

FLEXIBLE, SMART, COMPACT







¹⁾ UL 508 compliant.

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Product description

The AHS/AHM36 SSI absolute encoder product family provides increased flexibility due to its mechanical adaptation, electrical connectivity, and SSI communication. With their rotating male connector or cable outlets as well as the various mounting hole patterns and adapter flanges, these encoders are suitable for nearly any application. The encoders are able to connect to a wide range of controls due to a programming tool that can be used to make individual adjustments

to the structure of the SSI protocol, in addition to adjusting the singleturn/multiturn resolution, the counting direction, and other parameters. Thanks to the large operating temperature range from $-40\text{ }^{\circ}\text{C}$... $+100\text{ }^{\circ}\text{C}$ and the protection class up to IP67, this encoder family can be used in harsh ambient conditions. The rugged, reliable, fully magnetic sensor system provides a maximum resolution of 14 bits for the singleturn variant and 26 bits for the multiturn variant.

At a glance

- Compact 36 mm absolute encoder with max. 26 bits (singleturn: 14 bits, multiturn: 12 bits)
- Face mount flange, servo flange, blind hollow shaft
- Rotating M12 male connector or rotating cable outlet
- SSI interface
- Programmable SSI version: Resolution, preset value, etc. can be programmed (depending on the type)
- Protection class up to IP67 (depending on the type)
- Operating temperature: $-40\text{ }^{\circ}\text{C}$... $+100\text{ }^{\circ}\text{C}$ (depending on the type)

Your benefits

- Simple, time-saving mechanical installation due to a rotating male connector or cable outlet, various mounting hole patterns, and many different shafts
- Simple and flexible electrical installation with various configuration options and adjustable SSI protocol structure (programmable SSI version)
- Easy setup for various applications allowing binary, non-binary, and non-integer resolutions with the round axis functionality (programmable SSI version)
- Reliable operation in harsh environments thanks to the rugged, reliable, fully magnetic sensor system
- Space-efficient and cost-effective design that is suitable for applications where space is tight
- High performance at a cost-efficient price

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Fields of application

- Measures the absolute position in various industries, machines, and tools, including automated guided systems (AGS), industrial trucks, commercial vehicles, packaging

machines, logistics applications, machine construction and medical technology

Detailed technical data

Performance

	Basic	Advanced
Max. number of steps per revolution	4,096 (12 bit)	16,384 (14 bit)
Max. number of revolutions		
Absolute singleturn	1	
Absolute multiturn	4,096 (12 bit)	
Resolution		
Absolute singleturn		
Non-programmable	256, 360, 512, 720, 1,024, 2,048, 3,600, 4,096	256, 360, 512, 720, 1,024, 2,048, 3,600, 4,096, 8,192, 16,384
Programmable ¹⁾	–	1 ... 16,384
Absolute multiturn		
Non-programmable	8x12 bit, 9x12 bit, 10x12 bit, 11x12 bit, 12x12 bit	8x12 bit, 9x12 bit, 10x12 bit, 11x12 bit, 12x12 bit, 13x12 bit, 14x12 bit
Programmable ¹⁾	–	0x0 bit ... 14x12 bit
Error limits	± 0.35 ° (at 20 °C)	
Repeatability	± 0.25 ° (at 20 °C)	± 0.2 ° (at 20 °C)
Measuring increment (360 ° / number of steps per revolution)	± 0.09 °	± 0.022 °
Initialization time	100 ms ²⁾	

¹⁾ Can be programmed using SICK programming tools.

²⁾ Position can be read after this period.

Interfaces

	Basic	Advanced
Electrical interface	SSI	
Code type		
Non-programmable	Gray	
Programmable	–	Gray, binary
Code sequence		
Non-programmable	CW/CCW, configurable via cable	
Programmable	–	CW/CCW, configurable via Programming Tool or cable
Interface signals	Clock +, Clock -, Data +, Data-	
Max. clock frequency	60 kHz ... 2 MHz ¹⁾	
Set (electronic adjustment)	H active (L = 0 ... 3 V, H = 4 ... 5 V)	
CW/CCW (counting sequence when turning)	L active (L = 0 ... 1 V, H = 2 ... 5 V)	
Configuration data	–	Number of steps per revolution, number of revolutions (multiturn only), PRESET, counting direction, code type, offset, position bits, position of error bit, round axis functionality (multiturn version only), SSI mode
Position forming time	125 µs	

¹⁾ Min. LOW level (Clock +) 500 ns.



Electrical data

	Basic	Advanced
Connection type	M12 male connector, 8-pin, universal Cable, 8-wire, universal, 0.5 m Cable, 8-wire, universal, 1.5 m Cable, 8-wire, universal, 3 m Cable, 8-wire, universal, 5 m	
Operating voltage range	4.5 V DC ... 32 V DC	
Max. power consumption without load	≤ 1.5 W	
Reverse polarity protection	✓	
MTTFd: mean time to dangerous failure ¹⁾	230 years (EN ISO 13849-1)	

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 devices, average ambient temperature 40 °C, frequency of use 8760 h/a. All electronic failures are considered hazardous. For more information, see document no. 8015532.

Mechanical data

	Basic	Advanced
Shaft diameter	Solid shaft 6 mm, 1/4", 8 mm, 3/8", 10 mm Blind hollow shaft 6 mm, 1/4", 8 mm, 3/8", 10 mm	
Start up torque	Solid shaft 0.5 Ncm (at 20 °C) Blind hollow shaft 0.5 Ncm (at 20 °C)	1 Ncm (at 20 °C) 1 Ncm (at 20 °C)
Operating torque	Solid shaft < 0.5 Ncm (at 20 °C) Blind hollow shaft < 0.5 Ncm (at 20 °C)	< 1 Ncm (at 20 °C) < 1 Ncm (at 20 °C)
Permissible shaft loading	Solid shaft 40 N (radial) 20 N (axial)	
Permissible shaft movement, static/dynamic	Blind hollow shaft ± 0.3 mm / ± 0.1 mm radial ± 0.3 mm / ± 0.1 mm axial	
Max. operating speed	Singleturn 9,000 rpm ¹⁾ Multiturn 6,000 rpm ¹⁾	6,000 rpm ^{2), 3)} 6,000 rpm ^{2), 3)}
Bearing lifetime	Solid shaft 3.6 x 10 ⁸ revolutions Blind hollow shaft 2.0 x 10 ⁹ revolutions	
Shaft material	Stainless steel	
Flange material	Aluminum	
Housing material	Zinc	
Cable material	PUR	
Mass	Solid shaft 0.12 kg (related to encoder with connector outlet) Blind hollow shaft 0.12 kg (related to encoder with connector outlet)	

¹⁾ Take into account self-heating of 3.5 K per 1,000 revolutions/min when designing the operating temperature range.

