



Incremental encoders DFS60, Rotary

DFS60E-S4AL00500



Model Name > [DFS60E-S4AL00500](#)
Part No. > [1051195](#)



Illustration may differ

At a glance

- Compact installation depth
- High resolution up to 16 bits
- Optionally programmable: Output voltage, zero pulse position, zero pulse width and number of pulses
- Connection: Radial or axial cable outlet, M23 or M12 connector, axial or radial
- Electrical interfaces: 5V & 24V TTL/RS-422, 24 V HTL/push pull
- Mechanical interfaces: face mount or servo flange, blind or through hollow shaft
- Remote zero set possible

Your benefits

- Reduced storage costs and downtime due to customer-specific programming
- Variety of different mechanical and electrical interfaces enable the encoder to be optimally adjusted to fit the installation situation
- Excellent concentricity even at high speeds
- High resolution of up to 16 bits ensures precise measurements
- Permanent and safe operation due to a high enclosure rating, temperature resistance and a long bearing lifetime
- Programmability via the PGT-08 programming software and the PGT-10-S display programming tool allow the encoder to be adapted flexibly and quickly according to customer needs
- Programmable zero pulse position simplifies installation



Performance

Error limits:	$\pm 0.3^\circ$
Measuring step:	$90^\circ / \text{electronically/number of lines}$
Initialization time:	40 ms
Pulses per revolution:	500

Mechanical data

Mechanical interface:	Solid shaft, Face mount flange
Shaft diameter:	10 mm x 19 mm
Mass:	0.3 kg
Start up torque:	0.5 Ncm (20 °C)
Operating torque:	0.3 Ncm (20 °C)
Maximum operating speed:	10,000 /min
Moment of inertia of the rotor:	6.2 gcm ²
Bearing lifetime:	3.6×10^{10} revolutions

Max. angular acceleration:	500,000 rad/s ²
Permissible shaft loading radial/axial:	40 N (axial), 80 N (radial)

Electrical data

Electrical interface:	4.5 V ... 5.5 V, TTL/RS422, Cable, 8-pin, universal, 3 m
Connection type:	Cable, 8-pin, universal, 3 m ¹⁾
Maximum output frequency:	300 kHz
Reference signal, number:	1
Reference signal, position:	90 °, electronically, gated with A and B
Operating voltage range:	4.5 V ... 5.5 V
Load current max.:	30 mA
MTTFd: mean time to dangerous failure:	300 a (EN ISO 13849-1) ²⁾

¹⁾ The universal cable outlet is positioned in such a way, that it is possible to lay the cable in a radial or axial direction without kinking it ²⁾ 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.

Ambient data

EMC:	(according to EN 61000-6-2 and EN 61000-6-3)
Working temperature range:	0 °C ... 85 °C
Storage temperature range:	-40 °C ... 100 °C, without package
Resistance to shocks:	50 g (according to EN 60068-2-27)
Resistance to vibration:	20 g, 10 Hz ... 2,000 Hz (according to EN 60068-2-6)
Enclosure rating:	IP 65 (according to IEC 60529), shaft side, IP 67 (according to IEC 60529)
Permissible relative humidity:	90 % (condensation of the optical scanning not permitted)

Technical drawing of a cable reel (Fig. 1) showing three views: front, side, and top. The drawing includes dimensions in millimeters and inches.

Front View Dimensions:

- Overall width: 43.1 (1.70)
- Central hub diameter: 10 (0.39)
- Hub length: 18 (0.71)
- Hub diameter: 10 (0.39)
- Hub length: 9 (0.35)
- Hub diameter: 10 (0.39)
- Hub length: 19 ± 0.3 (0.75)
- Hub diameter: 10 (0.39)
- Hub length: 10 (0.39)
- Hub diameter: 10 (0.39)
- Hub length: 10 (0.39)
- Hub diameter: 10 (0.39)

Side View Dimensions:

- Overall height: 60 (2.36)
- Central hub diameter: 10 (0.39)
- Hub length: 18 (0.71)
- Hub diameter: 10 (0.39)
- Hub length: 9 (0.35)
- Hub diameter: 10 (0.39)
- Hub length: 19 ± 0.3 (0.75)
- Hub diameter: 10 (0.39)
- Hub length: 10 (0.39)
- Hub diameter: 10 (0.39)
- Hub length: 10 (0.39)
- Hub diameter: 10 (0.39)

Top View Dimensions:

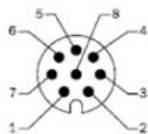
- Overall diameter: 48 ± 0.05 (1.89)
- Central hub diameter: 10 (0.39)
- Hub length: 18 (0.71)
- Hub diameter: 10 (0.39)
- Hub length: 9 (0.35)
- Hub diameter: 10 (0.39)
- Hub length: 19 ± 0.3 (0.75)
- Hub diameter: 10 (0.39)
- Hub length: 10 (0.39)
- Hub diameter: 10 (0.39)
- Hub length: 10 (0.39)
- Hub diameter: 10 (0.39)

Notes:

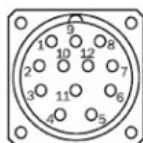
- [1] Cable diameter = 5,6 mm
- +/- 2 mm Bending radius = 30 mm

8-core cable

View of M12 device connector on encoder



View of M23 device connector on encoder



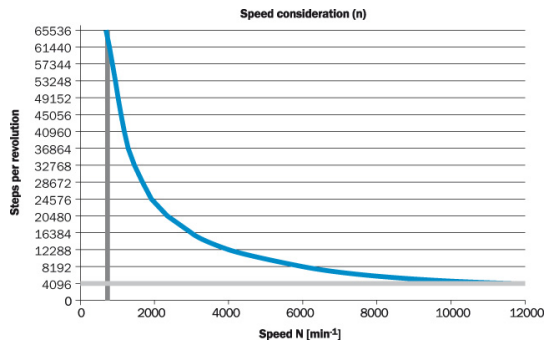
PIN, 8-pin, M12 connector	PIN, 12-pin, M23 connector	Core colors of encoders with cable outlet	TTL/HTL signal	Explanation
1	6	Brown	$\bar{A}$	Signal cable
2	5	White	A	Signal cable
3	1	Black	$\bar{B}$	Signal cable
4	8	Pink	B	Signal cable
5	4	Yellow	$\bar{Z}$	Signal cable
6	3	Lilac	Z	Signal cable
7	10	Blue	GND	Ground connection of the encoder
8	12	Red	+U _s	Supply voltage (volt-free to housing)
-	9	-	N.C.	Not assigned
-	2	-	N.C.	Not assigned
-	11	-	N.C.	Not assigned
-	7 ²⁾	-	SET	Zero pulse teach
Shield	Shield	Shield	Shield	Shield connected to housing on side of encoder. Connected to ground on side of control.

* Only at 4.5 ... 32 V, TTL/HTL programmable

The SET input serves to carry out the zero pulse teach function. If the SET input is applied to U₃ for longer than 250 ms, after it has been open for at least 1,000 ms or applied to GND, the current shaft position is assigned the zero pulse signal "Z".

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Drehzahlbetrachtung



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