Standard
sine wave output, SIL3/PLe, optical

Sendix 5814FS3 / 5834FS3 (shaft / hollow shaft)

SinCos



The incremental encoders 5814FS3 and 5834FS3 of the Sendix family are suited for use in safety-related applications up to SIL3 according to EN 61800-5-2 or PLe to EN ISO 13849-1.

These encoders are particularly suited for applications in the field of safe drive technology.

Safety-Lock™ | High rotational speed | Temperature range -40° ... +90°C | High protection level IP | High shaft load capacity | Shock / vibration resistant | Magnetic field proof | Reverse polarity protection | SinCos | Optical sensor

Functional Safety

- Encoder with individual certificate from TÜV.
- Suitable for applications up to SIL3 acc. to EN 61800-5-2.
- Suitable for applications up to PLe acc. to EN ISO 13849-1.
- With incremental SinCos tracks.
- Certified mechanical mounting + electronic.

Flexible

- Shaft and hollow shaft versions.
- Cable and connector variants.
- Various mounting options available.

Order code Shaft version

8.5814FS3	.	X	X	X	X	.	XXXX
Type		a	b	c	d		e

a *Flange*
1 = clamping flange, IP65, ø 58 mm [2.28"]
3 = clamping flange, IP67, ø 58 mm [2.28"]

b *Shaft (ø x L)*
2 = 10 x 20 mm [0.39 x 0.79"], with flat
A = 10 x 20 mm [0.39 x 0.79"], with feather key

c *Output circuit / supply voltage*
1 = SinCos / 5 V DC
2 = SinCos / 10 ... 30 V DC

d *Type of connection*
1 = axial cable, 1 m [3.28'] PVC
A = axial cable, special length PVC *)
2 = radial cable, 1 m [3.28'] PVC
B = radial cable, special length PVC *)
3 = axial M23 connector, 12-pin
4 = radial M23 connector, 12-pin
5 = axial M12 connector, 8-pin
6 = radial M12 connector, 8-pin

*) Available special lengths (connection types A, B):
2, 3, 5, 8, 10, 15 m [6.56, 9.84, 16.40, 26.25, 32.80, 49.21']
order code expansion .XXXX = length in dm
ex.: 8.5814FS3.122A.2048.0030 (for cable length 3 m)

e *Pulse rate*
1024, 2048

Optional on request
- Ex 2/22 (only for variants with IP67) [1)]
- surface protection salt spray

1) For the cable connection type, cable material PUR.

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Standard sine wave output, SIL3/PLe, optical	Sendix 5814FS3 / 5834FS3 (shaft / hollow shaft)	SinCos

Order code Hollow shaft

8.5834FS3	.	X	X	X	X	.	XXXX
Type		a	b	c	d		e

a *Flange*
9 = with torque stop FS, flexible, IP65
J = with torque stop FS, flexible, IP67
A = with torque stop FS, rigid, IP65 (incl. torque pin FS)
K = with torque stop FS, rigid, IP67 (incl. torque pin FS)
B = with stator coupling FS, ø 63 mm [2.48"], IP65
L = with stator coupling FS, ø 63 mm [2.48"], IP67

b *Through hollow shaft*
3 = ø 10 mm [0.39"]
4 = ø 12 mm [0.47"]
5 = ø 14 mm [0.55"]
Tapered shaft
K = ø 10 mm [0.39"]

c *Output circuit / supply voltage*
1 = SinCos / 5 V DC
2 = SinCos / 10 ... 30 V DC

d *Type of connection*
2 = radial cable, 1 m [3.28'] PVC
B = radial cable, special length PVC *)
E = tangential cable, 1 m [3.28'] PVC
F = tangential cable, special length PVC *)
4 = radial M23 connector, 12-pin
6 = radial M12 connector, 8-pin

