

# Standard Magnetic Encoder Kits K Series

Admotec Magnetic Encoder Technology opens fully new solutions for Rotary sensors. This unique technology is available as standard Kits allowing cost effective solutions for small volume applications or cost effective testing for new applications Custom design is indicated for large volume applications or for special shape design. The purpose of the leaflet is to give a survey of available Standard Magnetic Encoder Kits.



- **Rugged design**
- **Large Air Gap**
- **High accuracy 1)**
- **Insensitive to dirty environment (Oil and Dust)**
- **Long time stability 2)**
- **Insensitive to rotating magnetic stray fields**
- **Wide range of wheel diameters and resolutions**
- **Wide Temperature range**

- 1) Less than 4% edge jitter  
 2) No ageing, MR (magnetoresistive) sensors are working under magnetic saturation and are only sensing the directions of the field lines. Therefore they will give the full signal independently of the strength of the magnet.

## Technical Data

Technical Data			
Power Supply		5	[VDC]
Current (typical)		20	[mA]
Pitch (KS Series)	$\lambda$	1	[mm]
Pitch (KL Series)	$\lambda$	2.4 - 6	[mm]
Interpolation Factors	X	1,4,5,8,10,16,20	
Resolution	R	$X \cdot OD \cdot \pi / \lambda$	[PPR]
Accuracy (typical)		2-6	[Arcmin]
Frequency max.		250	[kHz]
Shock		30	[G]
Vibrations		10	[G (10-500Hz) for 0.5h]
Temperature (rotor)		-60 to +110	[°C]
Temperature (module)		-60 to 150	[°C]

Wheel Sizes		
Size	Wheel OD [mm]	max. speed [rpm]
02	8 - 49	15'000
04	50 - 99	12'000
06	100 - 149	10'000
08	150 - 199	8'000
10	200 - 249	6'000



KS Series						
Style	Type	Interpolator	Marker	Outputs	Air Gap	Magnet Pitch $\lambda$
Basic	KS1200	No	No	5 V Differential (RS422 Compatible)	0.3 mm	1 [mm]
	KS1300	No	Yes			
Hi-Resolution	KS2200	Yes	No			
	KS2300	Yes	Yes			
Sin/Cos	KS3200	No	No	1 Vp-p		
	KS3300	No	Yes			
Comtrack	KS4500	Yes	No	5 V TTL		

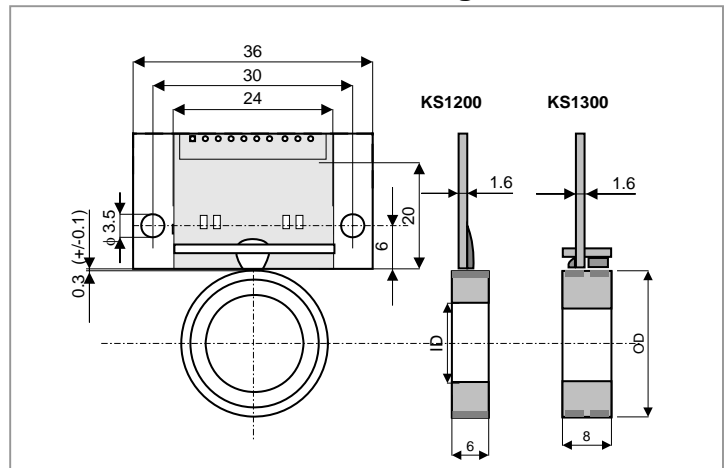
## Standard Outline and Mounting Dimensions

### Basic Encoder

For simple applications

- Output 5V TTL
- Connections A, B, 5VDC, GND

Wheel OD	A, B	A, B, Z
8-49	KS1202	KS1302
50-99	KS1204	KS1304
100-149	KS1206	KS1306
150-199	KS1208	KS1308
200-249	KS1210	KS1310

