PRODUCT INFORMATION

DFS60S Pro

SAFE, EASY, FLEXIBLE:
ENCODERS FOR FUNCTIONAL SAFETY

Safety encoder

SICK
Sensor Intelligence.

DFS60S PRO

SO SIMPLE YET SO SAFE

The safety expert

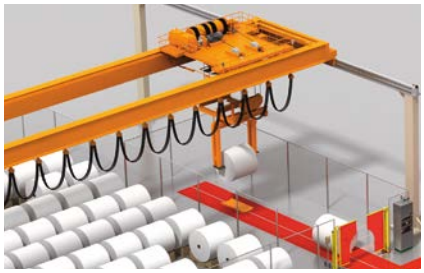
The DFS60S Pro is SICK's first certified incremental encoder in the premium segment – for functional safety technology. The encoder from the 60 mm class meets the highest requirements and offers a wide range of benefits: Easy to implement, flexible application possibilities, safe electrical and mechanical design, and compact dimensions. This makes it ideal for use in applications with limited space.

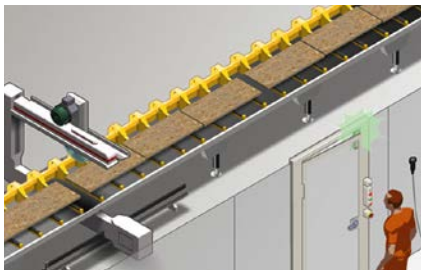
Less work for safety engineering

The DFS60S Pro provides safety functions for stationary and mobile safety applications in next to no time. This saves a considerable amount of time and money, particularly when the encoder is combined with a SICK Drive Monitor (optional). This is very easy to set up – using the plug and play principle – and gives you the benefit of two perfectly coordinated safety products. It's the ideal solution for ensuring the safety of people, machines, and systems.

MOBILE APPLICATIONS

In any situation requiring safe motion, the DFS60S Pro proves its reliability as a signal encoder for safety applications – for example, in automated guided vehicles with complex navigation requirements.





STATIONARY APPLICATIONS

The DFS60S Pro has a wide range of application possibilities in industrial environments – for example, it can be used to measure speed and direction of rotation.
It supports safety functions and significantly increases efficiency and productivity.

Dream team for enhanced safety

With the DFS60S Pro and the FX3 MOC0 Flexi Soft Drive Monitor, SICK offers complete solutions for demanding safety tasks.
The modules can be combined in a number of different ways, making it possible to perform a wide range of functions to ensure safe motion monitoring.

Ensuring safety with SICK

safetyPLUS® is the range of machine safety products and services provided by SICK for the protection of people and investments. We see PLUS as your comprehensive and individual support service with regard to the functional safety of your machines and systems. We support your individual requirements for legal compliance and flawless production with:

- safety products and systems, services, training, and tools
- the transfer of knowledge through personal consultation and online information
- safety tools which simplify the engineering process
- support functionality for production efficiency

HIGH PERFORMANCE IN EVERY DETAIL

We know how to improve machine safety

Everything about this encoder is geared toward safety: Reduced risk, increased reliability. It has undergone extremely stringent testing and is a certified safety product to SIL2/PLd.
The DFS60S Pro supports the safety functions defined in IEC 61800-5-2 and guarantees first-class quality and absolute precision – in every detail. It boasts a precise optical scanning system and a high mechanical load capability. Its electronic and mechanical design ensures certified safety levels, every time.

Tough in every respect

Thanks to its rugged design, the DFS60S Pro can withstand harsh environmental conditions – with an operating temperature range of –30 to 95 °C. Its protection class of IP65 makes it immune to external influences. The wide-set ball bearings minimize vibrations and ensure optimum concentricity.

Flexible application possibilities, easy to implement

The DFS60S Pro is very easy to install and offers numerous connection facilities for different mounting situations. With its electrical SinCos interface, it can be easily integrated into a range of different control environments. And thanks to its uncomplicated system implementation and easy approval process, the safety encoder can save you money too.

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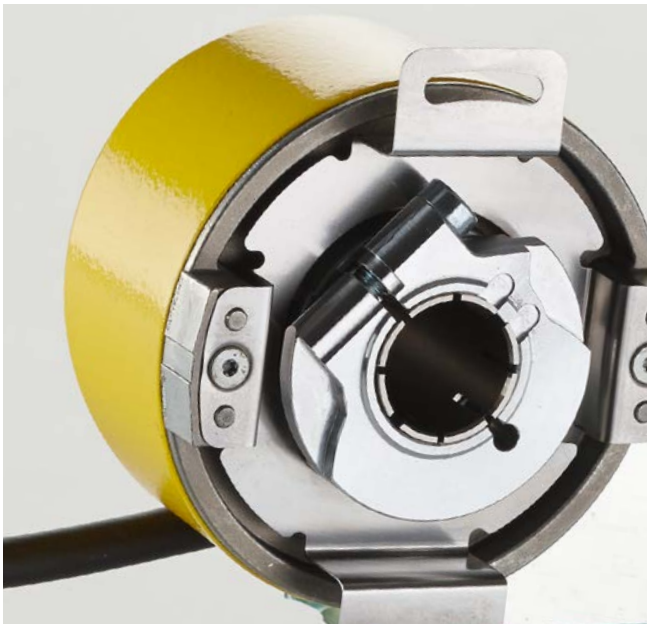

Safe in every sense

Mechanical safety and reliability are particularly important for safe encoders. The shafts of the solid shaft versions of the DFS60S Pro safety encoder with face mount or servo flanges are equipped with either a flat or a key for a form-fit and high force clamp connection.

The blind/through hollow shaft version is equipped with a over-engineered clamping ring for strong high force clamp connection and a key seat to ensure perfect form fit.
This allows SICK to set new standards for mechanical connections and to optimize safety in every detail.

Successfully tested by the IFA

The IFA is the Institute for Occupational Safety and Health of the German Social Accident Insurance – a renowned research and testing institute in Germany. The institute subjected the DFS60S Pro to rigorous testing in accordance with the latest findings and testing principles, and it passed with flying colors. This means that the DFS60S Pro, as the forerunner in its field, is able to meet the increased safety requirements.
With the DFS60S Pro, you can play it safe.

SAFE, EASY, FLEXIBLE: ENCODERS FOR FUNCTIONAL SAFETY

Product description

Safe electrical and mechanical design, easy system implementation, and flexible application possibilities. The DFS60S Pro is an incremental encoder for functional safety. It supports safety functions that conform to IEC 61800-5-2. The high enclosure rating, wide temperature range, and wide-set ball bearings are the key to enhanced durability. They make the DFS60S Pro the universal motion control sensor for stationary and mobile safety applications.

At a glance

- Encoders for functional safety technology: SIL2 (IEC 61508), SILCL2 (EN 62061), PL d (EN ISO 13849)
- Electrical interface: 4.5 V ... 32 V; sin/cos 1 V_{PP}; 1,024 periods
- Face mount flange or servo flange, blind hollow shaft or through hollow shaft (assembly options with key)
- Universal cable outlet, M23 or M12 male connector, axial or radial
- Enclosure rating: IP 65
- Operating temperature range: –30 °C ... +95 °C

Your benefits

- Certified safety solution that ensures the best possible protection for persons, machinery, and systems
- Easy and practical implementation of safety functions using an all-in-one solution, safety functions with the Flexi Soft Drive monitor by SICK: safe stop 1 (SS1), safe stop 2 (SS2), safe operating stop (SOS), safe speed monitoring (SSM), safely limited speed (SLS), safe direction (SDI), safe brake control (SBC)
- Form-fit and high force clamp connection for mechanical reliability
- Certified safety products reduce the scope of safety engineering
- Versatile connection options for high levels of flexibility and straightforward implementation
- Compact size for compatibility with applications in which installation space is limited

Additional information

→ www.mysick.com/en/DFS60S_Pro

For more information, simply enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples, and much more.

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Detailed technical data

Performance

Number of sine/cosine periods per revolution	1,024
Measurement step	0.3 angular seconds for interpolation of the sine/cosine signals with e.g. 12 bit[1)]
Typ. integral non-linearity	Typ. ± 45 angular seconds (with slackened stator coupling)
Differential non-linearity	± 7 angular seconds
Reference signal, number	1
Reference signal, position	90°, electric, logically gated with sine and cosine

[1)] Not safety-related.

Mechanical data

	Solid shaft, servo flange	Solid shaft, face mount flange	Blind hollow shaft	Through hollow shaft
Mechanical design	Solid shaft with flat/solid shaft with key		Blind hollow shaft with key seat	Through hollow shaft with key seat
Shaft diameter	6 mm	10 mm	6 mm 8 mm 3/8” 10 mm 12 mm 1/2” 14 mm 15 mm 5/8” (depending on type)	
Length of the shaft	10 mm	19 mm	–	
Shaft material	Stainless steel			
Flange material	Aluminum		Zinc die cast	
Housing material	Aluminum die cast			
Mass	Approx. 0.3 kg [1)]		Approx. 0.25 kg [1)]	
Startup torque	≤ 0.5 Ncm (at 20 °C)		≤ 0.8 Ncm (at 20 °C)	
Operating torque	≤ 0.3 Ncm (at 20 °C)		≤ 0.6 Ncm (at 20 °C)	
Permissible shaft loading	80 N (radial) 40 N (axial)		–	
Permissible shaft movement, static	–		± 0.3 mm (radial) ± 0.5 mm (axial)	
Permissible shaft movement, dynamic	–		± 0.05 mm (radial) ± 0.1 mm (axial)	
Max. angular acceleration	≤ 500,000 rad/s²			
Maximum operating speed	9,000 /min [2)]		6,000 /min [2)]	
Rotor moment of inertia	8 gcm²		56 gcm²	
Bearing lifetime	3.6 x 10^9 revolutions [3)]			

[1)] Relates to encoder with connector outlet.

[2)] Take into account self-heating of 3.0 K per 1,000 revolutions/min at the operating temperature measuring point when designing the operating temperature range.

[3)] At maximum speed and temperature.

Electrical data

	Solid shaft, servo flange	Solid shaft, face mount flange	Blind hollow shaft	Through hollow shaft
Electrical interface	4.5 V ... 32 V, SinCos 1.0 V_{PP} (differential)			
Connection type	M23 male connector, 12-pin, radial M23 male connector, 12-pin, axial M12 male connector, 8-pin, radial M12 male connector, 8-pin, axial Cable, 8-wire, universal, 0.5 m [1] Cable, 8-wire, universal, 1.5 m [1] Cable, 8-wire, universal, 3 m [1] Cable, 8-wire, universal, 5 m [1] Cable, 8-wire, universal, 10 m [1] (depending on type)		M23 male connector, 12-pin, radial M12 male connector, 8-pin, radial Cable, 8-wire, universal, 0.5 m [1] Cable, 8-wire, universal, 1.5 m [1] Cable, 8-wire, universal, 3 m [1] Cable, 8-wire, universal, 5 m [1] Cable, 8-wire, universal, 10 m [1] (depending on type)	
Initialization time	50 ms [2]			
Maximum output frequency	≤ 153.6 kHz			
Load resistance	≥ 120 Ω			
Max. power consumption without load	≤ 0.7 W			
Reverse polarity protection	✔			
Protection class	III (according to DIN EN 61140)			
Contamination rating	2			
Short-circuit protection of the outputs	✔ [3]			

[1] The universal cable outlet is positioned so that it is possible to lay it without bends in a radial or axial direction. UL approval not available.

