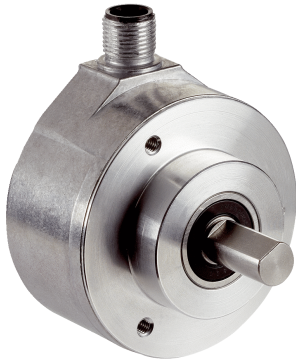


DFS60

High-resolution, programmable encoder for sophisticated applications

INCREMENTAL ENCODERS

SICK
Sensor Intelligence.



Technical data overview

Pulses per revolution	0 ... 65,536
Sine/cosine periods per revolution	1,024
Mechanical design	Solid shaft, Servo flange Solid shaft, face mount flange Blind hollow shaft Through hollow shaft
Shaft diameter	6 mm 10 mm 8 mm 3/8" 12 mm 1/2" 14 mm 15 mm 5/8"
Connection type	Male connector, M23, 12-pin, radial Male connector, M23, 12-pin, axial Male connector, M12, 8-pin, radial Male connector, M12, 8-pin, axial Cable, 8-wire, universal
Communication interface	Incremental
Communication Interface detail	TTL / RS-422 HTL / Push pull Sin/Cos TTL / HTL
Supply voltage	4.5 ... 5.5 V 10 ... 32 V 4.5 ... 32 V
Enclosure rating	IP67 IP65 (depending on type)
Programmable/configurable	- / ✓ (depending on type)
Output frequency	≤ 600 kHz ≤ 300 kHz ≤ 820 kHz ≤ 200 kHz (depending on type)
Operating temperature range	-40 °C ... +100 °C ¹⁾ -30 °C ... +100 °C ²⁾ 0 °C ... +85 °C -40 °C ... +100 °C ²⁾

¹⁾ Stationary position of the cable.

²⁾ Flexible position of the cable.

Product description

The DFS60 is a high-resolution incremental encoder with a diameter of 60mm. It offers a wide variety of mechanical and electric interfaces and can also be programmed by the customer if required. Programming of the output signal and zero pulse is a unique feature for the market. The high enclosure rating, wide temperature range and large ball bearing distance ensure extreme robustness, making the DFS60 the ideal encoder for industrial applications in harsh environments

At a glance

- Short installation depth
- High resolution of up to 16 bits
- Optional programming: Output voltage, zero pulse position, zero impulse width, pulse number and counting direction
- Connection: Radial or axial cable connection, M23 or M12 male connector, axial or radial.
- Electrical interfaces: 5 V & 24 V TTL/RS-422, 24 V HTL/push pull, 5 V sin/cos 1 Vss

- Mechanical interfaces: Face mount flange or servo flange, blind hollow shaft 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-Pro display programming tool allow the encoder to be adapted flexibly and quickly according to customer needs
- Programmable zero pulse position simplifies installation