*) Available special lengths (connection types B, F):
2, 3, 5, 8, 10, 15 m [6.56, 9.84, 16.40, 26.25, 32.80, 49.21']
order code expansion .XXXX = length in dm
ex.: 8.5834FS3.B42B.2048.0030 (for cable length 3 m)

e *Pulse rate*
1024, 2048

Optional on request
- Ex 2/22 (only for variants with IP67) [1]
  not for type of connection E, F
- surface protection salt spray

Accessories		Order no.
EMC shield terminal	for top-hat rail mounting	**8.0000.4G06.0312**
Screw retention	Loctite 243, 5 ml	**8.0000.4G05.0000**
Bellows coupling, safety-oriented	You will find an overview of our couplings for Sendix shaft encoders under kuebler.com/accessories.	
Safety modules Safety-M compact	You will find an overview of our systems and components for Functional Safety and the corresponding software under kuebler.com/safety.	

Cables and connectors		Order no.
Preassembled cables	M12 female connector with coupling nut, 8-pin, A coded, straight single ended 2 m [6.56'] PUR cable [2]	**05.00.60E1.8211.002M**
	M23 female connector with coupling nut, 12-pin, cw single ended 2 m [6.56'] PVC cable [2]	**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

1) For the cable connection type, cable material PUR.
2) Other lengths available.

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Standard
sine wave output, SIL3/PLe, optical | **Sendix 5814FS3 / 5834FS3 (shaft / hollow shaft)** | **SinCos**

Technical data

Notes regarding "Functional Safety"

These encoders are suitable for use in safety-related systems up to SIL3 acc. to EN 61800-5-2 and PLe to EN ISO 13849-1 in conjunction with controllers or evaluation units, which possess the necessary functionality.

Additional functions can be found in the operating manual.

Safety characteristics

Classification	PLe / SIL3
System structure	2 channel (Cat. 3)
PFH$_d$ value [1]	1.09 x 10^{-8} h^{-1}
Mission time / Proof test interval	20 years
Relevant standards	
Safety Integrity Level (SIL) acc. to	EN 61800-5-2 EN IEC 61800-5-3 [2] EN 61508 Parts 1 up to 7 EN IEC 62061
Performance Level (PL) acc. to	EN ISO 13849-1 EN ISO 13849-2

Mechanical characteristics

Maximum speed, shaft version		
	up to 70 °C [158 °F]	12000 min^{-1}, 10000 min^{-1} (continuous)
	up to T_{max}	8000 min^{-1}, 5000 min^{-1} (continuous)
Maximum speed, hollow shaft version		
	up to 70 °C [158 °F]	9000 min^{-1}, 6000 min^{-1} (continuous)
	up to T_{max}	6000 min^{-1}, 3000 min^{-1} (continuous)
Starting torque – at 20 °C [68 °F]		
	shaft version	< 0.01 Nm
	hollow shaft version	< 0.03 Nm
Mass moment of inertia		
	shaft version	4.0 x 10^{-6} kgm^2
	hollow shaft version	7.0 x 10^{-6} kgm^2
Insertion depth for shaft		
	hollow shaft version	min. 34 mm [1.34"]
Load capacity of shaft	radial	80 N
	axial	40 N
Weight		approx. 0.45 kg [15.87 oz]
Protection acc. to EN 60529		IP65, IP67
Working temperature range		-40 °C ... +90 °C [-40 °F ... +194 °F] [3]
Materials	shaft / hollow shaft	stainless steel
	flange	aluminum
	housing	zinc die-cast
	cable	PVC (PUR for Ex 2/22)
Shock resistance acc. to EN 60068-2-27		500 m/s^2, 11 ms
Vibration resistance acc. to EN 60068-2-6		200 m/s^2, 5 ... 2000 Hz

Electrical characteristics

Supply voltage		5 V DC (±5 %) or 10 ... 30 V DC
Power consumption (no load)	5 V DC	max. 70 mA
	10 ... 30 V DC	max. 45 mA
Reverse polarity protection of the supply voltage		yes
Short circuit proof outputs		yes [4]

EMC

Relevant standards	EN 55011 Class B EN 61326-1 + EN IEC 61326-1 for industrial, commercial and residential use EN 61800-5-2

