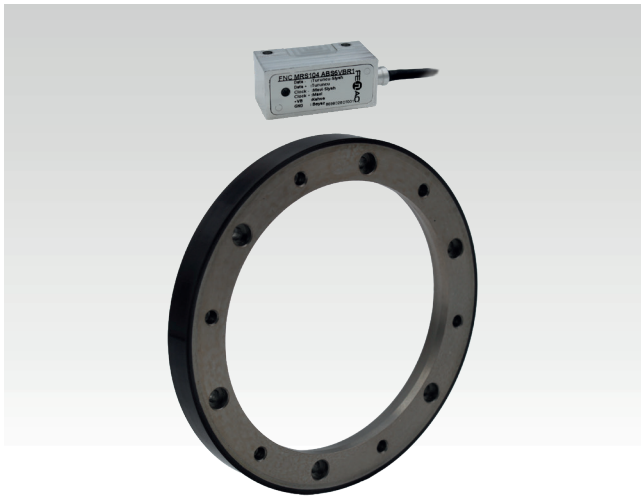


Absolute encoders

Singleturn up to 21 bit



FNC MRS104 Absolute Series



Features

- Bearingless encoders
- Robust mechanical and electrical construction
- Protection to IP65
- Up to 21 bit resolution
- Large axial and radial mounting tolerance
- Immune dirt, dust and humidity
- SSI or BiSS output
- Shock proof
- Magnetic Sensing Principle
- Absolute Position Feedback
- Compact and Slim Design
- High EMC Immunity

Technical data-electrical ratings

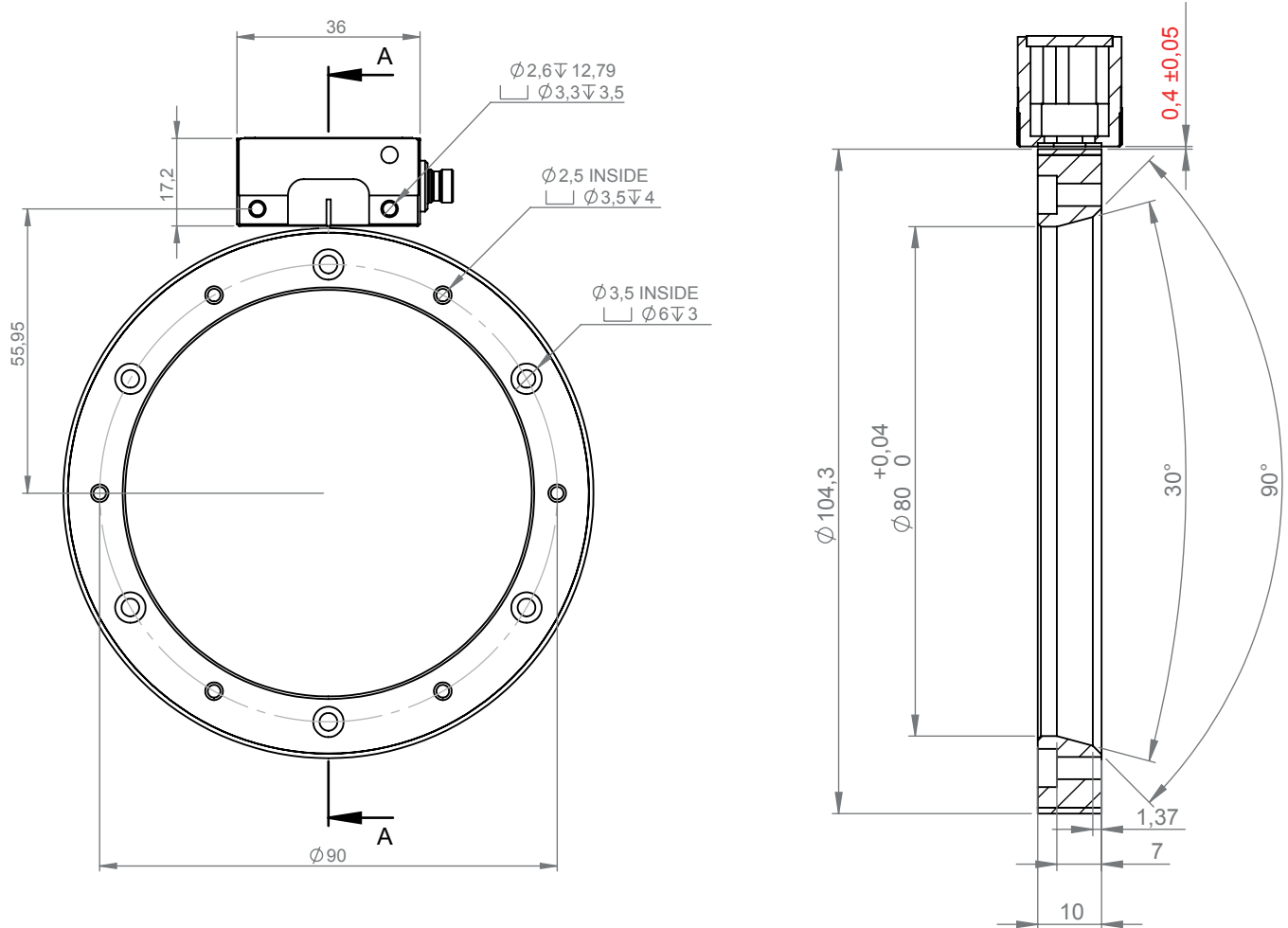
Voltage supply	4.75VDC to 5.5VDC
Protection	Output short circuit protection
Consumption w/o load	≤200 mA
Interface	SSI or BiSS
Resolution (steps/turn)	21 bit
Code	Gray or Binary
Output frequency	up to 2 MHz (SSI) up to 10 MHz (BiSS)
Output circuit	RS485 / RS422 SSI Data Line Driver
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Technical data-mechanical ratings