[2] After this period valid signals can be read.

[3] Short-circuit to another channel or GND permitted for max. 30 sec. In the case of US ≤ 12 V additional short-circuit to US permitted for max. 30 sec.

Safety technology parameters

Safety integrity level	SIL2 (IEC 61508), SILCL2 (IEC 62061) [1]
Category	3 (EN ISO 13849)
Test rate	Not required
Maximum demand rate	Continuous (analog signals)
Performance level	PL d (EN ISO 13849) [1]
PFHd: Probability of dangerous failure per hour	1.7×10^{-8} [2]
T_M (mission time)	20 years (EN ISO 13849)
Safety-related measuring increment	0.09°, quadrature analysis
Safety-related accuracy	± 0.09°

[1] For more detailed information on the exact configuration of your machine/system, please consult your local SICK subsidiary.

[2] The stated values apply to a diagnostic degree of coverage of 99%, which must be achieved by the external drive system, and an operating temperature of 95 °C.

8017880/2014-05-17
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Ambient data

EMC	According to EN 61000-6-2, EN 61000-6-3, and IEC 61326-3-1
Enclosure rating	IP 65 (according to IEC 60529) [1]
Permissible relative humidity	90%, condensation not permitted
Operating temperature range	
M23 male connector, 12-pin	–30 °C ... +95 °C [2]
M12 male connector, 8-pin	–30 °C ... +95 °C [2]
Cable, 8-wire	–30 °C ... +85 °C [2]
Storage temperature range	–30 °C ... +85 °C, without packaging
Resistance to shocks	100 g, 6 ms (according to EN 60068-2-27) [3]
Resistance to vibrations	
M23 male connector, 12-pin	10 g, 10 Hz ... 1,000 Hz (EN 60068-2-6) [4]
M12 male connector, 8-pin	30 g, 10 Hz ... 1,000 Hz (EN 60068-2-6) [4]
Cable, 8-wire	30 g, 10 Hz ... 1,000 Hz (EN 60068-2-6) [3]

[1] At least IP 65 when male connector connection has mating connector inserted.

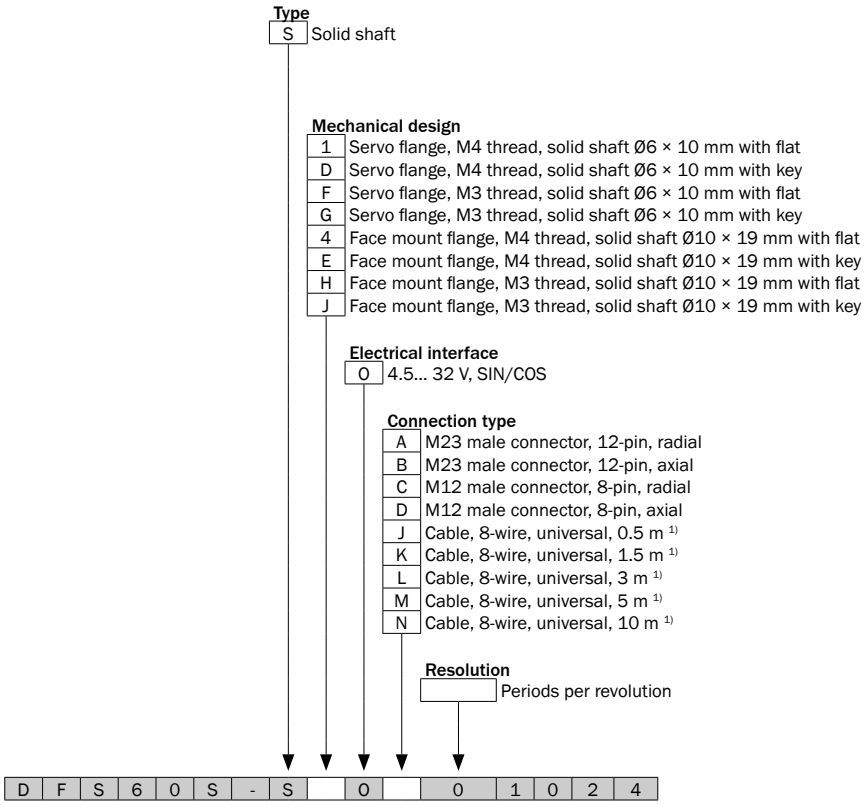
[2] Take into account self-heating of 3.0 K per 1,000 revolutions/min at the operating temperature measuring point when designing the operating temperature range.

[3] Checked during operation using vector length monitoring.

[4] Checked during operation using vector length monitoring. Includes mating connector.

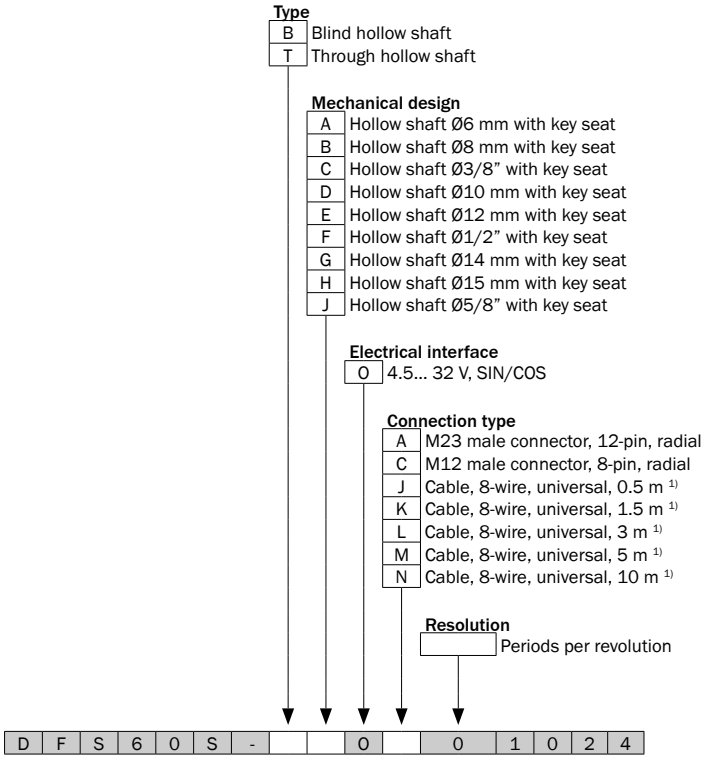
Type code

Solid shaft



[1] The universal cable outlet is positioned so that it is possible to lay it without bends in a radial or axial direction. UL approval not available.

Hollow shaft



1) The universal cable outlet is positioned so that it is possible to lay it without bends in a radial or axial direction. UL approval not available.

Ordering information

Other device versions available here ➜ www.mysick.com/en/DFS60S_Pro

Solid shaft, flat, face mount flange

- **Shaft diameter:** 10 mm
- **Shaft length:** 19 mm
- **Shaft mounting:** M4 thread

Connection type	Type	Part no.
M23 male connector, 12-pin, radial	DFS60S-S4OA01024	1069518
M12 male connector, 8-pin, radial	DFS60S-S4OC01024	1069519
Cable, 8-wire, universal, 1.5 m	DFS60S-S4OK01024	1069520

Solid shaft with key, face mount flange

- **Shaft diameter:** 10 mm
- **Shaft length:** 19 mm
- **Shaft mounting:** M4 thread

Connection type	Type	Part no.
M23 male connector, 12-pin, radial	DFS60S-SEOA01024	1069521
M12 male connector, 8-pin, radial	DFS60S-SEOC01024	1067912
Cable, 8-wire, universal, 1.5 m	DFS60S-SEOK01024	1067913

Solid shaft, flat, servo flange

- **Shaft diameter:** 6 mm
- **Shaft length:** 10 mm
- **Shaft mounting:** M4 thread

Connection type	Type	Part no.
M23 male connector, 12-pin, radial	DFS60S-S10A01024	1069522
M12 male connector, 8-pin, radial	DFS60S-S10C01024	1069517
Cable, 8-wire, universal, 1.5 m	DFS60S-S10K01024	1069523

Solid shaft with key, servo flange

- **Shaft diameter:** 6 mm
- **Shaft length:** 10 mm
- **Shaft mounting:** M4 thread

Connection type	Type	Part no.
M23 male connector, 12-pin, radial	DFS60S-SDOA01024	1067910
M12 male connector, 8-pin, radial	DFS60S-SDOC01024	1069524
Cable, 8-wire, universal, 1.5 m	DFS60S-SDOK01024	1069525

Blind hollow shaft with key seat

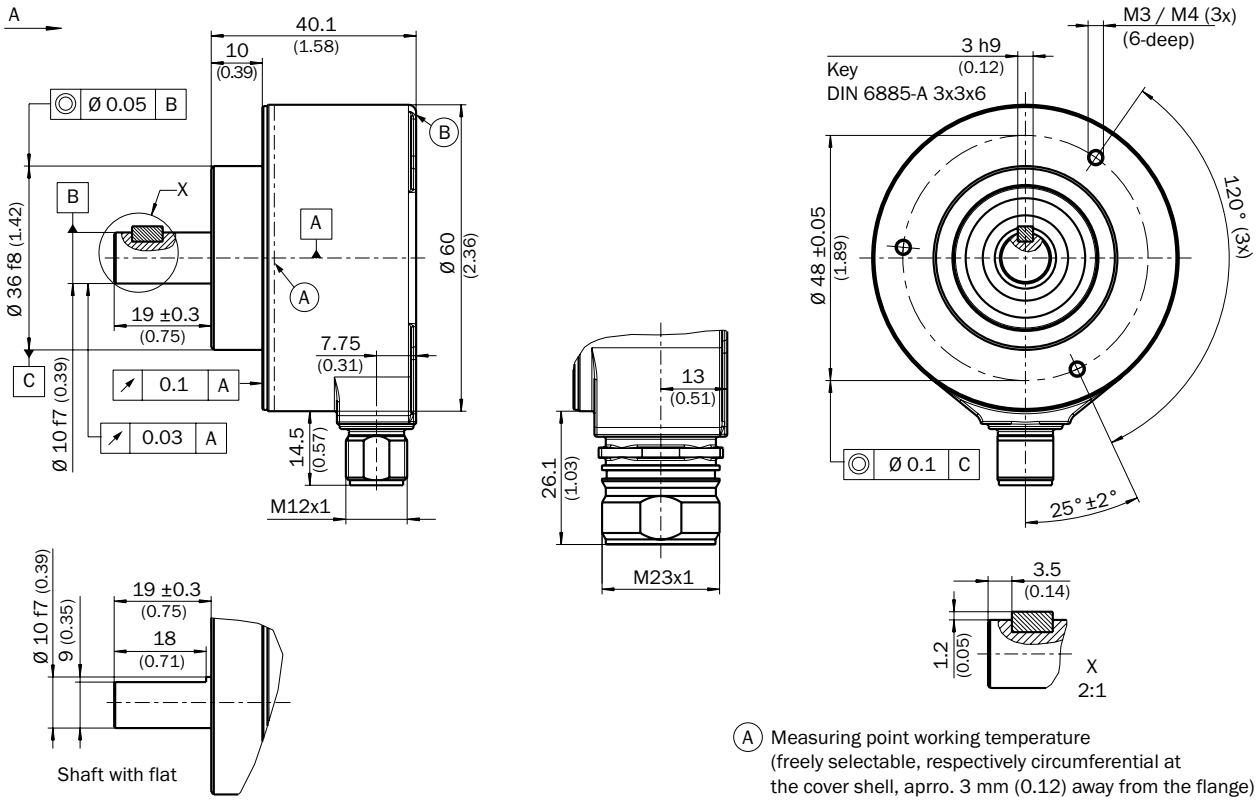
Shaft diameter	Connection type	Type	Part no.
10 mm	M23 male connector, 12-pin, radial	DFS60S-BDOA01024	1069535
	M12 male connector, 8-pin, radial	DFS60S-BDOC01024	1067915
	Cable, 8-wire, universal, 1.5 m	DFS60S-BDOK01024	1069536
12 mm	M23 male connector, 12-pin, radial	DFS60S-BEOA01024	1069537
	M12 male connector, 8-pin, radial	DFS60S-BEOC01024	1069538
	Cable, 8-wire, universal, 1.5 m	DFS60S-BEOK01024	1069539
14 mm	M23 male connector, 12-pin, radial	DFS60S-BGOA01024	1069540
	M12 male connector, 8-pin, radial	DFS60S-BGOC01024	1069541
	Cable, 8-wire, universal, 1.5 m	DFS60S-BGOK01024	1069542

