

Incremental encoders

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

| | | | |
|---------------------|----------------|--------------|--------------|
| Order code | 8.KIH50 | .XXXX | .XXXX |
| Hollow shaft | Type | a | b |

a Flange

2 = with spring element, long, IP65
 4 = with torque stop, long, IP65
 D = with stator coupling, IP65, ø 63 mm [2.48"]

b Through hollow shaft

9 = ø 8 mm
 4 = ø 3/8" (9,52 mm)
 3 = ø 10 mm
 5 = ø 12 mm
 6 = ø 1/2" (12,75 mm)
 A = ø 14 mm
 8 = ø 15 mm

c Output circuit / supply voltage

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 = 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

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.KIH50.xxxx.xxxx.9888

| 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 | Order no. |
|--|-------------------------|
| Cylindrical pin, long | |
| with fixing thread | |
| for flange with spring element (flange type 1 + 2) | 8.0010.4700.0000 |

| Connection technology | Order no. |
|--|-----------------------------|
| Cordset, pre-assembled | |
| 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 |
| Connector, self-assembly | |
| 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

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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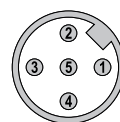
| Standard optical | Sendix Base KIS50 / KIH50 (shaft / hollow shaft) | | | Push-pull / RS422 / Open collector | |
|--|---|----------------------------------|---------------------------|---|---------------------------------|
| Electrical characteristics | | | | | |
| Output circuit | RS422 (TTL compatible) | RS422 (TTL compatible) | Push-pull | Push-pull (HTL/TTL universal, 7272 compatible) | Open collector (7273) |
| Order code | 1 | 4 | 5 | 2 | 3 |
| Supply voltage | 5 ... 30 V DC | 5 V DC ($\pm 5\%$) | 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 LOW | min. 2.5 V 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 outputs ²⁾ | yes ³⁾ | yes ³⁾ | yes | yes | yes |
| Reverse polarity protection of the supply voltage | 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 |
| 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⁾ |

- +V: Supply voltage encoder +V DC
- 0 V: Supply voltage encoder 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)

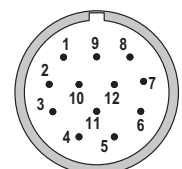
Top view of mating side, male contact base



M12 connector, 5-pin



M12 connector, 8-pin



M23 connector, 12-pin

1) Max. recommended cable length 30 m [98.43'].
 2) If supply voltage 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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Push-pull / RS422 / Open collector

Dimensions shaft version

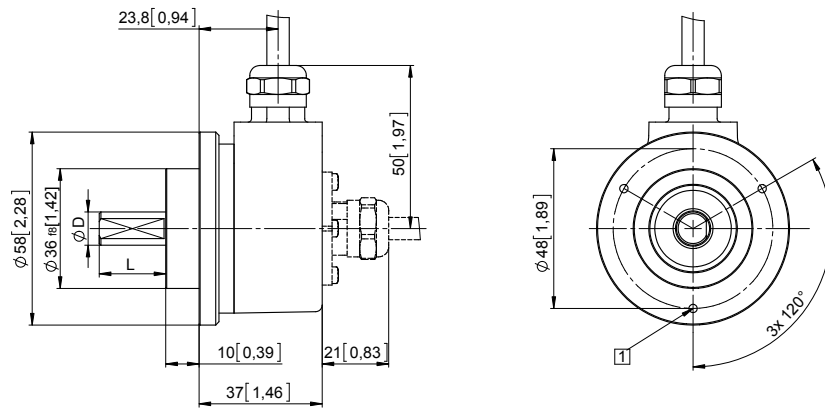
Dimensions in mm [inch]

Clamping flange, \varnothing 58 [2.28]

Flange type 8

1 3 x M3, 6 [0.24] deep

| D | Fit | L |
|-----------|-----|-----------|
| 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] |

