H6 Ball Bearing Optical Shaft Encoder

RoHS COMPLIANT

Description

The H6 series ball bearing optical shaft encoder has a molded polycarbonate housing,and utilizes either a 5-pin or 10-pin finger-latching connector. This non-contacting rotary to digital converter is designed to provide digital feedback information.

The H6 is fully assembled with a brass shaft, two 1/4" ID by 1/2" OD heavy duty ball bearings and a mounting plate. The mounting plate comes with 2 mounting holes for screws #4 or smaller.

A secure connection to the H6 series encoder is made through a 5-pin (single-ended versions) or 10-pin (differential versions) finger-latching connector (sold separately). The mating connectors are available from US Digital with several cable options and lengths.

For differential versions: the internal differential line driver (26C31) can source and sink 20mA at TTL levels. The recommended receiver is industry standard 26C32. Maximum noise immunity is achieved when the differential receiver is terminated with a 110-ohm resistor in series with a .0047 microfarad capacitor placed across each differential pair. The capacitor simply conserves power; otherwise power consumption would increase by approximately 20mA per pair, or 60mA for 3 pairs.

Features

- Heavy duty ball bearings track up to 10,000 RPM
- 2-channel quadrature, TTL squarewave outputs
- Optional index (3rd channel)
- Differential outputs available
- Optional Agilent compatible pin-out
- Positive finger-latching connector
- 64 to 2500 cycles per revolution (CPR)
- 256 to 10,000 pulses per revolution (PPR)
- Tracks from 0 to 100,000 cycles/sec
- -40 to +100C operating temperature

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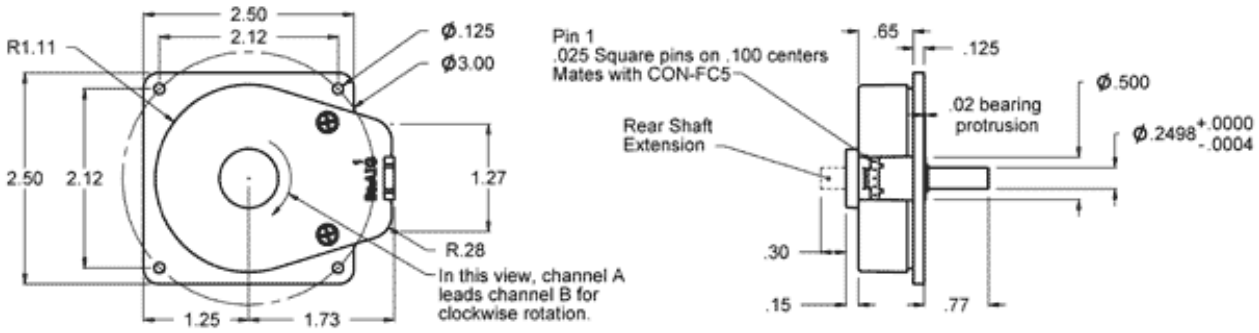
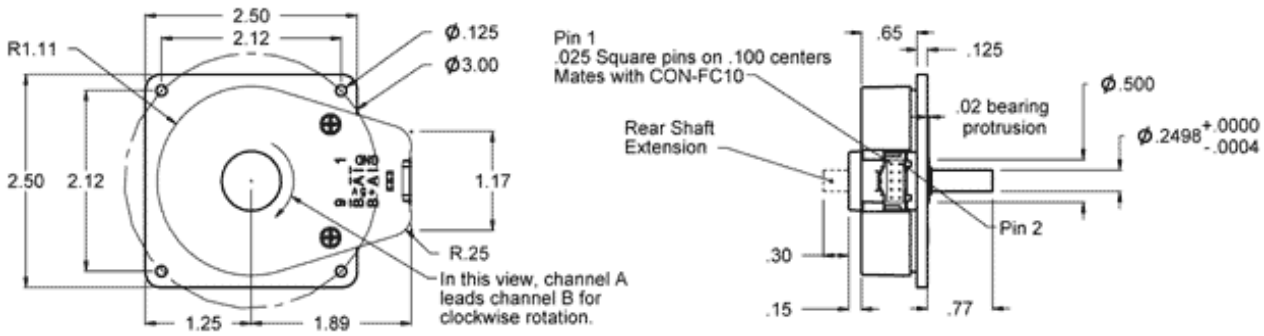
H6 Single-ended