²⁾ Take into account self-heating of 5.5 K per 1,000 revolutions/min when designing the operating temperature range.

³⁾ For Advanced type encoders, the shaft seal must be inspected regularly.



	Basic	Advanced
Rotor moment of inertia		
Solid shaft	2.5 gcm ²	
Blind hollow shaft	15 gcm ²	
Max. angular acceleration	≤ 500,000 rad/s ²	

¹⁾ Take into account self-heating of 3.5 K per 1,000 revolutions/min when designing the operating temperature range.

²⁾ Take into account self-heating of 5.5 K per 1,000 revolutions/min when designing the operating temperature range.

³⁾ For Advanced type encoders, the shaft seal must be inspected regularly.

Ambient data

	Basic	Advanced
EMC	According to EN 61000-6-2 and EN 61000-6-3	
Enclosure rating	IP 65 on housing side (acc. to IEC 60529) ¹⁾ IP 65 on shaft side (acc. to IEC 60529)	IP 66 + IP 67, on housing side (acc. to IEC 60529) ¹⁾ IP 66 + IP 67, on shaft side (acc. to IEC 60529) ²⁾
Permissible relative humidity	90% (condensation not permitted)	
Operating temperature range	-20 °C ... +70 °C	-40 °C ... +100 °C
Storage temperature range	-40 °C ... +100 °C, without packaging	
Resistance to shocks	100 g/6 ms (according to EN 60068-2-27)	
Resistance to vibrations	20 g/10 Hz ... 2,000 Hz (according to EN 60068-2-6)	

¹⁾ In an assembled male connector.

²⁾ For Advanced type encoders, the shaft seal must be inspected regularly.

Type code

Singleturn

Type

B	Basic
A	Advanced

Mechanical design ¹⁾

B	A	Blind hollow shaft, 6 mm
B	B	Blind hollow shaft, 8 mm
B	C	Blind hollow shaft, 3/8"
B	D	Blind hollow shaft, 10 mm
B	K	Blind hollow shaft, 1/4"
S	1	Solid shaft, servo flange, 6x12 mm
S	9	Solid shaft, servo flange, 8x12 mm
S	2	Solid shaft, servo flange, 10x12 mm
S	A	Solid shaft, servo flange, 1/4"x12 mm
S	B	Solid shaft, servo flange, 3/8"x12 mm
S	3	Solid shaft, face mount flange, 6x12 mm
S	5	Solid shaft, face mount flange, 8x12 mm
S	4	Solid shaft, face mount flange, 10x12 mm
S	8	Solid shaft, face mount flange, 1/4"x12 mm
S	7	Solid shaft, face mount flange, 3/8"x12 mm
S	C	Solid shaft, face mount flange, 10x24 mm, for use with the adapters 2072298 and 2072295 ²⁾

Electrical interface

A	4,5 ... 32 V, SSI, gray
P	4,5 ... 32 V, SSI, gray/binary, programmable (type A only)

Connection type

C	M12, 8-pin, universal
J	Cable, 8-wire, universal, 0,5 m ³⁾
K	Cable, 8-wire, universal, 1,5 m ³⁾
L	Cable, 8-wire, universal, 3 m ³⁾
M	Cable, 8-wire, universal, 5 m ³⁾

Resolution

00256 ... 04,096	Steps per revolution (type B) ⁴⁾
00256 ... 16,384	Steps per revolution (type A) ⁴⁾

A	H	S	3	6	-						O				
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¹⁾ Flange adapters can be used for additional mechanical interfaces, see Mounting suggestions.

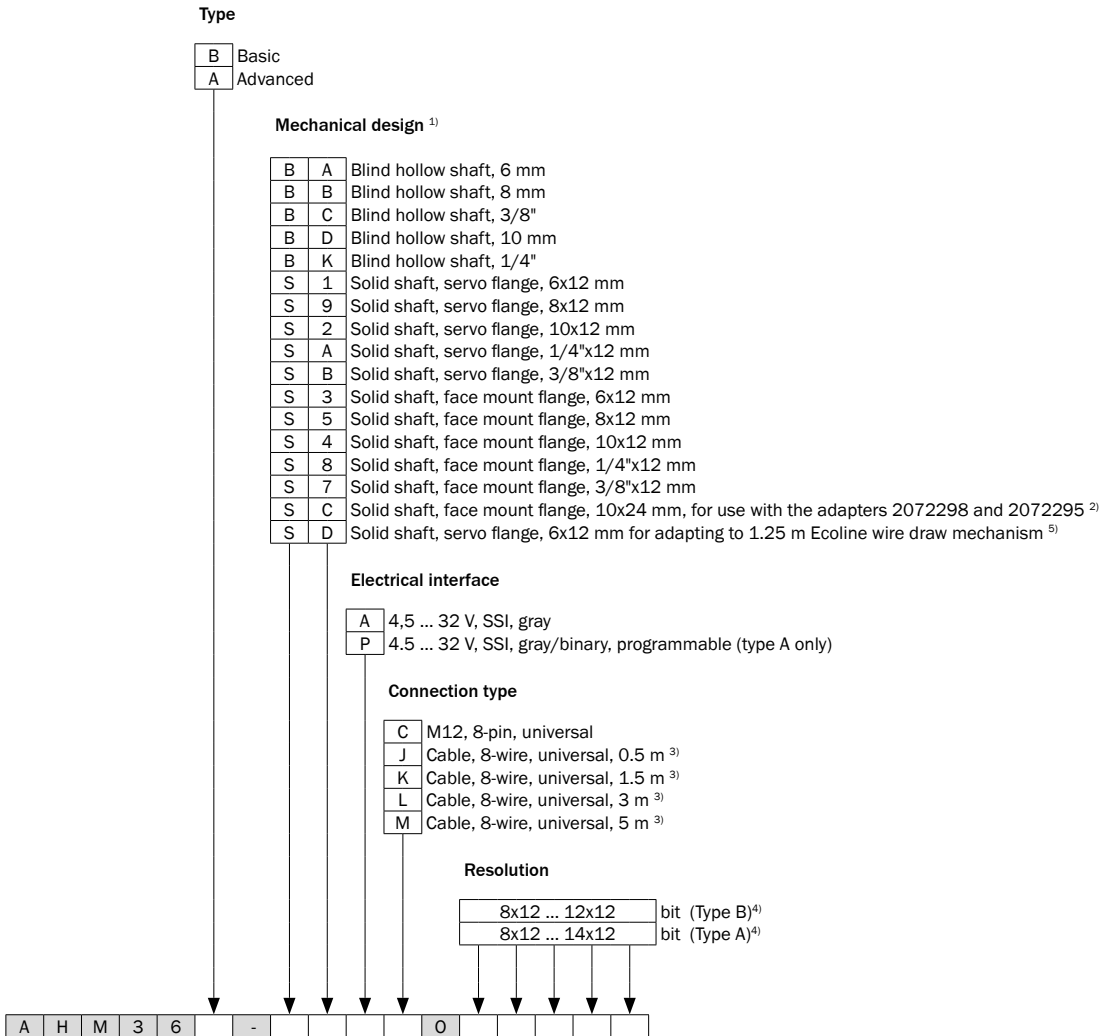
²⁾ Permissible shaft load lower than figure list in technical data.

