

Incremental encoders

Standard optical

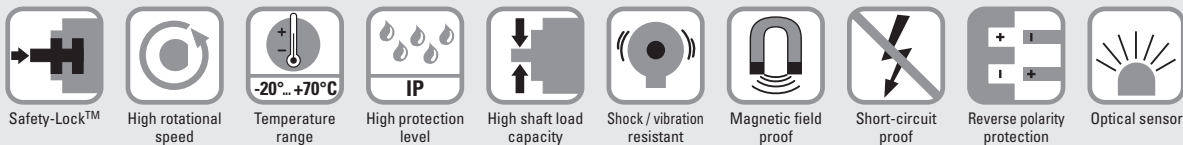
Sendix Base KIS50 / KIH50 (shaft / hollow shaft)

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 . PXX 0X
Type a b c d e f g h

a Flange

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

b Shaft ($\varnothing \times L$), with flat

- 3 = \varnothing 10 x 20 mm [0.39 x 0.79"]
- D = \varnothing 10 x 20 mm [0.39 x 0.79"], on both sides ¹⁾
- 5 = \varnothing 12 x 20 mm [0.47 x 0.79"]
- 8 = \varnothing 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

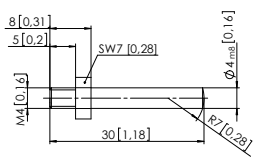
1) Suitable for measuring wheel systems MWE52 or MWE62.
 Only available with flange option a = 8 and radial type of connection.

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Order code Hollow shaft	8.KIH50 . XXXXX . XXXX . P XX 0 X
Type	a b c d e f g h
<p>a Flange 2 = with spring element, long, IP65 4 = with torque stop, long, IP65 D = with stator coupling, IP65, ø 63 mm [2.48"]</p> <p>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"</p> <p>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</p>	<p>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</p> <p>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)</p> <p>f Special output signal formats 00 = standard output other = see page 4</p> <p>g Capacitor 0 = standard</p> <p>h Special connector pin configuration 0 = standard wiring other = see page 4</p>

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 for flange with spring element (flange type 1 + 2)	with fixing thread 	8.0010.4700.0000

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
UKCA compliant in accordance with	
EMC Regulations	S.I. 2016/1091
RoHS Regulations	S.I. 2012/3032

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)											
		Signal:	0 V	+V	0 Vsens	+Vsens	A	\bar{A}	B	\bar{B}	0	$\bar{0}$	\perp
1, 2, 3, 4, 5	KIS50: 1, 2	Core color:	WH	BN	GY PK	RD BU	GN	YE	GY	PK	BU	RD	shield
	KIH50: 1, E												

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

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

Output circuit	Type of connection	M23 connector, 12-pin											
		Signal:	0 V	+V	0 Vsens	+Vsens	A	\bar{A}	B	\bar{B}	0	$\bar{0}$	\perp
1, 2, 3, 4, 5	KIS50: 7, 8	Pin:	10	12	11	2	5	6	8	1	3	4	PH ⁴⁾
	KIH50: 4												

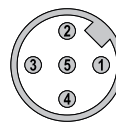
Terminal assignment – Special connector pin configuration

Order code ①	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 ①	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)

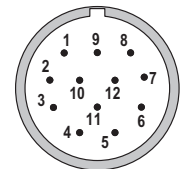
Top view of mating side, male contact base



M12 connector, 5-pin



M12 connector, 8-pin

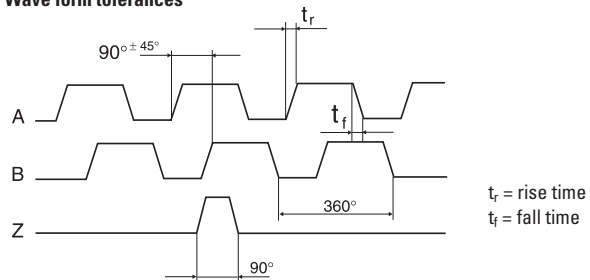


M23 connector, 12-pin

Special output signal formats

All Kübler encoders come standard with six channels where A leads B in the clockwise direction 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.

Wave form tolerances



Order code ①	Signal format description	Waveform diagram
	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.	
	Z gated with A & B. This is the Kübler standard. Z is 90° wide.	

