

## 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.

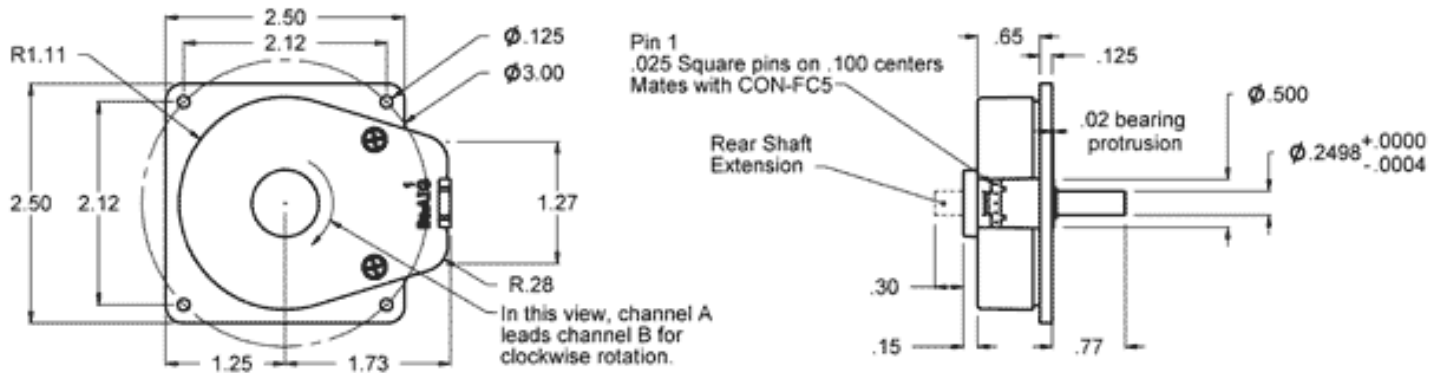
For differential versions: the internal differential line driver (26C31) can source and sink 20mA at TTL levels. The recommended receiver is industry standard 26C32. Maximum noise immunity is achieved when the differential receiver is terminated with a 110-ohm resistor in series with a .0047 microfarad 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.



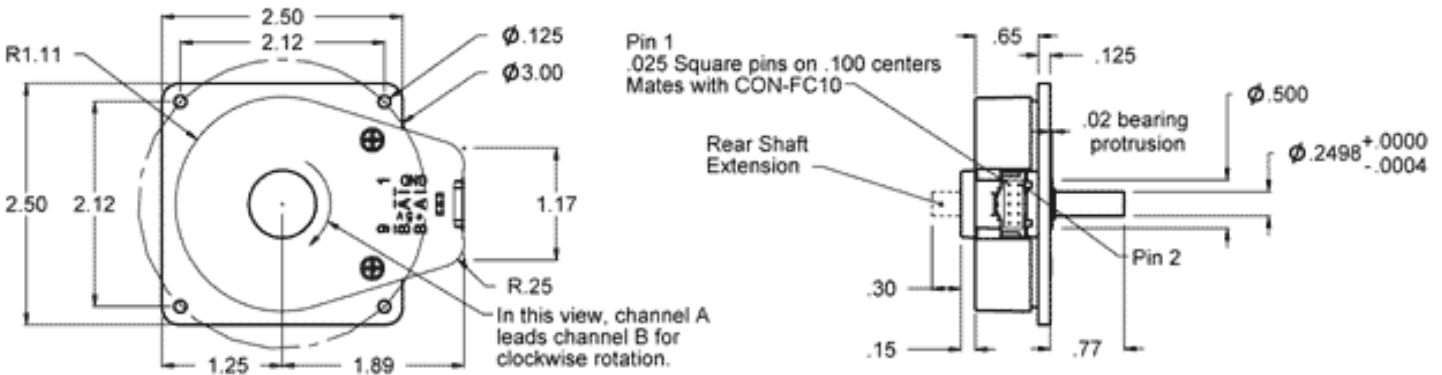
## Features

- ▶ Heavy duty ball bearings track up to 10,000 RPM
- ▶ 2-channel quadrature, TTL squarewave outputs
- ▶ Optional index (3rd channel)
- ▶ Differential outputs available
- ▶ Positive finger-latching connector
- ▶ 64 to 2500 cycles per revolution (CPR)
- ▶ 256 to 10000 pulses per revolution (PPR)
- ▶ -40 to +100C operating temperature

 H6 Single-ended



 H6 Differential



 Environmental

Parameter	Value	Units
Operating Temperature	-40 to 100	C
Vibration (5Hz to 2kHz)	20	G
Electrostatic Discharge, Human Body Model	$\pm 4$	kV

 Mechanical

Parameter	Dimension / Units
Max. Acceleration	100000 rad/sec <sup>2</sup>
Max. Shaft Speed	10000 rpm
Max. Shaft Torque	0.05 in-oz
Max. Shaft Loading	2 lbs.

Parameter	Dimension / Units
Bearing Life	life in millions of revs. = $(90/P)^3$ where P = radial load in pounds.
Weight	
Single-ended	3.02 oz.
Differential	3.15 oz.
Max. Shaft Total Indicated Runout	0.006 in.
Moment of Inertia	0.001 oz-in-s <sup>2</sup>

### 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  $V_{cc} = 5.0V_{dc}$  and  $25^{\circ}C$ .
- For complete details, see the EM1 product page.

Parameter	Min.	Typ.	Max.	Units	Conditions
Supply Voltage	4.5	5.0	5.5	V	
Supply Current		27	30	mA	CPR < 1000, no load
		55	57	mA	CPR ≥ 1000, no load
Low-level Output			0.5	V	IOL = 8mA max.
High-level Output	2.0			V	IOH = -8mA max.
	4.2	4.8		V	no load
Output Current Per Channel	-8		8	mA	
Output Rise Time		110		nS	
Output Fall Time		35		nS	

### Differential Electrical

- Specifications apply over entire operating temperature range.
- Typical values are specified at  $V_{cc} = 5.0V_{dc}$  and  $25^{\circ}C$ .
- For complete details, see the EM1 product pages.

Parameter	Min.	Typ.	Max.	Units	Conditions
Supply Voltage	4.5	5.0	5.5	V	

Parameter	Min.	Typ.	Max.	Units	Conditions
Supply Current		29	33	mA	CPR < 1000, no load
		57	60	mA	CPR ≥ 1000, no load
Low-level Output		0.2	0.4	V	IOL = 20mA max.
High-level Output	2.4	3.4		V	IOH = -20mA max.
Differential Output Rise/Fall Time			15	nS	

### Pin-out

#### 5-pin Single-ended

#### 10-pin Differential Standard

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

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		

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.

Base Pricing

Quantity	Price
1	\$83.30
10	\$72.35
50	\$64.90
100	\$61.05

- Add 16% per unit for **Output** of Differential