

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	High protection level	High shaft load capacity	Shock / vibration resistant	Magnetic field proof	Short-circuit proof	Reverse polarity protection	Optical sensor

Robust

- Resistant zinc 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	.XXXX	.XXXX
Shaft version	Type	a b c d	e

a Flange

- 8 = clamping flange, IP65 ø 58 mm [2.28"]
- B = synchro flange, IP65 ø 58 mm [2.28"]

b Shaft (ø x L), with flat

- 1 = ø 6 x 10 mm [0.24 x 0.39"]
- 6 = ø 8 x 15 mm [0.32 x 0.59"]
- 3 = ø 10 x 20 mm [0.39 x 0.79"]
- 5 = ø 12 x 20 mm [0.47 x 0.79"]
- 8 = ø 3/8 x 7/8"

c Output circuit / power supply

- 4 = RS422 (with inverted signal) / 5 V DC
- 1 = RS422 (with inverted signal) / 5 ... 30 V DC
- 2 = HTL/TTL universal / 4,7 ... 30 V DC
- 5 = push-pull (with inverted signal) / 10 ... 30 V DC
- 3 = open collector (with inverted signal) / 5 ... 30 V DC

d Type of connection

- 1 = axial cable, 1 m [3.28'] PVC
- 2 = radial cable, 1 m [3.28'] PVC
- R = radial M12 connector, 5-pin
- 3 = axial M12 connector, 8-pin
- 4 = radial M12 connector, 8-pin
- 7 = axial M23 connector, 12-pin
- 8 = radial M23 connector, 12-pin

e Pulse rate

- 100, 200, 250, 256, 360, 500, 512, 600, 1000, 1024, 2000, 2048, 2500, 3600, 4096, 5000 (e.g. 100 pulses => 0100)

High performance version (optionally available)

- Extended temperature range
- Higher rotational speed
- Higher shock resistance
- Higher vibration resistance

Order code 8.KIS50.xxxx.xxxx.9888

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Order code Hollow shaft	8.KIH50 . <table border="1" style="display: inline-table; text-align: center; font-size: small;"> <tr> <td style="border: 1px solid black;">XX</td> <td style="border: 1px solid black;">XX</td> <td style="border: 1px solid black;">XX</td> <td style="border: 1px solid black;">XX</td> <td style="border: 1px solid black;">XXXX</td> </tr> <tr> <td style="border: 1px solid black; font-size: x-small;">a</td> <td style="border: 1px solid black; font-size: x-small;">b</td> <td style="border: 1px solid black; font-size: x-small;">c</td> <td style="border: 1px solid black; font-size: x-small;">d</td> <td style="border: 1px solid black; font-size: x-small;">e</td> </tr> </table> <small>Type</small>	XX	XX	XX	XX	XXXX	a	b	c	d	e	
XX	XX	XX	XX	XXXX								
a	b	c	d	e								
a Flange 2 = with spring element, long, IP65 4 = with torque stop, long, IP65 D = with stator coupling, IP65, \varnothing 63 mm [2.48"]	c Output circuit / power supply 4 = RS422 (with inverted signal) / 5 V DC 1 = RS422 (with inverted signal) / 5 ... 30 V DC 2 = HTL/TTL universal / 4.7 ... 30 V DC 5 = push-pull (with inverted signal) / 10 ... 30 V DC 3 = open collector (with inverted signal) / 5 ... 30 V DC	e Pulse rate 100, 200, 250, 256, 360, 500, 512, 600, 1000, 1024, 2000, 2048, 2500, 3600, 4096, 5000 (e.g. 100 pulses => 0100)										
b Through hollow shaft 9 = \varnothing 8 mm 4 = \varnothing 3/8" (9,52 mm) 3 = \varnothing 10 mm 5 = \varnothing 12 mm 6 = \varnothing 1/2" (12,75 mm) A = \varnothing 14 mm 8 = \varnothing 15 mm	d Type of connection 1 = radial cable, 1 m [3.28'] PVC R = radial M12 connector, 5-pin 2 = radial M12 connector, 8-pin 4 = radial M23 connector, 12-pin E = tangential cable, 1 m [3.28'] PVC	High performance version (optionally available) - Extended temperature range - Higher rotational speed - Higher shock resistance - Higher vibration resistance Order code 8.KIH50.xxxx.xxxx.9888										

Mounting accessory for shaft encoders	Order no.
Coupling	
bellows coupling \varnothing 19 mm [0.75"] for shaft 6 mm [0.24"]	8.0000.1102.0606
bellows coupling \varnothing 19 mm [0.75"] for shaft 10 mm [0.39"]	8.0000.1102.1010

Mounting accessory for hollow shaft encoders	Dimensions in mm [inch]	Order no.
Cylindrical pin, long for flange with spring element (flange type 2)	with fixing thread	8.0010.4700.0000

Connection technology	Order no.
Cordset, pre-assembled	
M12 female connector with coupling nut, 8-pin 2 m [6.56'] PVC cable	05.00.6041.8211.002M
M23 female connector with coupling nut, 12-pin 2 m [6.56'] PVC cable	8.0000.6901.0002
Connector, self-assembly (straight)	
M12 female connector with coupling nut, 8-pin	05.CMB 8181-0
M23 female connector with coupling nut, 12-pin	8.0000.5012.0000

Further accessories can be found in the accessories section or in the accessories area of our website at: kuebler.com/accessories.
 Additional connectors can be found in the connection technology section or in the connection technology area of our website at: kuebler.com/connection_technology.

