



MWS250-D4WHC01500

MWS250

MEASURING WHEEL ENCODERS

SICK
Sensor Intelligence.



Illustration may differ



Ordering information

Type	part no.
MWS250-D4WHC01500	1155976

Other models and accessories → www.sick.com/MWS250

Detailed technical data

Features

Specialty	Programmable DFS60 encoder preset to 1,500 pulses and TTL incremental interface
------------------	---

Safety-related parameters

MTTF_D (mean time to dangerous failure)	300 years (EN ISO 13849-1) ^{1) 2)}
--	---

¹⁾ Valid for attached encoder.

²⁾ This product is a standard product and does not constitute a safety component as defined in the Machinery Directive. Calculation based on nominal load of components, average ambient temperature 40°C, frequency of use 8760 h/a. All electronic failures are considered hazardous. For more information, see document no. 8015532.

Performance

Pulses per revolution	1,500
Resolution in pulses/mm	4.9
Measuring increment (resolution in mm/pulse)	0.2 ¹⁾ ²⁾
Repeatability	< 0.1 mm ³⁾

¹⁾ Calculation example: Circumference of wheel / pulses per revolution = 200 mm / 16384 pulses per revolution = 0,012mm/pulse.

²⁾ Value based on measuring wheel circumference. The measuring wheel circumference depends on manufacturing tolerances, wear and tear, the selected spring tensioning force, and the behavior of the measurement wheel surface at different temperatures and on different measurement surfaces. To obtain the most accurate measurement results, we recommend performing a reference run for positioning tasks so that application-specific measuring wheel characteristics can be taken into account.

³⁾ Value is based on the mechanics. Backlash of the measuring wheel mechanics, is at a minimum. This enables a precise and repeatable measurement results.

Interfaces

Communication interface	Incremental
Communication Interface detail	TTL / RS-422
Programmable/configurable	✓
Number of signal channels	6-channel

Electronics

Connection type	Male connector, M12, 8-pin, radial
Supply voltage	4.5 V ... 32 V
Reverse polarity protection	✓
Short-circuit protection of the outputs	✓ ¹⁾ ²⁾

¹⁾ Programming TTL with ≥ 5.5 V: short-circuit opposite to another channel or GND permissible for maximum 30 s.

²⁾ Programming HTL or TTL with < 5.5 V: short-circuit opposite to another channel, US or GND permissible for maximum 30 s.

Mechanics

Measuring wheel circumference	12 "
Measuring wheel surface	PUR ¹⁾
Mounting	Dual wheel mount
Spring arm mechanism material	
Spring element	Hardened steel
Measuring wheel core	Aluminum
Spring arm	Aluminum
Start up torque	0.8 Ncm
Operating torque	0.6 Ncm
Bearing lifetime	3.6×10^{10} revolutions
Maximum travel/deflection of spring arm	10 mm
Recommended pretension	10 N ²⁾
Max. permissible working area for the spring (continuous operation)	± 15 mm
Recommended spring deflection	10 mm ... 30 mm
Service life of spring element	> 1 million cycles ³⁾
Mounting position relative to the measuring object	Possible from above or below
Moment of inertia of the rotor	40 gcm ²
Attached measuring wheel	BEF-MR10012VU, 2153197
Attached reference encoder	DFS60A-TJPC65536, 1036960, See the reference encoder for further technical data.

¹⁾ The surface of a measuring wheel is subject to wear. This depends on contact pressure, acceleration behavior in the application, traversing speed, measurement surface, mechanical alignment of the measuring wheel, temperature, and ambient conditions. We recommend you regularly check the condition of the measuring wheel and replace as required.

²⁾ At 20 mm pretension.

³⁾ One cycle corresponds to an upward and downward movement of ± 3 mm from the recommended pretension position.

Ambient data

EMC	According to EN 61000-6-2 and EN 61000-6-3
Enclosure rating	IP65 (IEC 60529)
Operating temperature range	-40 °C ... +100 °C
Storage temperature range	-40 °C ... +100 °C, without package

Classifications

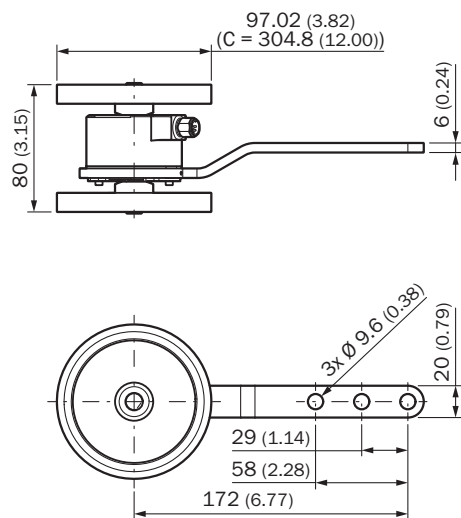
ECLASS 5.0	27270501
ECLASS 5.1.4	27270501