Order code ①	Signal format description	Waveform diagram
	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.	
04	Z gated with A & B. Z is 90° wide.	

1) PH = shield is attached to connector housing.

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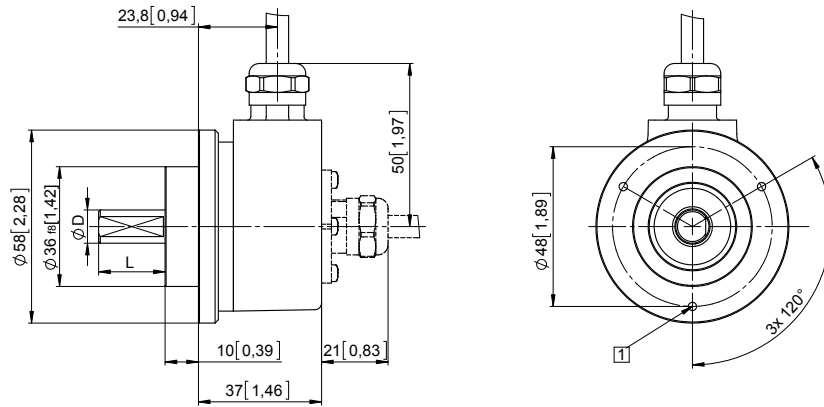
Dimensions shaft version

Dimensions in mm [inch]

Clamping flange, \varnothing 58 [2.28]

Flange type 8

1 3 x M3, 6 [0.24] deep

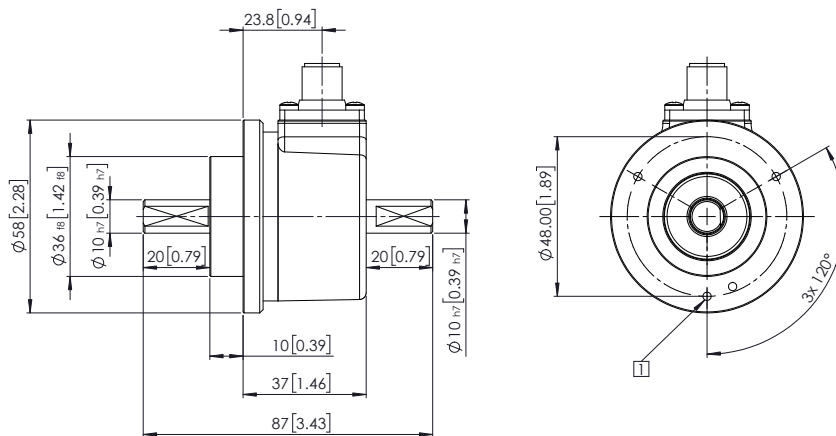


D	Fit	L
10 [0.39]	h7	20 [0.79]
12 [0.47]	h7	20 [0.79]
3/8"	h8	7/8"

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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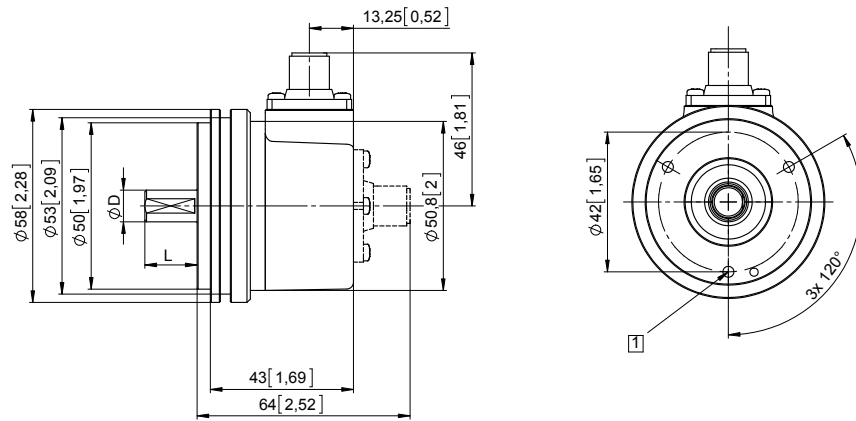
Dimensions shaft version

Dimensions in mm [inch]

Synchro flange, \varnothing 58 [2.28]