SinCos interface

Max. frequency -3dB	400 kHz
Signal level	1 Vpp (±10 %)
Short circuit proof	yes [4]
Pulse rate	1024 / 2048 ppr

Approvals

UL compliant in accordance with	File no. E224618
CE compliant in accordance with	
EMC Directive	2014/30/EU
RoHS Directive	2011/65/EU
ATEX Directive	2014/34/EU (for Ex 2/22 variants)
Machinery Directive	2006/42/EG

1) The specified value is based on a diagnostic coverage of 99 %, that must be achieved with an encoder evaluation unit.
The encoder evaluation unit must meet at least the requirements for SIL3.
2) Except for tensile test with tangential cable outlet according to chapter 6.14.
3) Cable version: -30 °C ... + 90 °C [-22 °F ... +194 °F] fixed installation.
4) Short circuit to 0 V or to output, one channel at a time, supply voltage correctly applied.

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Standard
sine wave output, SIL3/PLe, optical | **Sendix 5814FS3 / 5834FS3 (shaft / hollow shaft)** | **SinCos**

Terminal assignment

Output circuit	Type of connection	Cable (isolate unused cores individually before initial start-up)							
1, 2	1, 2, A, B, E, F	Signal:	0 V	+V	A	$\overline{A}$	B	$\overline{B}$	⏚
		Core color:	WH	BN	GN	YE	GY	PK	shield

Output circuit	Type of connection	M23 connector, 12-pin							
1, 2	3, 4	Signal:	0 V	+V	A	$\overline{A}$	B	$\overline{B}$	⏚
		Pin:	10	12	5	6	8	1	PH [1]

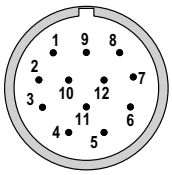
Output circuit	Type of connection	M12 connector, 8-pin							
1, 2	5, 6	Signal:	0 V	+V	A	$\overline{A}$	B	$\overline{B}$	⏚
		Pin:	1	2	3	4	5	6	PH [1]

+V: Supply voltage encoder +V DC
0 V: Supply voltage encoder ground GND (0 V)
A, $\overline{A}$: Cosine signal
B, $\overline{B}$: Sine signal
PH ⏚: Plug connector housing (shield)

Top view of mating side, male contact base



M12 connector, 8-pin



M23 connector, 12-pin

1) PH = shield is attached to connector housing.

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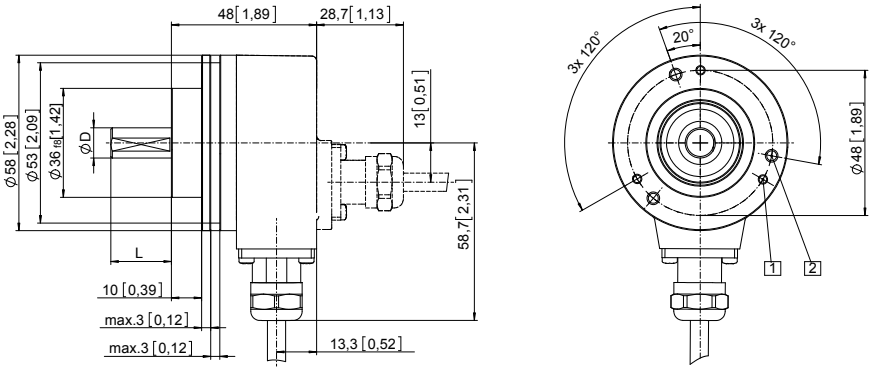
Standard
sine wave output, SIL3/PLe, optical | **Sendix 5814FS3 / 5834FS3 (shaft / hollow shaft)** | **SinCos**

Dimensions shaft version

Dimensions in mm [inch]

Clamping flange, ø 58 [2.28]
Flange type 1 + 3 with shaft type 2
(drawing with cable)

