

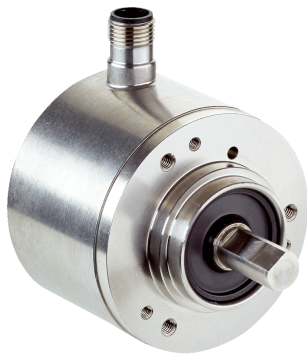


DFS60 Inox

High resolution, programmable encoders for demanding 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 Solid shaft, Square flange Blind hollow shaft
Shaft diameter	6 mm 10 mm 8 mm 3/8" 12 mm 15 mm 1/2" 14 mm 5/8"
Connection type	Male connector, M12, 8-pin, radial Cable, 8-wire, radial Male connector, M12, 12-pin, radial Cable, 12-wire, radial
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
Programmable/configurable	- / ✓ (depending on type)
Output frequency	≤ 820 kHz ≤ 200 kHz (depending on type)
Operating temperature range	-40 °C ... +100 °C ¹⁾ -30 °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 60 mm. It offers lots of mechanical and electrical interfaces and a housing made from aluminum or stainless steel. You can program the encoder yourself, if you want. A key feature is the range of options for programming the electrical parameters, e.g., the output signal level, the number of pulses per revolution, or the zero pulse width. This makes the DFS60 highly suitable for demanding applications as well. The high enclosure rating, wide temperature range, and wide-set ball bearings ensure a high level of ruggedness and make the DFS60 the ideal encoder for industrial applications with harsh ambient conditions.

At a glance

- Pulses per revolution: Up to 65,536 (16 bit)
- Housing diameter: 60 mm
- Solid shaft, blind hollow shaft, through hollow shaft
- Enclosure rating: IP65/IP67
- Communication interfaces: TTL RS 422, HTL Push Pull, Sin/Cos
- Connection type: M12 or M23 male connector, or universal cable
- Programmable, compact installation depth, remote zero set possible