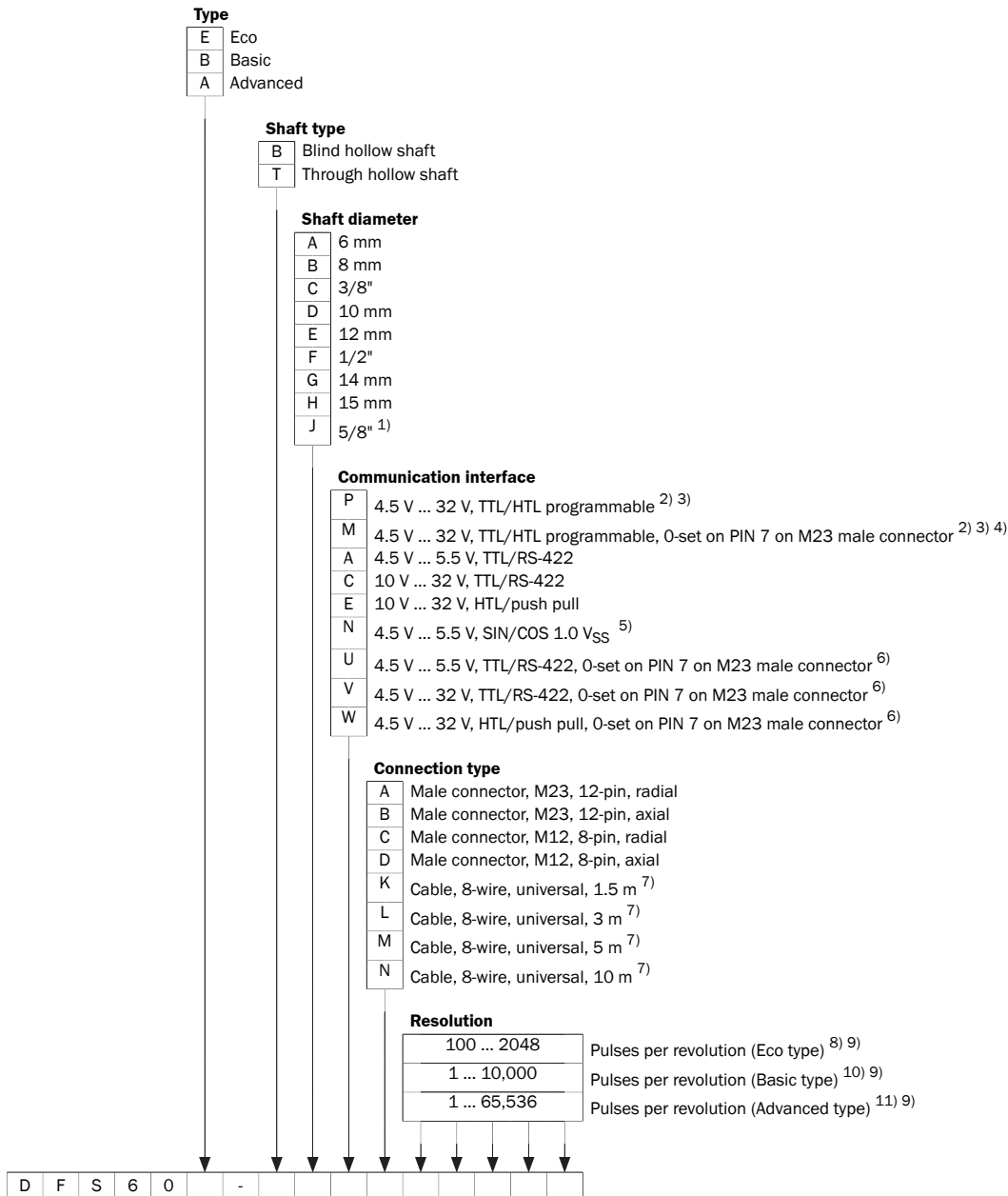
Fields of application

- Applications in factory and logistics automation for measurement of position, speed and distance, for example in print machines, textile machines, wood processing, packaging machines

Type code

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

Hollow shaft



1) Suitable for supporting collets, see "accessories".
 2) See below for programmable features.
 3) Factory setting: TTL output level.
 4) Only for A and B connection type.
 5) Only for type B and 1,024 periods per revolution.
 6) Only for B and A type and A and B connection type.
 7) The universal cable outlet is positioned so that it is possible to lay it without bends in a radial and axial direction.
 8) See "Pulses per revolution" table.
 9) Other pulses upon request.
 10) See "Pulses per revolution" table. Programmable (P and M communication interface): 1 ... 10,000, set to 10,000 pulses per revolution at the factory.

¹¹⁾ See "Pulses per revolution" table. Programmable (P and M communication interface): 1 ... 65,536, set to 65,536 pulses per revolution at the factory.

The following features can be programmed (only for programmable encoders):

- Pulses per revolution of 1 ... 65,536 using PGT-08-S or PGT-10-Pro programming tools
- Electrical zero pulse width 90°, 180°, 270° using PGT-08-S or PGT-10-Pro programming tools
- Mechanical zero pulse width 1° ... 359° using PGT-10-Pro programming tool
- Level of output voltage TTL or HTL using PGT-08-S or PGT-10-Pro programming tools
- CW/CCW counting direction using PGT -08-S or PGT -10-Pro programming tools
- 0-SET function using PGT-08-S or PGT-10-Pro programming tools
- 0-SET function via PIN 7 of the M23 male connector by applying US for at least 250 ms

Pulses per revolution (other pulses upon request)

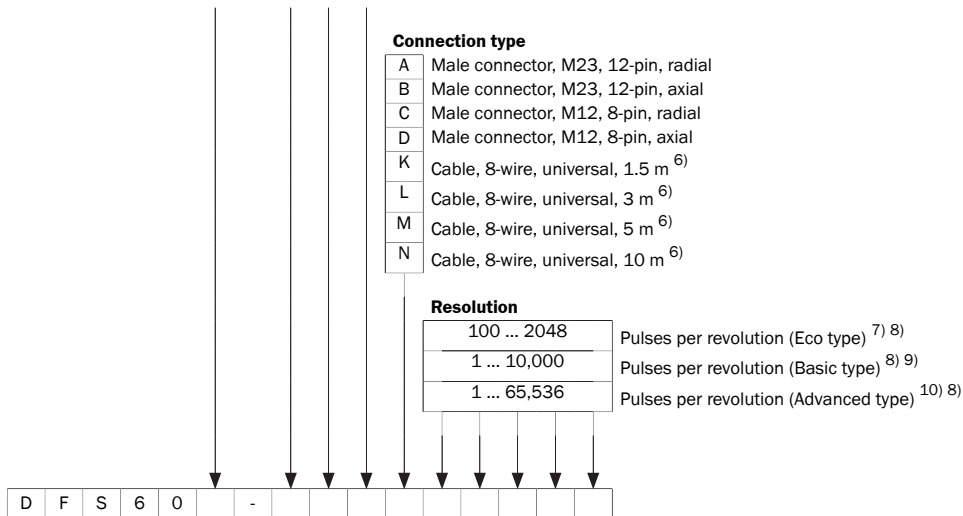
	DFS60E	DFS60B	DFS60A
Non-programmable	00100	00100	00100
	00200	00200	00200
	00250	00250	00250
	00256	00300	00300
	00314	00314	00314
	00360	00360	00360
	00500	00500	00500
	00512	00512	00512
	00720	00720	00720
	01000	01000	01000
	01024	01024	01024
	01250	01250	01250
	02000	02000	02000
	02048	02048	02048
	-	02500	02500
	-	03600	03600
	-	04000	04000
	-	04096	04096
	-	05000	05000
	-	07200	07200
-	08192	08192	
-	10000	10000	
-	-	16384	
-	-	32768	
-	-	65536	
Programmable	-	1 ... 10,000	1 ... 65,536

