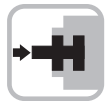


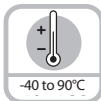
Sendix absolute, multiturn type F3663 (shaft) / F3683 (blind / hollow shaft) SSI/BiSS-C



Safety-Lock™



High rotational speed



Temperature



High IP



High shaft load capacity



Shock/vibration resistant



Magnetic field proof



Short-circuit proof



Reverse polarity protection



SIN/COS



Optical sensor



Seawater-resistant version on request

Reliable

- **Increased ability to withstand vibration and installation errors.** Sturdy Safety-Lock™ Design bearing structure eliminates machine downtime and repairs.
- **Fewer components and connection points increase the operational reliability:** TURCK OptoASIC technology with highest integration density (Chip-on-Board).
- **Die cast housing and protection up to IP67: Remains sealed even when subjected to harsh everyday use.**
- **Wide temperature range of** -40 to +194°F (-40 to +90°C).
- **Easy diagnosis in case of fault condition.** Status indication by means of LED, sensor, voltage and temperature monitoring.



Sendix® absolute



UL US pending Ex 2/22

Fast

- **High accuracy:** Update rate of the whole position value above 100 kHz for a max. jitter of 1 µs (real-time).
- **High productivity due to very short regulation cycles:** Clock rate with SSI up to 2 MHz, with BiSS-C up to 10 MHz.
- **High-resolution feedback system achievable in real-time:** SinCos incremental outputs.

Versatile

- **Connections for every application:** Tangential cable.
- **Open interfaces ensure flexibility and independence:** SSI or BiSS-C with Sine-Cosine-Option incremental track RS422.
- Multiple mounting brackets for easy installation.
- **Compact design.**
- **Fast and easy start-up on site:** Preset and reversal of rotation direction by control inputs.
- **Direct mounting on standard diameter shafts up to 10 mm** through hollow shaft up to 8 mm.

Mechanical characteristics:

Max. speed, shaft or blind hollow shaft version without shaft sealing (IP65):	12,000 RPM, continuous operation 10,000 RPM
Max. speed, shaft version (IP67) or blind hollow shaft (IP65) with shaft sealing:	10,000 RPM, continuous operation 8,000 RPM
Starting torque without shaft sealing:	< 1 oz-in (< 0.007 Nm)
Starting torque with shaft sealing:	< 1.4 oz-in (< 0.01 Nm)
Radial load capacity of shaft:	9 lbs (40 N)
Axial load capacity of shaft:	4.5 lbs (20 N)
Weight:	approx. 0.44 lbs (0.2 kg)

Protection acc. to EN 60 529:	Housing: IP67, Shaft: IP65, opt. IP67
EX approval for hazardous areas:	optional zone 2 and 22
Working temperature:	-40 to +194°F (-40 to +90°C)
Materials:	Shaft/Hollow shaft: stainless steel, Flange: aluminum, Housing: die cast zinc, Cable: PUR
Shock resistance acc. to DIN-IEC 68-2-27:	> 250g (> 2,500 m/s²), 6 ms
Vibration resistance acc. to DIN-IEC 68-2-6:	> 10 g (> 100 m/s²), 55-2,000 Hz

General electrical characteristics:

Supply voltage:	5 VDC ± 5 % or 10-30 VDC
Current consumption (without output load):	5 VDC: max. 60 mA, 10-30 VDC: max. 30 mA
Reverse polarity protection at power supply (+V):	yes

Conforms to CE requirements acc. to EN 61000-6-2, EN 61000-6-4 and EN 61000-6-3

RoHS compliant acc. to EU guideline 2002/95/EG	
Output driver:	RS485 transceiver type
Permissible load/channel:	max. ± 30 mA
Signal level high:	typ. 3.8 V
Signal level low at I _{load} = 20 mA:	typ. 1.3 V
Short-circuit proof outputs:	yes ¹⁾

Interface characteristics SSI:

Singleturn resolution:	10-17 bit
Number of revolutions:	Max. 24 bit
Code:	Binary or Gray
SSI clock rate:	≤ 14 bit: 50 kHz-2 MHz / ≥ 15 bit: 50 kHz-125 kHz
Monoflop time:	≤ 15 µs

Date refresh rate:	Up to 14 bits, ≤ 1 µs Up to 15-17 bits, 4 µs
Status and Parity bit:	optional on request
Note: If clock starts cycling within monoflop time, a second data transfer starts with the same data. If clock starts cycling after monoflop time, the data transfer starts with updated values. Max. update rate is dependent on clock speed, data length and monoflop time.	

