Data Sheet for Angle Sensors

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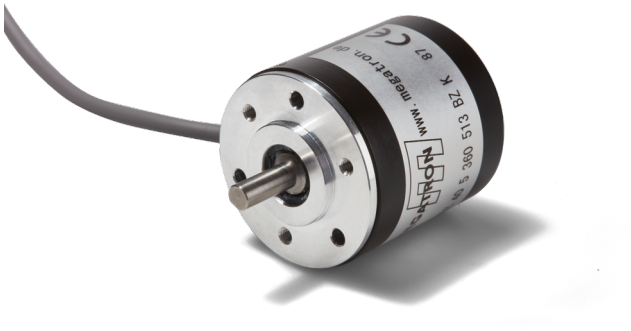
MEGATRON

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					A, /A, B, /B, Z, /Z
Number of pulses	20..3600 pulses per rev.					
Output voltage high	Vcc-1 min	----		Vcc-1 V min	Vcc-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/s²
Moment of inertia	$1.2x10^{-6}$kg • m²
Operational torque @ ambient temperature 1.) 2.)	≤ 0.049 Ncm
Operating temperature range	-10..+70 °C
Storage temperature range	-30..+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/s², 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 options=grey/cursive						
Series	**MOZ40**						
Shaft diameter / shaft length:							
Ø8 x 15 mm		**8**					
Option Ø6.35 x 15 mm		*6,35*					
Option Ø6 x 15 mm		**6**					
Option Ø5 x 15 mm		*5*					
Option shaft length in mm		*Ax,xx*					
Option shaft diameter in mm (≤5 mm)		*Dx,xx*					
Resolution in pulses per revolution:							
Option 20 ppr.			*20*				
Option 30 ppr.			*30*				
Option 32 ppr.			*32*				
Option 40 ppr.			*40*				
Option 50 ppr.			*50*				
Option 60 ppr.			*60*				
Option 100 ppr.			*100*				
Option 125 ppr.			*125*				
Option 200 ppr.			*200*				
Option 250 ppr.			*250*				
Option 256 ppr.			*256*				
Option 300 ppr.			*300*				
360 ppr.			**360**				
Option 400 ppr.			*400*				
500 ppr.			**500**				
Option 512 ppr.			*512*				
Option 600 ppr.			*600*				
Option 800 ppr.			*800*				
Option 900 ppr.			*900*				
Option 1000 ppr.			*1000*				
1024 ppr.			**1024**				
Option 1200 ppr.			*1200*				
Option 1500 ppr.			*1500*				
Option 1800 ppr.			*1800*				
Option 2000 ppr.			*2000*				
Option 2048 ppr.			*2048*				
Option 2500 ppr.			*2500*				
Option 3600 ppr.			*3600*				
Supply voltage / output:							
Standard: supply voltage 12 V (10.8..26.4 V/DC) & push pull output (B)				**1224**		**B**	
Option supply voltage 5 V (4.5..13.2 V/DC) & voltage output (NPN)				*0505*		*NPN*	
Option Supply voltage 5 V (4.5..13.2 V/DC) & open collector output K				*0512*		*K*	
Option supply voltage 12 V (10.8..26.4 V/DC) & open collector output HK				*1224*		*HK*	
Option supply voltage 5 V (4.75..5.25 V/DC) & linedriver output (N)				*05*		*N*	
Option supply voltage 12 V (10.8..26.4 V/DC) & PNP output (PNP)				*1224*		*PNP*	
Output signal: A+B+Z (Z=Index)					**BZ**		
Electrical connection:							
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*

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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

