

Data Sheet for Angle Sensors

Optical incremental Kit Encoder

Series OPTS



Picture shows version for shaft diameters until 10 mm

- Optical resolution until 10.000 pulses per revolution
- 15.6 mm housing depth
- Applicable for shaft diameters 2...25 mm
- 2 channels + index
- Supply voltage 5 VDC
- Output TTL
- Temperature range -25°..100° C

High resolution kit encoder, quick and safe to install in the application by using of special assembling tools. For long shafts, a circular hole in the back cover is available.

Electrical Data

Output signal	5 V - A, B, Z-Index (option A, B)
Number of pulses	1000..10000 pulses per rev. (other resolutions on request)
Output voltage high	≥ 2 V @ IOH = -5 mA max. (3.5 V typ. @ no load)
Output voltage low	≤ 0,5 V @ IOL = 5 mA max. (0.25 V typ. @ no load)
Limit frequency	300 kHz
Supply voltage	5 VDC ±10 %
Power consumption (no load)	≤ 85 mA (typ. 72 mA)
Output capacity	min. -5 mA / max. 5 mA
Output electronics	TTL
Switch-on delay	50 ns (rise time) / 50 ns (fall time)

Mechanical and Environmental Data, Miscellaneous

Mechanical angle of rotation /stroke 1.)	360° without stop
Max. allowed operational speed	Formula for calculation:
For ≥ 4000 and ≤ 5000 pulses per rev.	max. rpm. = (21.6 x 10E6) / pulses per rev.
For > 5000 pulses per rev.	max. rpm = (43.2 x 10E6) / pulses per rev.
Max. acceleration	250000 rad/sec ²

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Mechanical and Environmental Data, Miscellaneous

Operating temperature range	-25..+100 °C
Storage temperature range	-40..+100 °C
Vibration (IEC 68-2-6, Test Fc)	20 g / 5 until 2000 Hz / sine waveform
Housing diameter / length	61.21 mm x 55.98 mm
Housing depth	15.62 mm
Shaft diameter	2..25 mm
Shaft type	Hub for solid shafts
Permissible axial play	±0.25 mm
Permissible eccentricity + radial play	0.10 mm
Minimum shaft length incl. axial play	11.3 mm
Maximum haft length incl. axial play	13.3 mm (closed back cover) >13.3mm (with circular hole in back cover)
Max. radial load	< 1 N
Connection type	Contact pin's for soldering pitch 2.54 or compatible to Molex Plug (connection without possibility for interlocking)
Connection position	Radial
Sensor mounting	With 2 or 3 screws (not included in delivery)
Mass	app. 36 g
Fastening parts included in delivery	Mounting tools consisting of a centering tool and a spacer tool 1 x per delivery 2 x 4-40 1/2" fillister head screws for mounting the optical module 2 x 4-40 5/8" flat head screws for mounting the housing cover
Material housing	Plastic
Material disc	Mylar
Immunity ESD, human body model (MIL-STD-883, Method 3015.8)	± 4 kV

1.) According IEC 60393

2.) Determined by climatic conditions according to IEC 68-1, para. 5.3.1 without load collectives

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Order Code

Description	Selection: standard=black/bold, possible options=grey/cursive						
Series:	OPTS						
Shaft diameter							
Option 2 mm		2					
Option 3 mm		3					
Option 3.175 mm		3,175					
Standard: 4 mm		4					
Option 5 mm		5					
Standard: 6 mm		6					
Option 6.35 mm (1/4")		6,35					
Option 8 mm		8					
Option 10 mm		10					
Option 12 mm		12					
Option 14 mm		14					
Option 20 mm		20					
Option 25 mm		25					
Resolution in pulses per revolution:							
Option 1000 ppr.			1000				
Option 2048 ppr.			2048				
Standard: 4000 ppr.			4000				
Option 4096 ppr.			4096				
Option 5000 ppr.			5000				
Standard: 7200 ppr.			7200				
Option 8000 ppr.			8000				
Option 8192 ppr.			8192				
Option 10000 ppr.			10000				
Supply voltage:							
Standard: 5 V				5			
Output signal:							
Standard: A+B+Z					BZ		
Option: A+B (For > 2048 ppr. only option BZ available)					B		
Output electronics:							
Standard: TTL						TTL	
Back cover:							
Standard: Closed (without hole in back cover)							A
Option with circular hole in back cover for longer shafts							B

