

# MAGNETIC SCALES

Links to further documents for this series:

[Installation guide sensor MXW21](#)

[Installation guide sensor MXI21](#)

[Installation guide magnetic tape](#)



## MXW21 & MXI21 SERIES

### Key-Features:

- Measurement ranges up to 100 m
- Linearity up to  $\pm 15 \mu\text{m}$
- Resolution up to  $1 \mu\text{m}$
- Output: Sine/Cosine  $1 V_{pp}$  (MXW) or HTL/TTL (MXI)
- Unaffected by dust, debris or liquids
- Protection class IP67
- Operating temperature range from  $-25 \text{ }^\circ\text{C}$  to  $+85 \text{ }^\circ\text{C}$

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## TECHNICAL DATA SENSORS MXW11 AND MXI21

		MXW21	MXI21			
Measurement range	[m]	up to 99.99 (magnetic tape length -10 mm)				
Linearity max.		1 % of the period length	±15 µm			
Repeatability		±1 increment				
Resolution	[µm]	theoretically unlimited	1	2	10	50
Signal period	[µm]	2000	-			
Counting frequency	[kHz]	18	3333			
Output type		1 V <sub>PP</sub>	Line Driver, Push-Pull			
Output signal		sine/cosine, AB0, /AB0	AB0, /AB0			
Edge distance	[µs]	-	0.3			
Supply	[VDC]	+5 ±5 %	+5 ±5 % (Line Driver) or 10...30 (Push-Pull)			
Current consumption max.	[mA]	70				
Connection		Hi-flex cable with open wires or cable with connector M12, 8 pins				
Protection class		IP67				
Operating temperature	[°C]	-25...+85				
Storage temperature	[°C]	-40...+100				
Storage temperature		250 g, 6 ms according to CEI EN 60068-2-27				
Shock resistance		10 g, 5...2000 Hz according to CEI EN 60068-2-6				
Vibration resistance		-	yes (except 5 VDC version)			
Short-circuit protection		yes				
EMC		according to EN 61000-6-2 level 3				
Gap between sensor and tape	[mm]	0.1...1				
Travel speed	[m/s]	16	3.33	6.66	20	
Housing		die cast aluminium, UNI EN AC-46100				

## TECHNICAL DATA MAGNETIC TAPE WB20

Length	[m]	max. 100				
Accuracy class	[µm/m]	±85 µm/m, ±35 µm/m (up to 30 m) or ±8 µm/m (up to 10 m)				
Polar pitch	[mm]	2				
Protection class		IP67				
Operating temperature	[°C]	-25...+85				
Storage temperature	[°C]	-40...+100				
Thermal expansion coefficient	[1/K]	0.000016				

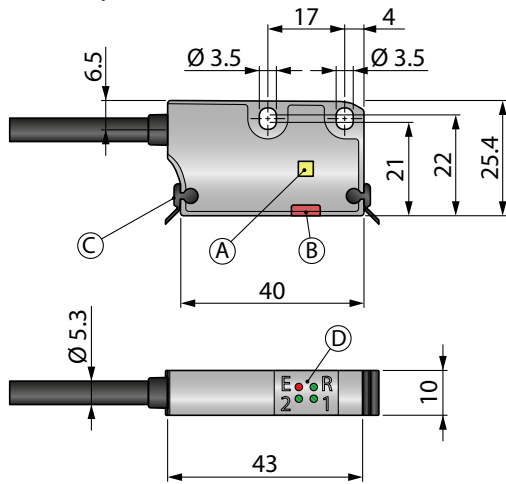
## CHEMICAL RESISTANCE MAGNETIC TAPE WB20

Acetone	••	Kerosene	•	Seawater	••
Acetylene	••	Ketone	•••	Steam heat	•
Antifreeze (Glacial acetic acid)	•	Mineral / Motor oil	•	Thinner	•••
Benzene	•••	Petrol	••	Turpentine	••
Heptane	•••				