³⁾ NRTL certificate only valid for operating temperatures from -40 °C ... + 85 °C.

⁴⁾ Number of steps for non-programmable devices: Basic: 256, 360, 512, 720, 1,024, 2,048, 3,600, 4,096 Advanced: 256, 360, 512, 720, 1,024, 2,048, 3,600, 4,096, 8,192, 16,384. Other steps available on request. Number of steps for programmable devices (Advanced only): 16,384, programmable using Programming Tool.



Multiturn



¹⁾ Flange adapters can be used for additional mechanical interfaces, see Mounting suggestions from page 17.
²⁾ Permissible shaft load lower than figure list in technical data.
³⁾ NRTL certificate only valid for operating temperatures from -40 °C ... + 85 °C.
⁴⁾ Resolution for non-programmable devices: Basic: 8x12, 9x12, 10x12, 11x12, 12x12. Advanced: 8x12, 9x12, 10x12, 11x12, 12x12, 13x12, 14x12. Other resolutions on request. Resolution for programmable devices (Advanced only): 14x12, programmable using Programming Tool.
⁵⁾ Protection class on shaft side always IP65.



Ordering information

Absolute singleturn, solid shaft, servo flange

- **Electrical interface:** SSI

Shaft diameter	Connection type	Number of steps	Resolution	Programmable	Type	Part no.
6 x 12 mm	M12 male connector, 8-pin, universal	4,096	4,096 x 1	-	AHS36B-S1AC004096	1066017
6 x 12 mm	M12 male connector, 8-pin, universal	≤ 16,384	16,384 x 1	✓	AHS36A-S1PC016384	1066014
	Cable, 8-wire, universal, 1.5 m	≤ 16,384	16,384 x 1	✓	AHS36A-S1PK016384	1066013

Absolute multiturn, solid shaft, servo flange

- **Electrical interface:** SSI

Shaft diameter	Connection type	Number of steps	Resolution	Programmable	Type	Part no.
6 x 12 mm	M12 male connector, 8-pin, universal	4,096	4,096 x 4,096	-	AHM36B-S1AC012x12	1066012
6 x 12 mm	M12 male connector, 8-pin, universal	≤ 16,384	16,384 x 4,096	✓	AHM36A-S1PC014x12	1066009
	Cable, 8-wire, universal, 1.5 m	≤ 16,384	16,384 x 4,096	✓	AHM36A-S1PK014x12	1066008

Absolute singleturn, solid shaft, face mount flange

- **Electrical interface:** SSI

Shaft diameter	Connection type	Number of steps	Resolution	Programmable	Type	Part no.
8 x 12 mm	M12 male connector, 8-pin, universal	16,384	16,384 x 1	-	AHS36A-S5AC016384	1067269



Absolute multiturn, solid shaft, face mount flange

- **Electrical interface:** SSI

Shaft diameter	Connection type	Number of steps	Resolution	Programmable	Type	Part no.
6 x 12 mm	M12 male connector, 8-pin, universal	≤ 16,384	16,384 x 4,096	✓	AHM36A-S3PC014x12	1066007
	Cable, 8-wire, universal, 1.5 m	≤ 16,384	16,384 x 4,096	✓	AHM36A-S3PK014x12	1066006

Absolute singleturn, blind hollow shaft

- **Electrical interface:** SSI

Shaft diameter	Connection type	Number of steps	Resolution	Programmable	Type	Part no.
6 mm	M12 male connector, 8-pin, universal	≤ 16,384	16,384 x 1	✓	AHS36A-BAPC016384	1066016
	Cable, 8-wire, universal, 1.5 m	≤ 16,384	16,384 x 1	✓	AHS36A-BAPK016384	1066015

