

# Incremental encoders

Incremental encoders

**Standard optical**
**Sendix Base KIS50 / KIH50 (shaft / hollow shaft)**
**Push-pull / RS422 / Open collector**


The encoders Sendix Base KIS50 / KIH50 offer a protection level up to IP65 and can be used with temperatures from -20°C up to +70°C. They are ideal for use in standard applications and in simple machines.

The Sendix Base KIS50 / KIH50 family also features our well proven Safety-Lock™ system, allowing higher tolerance of possible installation errors and increasing the overall performance of this encoder.



Safety-Lock™	High rotational speed	Temperature range -20...+70°C	High protection level IP	High shaft load capacity	Shock / vibration resistant	Magnetic field proof	Short-circuit proof	Reverse polarity protection	Optical sensor

### Robust

- Resistant die-cast housing and protection up to IP65.
- Wide temperature range, -20°C ... +70°C.
- Elimination of machine downtime thanks to sturdy bearing construction in "Safety-Lock™ Design".

### Flexible

- Suitable connection variant for every specific case: cable connection, M12 and M23 connector.
- Various mounting options.
- Up to 5000 pulses per revolution.

**Order code**      **8.KIS50 . XXXXX . XXXX**  
**Shaft version**      Type      a      b      c      d      e

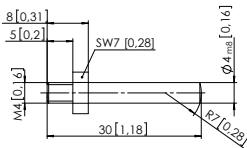
- |  |   |  |
|--|---|--|
| <p><b>a Flange</b><br/>8 = clamping flange, IP65    ø 58 mm [2.28"]<br/>B = synchro flange, IP65    ø 58 mm [2.28"]</p> <p><b>b Shaft (ø x L), with flat</b><br/>1 = ø 6 x 10 mm [0.24 x 0.39"]<br/>6 = ø 8 x 15 mm [0.32 x 0.59"]<br/>3 = ø 10 x 20 mm [0.39 x 0.79"]<br/>5 = ø 12 x 20 mm [0.47 x 0.79"]</p> | <p><b>c Output circuit / power supply</b><br/>4 = RS422 (with inverted signal) / 5 V DC<br/>1 = RS422 (with inverted signal) / 5 ... 30 V DC<br/>2 = push-pull (7272 compatible with inverted signal) / 5 ... 30 V DC<br/>5 = push-pull (with inverted signal) / 10 ... 30 V DC<br/>3 = open collector (with inverted signal) / 5 ... 30 V DC</p> | <p><b>d Type of connection</b><br/>1 = axial cable, 1 m [3.28'] PVC<br/>2 = radial cable, 1 m [3.28'] PVC<br/>3 = axial M12 connector, 8-pin<br/>4 = radial M12 connector, 8-pin<br/>7 = axial M23 connector, 12-pin<br/>8 = radial M23 connector, 12-pin</p> <p><b>e Pulse rate</b><br/>100, 200, 250, 256, 360, 500, 512, 600, 1000, 1024, 2000, 2048, 2500, 3600, 4096, 5000<br/>(e.g. 100 pulses =&gt; 0100)</p> |
|--|---|--|

**Order code**      **8.KIH50 . XXXXX . XXXX**  
**Hollow shaft**      Type      a      b      c      d      e

- |   |   |  |
|---|---|--|
| <p><b>a Flange</b><br/>2 = with spring element, long, IP65<br/>4 = with torque stop, long, IP65<br/>D = with stator coupling, IP65, ø 63 mm [2.48"]</p> <p><b>b Through hollow shaft</b><br/>9 = ø 8 mm [0.32"]<br/>3 = ø 10 mm [0.39"]<br/>5 = ø 12 mm [0.47"]<br/>A = ø 14 mm [0.55"]<br/>8 = ø 15 mm [0.59"]</p> | <p><b>c Output circuit / power supply</b><br/>4 = RS422 (with inverted signal) / 5 V DC<br/>1 = RS422 (with inverted signal) / 5 ... 30 V DC<br/>2 = push-pull (7272 compatible with inverted signal) / 5 ... 30 V DC<br/>5 = push-pull (with inverted signal) / 10 ... 30 V DC<br/>3 = open collector (with inverted signal) / 5 ... 30 V DC</p> | <p><b>d Type of connection</b><br/>1 = radial cable, 1 m [3.28'] PVC<br/>2 = radial M12 connector, 8-pin<br/>4 = radial M23 connector, 12-pin<br/>E = tangential cable, 1 m [3.28'] PVC</p> <p><b>e Pulse rate</b><br/>100, 200, 250, 256, 360, 500, 512, 600, 1000, 1024, 2000, 2048, 2500, 3600, 4096, 5000<br/>(e.g. 100 pulses =&gt; 0100)</p> |
|---|---|--|

