

Data Sheet for Angle Sensors

Optical Encoders

Series MHL40



- Optical resolution 10 bis 5000 pulses per revolution
- Metal housing, ball bearing
- 40mm housing diameter
- 6, 8, 10, 12 mm shaft diameter
- Output: Voltage, open collector, linedriver, push pull
- 2m signal cable

Spring plate mounting reduces the effects of radial and axial shaft eccentricity. The robust design of the MHL40 has been proven in hundreds of applications over many years. Where high reliability and long life are required, the MHL40 is recommended.

Electrical Data	Push Pull "B"	Open Collector "K"	Voltage Output "V"	Line Driver "N"
Output channels	A, B, Z			-
Number of pulses	10 to 5000 pulses per rev. (other pulses per revolution on request)			
Output voltage low	Residual voltage 0.4 VDC			Residual voltage max. 0.5 VDC
Output voltage high	@VSUP=5 VDC VSUP -2.0 VDC @VSUP12 to 24 VDC min. VSUP -3.0 VDC	Residual voltage max. 0.4 VDC	Residual voltage max. 0.4 VDC	@VSUP=5 VDC min. 2.5 VDC @VSUP 12 to 24 VDC min. VSUP -3.0 VDC
Limit frequency	300 kHz			
Supply voltage	12 to 24 VDC ±5 % 5 VDC ±5 %			
Current consumption (no load)	≤ 80 mA		≤ 50 mA	
Output load	(High) max. 30 mA (Low) max. 10 mA	max. 30 mA	max. 10 mA	(High) max. -20 mA (Low) max. 20 mA
Insulation voltage 1.)	≥ 100 MOhm @ 500 VDC			
Insulation resistance 1.)	750 VAC (1 min.)			
Output electronics	Push Pull	Open Collector NPN	Voltage output V	Linedriver
Switch-on delay	max. 1 µs			max. 0.5 µs

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Mechanical and Environmental Data, Miscellaneous

Mechanical angle of rotation/stroke 1.)	360° without stop
Bearing	Ball bearing
Max. operational speed	5000 rpm
Operational torque @ RT 1.) 2.)	≤ 0.4 Ncm
Operating temperature range	-10°C up to +70°C
Storage temperature range	-25°C up to +85°C
Protection grade (IEC 60529) standard	IP50
Vibration (IEC 68-2-6, Test Fc)	10 to 55 Hz (1 min.); 1.5 mm; each 2 h in X, Y, Z
Shock (IEC 68-2-27, Test Ea)	max. 50G
Housing diameter	40 mm
Housing depth	32 mm
Shaft diameter	Applicable for 6, 8, 10, 12 mm shaft diameter
Shaft type	Solid shaft
Max. radial load	< 19.61 N
Max. axial load	< 9.81 N
Connection type	Standard: round cable 2 m, Ø5 mm Option: 250 mm, Ø5 mm signal cable with plug (standard: 6 pol., linedriver: 8 pol.)
Connection position	Radial
Sensor mounting	Threaded holes in the sensor front (screws not included in delivery) or bracket
Mass	app. 120 g
Fastening parts included in delivery	Bracket included
Material shaft	Stainless steel
Material housing	Aluminium
Material disc	Plastic
Immunity ESD	± 4 kV (CE standard)

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	MHL40						
For shaft diameter							
Ø6 mm		6					
Ø8 mm		8					
Ø10 mm		10					
Ø12 mm		12					
Resolution in pulses per revolution							
10 ppr.				10			
50 ppr.				50			
100 ppr.				100			
256 ppr.				256			
360 ppr.				360			
500 ppr.				500			
1000 ppr.				1000			
1024 ppr.				1024			
1200 ppr.				1200			
1500 ppr.				1500			
1800 ppr.				1800			
2000 ppr.				2000			
2048 ppr.				2048			
2500 ppr.				2500			
3000 ppr.				3000			
3600 ppr.				3600			
5000 ppr.				5000			
Supply voltage							
12 to 24 V					1224		
5 V					5		
Output signal							
A + B + Z						BZ	
Output electronics							
Push Pull							B
Open collector NPN							K
Voltage output							V
Line driver							N
Housing options							
Without through-hole, blind hole depth 27 mm							A
With through-hole							B
Electrical Connection (radial)							
Round cable 2 m cable length							-
Round cable with plug (0.25 m cable length)							ST
Round cable user defined cable length [x.xx meter] without plug							CVRX,XX
Round cable user defined cable length[x.xx meter] with plug							CVRX,XX ST

