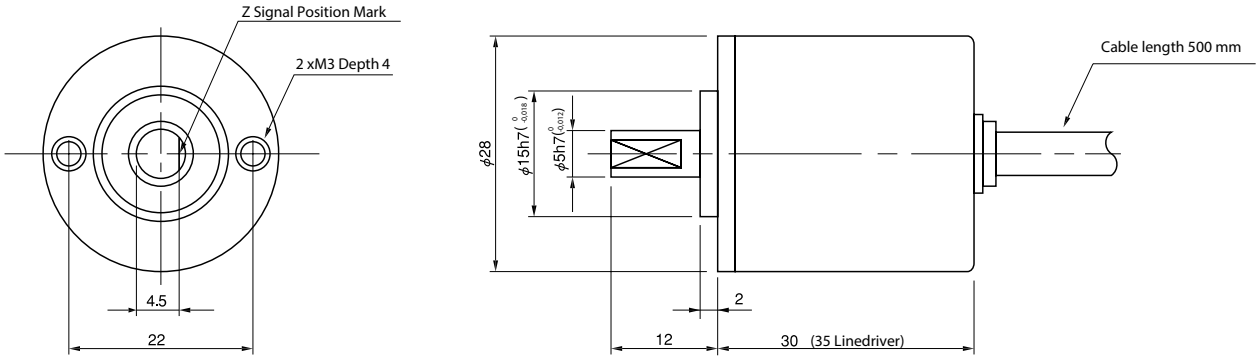
Requirement:
Shaft diameter 5 mm, shaft length 12 mm, 360 pulses per revolution, supply voltage 24 V ±10 %, 2 channels + index, open collector electronic, round cable 0,5m

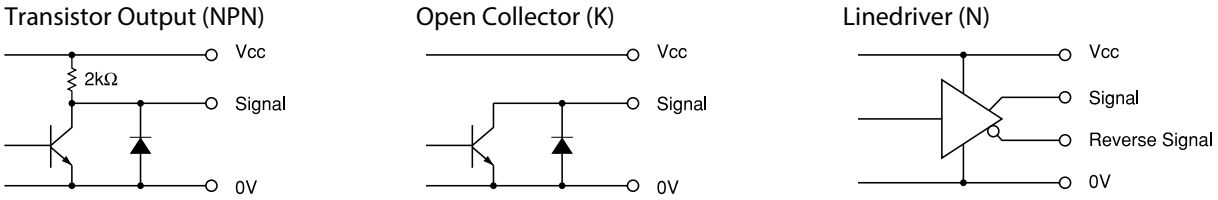
Example for order coder: MOZ30 360 24 BZ K

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

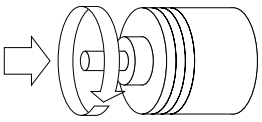
Technical Drawing





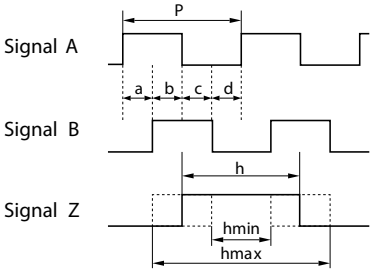
Wave Form

CW → Rotating Toward Clockwise Viewed from an Arrow



Rising point of A-Signal is always at one point while Z-Signal is at H-Level in CW.

NPN and K

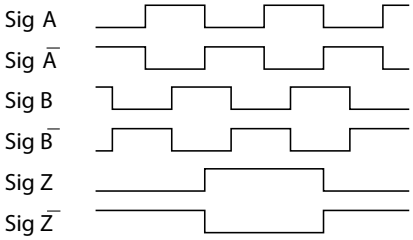


$$P = \frac{1}{\text{Resolution}}$$

$$a, b, c, d = \frac{P}{4} \pm \frac{P}{8} \quad \frac{P}{2} \leqq h \leqq \frac{3P}{2}$$

Wave Ratio (Duty); 50 ± 25 (%)

N



Electrical Connections

NPN and K

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

N

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

Dimensions in mm