Your benefits

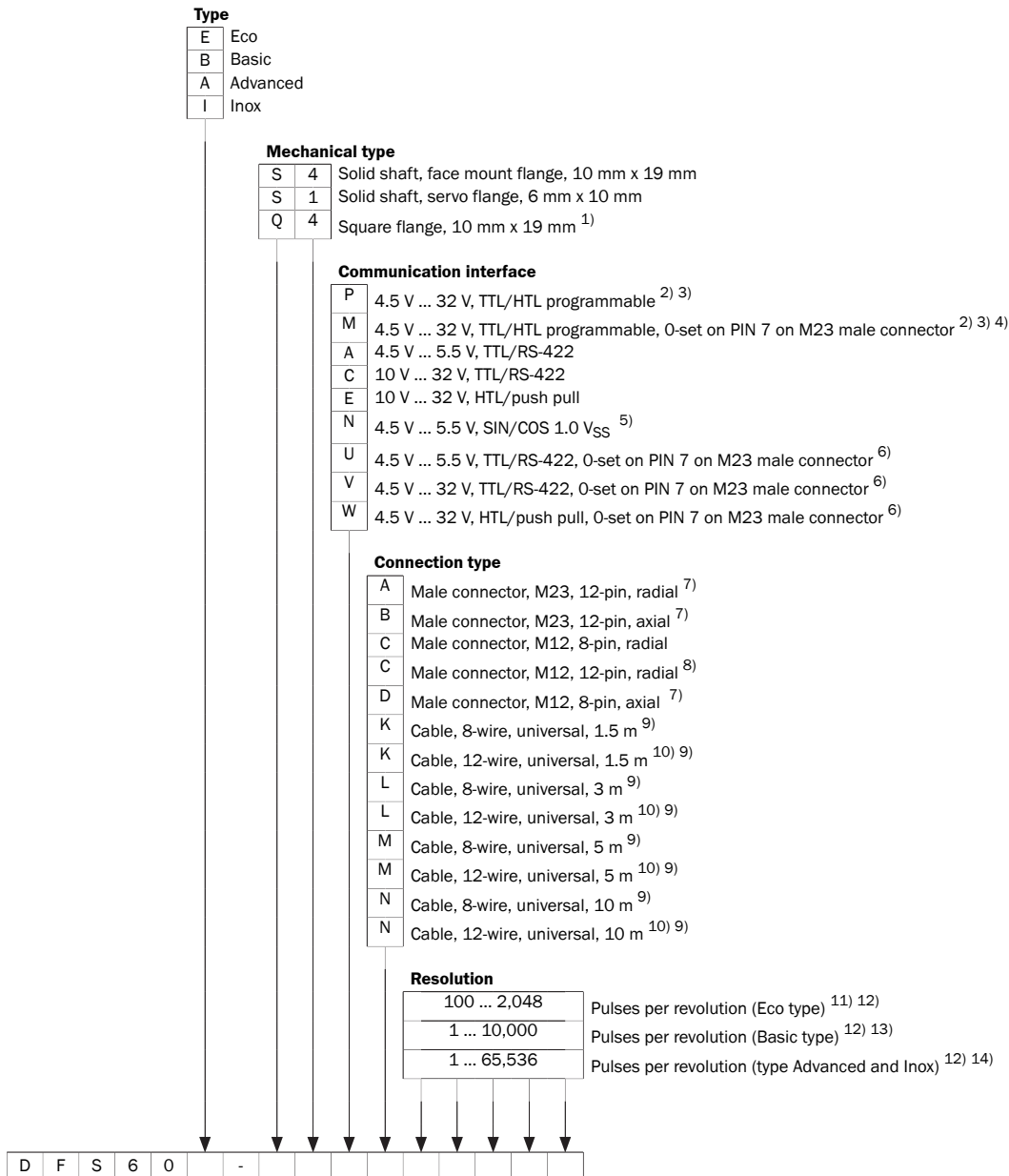
- The programmability of the encoder results in reduced storage, high machine availability, and easy and fast installation
- Flexible adaptation to the application-specific installation situation
- High resolution up to 16 bits allows applications with demanding requirements on measurement accuracy
- The stainless-steel housing offers high resistance to environmental influences
- Long-term and reliable operation thanks to a high enclosure rating, temperature resistance and bearing lifetime
- Excellent concentricity even at high speeds
- Simple mounting thanks to compact dimensions, when the installation space is limited

Fields of application

Measurement of position, speed and displacement in factory and logistics automation, e.g., in the food and beverages industry, medical technology, wood processing, in outdoor applications at ports or offshore plants, printing machines, textile machines and packaging machines

Type code

Other models and accessories → www.sick.com/DFS60_Inox



¹⁾ Only in combination with type Inox.

²⁾ See below for programmable features.

³⁾ Factory setting: TTL output level.

⁴⁾ Only in combination with connection type male connector, M23, axial and radial.

⁵⁾ Only in combination with type Basic and Inox and 1,024 periods per revolution.

⁶⁾ Only in combination with type Basic, Advanced and Inox and connection type male connector, M23, axial and radial.

⁷⁾ Only in combination with type Eco, Basic and Advanced.

⁸⁾ 12-pin for type Inox and M, V and W communication interface.

⁹⁾ The universal cable connection is positioned so that it is possible to lay it without bends in a radial and axial direction.

¹⁰⁾ 12-wire for type Inox and M, V and W communication interface.

¹¹⁾ See "Pulses per revolution" table.

¹²⁾ Other pulses upon request.

¹³⁾ See "Pulses per revolution" table. Programmable (P and M communication interface): 1 ... 10,000, set to 10,000 pulses per revolution at the factory.