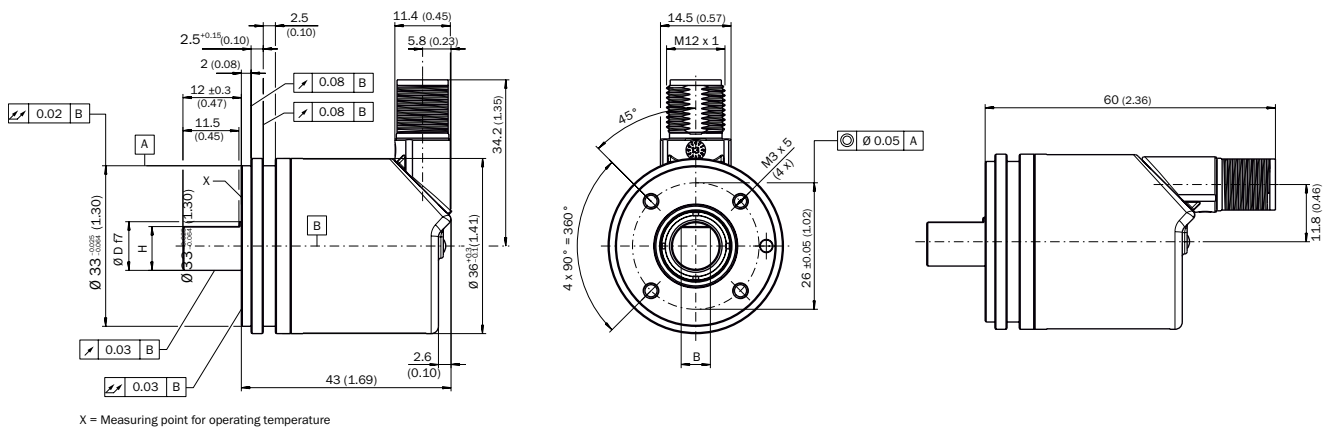
Absolute multiturn, blind hollow shaft

- **Electrical interface:** SSI

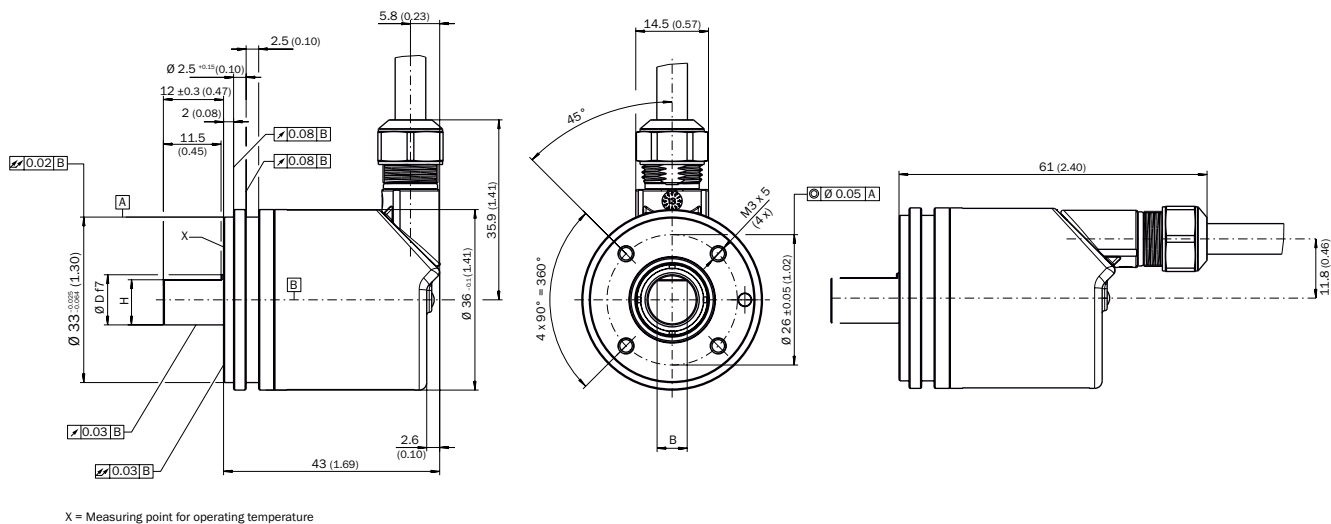
Shaft diameter	Connection type	Number of steps	Resolution	Programmable	Type	Part no.
6 mm	M12 male connector, 8-pin, universal	≤ 16,384	16,384 x 4,096	✓	AHM36A-BAPC014x12	1066011
	Cable, 8-wire, universal, 1.5 m	≤ 16,384	16,384 x 4,096	✓	AHM36A-BAPK014x12	1066010

Dimensional drawings (dimensions in mm)

Solid shaft, servo flange, M12 male connector



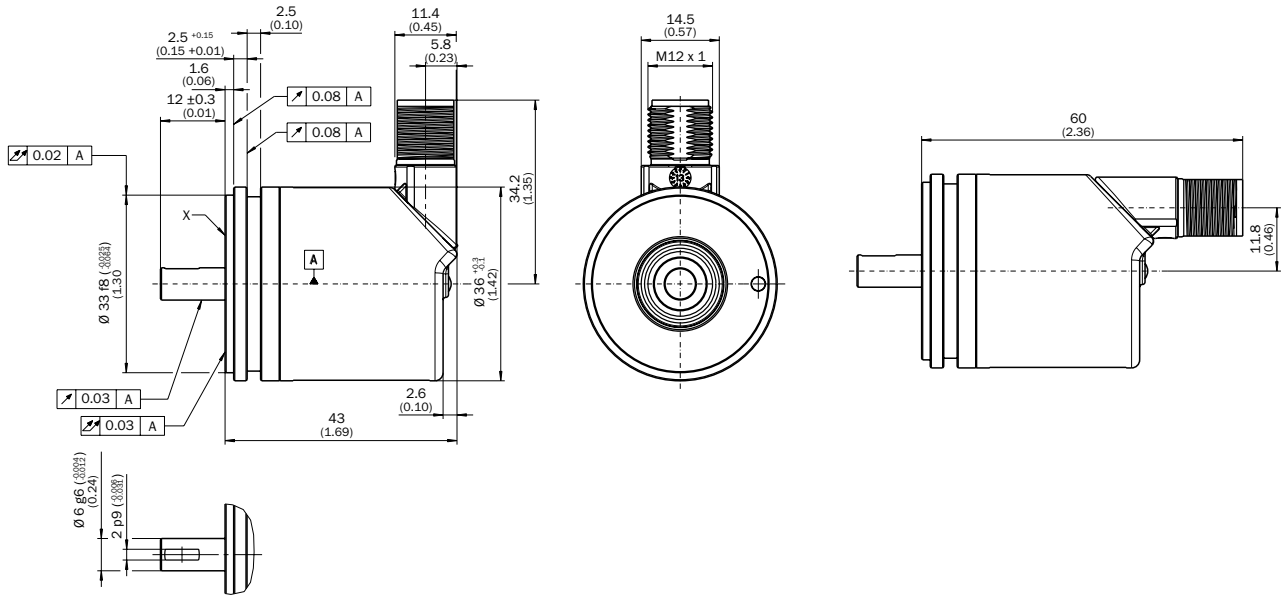
Solid shaft, servo flange, cable output



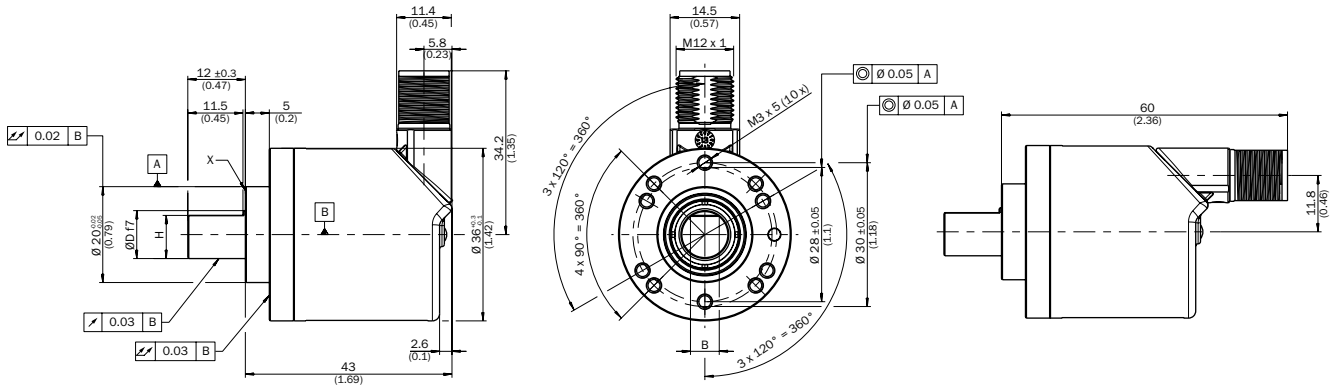
Bend radius of cable; R = 30 mm



Solid shaft, servo flange, for adapting to 1.25 m Ecoline wire draw mechanism, SD mechanical design

