

DFS60B-TGPC10000

DFS60

INCREMENTAL ENCODERS





Ordering information

Туре	part no.
DFS60B-TGPC10000	1036918

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

Illustration may differ



Detailed technical data

Safety-related parameters

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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

Pulses per revolution	10,000 ¹⁾
Measuring step	90°, electric/pulses per revolution
Measuring step deviation at non binary number of lines	± 0.01°
Error limits	± 0.05°

 $^{^{1)}}$ See maximum revolution range.

Interfaces

Communication interface	Incremental
Communication Interface detail	TTL/HTL
Factory setting	Factory setting: output level TTL
Number of signal channels	6-channel
Programmable/configurable	√
Initialization time	32 ms, 30 ms ¹⁾
Output frequency	≤ 600 kHz
Load current	≤ 30 mA
Power consumption	≤ 0.7 W (without load)

¹⁾ With mechanical zero pulse width.

Electronics

Connection type	Male connector, M12, 8-pin, radial
Supply voltage	4.5 32 V
Reference signal, number	1
Reference signal, position	90°, electric, logically gated with A and B
Reverse polarity protection	✓
Short-circuit protection of the outputs	✓ ^{1) 2)}

 $^{^{1)}}$ Programming TTL with \geq 5.5 V: short-circuit opposite to another channel or GND permissable for maximum 30 s.

Mechanics

Mechanical design	Through hollow shaft
Shaft diameter	14 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 gcm ²
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

ЕМС	According to EN 61000-6-2 and EN 61000-6-3
Enclosure rating	IP65, 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.

Certificates

EU declaration of conformity	✓
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 $^{^{2)}}$ Programming HTL or TTL with < 5.5 V: short-circuit opposite to another channel, US or GND permissable for maximum 30 s.

 $^{^{2)}}$ Stationary position of the cable.

 $^{^{}m 3)}$ Flexible position of the cable.

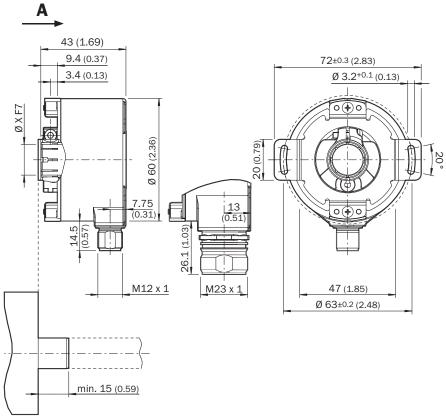
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UK declaration of conformity	✓
ACMA declaration of conformity	✓
Moroccan declaration of conformity	✓
China-RoHS	✓
cULus certificate	✓
Information according to Art. 3 of Data Act (Regulation EU 2023/2854)	✓

Classifications

ECLASS 5.0	27270501
ECLASS 5.1.4	27270501
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

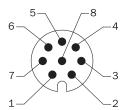


Dimensions in mm (inch)

① cable diameter = 5.6 mm + /- 0.2 mm bend radius = 30 mm

TypeThrough hollow shaft	Shaft diameter XF7	Shaft diameter xj7
DFS60x-TAxxxxxxxx	6 mm	Provided by customer
DFS60x-TBxxxxxxxxx	8 mm	
DFS60x-TCxxxxxxxxx	3/8″	
DFS60x-TDxxxxxxxxx	10 mm	
DFS60x-TExxxxxxxx	12 mm	
DFS60x-TFxxxxxxxxx	1/2"	
DFS60x-TGxxxxxxxx	14 mm	
DFS60x-THxxxxxxxxx	15 mm	
DFS60x-TJxxxxxxxxx	5/8″	

