

Incremental encoders

Standard optical

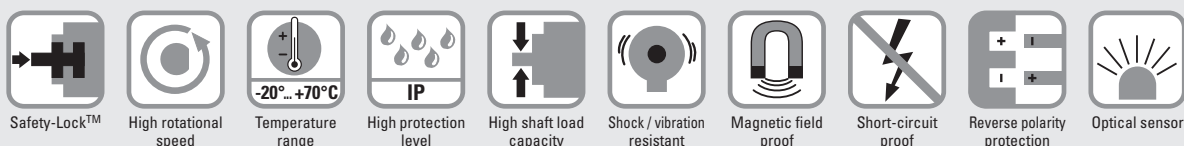
Sendix Base KIS50 / KIH50 (shaft / hollow shaft)

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.



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

Shaft version

8.KIS50 . XXXXX . XXXX . PXX0X
Type a b c d e f g h

a Flange

8 = clamping flange, IP65 ø 58 mm [2.28"]
B = synchro flange, IP65 ø 58 mm [2.28"]
D = square flange, IP65 ø 63,5 mm [2.5"]

b Shaft (ø x L), with flat

3 = ø 10 x 20 mm [0.39 x 0.79"]
D = ø 10 x 20 mm [0.39 x 0.79"], on both sides ¹⁾
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 / 5 V DC
1 = RS422 / 5 ... 30 V DC
2 = push-pull / 5 ... 30 V DC
5 = push-pull / 10 ... 30 V DC
3 = open collector / 5 ... 30 V DC

d Type of connection

1 = axial cable, 1 m [3.28'] PVC
2 = radial cable, 1 m [3.28'] PVC
P = axial M12 connector, 5-pin
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, 120, 200, 250, 256, 300, 360, 500, 512,
600, 1000, 1024, 1200, 2000, 2048, 2500,
3000, 3600, 4096, 5000
(e.g. 100 pulses => 0100)

f Special output signal formats

00 = standard output
other = see page 4

g Capacitor

0 = standard

h Special connector pin configuration

0 = standard wiring
other = see page 4

1) Suitable for measuring wheel systems MWE52 or MWE62.
Only available with flange option a = 8 and radial type of connection.

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Order code	8.KIH50	.XXXXX	.XXXX	P	XX0X				
Hollow shaft	Type	a	b	c	d	e	f	g	h
a Flange	2 = with spring element, long, IP65 4 = with torque stop, long, IP65 D = with stator coupling, IP65, ø 63 mm [2.48"]	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	f Special output signal formats	00 = standard output other = see page 4				
b Through hollow shaft	2 = ø 1/4" 4 = ø 3/8" 3 = ø 10 mm [0.39"] 5 = ø 12 mm [0.47"] 6 = ø 1/2" A = ø 14 mm [0.55"] 8 = ø 15 mm [0.59"] 7 = ø 5/8"	e Pulse rate	100, 120, 200, 250, 256, 300, 360, 500, 512, 600, 1000, 1024, 1200, 2000, 2048, 2500, 3000, 3600, 4096, 5000 (e.g. 100 pulses => 0100)	g Capacitor	0 = standard				
c Output circuit / power supply	4 = RS422 / 5 V DC 1 = RS422 / 5 ... 30 V DC 2 = push-pull / 5 ... 30 V DC 5 = push-pull / 10 ... 30 V DC 3 = open collector / 5 ... 30 V DC	h Special connector pin configuration	0 = standard wiring other = see page 4						

Mounting accessory for shaft encoders	Order no.
Coupling	bellows coupling ø 19 mm [0.75"] for shaft 6 mm [0.24"] 8.0000.1102.0606 bellows coupling ø 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.
Torque pin, ø 4 mm	with fixing thread	8.0010.4700.0000
for flange with spring element (flange type 1 + 2)		

Cables and connectors	Order no.
Preassembled cables	M12 female connector with coupling nut, 8-pin, A coded, straight single ended 2 m [6.56'] PVC cable 05.00.6041.8211.002M M23 female connector with coupling nut, 12-pin, cw single ended 2 m [6.56'] PVC cable 8.0000.6901.0002
Connectors	M12 female connector with coupling nut, 8-pin, A coded, straight (metal) 05.CMB 8181-0 M23 female connector with coupling nut, 12-pin, cw 8.0000.5012.0000

Further Kübler accessories can be found at: kuebler.com/accessories
Further Kübler cables and connectors can be found at: kuebler.com/connection-technology

