

# DFS20A-A2BAD001000

DFS2x

**INCREMENTAL ENCODERS** 





#### Ordering information

Туре	Part no.
DFS20A-A2BAD001000	1068937

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

Illustration may differ



#### Detailed technical data

#### Performance

Pulses per revolution	1,000
Measuring step	± 90°, electric/pulses per revolution
Measuring step deviation	± 0.008° pulses 100 10,000
Error limits	± 0.03°

#### Interfaces

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

 $<sup>^{1)}</sup>$  Valid positional data can be read once this time has elapsed.

#### Electrical data

Connection type	Male connector, MS, 10-pin, radial
Supply voltage	8 30 V
Reference signal, number	1
Reference signal, position	180°, Degree Marker Gated with BN2
Reverse polarity protection	<b>√</b>

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

<sup>&</sup>lt;sup>2)</sup> 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.

Short-circuit protection of the outputs	<b>✓</b> ¹)
MTTFd: mean time to dangerous failure	330 years (EN ISO 13849-1) <sup>2)</sup>

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

#### Mechanical data

Mechanical design	Solid shaft, Square flange
Shaft diameter	3/8"
Shaft length	16 mm
Weight	+ 0.4 kg <sup>1)</sup>
Shaft material	Stainless steel 1,4305
Flange material	Aluminum
Housing material	Aluminum
Start up torque	0.5 Ncm (+20 °C)
Operating torque	0.3 Ncm (+20 °C)
Permissible shaft loading	80 N (radial) 40 N (axial)
Operating speed	≤ 9,000 min <sup>-1</sup>
Moment of inertia of the rotor	15 gcm <sup>2</sup>
Bearing lifetime	3.6 x 10 <sup>9</sup> revolutions
Angular acceleration	≤ 500,000 rad/s²

 $<sup>^{1)}</sup>$  Based on encoder with MS male connector.

#### 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)

#### Classifications

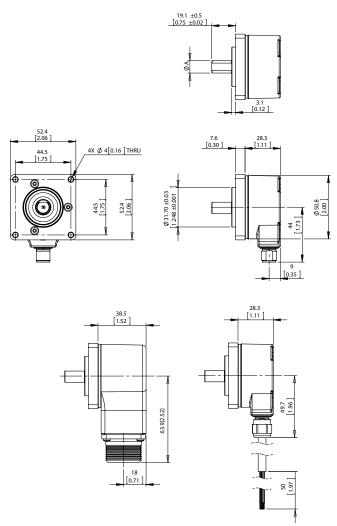
eCl@ss 5.0	27270501
eCl@ss 5.1.4	27270501
eCl@ss 6.0	27270590
eCl@ss 6.2	27270590
eCl@ss 7.0	27270501
eCl@ss 8.0	27270501
eCl@ss 8.1	27270501
eCl@ss 9.0	27270501
eCl@ss 10.0	27270501

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eCl@ss 11.0	27270501
eCl@ss 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 (Dimensions in mm (inch))

DFS20 square flange mount, radial connector outlet M12 and MS, cable outlet

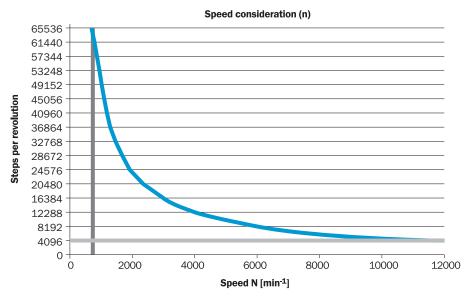


Туре	Shaft diameter A
DFS2x-x1xxxxxxxxx	1/4"
DFS2x-x2xxxxxxxx DFS2x-xCxxxxxxxxx	3/8″
DFS2x-xFxxxxxxxx	1/2"

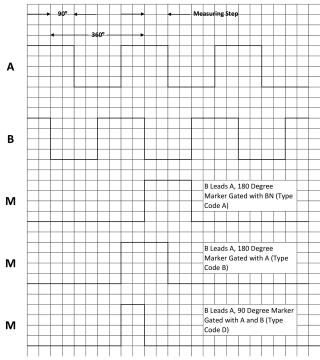
Туре	Shaft diameter A
DFS2x-x3xxxxxxxxx	6 mm
DFS2x-x4xxxxxxxxx	10 mm

#### **Diagrams**

Maximum revolution range

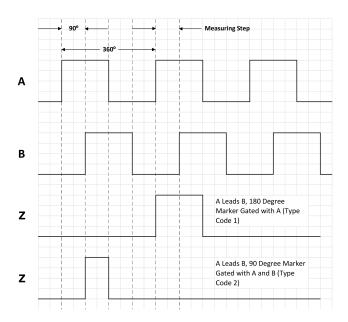


Signal Outputs with Counter Clock-wise Counting Direction Option Selected (B leads A for clock-wise rotation). Complement signals AN, BN and ZN are not shown.



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

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.

#### Recommended accessories

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

	Brief description	Туре	Part no.
Plug connectors and cables			
	Head A: female connector, MS/10, 10-pin, straight Head B: Flying leads Cable: shielded, 3 m	DOL-MS10- GO3MMA2	7102131
	Head A: female connector, MS/10, 10-pin, straight Head B: Flying leads Cable: shielded, 5 m	DOL-MS10- G05MMA2	7102132
	Head A: female connector, MS/10, 10-pin, straight Head B: Flying leads Cable: shielded, 10 m	DOL-MS10- G10MMA2	7102133
Hea Cab Hea Hea Cab Hea Hea	Head A: female connector, MS/10, 10-pin, straight Head B: Flying leads Cable: shielded, 1.5 m	DOL-MS10- G1M5MA2	7102130
	Head A: female connector, MS/10, 10-pin, straight Head B: Flying leads Cable: shielded, 20 m	DOL-MS10- G20MMA2	7102134
	Head A: female connector, MS/10, 10-pin, straight Head B: Flying leads Cable: shielded, 30 m	DOL-MS10- G30MMA2	7102135
	Head A: female connector, MS/10, 10-pin, straight Cable: unshielded	DOS-MS10-G	7102129

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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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