Solid shaft

Type	
E	Eco
B	Basic
A	Advanced

Mechanical design		
S	4	Solid shaft, face mount flange, 10 mm x 19 mm
S	1	Solid shaft, servo flange, 6 mm x 10 mm

Communication interface	
P	4.5 V ... 32 V, TTL/HTL programmable ^{1) 2)}
M	4.5 V ... 32 V, TTL/HTL programmable, 0-set on PIN 7 on M23 male connector ^{1) 2) 3)}
A	4.5 V ... 5.5 V, TTL/RS-422
C	10 V ... 32 V, TTL/RS-422
E	10 V ... 32 V, HTL/push pull
N	4.5 V ... 5.5 V, SIN/COS 1.0 V _{SS} ⁴⁾
U	4.5 V ... 5.5 V, TTL/RS-422, 0-set on PIN 7 on M23 male connector ⁵⁾
V	4.5 V ... 32 V, TTL/RS-422, 0-set on PIN 7 on M23 male connector ⁵⁾
W	4.5 V ... 32 V, HTL/push pull, 0-set on PIN 7 on M23 male connector ⁵⁾



- 1) See below for programmable features.
- 2) Factory setting: TTL output level.
- 3) Only for A and B connection type.
- 4) Only for type B and 1024 periods per revolution.
- 5) Only for B and A type and A and B connection type.
- 6) The universal cable outlet is positioned so that it is possible to lay it without bends in a radial and axial direction.
- 7) See "Pulses per revolution" table.
- 8) Other pulses upon request.
- 9) See "Pulses per revolution" table. Programmable (P and M communication interface): 1 ... 10,000, set to 10,000 pulses per revolution at the factory.
- 10) See "Pulses per revolution" table. Programmable (P and M communication interface): 1 ... 65536, set to 65536 pulses per revolution at the factory.

The following features can be programmed (only for programmable encoders):

- Pulses per revolution of 1 ... 65536 using PGT-08-S or PGT-10-Pro programming tools
- Electrical zero pulse width 90°, 180°, 270° using PGT-08-S or PGT-10-Pro programming tools
- Mechanical zero pulse width 1° ... 359° using PGT-10-Pro programming tool
- Level of output voltage TTL or HTL using PGT-08-S or PGT-10-Pro programming tools
- CW/CCW counting direction using PGT -08-S or PGT -10-Pro programming tools
- 0-SET function using PGT-08-S or PGT-10-Pro programming tools
- 0-SET function via PIN 7 of the M23 male connector by applying US for at least 250 ms

Pulses per revolution (other pulses upon request)

	DFS60E	DFS60B	DFS60A
Non-programmable	00100	00100	00100
	00200	00200	00200
	00250	00250	00250
	00256	00300	00300
	00314	00314	00314
	00360	00360	00360
	00500	00500	00500
	00512	00512	00512
	00720	00720	00720
	01000	01000	01000
	01024	01024	01024
	01250	01250	01250
	02000	02000	02000
	02048	02048	02048
	-	02500	02500
	-	03600	03600
-	04000	04000	
-	04096	04096	

	DFS60E	DFS60B	DFS60A
	-	05000	05000
	-	07200	07200
	-	08192	08192
	-	10000	10000
	-	-	16384
	-	-	32768
	-	-	65536
Programmable	-	1 ... 10,000	1 ... 65,536

SICK AT A GLANCE

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.

Comprehensive services complete our offering: SICK LifeTime Services provide support throughout the machine life cycle and ensure safety and productivity.

For us, that is “Sensor Intelligence.”

WORLDWIDE PRESENCE:

Contacts and other locations –www.sick.com