



# RCH50 Hollow-Shaft Encoders



The RCH50 incremental hollow-shaft encoders are designed to provide position and velocity data for high-performance servo-motor applications. The through-shaft design with self-contained bearings allows the encoder to accommodate large amounts of axial and radial movement of the motor shaft. The encoder internal bearings also maintain precise alignment of the encoder optical components facilitating high accuracy and resolution. The top or bottom clamp shaft attachment makes for easy installation into your servo-motor. RCH50 encoders include optional commutation signals for control of brushless motors, the slotted hole pattern on the spring adapter allows  $\pm 15^\circ$  rotation of the encoder to align the commutation tracks with the motor poles. Differential line driver outputs and resolutions up to 5000 cycles per revolution are available in this compact unit.

### Features:

- 50mm O.D. [1.97 inch] • Line count up to 5000
- 2 data channels in quadrature
- Once around index pulse
- 3 commutation channels (optional)
- Flexible mounting plate can accommodate large axial shaft movement
- Opto-Asic technology
- 300 KHz frequency response

### Environmental:

<b>Operating Temp</b>	-10° to 100°C
<b>Excursion Limits:</b>	
<b>Storage Temp</b>	-30° to 110°C
<b>Shock</b>	100 G's for 6mS
<b>Vibration</b>	25–3000 Hz @ 20 G's

### Mechanical:

<b>Moment of Inertia</b>	25.42 g-cm <sup>2</sup> [36 x 10 <sup>-5</sup> oz-in sec <sup>2</sup> ]
<b>Weight</b>	125 g [4.4 oz]
<b>Base Material</b>	Aluminum
<b>Cover Material</b>	PET 530 or Metal Filled PC
<b>Disc Material</b>	Glass
<b>Shaft Material</b>	Stainless Steel
<b>Motor End Play</b>	+0.762, -1.27 [+0.030", -0.050"] (increasing spring height)
<b>Shaft Run Out</b>	.127mm [0.005"] TIR
<b>Mounting Hardware</b>	Not supplied

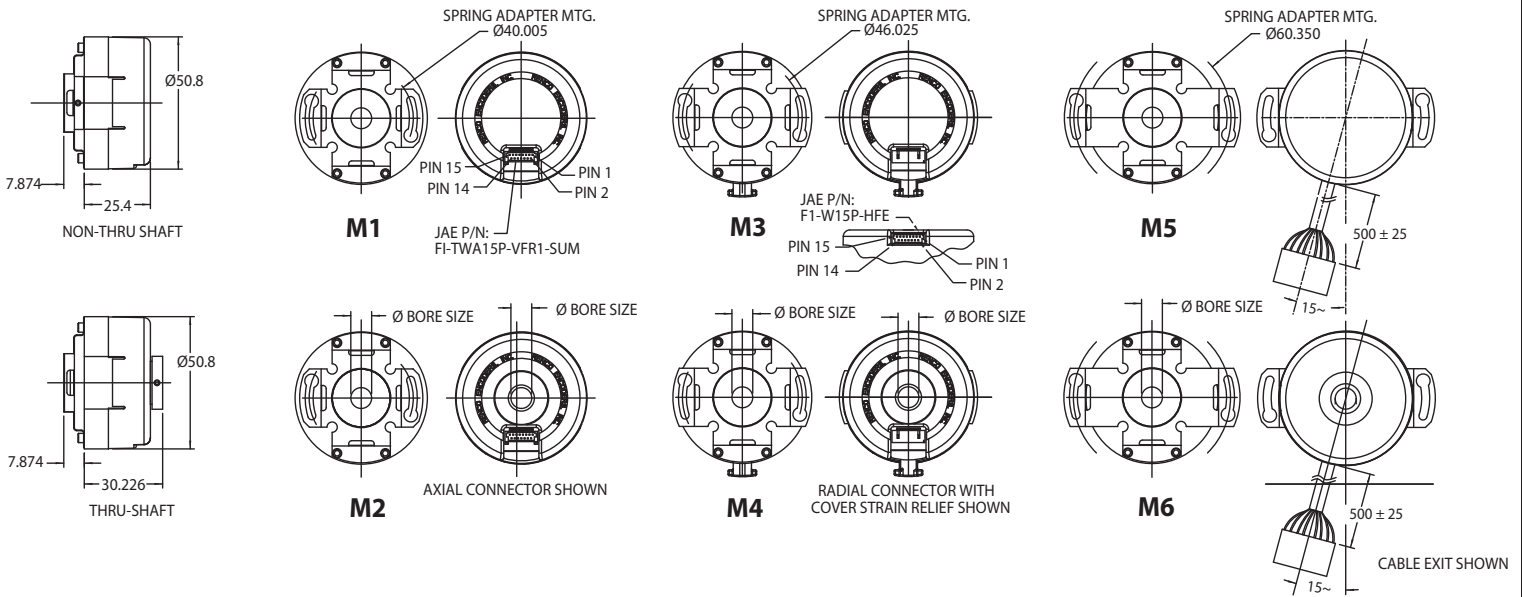
### Electrical:

<b>Signals</b>	Incremental with optional commutation
<b>Input Voltage</b>	5.0 VDC $\pm$ 10%, <b>5/0</b> = Single Supply or <b>5/5</b> = Dual Supply(not available with Cable Exit)
<b>Current (mA)</b>	<b>LD/LD:</b> 180 mA Max., <b>LD/VC:</b> 128 mA Max., <b>LD/VO:</b> 128 mA Max., <b>LD/O:</b> 120 mA Max., <b>VC/VC,VO/VO,VC/VO:</b> 76 mA Max. <b>VO/O,VC/O:</b> 68 mA Max.
<b>Output Format</b>	A/B in phase quadrature. INDEX width & location gated with respect to data.
<b>Output Type</b>	LD = AM26C31 20 mA Source or Sink Max. VO = Open Collector 4 mA Sink Max. VC = Open Collector w/ 2K Ohm pull-ups 4mA Sink Max.
<b>Output Logic Levels</b>	Logic 0 = 0.5 V Max, Logic 1 = 2.5 V Min..
<b>Operating Frequency</b>	To 300 KHz

