DFS60B-BDZZ00S98

DFS60

SICK
Sensor Intelligence.

INCREMENTAL ENCODERS

Ordering information

Illustration may differ

Type	part no.
DFS60B-BDZZ00S98	1090159

Other models and accessories ➜ www.sick.com/DFS60

Detailed technical data

Features

Special device	✓
Specialty	Customized Encoderflange Customized stator coupling Electrical interface: 4.5 V ... 32 V, SinCos 1.0 VPP (differential) M12 8-pin male connector with customized pin assignment
Standard reference device	DFS60B-BDNC01024
Additional information	Meurer internal ordering information: 5082017

Safety-related parameters

MTTF$_D$ (mean time to dangerous failure)	300 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

Sine/cosine periods per revolution	1,024
Measuring step	90 °, electric/pulses per revolution
Measuring step deviation at binary number of lines	± 0.008 °
Error limits	± 0.05 °

Interfaces

Communication interface	Incremental
Communication Interface detail	Sin/Cos [1]
Number of signal channels	6-channel
0-set function via hardware pin	✓
0-SET function	H-active, L = 0 - 3 V, H = 4,0 - U$_s$ V [2]
Initialization time	40 ms
Output frequency	≤ 200 kHz
Operating current	40 mA (without load)
Power consumption	≤ 0.7 W (without load)
Load resistance	≤ 120 Ω

[1] 1.0 V$_{SS}$ (differential).

[2] Only with devices with M23 connector in connection with electrical interfaces M, U, V and W.

Electronics

Connection type	Male connector, M12, 8-pin, radial, Customer-specific pin assignment
Supply voltage	4.5 ... 32 V
Reference signal, number	1
Reference signal, position	90°, electronically, gated with Sinus and Cosinus
Short-circuit protection of the outputs	✓ [1]

[1] Short-circuit opposite to another channel, US or GND permissable for maximum 30 s.

Mechanics

Mechanical design	Blind hollow shaft
Shaft diameter	10 mmFront clamp
Weight	+ 0.2 kg
Shaft material	Stainless steel
Flange material	Aluminum
Housing material	Aluminum die cast
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	± 0.1 mm (radial) ± 0.2 mm (axial)
Operating speed	≤ 6,000 min^{-1} [1]
Moment of inertia of the rotor	40 gcm²
Bearing lifetime	3.6 x 10^10 revolutions
Angular acceleration	≤ 500,000 rad/s²

[1] Allow for self-heating of 3.3 K per 1,000 rpm when designing the operating temperature range.

Ambient data

EMC	According to EN 61000-6-2 and EN 61000-6-3
Enclosure rating	IP67, Housing side, male connector (IEC 60529) [1] IP65, shaft side (IEC 60529)
Permissible relative humidity	90 % (Condensation not permitted)
Operating temperature range	–40 °C ... +100 °C [2] –30 °C ... +100 °C [3]
Storage temperature range	–40 °C ... +100 °C, without package
Resistance to shocks	70 g, 6 ms (EN 60068-2-27)
Resistance to vibration	30 g, 10 Hz ... 2,000 Hz (EN 60068-2-6)

[1] With mating connector fitted.
[2] Stationary position of the cable.
[3] Flexible position of the cable.