PIN assignment

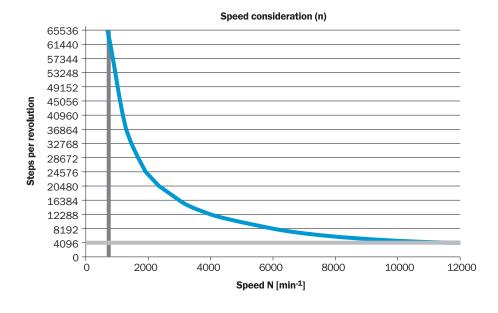


view of M12 male device connector on encoder

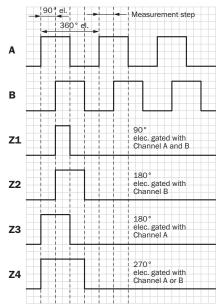
PINMale connector M12, 8-pin	PINMale connector M23, 12-pin	Wire colors (ca- ble connection)	TTL/HTL signal	Sin/Cos 1.0 V _{PP}	Explanation
1	6	Brown	_A	COS-	Signal wire
2	5	White	А	COS+	Signal wire
3	1	Black	_B	SIN-	Signal wire
4	8	Pink	В	SIN+	Signal wire
5	4	Yellow	_Z	_Z	Signal wire
6	3	Purple	Z	Z	Signal wire
7	10	Blue	GND	GND	Ground connection
8	12	Red	+U _S	+U _S	Supply voltage
-	9	-	N.c.	N.c.	Not assigned
-	2	-	N.c.	N.c.	Not assigned
-	11	-	N.c.	N.c.	Not assigned
-	7 1)	Orange	0-SET 1)	N.c.	Set zero pulse ¹⁾
Screen	Screen	Screen	Screen	Screen	Screen connect- ed to housing on encoder side. Con- nected to ground on control side.

¹⁾For electrical interfaces only: M, U, V, W with 0-SET function on PIN 7 on M23 plug. The 0-SET input is used to set the zero pulse to the current shaft position. If the 0-SET input is applied to US for longer than 250 ms after it has previously been open or applied to GND for at least 1,000 ms, the current shaft position is assigned zero pulse signal "Z".

maximum revolution range



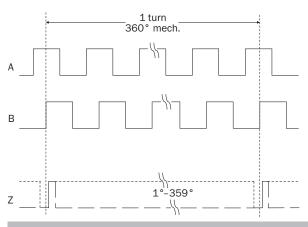
Diagrams Electrical zero pulse width can be configured to 90° , 180° , or 270° . Width of the zero pulse in relation to a pulse period.



Cw with view on the encoder shaft in direction "A", compare dimensional drawing.

Supply voltage	Output	
4,5 V 32 V	TTL/HTL programmable	

Diagrams Mechanical zero pulse width 1° to 359° programmable. Width of the zero pulse in relation to a mechanical revolution of the shaft.



Supply voltage	Output	
4,5 V 32 V	TTL/HTL programmable	

Recommended accessories

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

	Brief description	Туре	part no.
Mounting systems			
	Product family: Stator couplings Description: Standard stator coupling	BEF-DS00XFX	2056812
	 Description: Clamping ring for metal hollow shaft Material: Steel Details: Metal 	BEF-KR-M	2064709
programming devices			
V A	 Product segment: Programming devices Product family: PGT-10 Pro Description: Programming unit display for programmable SICK DFS60, DFV60, AFS/AFM60, AHS/AHM36 encoders, and wire draw encoder with DFS60, AFS/AFM60 and AHS/AHM36. Compact dimensions, low weight, and intuitive operation. Items supplied: 1 x PGT-10-Pro stand-alone programming tool,4 x alkaline type batteries, 1.5 V Mignon (AA) 	PGT-10-Pro	1072254
	 Product segment: Programming devices Product family: PGT-08-S Description: USB programming unit, for programmable SICK encoders AFS60, AFM60, DFS60, VFS60, DFV60 and wire draw encoders with programmable encoders. Not compatible with the portable SOPAS ET versions. 	PGT-08-S	1036616