ECLASS 6.0	27270590
ECLASS 6.2	27270590
ECLASS 7.0	27270501
ECLASS 8.0	27270501
ECLASS 8.1	27270501
ECLASS 9.0	27270501
ECLASS 10.0	27270790
ECLASS 11.0	27270707
ECLASS 12.0	27270504
ETIM 5.0	EC001486
ETIM 6.0	EC001486
ETIM 7.0	EC001486
ETIM 8.0	EC001486
UNSPSC 16.0901	41112113

Certificates

EU declaration of conformity	✓
UK declaration of conformity	✓
ACMA declaration of conformity	✓
Moroccan declaration of conformity	✓
China RoHS	✓

Dimensional drawing



Dimensions in mm (inch)

Anschlussbelegung

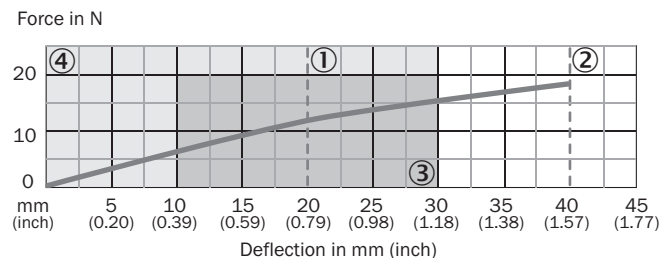


view of M12 male device connector on encoder

PIN Male connector M12, 8-pin	PIN Male connector M23, 12-pin	Wire colors (cable connection)	TTL/HTL signal	Sin/Cos 1.0 V _{PP}	Explanation
1	6	Brown	\bar{A}	COS-	Signal wire
2	5	White	A	COS+	Signal wire
3	1	Black	\bar{B}	SIN-	Signal wire
4	8	Pink	B	SIN+	Signal wire
5	4	Yellow	\bar{Z}	\bar{Z}	Signal wire
6	3	Purple	Z	Z	Signal wire
7	10	Blue	GND	GND	Ground connection
8	12	Red	+U _S	+U _S	Supply voltage
-	9	-	N.c.	N.c.	Not assigned
-	2	-	N.c.	N.c.	Not assigned
-	11	-	N.c.	N.c.	Not assigned
-	7 ¹⁾	Orange	0-SET ¹⁾	N.c.	Set zero pulse ¹⁾
Shielding	Shielding	Shielding	Shielding	Shielding	Shielding connected to housing on encoder side. Connected to ground on control side.

¹⁾For electrical interfaces only: M, U, V, W with 0-SET function on PIN 7 on M23 plug. The 0-SET input is used to set the zero pulse to the current shaft position. If the 0-SET input is applied to U_S for longer than 250 ms after it has previously been open or applied to GND for at least 1,000 ms, the current shaft position is assigned zero pulse signal "Z".







Diagrams Dual wheel, spring tension, yoke mount








- ① recommended pre-tension (20 mm)
- ② maximum deflection (40 mm)
- ③ recommended deflection range (10 - 30 mm)
- ④ permissible working area (0 - 30 mm)

Recommended accessories

Other models and accessories → www.sick.com/MWS250

	Brief description	Type	part no.
measuring wheels and measuring wheel mechanics			
	<ul style="list-style-type: none"> Product segment: Mounting systems Product: Brackets Description: Mounting bracket for encoders with two mounting brackets, counterweight, mounting from below with mounting fork 	BEF-MWS250-CW	2151728
	<ul style="list-style-type: none"> Product segment: Measuring wheels and measuring wheel mechanics Product: Brackets Description: Spring arm / mounting arm for MWS250 	BEF-MWS250-MS	2151727
	<ul style="list-style-type: none"> Product segment: Measuring wheels and measuring wheel mechanics Product: Measuring wheel mechanics Description: Mounting bracket for dual wheeled encoder systems, overbelt yoke mount 	BEF-MWS250-OBM	2151729
	<ul style="list-style-type: none"> Product segment: Measuring wheels and measuring wheel mechanics Product: Measuring wheel mechanics Description: Mounting bracket for dual wheeled encoder systems, spring tension underbelt yoke mount 	BEF-MWS250-UBM	2151730
	<ul style="list-style-type: none"> Product segment: Measuring wheels and measuring wheel mechanics Product: Measuring wheels Description: Aluminum measuring wheel with smooth polyurethane surface for 10 mm solid shaft, circumference 300 mm 	BEF-MR10300VU	2153196
	<ul style="list-style-type: none"> Product segment: Measuring wheels and measuring wheel mechanics Product: Measuring wheels 	BEF-MR10012VU	2153197

