H6 Ball Bearing Optical Shaft Encoder

Description

The H6 series ball bearing optical shaft encoder has a molded plastic, glass-filled enclosure, which 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 ball bearings and a mounting plate. The mounting plate comes with two 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 150 Ω resistor in series with a .0047 µF 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

- Ball bearing option tracks to 10,000 RPM
- 2-channel quadrature, TTL squarewave outputs
- 3rd channel index option available on some resolutions
- 64 to 10,000 cycles per revolution (CPR)
- 256 to 40,000 pulses per revolution (PPR)
- Wide operating temperature

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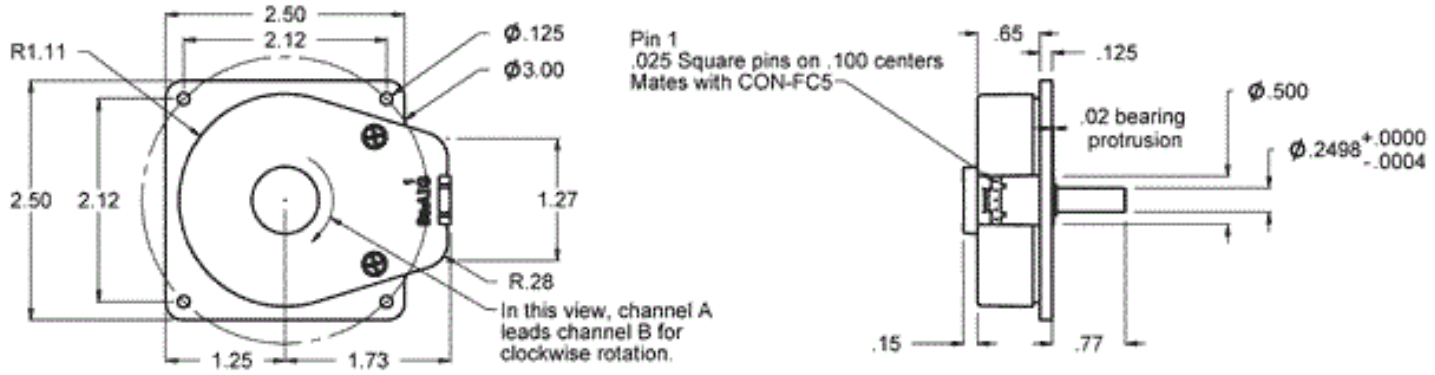
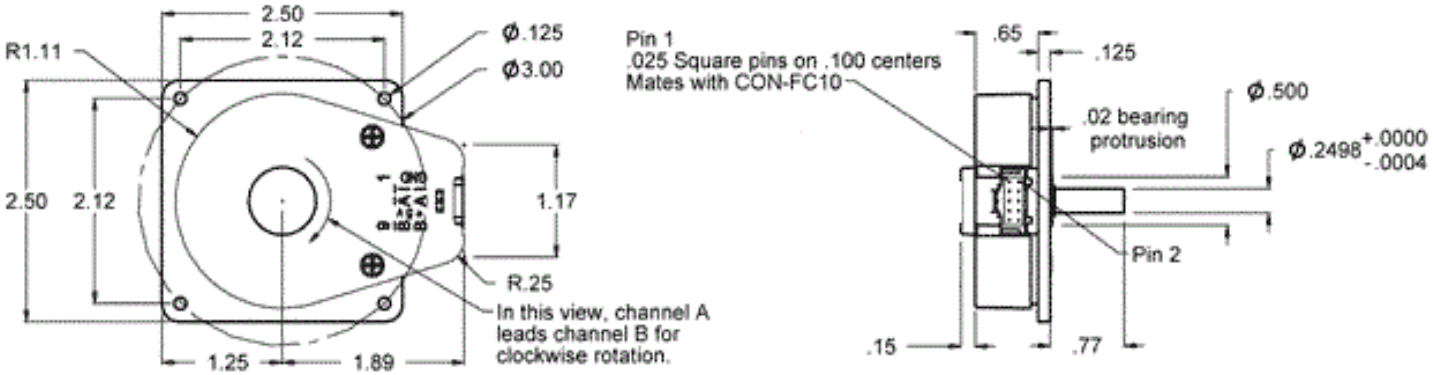
Rev. 160125171325

