

# DFS20A-A2BBD003000

DFS2x

**INCREMENTAL ENCODERS** 





#### Ordering information

Туре	Part no.
DFS20A-A2BBD003000	1110791

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

Illustration may differ



#### Detailed technical data

#### Performance

Pulses per revolution	3,000
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°, electric, gated with A
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> <sup>1)</sup>
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

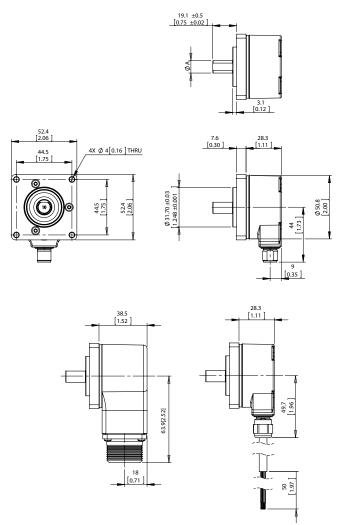
ECLASS 5.0	27270501
ECLASS 5.1.4	27270501
ECLASS 6.0	27270590
ECLASS 6.2	27270590
ECLASS 7.0	27270501
ECLASS 8.0	27270501
ECLASS 8.1	27270501
ECLASS 9.0	27270501
ECLASS 10.0	27270501

<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.

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 (Dimensions in mm (inch))

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

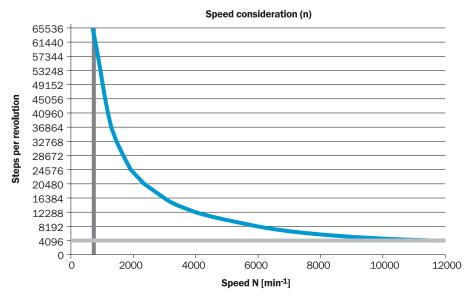


Туре	Shaft diameter A
DFS2x-x1xxxxxxxxx	1/4"
DFS2x-x2xxxxxxxx DFS2x-xCxxxxxxxxx	3/8"
DFS2x-xFxxxxxxxx	1/2"

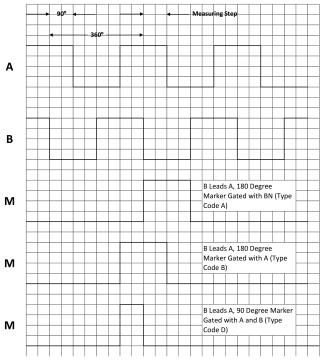
Туре	Shaft diameter A
DFS2x-x3xxxxxxxx	6 mm
DFS2x-x4xxxxxxxx	10 mm

#### **Diagrams**

Maximum revolution range

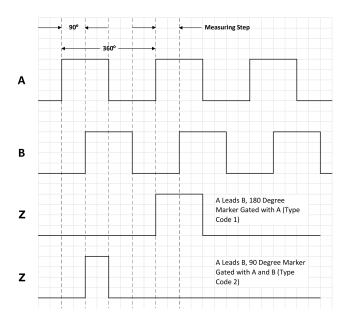


Signal Outputs with Counter Clock-wise Counting Direction Option Selected (B leads A for clock-wise rotation). Complement signals AN, BN and ZN are not shown.



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.
Others			
	<ul> <li>Connection type head A: Female connector, MS/10, 10-pin, straight</li> <li>Connection type head B: Flying leads</li> <li>Cable: 3 m, 11-wire</li> <li>Description: Shielded</li> </ul>	DOL-MS10- GO3MMA2	7102131
	<ul> <li>Connection type head A: Female connector, MS/10, 10-pin, straight</li> <li>Connection type head B: Flying leads</li> <li>Cable: 5 m, 11-wire</li> <li>Description: Shielded</li> </ul>	DOL-MS10- G05MMA2	7102132
	<ul> <li>Connection type head A: Female connector, MS/10, 10-pin, straight</li> <li>Connection type head B: Flying leads</li> <li>Cable: 1.5 m, 11-wire</li> <li>Description: Shielded</li> </ul>	DOL-MS10- G1M5MA2	7102130
The state of the s	<ul> <li>Connection type head A: Female connector, MS/10, 10-pin, straight</li> <li>Connection type head B: Flying leads</li> <li>Cable: 10 m, 11-wire</li> <li>Description: Shielded</li> </ul>	DOL-MS10- G10MMA2	7102133
	<ul> <li>Connection type head A: Female connector, MS/10, 10-pin, straight</li> <li>Connection type head B: Flying leads</li> <li>Cable: 20 m, 11-wire</li> <li>Description: Shielded</li> </ul>	DOL-MS10- G20MMA2	7102134

# DFS20A-A2BBD003000 | DFS2x

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Brief description	Туре	Part no.
<ul> <li>Connection type head A: Female connector, MS/10, 10-pin, straight</li> <li>Connection type head B: Flying leads</li> <li>Cable: 30 m, 11-wire</li> <li>Description: Shielded</li> </ul>	DOL-MS10- G30MMA2	7102135
<ul> <li>Connection type head A: Female connector, MS/10, 10-pin, straight, A-coded</li> <li>Description: Unshielded</li> </ul>	DOS-MS10-G	7102129

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## **WORLDWIDE PRESENCE:**

Contacts and other locations -www.sick.com