Diameter	Mounting hole : Ø90 mm Inner diameter : Ø80 mm Outer diameter : Ø104 mm
Travel speed	≤10,000 rpm
Materials	Read Head: Aluminum Ring : stainless steel
System accuracy	0.05°
Operating temperature	-40...+85°C (+125°C on request)
Storage temperature	-45... +85°C (+125°C on request)
Weight approx.	250 g

FNC MRS104 Absolute Series

Mechanical Dimensions



Absolute encoders

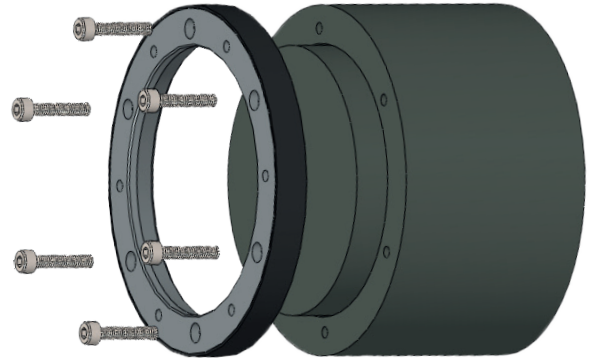
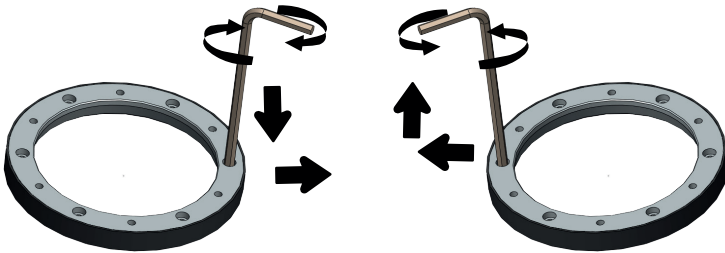
Mechanical Installation , Readhead Installation and Alignment

