HS30A Optical Kit Encoder

A, B Channel Quadrature TTL Outputs

Features

- Two channel quadrature TTL compatible outputs
- 96 ~ 1250 cycles per resolution (CPR)
- Widely operating environment temperature from -40℃ ~ 85℃
- Intelligent mounting design
- Compact size appearance
- Cost effectively
- Single 5V DC supply
- RoHS compatible

Description

The Honest Sensor Kit Encoder series of HS30A, HS30B, and HS56 are all composed with well thought-out components. From mounting the base, installing the hub disc, to sliding in the optical Module; we make every step easy and user friendly. Our encoders come with two distinct output options: single ended (A, B, Index) and differential (A, B, Index, A-, B-, Index-) outputs. We are also able to customize encoders for our customers that are tailored to their individual needs.

Honest Sensor also endeavors to develop and manufacture innovative encoder discs to enhance and augment the great performance of our encoders. Our encoder discs can also be custom manufactured according to customer needs. The specially designed base and cover of our encoders are made of PC material and is produced by our own mold and injection machine. This results in encoders that are more resistant to external shocks and thus offers secure protection of components inside the encoder. The special design of our slide-on sensor which with the help of the aligning pins perfectly positions the sensor on the base without further alignment. With this exceptional design, the modules can be assembled and disassembled with great ease for the purpose of swapping out discs, without any troublesome realignment nor loss of signal. Our encoder modules come with output connection cables adapted to the needs of our customers.

With Excellent optical clarity, high temperature resistant discs, with resolutions up to 1250 CPR, and user friendly designs, the HS30A, HS30B, and HS56 encoder modules are your smart choice for encoders!

Electrical

Electrical Characteristics

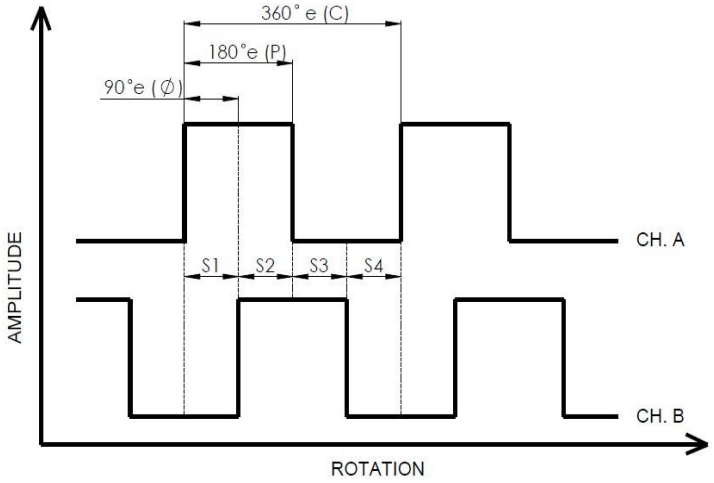
Parameter	Min.	Typ.	Max.	Units
Storage Temperature	- 40		85	°C
Operating	- 40		85	°C
Temperature Supply	4.5	5.0	5.5	V
Voltage		17	40	mA
Supply Current	- 0.5		7	V
Output Voltage	- 1.0		10	mA
Output Current Per Channel	0.7			V
High Level Output Voltage	-0.04			mA
High Level Output Current			0.4	V
Low Level Output Voltage			3.2	mA
Low Level Output Current			20	kHz
Count Frequency			100	pF

* Typ. value measured subject to Vcc = 0.5V and Temperature 25 °C.

Encoding Characteristics

Parameter	Sym.	Min.	Typ.	Max.	Units
Cycle Error	ΔC		3	5.5	°e
Pulse Width Error	ΔP		7	30	°e
State Width Error	ΔS		5	30	°e
Phase Error	Δφ		2	15	°e

Output Waveform



Count (N):
The total amount of the count (bar and window) as a pair among per rotation.

Cycle (C):
it indicates the fully one cycle of the electrical degrees measured as 360 °e degree.

Cycle Error (ΔC):
The deviation in the electrical degree among the pulse width against its ideal value. It's the symbol of the uniform cycle.