¹⁾ Short-circuit to 0V or to output, one channel at a time, supply voltage correctly applied

Sendix absolute, multiturn type F3663 (shaft) / F3683 (blind / hollow shaft) SSI/BiSS-C

Interface characteristics BiSS-C:

Singleturn resolution:	10-17 bit
Number of revolutions:	Max. 24 bit
Code:	Binary
Clock rate:	up to 10 MHz
Max. update rate:	< 10 µs, depending on clock speed and data length
Data refresh rate:	≤ 1 µs
Note: Bidirectional, programmable parameters are: resolution, code, direction, alarms and warnings; Multicycle data output, e.g. for temperature; CRC data verification	

Incremental output (A/B). 2048 ppr:

	Sin/Cos	RS422 Compatible
Max. -3dB frequency:	400 kHz	400 kHz
Signal level:	1 Vpp (± 20%)	High: min. 2.5V Low: max. 0.5V
Short-circuit proof:	yes ¹⁾	yes ¹⁾

¹⁾ Short-circuit to 0V or to output, one channel at a time, supply voltage 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
Signal level low:	< 1 V
Active at:	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 22k).

If the LED is ON (status output LOW) this indicates: Sensor error, singleturn or multiturn (soiling, glass breakage etc.); LED error, failure or aging; Over temperature; Under voltage.
In the SSI mode, the fault indication can only be reset by switching off the power-supply to the device.

Pin configuration:

Interface 1 and 2 (SSI or BiSS-C, SET, DIR, Status) (Connection 1, 3)

Output:	Common (0 V)	+V	+Clock	-Clock	+Data	-Data	SET	DIR	Status	PE
Color:	WH	BN	GN	YE	GY	PK	BU	RD	VT	Shield

Interface 1 and 2 (SSI or BiSS-C, SET, DIR) (Connection 5)

Output:	GND	+V	+Clock	-Clock	+Data	-Data	SET	DIR	Shield/PE
Connector:	1	2	3	4	5	6	7	8	PH

Interface 3 and 4 (SSI or BiSS-C, SET, DIR, 2048 Sin/Cos) (Connection 1, 3)

Output:	GND	+V	+Clock	-Clock	+Data	-Data	SET	DIR	A	A inv	B	B inv	PE
Color:	WH	BN	GN	YE	GY	PK	BU	RD	BK	VT	GY/PK	RD/BU	Shield

Interface 5 (SSI or BiSS-C, SET, DIR, voltage sense outputs) (Connection 1, 3)

Output:	GND	+V	+Clock	-Clock	+Data	-Data	SET	DIR	0 V sens	+V sens	PE
Color:	WH	BN	GN	YE	GY	PK	BU	RD	VT	RD/BU	Shield

Interface 6 (SSI or BiSS-C, SET, DIR, 2048 Sin/Cos, voltage sense outputs) (Connection 1, 3)

Output:	GND	+V	+Clock	-Clock	+Data	-Data	0 V sens	+V sens	A	A inv	B	B inv	PE
Color:	WH	BN	GN	YE	GY	PK	BU	RD	BK	VT	GY/PK	RD/BU	Shield

Interface 7 and 8 (SSI or BiSS-C, SET, DIR, 2048 Sin/Cos) (Connection 1, 3)

Output:	GND	+V	+Clock	-Clock	+Data	-Data	A	A inv	B	B inv	PE
Color:	WH	BN	GN	YE	GY	PK	BK	VT	GY/PK	RD/BU	Shield

SET input:

Input characteristics:	active HIGH
Input type:	comparator
Signal level high:	min. 60 % of V+ (supply voltage), max: V+
Signal level low:	max. 30 % of V+ (supply voltage)
Input current:	< 0.5 mA
Min. pulse duration (SET):	10 ms
Input delay:	1 ms
New position data readable after:	1 ms
Internal processing time:	200 ms

The encoder may be set to zero at any position by means of a HIGH signal on the SET input or by pressing the optional SET key. Other preset values may be factory programmed. The SET input has a signal delay time of approximately 1 ms. Once the SET function has been triggered, the encoder requires an internal processing time of approximately 200 ms before the new position data can be read. During this time the LED is ON and the status output is at LOW.

