

# H15D

## Differential Servo Mount Encoder

### Description:

The H15D differential optical encoder is a non-contacting rotary to digital position feedback device designed for applications requiring a size 15 servo mount. The H15D design features two rugged radial ball bearings and a standard 1/4" diameter shaft which may be coupled to the application shaft using one of US Digital's flexible couplings (see the FC data sheet).

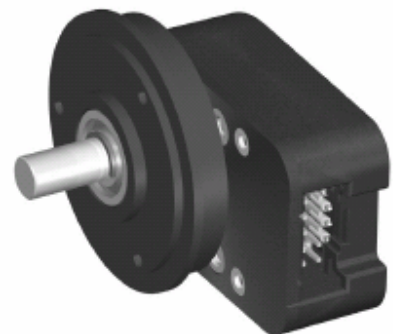
The H15D may be mounted and held in position by either attaching to the 4-40 machine screw holes in the base or by using the attached servo ring and separate servo cleats (see *Accessories on the next page*). The servo ring is made of black anodized aluminum while the servo cleats are made of stainless steel.

The mating connector has 10 pins, is polarized and latches into the encoder. Depressing the latch tab allows the connector to be unplugged. Mating connector assemblies are available from stock as shown below. Custom cables are also readily available (see the *Cables & Connectors data sheet*).

The H15D has an internal differential line driver (26C31) that can source and sink 20mA at TTL levels. The cable that connects to this encoder should have 3 twisted pairs plus power and ground. Group each pair of differential signals. The recommended receiver is industry standard 26C32. Maximum noise immunity is achieved when the differential receiver is terminated with a 110ohm resistor in series with a .0047mf capacitor placed across each differential pair. The capacitor simply conserves power; otherwise power consumption would increase by 20mA per pair, or 60mA for 3 pairs.

### Features:

- > Industry standard size 15 mounting
- > 32 to 1250 cycles per revolution (CPR)
- > 128 to 5000 pulses per revolution (PPR)
- > Positive finger-latching connector
- > Low cost
- > 2-channel quadrature, TTL squarewave outputs
- > 3rd channel index option
- > 100KHz frequency cycle response
- > 400KHz frequency quadrature response
- > -40 to 100°C operating temperature



### Mechanical Specifications:

Shaft Speed	10,000 RPM max. continuous
Acceleration	10,000 rad/sec <sup>2</sup>
Shaft Torque	0.05 in. oz. max.
Shaft Loading	2 lbs. max.
Bearing Life	(90/P) <sup>3</sup> - life in millions of revs. where P = radial load in pounds.
Weight	2.3 oz.
Shaft Runout	0.0006 T.I.R. max.
Moment of Inertia	6.1x10 <sup>-6</sup> oz-in-s <sup>2</sup>
Vibration	20 g, 5 to 2KHz

### Phase Relationship:

B leads A for clockwise shaft rotation, A leads B for counter clockwise shaft rotation viewed from the shaft/bushing side of the encoder (see the *EM1 & HEDS data sheet*).

### Electrical Specifications:

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 - 900, 1800, 2500 CPR	-	56	59	mA	No load
Index - All Other Resolutions	-	58	88	mA	No load
Non-index <1000 CPR	-	18	43	mA	No load
Non-index >=1000 CPR	-	58	88	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 data sheet.

### Compatible Cables & Connectors:

10-pin Finger-latching:

Part Number	Description
CON-FC10	Connector
CA-4217-6FT	Connector on one end of a 6' shielded round cable
CA-4174-6FT	Same as CA-4217, but for L-option only
CA-3619-6FT	Connector on both ends of a 6' shielded round cable
CA-3607-6FT	Same as CA-3619, but for L-option only

Attention:

- > Specify cable length when ordering.
- > Custom cable lengths are available. See the Cables & Connectors data sheet for more information.