Order example OPTS

Requirement:

Shaft diameter 6 mm, resolution 4000 pulses per revolution, supply voltage 5 V, 2 channels A+B+Z, output electronics TTL, back cover without circular hole for longer shafts

Example for order code: OPTS 6 4000 5 BZ A

For higher quantities or on-going demand, additional options are available as described below

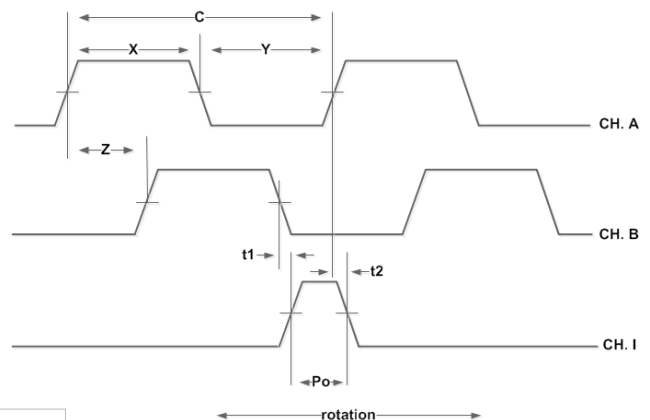
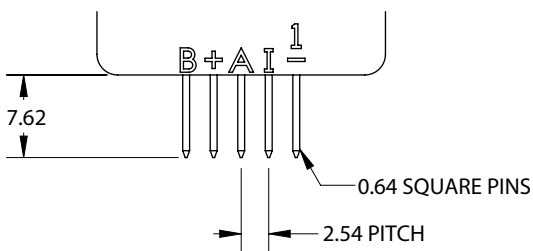
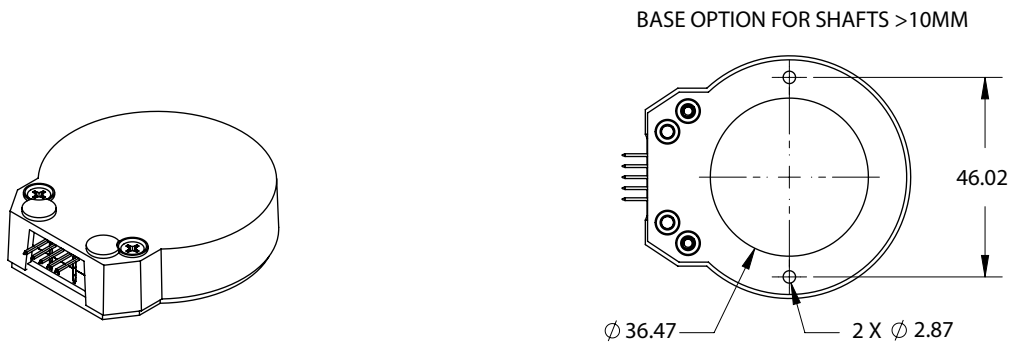
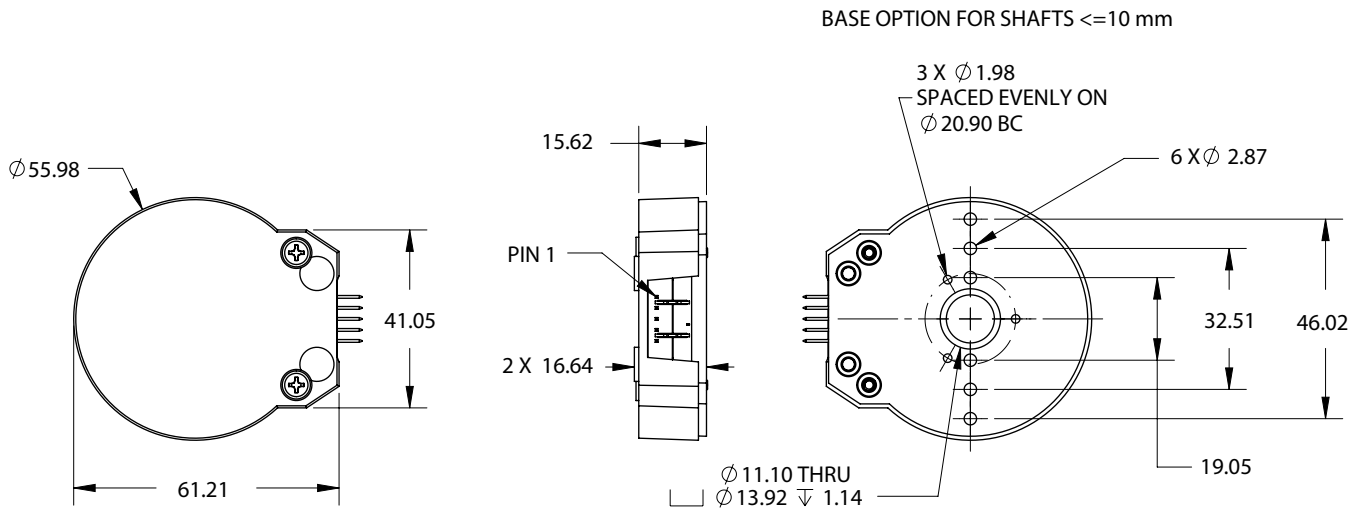
For example:

- Linedriver
- Other numbers of pulses: 64, 100, 200, 400, 500, 512, 1024, 1800, 2000, 2500, 3600 pulses per revolution
- Other hub diameters for other shaft diameters
- Special connector and cable design

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Connection diagram

PIN 1	GND
PIN 2	Index (Z)
PIN 3	Channel A
PIN 4	+5 VDC
PIN 5	Channel B

Dimensions in mm

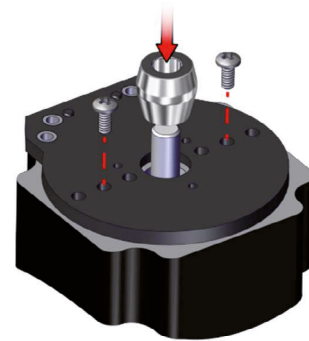
Recommendation for mating connector:
Standard, contact pins (TTL output):
 MOLEX: KK 254 crimp housing, 5 circuits, series 2695
 KK254 crimp terminals series 2759

Assembly instruction for shaft diameters < 10 mm

During transport, storage, assembly and operation, it must be followed the ESD guidelines. Avoid touching the disc in the area of the increments.

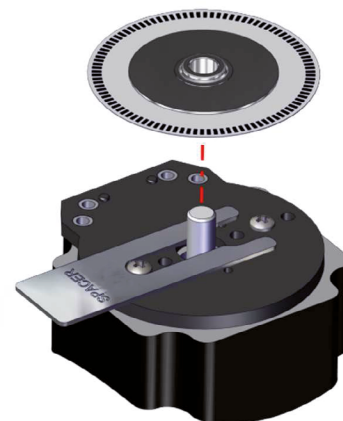
Step 1:

Place encoder base onto mounting surface. Slip centering tool over the shaft and into the center hole of the base. While holding pressure on the centering tool, tighten mounting screws. Remove centering tool.



Step 2:

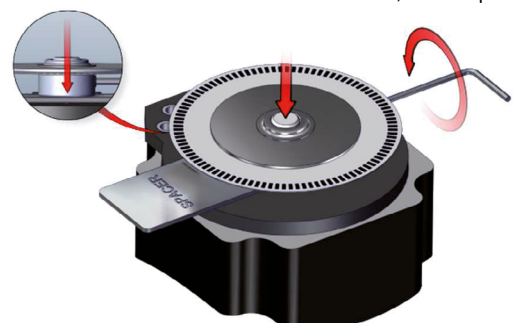
Place spacer tool around shaft. Slip hubdisk assembly onto shaft with codewheel disk towards top until it bottoms out against spacer tool.



Hub Set Screw:
max. 0,3 Nm torque

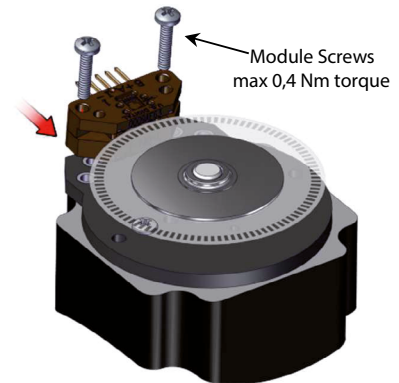
Step 3:

Tighten set screw with provided hex wrench while pressing down on hub. Remove spacer tool.