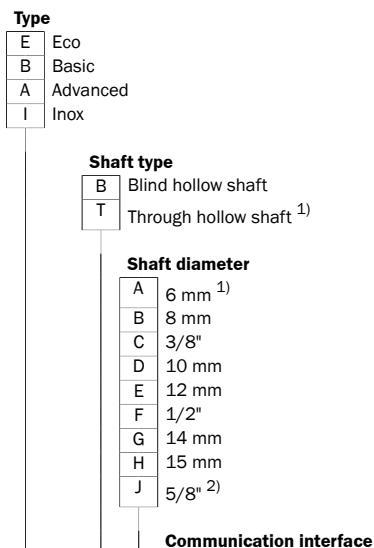
¹⁴⁾ See "Pulses per revolution" table. Programmable (P and M communication interface): 1 ... 65,536, set to 65,536 pulses per revolution at the factory.

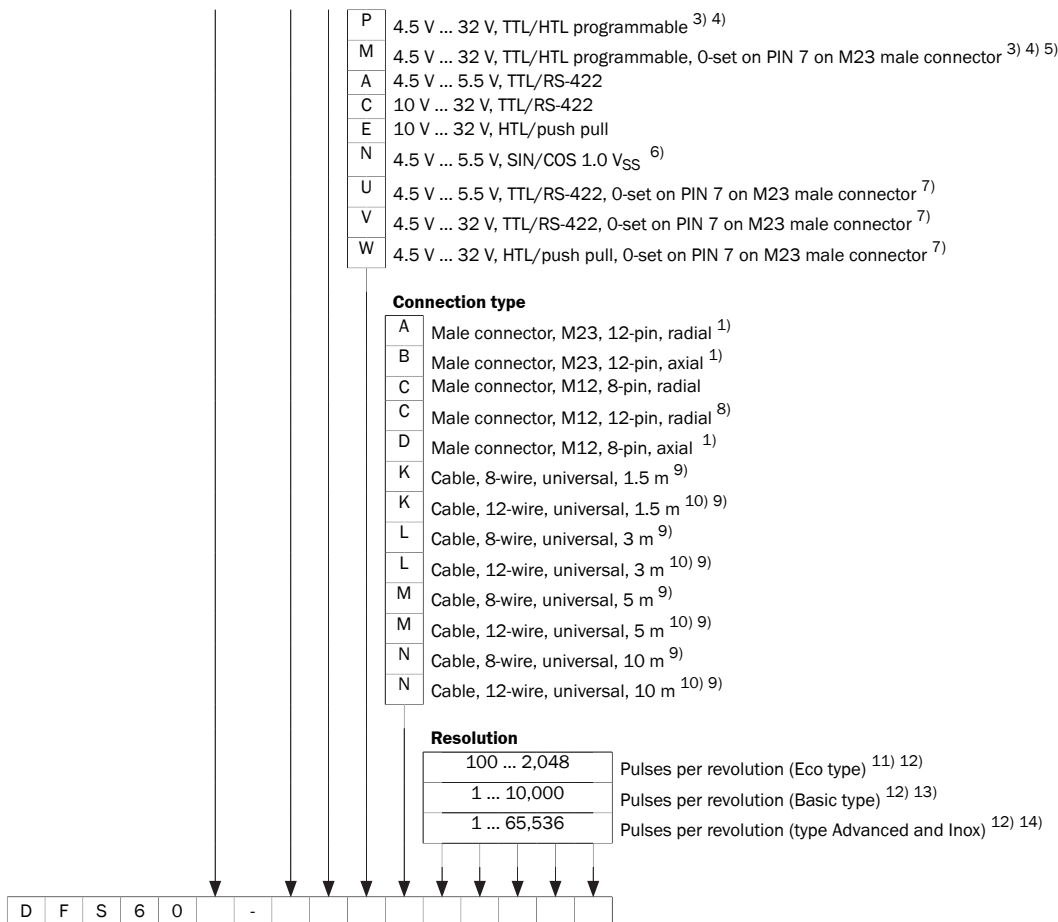
The following features can be programmed (only for programmable encoders):

- 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 / DFS60I
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