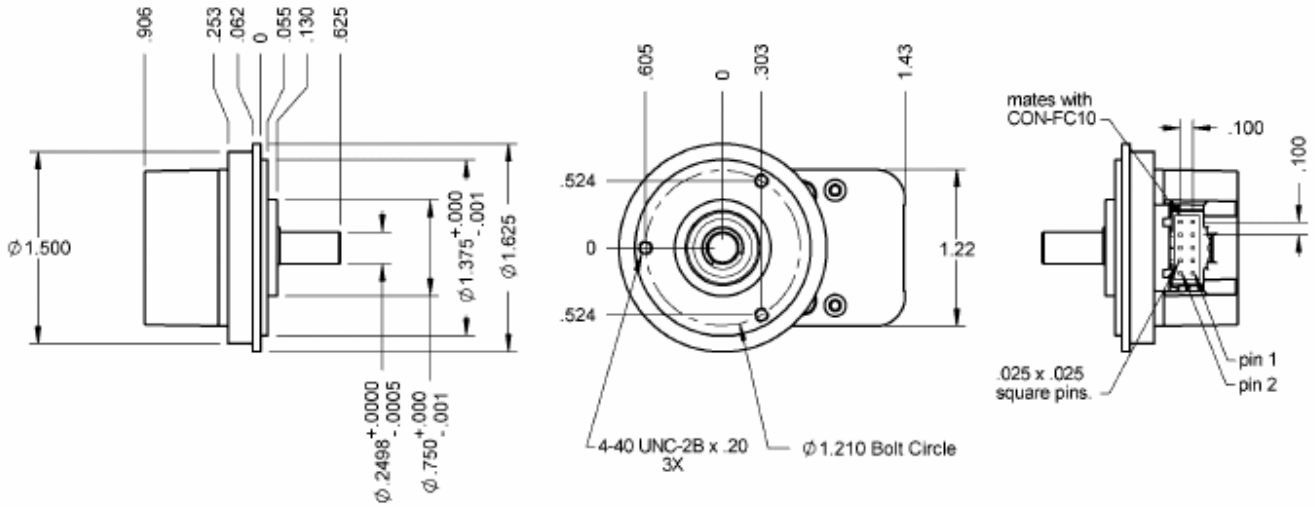
### Encoder Pin-out:

Pin	Standard	Agilent (L-option)
1	Ground	No connection
2	Ground	+5VDC power
3	Index-	Ground
4	Index+	No connection
5	A- channel	A- channel
6	A+ channel	A+ channel
7	+5VDC power	B- channel
8	+5VDC power	B+ channel
9	B- channel	Index-
10	B+ channel	Index+

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## Differential Servo Mount Encoder

### Mechanical Drawing:



### CLEAT-KIT:

Includes: 3 cleats and 3 screws.

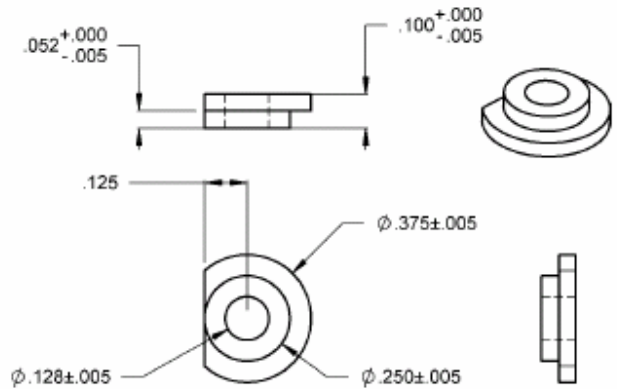
**Cleat Description:** Stainless steel servo cleats are used for the mounting of the H15D encoder by means of its servo style mounting. Mounting holes should be arrayed at 120° on a 1.90" bolt circle.

**Screw Description:** 4-40 x 1/4" stainless steel phillips pan-head screws.

- > To order cleats individually, specify CLEAT-5889.
- > To order screws individually, specify SCREW-290.

### CLEAT-KIT

Price  
\$5.00



### Ordering Information:

H15D -

- CPR:
- 32\*\*\*
  - 50
  - 96
  - 100
  - 110\*\*
  - 120\*\*
  - 192
  - 200
  - 250
  - 256
  - 360
  - 400
  - 500
  - 540\*\*
  - 720\*\*\*
  - 900\*\*\*
  - 1000
  - 1016\*\*
  - 1024
  - 1250\*\*\*

Options: (specify in order shown)  
I = Index (3rd channel).  
L = Agilent compatible pin-out.

Notes:  
\* Index / resolutions >= 1000 CPR.  
\*\* Index option not available.  
\*\*\* 32, 720, 900, 1250 CPR only available with index.