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Technical data

Mechanical characteristics

Maximum speed	6000 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]
Material	shaft stainless steel
Shock resistance acc. to EN 60068-2-27	1000 m/s ² , 6 ms
Vibration resistance acc. to EN 60068-2-6	100 m/s ² , 10 ... 2000 Hz

Approvals

CE compliant in accordance with	
EMC Directive	2014/30/EU
RoHS Directive	2011/65/EU

Electrical characteristics

Output circuit	RS422 (TTL compatible)	RS422 (TTL compatible)	Push-pull	Push-pull (HTL/TTL universal, 7272 compatible)	Open collector (7273)
Order code	1	4	5	2	3
Power supply	5 ... 30 V DC	5 V DC (±5 %)	10 ... 30 V DC	5 ... 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 µs	max. 1 µs	
Falling edge time t_f	max. 200 ns	max. 200 ns	max. 1 µs	max. 1 µs	
Short circuit proof outputs²⁾	yes ³⁾	yes ³⁾	yes	yes	yes
Reverse polarity protection of the power supply	yes	no	yes	no	no

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 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
Output circuit	Type of connection	M12 connector, 5-pin											
1, 2, 3, 4, 5	KIS50: P, R	Signal:	0 V	+V	A	B	0	$\perp$					
	KIH50: R	Pin:	1	2	3	4	5	PH ⁴⁾					
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 ⁴⁾
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 ⁴⁾

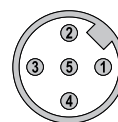
Terminal assignment – Special connector pin configuration

Order code ^h	Output circuit	Type of connection	M12 connector, 8-pin										
7	1, 2, 3, 4, 5	KIS50: 3, 4	Signal:	0 V	+V	A	$\bar{A}$	B	$\bar{B}$	0	$\bar{0}$	$\perp$	
		KIH50: 2	Pin:	7	2	1	3	4	5	6	8	PH ¹⁾	

Order code ^h	Output circuit	Type of connection	M12 connector, 5-pin						
9	1, 2, 3, 4, 5	KIS50: P, R	Signal:	0 V	+V	A	B	0	$\perp$
		KIH50: R	Pin:	3	1	4	2	5	PH ¹⁾

+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)

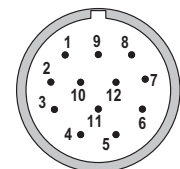
Top view of mating side, male contact base



M12 connector, 5-pin



M12 connector, 8-pin

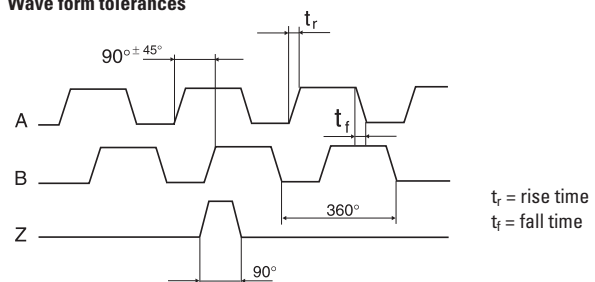


M23 connector, 12-pin

Special output signal formats

All Kübler encoders come standard with six channels where A leads B in the clockwise direction viewing the shaft or collet end. The tolerance of the wave form affects the control and, in some cases, may affect the smoothness of system operation.

Wave form tolerances



A leads 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.	A
Order code ¹⁾	
Z gated with A & B. This is the Kübler standard. Z is 90° wide.	Z

B leads A when the shaft is rotated in the clockwise direction viewing the shaft or collet end. This format applies to the pin key codes listed below.	A
Order code ¹⁾	
04 Z gated with A & B. Z is 90° wide.	Z

1) PH = shield is attached to connector housing.