Classifications

ECLASS 5.0	27270501
ECLASS 5.1.4	27270501

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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
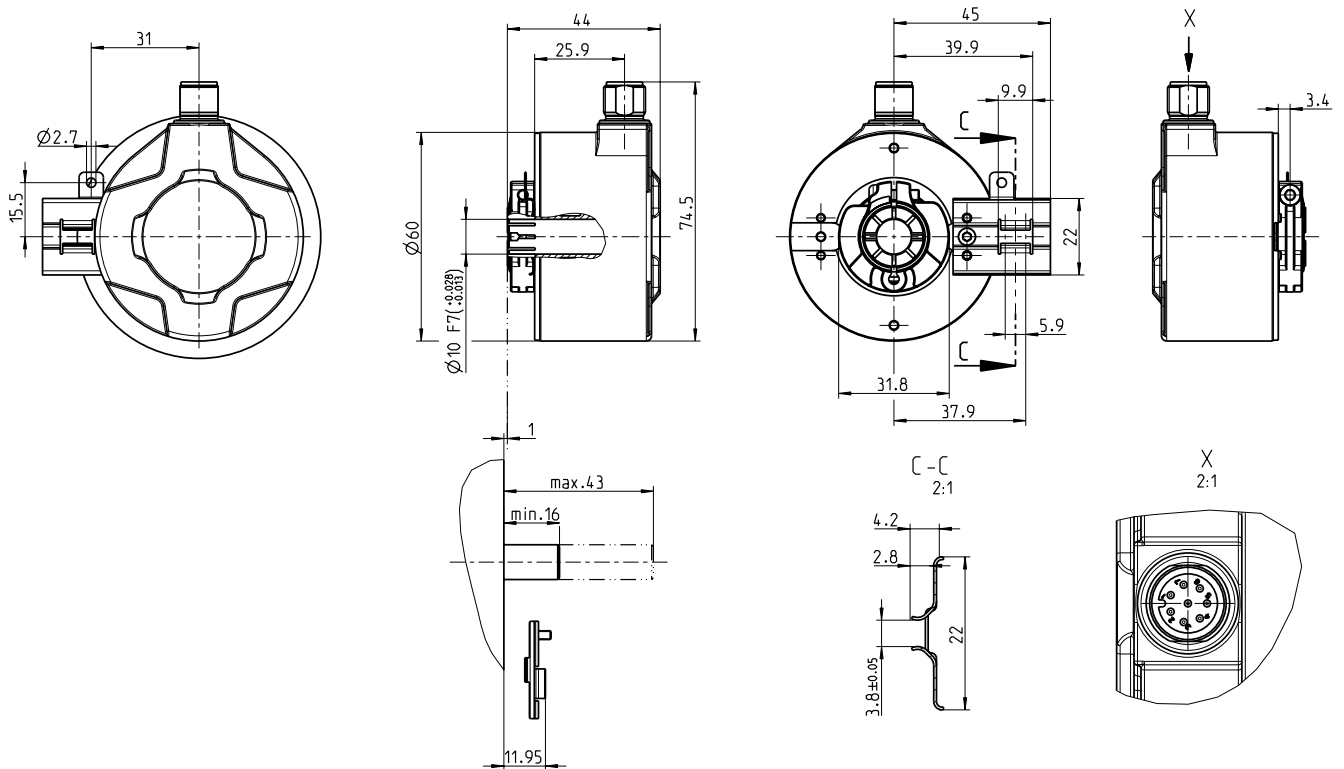
Dimensions in mm (inch)

PIN assignment

Ansicht Gerätestecker M12 an
Leitung/Gehäuse

Pin, 8-pin, M12 connector	SIN/COS 1.0 V$_{pp}$	Explanation
1	GND	Ground connection of the encoder
2	+U$_S$	Supply voltage (volt-free to housing)
3	COS+	Signal cable
4	COS-	Signal cable
5	SIN+	Signal cable
6	SIN-	Signal cable
7	N.C.	Not assigned
8	N.C.	Not assigned
Shield	Shield	Shield connected to housing on side of encoder. Connected to ground on side of control.

maximum revolution range

Speed consideration (n)

Steps per revolution vs Speed N [min^{-1}]
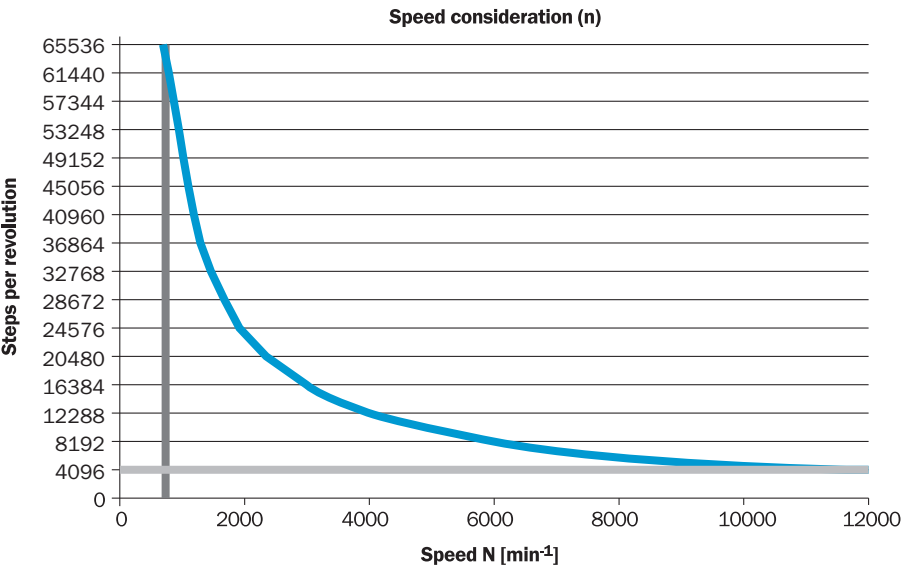
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We have extensive experience in a wide range of industries and understand their processes and requirements. With intelligent sensors, we can deliver exactly what our customers need. In application centers in Europe, Asia and North America, system solutions are tested and optimized in accordance with customer specifications. All this makes us a reliable supplier and development partner.

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