- 1) Only in combination with type Eco, Basic and Advanced.
- 2) Suitable for supporting collets, see "accessories".
- 3) See below for programmable features.
- 4) Factory setting: TTL output level.
- 5) Only for A and B connection type.
- 6) Only in combination with type Basic and Inox and 1,024 periods per revolution.
- 7) Only in combination with type Basic, Advanced and Inox and connection type male connector, M23, radial and axial.
- 8) 12-pin for type Inox and M, V and W communication interface.
- 9) The universal cable connection is positioned so that it is possible to lay it without bends in a radial and axial direction.
- 10) 12-wire for type Inox and M, V and W communication interface.
- 11) See "Pulses per revolution" table.
- 12) Other pulses upon request.
- 13) See "Pulses per revolution" table. Programmable (P and M communication interface): 1 ... 10,000, set to 10,000 pulses per revolution at the factory.
- 14) 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):

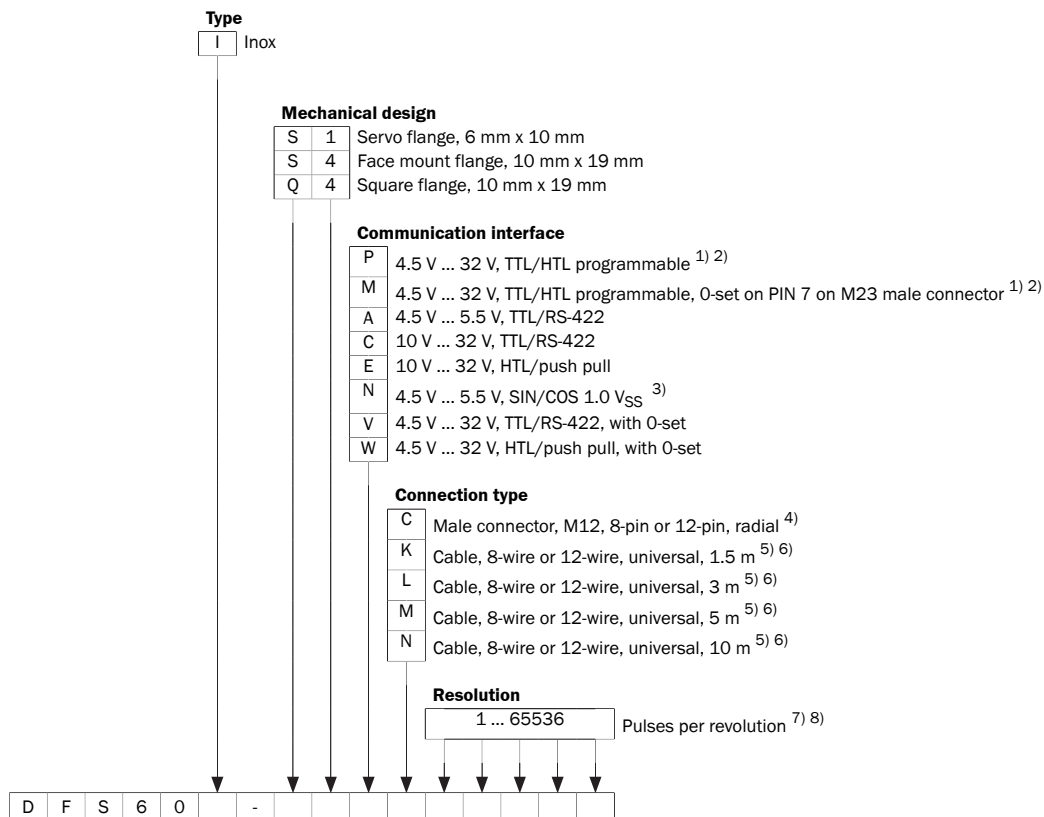
- Pulses per revolution of 1 ... 65,536 using PGT-08-S or PGT-10-Pro programming tools
- Electrical zero pulse width 90°, 180°, 270° using PGT-08-S or PGT-10-Pro programming tools
- Mechanical zero pulse width 1° ... 359° using PGT-10-Pro programming tool
- Level of output voltage TTL or HTL using PGT-08-S 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 / DFS60I
Non-programmable	00100	00100	00100
	00200	00200	00200

	DFS60E	DFS60B	DFS60A / DFS60I
	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



- 1) Factory setting: TTL output level.
- 2) See below for programmable features.
- 3) Only for 1024 periods per revolution.
- 4) 12-pin for M, V and W communication interface.
- 5) 12-wire for M, V and W communication interface.
- 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. Programmable (P and M communication interface): 1 ... 65536, set to 65536 pulses per revolution at the factory.
- 8) Other pulses upon request.