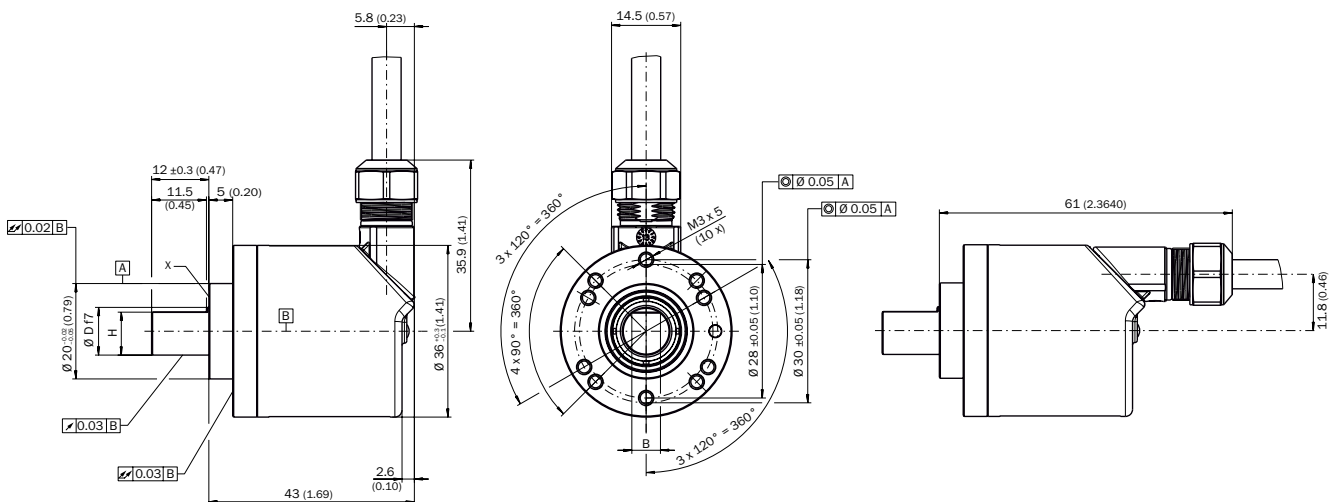


Solid shaft, face mount flange, M12 male connector



X = Measuring point for operating temperature

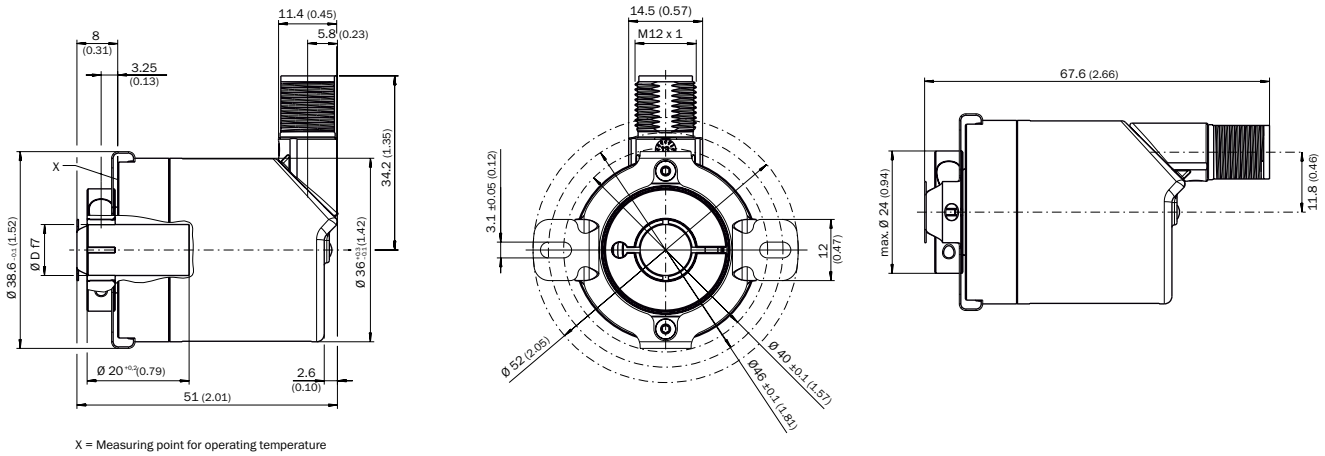
Solid shaft, face mount flange, cable output



X = Measuring point for operating temperature

Bend radius of cable; R = 30 mm

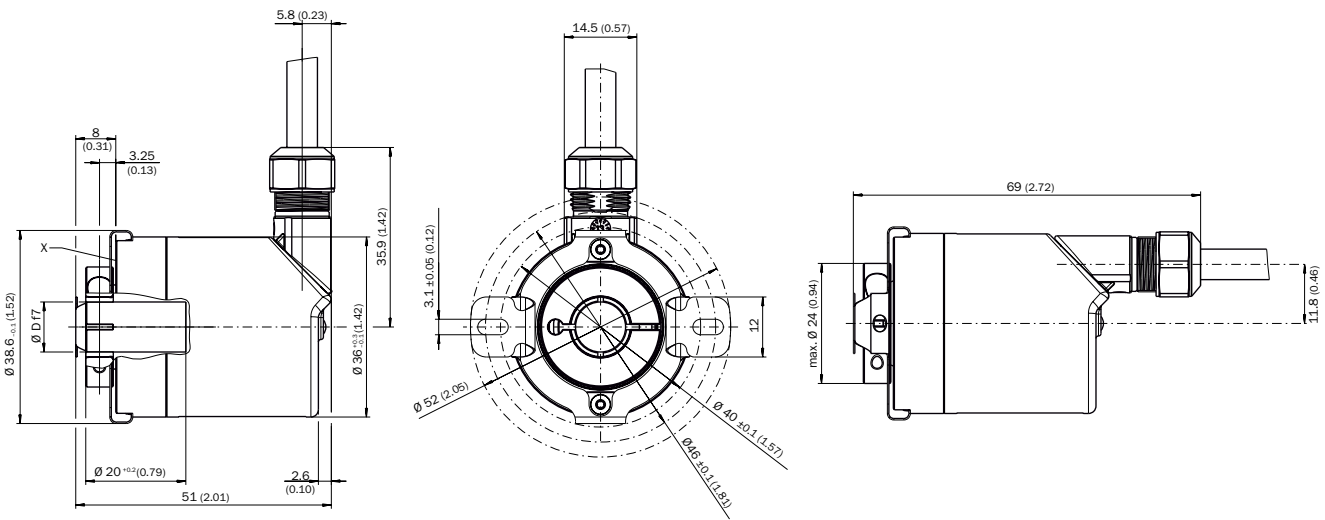
Blind hollow shaft, M12 male connector



X = Measuring point for operating temperature

Customer's own shaft: insertion depth of at least 15 mm to max. of 22 mm, from contact surface, from stator coupling, recommended shaft tolerance of k7

