Data sheet

MWS075-12C121P100500

MWS075

MEASURING WHEEL ENCODERS

SICK
Sensor Intelligence.

Illustration may differ

Ordering information

Type	part no.
MWS075-12C121P100500	1149670

Included in delivery: DBS50E-S5AP00500 (1), BEF-MWS075-ARM (1), BEF-MR008020R (1)

Other models and accessories → www.sick.com/MWS075

Detailed technical data

Performance

Pulses per revolution	500
Resolution in pulses/mm	2.5
Measuring increment (resolution in mm/pulse)	0.4 [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

Electronics

Connection type	Cable, 8-wire, with male connector, M12, 8-pin, universal, 0.5 m
Supply voltage	4.5 V ... 5.5 V
Reverse polarity protection	✓
Short-circuit protection of the outputs	✓ [1]

[1] The short-circuit rating is only given if Us and GND are connected correctly.

Mechanics

Measuring wheel circumference	200 mm
Measuring wheel surface	O-ring NBR70 [1]

[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] Allow for self-heating of 3.3 K per 1,000 rpm when designing the operating temperature range.

[3] No permanent operation. Decreasing signal quality.

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

[5] When mounted from below, the encoder weight during spring pretensioning must be taken into account.

Encoder material	
Cable	PVC
Spring arm mechanism material	
Measuring wheel core	Aluminum
Start up torque	+ 0.9 Ncm
Operating torque	0.6 Ncm
Operating speed	6,000 min^{-1} [2]
Maximum operating speed	8,000 min^{-1} [3]
Bearing lifetime	2.0 x 10^9 revolutions
Maximum travel/deflection of spring arm	14 N with 14 mm spring travel
Recommended pretension	15 N At 10 mm deflection
Max. permissible working area for the spring (continuous operation)	± 3 mm
Recommended spring deflection	2 mm ... 13 mm
Service life of spring element	> 1.4 million cycles [4]
Mounting position relative to the measuring object	Preferably from above, from below possible [5]
Moment of inertia of the rotor	0.65 gcm^2
Mounted encoder	DBS36/50, DBS50E-S5AP00500, 1066755
Mounted mechanic	BEF-MWS075-ARM, 2145180
Attached measuring wheel	BEF-MR008020R, 2055223

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Ambient data

EMC	According to EN 61000-6-2 and EN 61000-6-3 (class A)
Enclosure rating	IP65
Operating temperature range	–20 °C ... +85 °C
Storage temperature range	–40 °C ... +100 °C, without package

Certificates

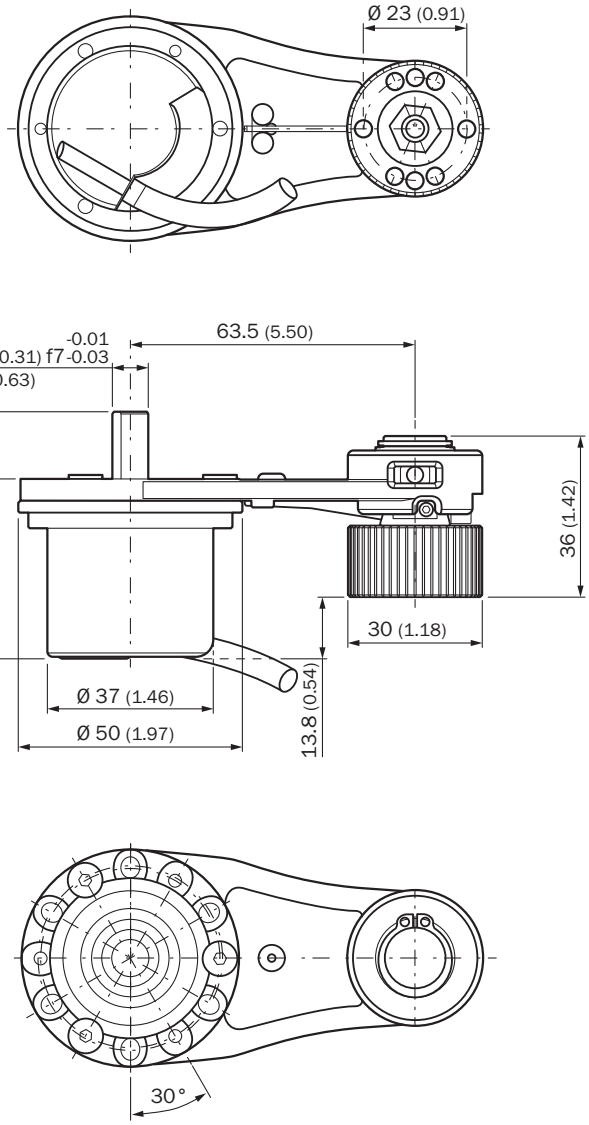
EU declaration of conformity	✓
UK declaration of conformity	✓
ACMA declaration of conformity	✓
China RoHS	✓

