



# Incremental encoders

<b>Compact optical</b>	<b>Sendix Base KIS40 / KIH40 (shaft / hollow shaft)</b>	<b>Push-pull / RS422 / Open collector</b>
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<b>Order code</b>	<b>8.KIH40</b>	<b>.XXXXX</b>	<b>.XXXX</b>	<b>.PXX<sup>1)</sup></b>			
<b>Hollow shaft</b>	Type	a	b	c	d	e	f
<b>a Flange</b>		<b>d Type of connection</b>		<b>Stock types</b>			
2 = with spring element, long		1 = axial cable, 2 m [6.56'] PVC		8.KIH40.2442.1024			
5 = with stator coupling, ø 46 mm [1.81"]		2 = radial cable, 2 m [6.56'] PVC		8.KIH40.2462.1000			
				8.KIH40.2462.1024			
<b>b Blind hollow shaft (insertion depth max. 18 mm [0.71"])</b>		<b>e Pulse rate</b>		8.KIH40.5442.0360			
4 = ø 8 mm [0.32"]		25, 100, 200, 360, 500, 512, 600,		8.KIH40.5442.0500			
3 = ø 1/4"		(e.g. 500 pulses => 0500)		8.KIH40.5442.1024			
				8.KIH40.5442.2048			
				8.KIH40.5442.2500			
				8.KIH40.5462.0500			
				8.KIH40.5462.2048			
<b>c Output circuit / power supply</b>		<b>f Special signal format</b>		<b>Optional on request</b>			
3 = open collector (with inverted signal) / 10 ... 30 V DC		P03 = see page 62		- other pulse rates			
4 = push-pull (with inverted signal) / 10 ... 30 V DC							
6 = RS422 (with inverted signal) / 5 V DC							
7 = open collector (without inverted signal) / 10 ... 30 V DC							
8 = push-pull (without inverted signal) / 10 ... 30 V DC							
A = open collector (with inverted signal) / 5 ... 30 V DC							
B = push-pull (with inverted signal) / 5 ... 30 V DC							
C = RS422 (with inverted signal) / 5 ... 30 V DC							

Mounting accessory for shaft encoders		Order no.
<b>Coupling</b>	bellows coupling ø 15 mm [0.59"] for shaft 6 mm [0.24"]	<b>8.0000.1202.0606</b>
Connection technology		Order no.
<b>Connector, self-assembly (straight)</b>	M12 female connector with coupling nut, 8-pin	<b>05.CMBS 8181-0</b>

Further accessories can be found in the accessories section or in the accessories area of our website at: [www.kuebler.com/accessories](http://www.kuebler.com/accessories).  
Additional connectors can be found in the connection technology section or in the connection technology area of our website at: [www.kuebler.com/connection\\_technology](http://www.kuebler.com/connection_technology).

Technical data			
Mechanical characteristics			
<b>Maximum speed</b>	4500 min <sup>-1</sup>		
<b>Mass moment of inertia</b>	approx. 0.2 x 10 <sup>-6</sup> kgm <sup>2</sup>		
<b>Starting torque – at 20°C [68°F]</b>	< 0.05 Nm		
<b>Shaft load capacity</b>	radial	40 N	
	axial	20 N	
<b>Weight</b>	ca. 0.17 kg [6.00 oz]		
<b>Protection acc. to EN 60529</b>	IP64		
Electrical characteristics			
<b>Output circuit</b>	<b>RS422</b> (TTL comp.)	<b>Push-pull<sup>2)</sup></b> (7272 comp.)	<b>Open collector</b> (7273)
<b>Power supply</b>	5 V DC (±5 %) / 5 ... 30 V DC	10 ... 30 V DC / 5 ... 30 V DC	10 ... 30 V DC / 5 ... 30 V DC
<b>Power consumption with inverted signal (no load)</b>	typ. 40 mA max. 90 mA / max. 165 mA	typ. 50 mA max. 100 mA	100 mA
<b>Permissible load / channel</b>	max. +/- 20 mA	max. +/- 20 mA	20 mA sink at 30 V DC
<b>Pulse frequency</b>	max. 250 kHz	max. 250 kHz	max. 250 kHz
<b>Signal level</b>	HIGH min. 2.5 V LOW max. 0.5 V	min. +V - 2.0 V max. 0.5 V	
<b>Rising edge time t<sub>r</sub></b>	max. 200 ns	max. 1 µs	
<b>Falling edge time t<sub>f</sub></b>	max. 200 ns	max. 1 µs	
<b>Short circuit proof outputs<sup>3)</sup></b>	yes <sup>4)</sup>	yes	yes
<b>Reverse polarity protection of the power supply</b>	no/yes	yes	yes
<b>UL approval</b>	file no. E224618		
<b>CE compliant acc. to</b>	EMC guideline 2014/30/EU RoHS guideline 2011/65/EU		

1) Is only necessary when a special output signal format is required.  
2) Max. recommended cable length 30 m [98.43'].  
3) If power supply correctly applied.

4) Only one channel allowed to be shorted-out:  
at +V= 5 V DC, short-circuit to channel, 0 V, or +V is permitted.  
at +V= 5 ... 30 V DC, short-circuit to channel or 0 V is permitted.