Blind hollow shaft, cable outlet



X = Measuring point for operating temperature

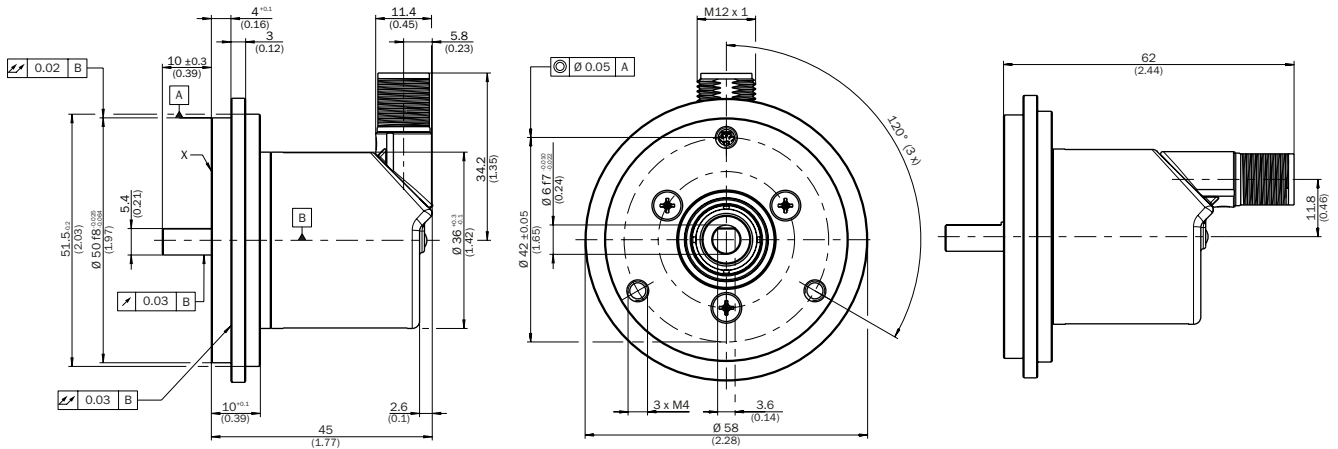
Bend radius of cable; R = 30 mm

Customer's own shaft: insertion depth of at least 15 mm to max. of 22 mm, from contact surface, from stator coupling, recommended shaft tolerance of k7



Proposed fitting

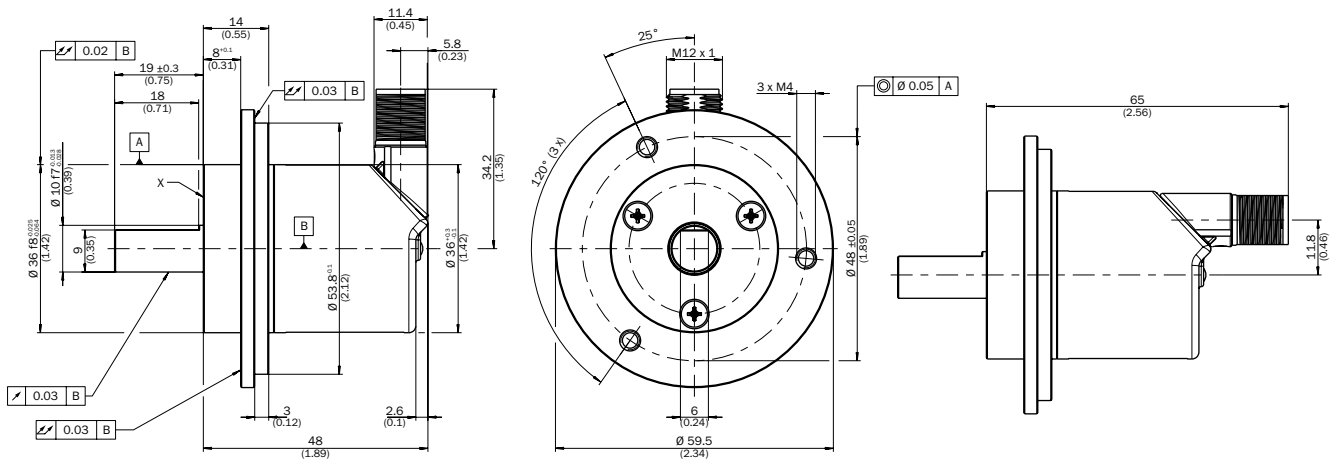
Solid shaft, face mount flange with flange adapter, centering hub D20 to D50 (BEF-FA-020-050, 2072297)



X = Measuring point for operating temperature

Sample order for 6 mm shaft diameter: AHx36x-S3xx0xxxx + BEF-FA-020-050 (adapter is not pre-assembled)

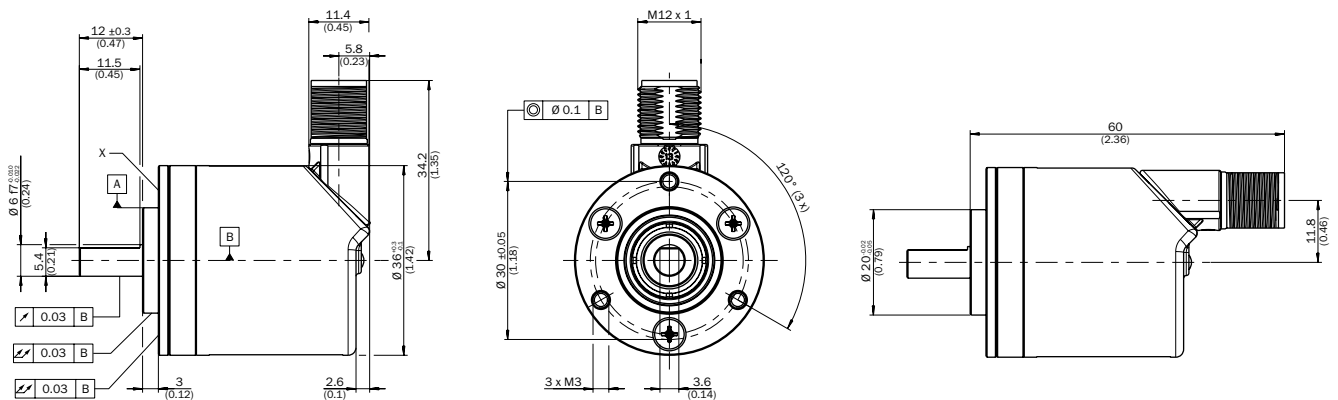
Solid shaft, face mount flange with flange adapter, centering hub D20 to D36 (BEF-FA-020-036, 2072298)



X = Measuring point for operating temperature

Sample order for 10 mm shaft diameter: AHx36x-SCxx0xxxx + BEF-FA-020-036 (adapter is not pre-assembled)

