



- 🗆 63.5 mm [2.5"] 6 = SSI, BiSS + 2048 ppr. SinCos / 5 V DC, with sensor output
  - 7 = SSI, BiSS + 2048 ppr. RS422 (TTL-comp.) / 5 V DC
    - 8 = SSI, BiSS + 2048 ppr. RS422 (TTL-comp.) / 10 ... 30 V DC
    - 9 = SSI, BiSS + 2048 ppr. RS422 (TTL-comp.) / 5 V DC, with sensor output

<b>D x 20 mm [0.39 x 0.79"]</b> <sup>2)</sup>			
/4" x 7/8"	<b>d</b> Type of connection	Code	Options (service)
/8" x 7/8"	1 = axial cable, 1 m [3.28'] PVC	B = SSI, binary	1 = no option
	A = axial cable, special length PVC *)	C = BiSS, binary	2 = status LED
	2 = radial cable, 1 m [3.28'] PVC	<b>G</b> = SSI, gray	3 = SET button and status LED
	B = radial cable, special length PVC *)		
	3 = axial M23 connector, 12-pin	Resolution <sup>4)</sup>	Optional on request
	4 = radial M23 connector, 12-pin	A = 10 bit	- Ex 2/22 <sup>6)</sup>
	5 = axial M12 connector, 8-pin <sup>3)</sup>	1 = 11 bit	- surface protection
	6 = radial M12 connector, 8-pin <sup>3)</sup>	2 = 12 bit	salt spray tested
	<ul> <li>*) Available special lengths (connection types A, B):</li> <li>2, 3, 5, 8, 10, 15 m [5.56, 9.84, 16.40, 26.25, 32.80, 49.21']</li> <li>order code expansion .XXXX = length in dm</li> <li>ex.: 8.5853.112A.G323.0030 (for cable length 3 m)</li> </ul>	<b>3 = 13 bit</b> 4 = 14 bit 7 = 17 bit C = 21 bit <sup>5)</sup>	- other resolutions

- 1) Preferred type only in conjunction with flange type 2.
- 2) Preferred type only in conjunction with flange type 1.

**b** Shaft (ø x L), with flat

2 = 10 3 = 1/4 4 = 3/8

1 = 6 x 10 mm [0.24 x 0.39"] 1)

3) Can be combined only with interface 1 and 2

- 4) Resolution, preset value and counting direction factory-programmable.
- 5) Only in conjunction with interface 1 or 2 and code C. For the cable connection type, cable material PUR. 6)

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Standard optical	Sendix 5853 / 5873 (shaft / hollow shaf	t) SSI / BiSS + incremental
	then the delivery time will be 10	, C

Mounting accessory for shaft encoders		Order no.
Coupling	bellows coupling ø 19 mm [0.75"] for shaft 6 mm [0.24"] bellows coupling ø 19 mm [0.75"] for shaft 10 mm [0.39"]	8.0000.1102.0606 8.0000.1102.1010
Mounting accessory for hollow shaft encoders	Dimensions in mm [inch]	Order no.
Cylindrical pin, long	with fixing thread	8.0010.4700.0000
for flange with spring element (flange type 1 + 2)	8[0.31] 5[0.2] SW7 [0.28] SW7 [0.28] S	
Connection technology		Order no.
Cordset, pre-assembled	M12 female connector with coupling nut, 8-pin 2 m [6.56'] PVC cable	05.00.6041.8211.002M
	M23 female connector with coupling nut, 12-pin 2 m [6.56'] PVC cable	8.0000.6901.0002.0031
Connector, self-assembly (straight)	M12 female connector with coupling nut, 8-pin M23 female connector with coupling nut, 12-pin	05.CMB 8181-0 8.0000.5012.0000

Further accessories can be found in the accessories section or in the accessories area of our website at: www.kuebler.com/accessories.

Additional connectors can be found in the connection technology section or in the connection technology area of our website at: www.kuebler.com/connection\_technology.

Can be combined only with shaft K and type of connection E or F.
 Can be combined only with interface 1 and 2.
 Resolution, preset value and counting direction factory-programmable.

Only in conjunction with interface 1 or 2 and code C.
 For the cable connection type, cable material PUR.