Technical data	
Mechanical characteristics	
Maximum speed	6000 min ⁻¹ for option 9888 8000 min ⁻¹ 3000 min ⁻¹ (continuous)
Mass moment of inertia	shaft version approx. 1.8 x 10 ⁻⁶ kgm ² hollow shaft version approx. 6 x 10 ⁻⁶ kgm ²
Starting torque at 20°C [68°F]	< 0.01 Nm
Shaft load capacity	radial 80 N axial 40 N
Weight	approx. 0.4 kg [14.11 oz]
Protection acc. to EN 60529	
IP65	
Working temperature range	
-20°C ... +70°C [-4°F ... +158°F] for option 9888 -40°C ... +80°C [-40°F ... +176°F]	
Material	
shaft stainless steel	
Shock resistance acc. to EN 60068-2-27	
1000 m/s ² , 6 ms for option 9888 2000 m/s ² , 6 ms	
Vibration resistance acc. to EN 60068-2-6	
100 m/s ² , 10 ... 2000 Hz for option 9888 200 m/s ² , 10 ... 2000 Hz	

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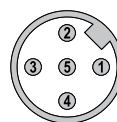
Electrical characteristics					
Output circuit	RS422 (TTL compatible)	RS422 (TTL compatible)	Push-pull	HTL/TTL universal	Open collector (7273)
	Order code 1	4	5	2	3
Power supply	5 ... 30 V DC	5 V DC ($\pm 5\%$)	10 ... 30 V DC	4.7 ... 30 V DC	5 ... 30 V DC
Power consumption (no load)	typ. 40 mA max. 90 mA	typ. 40 mA max. 90 mA	typ. 50 mA max. 100 mA	typ. 50 mA max. 100 mA	100 mA
Permissible load / channel	max. +/- 20 mA	max. +/- 20 mA	max. +/- 20 mA	max. +/- 20 mA	20 mA sink at 30 V DC
Pulse frequency	max. 300 kHz	max. 300 kHz	max. 300 kHz	max. 300 kHz ¹⁾	max. 300 kHz
Signal level	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	
Rising edge time t_r	max. 200 ns	max. 200 ns	max. 1 μ s	max. 1 μ s	
Falling edge time t_f	max. 200 ns	max. 200 ns	max. 1 μ s	max. 1 μ s	
Short circuit proof outputs²⁾	yes ³⁾	yes ³⁾	yes	yes	yes
Reverse polarity protection of the power supply	yes	no	yes	no	no
CE compliant acc. to	EMC guideline 2014/30/EU RoHS guideline 2011/65/EU				

Terminal assignment

Output circuit	Type of connection	Cable (isolate unused cores 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	Core color:	WH	BN	GY PK	RD BU	GN	YE	GY	PK	BU	RD	shield	
1, 2, 3, 4, 5	M12 connector, 5-pin		Signal:	0 V	+V	A	B	0	\perp					
	KIS50: R	KIH50: R	Pin:	1	2	3	4	5	PH ⁴⁾					
1, 2, 3, 4, 5	M12 connector, 8-pin		Signal:	0 V	+V	0 Vsens	+Vsens	A	\bar{A}	B	\bar{B}	0	$\bar{0}$	\perp
	KIS50: 3, 4	KIH50: 2	Pin:	1	2			3	4	5	6	7	8	PH ⁴⁾
1, 2, 3, 4, 5	M23 connector, 12-pin		Signal:	0 V	+V	0 Vsens	+Vsens	A	\bar{A}	B	\bar{B}	0	$\bar{0}$	\perp
	KIS50: 7, 8	KIH50: 4	Pin:	10	12	11	2	5	6	8	1	3	4	PH ⁴⁾

- +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)

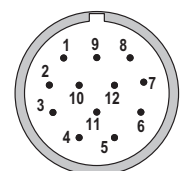
Top view of mating side, male contact base



M12 connector, 5-pin



M12 connector, 8-pin



M23 connector, 12-pin

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.
 4) PH = shield is attached to connector housing.