Solid shaft, face mount flange with flange adapter, centering hub D20 to D36, 2 mm high (BEF-FA-020-036-002, 2072296)

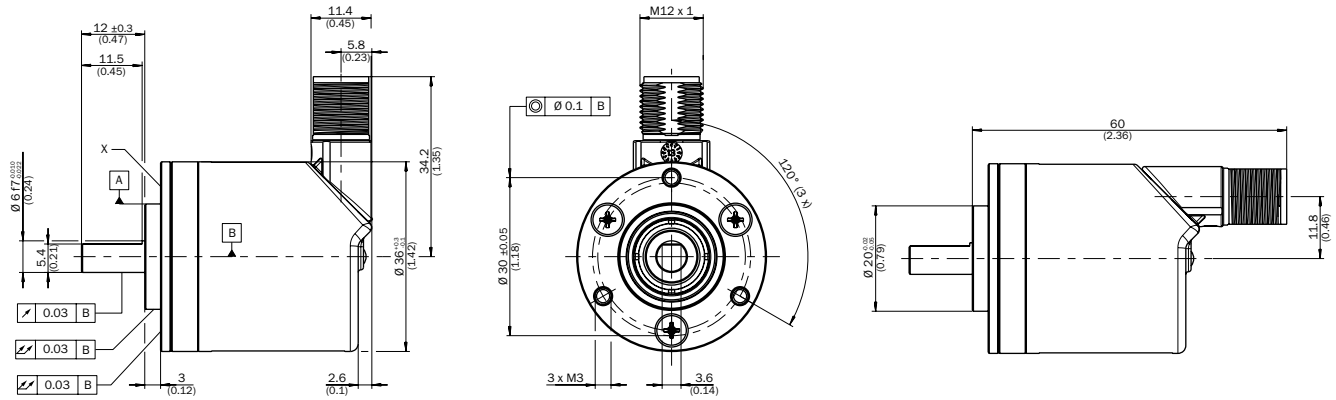


X = Measuring point for operating temperature

Sample order for 6 mm shaft diameter: AHx36x-S3xx0xxxx + BEF-FA-020-036-002 (adapter is not pre-assembled)

G

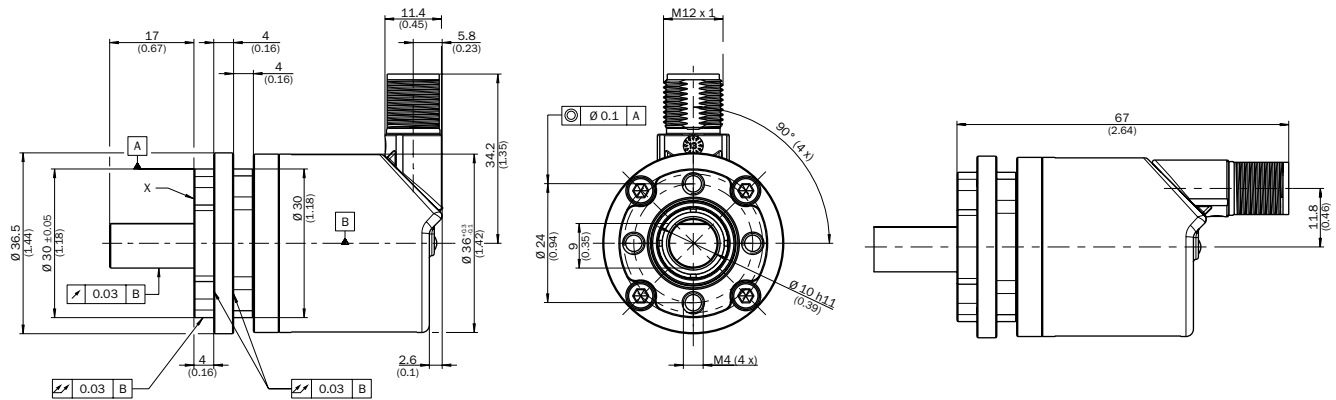
Solid shaft, face mount flange with flange adapter, centering hub D20 to D24 (BEF-FA-020-024, 2072294)



X = Measuring point for operating temperature

Sample order for 6 mm shaft diameter: AHx36x-S3xx0xxxx + BEF-FA-020-024 (adapter is not pre-assembled)

Solid shaft, face mount flange with flange adapter, centering hub D20 to D30 (BEF-FA-020-030, 2072295)



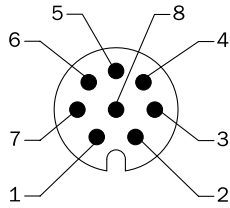
X = Measuring point for operating temperature

Sample order for 10 mm shaft diameter: AHx36x-SCxx0xxxx + BEF-FA-020-030 (adapter is not pre-assembled)



PIN assignment

View of M12 male device connector on encoder



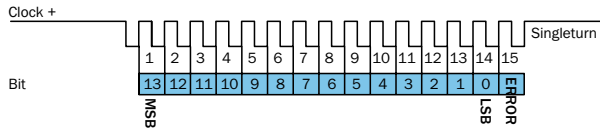
PIN, 8-pin, M12 male connector	Wire colors, cable outlet	Signal	Explanation
1	Brown	Data-	Interface signals
2	White	Data+	Interface signals
3	Black	V/ \bar{R}	Sequence for direction of rotation
4	Pink	SET	Electronic adjustment
5	Yellow	Clock+	Interface signals
6	Lilac	Clock-	Interface signals
7	Blue	GND	Ground connection
8	Red	+US	Operating voltage
Screen	Screen	Screen	Screen connected to housing on encoder side. Connected to ground on control side.

V/ \bar{R} Forwards / Reverse: This input programs the counting direction for the encoder. When it is not connected, this input is set to HIGH. If the encoder shaft is rotated clockwise (to the right) as viewed when facing the shaft, it counts in ascending order. If it should count in ascending order when the shaft is rotated counterclockwise (to the left), then this connection must be permanently set to LOW level (GND).

SET This input is for electronic zeroing. If the SET cable is set to US for more than 250 ms, the mechanical position corresponds to the 0 value, i. e., the predetermined SET value.

Singleturn signal outputs

Singleturn SSI data format



Cycle 1–14: position bits
Cycle 15: errorbit

Non-programmable encoder

Non-programmable encoders always output the SSI position MSB-justified (left-justified).

- 14 bits + 1 errorbit are always output (irrespective of the type and resolution selected)
- For resolutions below 14 bits, non-assigned bits are filled with 0.

Programmable encoder

- Per default, programmable encoders output the SSI position MSB-justified (left-justified).
- The operating modes “binary” and “non-binary” can be selected to set the resolution.
- All formats (left and right-justified) can be covered by shifting the bits in the programming interface accordingly using the arrow keys.

