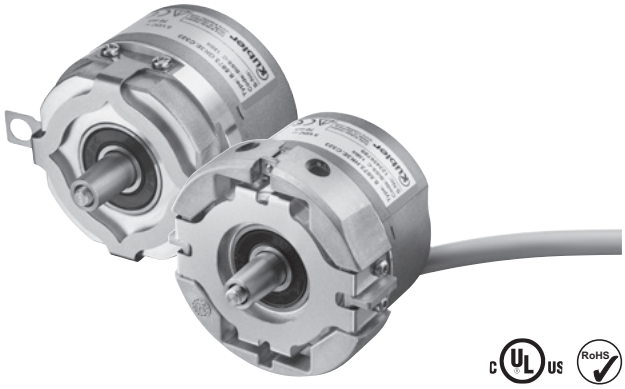
Motor-Line optical | **Sendix 5873 (tapered shaft)** | **SSI / BiSS (+incremental)**



The optical Sendix 5873 singleturn encoders with SSI or BiSS interface and optional 2048 ppr SinCos incremental track reach a resolution of up to 21 bits.

Advantages: Plug-and-Play for commissioning, including electronic data sheet and possibility to set the absolute measuring system to a predefined position value.

Specially designed for mounting on direct drives in the elevator technology.

Electronic data sheet | Safety-Lock™ | Temperature range | High protection level | High shaft load capacity | Shock / vibration resistant | Magnetic field proof | Short-circuit proof | Reverse polarity protection | SinCos | Optical sensor

Reliable and insensitive

- Sturdy bearing construction in Safety-Lock™ design for resistance against vibration and installation errors.
- Encoder specially designed for mounting on direct drives in the elevator technology.

Versatile

- High-precision with a data refresh rate of the position value ≤ 1µs.
- High-resolution feedback in real-time via 21 bit fully digital or incremental outputs SinCos and RS422.
- BiSS-C BP3 encoder profile.
- Short control cycles, clock rate with SSI up to 2 MHz / with BiSS up to 10 MHz.

Order code Tapered shaft

8.5873	.	X	K	X	X	.	X	X	2	X
Type		a	b	c	d		e	f	g	h

a *Flange*
G = with stator coupling, IP65, ø 72 mm [2.83"]
H = with expanding coupling, IP65, ø 65 mm [2.56"]

b *Tapered shaft*
K = ø 10 mm [0.39"]

c *Interface / power supply*
1 = SSI, BiSS / 5 V DC
2 = SSI, BiSS / 10 ... 30 V DC
3 = SSI, BiSS + 2048 ppr. SinCos / 5 V DC
4 = SSI, BiSS + 2048 ppr. SinCos / 10 ... 30 V DC
5 = SSI, BiSS / 5 V DC, with sensor output
6 = SSI, BiSS + 2048 ppr. SinCos / 5 V DC, with sensor output
9 = SSI, BiSS + 2048 ppr. RS422 (TTL-comp.) / 5 V DC, with sensor output
E = SSI, BiSS + 2048 ppr. SinCos / 4,5 ... 5,5 V DC, with sensor output [1]

d *Type of connection*
E = tangential cable, 1 m PVC
F = tangential cable, length PVC see below *)
G = tangential cable, with Sub-D connector (male contact, 15-pin, double-row), length PVC s. below *) [2]
H = tangential cable, with Phoenix Contact connector (MC1.5/16-STF-3.81), length PVC s. below *) [2]
*) Available lengths (connection types F, G, H):
2, 3, 5, 8, 10, 15 m [5.56, 9.84, 16.40, 26.25, 32.80, 49.21']
order code expansion .XXXX = length in dm
ex.: 8.5873.GK2E.G323.0030 (for cable length 3 m)

e *Code*
B = SSI, binary
C = BiSS, binary
G = SSI, gray

f *Resolution* [3]
A = 10 bit
1 = 11 bit
2 = 12 bit
3 = 13 bit
4 = 14 bit
7 = 17 bit
C = 21 bit [4]

g *Inputs / outputs* [3]
2 = SET, DIR input additional status output

h *Options (service)*
1 = no option
2 = status LED
3 = SET button and status LED

1) Without reverse polarity protection.
2) Can be combined as a standard only with interface E (other variants on request).
3) Resolution, preset value and counting direction factory-programmable.
4) Only in conjunction with interface 1 or 2 and code C.