H6 Differential



Mechanical

Parameter	Dimension / Units
Shaft Speed	10,000 RPM max. continuous
Acceleration	10,000 rad/sec²
Shaft Torque	0.05 in. oz. max.
Shaft Loading	2 lbs. max.
Bearing Life	$(90/P)^3$ = life in millions of revs. where P = radial load in pounds.
Weight - Polycarbonate Single-ended (H6S)	3.02 oz.
Weight - Polycarbonate Differential (H6D)	3.15 oz.
Weight - Metal Single-ended (H6MS)	4.38 oz.
Weight - Metal Differential (H6MD)	4.58 oz.
Shaft Runout	0.006 T.I.R. max.

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Parameter	Dimension / Units
Moment of Inertia	0.001 oz. in. s^2
Vibration	5 Hz to 2 kHz, 20G

Phase Relationship

B leads A for clockwise shaft rotation, and A leads B for counterclockwise rotation viewed from the shaft side of the encoder (*see the EM1 / HEDS page*).

Single-ended Electrical

- Specifications apply over entire operating temperature range.
- Typical values are specified at Vcc = 5.0Vdc and 25 ° C.
- For complete details see the EM1 and HEDS product pages.

	Supply Current	Output voltage low	Output voltage high	
Resolution	Typ / Max	Max	Min	Based on
1000, 1024 CPR, non-index	17 / 40 mA	0.4 volts @ 3.2mA	2.4 volts @ -200uA	Low-res HEDS
2000, 2048 CPR, non-index	57 / 85 mA	0.5 volts @ 8mA	2.4 volts @ -40uA	High-res HEDS
64 CPR, with index	27 / 30 mA	0.5 volts @ 8mA	2.0 volts @ -8mA	EM1
1000, 1024 CPR, with index	57 / 85 mA	0.5 volts @ 8mA	2.4 volts @ -40uA	High-res HEDS
2000, 2048 CPR, with index	57 / 85 mA	0.5 volts @ 8mA	2.4 volts @ -40uA	High-res HEDS
2500 CPR, with index	55 / 57 mA	0.5 volts @ 8mA	2.0 volts @ -8mA	EM1

Differential Electrical

Specification	Min.	Typ.	Max.	Units	Notes
Supply	4.5	5.0	5.5	Volts	
Current Consumption					
Index: 64 CPR	-	28	53	mA	No load
Index: 1800, 2500 CPR	-	56	59	mA	No load
Index: All Other Resolutions	-	58	88	mA	No load
Non-index: <2000 CPR	-	18	43	mA	No load
Non-index: >=2000	-	58	88	mA	No load
Non-index: 2500	-	56	59	mA	No load
Output Voltage					
Sourcing to +5	2.4	3.4	-	Volts	@ -20mA
Sinking to Ground	-	0.2	0.4	Volts	@ 20mA

For complete details see the EM1 / HEDS page.

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Pin-out

5-pin Single-ended		10-pin Differential Standard		10-pin Differential (L-option*)	
Pin	Description	Pin	Description	Pin	Description
1	Ground	1	Ground	1	No connection
2	Index	2	Ground	2	+5VDC power
3	A channel	3	Index-	3	Ground
4	+5VDC power	4	Index+	4	No connection
5	B channel	5	A- channel	5	A- channel
		6	A+ channel	6	A+ channel
		7	+5VDC power	7	B- channel
		8	+5VDC power	8	B+ channel
		9	B- channel	9	Index-
		10	B+ channel	10	Index+

* Agilent compatible version.

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Ordering Information

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CPR	Index	Output
64	NE =*No Index, EM1 Compatible*	S =*Single-ended*
100	IE =*Index, EM1 Compatible*	D =*Differential*
200		
400		
500		
512		
1000		
1024		
1800		
2000		
2048		
2500		

Rules

- Index must be equal to NE when CPR is equal to 64

Notes

- Cables and connectors are not included and must be ordered separately.
- US Digital warrants its products against defects in materials and workmanship for two years. See complete warranty for details.

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