



Incremental encoders DFS60, Rotary

DFS60B-S1AL02048



Model Name > DFS60B-S1AL02048
Part No. > 1058794



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:	$\pm 0.05^\circ$
Measuring step:	$90^\circ / \text{electronically/number of lines}$
Initialization time:	40 ms
Pulses per revolution:	2,048

Mechanical data

Mechanical interface:	Solid shaft, Servo flange
Shaft diameter:	6 mm x 10 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:	600 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.

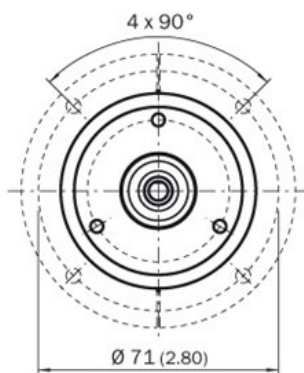
Ambient data

EMC:	(according to EN 61000-6-2 and EN 61000-6-3)
Working temperature range:	-30 °C ... 100 °C
Storage temperature range:	-40 °C ... 100 °C, without package
Resistance to shocks:	70 g (according to EN 60068-2-27)
Resistance to vibration:	30 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 mechanical part with dimensions and tolerances. The drawing includes a top view and a side view. Key dimensions and tolerances are as follows:

- Top View Dimensions:**
 - Overall width: 58 ± 0.1 (2.28)
 - Overall height: 51.5 ± 0.2 (2.03)
 - Inner hole diameter: $\varnothing 50$ (1.97) f8
 - Distance from top edge to hole center: 5.7 (0.22)
 - Distance from hole center to right edge: 43.1 (1.70)
 - Distance from hole center to feature A: 10 ± 0.3 (0.39)
 - Distance from hole center to feature B: 9.5 (0.37)
 - Distance from hole center to feature C: 6 (0.24) f7
 - Distance from hole center to feature D: 3 (0.12)
 - Distance from hole center to feature E: 4 ± 0.1 (0.16)
- Side View Dimensions:**
 - Overall height: 60 ± 0.36 (2.36)
 - Distance from bottom edge to feature A: 10 ± 0.1 (0.39)
- Surface Tolerances:**
 - Surface A: 0.1
 - Surface B: 0.05
 - Surface C: 0.1
 - Surface D: 0.1
 - Surface E: 0.1

Technical drawing of a circular part with three holes. The drawing shows a top view with three holes spaced 120 degrees apart. The outer diameter is 42 ± 0.05 mm. The holes have a diameter of 0.05 mm. The depth of the holes is 3 mm, with a note '(6-deep)' indicating a total depth of 6 mm. A feature control symbol indicates a circular runout tolerance of 0.05 mm at maximum material condition (C) for the holes.



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PIN assignment

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	$\overline{A}$	Signal cable
2	5	White	A	Signal cable
3	1	Black	$\overline{B}$	Signal cable
4	8	Pink	B	Signal cable
5	4	Yellow	$\overline{Z}$	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 ^a	-	SET	Zero pulse teach
Shield	Shield	Shield	Shield	Shield connected to housing on side of encoder. Connected to ground on side of control.

^a 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 U_s for longer than 250 ms, after it has was open for at least 1,000 ms or applied to GND, the current shaft position is assigned the zero pulse signal "Z".

Signalausgänge

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Drehzahlbetrachtung



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