

DFS21A-KFP1N065536

DFS2x

INCREMENTAL ENCODERS





Ordering information

Туре	part no.
DFS21A-KFP1N065536	1067262

Other models and accessories → www.sick.com/DFS2x

Illustration may differ







Detailed technical data

Safety-related parameters

MTTF _D (mean time to dangerous failure)	330 years (EN ISO 13849-1) ¹⁾

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.

Performance

Pulses per revolution	65,536
Measuring step	± 90°, electric/pulses per revolution
Measuring step deviation	± 0.002° pulses > 10,000
Error limits	± 0.03°

Interfaces

Communication interface	Incremental		
Communication Interface detail	TTL/HTL		
Factory setting	Factory setting: output level TTL		
Number of signal channels	6-channel		
0-set function via hardware pin	✓		
0-SET function	H-active, $L = 0 - 3 \text{ V}$, $H = 4.0 - U_s \text{ V}$		
Programmable/configurable	√		
Initialization time	40 ms ¹⁾		
Output frequency	820 kHz		
Load current	30 mA		
Power consumption	0.7 W (without load)		

¹⁾ Valid positional data can be read once this time has elapsed.

Electronics

Connection type	Cable, 9-wire, radial, 5 m		
Supply voltage	4.75 30 V		
Reference signal, number	1		
Reference signal, position	180°, electric, gated with A		
Code sequence	Clockwise		
Reverse polarity protection	✓		
Short-circuit protection of the outputs	✓ ¹⁾		

 $^{^{1)}\,\}mbox{Short-circuit}$ opposite to another channel or GND permissable for maximum 30 s.

Mechanics

Mechanical design	Through hollow shaft			
Shaft diameter	1/2" Front clamp			
Flange type / stator coupling	2-point stator coupling			
Weight	$+$ 0.3 kg $^{1)}$			
Shaft material	Stainless steel 1,4305			
Flange material	Aluminum			
Housing material	Aluminum			
Start up torque	0.8 Ncm (+20 °C)			
Operating torque	0.6 Ncm (+20 °C)			
Permissible movement static	± 0.3 mm (radial) ± 0.5 mm (axial)			
Permissible movement dynamic	± 0.05 mm (radial) ± 0.1 mm (axial)			
Operating speed	≤ 6,000 min ⁻¹			
Moment of inertia of the rotor	40 gcm ²			
Bearing lifetime	3.6 x 10 ⁹ revolutions			
Angular acceleration	≤ 500,000 rad/s²			

¹⁾ Based on encoder with M12 plug.

Ambient data

EMC	According to EN 61000-6-2 and EN 61000-6-3
Enclosure rating	IP65, shaft side (IEC 60529) IP67, housing side (IEC 60529)
Permissible relative humidity	90 % (Condensation not permitted)
Operating temperature range	-30 °C +85 °C
Storage temperature range	-40 °C +100 °C, without package
Resistance to shocks	100 g, 11 ms (EN 60068-2-27)
Resistance to vibration	30 g, 10 Hz 2,000 Hz (EN 60068-2-6)

Certificates

EU declaration of conformity	✓
UK declaration of conformity	✓
ACMA declaration of conformity	1

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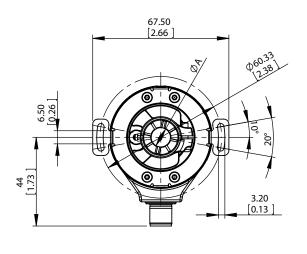
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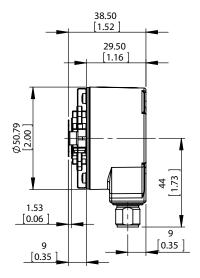
China RoHS	✓
Information according to Art. 3 of Data Act (Regulation EU 2023/2854)	✓

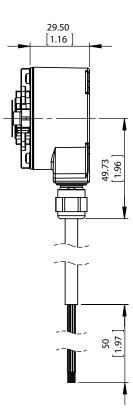
Classifications

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	27270501
ECLASS 11.0	27270501
ECLASS 12.0	27270501
ETIM 5.0	EC001486
ETIM 6.0	EC001486
ETIM 7.0	EC001486
ETIM 8.0	EC001486
UNSPSC 16.0901	41112113

Dimensional drawing DFS21 through hollow shaft



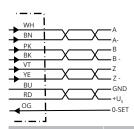




Dimensions in mm (inch)

Туре	Shaft diameterA			
DFS2x-x1xxxxxxxxx	1/4"			
DFS2x-x2xxxxxxxxDFS2x-xCxxxxxxxxx	3/8″			
DFS2x-xFxxxxxxxxx	1/2"			
DFS2x-x3xxxxxxxx	6 mm			
DFS2x-x4xxxxxxxx	10 mm			