FNC MRS104 Absolute Series

Mechanical Installation

Tightening Torque Volues

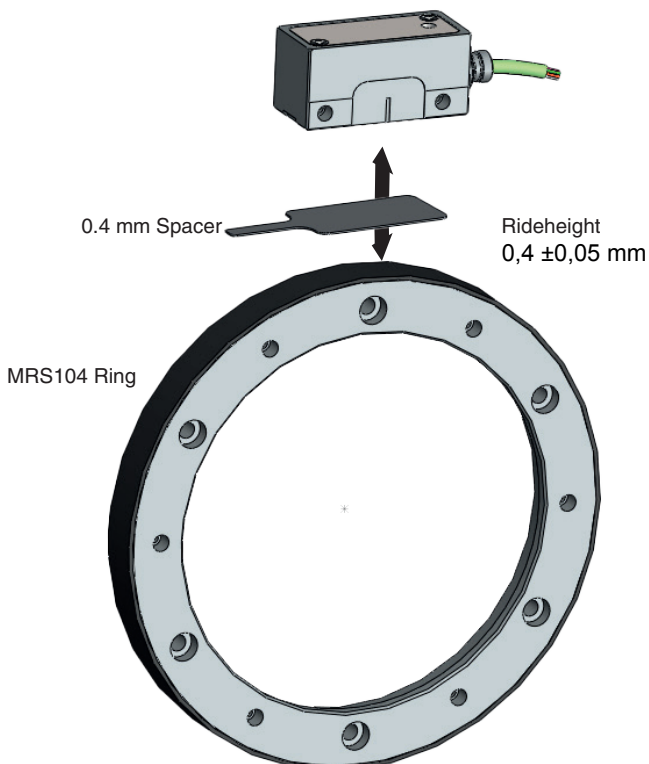
Mechanical Interface 8 Mounting Geometry



- During assembly the screws should only be tightened with allen keys to 3 Nm.
- Insert screws into all mounting holes.
- Tighten all screws.
- Ensure that all screws are tightened to 2 Nm.

Readhead Installation and Alignment

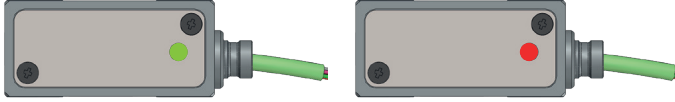
Readhead Alignment Description



Parameter	Value	Unit	Technical Definition
Nominal Air Gap (Z Axis)	0.40	mm	Vertical separation distance
Air Gap Tolerance	± 0.10	mm	
Radial Offset (Y Axis)	± 0.15	mm	Centering over magnetic tracks
Tangential Offset (X Axis)	± 0.10	mm	Position along the rotation path
Max. Tilt (Parallelism)	< 0.5	Degree	Parallelism between surfaces

FNC MRS104 Absolute Series

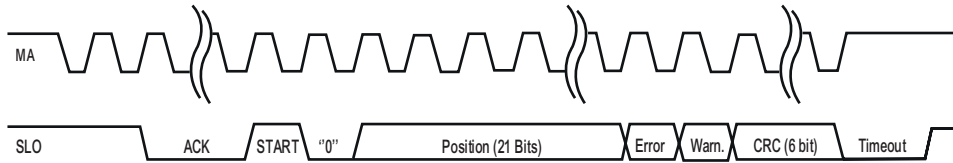
Led Status



Green LED (Status)	Red LED (Error)	System State	Description & Action
ON	OFF	Normal Operation	The sensor is operating within specified parameters. Alignment and signal amplitude are optimal.
OFF	ON	Warning / Temporary Error	Sensor has detected an out-of-tolerance condition (e.g., incorrect air gap or magnetic interference). System will recover once the fault is cleared.
OFF	LATCHED ON	Fatal / Latched Error	A critical system fault occurred (e.g., total loss of magnetic signal or hardware lock). Position data is invalid. To return the device to normal operation, a power cycle (power off/on) is required.