Response time (DIR input)	1 ms
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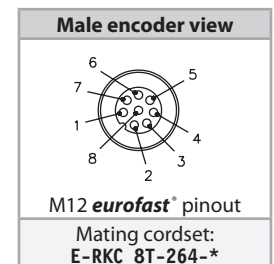
DIR input:

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 LED will come ON and the status output will switch to LOW.

Power-on delay:

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

Wiring diagrams:



* Length in meters.

Sendix absolute, multiturn type F3663 (shaft) / F3683 (blind / hollow shaft) SSI/BiSS-C

Part number key: F3663 shaft version

T8.F3663.XXXX.XXX2

Type		Inputs/outputs
		2 = SET, DIR input
Flange		Resolution Multiturn
1 = clamping flange Ø 36 mm, IP67		2 = 12 bit MT
2 = servo flange Ø 36 mm, IP67		6 = 16 bit MT
3 = clamping flange Ø 36 mm, IP65		4 = 24 bit MT
4 = servo flange Ø 36 mm, IP65		Resolution Singleturn
Shaft (Ø x L)		A = 10 bit ST
1 = Ø 6 mm x 12.5 mm		2 = 12 bit ST
2 = Ø 6.35 mm (1/4") x 12.5 mm		3 = 13 bit ST
3 = Ø 8 mm x 15 mm		4 = 14 bit ST
4 = Ø 9.525 mm (3/8") x 15.875 mm (5/8")		7 = 17 bit ST
5 = Ø 10 mm x 20 mm		Code
Voltage supply and output		B = SSI, binary
1 = 5 VDC, SSI or BiSS-C		C = BiSS-C, binary
2 = 10-30 VDC, SSI or BiSS-C		G = SSI, gray
3 = 5 VDC, SSI or BiSS-C, and 2048 ppr SinCos		Type of connection
4 = 10-30 VDC, SSI or BiSS-C, and 2048 ppr SinCos		1 = tangential cable outlet (1 m PUR)
5 = 5 VDC, SSI or BiSS-C with sensor outputs for monitoring the supply voltage on the encoder		3 = tangential cable outlet (5 m PUR)
6 = 5 VDC, SSI or BiSS-C, and 2048 ppr SinCos with sensor outputs for monitoring the supply voltage on the encoder		5 = tangential cable outlet (1 m PUR) with 8-pin M12 eurofast connector
7 = 5 VDC, SSI or BiSS-C and 2048 ppr. incr. signals RS422		(only valid with output 1 & 2)
8 = 10-30 VDC, SSI or BiSS-C and 2048 ppr. incr. signals RS422		

Part number key: F3683 hollow shaft version

T8.F3683.XXXX.XXX2

Type		Inputs/outputs
		2 = SET, DIR input (additional status output)
Flange		Resolution Multiturn
1 = Ø 36 mm, with short torque stop, IP65		2 = 12 bit MT
2 = Ø 36 mm, with slotted flex mount, IP65		6 = 16 bit MT
3 = Ø 36 mm, with long torque stop, IP65		4 = 24 bit MT
Hollow shaft		Resolution Singleturn
1 = Ø 6 mm		A = 10 bit ST
2 = Ø 6.35 mm		2 = 12 bit ST
3 = Ø 8 mm		3 = 13 bit ST
4 = Ø 10 mm (blind hollow shaft)		4 = 14 bit ST
Voltage supply and output		7 = 17 bit ST
1 = 5 VDC, SSI or BiSS-C		Code
2 = 10-30 VDC, SSI or BiSS-C		B = SSI, binary
3 = 5 VDC, SSI or BiSS-C, and 2048 ppr SinCos		C = BiSS-C, binary
4 = 10-30 VDC, SSI or BiSS-C, and 2048 ppr SinCos		G = SSI, gray
5 = 5 VDC, SSI or BiSS-C with sensor outputs for monitoring the supply voltage on the encoder		Type of connection
6 = 5 VDC, SSI or BiSS-C, and 2048 ppr SinCos with sensor outputs for monitoring the supply voltage on the encoder		1 = tangential cable outlet (1 m PUR)
7 = 5 VDC, SSI or BiSS-C and 2048 ppr. incr. signals RS422		3 = tangential cable outlet (5 m PUR)
8 = 10-30 VDC, SSI or BiSS-C and 2048 ppr. incr. signals RS422		5 = tangential cable outlet (1 m PUR) with 8-pin M12 eurofast connector
		(only valid with output 1 & 2)

