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

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Electrical

Electrical Characteristics

Parameter	Min.	Typ.	Max.	Units
Storage Temperature	- 40		85	°C
Operating Temperature	- 40		85	°C
Supply Voltage	4.5	5.0	5.5	V
Supply Current		17	40	mA
Output Voltage	- 0.5		7	V
Output Current Per Channel	- 1.0		10	mA
High Level Output Voltage	0.7			V
High Level Output Current	-0.04			mA
Low Level Output Voltage			0.4	V
Low Level Output Current			3.2	mA
Count Frequency			20	kHz
Load Capacitance			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	$\Delta \varphi$		2	15	°e

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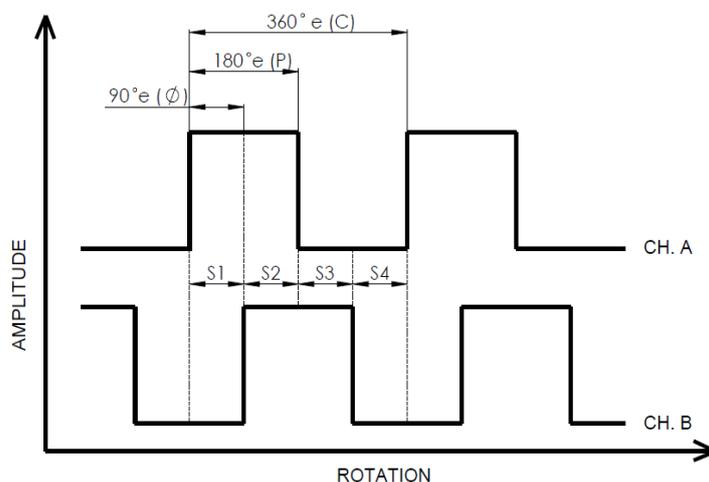
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Count (N):
The total amount of the count (bar and window) as a pair among per rotation.

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 tthe 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.

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Mechanical Specification

Package Dimensions
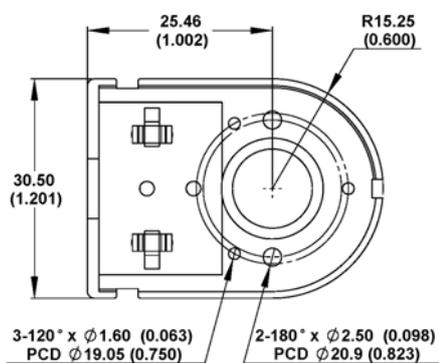
Top View (base plate only)   **Top View**   **Side View**
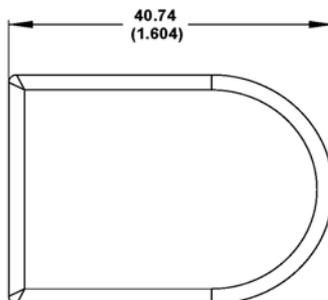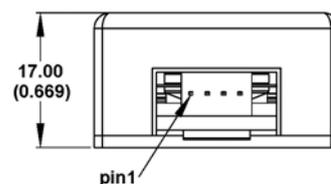
Note: Dimensions in millimeters (inches)

Pin-out Description

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

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Mechanical Characteristics

Parameter	Sym.	Value	Tolerance	Units
Dimension		40.74 x 30.5 x 17.00		mm (in.)
		(1.604 x 1.201 x 0.669)		
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	±0.01	mm (in.)
		(0.157 / 0.197 / 0.236 / 0.250 / 0.315)	(±0.0004)	
Shaft Length	L	13.648 (0.537)	+0.552 (+0.022)	mm (in.)
Boss Diameter	D	11.00 (0.433) Max.		mm (in.)
Boss Height	H	2.50 (0.098) Max		mm (in.)
2 Screw Bolt Circle Diameters		19.05 (0.750)	±0.13 (±0.005)	mm (in.)
3 Screw Bolt Circle Diameters		20.90 (0.823)	±0.13 (±0.005)	mm (in.)
Mounting Screws				
2 Mounting Screw Size		M2.5		mm
3 Mounting Screw Size		M1.6		mm
Hub Set Screw		M3		mm