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Mounting accessory for shaft encoders		Order no.
<b>Coupling</b>	bellows coupling $\varnothing$ 19 mm [0.75"] for shaft 6 mm [0.24"]	<b>8.0000.1102.0606</b>
	bellows coupling $\varnothing$ 19 mm [0.75"] for shaft 10 mm [0.39"]	<b>8.0000.1102.1010</b>
Mounting accessory for hollow shaft encoders		Order no.
<b>Cylindrical pin, long</b> for flange with spring element (flange type 2)	with fixing thread 	<b>8.0010.4700.0000</b>
Connection technology		Order no.
<b>Cordset, pre-assembled</b>	M12 female connector with coupling nut, 8-pin 2 m [6.56'] PVC cable	<b>05.00.6041.8211.002M</b>
	M23 female connector with coupling nut, 12-pin 2 m [6.56'] PVC cable	<b>8.0000.6901.0002</b>
<b>Connector, self-assembly (straight)</b>	M12 female connector with coupling nut, 8-pin	<b>05.CMB 8181-0</b>
	M23 female connector with coupling nut, 12-pin	<b>8.0000.5012.0000</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>	6000 min <sup>-1</sup> 3000 min <sup>-1</sup> (continuous)
<b>Mass moment of inertia</b>	shaft version approx. 1.8 x 10 <sup>-6</sup> kgm <sup>2</sup> hollow shaft version approx. 6 x 10 <sup>-6</sup> kgm <sup>2</sup>
<b>Starting torque at 20°C [68°F]</b>	< 0.01 Nm
<b>Shaft load capacity</b>	radial 80 N axial 40 N
<b>Weight</b>	approx. 0.4 kg [14.11 oz]
<b>Protection acc. to EN 60529</b>	IP65
<b>Working temperature range</b>	-20°C ... +70°C [-4°F ... +158°F]
<b>Material</b>	shaft stainless steel
<b>Shock resistance acc. to EN 60068-2-27</b>	1000 m/s <sup>2</sup> , 6 ms
<b>Vibration resistance acc. to EN 60068-2-6</b>	100 m/s <sup>2</sup> , 10 ... 2000 Hz

Electrical characteristics					
Output circuit	RS422 (TTL compatible)	RS422 (TTL compatible)	Push-pull	Push-pull (7272 compatible)	Open collector (7273)
	Order code <b>1</b>	<b>4</b>	<b>5</b>	<b>2</b>	<b>3</b>
<b>Power supply</b>	5 ... 30 V DC	5 V DC (±5 %)	10 ... 30 V DC	5 ... 30 V DC	5 ... 30 V DC
<b>Power consumption (no load)</b>	typ. 40 mA max. 90 mA	typ. 40 mA max. 90 mA	typ. 50 mA max. 100 mA	typ. 50 mA max. 100 mA	100 mA
<b>Permissible load / channel</b>	max. +/- 20 mA	max. +/- 20 mA	max. +/- 20 mA	max. +/- 20 mA	+/- 20 mA sink at 30 V DC
<b>Pulse frequency</b>	max. 300 kHz	max. 300 kHz	max. 300 kHz	max. 300 kHz <sup>1)</sup>	max. 300 kHz
<b>Signal level</b>	HIGH min. 2.5 V LOW max. 0.5 V	min. 2.5 V max. 0.5 V	min +V - 1.0 V 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. 200 ns	max. 1 μs	max. 1 μs	
<b>Falling edge time t<sub>f</sub></b>	max. 200 ns	max. 200 ns	max. 1 μs	max. 1 μs	
<b>Short circuit proof outputs<sup>2)</sup></b>	yes <sup>3)</sup>	yes <sup>3)</sup>	yes	yes	yes
<b>Reverse polarity protection of the power supply</b>	yes	no	yes	no	no
<b>CE compliant acc. to</b>	EMC guideline 2014/30/EU RoHS guideline 2011/65/EU				

1) Max. recommended cable length 30 m [98.43'].  
2) If power supply correctly applied.