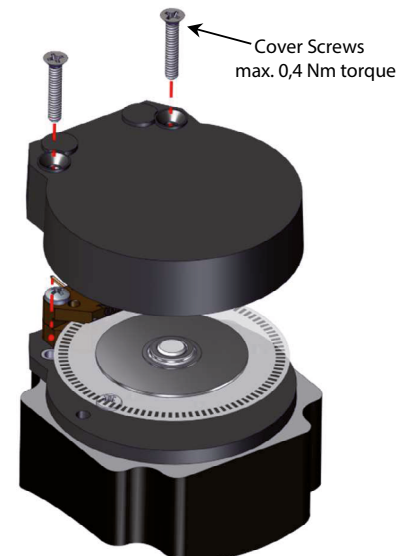
Step 4:

Orient module with connector pins toward the top. Gently slide module onto base. Fit module onto the two alignment pins on base and secure with two 4-40 x 1/2" pan head screws (supplied).



Step 5:

Place cover over assembly and secure with two 4-40 x 5/8" flat head screws (supplied).

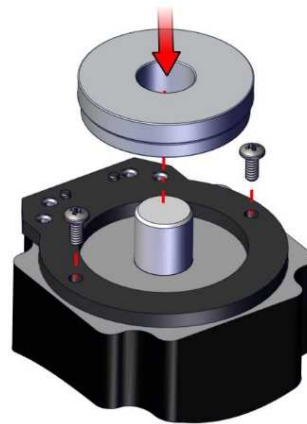


Assembly instruction for shaft diameters ≥ 10 mm

During transport, storage, assembly and operation, it must be followed the ESD guidelines. Avoid touching the disc in the area of the increments.

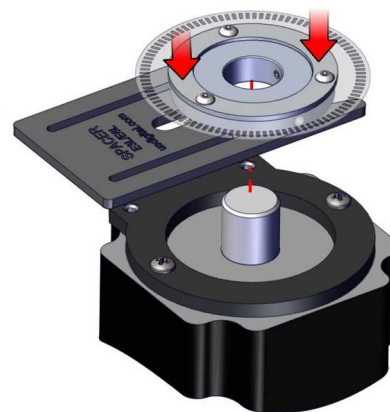
Step 1:

Place encoder base onto mounting surface. Slip centering tool over the shaft and into the center hole of the base. While holding pressure on the centering tool, tighten mounting screws. Remove centering tool.



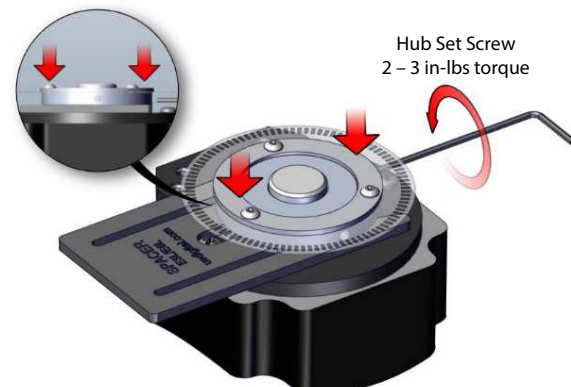
Step 2:

Push the spacer tool onto the bottom section of the hubdisk assembly. Slip hubdisk assembly onto shaft and slide down until spacer tool bottoms out against encoder base.



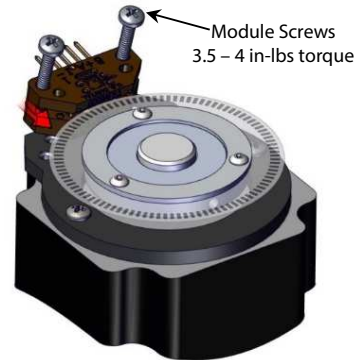
Step 3:

Tighten set screw with provided hex wrench while pressing down on hub. Remove spacer tool.



Step 4:

Slip optical module into position until the two alignment pins slip into holes of module (thick side of module towards bottom). Secure with two 4-40 x 1/2" screws (supplied).



Step 5:

Place cover over assembly and secure with two 4-40 5/8" flat head screws (supplied).

