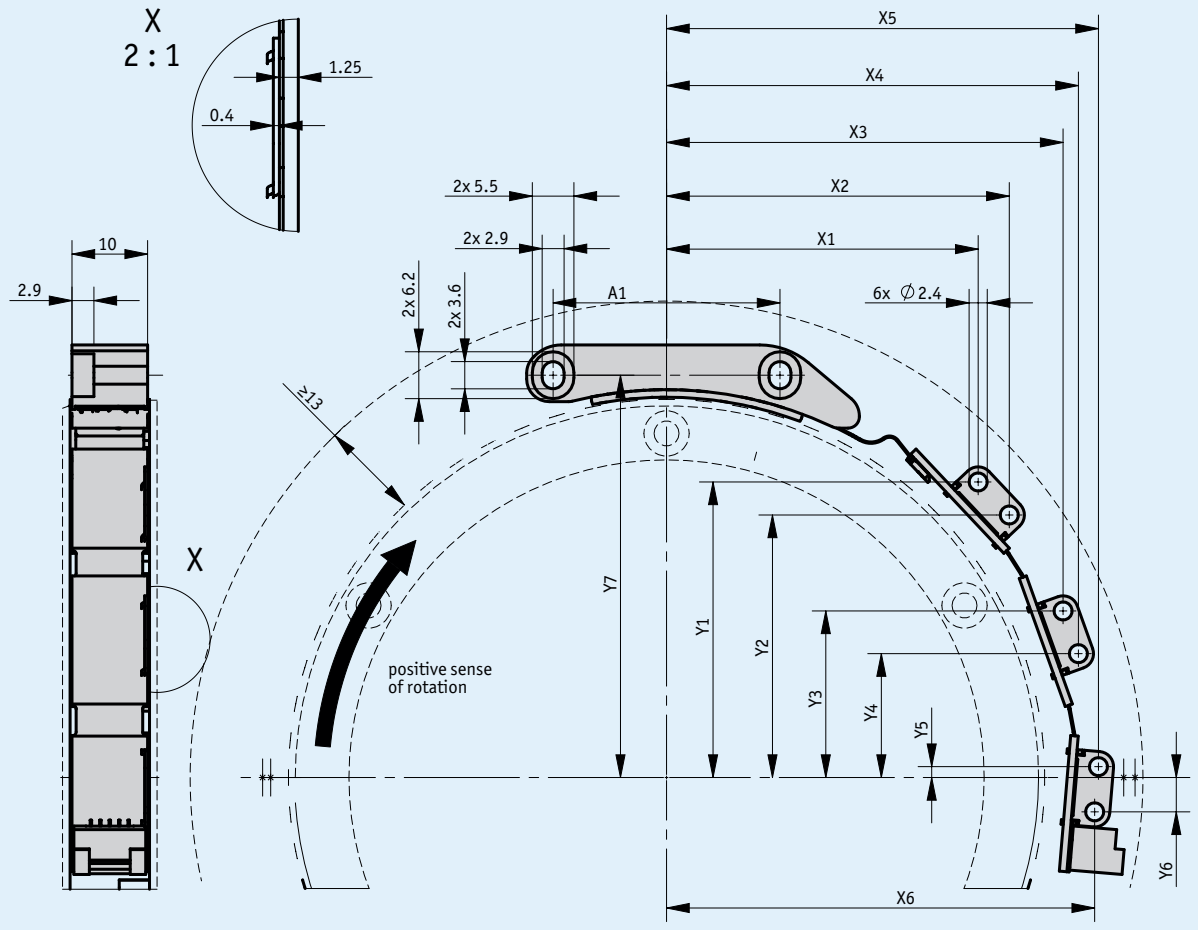
Profile

- Magnetic absolute encoder single-turn
- Integration into small installation space possible
- Absolute resolution up to 20 Bit
- Repeatability 0.01°
- Reading distance ≤0.6 mm
- Interface BiSS C, SSI
- Optionally analog Sin/Cos 1 Vss or digital line driver
- Industrial and medical applications e.g., motor feedback, handling automation and robotics
- Industry 4.0 ready





pole number	øD	A1	X1	X2	X3	X4	X5	X6	Y1	Y2	Y3	Y4	Y5	Y6	Y7
158	100	30	40.3	44.3	51.9	54.0	56.6	56.5	39.8	35.3	22.7	17.1	2.3	-3.7	53.2