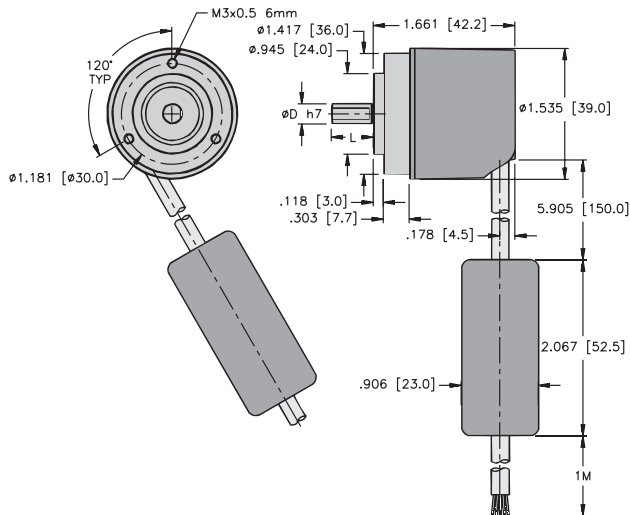
Accessories:

- See page J1, Connectivity, for cables and connectors
- See page G1, Accessories, for mounting attachments and couplings

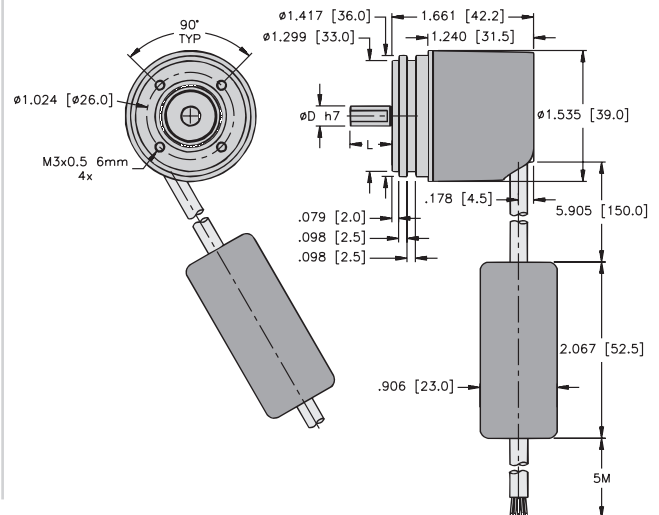
Sendix absolute, multiturn type F3663 (shaft) / F3683 (blind / hollow shaft) SSI/BiSS-C

Dimensions: F3663 shaft version

F3663 flanges 1 & 3 Cable connection 1

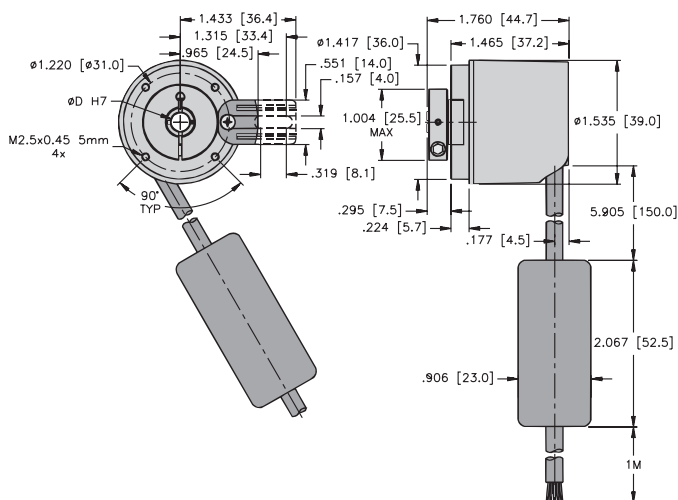


F3663 flanges 2 & 4 Cable connection 3



Dimensions: F3683 hollow shaft version

F3683 flange 1 and 3 Cable connection 1



F3683 flange 2 (blind hollow shaft) Cable connection 5