Pulse Width (P):
Normally it refers to the "HIGH" number of electrical of the output during the one cycle.

Pulse Width Error (ΔP):
The deviation in the electrical degree among the pulse width against its ideal value about 180 °e degree.

State Width (S):
The number of electrical degree between Channel A and Channel B as a result of the transition in the output state. There are 4 states per cycle from the output of Channel A and Channel B. For each states nominated at 90 °e (S1-S4).

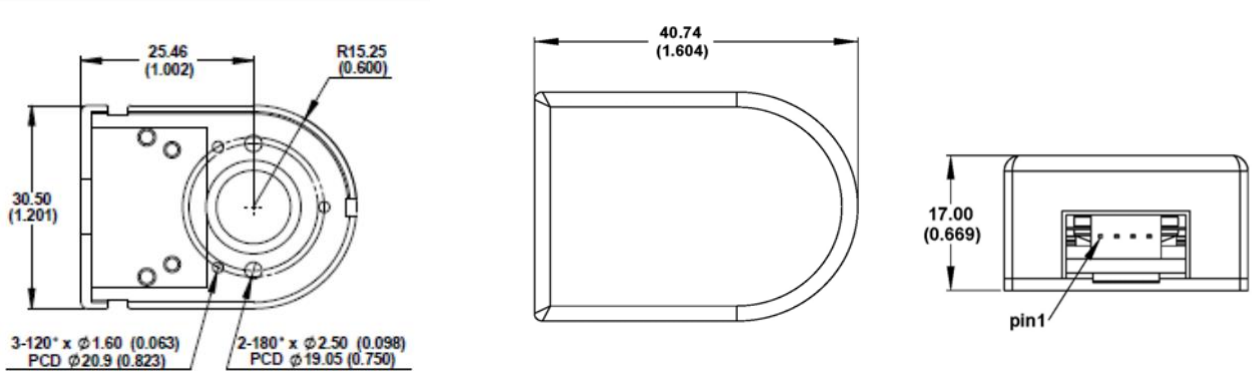
State Width Error(ΔS):
The deviation in electrical degree among each of states width upon the ideal 90 °e.

Phase (φ):
The number of electrical degrees between the centre of the high state on channel A and the centre of the high state on channel B. This value is nominally 90 °e (the signals A and B can be used for quadrature

Phase Error (Δφ):
The deviation in electrical degrees of the phase from its ideal value of 90 °e.

Mechanical Specification

Package Dimensions



Top View (base plate only) **Top View** **Side View**

Note: Dimensions in millimeters (inches)

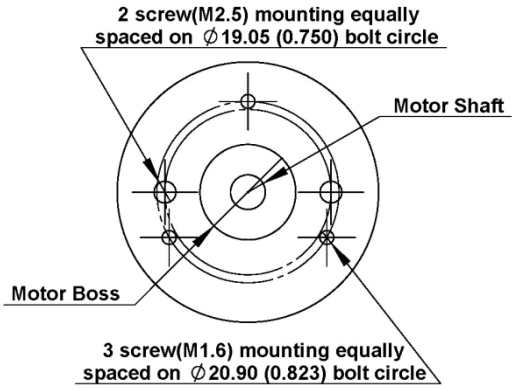
Pin-out Description

Voltage (4 pin)		
Pin	Color	Description
1	black	Ground
2	white	Channel A
3	red	DC +5V
4	green	Channel B