Absolute encoders - singleturn

Motor-Line optical | **Sendix 5873 (tapered shaft)** | **SSI / BiSS (+incremental)**

Technical data

Mechanical characteristics

Maximum speed hollow shaft version		
	IP65 up to 70°C [158°F]	9000 min^{-1}, 6000 min^{-1} (continuous)
	IP65 up to T_{max}	6000 min^{-1}, 3000 min^{-1} (continuous)
Starting torque at 20°C [68°F]		< 0.01 Nm
Mass moment of inertia		6.0 x 10^{-6} kgm^2
Load capacity of shaft	radial	80 N
	axial	40 N
Weight		approx. 0.35 kg [12.35 oz]
Protection acc. to EN 60529	housing side	IP67
	shaft side	IP65
Working temperature range		-40°C ... +90°C [-40°F ... +194°F] (+105°C [+212°F] with interface E) [1]
Materials	tapered shaft	stainless steel
	flange	aluminium
	housing	zinc die-cast
	cable	PVC
Shock resistance acc. EN 60068-2-27		2500 m/s^2, 6 ms
Vibration resistance acc. EN 60068-2-6		100 m/s^2, 55 ... 2000 Hz

Electrical characteristics

Power supply		5 V DC (+5 %) or 10 ... 30 V DC
Current consumption (no load)	5 V DC	max. 70 mA
	10 ... 30 V DC	max. 45 mA
Reverse polarity protection of the power supply		yes (not for interface E)
Short circuit proof outputs		yes [2]
UL approval		file 224618
CE compliant acc. to		EMC guideline 2014/30/EU RoHS guideline 2011/65/EU

SSI interface

Output driver		RS485 transceiver type
Permissible load / channel		max. +/- 20 mA
Signal level	HIGH	typ. 3.8 V
	LOW at I_{Load} = 20 mA	typ. 1.3 V
Resolution		10 ... 14 bit and 17 bit
Code		binary or gray
SSI clock rate		50 kHz ... 2 MHz
Data refresh rate	resolution ≤ 14 bit	≤ 1 µs
	resolution ≥ 15 bit	4 µs
Monoflop time		≤ 15 µs

Note: If the clock starts cycling within the monoflop time, a second data transfer starts with the same data. If the clock starts cycling after the monoflop time, the data transfer starts with the new values. The update rate is dependent on the clock speed, data length and monoflop-time.

BiSS interface

Output driver		RS485 transceiver type
Permissible load / channel		max. +/- 20 mA
Signal level	HIGH	typ. 3.8 V
	LOW at I_{Load} = 20 mA	typ. 1.3 V
Resolution		10 ... 14 bit; 17, 19 and 21 bit
Code		binary
Clock rate		50 kHz ... 10 MHz
Max. update rate		< 15 µs, depends on the clock rate and the data length
Data refresh rate		< 1 µs
Protocol		BiSS-C BP3 encoder profile

Note:
- Bidirectional, factory programmable parameters are: resolution, code, direction, alarms and warnings
- CRC data verification
- EDS (electronic data sheet)

Status output and LED

Output driver		open collector, internal pull up resistor 22 kOhm
Permissible load		max. 20 mA
Signal level	HIGH	+V
	LOW	< 1 V
Active		LOW

The optional LED (red) and the status output serve to display various alarm or error messages. In normal operation the LED is OFF and the status output is HIGH (Open Collector with int. pull-up 22 kOhm).

An active status output (LOW) displays:
- Sensor error, singleturn or multiturn (soiling, glass breakage etc.)
- LED fault (failure or ageing)
- over- or under-temperature

In the SSI mode, the fault indication can only be reset by switching off the power supply to the device.

Option incremental outputs (A/B), 2048 ppr

	SinCos	RS422 TTL compatible
Max. frequency -3dB	400 kHz	400 kHz
Signal level	1 Vpp (±20 %)	HIGH: min. 2.5 V LOW: max. 0.5 V
Short circuit proof	yes	yes

1) Temperature measured on the flange – max. 80°C allowable on the cable (fixed installation).
2) Short circuit to 0 V or to output, one channel at a time, power supply correctly applied.

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SET input or SET button

Input		active HIGH
Input type		comparator
Signal level	HIGH	min: 60 % of +V (power supply) max: +V
	LOW	max: 25 % of +V (power supply)
Input current		< 0.5 mA
Min. pulse duration (SET)		10 ms
Timeout after SET signal		14 ms
Response time (DIR input)		1 ms

The encoder can be set to zero at any position by means of a HIGH signal on the SET input or by pressing the optional SET button (with a pencil, ball-point pen or similar).
Other preset values can be factory-programmed. The SET input has a signal processing time of approx. 1 ms. Once the SET function has been triggered, the encoder requires an internal processing time of approx. 15 ms before the new position data can be read. During this time the status output is at LOW.

If this input is not used, it should be connected to 0 V (Encoder ground GND) in order to avoid interferences.

DIR input

Direction input: A HIGH signal switches the direction of rotation from the default cw to ccw. This function can also be factory-programmed to be inverted. If DIR is changed when the device is already switched on, then this will be interpreted as an error.
The LED will come ON and the status output will switch to LOW.

If this input is not used, it should be connected to 0 V (Encoder ground GND) in order to avoid interferences.

Power-ON Time

After Power-ON the device requires a time of approx. 150 ms before valid data can be read.

Hot plugging of the encoder should be avoided.