Anschlussbelegung



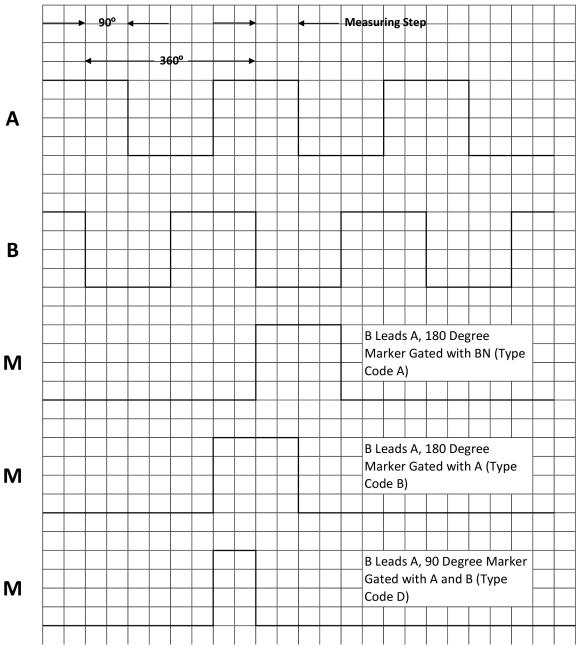
M12, 8-pin	MS, 10-pin	MS, 7-pin	MS, 6-pin	Cable, 9-wire	Signal	Description
1	Н	-	-	Brown	_A	Signal wire
2	Α	Α	E	White	Α	Signal wire
3	I	-	-	Black	_В	Signal wire
4	В	В	D	Pink	В	Signal wire

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M12, 8-pin	MS, 10-pin	MS, 7-pin	MS, 6-pin	Cable, 9-wire	Signal	Description
5	J	-	-	Yellow	-z	Signal wire
6	С	С	С	Purple	Z	Signal wire
7	F	F	А	Blue	GND	GND
8	D	D	В	Red	Us	Supply voltage
-	E	E	-	Orange	0-SET	Input signal
-	G	G	F	-	Housing	Electrically con- nected to the housing potential
-	-	-	-	Blank	Drain wire	Bare wire par- allel to the braided screen
-	-	-	-	Shielding	Shielding	Screen connect- ed to housing on encoder side

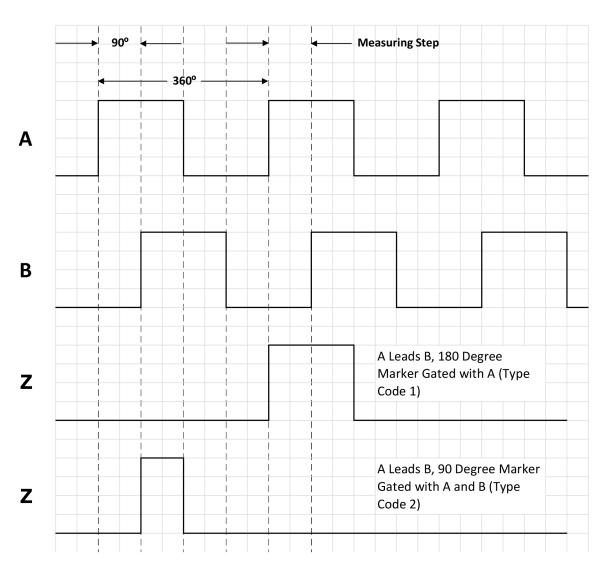
Diagrams Signal Outputs with Counter Clock-wise Counting Direction Option Selected (B leads A for clock-wise rotation). Complement signals AN, BN and ZN are not shown.



Cw with view on the encoder shaft in direction "A", compare dimensional drawing.

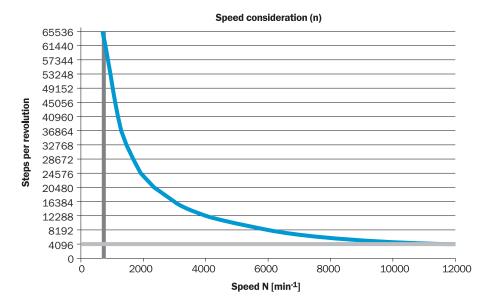
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Diagrams Signal Outputs with Clock-wise Counting Direction Option Selected (A leads B for clock-wise rotation). Complement signals AN, BN and ZN are not shown.



Cw with view on the encoder shaft in direction "A", compare dimensional drawing.

maximum revolution range



Recommended accessories

Other models and accessories → www.sick.com/DFS2x

	Brief description	Туре	part no.
programming	devices		
	 Product segment: Programming devices Product family: PGT-08-S Description: USB programming unit, for programmable SICK encoders AFS60, AFM60, DFS60, VFS60, DFV60 and wire draw encoders with programmable encoders. Not compatible with the portable SOPAS ET versions. 	PGT-08-S	1036616

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