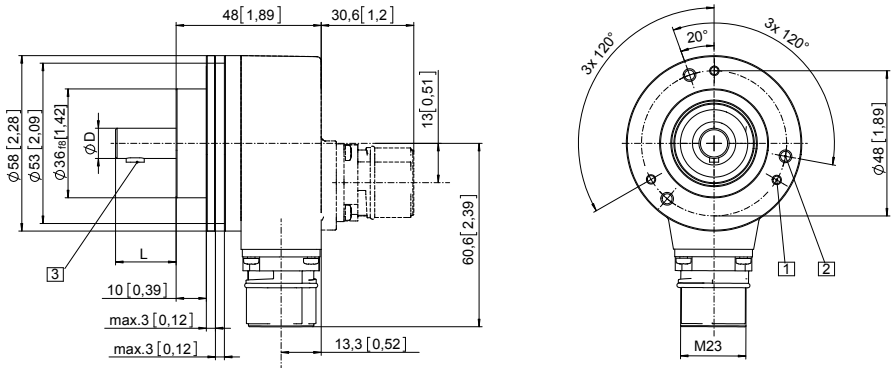
1 3 x M3, 6 [0.24] deep
2 3 x M4, 8 [0.32] deep



D	Fit	L
10 [0.39]	f7	20 [0.79]

Clamping flange, ø 58 [2.28]
Flange type 1 + 3 with shaft type A
(drawing with M23 connector)

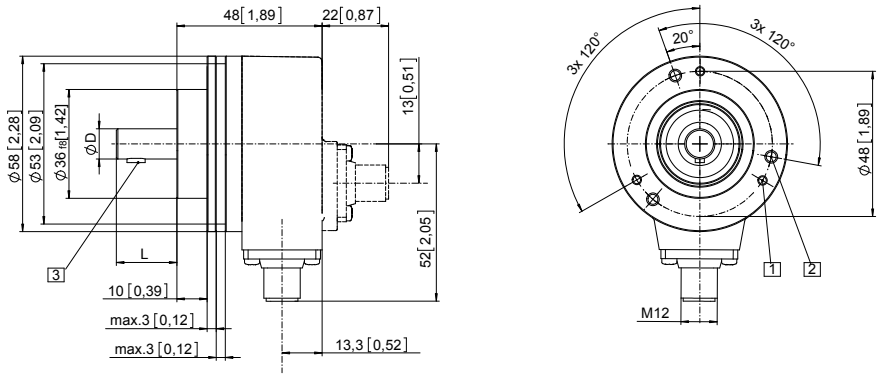
1 3 x M3, 6 [0.24] deep
2 3 x M4, 8 [0.32] deep
3 Feather key DIN 6885 - A - 3x3x6



D	Fit	L
10 [0.39]	f7	20 [0.79]

(drawing with M12 connector)

1 3 x M3, 6 [0.24] deep
2 3 x M4, 8 [0.32] deep
3 Feather key DIN 6885 - A - 3x3x6



D	Fit	L
10 [0.39]	f7	20 [0.79]

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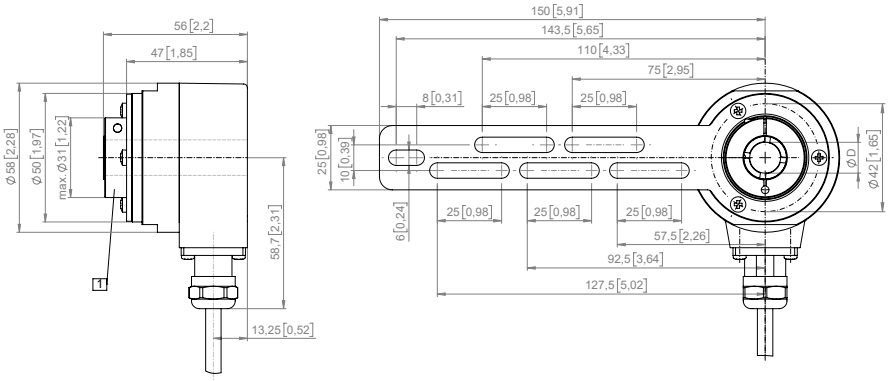
Standard
sine wave output, SIL3/PLe, optical | **Sendix 5814FS3 / 5834FS3 (shaft / hollow shaft)** | **SinCos**