Terminal assignment

Interface	Type of connection	Features	Cable (isolate unused wires individually before initial start-up)													
1, 2	E, F	SET, DIR, Status	Signal:	0 V	+V	C+	C-	D+	D-	SET	DIR	Stat	N/C	N/C	N/C	⏚
			Cable colour:	WH	BN	GN	YE	GY	PK	BU	RD	BK	-	-	-	shield

Interface	Type of connection	Features	Cable (isolate unused wires individually before initial start-up)													
5	E, F	SET, DIR, Status sensor output	Signal:	0 V	+V	C+	C-	D+	D-	SET	DIR	Stat	N/C	0 Vsens	+Vsens	⏚
			Cable colour:	WH	BN	GN	YE	GY	PK	BU	RD	BK	-	GY-PK	RD-BU	shield

Interface	Type of connection	Features	Cable (isolate unused wires individually before initial start-up)													
3, 4	E, F	SET, DIR, SinCos oder inkr. RS422	Signal:	0 V	+V	C+	C-	D+	D-	SET	DIR	A	$\overline{A}$	B	$\overline{B}$	⏚
			Cable colour:	WH	BN	GN	YE	GY	PK	BU	RD	BK	VT	GY-PK	RD-BU	shield

Interface	Type of connection	Features	Cable (isolate unused wires individually before initial start-up)													
6, 9, E	E, F	SinCos or incr. RS422 sensor output	Signal:	0 V	+V	C+	C-	D+	D-	A	$\overline{A}$	B	$\overline{B}$	0 Vsens	+Vsens	⏚
			Cable colour:	WH	BN	GN	YE	GY	PK	BU	RD	BK	VT	GY-PK	RD-BU	shield

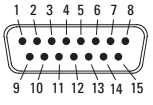
Interface	Type of connection	Features	Tangential cable, with Phoenix Contact connector (MC1.5/16-STF-3.81), 16-pin															
E	H	SinCos sensor output	Signal:	+V	+Vsens	0 V	0Vsens	N/C	A	$\overline{A}$	B	$\overline{B}$	C+	C-	D+	D-	N/C	N/C	N/C
			Pin:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

Interface	Type of connection	Features	Tangential cable, with Sub-D connector (male contact), 15-pin														
E	G	SinCos sensor output	Signal:	A	0 V	B	+V	D+	–	–	C+	$\overline{A}$	0 Vsens	$\overline{B}$	+Vsens	D-	–	C-	⏚
			Pin:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	

+V: Encoder power supply +V DC
0 V: Encoder power supply ground GND (0 V)
0 V_{sens} / +V_{sens}: Using the sensor outputs of the encoder, the voltage present can be measured and if necessary increased accordingly.
C+, C-: Clock signal
D+, D-: Data signal
A, $\overline{A}$: Incremental output channel A (cosine)
B, $\overline{B}$: Incremental output channel B (sine)
SET: Set input
DIR: Direction input
Stat: Status output
PH ⏚: Plug connector housing (shield)

Top view of mating side, male contact base

Phoenix Contact connector (MC1.5/16-STF-3.81), 16-pin



Sub-D connector (male contact), 2-reihig, 15-pin

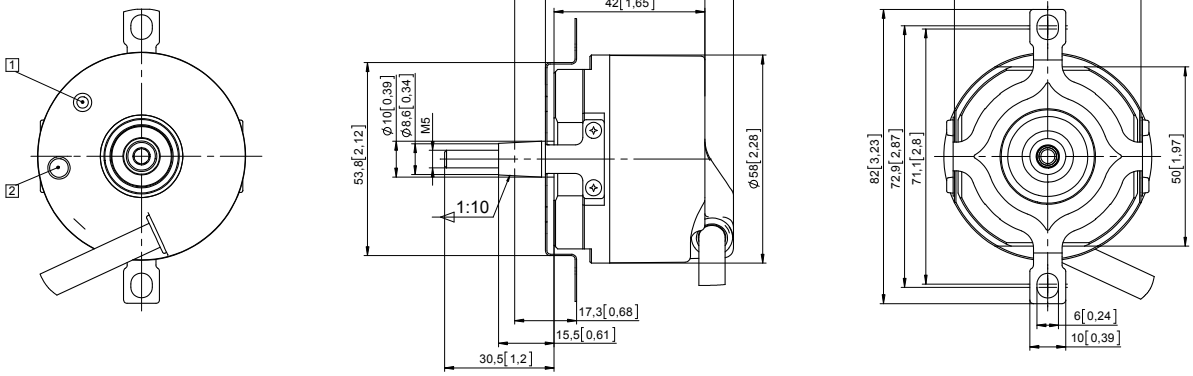
Motor-Line optical	Sendix 5873 (tapered shaft)	SSI / BiSS (+incremental)

Dimensions tapered shaft version

Dimensions in mm [inch]

Flange with stator coupling, ø 72 [2.83]
Flange type G
(with tapered shaft K and tangential cable)

1 Status-LED
2 SET button



Flange with expanding coupling, ø 65 [2.56"]
Flange type H

1 Recommended torque for (SW 2) tightening screw 1 Nm
2 Recommended torque for (SW 4) tightening screw 3 $^{+0,5}$ Nm
3 Status-LED
4 SET button