(*) The option VSUP 5 V can be linked to a minimum order quantity in conjunction with the options B, K, V.
Please inquire the minimum order quantity in combination with the desired product order code from MEGATRON.

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Series MHL40

Order example MHL40

Requirement:

Shaft diameter 6 mm, resolution 360 pulses per revolution, supply voltage 12 to 24 V, 2 channels A+B and Index, output electronics line driver, without through-hole, 2 m signal cable length

Example for order code: MHL40 6 360 1224 BZ N A

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

For example:

- Other resolutions
- Special cable length
- Special cable and connector design

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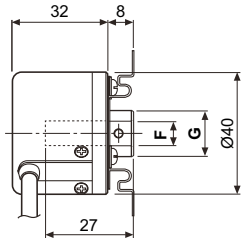
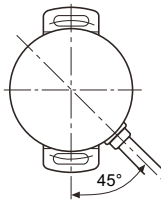


Optical Encoders

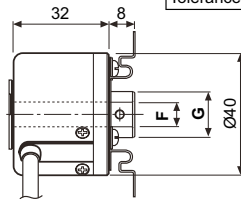
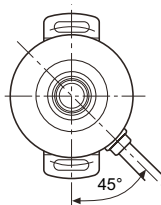
Series MHL40

Drawing

Without through-bore option A

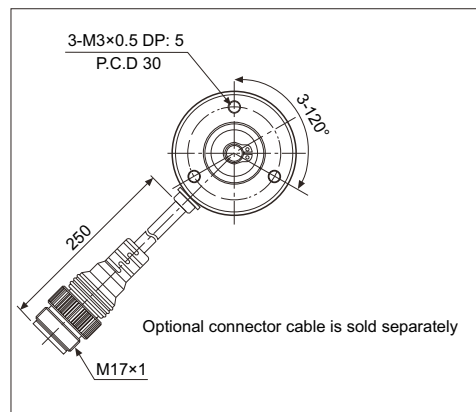
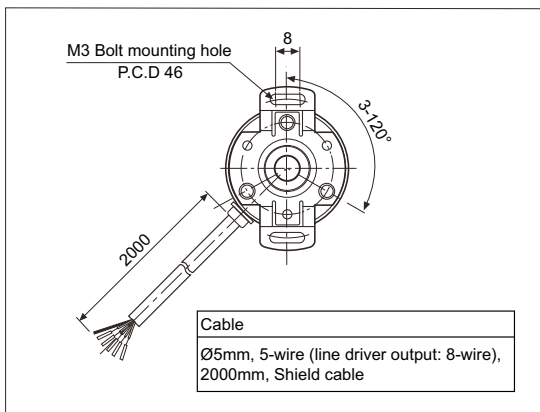
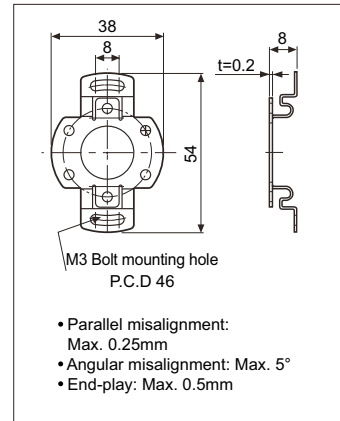


With through-bore option B

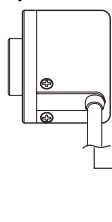


F	Ø6	Ø8	Ø10	Ø12
G	Ø15		Ø17	
Tolerance	+0.015 0			

Dimensions in mm

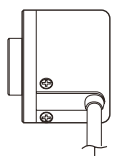


Totem pole output / NPN open collector output / Voltage output



- Black: OUT A
- White: OUT B
- Orange: OUT Z
- Brown: +V (5VDC, 12-24VDC ±5%)
- Blue: GND (0V)
- Shield: F.G.