RoHS COMPLIANT

H6 Single-ended



H6 Differential



Environmental

Parameter	Value	Units
Operating Temperature (CPR < 3600)	-40 to 100	C
Operating Temperature (CPR ≥ 3600)	-25 to 100	C
Vibration (5Hz to 2kHz)	20	G
Electrostatic Discharge, IEC 61000-4-2	± 4	kV

Mechanical

Parameter	Dimension / Units
Max. Acceleration	100000 rad/sec²
Max. Shaft Speed	10000 rpm
Max. Shaft Torque	0.05 in-oz

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Parameter	Dimension / Units
Max. Shaft Loading	2 lbs.
Bearing Life	life in millions of revs. = $(90/P)^3$ where P = radial load in pounds.
Weight Single-ended Differential	 3.02 oz. 3.15 oz.
Max. Shaft Total Indicated Runout	0.006 in.
Moment of Inertia	0.001 oz-in-s²
Technical Bulletin TB1001 - Shaft and Bore Tolerances	Download

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 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 andEM2 product pages.

Parameter	Min.	Typ.	Max.	Units	Conditions
Supply Voltage	4.5	5.0	5.5	V	
Supply Current		27	33	mA	CPR < 1000, no load
		54	62	mA	CPR ≥ 1000 and < 3600, no load
		72	85	mA	CPR ≥ 3600, no load
Low-level Output			0.5	V	I_{OL} = 8mA max., CPR < 3600
			0.5	mA	I_{OL} = 5mA max., CPR ≥ 3600
		0.05		mA	no load, CPR < 3600
		0.25		mA	no load, CPR ≥ 3600
High-level Output	2.0			V	I_{OH} = -8mA max., CPR < 3600
	2.0			V	I_{OH} = -5mA max., CPR ≥ 3600
		4.8		V	no load, CPR < 3600
		3.5		V	no load, CPR ≥ 3600
Output Current Per Channel	-8		8	mA	CPR < 3600
	-5		5	mA	CPR ≥ 3600

Parameter	Min.	Typ.	Max.	Units	Conditions
Output Rise Time		110		nS	CPR < 3600
		50		nS	CPR ≥ 3600
Output Fall Time		35		nS	CPR < 3600
		50		nS	CPR ≥ 3600

Differential 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 EM2 product pages.

Parameter	Min.	Typ.	Max.	Units	Conditions
Supply Voltage	4.5	5.0	5.5	V	
Supply Current		29	36	mA	CPR < 1000, no load
		56	65	mA	CPR ≥ 1000 and < 3600, no load
		74	88	mA	CPR ≥ 3600, no load
Low-level Output		0.2	0.4	V	I_{OL} = 20mA max.
High-level Output	2.4	3.4		V	I_{OH} = -20mA max.
Differential Output Rise/Fall Time			15	nS	

Pin-out

5-pin Single-ended

Pin	Description
1	Ground
2	Index
3	A channel
4	+5VDC power
5	B channel

10-pin Differential Standard

Pin	Description
1	Ground
2	Ground
3	Index-
4	Index+
5	A- channel
6	A+ channel
7	+5VDC power
8	+5VDC power
9	B- channel
10	B+ channel

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Ordering Information

H6 - [ ] - [ ] - [ ]

CPR	Index	Output
64 =	NE =*No Index*	S =*Single-ended*
100 =	IE =*Index*	D =*Differential*
200 =		
400 =		
500 =		
512 =		
1000 =		
1024 =		
1800 =		
2000 =		
2048 =		
2500 =		
3600		
4000		
4096		
5000		
7200		
8000		
8192		
10000		

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.

Base Pricing

Quantity	Price
1	$112.50
5	$83.30
10	$72.35

For volume discounts, please contact us at sales@usdigital.com or 800.736.0194.

- Add 18% per unit for **CPR** of 3600 , 4000 , 4096 , 5000 , 7200 , 8000 , 8192 or 10000
- Add 16% per unit for **Output** of Differential

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