Through hollow shaft with key seat

Shaft diameter	Connection type	Type	Part no.
6 mm	M23 male connector, 12-pin, radial	DFS60S-TAOA01024	1067914
10 mm	M23 male connector, 12-pin, radial	DFS60S-TDOA01024	1069526
	M12 male connector, 8-pin, radial	DFS60S-TDOC01024	1069527
	Cable, 8-wire, universal, 1.5 m	DFS60S-TDOK01024	1067916
12 mm	M23 male connector, 12-pin, radial	DFS60S-TEOA01024	1069528
	M12 male connector, 8-pin, radial	DFS60S-TEOC01024	1069529
	Cable, 8-wire, universal, 1.5 m	DFS60S-TEOK01024	1069530
14 mm	M23 male connector, 12-pin, radial	DFS60S-TGOA01024	1069531
	M12 male connector, 8-pin, radial	DFS60S-TGOC01024	1069532
	Cable, 8-wire, universal, 1.5 m	DFS60S-TGOK01024	1069534

Dimensional drawings (dimensions in mm)

Solid shaft, face mount flange, male connector connection, radial



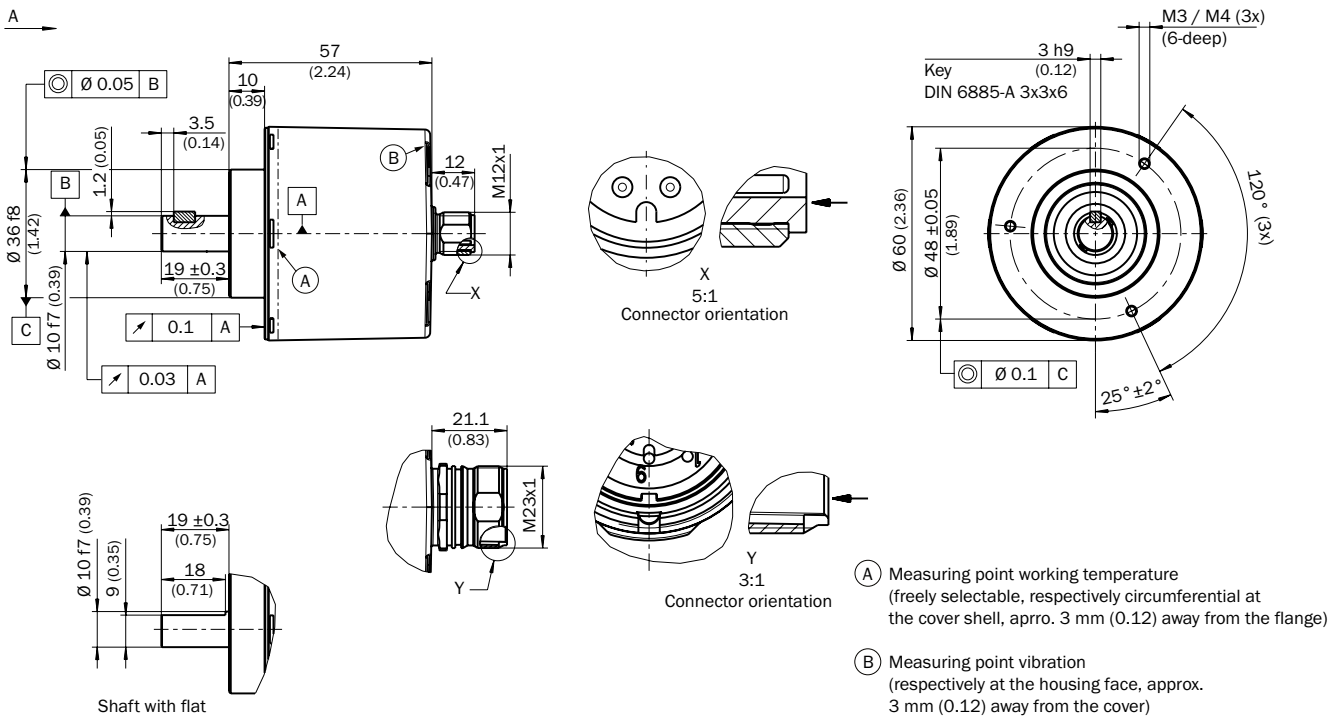
(A) Measuring point working temperature
(freely selectable, respectively circumferential at the cover shell, aprro. 3 mm (0.12) away from the flange)

(B) Measuring point vibration
(respectively at the housing face, approx. 3 mm (0.12) away from the cover)

General tolerances as per DIN ISO 2768-mk

8017880/2014-05-17

Solid shaft, face mount flange, male connector connection, axial



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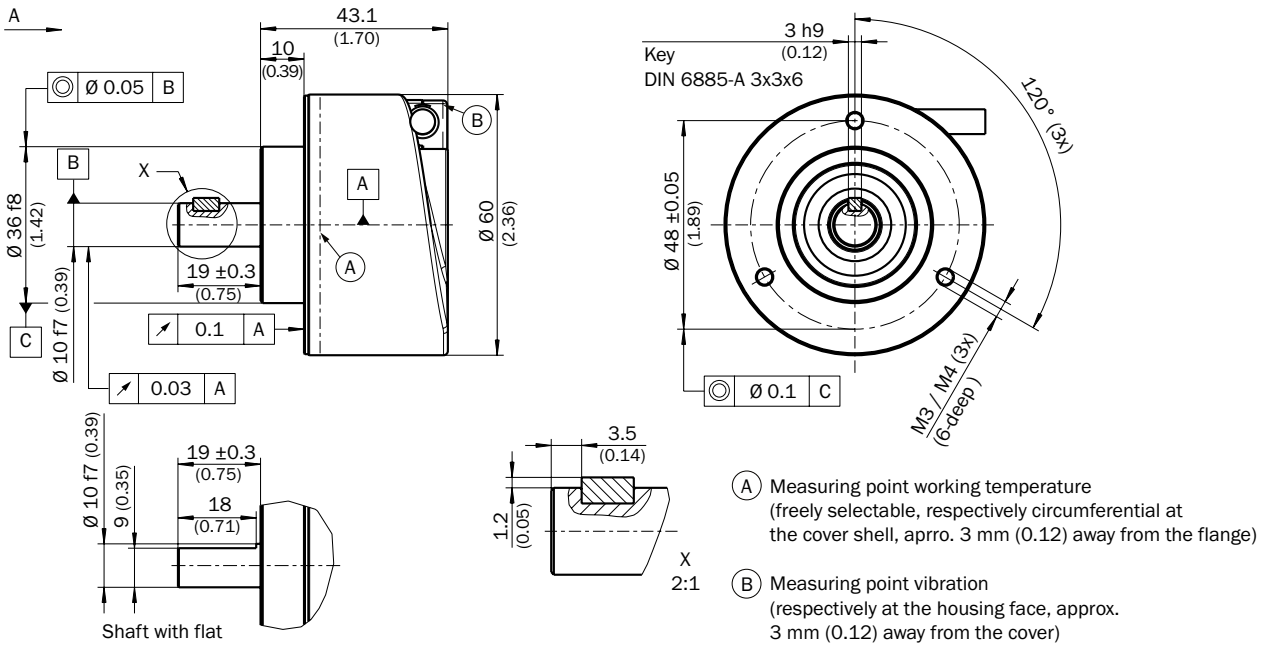
General tolerances as per DIN ISO 2768-mk

Solid shaft, face mount flange, cable connection



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(B) Measuring point vibration
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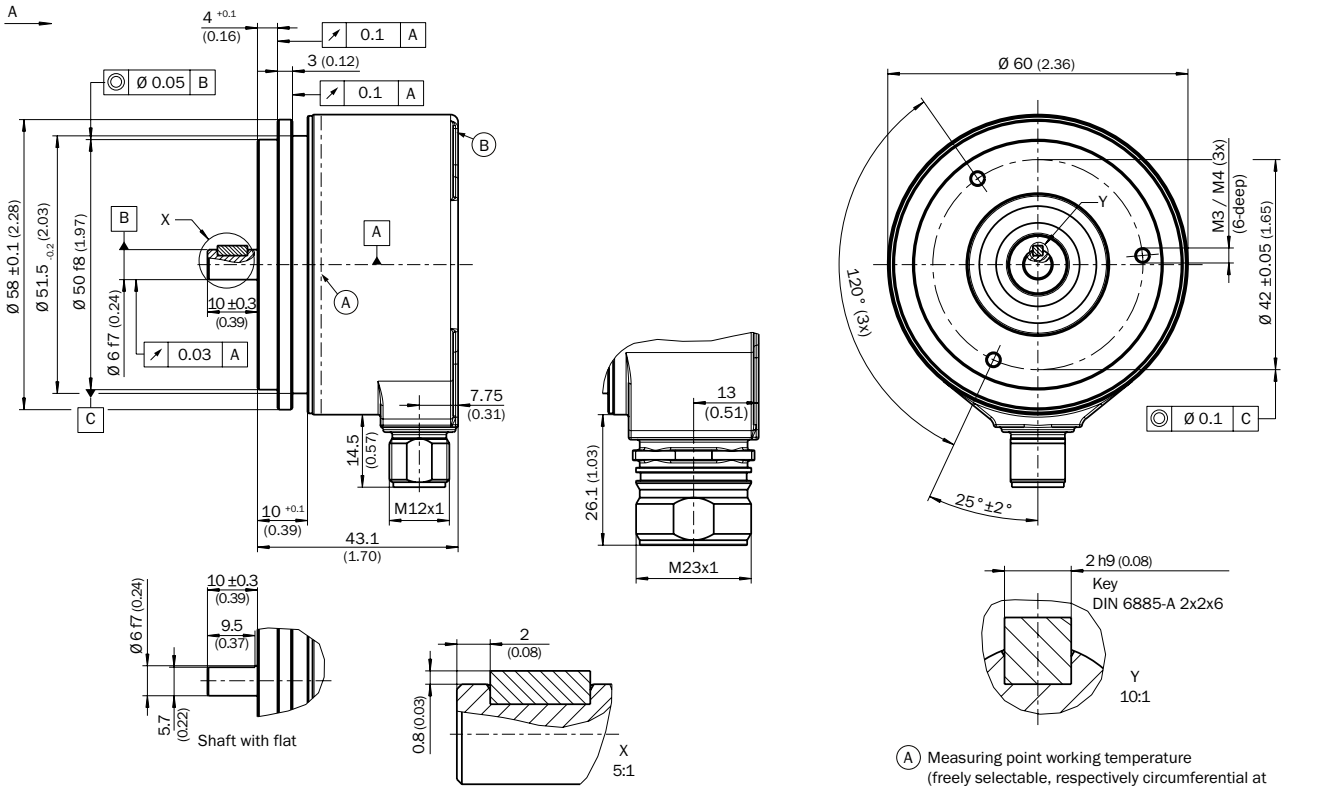
General tolerances as per DIN ISO 2768-mk