Classifications

ECLASS 5.0	27270501
ECLASS 5.1.4	27270501
ECLASS 6.0	27270590
ECLASS 6.2	27270590

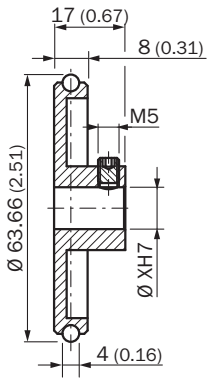
ECLASS 7.0	27270501
ECLASS 8.0	27270501
ECLASS 8.1	27270501
ECLASS 9.0	27270501
ECLASS 10.0	27270790
ECLASS 11.0	27270707
ECLASS 12.0	27270504
ETIM 5.0	EC001486
ETIM 6.0	EC001486
ETIM 7.0	EC001486
ETIM 8.0	EC001486
UNSPSC 16.0901	41112113

Dimensional drawing



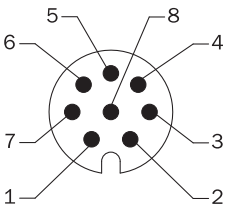
Dimensions in mm (inch)
Please refer to the dimensional drawings in the respective data sheet for the installed encoder.

Dimensional drawing



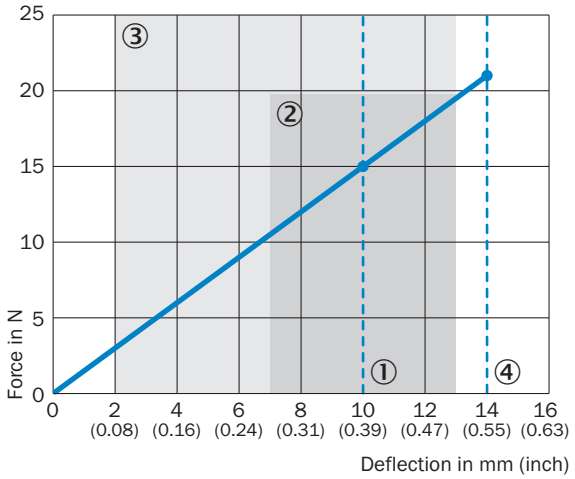
Dimensions in mm (inch)

Anschlussbelegung



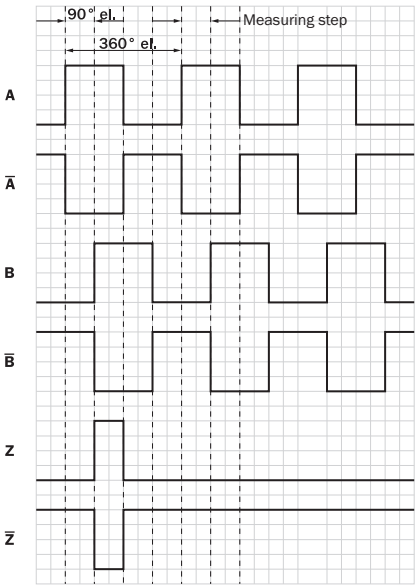
Wire colors (cable connection)	Male connector M12, 8-pin	Male connector M23, 12-pin	TTL/HTL 6-channel signal	Explanation
Brown	1	6	A-	Signal wire
White	2	5	A	Signal wire
Black	3	1	B-	Signal wire
Pink	4	8	B	Signal wire
Yellow	5	4	Z-	Signal wire
Purple	6	3	Z	Signal wire
Blue	7	10	GND	Ground connection
Red	8	12	$+U_S$	Supply voltage
-	-	9	Not assigned	Not assigned
-	-	2	Not assigned	Not assigned
-	-	11	Not assigned	Not assigned
-	-	7	Not assigned	Not assigned