• No effect or low effect   •• Low to Medium effect   ••• Strong effect

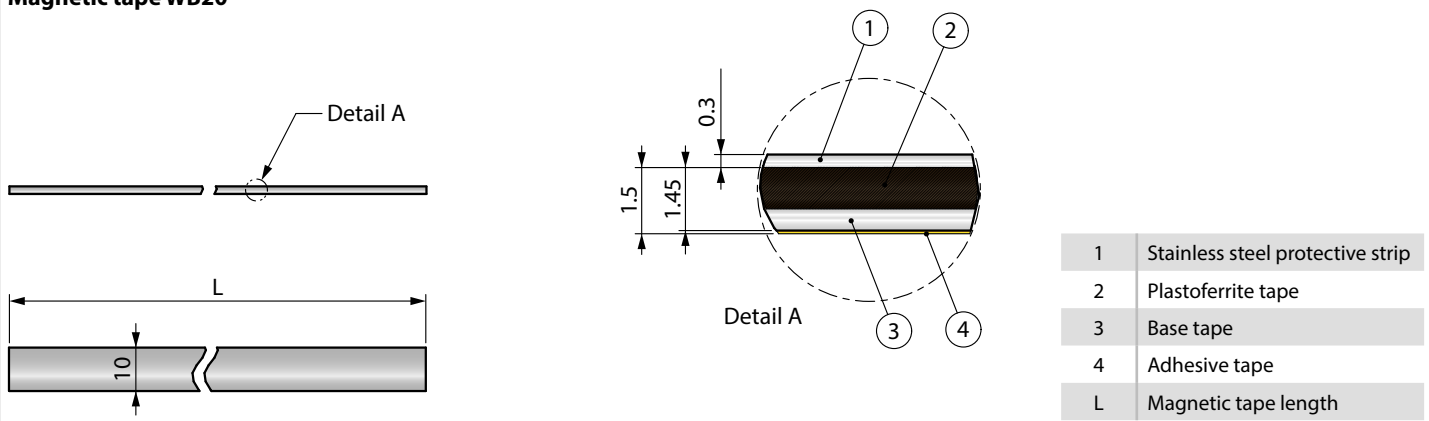
## TECHNICAL DRAWING

### Sensor MXW21, MXI21

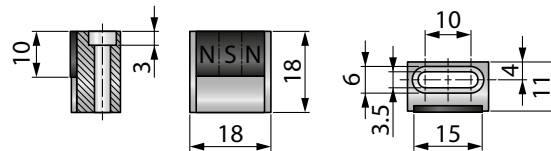


	MXW21	MXI21
<b>A</b>	Reference sensor for versions R and T	
<b>B</b>	Incremental sensor	
<b>C</b>	Dust wipers (not included in delivery)	
<b>D</b>	Diagnostic LEDs	Diagnostic LEDs
	E: Gap/Speed error (red) R: Reference detection (green) 1: Output A (green) 2: Output B (green)	E: Gap/Speed error (red) R: Reference detection (green) 1: Power On (green) 2: No function

### Magnetic tape WB20



### Reference magnet WKM-1309-2

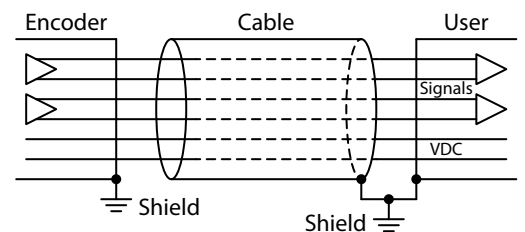
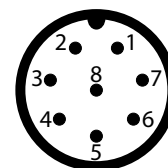


## ELECTRICAL CONNECTION

Function	Cable output	Connector output	Connection cable K8P...
GND <sub>Supply</sub>	BK	Pin 1	WH
+V	RD	Pin 2	BN
A	YE	Pin 3	GN
/A	BU	Pin 4	YE
B	GN	Pin 5	GY
/B	OG	Pin 6	PK
0 <sup>1)</sup>	WH	Pin 7	BU
/0 <sup>1)</sup>	GY	Pin 8	RD
Shield	Shield	Housing	Shield

<sup>1)</sup> only available with reference options I / K (index) and R / T (reference)

### Connector, M12 (male)



## ORDER CODE SENSOR MXW21

MXW21 - □ - □ - □

<b>Output signal</b> 1 V <sub>pp</sub> Sine/Cosine	V-1
<b>Reference</b> Without Every 2 mm (RS422 Level) 1 reference point (RS422 Level) <sup>1)</sup> Every 2 mm (1 V <sub>pp</sub> Level) 1 reference point (1 V <sub>pp</sub> Level) <sup>1)</sup>	N I R K T

<sup>1)</sup> Accessory WKM-1309-2 necessary

L2	<b>Connection</b> Cable output 2 m Cable output 5 m Cable output 5 m Cable 0.5 m + M12 connector Cable 2 m + M12 connector
L5	
L10	
M0,5	
M2	

## ORDER CODE SENSOR MXI21

MXI21 - □ - □ - □ - □ - H

<b>Output signal</b> Push-Pull (AB, /AB) (HTL) Line Driver (AB, /AB) (TTL)	YC-2 L-1
<b>Resolution</b> 1 µm 2 µm 10 µm 50 µm	1 2 10 50

L2	<b>Connection</b> Cable output 2 m Cable output 5 m Cable output 5 m Cable 0.5 m + M12 connector Cable 2 m + M12 connector
L5	
L10	
M0,5	
M2	

N	<b>Reference</b> Without Every 2 mm 1 reference point <sup>1)</sup>
I	
R	

<sup>1)</sup> Accessory WKM-1309-2 necessary

## ORDER CODE MAGNETIC TAPE WB20

WB20 - □ - □ - □

<b>Length</b> Up to 100 m	X <sup>1)</sup>
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<sup>1)</sup> length in meters  
measurement range = length - 10 mm

1	<b>Stainless steel protective strip</b> Supplied
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100	<b>Accuracy class</b> ±85 µm/m ±35 µm/m (up to 30 m) ±8 µm/m (up to 10 m)
50	
10	

## ACCESSORIES

### Cable with connector (female) M12, 8 poles, shielded, IP67

K8P2M-S-M12	2 m, straight connector
K8P5M-S-M12	5 m, straight connector
K8P10M-S-M12	10 m, straight connector

### Additional accessories

WKM-1309-2 <sup>1)</sup>	Reference magnet for options R and T
KIT WIPERS <sup>1)</sup>	Dust wipers (10 pcs)

<sup>1)</sup> not included in the scope of delivery of the sensor

### Digital displays for sensors with HTL output, 2 channel

WAY-DX-S	touch screen, supply: 18...30 VDC
WAY-DX-AC	touch screen, supply: 115...230 VAC

For more information and options please refer to the [WAY-DX data sheet](#).

### Mating connector (female) M12, 8 poles, for self assembly

D8-G-M12-S	straight connector
D8-W-M12-S	angular connector

### Digital displays for sensors with HTL or TTL output, 2 channel

WAY-DXM-S	touch screen, supply: 18...30 VDC
WAY-DXM-AC	touch screen, supply: 115...230 VAC

For more information and options please refer to the [WAY-DXM data sheet](#).

Subject to change without prior notice.

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