Cable diameter = 5.6 ± 0.2 mm; bend radius R = min. 7.5 x diameter cable

Solid shaft, servo flange, male connector connection, radial



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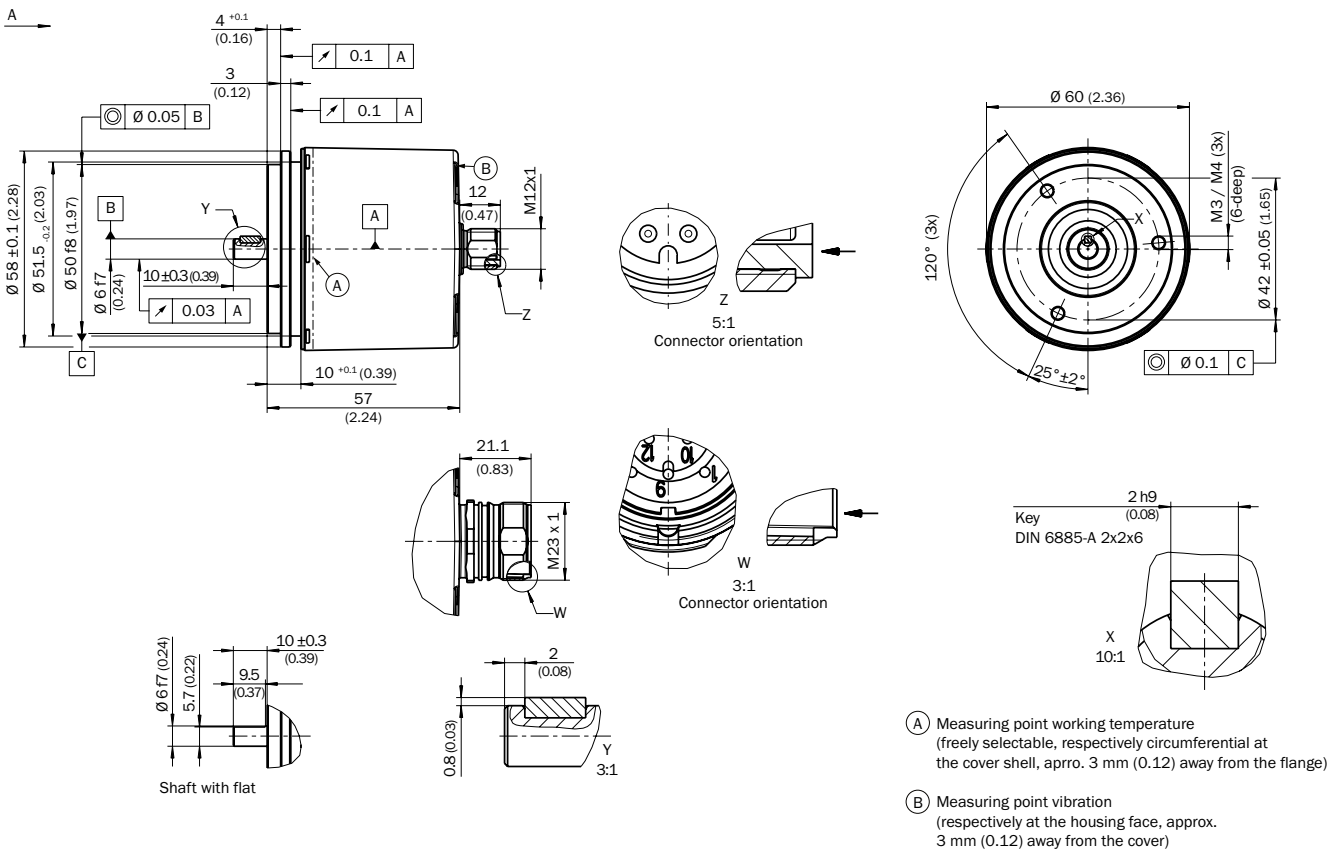
(B) Measuring point vibration
(respectively at the housing face, approx. 3 mm (0.12) away from the cover)

General tolerances as per DIN ISO 2768-mk

Solid shaft, servo flange, male connector connection, axial

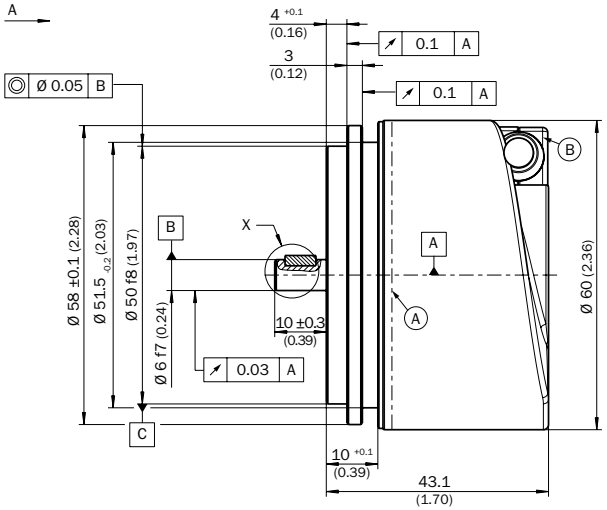


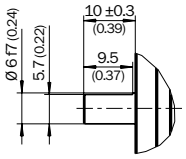
(A) Measuring point working temperature (freely selectable, respectively circumferential at the cover shell, aprro. 3 mm (0.12) away from the flange)

(B) Measuring point vibration (respectively at the housing face, approx. 3 mm (0.12) away from the cover)

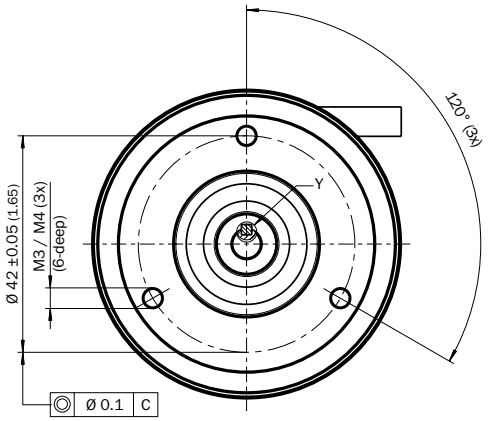
General tolerances as per DIN ISO 2768-mk

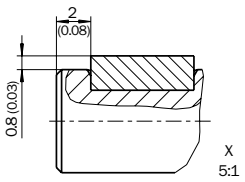
Solid shaft, servo flange, cable connection

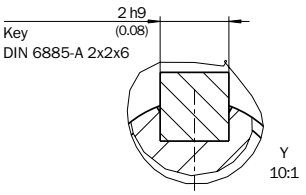




Shaft with flat





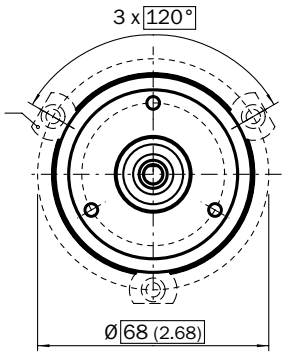


(A) Measuring point working temperature
(freely selectable, respectively circumferential at the cover shell, aprro. 3 mm (0.12) away from the flange)

(B) Measuring point vibration
(respectively at the housing face, approx. 3 mm (0.12) away from the cover)

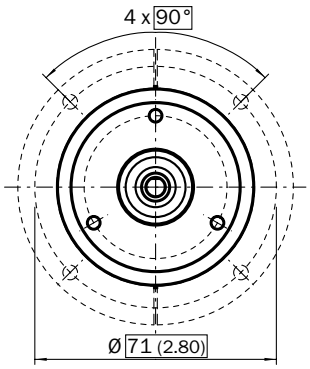
General tolerances as per DIN ISO 2768-mk
Cable diameter = 5.6 ± 0.2 mm; bend radius R = min. 7.5 x diameter cable

Mounting suggestion for small servo clamp (part number 2029166)



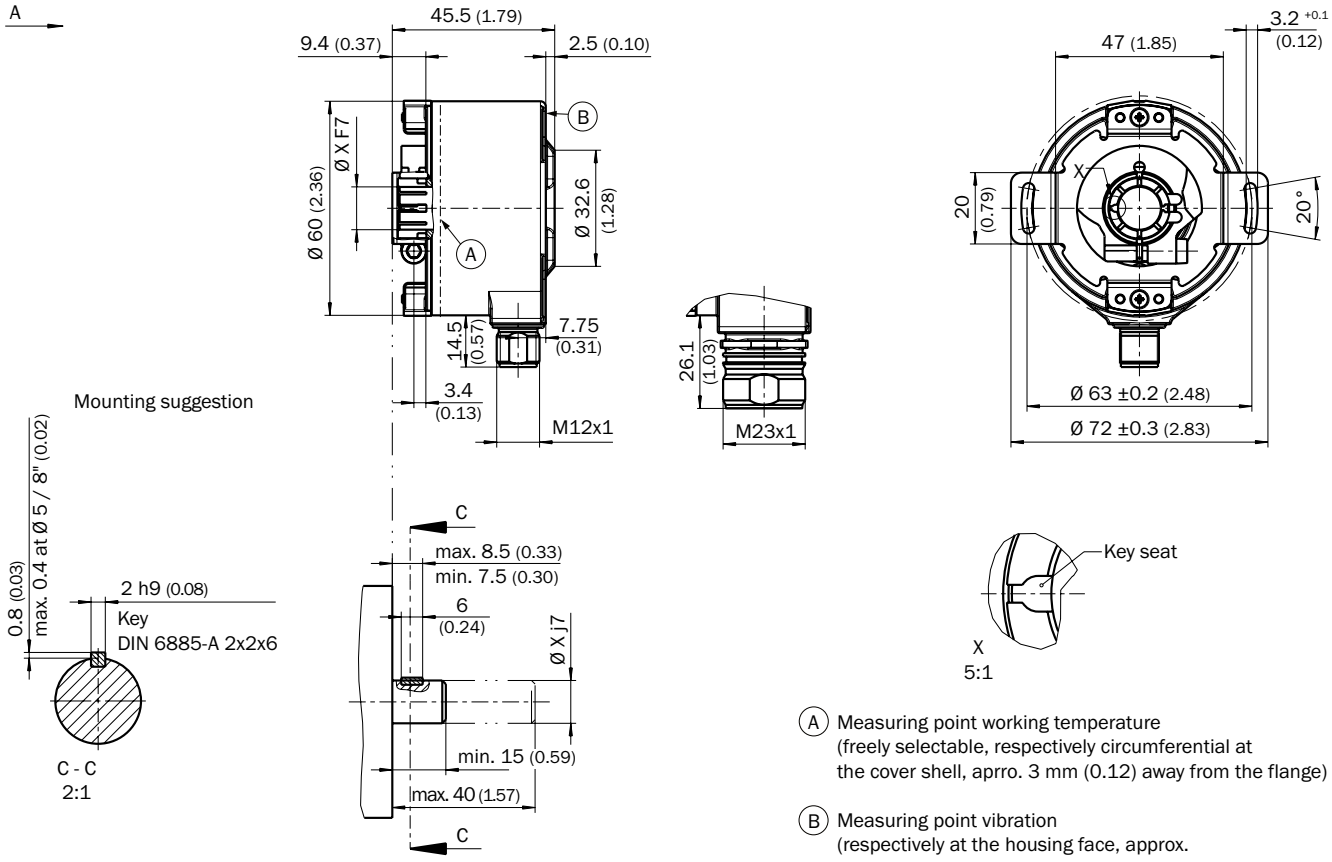
All dimensions in mm (inch)