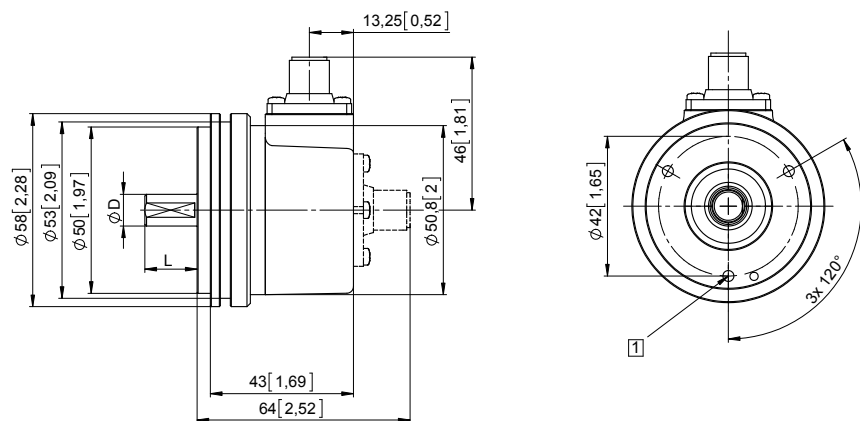


Synchro flange, \varnothing 58 [2.28]

Flange type 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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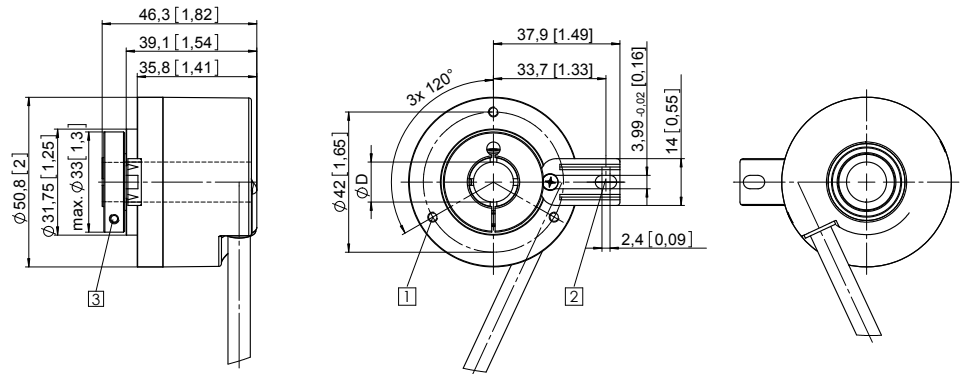
Dimensions hollow shaft version

Dimensions in mm [inch]

Flange with spring element, long Flange type 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

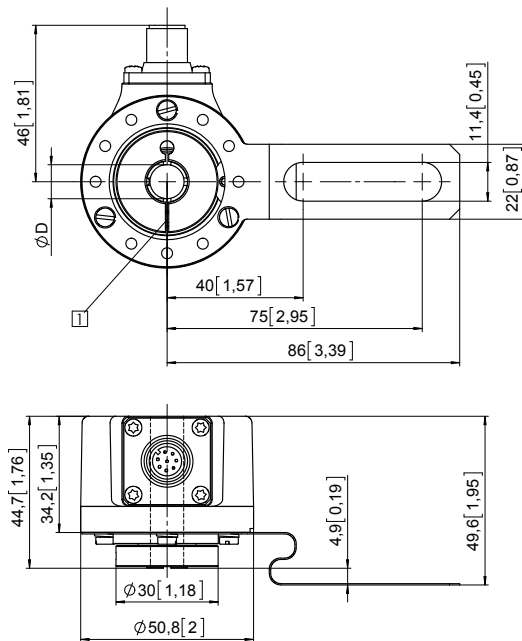
| D | Fit |
|-----------|-----|
| 8 [0.32] | H7 |
| 10 [0.39] | H7 |
| 12 [0.47] | H7 |
| 14 [0.55] | H7 |
| 15 [0.59] | H7 |



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 |