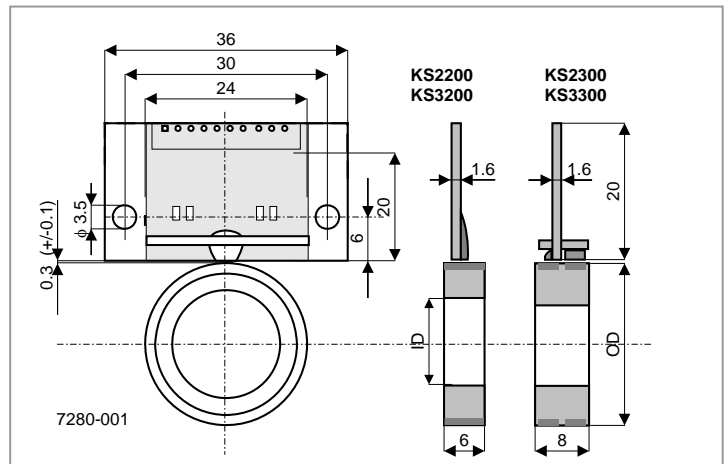


### Hi-Resolution Encoder

For applications requiring a high resolution sensor within limited space

- With Interpolator
- Outputs 5V Differential (RS422 Compatible)
- With Digital pots
- Connections A, A<sub>I</sub>, B, B<sub>I</sub>, (Z, Z<sub>I</sub>) 5VDC, GND

Wheel OD	A+, A-, B+, B-	A+, A-, B+, B-, Z+, Z-
8-49	KS2202	KS2302
50-99	KS2204	KS2304
100-149	KS2206	KS2306
150-199	KS2208	KS2308
200-249	KS2210	KS2310



### Sin/Cos Encoder

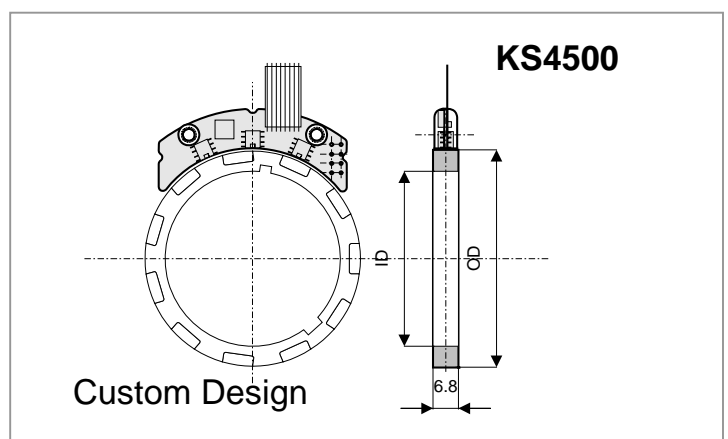
- With Digital pots
- Connections A+, A-, B+, B-, (Z+, Z-) 5VDC, GND

Wheel OD	SIN/COS	SIN/COS + Z
8-49	KS3202	KS3302
50-99	KS3204	KS3304
100-149	KS3206	KS3306
150-199	KS3208	KS3308
200-249	KS3210	KS3310

### Comtrack Encoder

For Commutation of Brushless Motors

- Custom Design
- 1 to 44 PP (Pole Pairs) depending on OD
- Connections: A, B, U, V, W, 5VDC, GND
- With Interpolator



## Selection and Ordering Data

### Wheel Diameter Selection

Series KL		Interpolation factors						
Wheel OD [mm]		1*	4	5	8	10	16	20
min	max	Resolutions [PPR]						
8	15	8	32	40	64	80	128	160
8	19	10	40	50	80	100	160	200
9	23	12	48	60	96	120	192	240
12	31	16	64	80	128	160	256	320
15	38	20	80	100	160	200	320	400
18	46	24	96	120	192	240	384	480
23	57	30	120	150	240	300	480	600
24	61	32	128	160	256	320	512	640
28	69	36	144	180	288	360	576	720
31	76	40	160	200	320	400	640	800
37	92	48	192	240	384	480	768	960
38	95	50	200	250	400	500	800	1000
46	115	60	240	300	480	600	960	1200
49	122	64	256	320	512	640	1024	1280
55	138	72	288	360	576	720	1152	1440
61	153	80	320	400	640	800	1280	1600
69	172	90	360	450	720	900	1440	1800
73	183	96	384	480	768	960	1536	1920
76	191	100	400	500	800	1000	1600	2000
92	229	120	480	600	960	1200	1920	2400
98	244	128	512	640	1024	1280	2048	2560
110	250	144	576	720	1152	1440	2304	2880
115	250	150	600	750	1200	1500	2400	3000
122	250	160	640	800	1280	1600	2560	3200
138	250	180	720	900	1440	1800	2880	3600
153	250	200	800	1000	1600	2000	3200	4000
183	250	240	960	1200	1920	2400	3840	4800
191	250	250	1000	1250	2000	2500	4000	5000
196	250	256	1024	1280	2048	2560	4096	5120
229	250	300	1200	1500	2400	3000	4800	6000

