



# DFS20A-A2A1C002048

DFS2x

INCREMENTAL ENCODERS

**SICK**  
Sensor Intelligence.

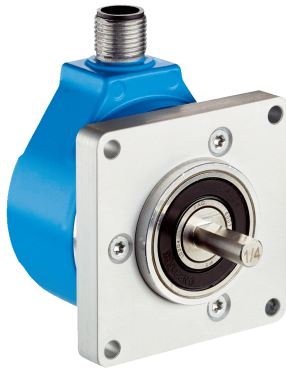


Illustration may differ



### Ordering information

Type	Part no.
DFS20A-A2A1C002048	1077880

Other models and accessories → [www.sick.com/DFS2x](http://www.sick.com/DFS2x)

### Detailed technical data

#### Performance

<b>Pulses per revolution</b>	2,048
<b>Measuring step</b>	± 90° electronically/ppr
<b>Measuring step deviation</b>	± 0.008°
<b>Error limits</b>	± 0.03°
<b>Initialization time</b>	40 ms <sup>1)</sup>

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

#### Interfaces

<b>Communication interface</b>	Incremental
<b>Communication Interface detail</b>	TTL RS-422

#### Electrical data

<b>Connection type</b>	Male connector, M12, 8-pin, radial <sup>1)</sup>
<b>Power consumption</b>	0.7 W (without load)
<b>Supply voltage</b>	4.5 ... 5.5 V
<b>Output frequency</b>	820 kHz
<b>Reference signal, number</b>	1
<b>Reference signal, position</b>	180°, electric, gated with A
<b>Code sequence</b>	Clockwise

<sup>1)</sup> Zero set possible, not for programmable devices.

#### Mechanical data

<b>Mechanical design</b>	Solid shaft, square flange 2"
<b>Shaft diameter</b>	3/8"
<b>Weight</b>	0.4 kg (maximum)
<b>Start up torque</b>	0.5 Ncm (+20 °C)

<b>Operating torque</b>	0.3 Ncm (+20 °C)
<b>Permissible shaft loading radial/axial</b>	40 N (axial) 80 N (radial)
<b>Operating speed</b>	9,000 min <sup>-1</sup>
<b>Moment of inertia of the rotor</b>	15 gcm <sup>2</sup>
<b>Bearing lifetime</b>	3.6 x 10 <sup>9</sup> revolutions
<b>Angular acceleration</b>	≤ 500,000 rad/s <sup>2</sup>

## Ambient data

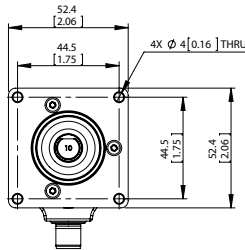
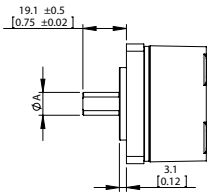
<b>EMC</b>	According to EN 61000-6-2 and EN 61000-6-3
<b>Enclosure rating</b>	IP65 (according to IEC 60529)
<b>Permissible relative humidity</b>	90 % (Condensation not permitted)
<b>Operating temperature range</b>	-30 °C ... +85 °C
<b>Storage temperature range</b>	-40 °C ... +100 °C, without package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

## Classifications

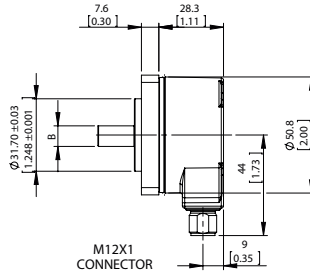
<b>ECl@ss 5.0</b>	27270501
<b>ECl@ss 5.1.4</b>	27270501
<b>ECl@ss 6.0</b>	27270590
<b>ECl@ss 6.2</b>	27270590
<b>ECl@ss 7.0</b>	27270501
<b>ECl@ss 8.0</b>	27270501
<b>ECl@ss 8.1</b>	27270501
<b>ECl@ss 9.0</b>	27270501
<b>ETIM 5.0</b>	EC001486
<b>ETIM 6.0</b>	EC001486
<b>UNSPSC 16.0901</b>	41112113

### Dimensional drawing (Dimensions in mm (inch))

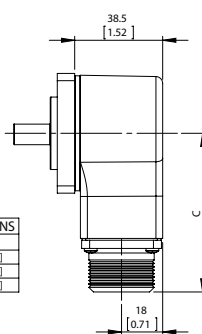
SHAFT OPTIONS		
NOMINAL	SHAFT Ø "A"	FLAT DIM "B"
1/4"	6.327/6.312/2491/2485	5.5[.22]
3/8"	9.507/9.492[.3743/.3737]	8.5[.33]
10MM	9.977/9.962[.3928/.3922]	9[.35]



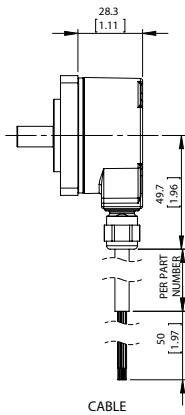
SQUARE FLANGE



M12X1 CONNECTOR



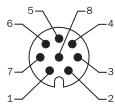
MIL CONNECTOR



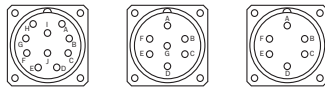
CABLE

MIL CONNECTOR OPTIONS	
TYPE	DIM "C"
6 PIN	63.9[2.52]
7 PIN	63.9[2.52]
10 PIN	69.4[2.73]

### PIN assignment



View of the M12 connector on the encoder



View of the MS connector on the encoder

## Maximum revolution range

Maximum revolution range



## Signal outputs

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.

## 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.”

## WORLDWIDE PRESENCE:

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