Mechanical data

Feature	Technical data	Additional information
Housing design	open printed circuit board	
Material	aluminum	reader head
Sensor/ring reading distance	≤0.6 mm	
Weight	15 g	

Electrical data

Feature	Technical data	Additional information
Operating voltage	4.5 ... 30 V DC	reverse polarity protection
Power input	<1.5 W	
Output circuit	LD, 1 Vpp	
Interface	BiSS C, SSI	
Real-time requirement	signal output proportional to speed	Sin Cos output
Type of connection	JST connector	SM10B-GHDS-A-GAN-TF

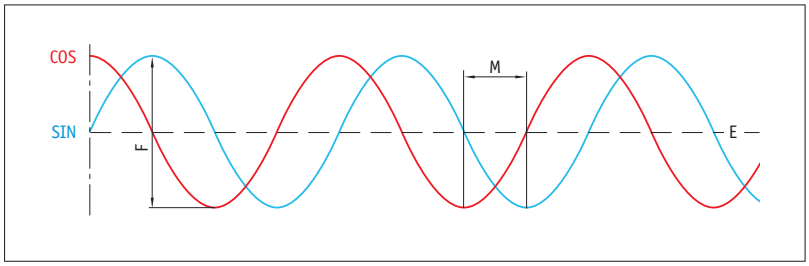
Sin/cos output

Feature	Technical data	Additional information
Output signals	sin, /sin, cos, /cos	
Output voltage	1 V_{PP} ±10%	at 0 ... 70° C, 120 Ω terminating resistor
Signal period	2000 µm	

LD output circuit

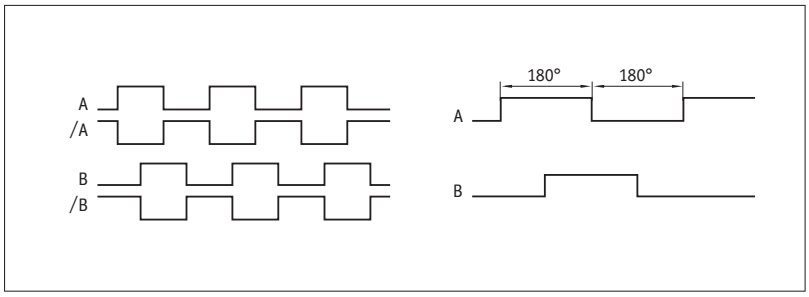
Feature	Technical data	Additional information
Output signals	A, /A, B, /B	
Output signal level high	>2.5 V	
Output signal level low	<0.5 V	

Signal pattern, Sin/Cos output

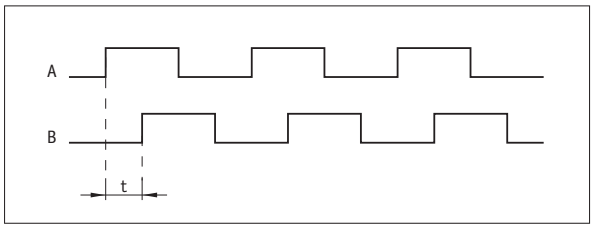


E: reference voltage 2.5 V
F: 1 V_{SS} ±10%
M: 90° ±1.0° / ±3° (25 kHz)

Signal pattern, LD output circuit



Pulse interval, LD output circuit



Example: Pulse interval t = 1 µs
(i. e., the downstream unit must be able to process 250 kHz)

Formula for counting frequency $= \frac{1}{1\ \mu s \times 4} = 250\ kHz$

System data

Feature	Technical data	Additional information
Pole length	2 mm	incremental track
Resolution	system resolution absolute = scaling factor absolute (MSAC200) * number of poles (MRAC200)	with SSI, BiSS C interface
	system resolution incremental = scaling incremental (MSAC200) * number of poles (MRAC200) * 4	with LD output circuit
	2 mm	with 1 Vpp output circuit
Scaling factor	8, 9, 10, 11 bit absolute	
	8, 9, 10, 11 bit incremental	
System accuracy	±0.155°	with 70 poles with mechanical concentricity of the system ≤ 100 µm
	±0.131°	with 86 poles with mechanical concentricity of the system ≤ 100 µm
	±0.114°	with 102 poles with mechanical concentricity of the system ≤ 100 µm
	±0.096°	with 128 poles with mechanical concentricity of the system ≤ 100 µm
	±0.082°	with 158 poles with mechanical concentricity of the system ≤ 100 µm
	±0.085°	with 224 poles with mechanical concentricity of the system ≤ 150 µm
	±0.071°	with 396 poles with mechanical concentricity of the system ≤ 200 µm
Repeat accuracy	0.01°	unidirectional
Measuring range	≤360°	Singleturn
Circumferential speed	≤5 m/s	absolute
	≤25 m/s	incremental (Sin/Cos)