Flange type B

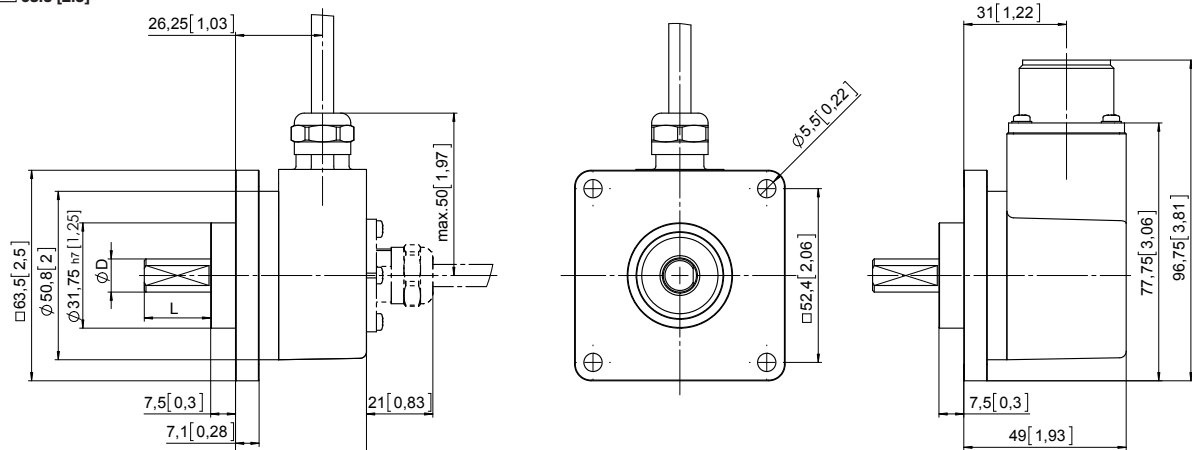
1 3 x M4, 6 [0.24] deep



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

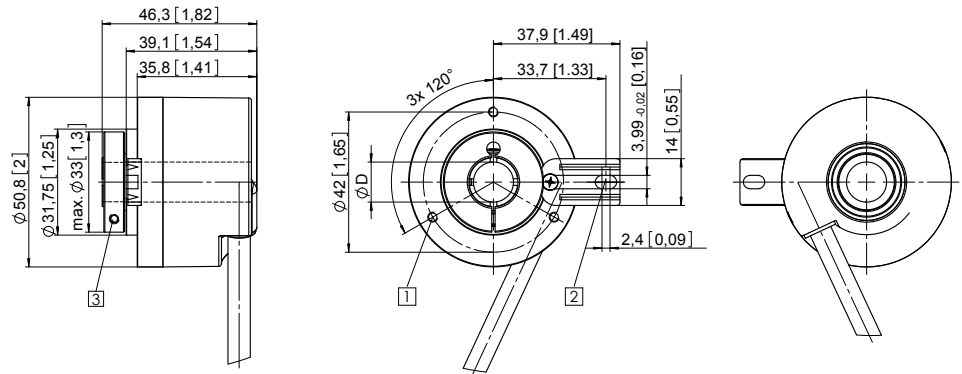
Dimensions in mm [inch]

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

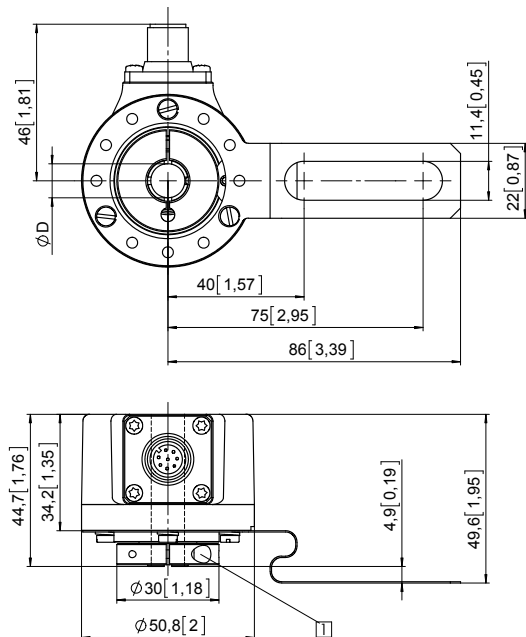


Flange with torque stop, long

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, \varnothing 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