Dimensions hollow shaft version

Dimensions in mm [inch]

Flange with torque stop FS, rigid
Flange type A + K
Through hollow shaft
(drawing with cable)

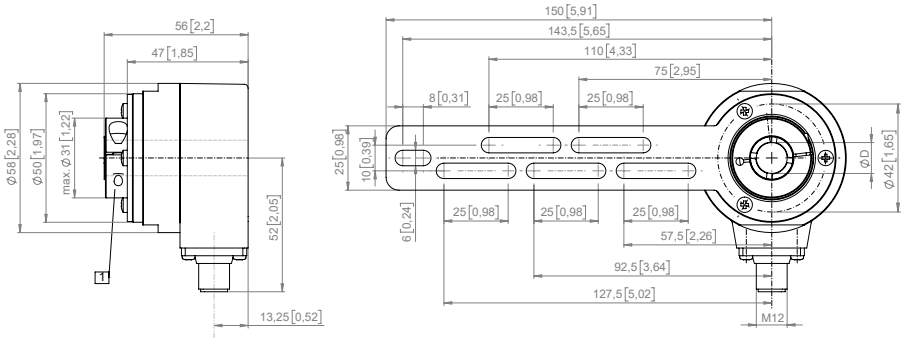
1 SW 3, recommended torque for the clamping ring 2.5 Nm



D	Fit
10 [0.39]	H7
12 [0.47]	H7
14 [0.55]	H7

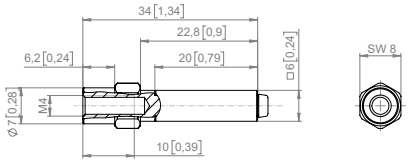
(drawing with M12 connector)

1 SW 3, recommended torque for the clamping ring 2.5 Nm



D	Fit
10 [0.39]	H7
12 [0.47]	H7
14 [0.55]	H7

Torque pin FS
with rectangular sleeve and M4 thread
(included in scope of delivery)



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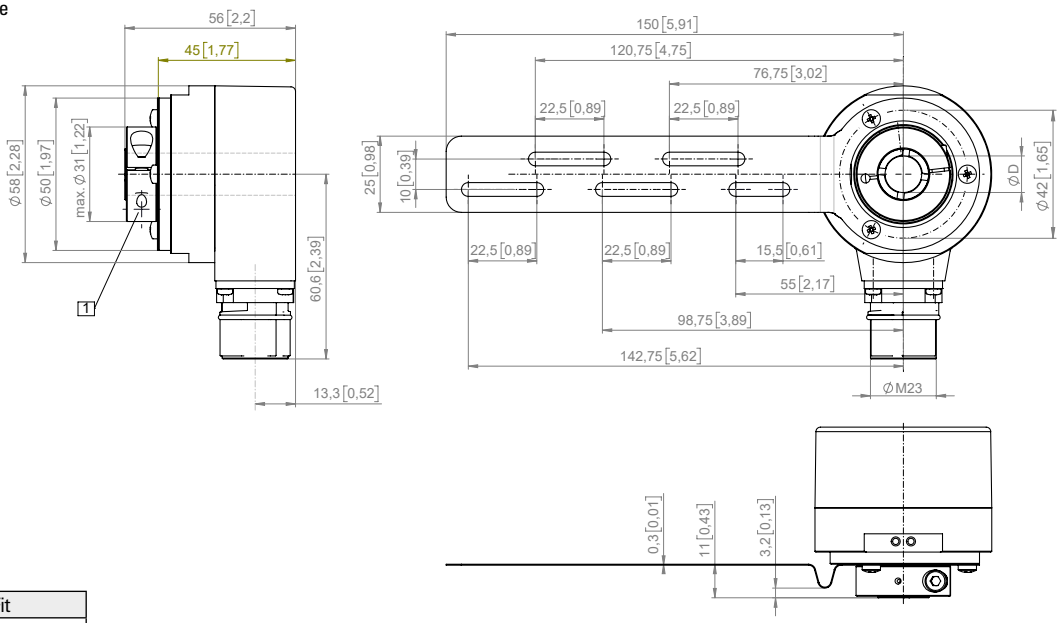
Standard
sine wave output, SIL3/PLe, optical | **Sendix 5814FS3 / 5834FS3 (shaft / hollow shaft)** | **SinCos**