#### Standard optical

### Sendix 5853 / 5873 (shaft / hollow shaft)

**BiSS** interface **Output driver** 

Signal level

Resolution

Max. update rate

\_

Data refresh

Code **Clock rate** 

rate

Protocol

Note:

Permissible load / channel

#### SSI / BiSS + incremental

RS485 transceiver type

10 ... 14 bit; 17, 19 and 21 bit

BiSS-C BP3 encoder profile

 $< 15 \, \mu s,$  depends on the clock rate

max. +/- 20 mA

50 kHz ... 10 MHz

and the data length

typ. 3.8 V

typ. 1.3 V

binary

4 μs

Bidirectional, factory programmable parameters are:

resolution, code, direction, alarms and warnings

HIGH

LOW at  $I_{Load} = 20 \text{ mA}$ 

ST resolution  $\leq$  14 bit  $\leq$  1 µs

ST resolution 17 bit 2.4 µs ST resolution 21 bit

**Technical data** 

Mechanical	characteristics	
Maximum spee	d shaft version	
	IP65 up to 70°C [158°F] IP65 up to T <sub>max</sub> IP67 up to 70°C [158°F] IP67 up to T <sub>max</sub>	12000 min <sup>-1</sup> , 10000 min <sup>-1</sup> (continuous) 8000 min <sup>-1</sup> , 5000 min <sup>-1</sup> (continuous) 11000 min <sup>-1</sup> , 9000 min <sup>-1</sup> (continuous) 8000 min <sup>-1</sup> , 5000 min <sup>-1</sup> (continuous)
Maximum spee	d hollow shaft version	
	IP65 up to 70°C [158°F] IP65 up to T <sub>max</sub> IP67 up to 70°C [158°F] IP67 up to T <sub>max</sub>	9000 min <sup>-1</sup> , 6000 min <sup>-1</sup> (continuous) 6000 min <sup>-1</sup> , 3000 min <sup>-1</sup> (continuous) 8000 min <sup>-1</sup> , 4000 min <sup>-1</sup> (continuous) 4000 min <sup>-1</sup> , 2000 min <sup>-1</sup> (continuous)
Starting torque	IP65	< 0.01 Nm
at 20°C [68°F]	IP67	< 0.05 Nm
Mass moment of	of inertia	
	shaft version	3.0 x 10 <sup>-6</sup> kgm <sup>2</sup>
	hollow shaft version	6.0 x 10 <sup>-6</sup> kgm <sup>2</sup>
Load capacity o	o <b>f shaft</b> radial axial	80 N 40 N
Weight		approx. 0.35 kg [12.35 oz]
Protection	housing side	IP67
acc. to EN 6052	9 shaft side	IP65, opt. IP67
Working tempe	rature range	-40°C +90°C [-40°F +194°F] <sup>1)</sup>
Materials	shaft/hollow shaft flange housing cable	stainless steel aluminum zinc die-cast PVC (PUR for Ex 2/22)
Shock resistan	<b>ce</b> acc. EN 60068-2-27	2500 m/s <sup>2</sup> , 6 ms
Vibration resistance acc. EN 60068-2-6		100 m/s², 55 2000 Hz

#### Electrical characteristics

Power supply	5 V DC (+5 %) or 10 30 V DC
Current consumption (no load) 5 V DC 10 30 V DC	max. 70 mA max. 45 mA
Reverse polarity protection of the power supply	yes
Short circuit proof outputs	yes <sup>2)</sup>
UL approval	file no. E224618
<b>CE compliant</b> acc. to	EMC guideline 2014/30/EU RoHS guideline 2011/65/EU

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

1) Cable version: -30°C ... +75°C [-22°F ... +167°F].

power supply correctly applied.

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:

CRC data verification EDS (electronic data sheet)

- Sensor error, singleturn or multiturn (soiling, glass breakage etc.)

- LED fault (failure or ageing)
- over- or under-temperature

power supply to the device.

In the SSI mode, the fault indication can only be reset by switching off the

Incremental outputs (A/B)							
	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 <sup>2)</sup>	yes <sup>2)</sup>					
Pulse rate	2048 ppr	2048 ppr					

<sup>2)</sup> Short circuit to 0 V or to output, one channel at a time,



# Standard optical

### Sendix 5853 / 5873 (shaft / hollow shaft)

### SSI / BiSS + incremental

SET	innut	or SET	<b>button</b>
SEL	Input	UL PEI	DULLOII

	active HIGH
	comparator
HIGH	min: 60 % of +V (power supply) max: +V
LOW	max: 25 % of +V (power supply)
	< 0.5 mA
	10 ms
	14 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 inverted function can also be factory-programmed. If DIR is changed when the device is already switched on, then this will be interpreted as an error. 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.

Response time (DIR input)

1 ms

### Power-ON

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.



