



MWS120-3EN2PM18X12

MWS120

MEASURING WHEEL ENCODERS

SICK
Sensor Intelligence.



Illustration may differ



Ordering information

Type	part no.
MWS120-3EN2PM18X12	1149116

Included in delivery: AFM60A-S4PM262144 (1), BEF-MWS120-ARM (1), BEF-MR10500APG (1)

Other models and accessories → www.sick.com/MWS120

Detailed technical data

Safety-related parameters

MTTF_D (mean time to dangerous failure)	250 years (EN ISO 13849-1) ^{1) 2)}
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¹⁾ 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.

²⁾ Value refers to the mounted encoder.

Performance

Max. resolution (number of steps per revolution x number of revolutions)	18 bit x 12 bit (262,144 x 4,096)
Measuring increment (resolution in mm/pulse)	0.0008 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	SSI
Programmable/configurable	✓

Electronics

Connection type	Cable, universal, 5 m
Power consumption	≤ 0.7 W (without load)
Supply voltage	4.5 V DC ... 32 V DC
Reverse polarity protection	✓

Mechanics

Measuring wheel circumference	500 mm ¹⁾
Measuring wheel surface	Knurled polyurethane surface
Mounting	Measuring wheel mounted at the rear
Spring arm mechanism material	
Spring element	Stainless steel
Measuring wheel core	Aluminum
Start up torque	< 0.5 Ncm (at 20 °C)
Operating torque	< 0.3 Ncm (at 20 °C)
Bearing lifetime	3.0 x 10 ⁹ revolutions
Minimum spring tension force	4 N ²⁾ ³⁾
Max. permissible working area for the spring (continuous operation)	± 10 mm
Service life of spring element	> 1.5 million cycles
Mounting position relative to the measuring object	Preferably from above, from below possible ⁴⁾
Mounted encoder	AFM60 SSI, AFM60A-S4PM262144, 1037512
Mounted mechanic	BEF-MWS120-ARM, 2118239
Attached measuring wheel	BEF-MR10500APG, 2055224

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⁾ The correct spring tensioning force for the application prevents slippage in the application without damaging the measuring surface.

³⁾ The clamping force can be set in 6 fixed increments of 4 N. 4 N corresponds to one increment.

⁴⁾ When mounted from below, the encoder weight during spring pretensioning must be taken into account.

Ambient data

EMC	According to EN 61000-6-2 and EN 61000-6-3 ¹⁾
Enclosure rating	IP67 (IEC 60529)
Operating temperature range	-30 °C ... +80 °C ²⁾
Storage temperature range	-40 °C ... +100 °C ²⁾

¹⁾ EMC according to the standards quoted is achieved if shielded cables are used.

²⁾ This value reflects the smallest temperature value of the installed products. For more information, please look at the individual data sheets.

Certificates

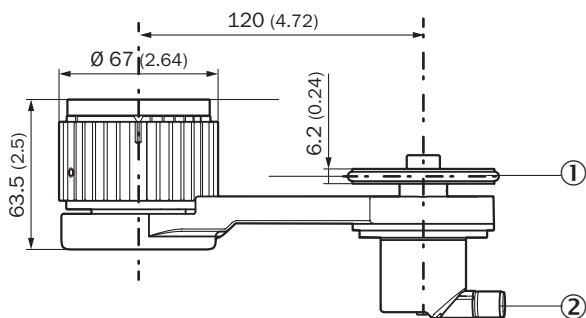
EU declaration of conformity	✓
UK declaration of conformity	✓
ACMA declaration of conformity	✓
Moroccan declaration of conformity	✓
China RoHS	✓

