

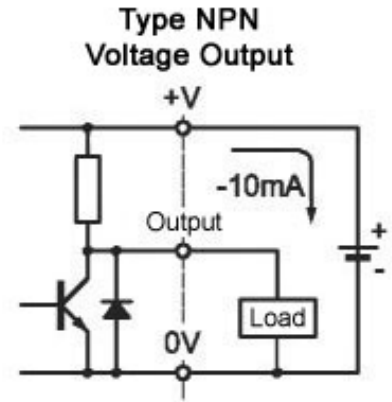
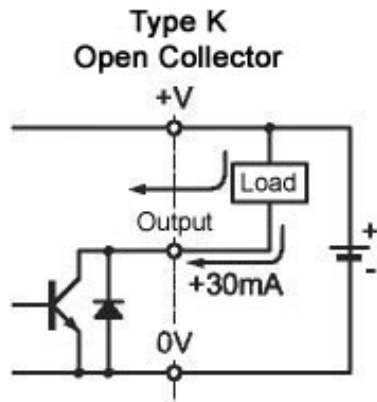
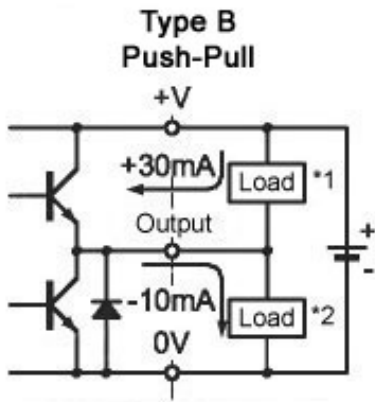
- **Hollow Shaft**
- **2 Channels w/ Reference Pulse**
- **40mm Diameter**
- **5000 RPM**
- **10 to 3600 PPR**
- **Supply Voltage: 5V, 12 to 24V**



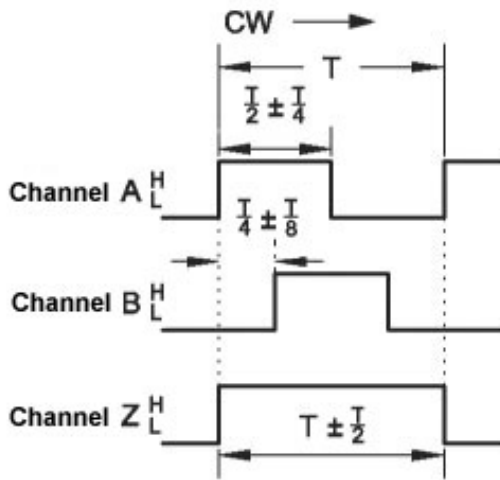
The MHL40 series incremental encoder is characterized by economy, high resolution and very long life. Rugged design features aluminum housing, metal shaft and ball bearings making it ideal for applications where a high quality encoder with long life is required. Four output types to choose from; "Push-Pull", "Open Collector", "Voltage" & "Linedriver".

Electrical Specifications	B	K	NPN	N
Resolution (PPR)	10, 20, 50, 100, 360, 500, 1000, 1024, 2000, 2048, 2500, 3600			
Channels	A, B, Z			A, /A, B, /B, Z, /Z
Frequency Response	180 kHz			
Supply Voltage	5VDC ±5% or 12~24VDC ±5%			5VDC ±5%
Current Consumption (no load)	60mA			50mA
Insulation Resistance	Min. 100 Mohms @ 500VDC			
Dielectric Strength	750VAC, 1 minute (between all terminals and case)			
Output Voltage - High	See charts below			
Output Voltage - Low				
Sink Current				
Signal Risetime				
Mechanical Specifications				
Moment of Inertia	40g · cm <sup>2</sup>			
Max Slewing Speed	5000 RPM			
Starting Torque	50 gf-cm max.			
Shaft Loading	Axial: 1kgf max. / Radial: 2kgf			
Play of Shaft	Axial: 0.2mm max. / Radial: 0.1mm max.			
Weight	120 grams			
Environmental Specifications				
Operating Temperature	-10°C to +70°C			
Storage Temperature	-25°C to +85°C			
Humidity	85% RH			
Vibration	10 - 55 Hz, 1.5mm, 2 hrs.			
Shock	50G max.			
Protection Grade	IP 50			
Materials				
Housing	Aluminum			
Shaft	Stainless Steel			

## Schematic and Output Waveform for Type B, K & NPN



**Output Waveform Type B, K, NPN**



Control Output Characteristics				
Type	Low		High	
	Current	Voltage	Current	Voltage
<b>B</b>	30mA	0.4V max.	10mA	V <sub>cc</sub> -1.5V min.
<b>K</b>	30mA	0.4V max.	30mA	V <sub>cc</sub>
<b>NPN</b>	10mA	0.4V max.	10mA	V <sub>cc</sub>

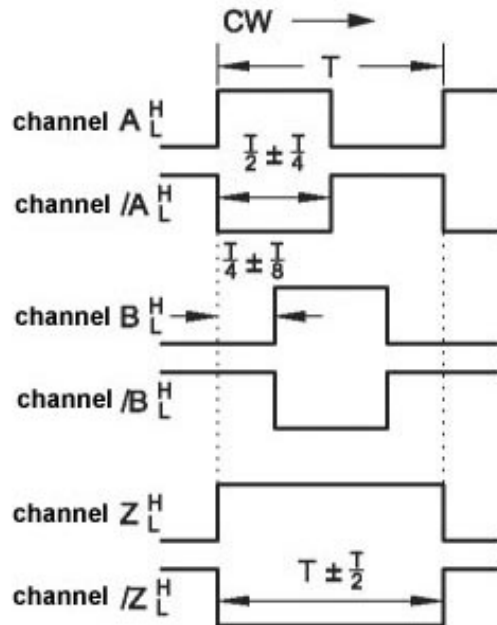
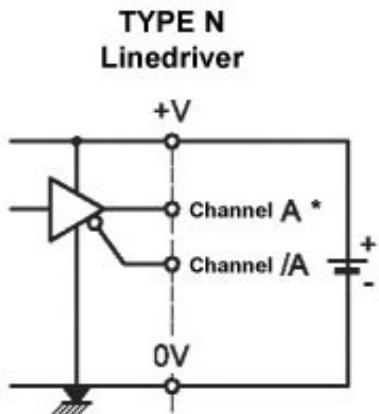
  

Type	Signal Response Time (Rise/Fall)	
<b>B</b>	1μS max.	
<b>K</b>	1μS max.	
<b>NPN</b>	1μS (5VDC: Output resistance 820Ω) 2μS (12-24VDC: Output resistance 4.7KΩ)	

Cable Connections		
Brown: V+	Black: Channel A	White: Channel B
Orange: Channel Z	Blue: 0V (Gnd)	Shield

## Schematic and Output Waveform for Type N (Linedriver)



\* channel B and Z are the same as shown

Control Output Characteristics			
Low		High	
Current	Voltage	Current	Voltage
20mA	0.5V max.	-20mA	2.5V

Signal Response Time (Rise/Fall)	
0.5μS max.	Based on cable length of 2m and 20mA max. sink current

Cable Connections	
Brown: V+ (5V)	Orange: Channel Z
Black: Channel A	Yellow: Channel /Z
Red: Channel /A	Blue: 0V (GND)
White: Channel B	Shield
Gray: Channel /B	