3) 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

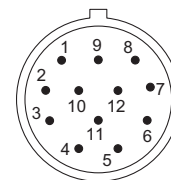
Output circuit	Type of connection	Cable (isolate unused wires individually before initial start-up)												
1, 2, 3, 4, 5	KIS50: 1, 2	Signal:	0 V	+V	0 Vsens	+Vsens	A	$\bar{A}$	B	$\bar{B}$	0	$\bar{0}$	$\perp$	
	KIH50: 1, E	Cable color:	WH	BN	GY PK	RD BU	GN	YE	GY	PK	BU	RD	shield	
Output circuit	Type of connection	M12 connector, 8-pin												
1, 2, 3, 4, 5	KIS50: 3, 4	Signal:	0 V	+V	0 Vsens	+Vsens	A	$\bar{A}$	B	$\bar{B}$	0	$\bar{0}$	$\perp$	
	KIH50: 2	Pin:	1	2			3	4	5	6	7	8	PH <sup>1)</sup>	
Output circuit	Type of connection	M23 connector, 12-pin												
1, 2, 3, 4, 5	KIS50: 7, 8	Signal:	0 V	+V	0 Vsens	+Vsens	A	$\bar{A}$	B	$\bar{B}$	0	$\bar{0}$	$\perp$	
	KIH50: 4	Pin:	10	12	11	2	5	6	8	1	3	4	PH <sup>1)</sup>	

- +V: Encoder power supply +V DC
- 0 V: Encoder power supply ground GND (0 V)
- 0 Vsens / +Vsens: Using the sensor outputs of the encoder, the voltage present can be measured and if necessary increased accordingly.
- A,  $\bar{A}$ : Incremental output channel A
- B,  $\bar{B}$ : Incremental output channel B
- 0,  $\bar{0}$ : Reference signal
- PH  $\perp$ : Plug connector housing (shield)

### Top view of mating side, male contact base



M12 connector, 8-pin



M23 connector, 12-pin

## Dimensions shaft version

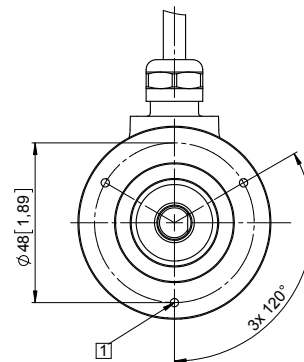
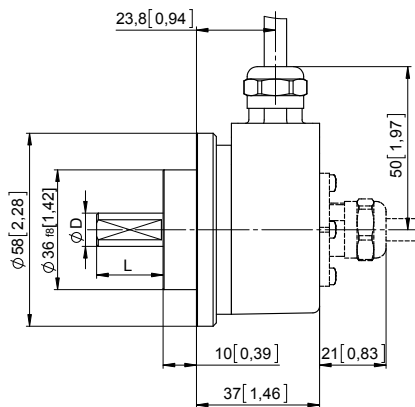
Dimensions in mm [inch]

### Clamping flange, $\varnothing$ 58 [2.28]

#### Flange type 8

1) 3 x M3, 6 [0.24] deep

D	Fit	L
6 [0.24]	h7	10 [0.39]
8 [0.32]	h7	15 [0.59]
10 [0.39]	f7	20 [0.79]
12 [0.47]	h7	20 [0.79]

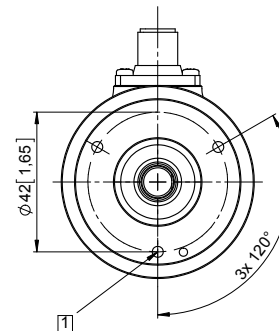
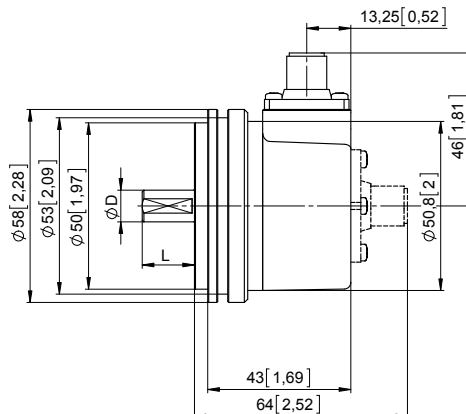