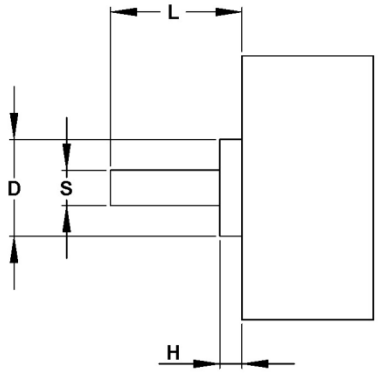
Mechanical Characteristics

Parameter	Sym.	Value	Tolerance	Units
Dimension		40.74 x 30.5 x 17.00 (1.604 x 1.201 x 0.669)		mm (in.)
Base Plate Thickness		4.00 (0.157)		mm (in.)
Encoder Weight		16.95 (0.60)		g (oz.)
Motor Required				
Shaft Diameters	S	4.00 / 5.00 / 6.00 / 6.35 / 8.00 (0.157 / 0.197 / 0.236 / 0.250 / 0.315)	±0.01 (±0.0004)	mm (in.)
Shaft Length	L	13.648 (0.537)	+0.552 (+0.022)	mm (in.)
Boss	D	11.00 (0.433) Max.		mm (in.)
Diameter	H	2.50 (0.098) Max		mm (in.)
Boss Height		19.05 (0.750)	±0.13 (±0.005)	mm (in.)
2 Screw Bolt Circle Diameters		20.90 (0.823)	±0.13 (±0.005)	mm (in.)
3 Screw Bolt Circle Diameters				
Mounting Screws		M2.5		mm
2 Mounting Screw Size		M1.6		mm
3 Mounting Screw Size		M3		mm

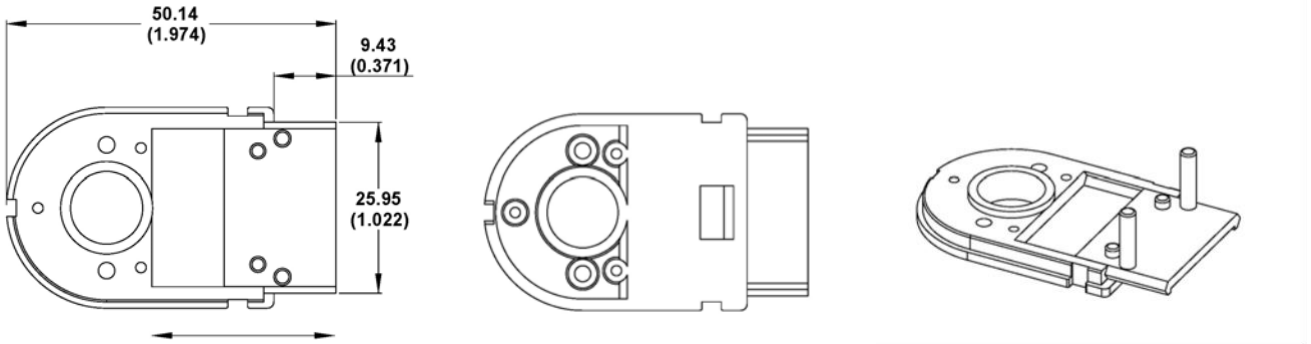
Mounting Considerations



Mounting Holes



Side View (Motor)



Base Plate with Slider (to draw out the slider precede to install encoder disc)

Note: Dimensions in millimeters (inches)

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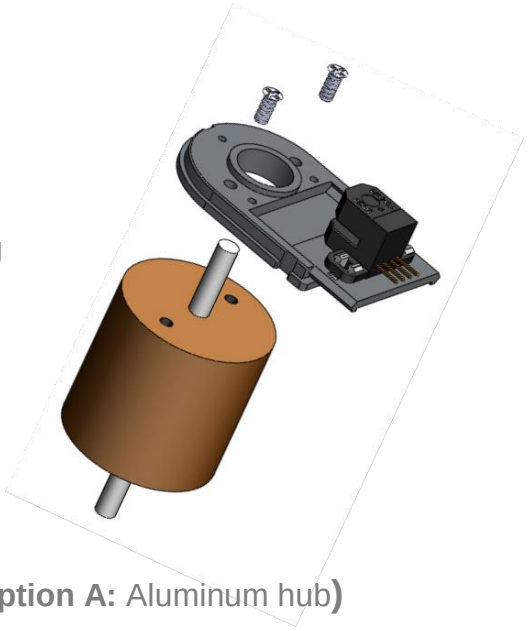
Assembly Instruction

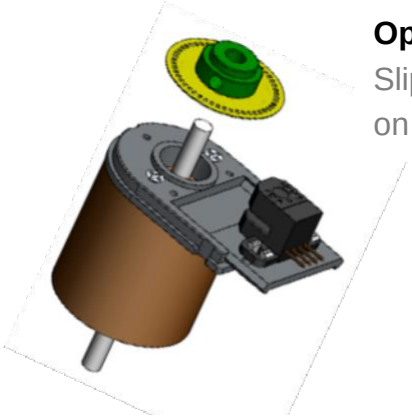
Step 1. Base Mounting:

To draw out the slider precede to install encoder disc firstly.
Then, to fix the base by tightening with two screws properly.