	Brief description	Type	part no.
	<ul style="list-style-type: none"> Description: Aluminum measuring wheel with smooth polyurethane surface for 10 mm solid shaft, circumference 300 mm 		
	<ul style="list-style-type: none"> Product segment: Measuring wheels and measuring wheel mechanics Product: Measuring wheels Description: Aluminium measuring wheel with O-ring (NBR70) for 10 mm solid shaft, circumference 300 mm 	BEF-MR010030R	2049278
	<ul style="list-style-type: none"> Product segment: Measuring wheels and measuring wheel mechanics Product: Measuring wheels Description: Measuring wheel with O-ring (NBR70) for 10 mm solid shaft, circumference 500 mm 	BEF-MR010050R	2055227
	<ul style="list-style-type: none"> Product segment: Measuring wheels and measuring wheel mechanics Product: Measuring wheels Description: Aluminum measuring wheel with cross-knurled surface for 10 mm solid shaft, circumference 300 mm 	BEF-MR10300AK	2115703
	<ul style="list-style-type: none"> Product segment: Measuring wheels and measuring wheel mechanics Product: Measuring wheels Description: Aluminum measuring wheel with smooth polyurethane surface for 10 mm solid shaft, circumference 300 mm 	BEF-MR10300AP	2118512
	<ul style="list-style-type: none"> Product segment: Measuring wheels and measuring wheel mechanics Product: Measuring wheels Description: Aluminum measuring wheel with ridged polyurethane surface for 10 mm solid shaft, circumference 300 mm 	BEF-MR10300APG	2118496
	<ul style="list-style-type: none"> Product segment: Measuring wheels and measuring wheel mechanics Product: Measuring wheels Description: Aluminum measuring wheel with studded polyurethane surface for 10 mm solid shaft, circumference 300 mm 	BEF-MR10300APN	2118494
	<ul style="list-style-type: none"> Product segment: Measuring wheels and measuring wheel mechanics Product: Measuring wheels Description: Aluminum measuring wheel with cross-knurled surface for 10 mm solid shaft, circumference 500 mm 	BEF-MR10500AK	4084733
	<ul style="list-style-type: none"> Product segment: Measuring wheels and measuring wheel mechanics Product: Measuring wheels Description: Aluminum measuring wheel with cross knurled surface for solid shaft 10 mm, circumference 500 mm +/-0,2 mm (circumferential tolerance at 20 °C. Circumferential tolerance depends on the temperature coefficient of the material) 	BEF-MR10500AK-A	2125732
	<ul style="list-style-type: none"> Product segment: Measuring wheels and measuring wheel mechanics Product: Measuring wheels Description: Aluminum measuring wheel with smooth polyurethane surface for 10 mm solid shaft, circumference 500 mm 	BEF-MR10500AP	4084734

	Brief description	Type	part no.
	<ul style="list-style-type: none"> Description: Aluminum measuring wheel with smooth polyurethane surface for 10 mm solid shaft, circumference 200 mm 		
connectors and cables			
	<ul style="list-style-type: none"> Description: Incremental, shielded, SSI Connection type head A: Female connector, M12, 8-pin, straight Connection type head B: Flying leads Signal type: Incremental, SSI Cable: 2 m, 8-wire, PUR, halogen-free Connection systems: Flying leads Application: Drag chain operation, Zones with oils and lubricants 	DOL-1208-G02MAC1	6032866
	<ul style="list-style-type: none"> Description: Incremental, shielded, SSI Connection type head A: Female connector, M12, 8-pin, straight Connection type head B: Flying leads Signal type: Incremental, SSI Cable: 5 m, 8-wire, PUR, halogen-free Connection systems: Flying leads Application: Drag chain operation, Zones with oils and lubricants 	DOL-1208-G05MAC1	6032867
	<ul style="list-style-type: none"> Description: Incremental, shielded, SSI Connection type head A: Female connector, M12, 8-pin, straight Connection type head B: Flying leads Signal type: Incremental, SSI Cable: 10 m, 8-wire, PUR, halogen-free Connection systems: Flying leads Application: Drag chain operation, Zones with oils and lubricants 	DOL-1208-G10MAC1	6032868
	<ul style="list-style-type: none"> Description: Incremental, shielded, SSI Connection type head A: Female connector, M12, 8-pin, straight Connection type head B: Flying leads Signal type: Incremental, SSI Cable: 20 m, 8-wire, PUR, halogen-free Connection systems: Flying leads Application: Drag chain operation, Zones with oils and lubricants 	DOL-1208-G20MAC1	6032869
	<ul style="list-style-type: none"> Description: Incremental, shielded, SSI Connection type head A: Female connector, M12, 8-pin, straight, A-coded Signal type: Incremental, SSI Cable: CAT5, CAT5e Connection systems: IDC quick connection Permitted cross-section: 0.14 mm² ... 0.34 mm² 	DOS-1208-GA01	6045001

SICK AT A GLANCE

SICK is one of the leading manufacturers of intelligent sensors and sensor solutions for industrial applications. A unique range of products and services creates the perfect basis for controlling processes securely and efficiently, protecting individuals from accidents and preventing damage to the environment.

We have extensive experience in a wide range of industries and understand their processes and requirements. With intelligent sensors, we can deliver exactly what our customers need. In application centers in Europe, Asia and North America, system solutions are tested and optimized in accordance with customer specifications. All this makes us a reliable supplier and development partner.

Comprehensive services complete our offering: SICK LifeTime Services provide support throughout the machine life cycle and ensure safety and productivity.

For us, that is “Sensor Intelligence.”

WORLDWIDE PRESENCE:

Contacts and other locations –www.sick.com