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Dimensions shaft version

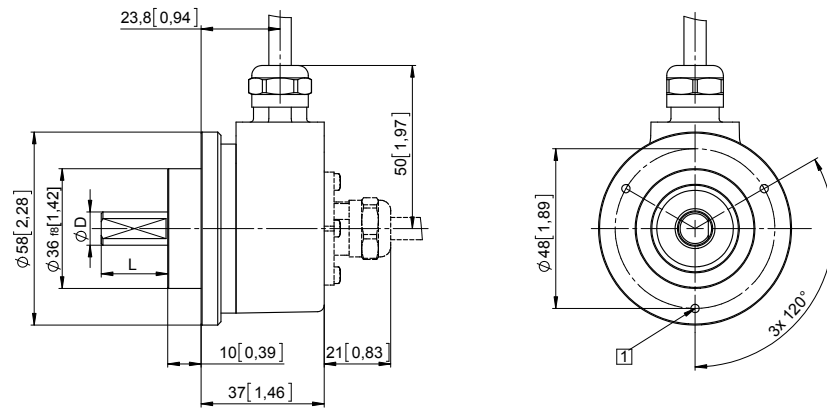
Dimensions in mm [inch]

Clamping flange, \varnothing 58 [2.28]

Flange type 7, 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]	h7	20 [0.79]
12 [0.47]	h7	20 [0.79]

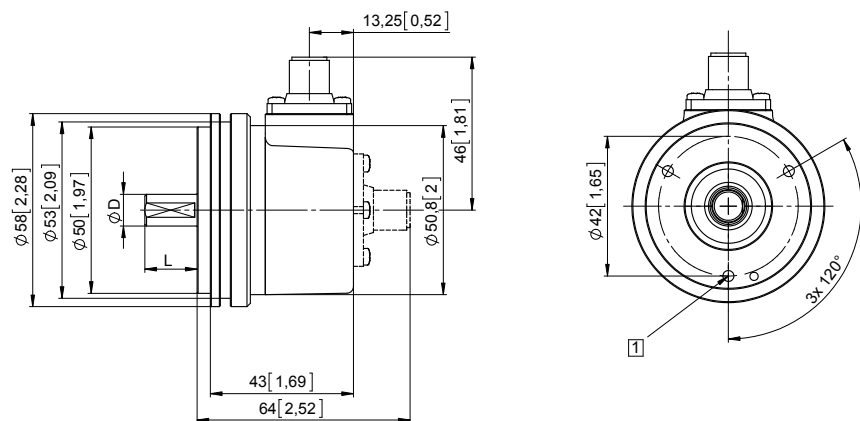


Synchro flange, \varnothing 58 [2.28]

Flange type A, 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]	h7	20 [0.79]
12 [0.47]	h7	20 [0.79]



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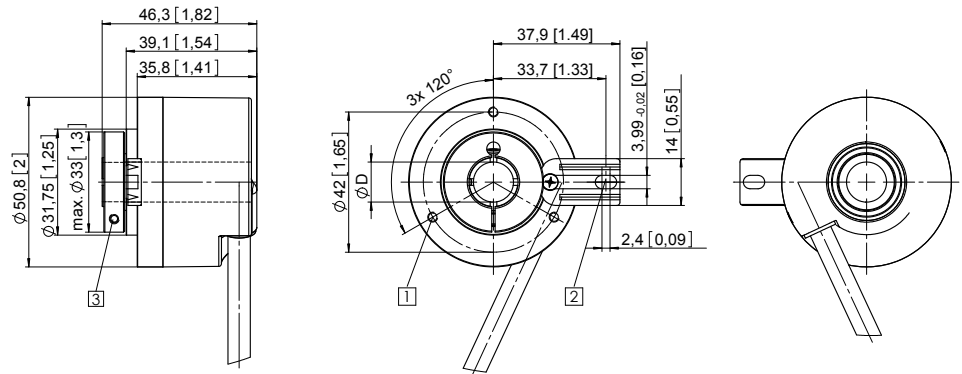
Dimensions hollow shaft version

Dimensions in mm [inch]

Flange with spring element, long Flange type 1, 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

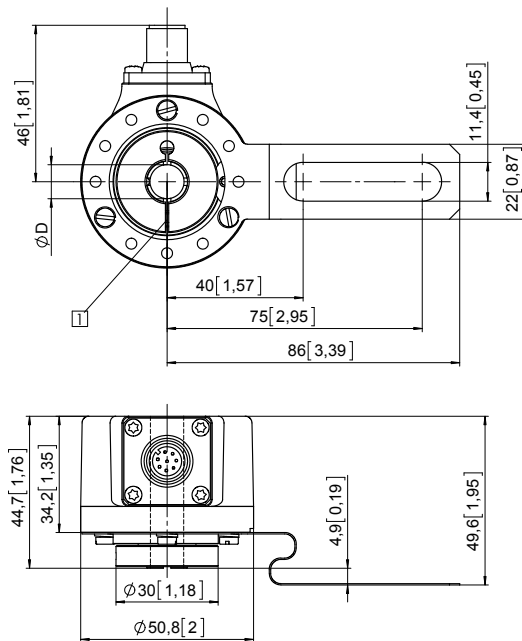
D	Fit
8 [0.32]	H7
10 [0.39]	H7
12 [0.47]	H7
14 [0.55]	H7
15 [0.59]	H7



Flange with torque stop, long Flange type 3, 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 C, 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