Diagrams Force deflection chart with working range



① Proposed Pre-tension: 10 mm
② Allowed operating travel (continuous operation) +/- 3 mm
③ Proposed spring deflection: 2 - 13 mm
④ Maximum spring travel: 14 mm

Diagrams Signal outputs for electrical interfaces TTL and HTL



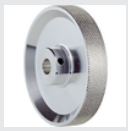
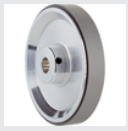
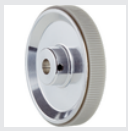
Cw with view on the encoder shaft in direction "A", compare dimensional drawing.
① Interfaces G, P, R only for channels A, B, Z.

Supply voltage	Output
4.5 V...5.5 V	TTL/RS422
7 V...30 V	TTL/RS422
7 V...30 V	HTL/Push Pull
7 V...27 V	HTL/push pull, 3 channel
4.5 V...5.5 V	Open Collector NPN, 3 channel
7 V...30 V	Open Collector NPN, 3 channel

Recommended accessories

Other models and accessories ➜ www.sick.com/MWS075

	Brief description	Type	part no.
Mounting systems			
	• **Description:** Mounting bracket for MWS075 • **Suitable for:** MWS075	BEF-WF-MWS075	2145906
	• **Description:** Mounting bracket for encoder with spigot 36 mm	BEF-WF-MRS	2084709

	Brief description	Type	part no.
measuring wheels and measuring wheel mechanics			
	• **Product segment:** Measuring wheels and measuring wheel mechanics • **Product:** Measuring wheels • **Description:** Aluminium measuring wheel with O-ring (NBR70) for 8 mm solid shaft, circumference 200 mm	BEF-MR008020R	2055223
	• **Product segment:** Measuring wheels and measuring wheel mechanics • **Product:** Measuring wheels • **Description:** Measuring wheel with O-ring (NBR70) for 8 mm solid shaft, circumference 300 mm	BEF-MR008030R	2055635
	• **Product segment:** Measuring wheels and measuring wheel mechanics • **Product:** Measuring wheels • **Description:** Aluminum measuring wheel with cross-knurled surface for 8 mm solid shaft, circumference 200 mm	BEF-MR08200AK	4084741
	• **Product segment:** Measuring wheels and measuring wheel mechanics • **Product:** Measuring wheels • **Description:** Aluminum measuring wheel with smooth polyurethane surface for 8 mm solid shaft, circumference 200 mm	BEF-MR08200AP	4084742
	• **Product segment:** Measuring wheels and measuring wheel mechanics • **Product:** Measuring wheels • **Description:** Aluminum measuring wheel with ridged polyurethane surface for 8 mm solid shaft, circumference 200 mm	BEF-MR08200APG	4084744
	• **Product segment:** Measuring wheels and measuring wheel mechanics • **Product:** Measuring wheels • **Description:** Aluminum measuring wheel with studded polyurethane surface for 8 mm solid shaft, circumference 200 mm	BEF-MR08200APN	4084743
	• **Product segment:** Measuring wheels and measuring wheel mechanics • **Product:** Measuring wheels • **Description:** Aluminum measuring wheel core, with flat, vulcanized smooth PU measurement surface, suitable for encoder with 8 mm solid shaft, circumference 200 mm +/- 0.2 mm	BEF-MR08200VU	2137369

	Brief description	Type	part no.
connectors and cables			
	• **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
	• **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
	• **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
	• **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
	• **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:** 25 m, 8-wire, PUR, halogen-free • **Connection systems:** Flying leads • **Application:** Drag chain operation, Zones with oils and lubricants	DOL-1208-G25MAC1	6067859
	• **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

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