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Push-pull / RS422 / Open collector

Dimensions shaft version

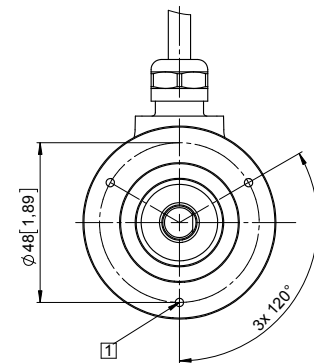
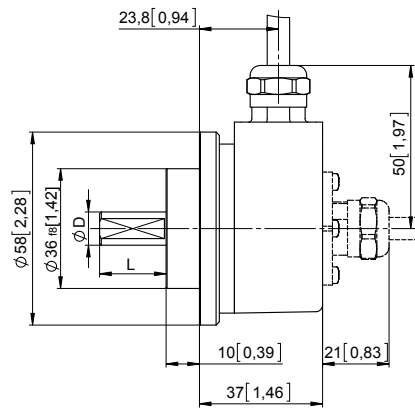
Dimensions in mm [inch]

Clamping flange, $\varnothing$ 58 [2.28]

Flange type 8

1 3 x M3, 6 [0.24] deep

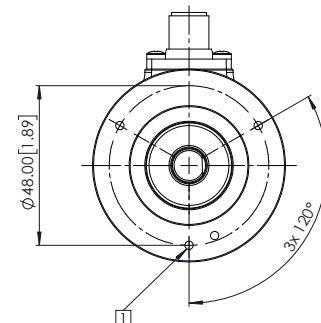
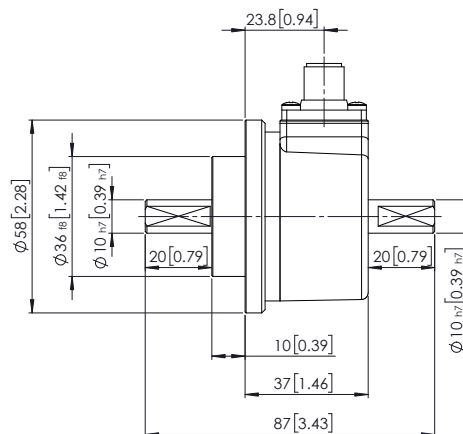
D	Fit	L
10 [0.39]	h7	20 [0.79]
12 [0.47]	h7	20 [0.79]
3/8"	h8	7/8"



Clamping flange, $\varnothing$ 58 [2.28]

Flange type 8 and shaft $\varnothing$ 10 mm on both sides

1 3 x M3, 6 [0.24] deep



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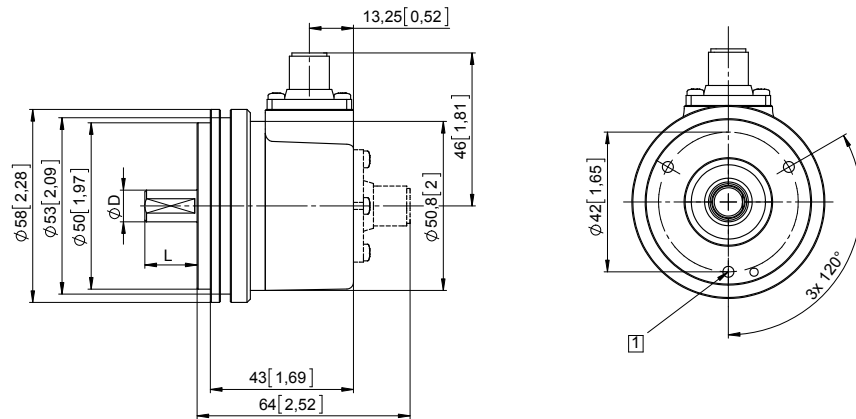
Push-pull / RS422 / Open collector

Dimensions shaft version

Dimensions in mm [inch]

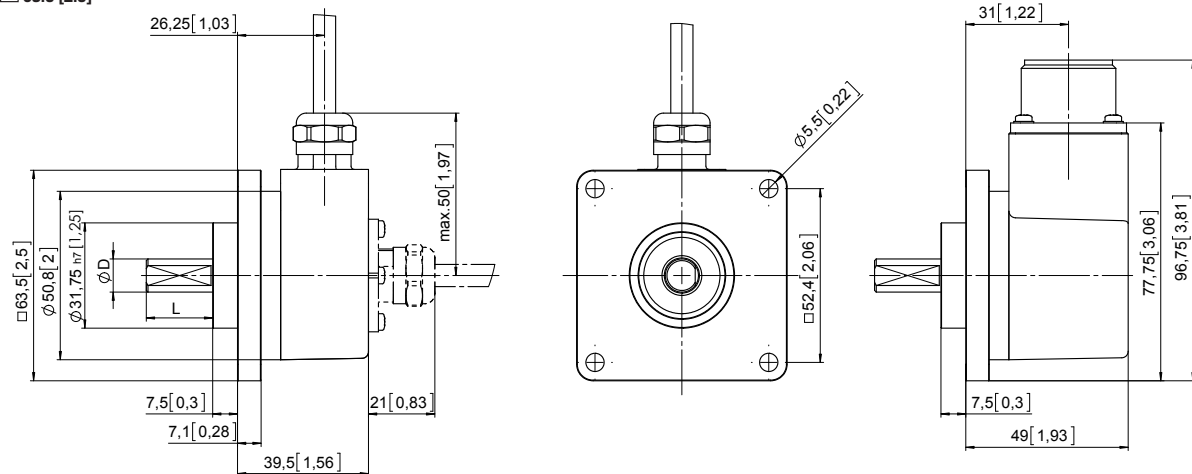
**Synchro flange, $\varnothing$ 58 [2.28]
Flange type B**