Standard optical

### Sendix 5853 / 5873 (shaft / hollow shaft)

SSI / BiSS + incremental

#### **Terminal assignment**

Interface	Type of connection	Features	Cable (isolate unused cores individually before initial start-up)													
1, 2	1, 2 1, 2, A, B, E, F	SET. DIR. Status	Signal:	0 V	+V	C+	C-	D+	D-	SET	DIR	Stat	N/C	N/C	N/C	Ŧ
1, 2	I, Z, A, D, E, F	SEI, DIN, Status	Core color:	WH	BN	GN	YE	GY	PK	BU	RD	BK	-	-	-	shield
Interface	Type of connection	Features	M23 connecto	or, 12-pir	ı				_						_	
1, 2	3, 4	SET, DIR, Status	Signal:	0 V	+V	C+	C-	D+	D-	SET	DIR	Stat	N/C	N/C	N/C	Ŧ
1,2	3, 1		Pin:	1	2	3	4	5	6	7	8	9	10	11	12	PH
Interface	Type of connection	Features	Cable (isolate	unused	cores ii	ndividua	ally befo	re initia	ıl start-ı	ıp)						
5	1, 2, A, B, E, F	SET, DIR, Status	Signal:	0 V	+V	C+	C-	D+	D-	SET	DIR	Stat	N/C	0 Vsens	+Vsens	Ŧ
5	1, 2, A, D, L, I	sensor output	Core color:	WH	BN	GN	YE	GY	PK	BU	RD	BK	-	GY-PK	RD-BU	shield
Interface	Type of connection	Features	M23 connecto	or, 12-pir	ı											
5	3, 4	SET, DIR, Status	Signal:	0 V	+V	C+	C-	D+	D-	SET	DIR	Stat	N/C	0 Vsens	+Vsens	Ť
5	3, 4	sensor output	Pin:	1	2	3	4	5	6	7	8	9	10	11	12	PH
Interface	Type of connection	Features	Cable (isolate	unused	cores ii	ndividua	ally befo	re initia	ıl start-ı	ıp)						
3, 4, 7, 8	1, 2, A, B, E, F	SET, DIR, SinCos	Signal:	0 V	+V	C+	C-	D+	D-	SET	DIR	Α	Ā	В	B	Ŧ
3, 4, 7, 0	I, Z, A, D, E, F	or incr. RS422	Core color:	WH	BN	GN	YE	GY	PK	BU	RD	BK	VT	GY-PK	RD-BU	shield
Interface	Type of connection	Features	M23 connecto	or, 12-pir	1											
3, 4, 7, 8	3, 4	SET, DIR, SinCos	Signal:	0 V	+V	C+	C-	D+	D-	SET	DIR	Α	Ā	В	B	Ť
3, 4, 7, 0	3, 4	or incr. RS422	Pin:	1	2	3	4	5	6	7	8	9	10	11	12	PH
Interface	Type of connection	Features	Cable (isolate	unused	cores ii	ndividua	ally befo	re initia	l start-ı	ıp)						
6.0	124855	SinCos o. incr. RS422	Signal:	0 V	+V	C+	C-	D+	D-	Α	Ā	В	B	0 Vsens	+Vsens	Ť
6, 9	1, 2, A, B, E, F	sensor output	Core color:	WH	BN	GN	YE	GY	PK	BU	RD	BK	VT	GY-PK	RD-BU	shield
Interface	Type of connection	Features	M23 connecto	or, 12-pir	1											
6, 9	3, 4	SinCos o. incr. RS422	Signal:	0 V	+V	C+	C-	D+	D-	Α	Ā	В	B	0 Vsens	+Vsens	Ť
0, 3	3,4	sensor output	Pin:	1	2	3	4	5	6	7	8	9	10	11	12	PH
Interface	Type of connection	Features	M12 connector, 8-pin													
1, 2	5, 6	SET, DIR	Signal:	0 V	+V	C+	C-	D+	D-	SET	DIR	Ŧ				
1, 2 5, 6	5E1, DIN	Pin:	1	2	3	4	5	6	7	8	PH					

+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.

 C+, C-:
 Clock signal

 D+, D-:
 Data signal

 A, Ā:
 Incremental output channel A (cosine)

 B, 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





M12 connector, 8-pin

M23 connector, 12-pin









Pitch circle diameter for fixing screws 63 [2.48] (drawing with M23 connector)

- 1 Fixing screws DIN 912 M3 x 8 (washer included in delivery)
- 2 Recommended torque for the clamping ring 0.6 Nm

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









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

- 1 Status-LED
- 2 SET button
- $\fboxspace{1.5}$  Recommended torque for (SW 4) tightening screw 3  $^{\rm +0.5}$  Nm
- 4 Recommended torque for (SW 2) tightening screw 1 Nm