Mounting suggestion for half-shell servo clamp (part number 2029165)



All dimensions in mm (inch)

Blind hollow shaft, male connector connection



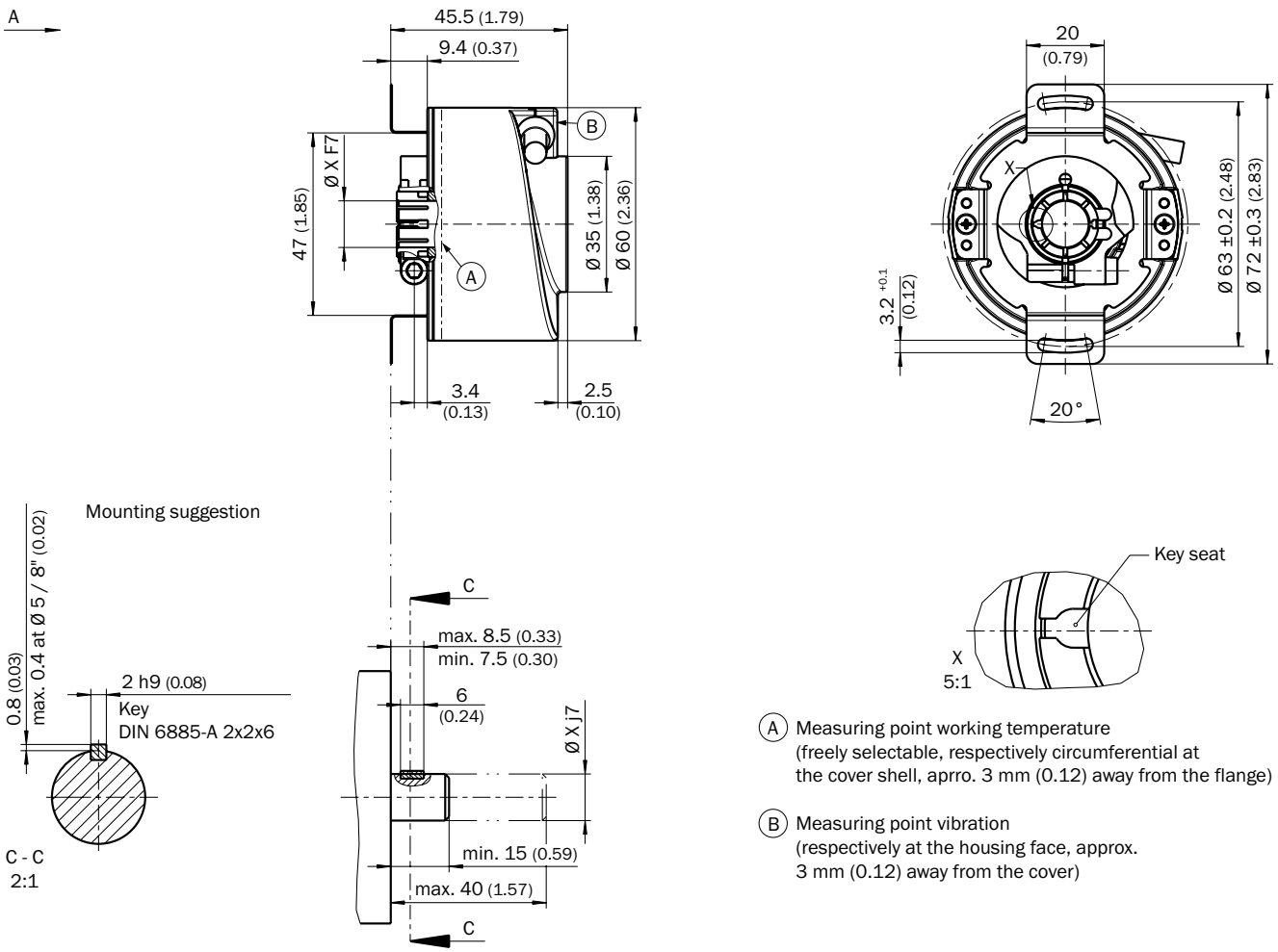
(A) Measuring point working temperature
(freely selectable, respectively circumferential at the cover shell, aprro. 3 mm (0.12) away from the flange)

(B) Measuring point vibration
(respectively at the housing face, approx. 3 mm (0.12) away from the cover)

General tolerances as per DIN ISO 2768-mk

XF7 shaft diameter	xj7 shaft diameter
6 mm	Provided by customer
8 mm	
3/8”	
10 mm	
12 mm	
1/2”	
14 mm	
15 mm	
5/8”	

Blind hollow shaft, cable connection



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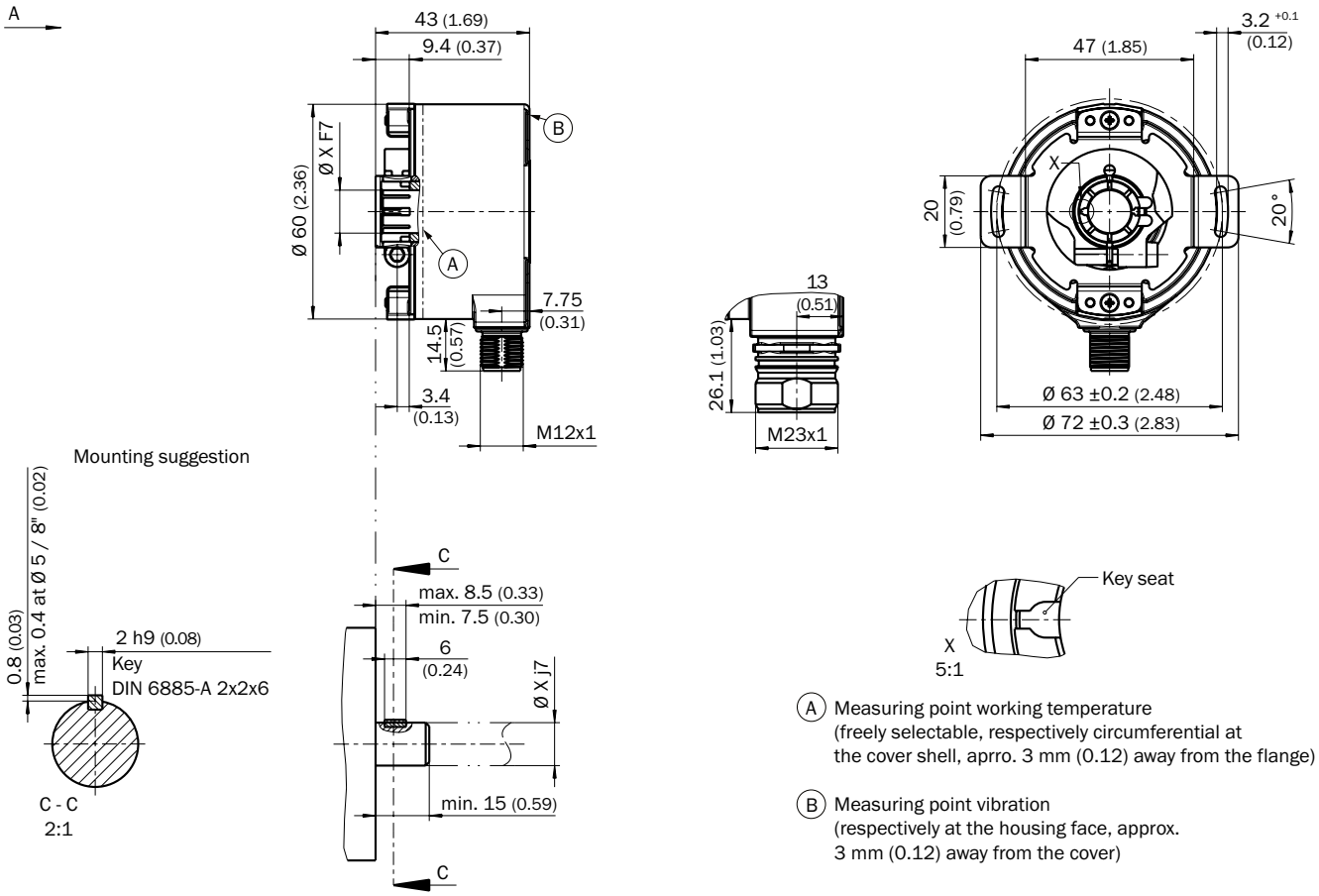
General tolerances as per DIN ISO 2768-mk

Cable diameter = 5.6 ± 0.2 mm; bend radius R = min. 7.5 x diameter cable

XF7 shaft diameter	xj7 shaft diameter
6 mm	Provided by customer
8 mm	
3/8"	
10 mm	
12 mm	
1/2"	
14 mm	
15 mm	
5/8"	