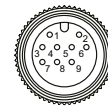
Line driver output



- Black: OUT A
- Red: OUT \bar{A}
- White: OUT B
- Gray: OUT \bar{B}
- Orange: OUT Z
- Yellow: OUT \bar{Z}
- Brown: +V (5VDC, 12-24VDC ±5%)
- Blue: GND (0V)
- Shield: F.G.

The metal case and shield wire of encoder should be grounded (F.G.).
Unused wires must be insulated.

Totem pole output / NPN open collector output / Voltage output



Totem pole output/ NPN open collector output/ Voltage output			Line driver output		
Pin No	Function	Cable color	Pin No	Function	Cable color
①	OUT A	Black	①	OUT A	Black
②	OUT B	White	②	OUT \bar{A}	Red
③	OUT Z	Orange	③	+V	Brown
④	+V	Brown	④	GND	Blue
⑤	GND	Blue	⑤	OUT B	White
⑥	F.G.	Shield	⑥	OUT \bar{B}	Gray
			⑦	OUT Z	Orange
			⑧	OUT \bar{Z}	Yellow
			⑨	F.G.	Shield

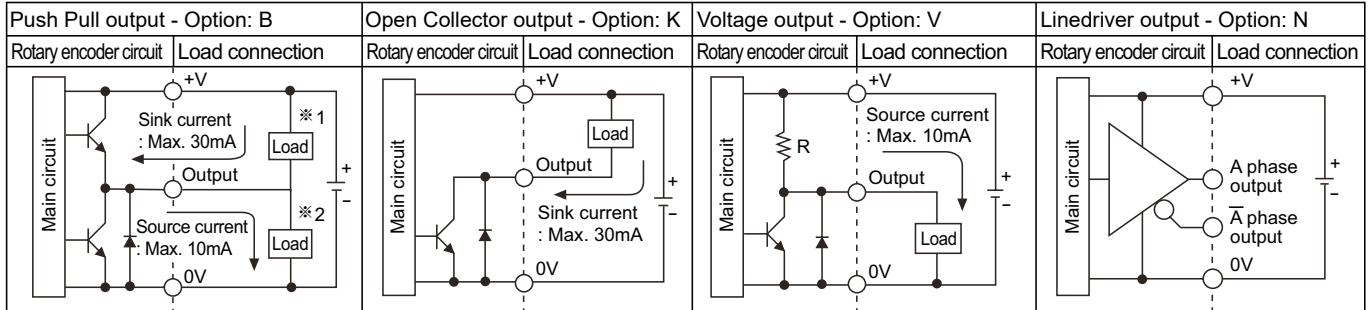
F.G. (field ground): It should be grounded separately.

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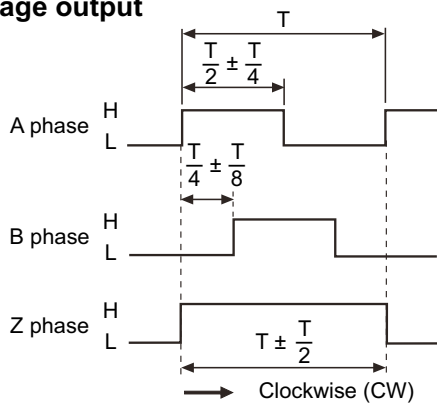
Series MHL40

Output Diagram



Output Waveform

Push-Pull output /
Open collector output /
Voltage output



※ Z reverse phase output is optional.

Line driver output

