

ONLINE DATA SHEET
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Incremental encoders
DFS60, Rotary

DFS60E-TBAK02048



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DFS60, Rotary

Model Name > DFS60E-TBAK02048
Part No. > 1054211



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:	± 0.3 °
Measuring step deviation:	± 0.2 °
Measuring step:	90 °/electronically/number of lines
Initialization time:	40 ms
Pulses per revolution:	2,048

Mechanical data

Mechanical interface:	Through hollow shaft
Shaft diameter:	8 mm
Mass:	0.2 kg
Start up torque:	0.8 Ncm (+20 °C)
Operating torque:	0.6 Ncm (+20 °C)
Permissible movement axial static/dynamic:	± 0.5 mm, ± 0.2 mm
Permissible movement radial static/dynamic:	± 0.3 mm, ± 0.1 mm

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Maximum operating speed:	9,000 /min
Moment of inertia of the rotor:	40 gcm²
Bearing lifetime:	3.6 x 10^10 revolutions
Max. angular acceleration:	500,000 rad/s²
Shaft material:	Metal

Electrical data

Electrical interface:	4.5 V ... 5.5 V, TTL/RS422, Cable, 8-pin, universal, 1.5 m
Connection type:	Cable, 8-wire, universal, 1.5 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)]

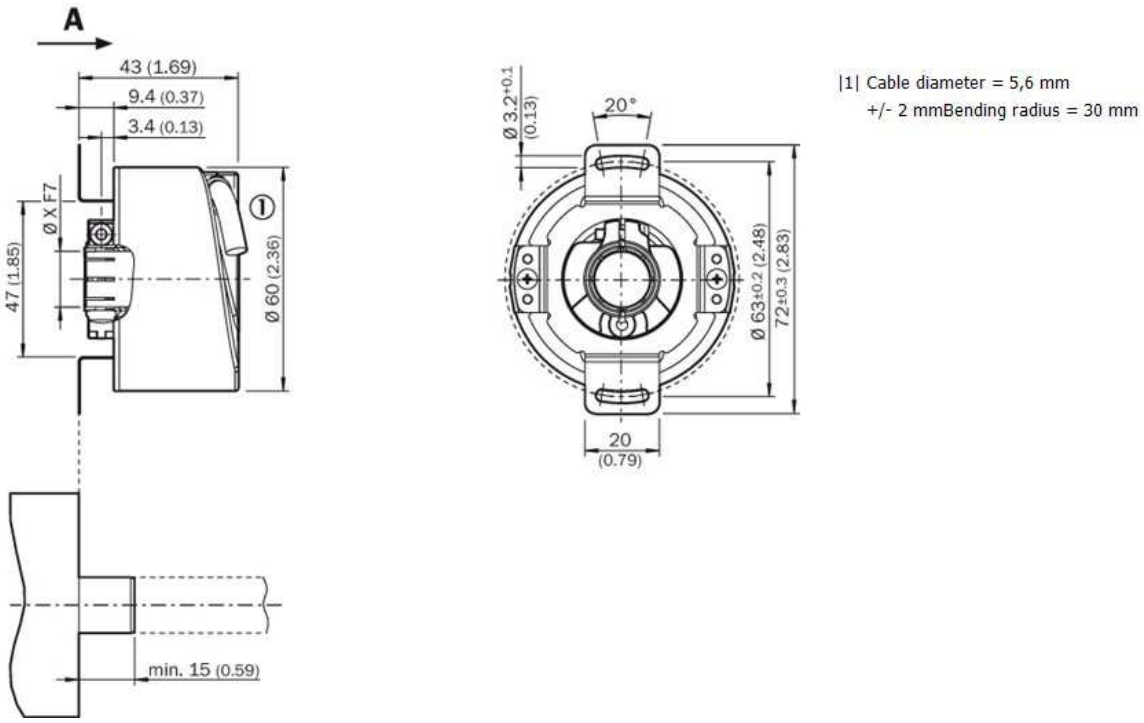
[1)] The universal cable outlet is positioned in such a way, that it is possible to lay the cable in a radial or axial direction without kinking it [2)] This product is a standard product and does not constitute a safety component as defined in the Machinery Directive. Calculation based on nominal load 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), housing side
Permissible relative humidity:	90 % (condensation of the optical scanning not permitted)

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Dimensional drawing

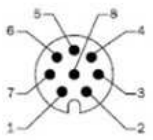


|1| Cable diameter = 5,6 mm +/- 2 mmBending radius = 30 mm

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 [1]	–	SET	Zero pulse teach
Shield	Shield	Shield	Shield	Shield connected to housing on side of encoder. Connected to ground on side of control.

[1] Only at 4.5 ... 32 V, TTL/HTL programmable

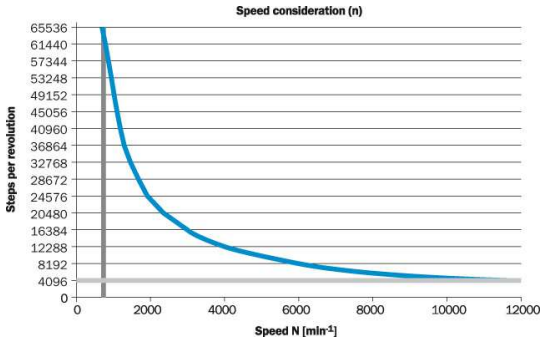
The SET input serves to carry out the zero pulse teach function. If the SET input is applied to U_s for longer than 250 ms, after it has was open for at least 1,000 ms or applied to GND, the current shaft position is assigned the zero pulse signal "Z".

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Signalausgänge

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Drehzahlbetrachtung



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