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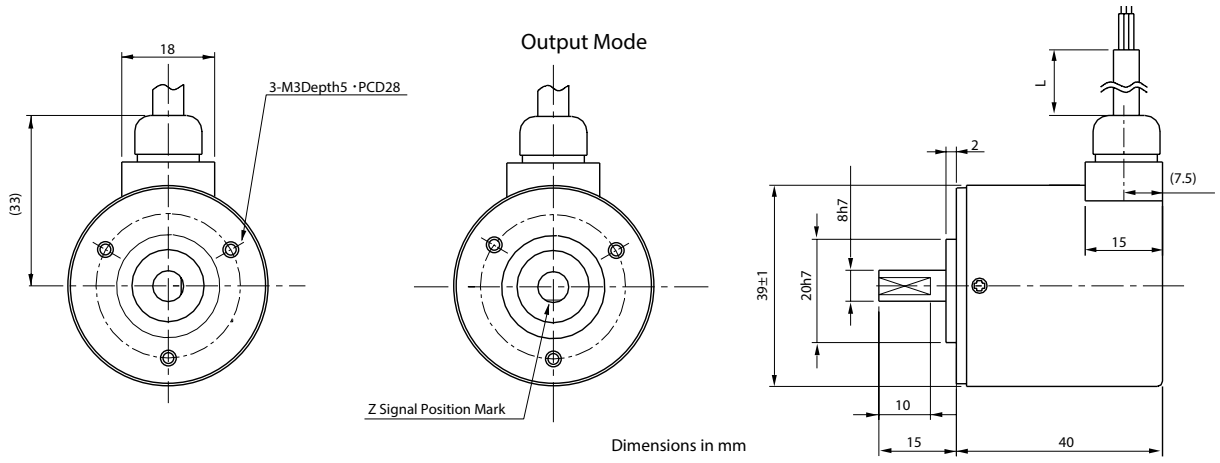
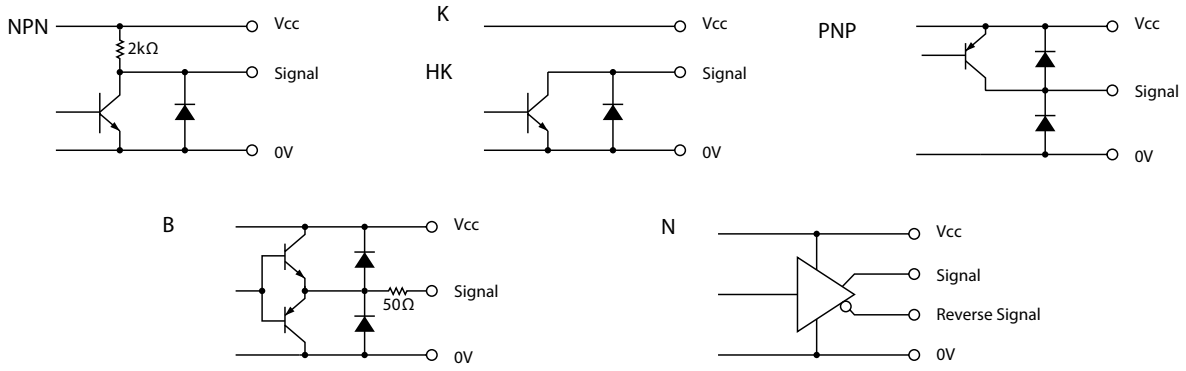
Technical Drawing



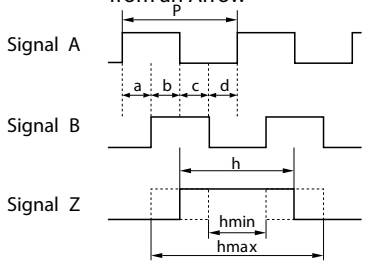
Dimensions in mm

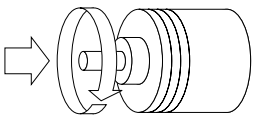
Output Circuit



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.

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

$$\frac{P}{2} \leqq h \leqq \frac{3P}{2}$$

$$a, b, c, d = \frac{P}{4} \pm \frac{P}{8}$$

Wave Ratio (Duty); 50 ± 25 (%)

N has reverse signal of Signal A,B,Z.

Electrical Connections

NPN
K
HK
PNP
B

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 $\overline{B}$
Black	0V	Gray	Signal B
Green	Signal $\overline{A}$	Yellow	Signal $\overline{Z}$
Blue	Signal A	Orange	Signal Z
Shield	NC		