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## Terminal assignment

Output circuit	Type of connection	Cable (isolate unused cores individually before initial start-up)									
3, 4, 6, A, B, C with inv. signal	1, 2	Signal:	0 V	+V	A	$\bar{A}$	B	$\bar{B}$	0	$\bar{0}$	
		Core color:	WH	BN	GN	YE	GY	PK	BU	RD	

Output circuit	Type of connection	Cable (isolate unused cores individually before initial start-up)									
7, 8 without inv. signal	1, 2	Signal:	0 V	+V	A	-	B	-	0	-	
		Core color:	WH	BN	GN	-	GY	-	BU	-	

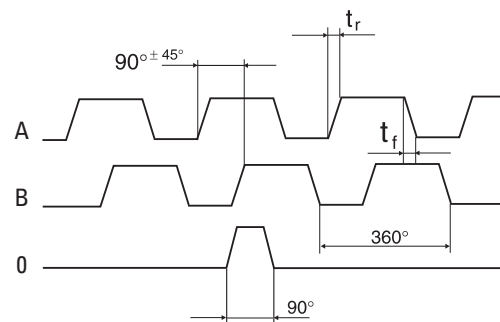
- +V: Encoder power supply +V DC
- 0 V: Encoder power supply ground GND (0 V)
- A,  $\bar{A}$ : Incremental output channel A
- B,  $\bar{B}$ : Incremental output channel B
- 0,  $\bar{0}$ : Reference signal

## Output signal formats

All Kübler encoders come standard with six channels where A leads B in the clockwise direction and the standard index is gated with A & B. The tolerance of the wave form affects the control and, in some cases, may affect the smoothness of system operation.

<b>A leads B</b> when the shaft is rotated in the clockwise direction viewing the shaft or collet end. This is the Kübler standard. This format applies to the pin key codes listed below.		
Order code <b>i</b>		
standard	0 gated with A & B. This is the Kübler standard. 0 is 90° wide.	
<b>P03</b>	0 ungated. 0 is 330° to 360° wide.	

## Wave form tolerances



$t_r$  = rising edge time  
 $t_f$  = falling edge time

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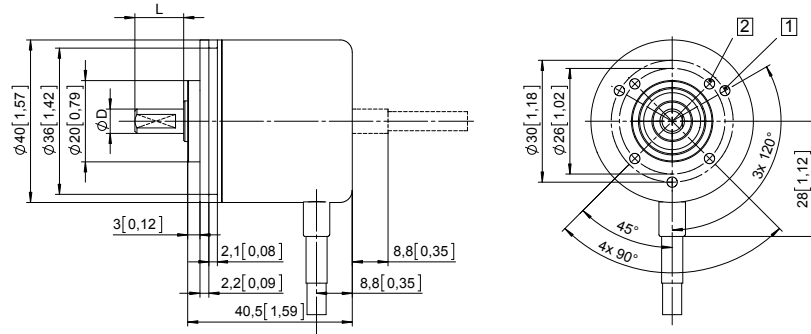
### Dimensions shaft version

Dimensions in mm [inch]

#### Clamping-synchro flange, ø 40 [1.57]

##### Flange type 1

- 1 3 x M3, 4 [0.16] deep
- 2 4 x M3, 4 [0.16] deep



D	Fit	L
6 [0.24]	h7	12.5 [0.49]
1/4"	h7	12.5 [0.49]
8 [0.32]	h7	12.5 [0.49]

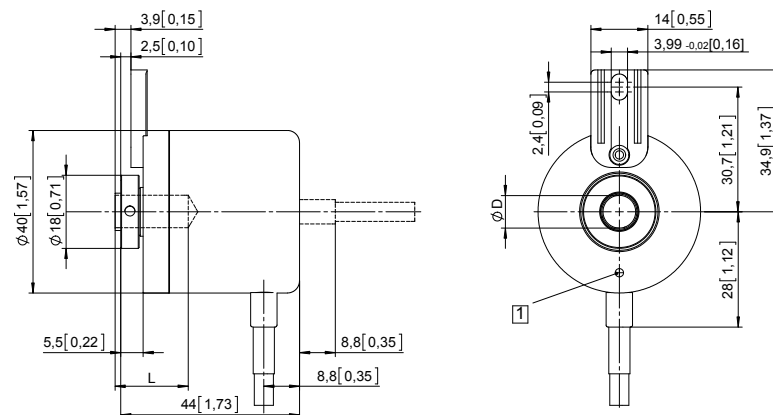
### Dimensions hollow shaft version

Dimensions in mm [inch]

#### Flange with spring element, long

##### Flange type 2

- 1 M2,5, 4 [0.16] deep

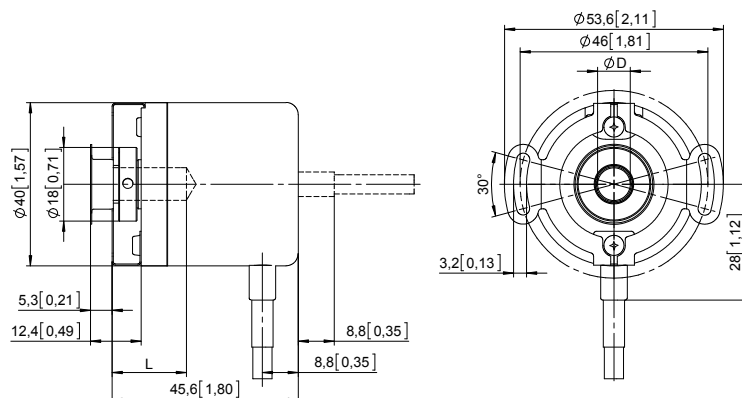


D	Fit	L
8 [0.32]	H7	18 [0.71]
1/4"	H7	18 [0.71]

L = insertion depth max. blind hollow shaft

#### Flange with stator coupling, ø 46 [1.81]

##### Flange type 5



D	Fit	L
8 [0.32]	H7	18 [0.71]
1/4"	H7	18 [0.71]

L = insertion depth max. blind hollow shaft  
insertion depth min. = 1.5 x D