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Mounting Considerations

2 screw(M2.5) mounting equally
spaced on ⌀19.05 (0.750) bolt circle

Motor Shaft

Motor Boss

3 screw(M1.6) mounting equally
spaced on ⌀20.90 (0.823) bolt circle

Mounting Holes

L

D S

H

Side View (Motor)

50.14
(1.974)

9.43
(0.371)

25.95
(1.022)
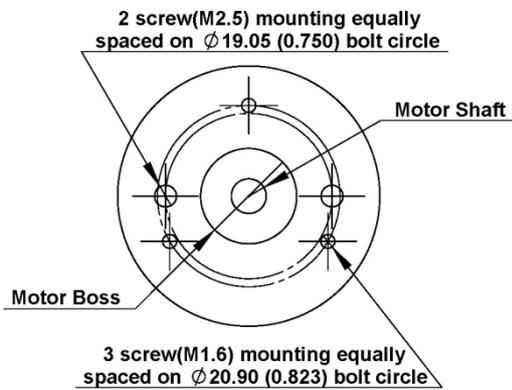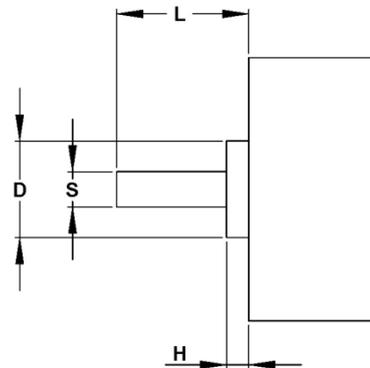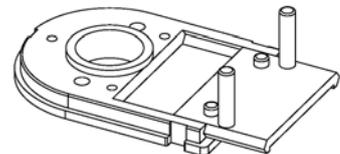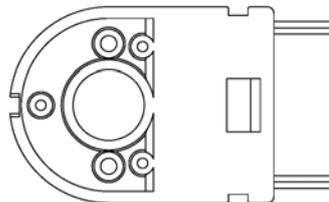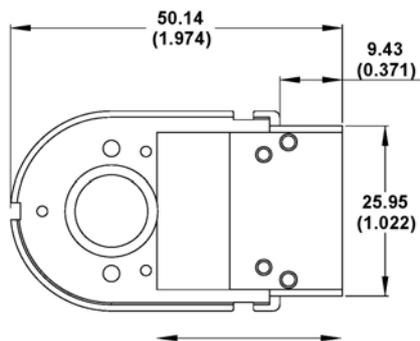
Base Plate with Slider (to draw out the slider precede to install encoder disc)

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.
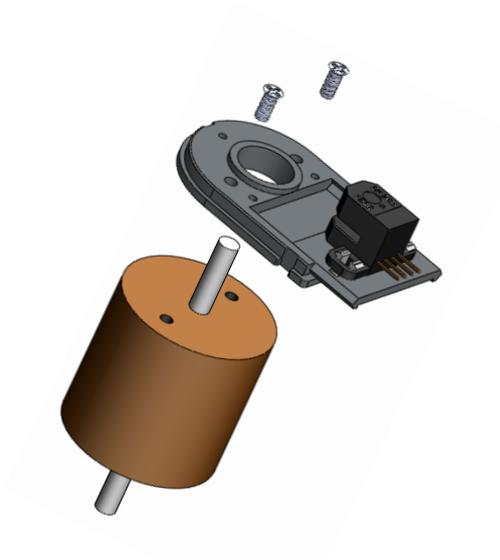
Step 2. Disc Installation: (Option A: Aluminum hub,   Option P: Push-on-hub)

Step 2.1

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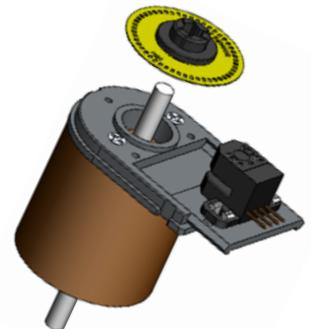
Option P:
Slip the push-on-hubdisc on the shaft of motor.