	Brief description	Туре	part no.
connectors an	d cables		
C. P.	Connection type head A: Female connector, M12, 8-pin, straight Connection type head B: Male connector, D-Sub, 9-pin, straight Signal type: Incremental Cable: 0.5 m, 8-wire Description: Incremental, shielded Note: Programming adapter cable for programming tool PGT-10-Pro and PGT-08-S	DSL-2D08-G0M5AC3	2046579
	 Connection type head A: Female connector, M12, 8-pin, straight Connection type head B: Flying leads Signal type: Incremental, SSI Cable: 2 m, 8-wire, PUR, halogen-free Description: Incremental, shielded, SSI Connection systems: Flying leads 	DOL-1208-G02MAC1	6032866
	 Connection type head A: Female connector, M12, 8-pin, straight Connection type head B: Flying leads Signal type: Incremental, SSI Cable: 5 m, 8-wire, PUR, halogen-free Description: Incremental, shielded, SSI Connection systems: Flying leads 	DOL-1208-G05MAC1	6032867
	 Connection type head A: Female connector, M12, 8-pin, straight Connection type head B: Flying leads Signal type: Incremental, SSI Cable: 10 m, 8-wire, PUR, halogen-free Description: Incremental, shielded, SSI Connection systems: Flying leads 	DOL-1208-G10MAC1	6032868
	 Connection type head A: Female connector, M12, 8-pin, straight Connection type head B: Flying leads Signal type: Incremental, SSI Cable: 20 m, 8-wire, PUR, halogen-free Description: Incremental, shielded, SSI Connection systems: Flying leads 	DOL-1208-G20MAC1	6032869
	 Connection type head A: Female connector, M12, 8-pin, straight, A-coded Signal type: Incremental, SSI Cable: CAT5, CAT5e Description: Incremental, shieldedSSI Connection systems: IDC quick connection Permitted cross-section: 0.14 mm² 0.34 mm² 	DOS-1208-GA01	6045001
	Connection type head A: Female connector, M12, 8-pin, angled Connection type head B: Flying leads Signal type: HIPERFACE®, Incremental Cable: 2 m, 8-wire, PUR, halogen-free Description: HIPERFACE®, shielded, Incremental	DOL-1208-W02MAC1	6037724
	Connection type head A: Female connector, M12, 8-pin, angled Connection type head B: Flying leads Signal type: HIPERFACE®, Incremental Cable: 5 m, 8-wire, PUR, halogen-free Description: HIPERFACE®, shielded, Incremental	DOL-1208-W05MAC1	6037725
	Connection type head A: Female connector, M12, 8-pin, angled Connection type head B: Flying leads Signal type: HIPERFACE®, Incremental Cable: 10 m, 8-wire, PUR, halogen-free Description: HIPERFACE®, shielded, Incremental	DOL-1208-W10MAC1	6037726
	Connection type head A: Female connector, M12, 8-pin, angled Connection type head B: Flying leads Signal type: HIPERFACE®, Incremental Cable: 20 m, 8-wire, PUR Description: HIPERFACE®, shielded, Incremental	DOL-1208-W20MAC1	6037727
	 Connection type head A: Female connector, M12, 8-pin, angled Connection type head B: Flying leads Cable: 2 m, 8-wire, PVC Description: Shielded Connection systems: Flying leads 	DOL-1208-W02MA	6020992
1/8	 Connection type head A: Female connector, M12, 8-pin, angled Connection type head B: Flying leads Signal type: Sensor/actuator cable Cable: 2 m, 8-wire, PUR, halogen-free 	DOL-1208- W02MAS01	6029224

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	Brief description	Туре	part no.
	Description: Sensor/actuator cable, shielded Connection systems: Flying leads		
>	 Connection type head A: Female connector, M12, 8-pin, angled Connection type head B: Flying leads Cable: 2 m, 8-wire, PUR, halogen-free Description: Unshielded 	DOL-1208-W02MC	6035623
	 Connection type head A: Female connector, M12, 8-pin, angled Connection type head B: Flying leads Cable: 5 m, 8-wire, PVC Description: Shielded Connection systems: Flying leads 	DOL-1208-W05MA	6021033
3	 Connection type head A: Female connector, M12, 8-pin, angled Connection type head B: Flying leads Cable: 5 m, 8-wire, PUR Description: Unshielded 	DOL-1208-W05MC	6035624
3	 Connection type head A: Female connector, M12, 8-pin, angled Connection type head B: Flying leads Cable: 10 m, 8-wire, PUR, halogen-free Description: Unshielded 	DOL-1208-W10MC	6035625

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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.

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For us, that is "Sensor Intelligence."

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