### Synchro flange, $\varnothing$ 58 [2.28]

#### Flange type B

1) 3 x M4, 6 [0.24] deep

D	Fit	L
6 [0.24]	h7	10 [0.39]
8 [0.32]	h7	15 [0.59]
10 [0.39]	f7	20 [0.79]
12 [0.47]	h7	20 [0.79]



1) PH = shield is attached to connector housing.

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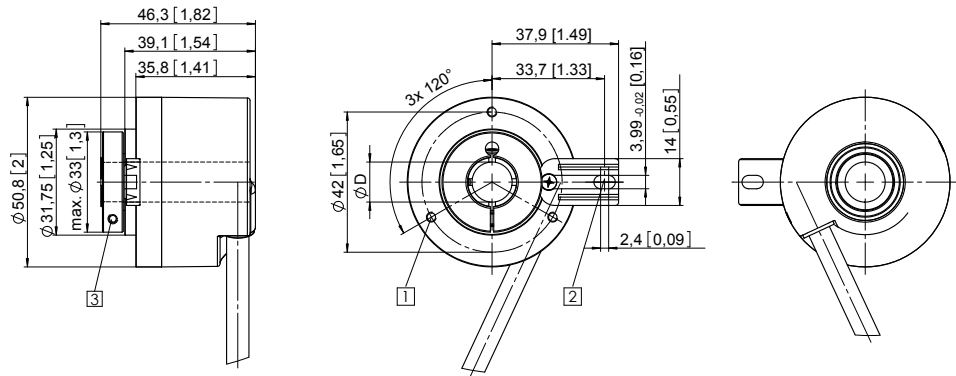
## Dimensions hollow shaft version

Dimensions in mm [inch]

### Flange with spring element, long Flange type 2

- 1 3 x M3, 6 [0.24] deep
- 2 Slot spring element, recommendation: cylindrical pin DIN 7,  $\varnothing 4$  [0.16]
- 3 Recommended torque for the clamping ring 0.6 Nm

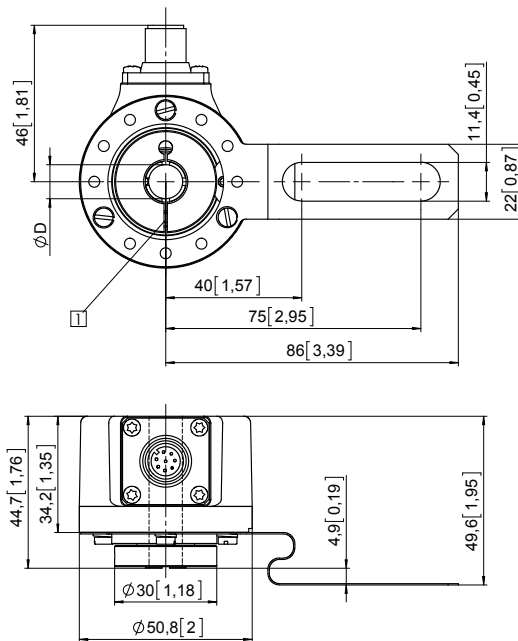
D	Fit
8 [0.32]	H7
10 [0.39]	H7
12 [0.47]	H7
14 [0.55]	H7
15 [0.59]	H7



### Flange with torque stop, long Flange type 4

- 1 Recommended torque for the clamping ring 0.6 Nm

D	Fit
8 [0.32]	H7
10 [0.39]	H7
12 [0.47]	H7
14 [0.55]	H7
15 [0.59]	H7



### Flange with stator coupling, $\varnothing 63$ [2.48] Flange type D

- 1 Recommended torque for the clamping ring 0.6 Nm

D	Fit
8 [0.32]	H7
10 [0.39]	H7
12 [0.47]	H7
14 [0.55]	H7
15 [0.59]	H7