Step 2. Disc Installation: (Option A: Aluminum hub)

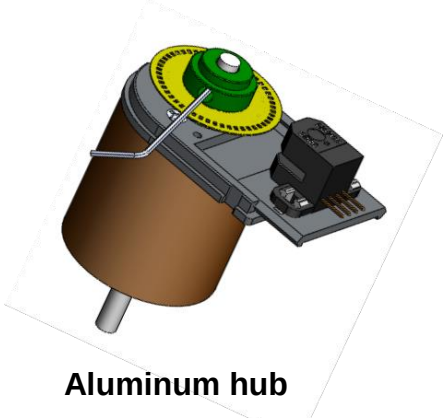
Step 2.1



Option A:
Slip the aluminum hubdisc on the shaft of motor.

Aluminum hub

Step 2.2

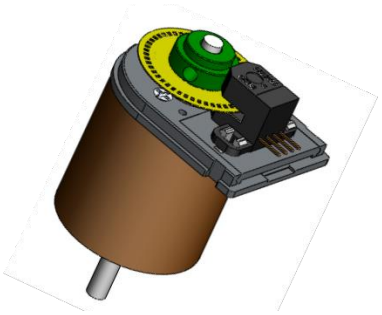


Option A:
Tighten screw with the hex wrench after pressing down the hub.
In the mean time to adjust the proper gap of hub position.

Aluminum hub

Step 3. Module Installation:

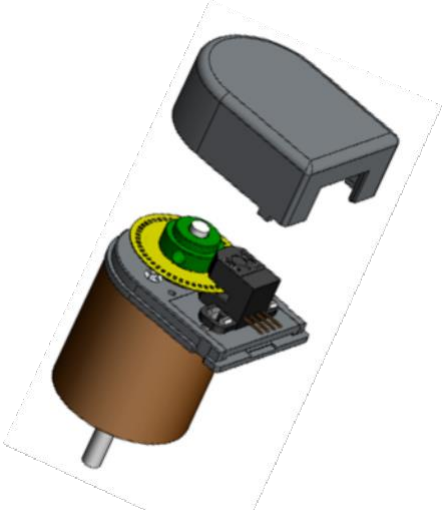
Slip the slider into the optical module until the bottom reached.



Aluminum hub

Step 4. Cover Mounting:

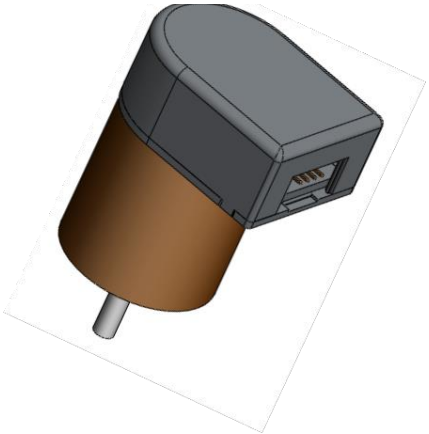
Place and press the cover down the module with a snap.



Aluminum hub

Step5. Completion:

The encoder is available for use.



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A, B Channel Quadrature TTL Outputs

Ordering Information

HS30A - [ ] [ ] - [ ] [ ] - [ ]

Resolution	Disc	Shaft Diameter	Hub	adapter
96: 96 CPR	P: plastic(Default)	3: 3mm	A: aluminum	J: wire solder on PCB
100: 100 CPR	M: metal	4: 4mm		
192: 192 CPR		5: 5mm		
200: 200 CPR		6: 6mm		
256: 256 CPR		6.35: 6.35mm (1/4")		
300: 300 CPR		8: 8mm		
360: 360 CPR		10: 10mm		
400: 400 CPR				
500: 500 CPR				
512: 512 CPR				
1000: 1000 CPR				
1024: 1024 CPR				
1200: 1200 CPR				
1250: 1250 CPR				

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