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)

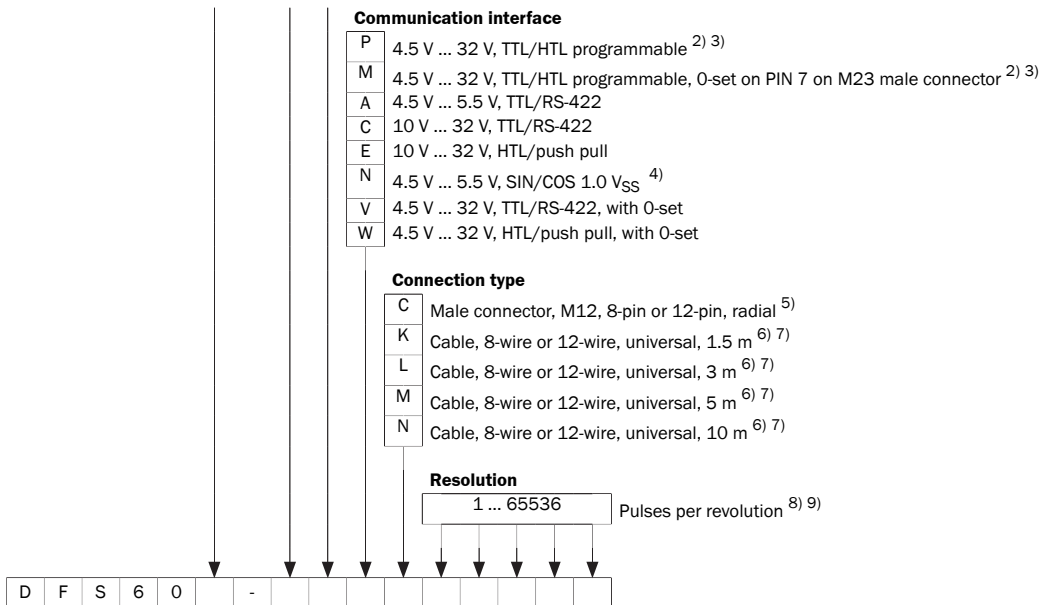
	DFS60I
Non-programmable	00100
	00200
	00250
	00300
	00314
	00360
	00500
	00512
	00720
	01000
	01024
	01250
	02000
	02048
	02500
	03600
	04000
	04096
	05000
	07200
08192	
10000	
16384	
32768	
65536	
Programmable	1 ... 65536

Hollow shaft

Type
 Inox

Mechanical design

B	B	Blind hollow shaft, 8 mm
B	C	Blind hollow shaft, 3/8"
B	D	Blind hollow shaft, 10 mm
B	E	Blind hollow shaft, 12 mm
B	F	Blind hollow shaft, 1/2"
B	G	Blind hollow shaft, 14 mm
B	H	Blind hollow shaft, 15 mm
B	J	Blind hollow shaft, 5/8" ¹⁾



- 1) Suitable for supporting collets, see "accessories".
- 2) Factory setting: TTL output level.
- 3) See below for programmable features.
- 4) Only for 1024 periods per revolution.
- 5) 12-pin for M, V and W communication interface.
- 6) 12-wire for M, V and W communication interface.
- 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. Programmable (P and M communication interface): 1 ... 65536, set to 65536 pulses per revolution at the factory.
- 9) Other pulses upon request.

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)

	DFS60I
Non-programmable	00100
	00200
	00250
	00300
	00314
	00360
	00500
	00512
	00720
	01000
	01024
	01250
	02000
	02048
	02500
	03600

	DFS60I
	04000
	04096
	05000
	07200
	08192
	10000
	16384
	32768
	65536
	Programmable

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.”

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