Through hollow shaft, male connector connection



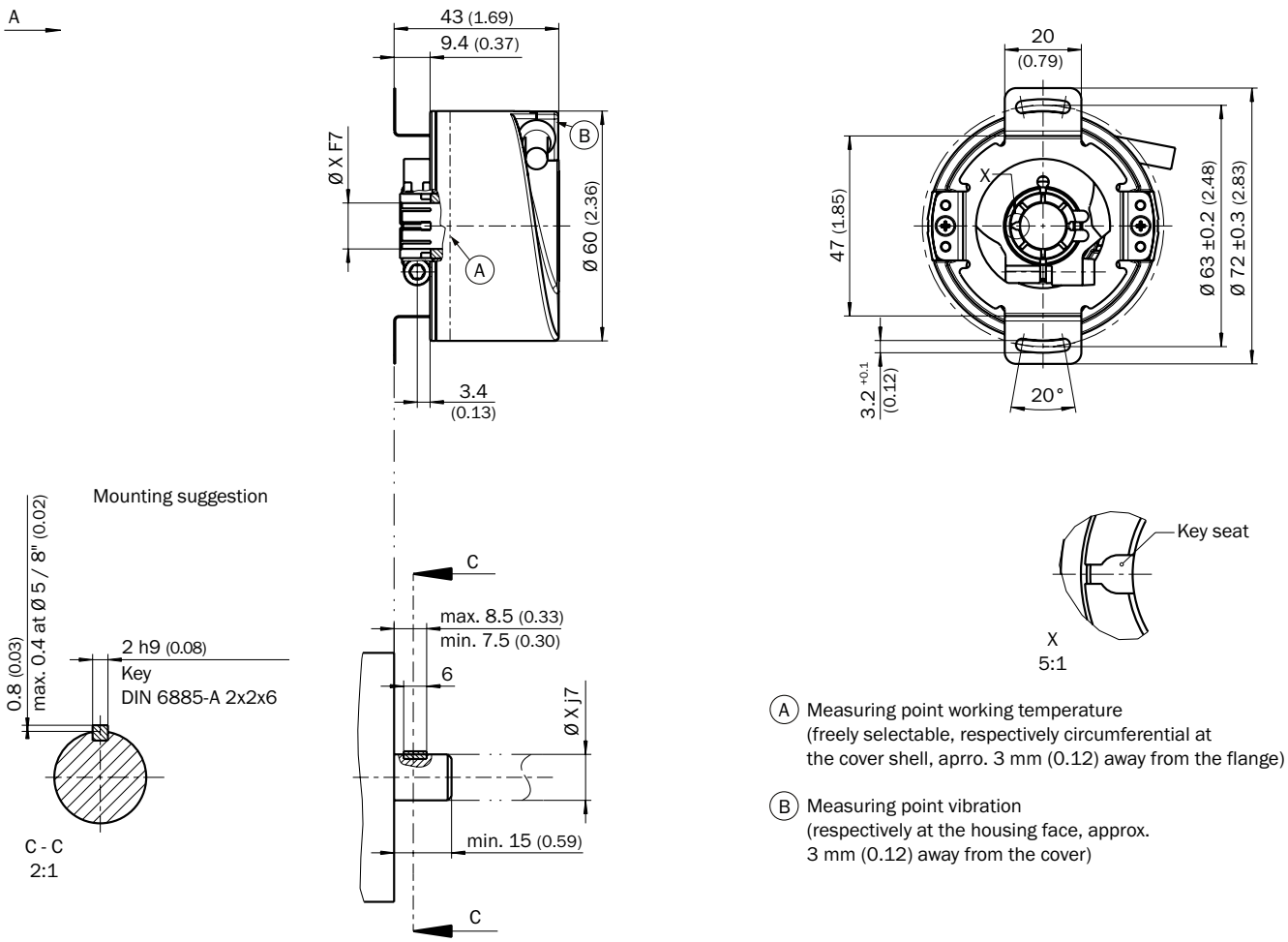
(A) Measuring point working temperature (freely selectable, respectively circumferential at the cover shell, aprro. 3 mm (0.12) away from the flange)

(B) Measuring point vibration (respectively at the housing face, approx. 3 mm (0.12) away from the cover)

General tolerances as per DIN ISO 2768-mk

XF7 shaft diameter	xj7 shaft diameter
6 mm	Provided by customer
8 mm	
3/8”	
10 mm	
12 mm	
1/2”	
14 mm	
15 mm	
5/8”	

Through hollow shaft, cable connection



(A) Measuring point working temperature
(freely selectable, respectively circumferential at the cover shell, aprro. 3 mm (0.12) away from the flange)

(B) Measuring point vibration
(respectively at the housing face, approx. 3 mm (0.12) away from the cover)

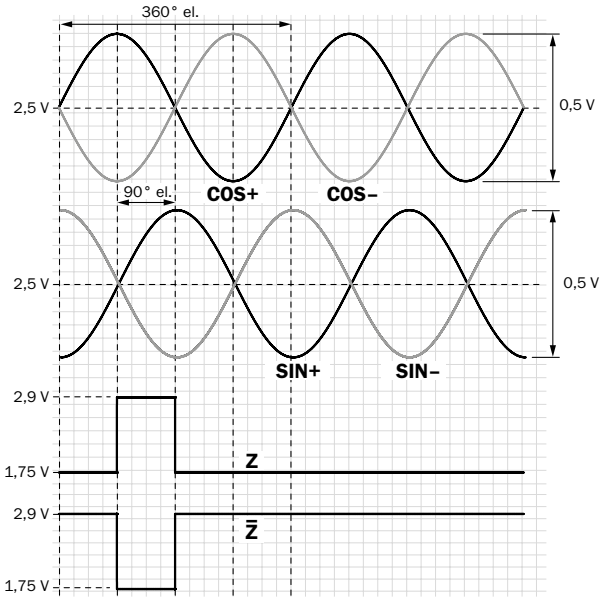
General tolerances as per DIN ISO 2768-mk

Cable diameter = 5.6 ± 0.2 mm; bend radius R = min. 7.5 x diameter cable

XF7 shaft diameter	xj7 shaft diameter
6 mm	Provided by customer
8 mm	
3/8"	
10 mm	
12 mm	
1/2"	
14 mm	
15 mm	
5/8"	

Interface signals

SIN/COS interface signals before differential generation

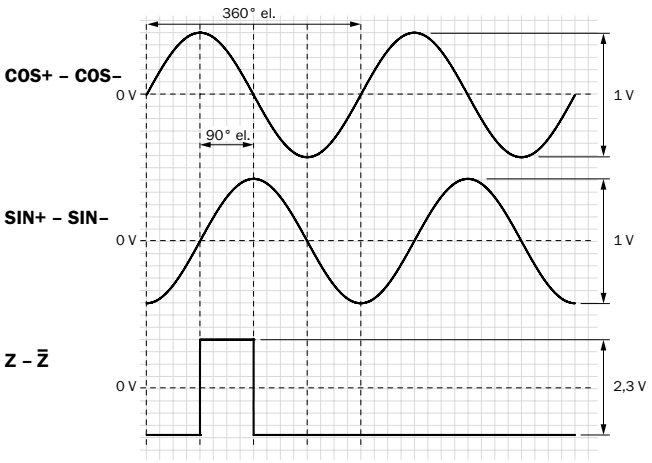


For clockwise shaft rotation, looking in direction “A” (see dimensional drawing)

Signal	Interface signals	Interface signals before differential generation With 120 Ω load	Signal offset	Supply voltage	Output
+ SIN - SIN + COS - COS	Analog, differential	0.5 V_{PP} ± 20%	2.5 V ± 10%	4.5 V ... 32 V	Sine 0.5 V_{PP}

Signal	Interface signals	Interface signals before differential generation With 120 Ω load
Z Z_	Digital, differential	Low: 1.75 V ± 15%, High: 2.90 V ± 15%

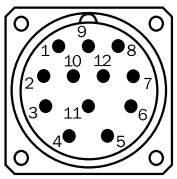
SIN/COS interface signals after differential generation



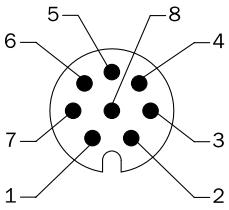
For clockwise shaft rotation, looking in direction “A” (see dimensional drawing)

PIN and wire allocation

View of the M23 male connector plug-in face



View of the M12 male connector plug-in face



PIN M12 male connector, 8-pin	PIN M23 male connector, 12-pin	Wire colors Cable connection	Signal	Explanation
1	6	Brown	COS -	Signal
2	5	White	COS +	Signal
3	1	Black	SIN -	Signal
4	8	Pink	SIN +	Signal
5	4	Yellow	Z_	Signal (do not use for safety-related operating modes)
6	3	Violet	Z	Signal (do not use for safety-related operating modes)
7	10	Blue	GND	Ground connection
8	12	Red	US	Supply voltage (volt-free to housing)
-	9	-	N. C.	Not connected
-	2	-	N. C.	Not connected
-	11	-	N. C.	Not connected
-	7	-	N. C.	Not connected
Shielding	Shielding	Shielding	Shielding	Shield connected with encoder housing Connected to ground on control side

Cable information

Permissible length of cable at maximum output frequency depending on supply voltage:

Connection type	+ US	Max. length of cable[1]
M12	4.5 V...5.0 V	50 m
M23	5.0 V...7.0 V	100 m
	7.0 V...30 V	150 m
Cable outlet	4.5 V...5.0 V	50 m - (4 x length of encoder cable)
	5.0 V...7.0 V	100 m - (4 x length of encoder cable)
	7.0 V...30 V	150 m - (4 x length of encoder cable)

[1] Data cable 4 x 2 x 0.25 mm2+ 2 x 0.5 mm2 + 1 x 0.14 mm² with shielding (for US, GND 2 x 0.5 mm²), part. no. 6027530

Accessories

The accessories are part of the safety-related function chain and must be assessed and validated accordingly by the user. This is not an integral part of the safety assessment carried out by SICK STEGMANN.

Flanges

Flange plate

Figure	Brief description	Type	Part no.
	Stator coupling, one-sided, 179 mm long with slot	On request	On request [1]
	Flange adapter, adaptation of face mount flange with 36 mm centering collar to 50 mm servo flange, aluminum, including 3 flat head screws M4 x 10	BEF-FA-036-050	2029160
	Flange adapter, adaptation of face mount flange with 36 mm centering collar to 60 mm square mounting plate, aluminum, including 3 flat head screws M4 x 10	BEF-FA-036-060REC	2029162
	Flange adapter, adaptation of face mount flange with 36 mm centering collar to 58 mm square mounting plate with shock absorbers, aluminum	BEF-FA-036-060RSA	2029163
	Flange adapter, adaptation of face mount flange with 36 mm centering collar to 63 mm square mounting plate, aluminum, including 3 flat head screws M4 x 10	BEF-FA-036-063REC	2034225
	Flange adapter, adaptation of face mount flange with 36 mm centering collar to 100 mm servo flange with 60 mm centering collar, aluminum	BEF-FA-036-100	2029161

[1] For more detailed information, please consult your local SICK subsidiary. The stator coupling is mounted ex works. The customer is not permitted to replace the stator coupling

Other mounting accessories

Servo clamps

Figure	Brief description	Type	Part no.
	Half-shell servo clamps (set of 2) for servo flanges with a 50 mm centering collar, not including mounting hardware	BEF-WG-SF050	2029165
	Servo clamps, large, for servo flanges (clamping claws, mounting eccentrics), (set of 3), not including mounting hardware	BEF-WK-SF	2029166

Miscellaneous

Figure	Brief description	Type	Part no.
	1 M4x16 cylinder head screw and 1 2x2x6 feather key acc. to DIN 6885	BE F-MK-SE01	2073617

8017880/2014-05-17
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Shaft adaptation