Pulse Diagram Biss and SSI

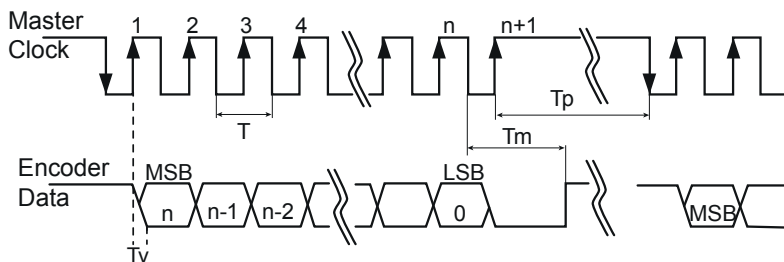
Biss Pulse Diagram



Biss Description

Symbol	Description
ACK	Absolute position one clock cycle
Start	Encoder signal for "start" data transmit
"0"	Start with follower
AP	Absolute position data
EB	Error bit
WB	Warning bit
CRC	Cyclic redundancy check
Timeout	Elapse between the sequential "start" request cycle's (20 ms)
Total Bit Size	ACK+Start+AP+EB+WB+CRC
ODR	(T x Total Bit Size) + Timeout

SSI Pulse Diagram



SSI Description

Symbol	Description
n	Total number of data bits
T	Clock Period
$f = 1/T$	Clock frequency
Tv	Bit update time
Tp	Pause time
Tm	Monoflop time
ACK	Absolute position one

Absolute encoders

Cable / Connector Wiring



FNC MRS104 Absolute Series

Cable Connection

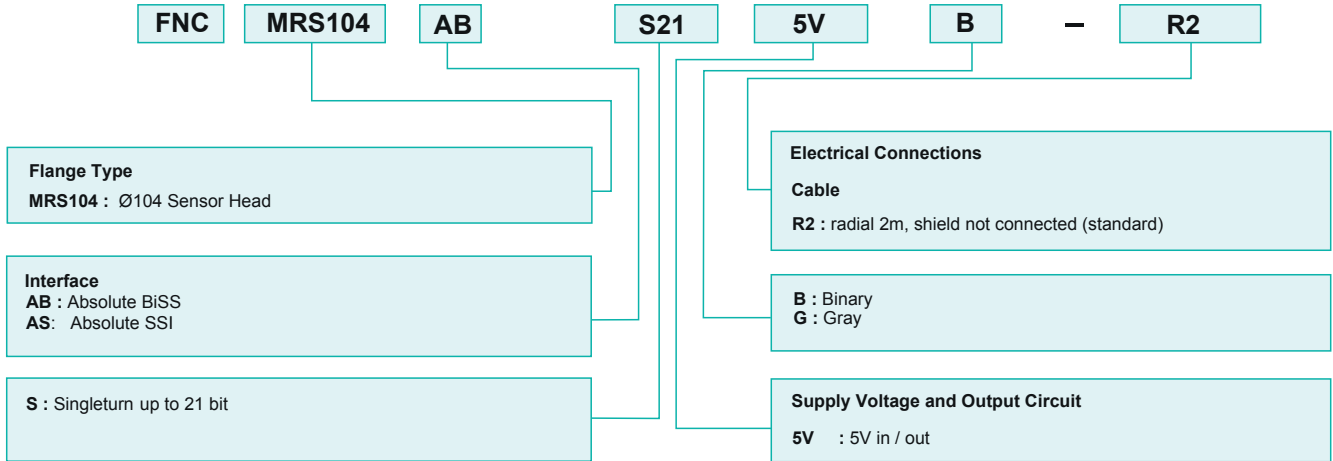
Function	Color	Renk	Farbe	Description
+VB	 Brown	Kahve	Braun	Supply voltage
GND	 White	Beyaz	Wei	Ground
DATA+	 Orange	Turuncu	Orange	Positive data output.
DATA-	 Orange-Black	Turuncu-Siyah	Orange-Schwarz	Negative data output.
CLOCK+	 Blue	Mavi	Gelb	Positive SSI clock output.
CLOCK-	 Blue-Black	Mavi-Siyah	Gelb-Schwarz	Negative SSI clock output.
Shield	Black	Siyah	Schwarz	

Terminal Significance

+Vs	Encoder supply voltage
0 V	Encoder ground connection relating to +Vs
Data+	Positive data output.
Data-	Negative data output.
Clock+	Positive SSI clock output.
Clock-	Negative SSI clock output.

FNC MRS104 Absolute Series

Encoder Part Number for Sensor Head



Encoder Part Number for Magnetic Ring