Incremental LD peripheral speed

		Peripheral speed Vmax [m/s]					
Incremental scaling [bit]	**8**	15.63	7.81	3.13	1.56	0.78	0.31
	9	7.81	3.91	1.56	0.78	0.39	0.16
	10	3.91	1.95	0.78	0.39	0.20	0.08
	11	1.95	0.95	0.39	0.20	0.10	0.04
Pulse interval [µs]		0.10	0.20	0.50	1.00	2.00	5.00
Counting frequency [kHz]		2500.00	1250.00	500.00	250.00	125.00	50.00

Information on the speed as a function of the number of poles of the magnetic rings can be found in the assembly instructions.

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	-40 ... +105 °C	
Storage temperature	-40 ... +105 °C	without packaging
Relative humidity	95 %	condensation not permitted
EMC	EN 61000-6-2	interference resistance/immission
	EN 61000-6-4	interference resistance / immission (EMC according to the standards listed is ensured when the motor feedback system is mounted in an electrically conductive housing connected to the central grounding point of the motor regulator via a cable shield. If other shield concepts are used, the user must carry out his own tests.)
Protection category	IP00	
Shock resistance	≤1000 m/s^2 , 6 ms	EN 60068-2-27, 3 axes (+/-), each 3 shocks
Vibration resistance	≤200 m/s^2 , 10 ... 2000 Hz	EN 60068-2-6, 3 axes, each 20 cycles

Pin assignment

SSI	BiSS C	PIN
B, Cos+	B, Cos+	1
/B, Cos-	/B, Cos-	2
A, Sin+	A, Sin+	3
/A, Sin-	/A, Sin-	4
T-	NMA	5
D-	NSLO	6
T+	MA	7
D+	SLO	8
UB	UB	9
GND	GND	10

Industry 4.0

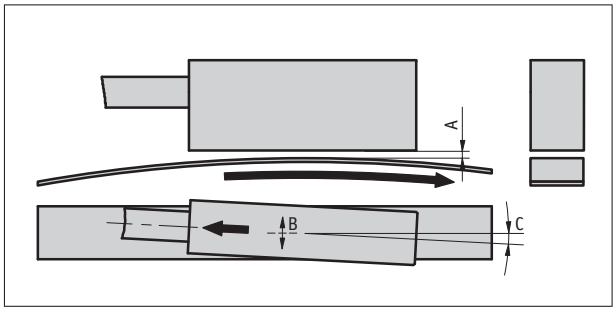
In most cases, data exchange with the magnetic encoders is limited to the exchange of process data. In addition to the process data, intelligent drives provide additional information that can be evaluated for condition monitoring up to predictive maintenance:

Process Data	Smart Value	Smart Function
Actual position	Temperature	Plausibility monitoring

Hint for mounting

When you mount the sensor and magnetic tape, please be careful to align both system components correctly.

A, Sensor/tape reading distance	0.1 ... 0.6 mm
B, Lateral offset	±0.5 mm
C, Alignment error	±0.5°



Symbolic representation

Order

Ordering table

Feature	Ordering data		Specification	Additional information
Design	158	A	158 poles	
			others on request	
Interface	BiSS/C	B	BiSS C	
	SSI		SSI	
absolute scaling	8	C	8 bit	
	9		9 bit	
	10		10 bit	
	11		11 bit	
incremental scaling	8	D	8 bit	
	9		9 bit	
	10		10 bit	
	11		11 bit	
Pulse interval	...	E	0.1, 0.2, 0.5, 1, 2, 5 in µs	

Order key

MSAC200 - [ ] - [ ] - [ ] - LD - [ ] - [ ]
A B C D E

Scope of delivery: *Quick Start Guide, MSAC200*

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