Shaft couplings

Figure	Brief description	Type	Part no.
	Bellows coupling, shaft diameter 6 mm / 6 mm, maximum shaft offset: radial +/- 0.25 mm, axial +/- 0.4 mm, angular +/- 4 °; max. speed 10,000 rpm, –30 ° to +120 ° Celsius, max. torque 80 Ncm; material: stainless steel bellows, aluminum clamping hubs, for use with key	KUP-0606-BP	2075379
	Bellows coupling, shaft diameter 6 mm / 10 mm, maximum shaft offset: radial +/- 0.25 mm, axial +/- 0.4 mm, angular +/- 4 °; max. speed 10,000 rpm, –30 ° to +120 ° Celsius, max. torque 80 Ncm; material: stainless steel bellows, aluminum clamping hubs, for use with key	KUP-0610-BP	2075375
	Bellows coupling, shaft diameter 10 mm / 10 mm, maximum shaft offset: radial +/- 0.25 mm, axial +/- 0.4 mm, angular +/- 4 °; max. speed 10,000 rpm, –30 ° to +120 ° Celsius, max. torque 80 Ncm; material: stainless steel bellows, aluminum clamping hubs, for use with key	KUP-1010-BP	2075373
	Bellows coupling, shaft diameter 6 mm / 6 mm, maximum shaft offset: radial +/- 0.25 mm, axial +/- 0.4 mm, angular +/- 4 °; max. speed 10,000 rpm, –30 ° to +120 ° Celsius, max. torque 80 Ncm; material: stainless steel bellows, 2 setscrews used in each case for fixing	KUP-0606-BS	2075378
	Bellows coupling, shaft diameter 6 mm / 10 mm, bellows coupling, shaft diameter 6 mm / 6 mm, maximum shaft offset: radial +/- 0.25 mm, axial +/- 0.4 mm, angular +/- 4 °; max. speed 10,000 rpm, –30 ° to +120 ° Celsius, max. torque 80 Ncm; material: stainless steel bellows, 2 setscrews used in each case for fixing	KUP-0610-BS	2075377
	Bellows coupling, shaft diameter 10 mm / 10 mm, maximum shaft offset: radial +/- 0.25 mm, axial +/- 0.4 mm, angular +/- 4 °; max. speed 10,000 rpm, –30 ° to +120 ° Celsius, max. torque 80 Ncm; material: stainless steel bellows, 2 setscrews used in each case for fixing	KUP-1010-BS	2075376

Plug connectors and cables

Connecting cables with female connector

Figure	Brief description	Length of cable	Type	Part no.
	Head A: female connector, M12, 8-pin, straight Head B: cable Cable: suitable for drag chain, PUR, shielded	2 m	DOL-1208-G02MAC1	6032866
		5 m	DOL-1208-G05MAC1	6032867
		10 m	DOL-1208-G10MAC1	6032868
		20 m	DOL-1208-G20MAC1	6032869
	Head A: female connector, M23, 12-pin, straight Head B: cable Cable: incremental, PUR, shielded	2 m	DOL-2312-G02MLA3	2030682
		7 m	DOL-2312-G07MLA3	2030685
		10 m	DOL-2312-G10MLA3	2030688
		15 m	DOL-2312-G15MLA3	2030692
		20 m	DOL-2312-G20MLA3	2030695
		25 m	DOL-2312-G25MLA3	2030699
		30 m	DOL-2312-G30MLA3	2030702
	Head A: female connector, M23, 12-pin, straight Head B: cable Cable: incremental, suitable for drag chain, PUR, shielded	1.5 m	DOL-2312-G1M5MA3	2029212
		3 m	DOL-2312-G03MMA3	2029213
		5 m	DOL-2312-G05MMA3	2029214
		10 m	DOL-2312-G10MMA3	2029215
		20 m	DOL-2312-G20MMA3	2029216
		30 m	DOL-2312-G30MMA3	2029217

Female connectors (ready to assemble)

Figure	Brief description	Type	Part no.
	Head A: female connector, M12, 8-pin, straight, A-coded, incremental, SSI, shielded, for cable diameter 4 mm ... 8 mm Head B: - Operating temperature: –40 °C ... +85 °C	DOS-1208-GA01	6045001
	Head A: female connector, M23, 12-pin, straight, shielded, for cable diameter 5.5 mm ... 10.5 mm Head B: - Operating temperature: –40 °C ... +125 °C	DOS-2312-G02	2077057

Cables (ready to assemble)

Figure	Brief description	Type	Part no.
	Head A: cable Head B: cable Cable: SSI, suitable for drag chain, PUR, halogen-free, shielded, 4 x 2 x 0.15 mm², Ø 5.6 mm	LTG-2308-MWENC	6027529
	Head A: cable Head B: cable Cable: SSI, PUR, shielded, 4 x 2 x 0.25 mm² + 2 x 0.5 mm² + 1 x 0.14 mm², Ø 7.5 mm	LTG-2411-MW	6027530
	Head A: cable Head B: cable Cable: SSI, suitable for drag chain, PUR, halogen-free, shielded, 4 x 2 x 0.25 mm² + 2 x 0.5 mm² + 2 x 0.14 mm², Ø 7.8 mm	LTG-2512-MW	6027531
	Head A: cable Head B: cable Cable: suitable for drag chain, PUR, halogen-free, shielded, resistant to UV and saltwater, 4 x 2 x 0.25 mm² + 2 x 0.5 mm² + 2 x 0.14 mm², Ø 7.8 mm	LTG-2612-MW	6028516

Male connector (ready to assemble)

Figure	Brief description	Type	Part no.
	Head A: male connector, M12, 8-pin, straight, A-coded, incremental, shielded, for cable diameter 4 mm ... 8 mm Head B: - Operating temperature: –40 °C ... +85 °C	STE-1208-GA01	6044892
	Head A: male connector, M23, 12-pin, straight, for cable diameter 5.5 mm ... 10.5 mm Head B: - Operating temperature: –40 °C ... +125 °C	STE-2312-G01	2077273

Suitable control solutions from SICK

Safety controllers

Figure	Type	Part no.
	FX3-CPU000000	1043783
	FX3-CPU130002	1043784
	FX3-CPU230002	1058999
	FX3-CPU320002	1059305

8017880/2014-05-17

Figure	Type	Part no.
	FX3-CPU130002	1043784

Motion control module

Figure	Type	Part no.
	FX3-MOC000000	1062344

I/O modules

Figure	Type	Part no.
	FX3-XTIO84002	1044125
	FX3-XTDI80002	1044124
	FX3-XTDS84002	1061777

Modules and gateways

Connection modules

Figure	Brief description	Type	Part no.
	Facility for connecting two encoders. Connection to Drive Monitor FX3-MOC: female connector, D-Sub HD, 15-pin.	Dual encoder connector box	2068729

Gateways

Figure	Type	Part no.
	FX0-GENT00000	1044072
	FX0-GMOD00000	1044073
	FX0-GPNT00000	1044074
	FX0-GETC00000	1051432
	FX0-GPRO00000	1044075
	FX0-GCAN00000	1044076
	FX0-GDEV00000	1044077
	FX0-STIO68002	1061778

Plug connectors and cables

Connecting cables with female connector

Figure	Brief description	Type	Part no.
	Head A: female connector, Micro D-Sub, 15-pin, straight Head B: cable Cable: shielded, 2 m For direct encoder connection	Connecting cable	2067893

Accessories for safety controllers

Connection cables with female and male connector

Brief description	Type	Part no.
Head A: female connector, Micro D-Sub, 15-pin, straight Head B: male connector, D-Sub-HD, 15-pin, straight Cable: shielded, 2 m For connecting the Drive Monitor FX3-MOC with a motor feedback splitter box or a dual encoder connector box	Connection cable	2067798
Head A: male connector, D-Sub-HD, 15-pin, straight Head B: female connector, Micro D-Sub, 15-pin, straight Cable: shielded, 10 m For connecting the Drive Monitor FX3-MOC with a motor feedback splitter box or a dual encoder connector box	Connection cable	2067799

Connection cables with male and male connector

Brief description	Type	Part no.
Head A: male connector, D-Sub-HD, 15-pin, straight Head B: male connector, D-Sub, 9-pin, straight Cable: shielded, 10 m For connecting two motor feedback splitter boxes	Connection cable	2067801

8017880/2014-05-17
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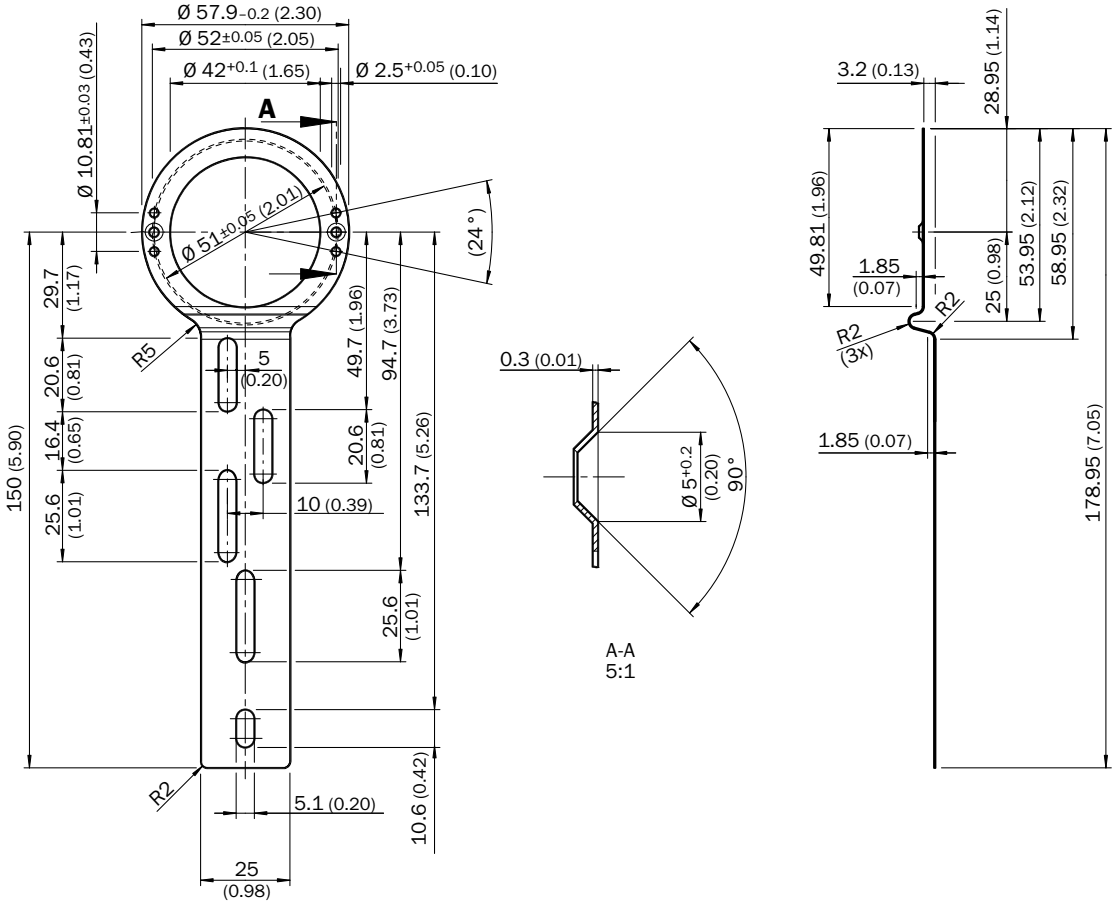
Brief description	Type	Part no.
Head A: male connector, D-Sub-HD, 15-pin, straight Head B: male connector, D-Sub, 9-pin, straight Cable: shielded, 2 m For connecting two motor feedback splitter boxes	Connection cable	2067800