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

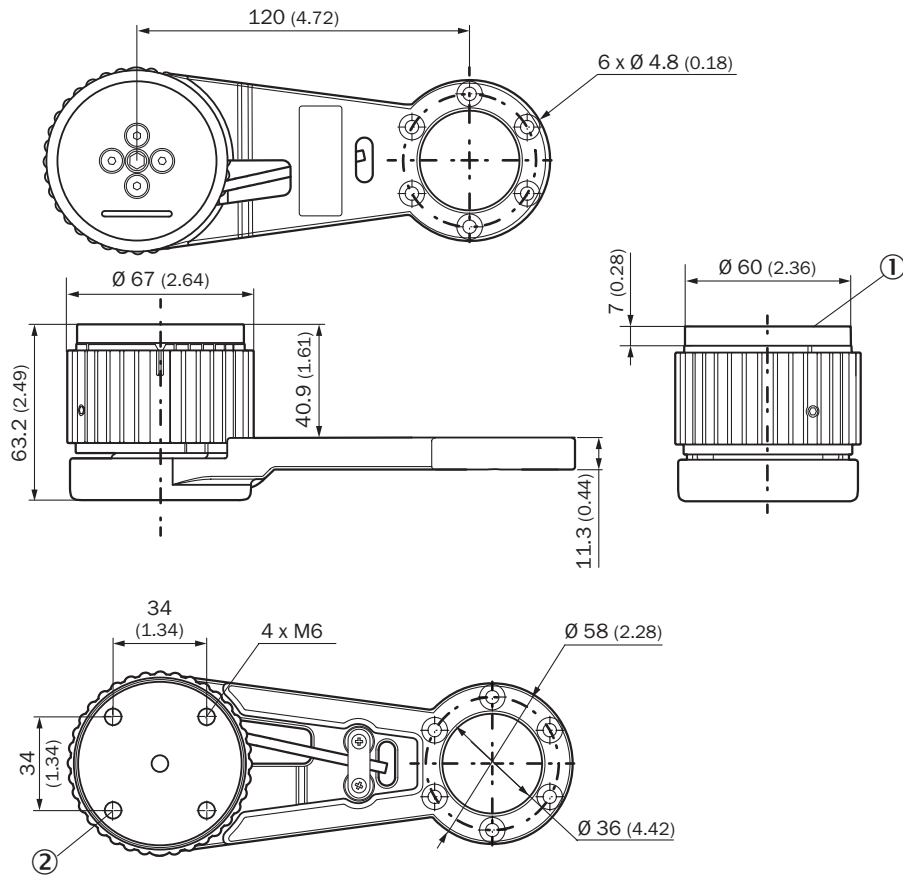
Dimensional drawing



Dimensions in mm (inch)

- ① The measuring wheel circumference and surface depend on the installed measuring wheel.
- ② Please refer to the dimensional drawings in the respective data sheet for the installed encoder.

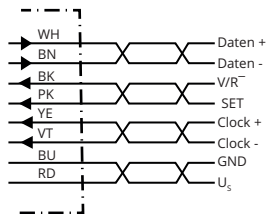
Dimensional drawing



Dimensions in mm (inch)

- ① Adapter plate
- ② Holes of the adapter plate, maximum thread depth 6 mm



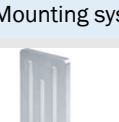
Anschlussbelegung







Recommended accessories

Other models and accessories → www.sick.com/MWS120

	Brief description	Type	part no.
measuring wheels and measuring wheel mechanics			
	<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 200 mm 	BEF-MR010020R	2055224
	<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 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 10 mm solid shaft, circumference 200 mm 	BEF-MR10200AK	4084737
	<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 200 mm 	BEF-MR10200AP	4084738
	<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 200 mm 	BEF-MR10200APG	4084740
	<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 200 mm 	BEF-MR10200APN	4084739
	<ul style="list-style-type: none"> Product segment: Measuring wheels and measuring wheel mechanics Product: Measuring wheels 	BEF-MR10500AP	4084734

	Brief description	Type	part no.
	<ul style="list-style-type: none"> Description: Spring arm for linear measurement with contact, spring contact pressure manually adjustable without tools in 6 increments of 4 N from 0 ... 24 N, can be combined with separately available encoders and measuring wheels. Items supplied: MWS120 spring arm (part number: 2118239), 3 pcs. M4 x 16 cylinder head screws for adapter or encoder mounting Suitable for: MWS120, direct mounting Ø 60 mm face mount flange encoder with mechanical shaft design "S4" = Ø 10 mm, DBS60, DFS60, AFS60 AFM60. Ø 36 mm encoders such as AHS/AHM36 can be mounted with an adapter flange (part no.: 2072298), MWS120 mounting bracket (part number: 2113284) 		
	<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
Mounting systems			
	<ul style="list-style-type: none"> Description: Mounting bracket for MWS120 measuring wheel system and SPEETEC 1D laser surface motion sensors Suitable for: MWS120, NCV50 (in conjunction with BEF-WN-NCV50 mounting bracket part no.: 2117456) 	BEF-WF-MWS-NCV	2113284

	Brief description	Type	part no.
connectors and cables			
	<ul style="list-style-type: none"> • Description: Incremental, shielded • Connection type head A: Male connector, M12, 8-pin, straight, A-coded • Signal type: Incremental • Cable: CAT5, CAT5e • Connection systems: IDC quick connection • Permitted cross-section: 0.14 mm² ... 0.34 mm² 	STE-1208-GA01	6044892
	<ul style="list-style-type: none"> • Description: HIPERFACE[®], shielded, SSI, Incremental, RS-422 • Connection type head A: Male connector, M23, 12-pin, straight, A-coded • Signal type: HIPERFACE[®], SSI, Incremental, RS-422 • Connection systems: Solder connection 	STE-2312-G	6027537
	<ul style="list-style-type: none"> • Description: HIPERFACE[®], shielded, SSI, Incremental • Connection type head A: Male connector, M23, 12-pin, straight, A-coded • Signal type: HIPERFACE[®], SSI, Incremental • Connection systems: Solder connection 	STE-2312-GX	6028548
	<ul style="list-style-type: none"> • Description: HIPERFACE[®], shielded, SSI, Incremental • Connection type head A: Male connector, M23, 12-pin, straight, A-coded • Signal type: HIPERFACE[®], SSI, Incremental • Connection systems: Solder connection 	STE-2312-G01	2077273

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.”

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