\*Magnetic Resolution (Number of magnets on the wheel)

Series KS		Interpolation factors						
Wheel OD [mm]		1*	4	5	8	10	16	20
		Resolutions [PPR]						
10	30	120	150	240	300	480	600	
10	32	128	160	256	320	512	640	
11	36	144	180	288	360	576	720	
13	40	160	200	320	400	640	800	
15	48	192	240	384	480	768	960	
16	50	200	250	400	500	800	1000	
19	60	240	300	480	600	960	1200	
20	64	256	320	512	640	1024	1280	
23	72	288	360	576	720	1152	1440	
25	80	320	400	640	800	1280	1600	
29	90	360	450	720	900	1440	1800	
31	96	384	480	768	960	1536	1920	
32	100	400	500	800	1000	1600	2000	
38	120	480	600	960	1200	1920	2400	
41	128	512	640	1024	1280	2048	2560	
46	144	576	720	1152	1440	2304	2880	
48	150	600	750	1200	1500	2400	3000	
51	160	640	800	1280	1600	2560	3200	
57	180	720	900	1440	1800	2880	3600	
64	200	800	1000	1600	2000	3200	4000	
76	240	960	1200	1920	2400	3840	4800	
80	250	1000	1250	2000	2500	4000	5000	
81	256	1024	1280	2048	2560	4096	5120	
95	300	1200	1500	2400	3000	4800	6000	
115	360	1440	1800	2880	3600	5760	7200	
127	400	1600	2000	3200	4000	6400	8000	
143	450	1800	2250	3600	4500	7200	9000	
153	480	1920	2400	3840	4800	7680	9600	
159	500	2000	2500	4000	5000	8000	10000	
163	512	2048	2560	4096	5120	8192	10240	
191	600	2400	3000	4800	6000	9600	12000	
229	720	2880	3600	5760	7200	11520	14400	
239	750	3000	3750	6000	7500	12000	15000	

\*Magnetic Resolution (Number of magnets on the wheel)

### Ordering Data

KL	2	2	04	-	90 X 4	-	XXX/XXX
<b>Series:</b> KL Large Airgap KS Small Airgap				<b>Diameters:</b> OD/ID [Drwg.]			
<b>Style:</b> 1 Basic 2 High Resolution 3 Sin/Cos 4 Comtrack				<b>Encoder Resolution (PPR)</b> [Magnetic Resolution x Interpolation Factor]			
<b>Number of Channels:</b> 1 A 2 A, B 3 A, B, Z 5 A, B, U, V, W 6 A, B, Z, U, V, W				<b>Wheel Size:</b> 00 Moulded 02 8 - 50 mm 04 51 - 100 mm 06 101 - 150 mm 08 151 - 200 mm 10 201 - 250 mm			

#### Remarks:

- OD and resolution have to be taken from the selection table.
- ID can be done according to your mechanical requirement.
- For small quantities (samples and prototypes) please ask for our price list. In this case the wheels are turned on a lathe from a "puck".
- For larger quantities we suggest to use a moulded magnetic wheel. In this case the shape of the wheel can be done according to your drawing. It will be a pleasure for us to submit you an offer.
- On request magnetic encoder with radial air gap (sensor module on the side of the wheel) are also feasible.

Admotec Inc.  
 85 Mechanic Street  
 Lebanon NH 03766-1500 USA  
 Tel +1 603 448 7000 Fax +1 603 448 7007  
[www.admotec.com](http://www.admotec.com)

K Series.doc

Admotec Precision AG  
 Kartausstr.3,  
 CH 8008 Zürich Switzerland  
 Tel +41 44 422 22 75 Fax +41 44 42 22 76  
[www.admotec.ch](http://www.admotec.ch)