Data sheet

MWS075-16C121K302500

MWS075

MEASURING WHEEL ENCODERS

SICK
Sensor Intelligence.

Illustration may differ

Ordering information

Type	part no.
MWS075-16C121K302500	1148021

Included in delivery: DBS50E-S5AK02500 (1), BEF-MR08200VU (1)

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

Detailed technical data

Performance

Pulses per revolution	2,500
Resolution in pulses/mm	12.5
Measuring increment (resolution in mm/pulse)	0.8 [1] [2]
Repeatability	< 0.1 mm [3]

[1] Calculation example: Measuring wheel circumference / number of steps per revolution = 200 mm / 16384 steps per revolution = 0.012 mm/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, universal, 1.5 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	Vulcanized PU [1]
Encoder material	

[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.

Cable	PVC
Spring arm mechanism material	
Measuring wheel, spring arm	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 mm at 14 N 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-S5AK02500, 1062722
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	–30 °C ... +80 °C
Storage temperature range	–40 °C ... +100 °C, without package

Certificates

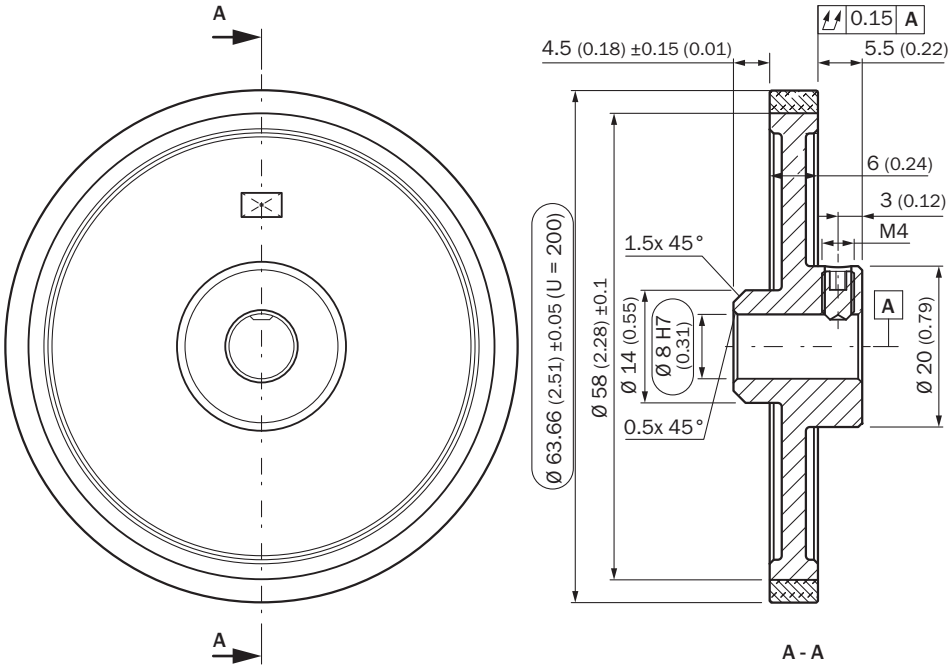
EU declaration of conformity	✓
UK declaration of conformity	✓
ACMA declaration of conformity	✓
China-RoHS	✓

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

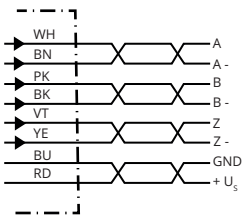
ECLASS 8.1	27270501
ECLASS 9.0	27270501
ECLASS 10.0	27270790
ECLASS 11.0	27270707
ECLASS 12.0	27270504
ETIM 5.0	EC001486
ETIM 6.0	EC001486
ETIM 7.0	EC001486
ETIM 8.0	EC001486
UNSPSC 16.0901	41112113

Dimensional drawing



Dimensions in mm (inch)

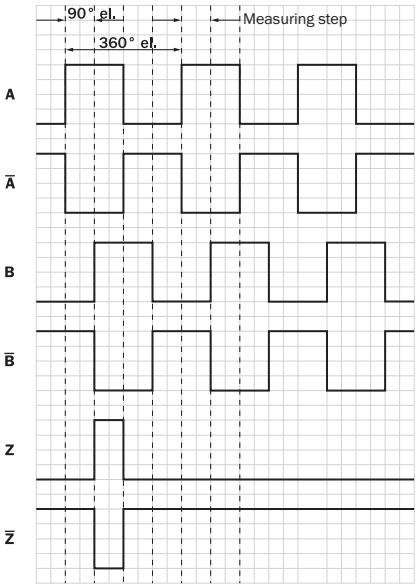
PIN assignment



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

Wire colors (cable connection)	Male connector M12, 8-pin	Male connector M23, 12-pin	TTL/HTL 6-channel signal	Explanation
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 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
4.5 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

	Brief description	Type	part no.
measuring wheels and measuring wheel mechanics			
	• **Product segment:** Measuring wheels and measuring wheel mechanics • **Product family:** 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 family:** 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 family:** 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 family:** 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 family:** 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 family:** 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 family:** 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			
	• **Connection type head A:** Male connector, M23, 12-pin, straight, A-coded • **Signal type:** HIPERFACE®, SSI, Incremental • **Description:** HIPERFACE®, shieldedSSIIncremental • **Connection systems:** Solder connection	STE-2312-G01	2077273
	• **Connection type head A:** Male connector, M23, 12-pin, straight, A-coded • **Signal type:** HIPERFACE®, SSI, Incremental • **Description:** HIPERFACE®, shieldedSSIIncremental • **Connection systems:** Solder connection	STE-2312-GX	6028548
	• **Connection type head A:** Male connector, M12, 8-pin, straight, A-coded • **Signal type:** Incremental • **Cable:** CAT5, CAT5e • **Description:** Incremental, shielded • **Connection systems:** IDC quick connection • **Permitted cross-section:** 0.14 mm² ... 0.34 mm²	STE-1208-GA01	6044892
	• **Connection type head A:** Male connector, M23, 12-pin, straight, A-coded • **Signal type:** HIPERFACE®, SSI, Incremental, RS-422 • **Description:** HIPERFACE®, shieldedSSIIncrementalRS-422 • **Connection systems:** Solder connection	STE-2312-G	6027537

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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