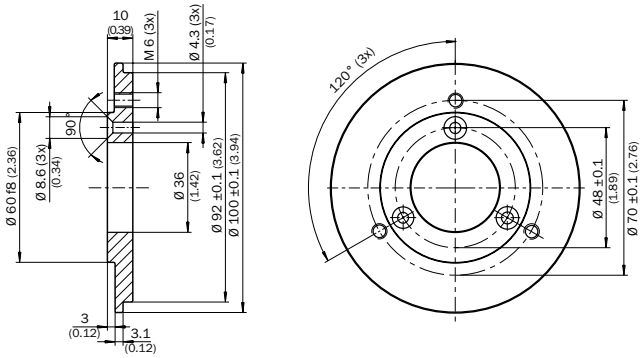
Dimensional drawings for accessories (dimensions in mm)

Flange plate

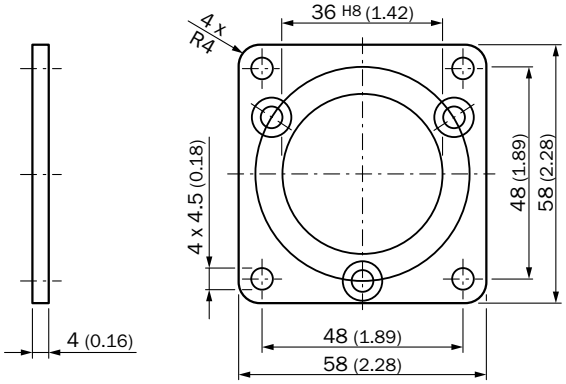
BEF-DS02DFS/VFS



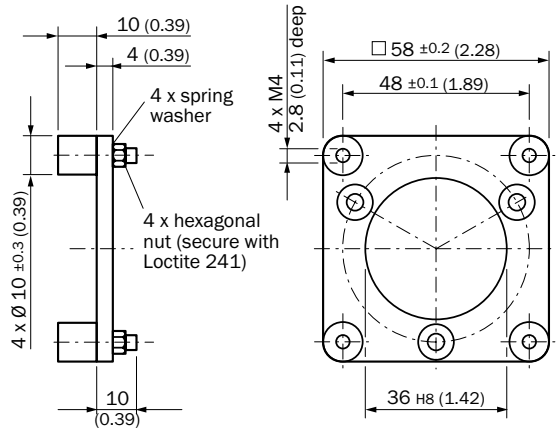
BEF-FA-036-050
BEF-FA-036-100



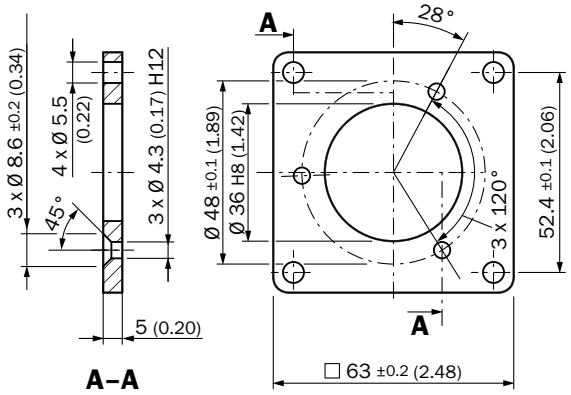
BEF-FA-036-060REC



BEF-FA-036-060RSA

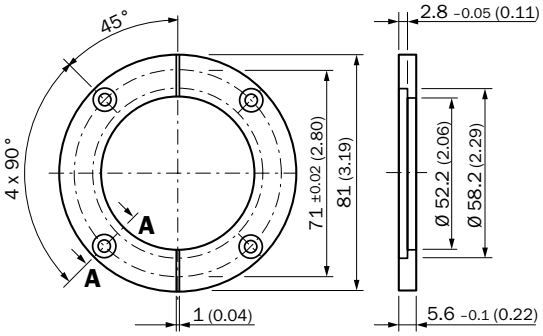


BEF-FA-036-063REC

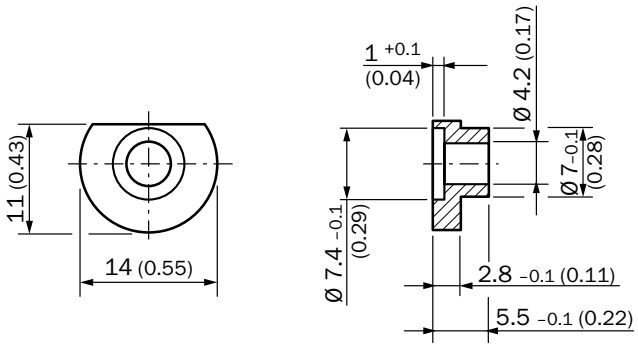


Servo clamps

BEF-WG-SF050

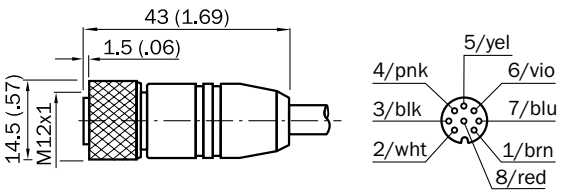


BEF-WK-SF



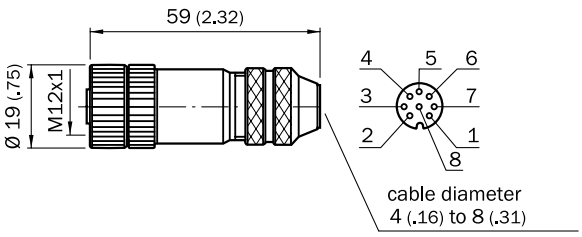
Connecting cables with female connector

DOL-1208-G02MAC1
DOL-1208-G05MAC1
DOL-1208-G10MAC1
DOL-1208-G20MAC1



Female connectors (ready to assemble)

DOS-1208-GA01

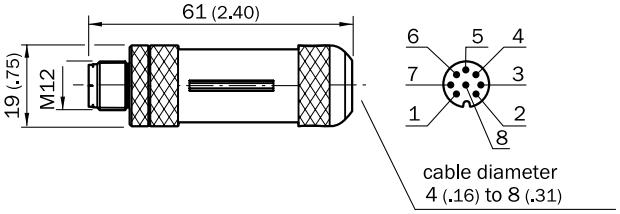


All dimensions in mm (inch)

8017880/2014-05-17

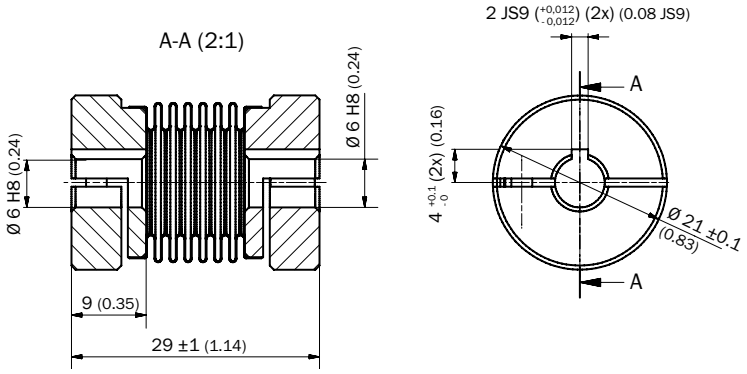
Male connector (ready to assemble)

STE-1208-GA01

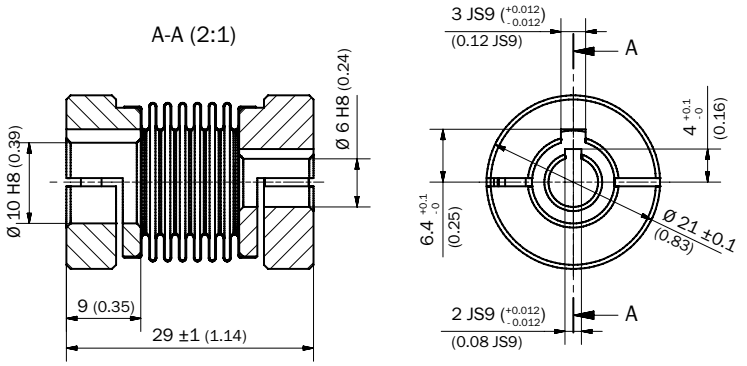


Shaft adaptation

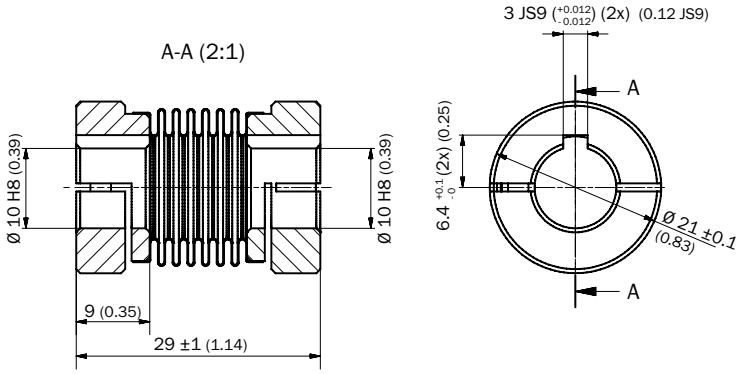
KUP-0606-BP



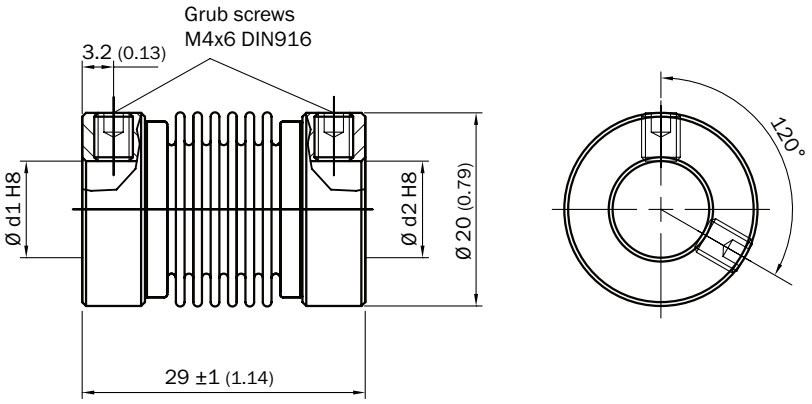
KUP-0610-BP



KUP-1010-BP



KUP-xxxx-BS



d1	d2	Part number	Type designation
10 mm	10 mm	2075376	KUP-1010-BS
06 mm	10 mm	2075377	KUP-0610-BS
06 mm	06 mm	2075378	KUP-0606-BS

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SICK AT A GLANCE

SICK is a leading manufacturer of intelligent sensors and sensor solutions for industrial applications. With almost 7,000 employees and over 50 subsidiaries and equity investments as well as numerous representative offices worldwide, we are always close to our customers. 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.

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