Aluminum hub

Push-on-hub

Step 2.2
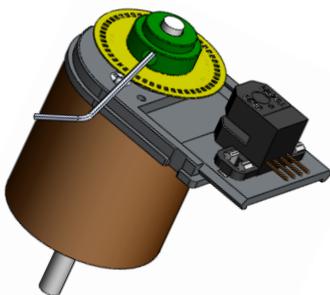
Option A:
Tighten screw with the hex wrench after pressing down the hub.
In the mean time to adjust the proper gap of hub position.
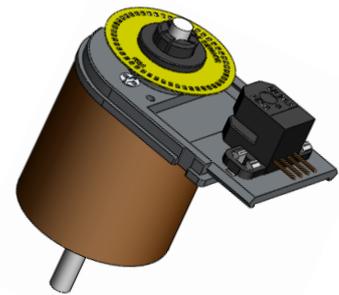
Option P:
To ensure the proper gap of hub position by the manual adjustment.

Aluminum hub

Push-on-hub

Step 3. Module Installation:

Slip the slider into the optical module until the bottom reached.
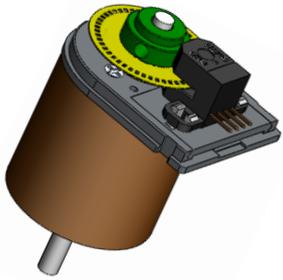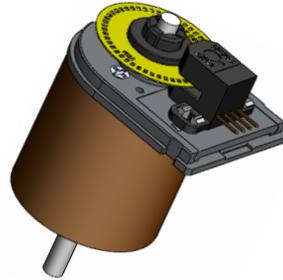
Aluminum hub   **Push-on-hub**

Step 4. Cover Mounting:

Place and press the cover down the module with a snap.
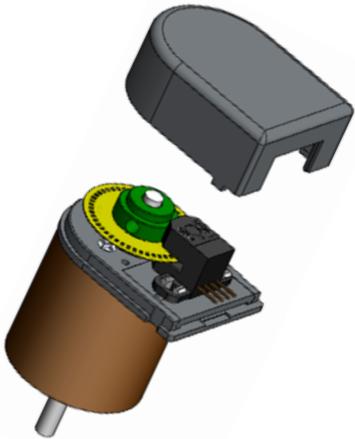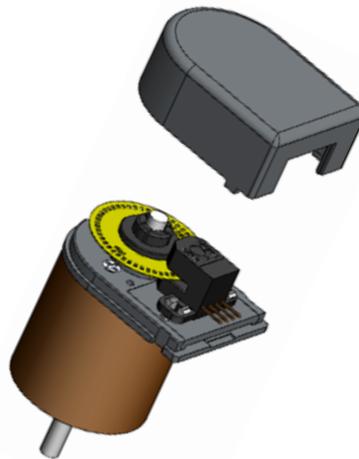
Aluminum hub   **Push-on-hub**

Step5. Completion:

The encoder is available for use.
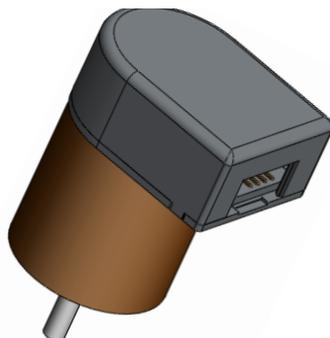
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Ordering Information

HS30A - [_____] P - [_____] [_____]

Resolution	Shaft Diameter	Hub
96: 96 CPR	**3:** 3mm	**A:** aluminum
100: 100 CPR	**4:** 4mm	**P:** plastic (push-on-hub)
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		
400: 400 CPR		
500: 500 CPR		
512: 512 CPR		
1000: 1000 CPR		
1024: 1024 CPR		
1200: 1200 CPR		
1250: 1250 CPR		