Dimensions hollow shaft version

Dimensions in mm [inch]

Flange with torque stop FS, flexible
Flange type 9 + J
Through hollow shaft
(drawing with M23 connector)

1 Recommended torque for the clamping ring 2.5 Nm

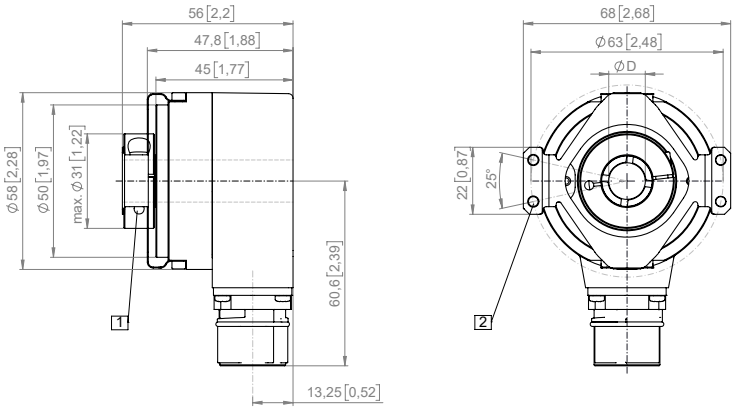


D	Fit
10 [0.39]	H7
12 [0.47]	H7
14 [0.55]	H7

Flange with stator coupling FS, ø 63 [2.48]
Flange type B + L
Through hollow shaft
(drawing with M23 connector)

1 SW 3, recommended torque for the clamping ring 2.5 Nm

2 For (4x) M3 screw



D	Fit
10 [0.39]	H7
12 [0.47]	H7
14 [0.55]	H7

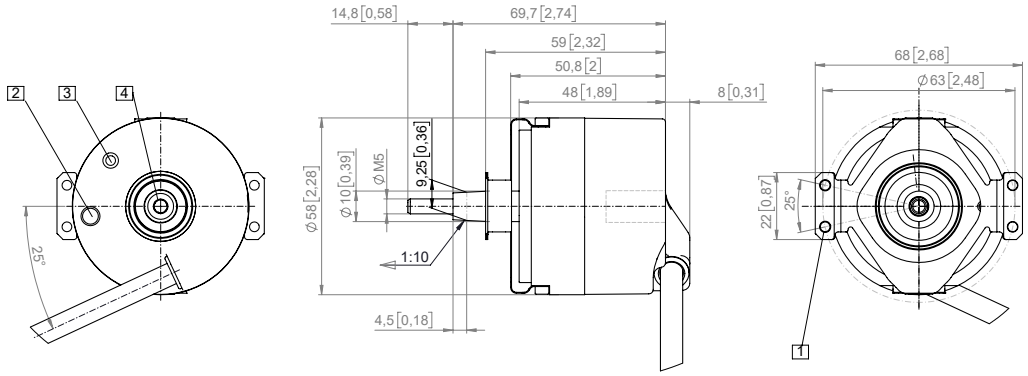
Standard
sine wave output, SIL3/PLe, optical | **Sendix 5814FS3 / 5834FS3 (shaft / hollow shaft)** | **SinCos**

Dimensions hollow shaft version

Dimensions in mm [inch]

Flange with stator coupling FS, ø 63 [2.48]
Flange type B + L
Tapered shaft
(drawing with tangential cable outlet)

1 For (4x) M3 screw
2 Status-LED
3 SET button
4 Recommended torque for central screw M5 (SW 4) 3.0 $^{+0.5}$ Nm (tapered shaft)



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