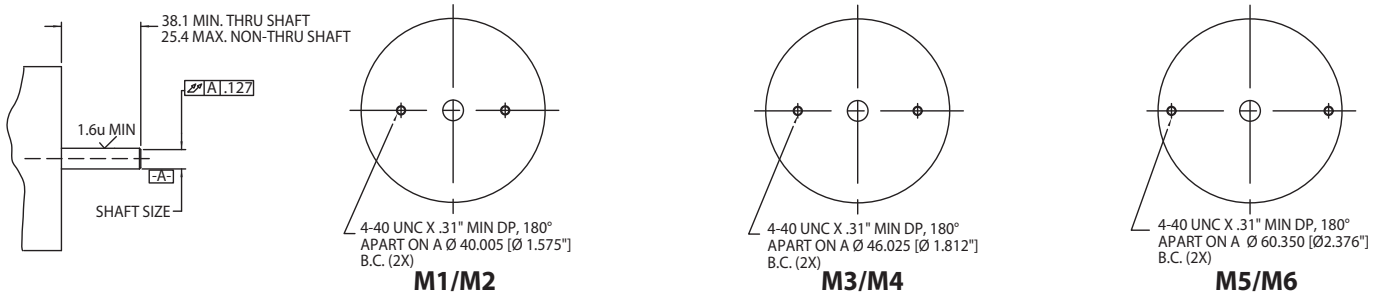
### Resolution:

<b>Line Count</b>	250, 256, 500, 512, 1000, 1024, 2000, 2048, 2500, 4000, 4096, 5000
<b>Commutation</b>	0, 2, 3, 4
<b>Index Gating</b>	1 = Index Gated with A & B, Index width 90° $\pm$ 45° (LD only) 6 = Index Gated with A- & B-, Index width 90° $\pm$ 45°

## Mechanical Dimensions



## Mounting Requirements



## Pin Functions

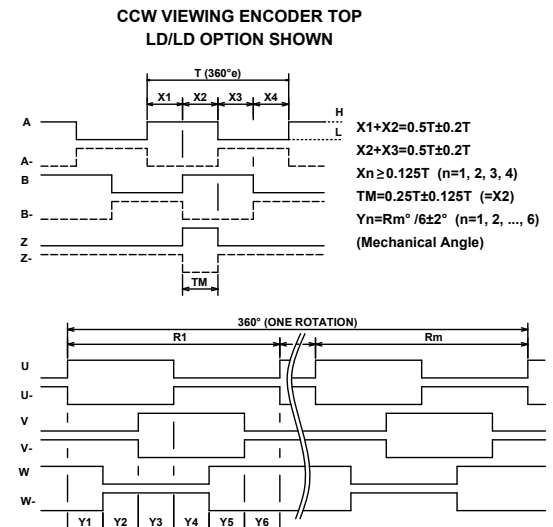
PIN NO	CONNECTOR OPTION		CABLE OPTION	
	LD/LD*	LD/VC, LD/VO*	LD/0*	VC/VC, VO/VO VC/VO*
1	A	A	A	A
2	A-	A-	A-	B
3	B	B	B	Z
4	B-	B-	B-	U
5	Z	Z	Z	V
6	Z-	Z-	Z-	W
7	U	U	+5V	+5V
8	U-	GND2	GND	GND
9	V	V		
10	V-	+5V2		
11	W	W		
12	W-	W-		
13	+5V	+5V		
14	GND	GND		
15	CASE GND	CASE GND		

\* For pinout of other output options, contact factory.

## Bore Size

SPECIFY	HUB SIZE +0.01 -0	SHAFT SIZE +0 -0.013
3/16	4.757	4.754
1/4	6.345	6.342
3/8	9.52	9.517
1/2	12.695	12.692
5mm	5	4.997
6mm	6	5.997
7.5mm	7.5	7.497
8mm	8	7.997
10mm	10	9.997
12mm	12	11.997

## Phase Quadrature



## Output Format

DATA / COMM
LD/LD, LD/VC, LD/VO, LD/0, VC/VC, VO/VO, VC/VO, VO/0, VC/0

## Connector or Cable Option

CONNECTOR OPTION	
A	Axial Connector
R	Radial Connector
RS	Radial Connector w/ Strain Relief
CABLE OPTION	
CA500	500 mm Integral Cable
CA1000	1000 mm Integral Cable

## Cover Option

NC = Non-Conductive
CC = Conductive Cover (use with Cable Option only)

## Case Ground Option

GND1 = No Connection GND to CASE GND
GND2 = Direct Connection GND to CASE GND
GND3 = Enhanced Noise Suppression (use with CC cover option)

## Ordering Information

**RCH50i** - \_\_\_\_\_ / \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_ / \_\_\_\_\_ - 5 / \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_ - **M** \_\_\_\_\_ - \_\_\_\_\_  
 RESOLUTION See Front Page    COMMUTATION See Front Page    BORE SIZE    OUTPUT FORMAT    5/0 Single Supply    GATING OPTION See Front Page    CONNECTOR or CABLE    COVER    MOUNTING    CASE GROUND