1 3 x M4, 6 [0.24] deep



D	Fit	L
10 [0.39]	h7	20 [0.79]
12 [0.47]	h7	20 [0.79]
3/8"	h8	7/8"

**Square flange, $\square$ 63.5 [2.5]
Flange type D**



MIL-connector version

D	Fit	L
10 [0.39]	h7	20 [0.79]
12 [0.47]	h7	20 [0.79]
3/8"	h8	7/8"

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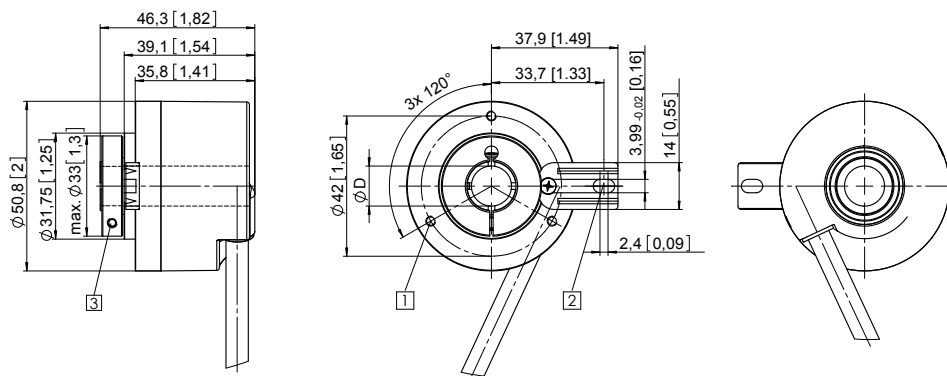
Dimensions hollow shaft version

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

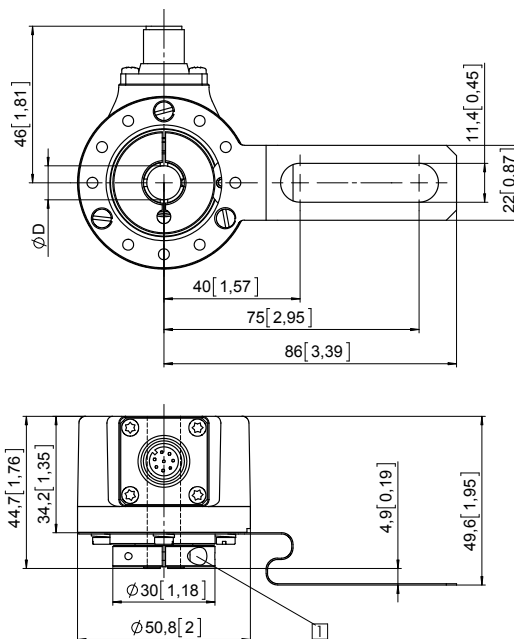
D	Fit
1/4"	H7
3/8"	H7
10 [0.39]	H7
12 [0.47]	H7
1/2"	H7
14 [0.55]	H7
15 [0.59]	H7
5/8"	H7



Flange with torque stop, long Flange type 4

- 1** Recommended torque for the clamping ring 0.6 Nm

D	Fit
1/4"	H7
3/8"	H7
10 [0.39]	H7
12 [0.47]	H7
1/2"	H7
14 [0.55]	H7
15 [0.59]	H7
5/8"	H7



**Flange with stator coupling, ø 63 [2.48]
Flange type D**

- 1** Recommended torque for the clamping ring 0.6 Nm

D	Fit
1/4"	H7
3/8"	H7
10 [0.39]	H7
12 [0.47]	H7
1/2"	H7
14 [0.55]	H7
15 [0.59]	H7
5/8"	H7