Errorbit

ERROR: general error This bit is set as soon as an error occurs in the encoder. This bit remains set as long as the error is present. In non-programmable encoders, the errorbit is always output as the 15th bit. In programmable encoders, it can also be output as the 15th bit or can be transmitted directly after the position bits.

The evaluation of the errorbit must be implemented in the control unit.

The errorbit output need not be used by the control unit.

If the errorbits cannot be evaluated in the control unit, the control unit must be set to the encoder resolution.

The errorbits must then be masked out at the control.

SSI mode:

Non-programmable encoders work in asynchronous SSI mode.

In programmable encoders, the programming interface enables users to choose between asynchronous and synchronous SSI mode. Asynchronous SSI mode is selected as the default setting.

Asynchronous SSI mode:

The position is always formed and made available every 125 μ s. The time for calculating the position is not related to the master clock. In asynchronous SSI mode, the break between two clock bursts must remain constant with a maximum deviation of $\pm 20\%$ and must not exceed 600 ms.

Synchronous SSI mode:

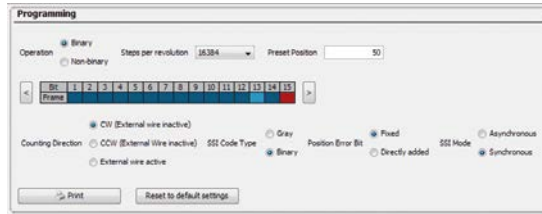
The position is formed in sync with the master clock output, i.e., the time of the position values is related to the time of the master clock.

The position formation process begins 20 μ s following the end of a clock burst. The position is then made available after 125 μ s. The next position is formed a further 20 μ s after the end of the subsequent clock burst. The break between two clock bursts must be at least 150 μ s.

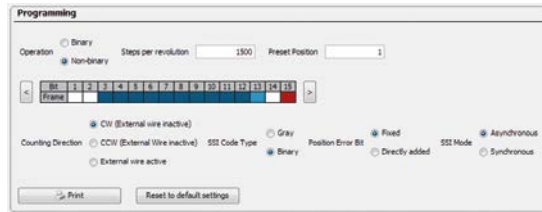
Programming interface and legend

- > Position Bits:
These bits contain the position within the transmission frame. Depending on the setting the position format is either gray or binary.
- > Error Bit:
In case the device enters the error state this bit is set high.
- > Zero Bit:
Zeros are transmitted in order to fill up the transmission frame.

Operating mode: binary

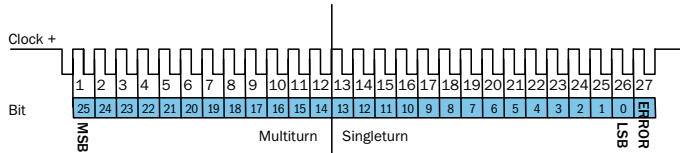


Operating mode: non binary



Multiturn signal outputs

Multiturn SSI data format



Cycle 1-12: multiturn position bits
Cycle 13-26: singleturn position bits
Cycle 27: errorbit

Non-programmable encoder

Non-programmable encoders always output the SSI position MSB-justified (left-justified).

- For non-programmable multiturn encoders, the number of revolutions is set to a fixed 4,096 (12 bits).
- 26 bits + 1 errorbit are always output (irrespective of the type and resolution selected).

For resolutions below 26 bits, non-assigned bits are filled with 0.

Programmable encoder

- Per default, programmable encoders output the SSI position MSB-justified (left-justified).
- The operating modes “binary”, “non-binary” and “round axis functionality” can be selected to set the resolution.
- All formats (left and right-justified, 25 bit mode and fir-tree format) can be covered by shifting the bits in the programming interface accordingly using the arrow keys.

Errorbit

ERROR: general error This bit is set as soon as an error occurs in the encoder. This bit remains set as long as the error is present. In non-programmable encoders, the errorbit is always output as the 27th bit. In programmable encoders, it can also be output as the 27th bit or can be transmitted directly after the position bits.

The evaluation of the errorbit must be implemented in the control unit.

The errorbit output need not be used by the control unit.

If the errorbits cannot be evaluated in the control unit, the control unit must be set to the encoder resolution.

The errorbits must then be masked out at the control.

SSI mode:

Non-programmable encoders work in asynchronous SSI mode.

In programmable encoders, the programming interface enables users to choose between asynchronous and synchronous SSI mode. Asynchronous SSI mode is selected as the default setting.

Asynchronous SSI mode:

The position is always formed and made available every 125 μ s. The time for calculating the position is not related to the master clock. In asynchronous SSI mode, the break between two clock bursts must remain constant with a maximum deviation of $\pm 20\%$ and must not exceed 600 ms.

Synchronous SSI mode:

The position is formed in sync with the master clock output, i.e., the time of the position values is related to the time of the master clock.

The position formation process begins 20 μ s following the end of a clock burst. The position is then made available after 125 μ s. The next position is formed a further 20 μ s after the end of the subsequent clock burst. The break between two clock bursts must be at least 150 μ s.

Round axis functionality

The programmable multi-turn encoder supports the gear functions for rotary axes (endless shaft). Here, the number of revolutions is set a break; a total number of steps is also set. The total number of steps is distributed over the set number of revolutions, e. g. 100 steps to 12.5 revolutions (see example for the programming interface on the next page).

The round axis functionality can be used to implement a number for the overall resolution that is not a 2n multiple of the number of steps per revolution. It is also possible to set a non-integer number both for the number of revolutions and for the number of steps per revolution.

Programming interface and legend

- -> Multi Bits:
These bits contain the number of revolutions. In particular, this is important for the binary mode, because the multi part is separated from the single part within the transmission frame.
- -> Single Bits:
In binary mode the transmission frame contains a multi- and single part. The multi part shows the number of turns and the single part the position within one revolution.
- -> Error Bit:
This bit is set high in case the device enters an error state.
- > Zero Bit:
Zeros are transmitted in order to fill up the transmission frame.
- -> Position Bits:
These bits contain the position within the transmission frame. Depending on the setting the position format is either gray or binary.

Operating mode: binary

Programming

Operation: Binary Steps per revolution: 16384
 Non-binary Number of revolutions: 4096
 Round Axis Total measuring range: 67108864 Preset Position: 1

Bit Frame: [1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27]

Counting Direction: CW (External wire inactive)
 CCW (External Wire inactive) External wire active

SSI Code Type: Gray Binary

Position Error Bit: Fixed Directly added

SSI Mode: Asynchronous Synchronous

Buttons: Print, Reset to default settings

Operating mode: non binary

Programming

Operation Mode: Binary Scaling Parameter: Steps per revolution: 3000
 Non-binary Number of revolutions: 15
 Round Axis Total measuring range: 45000 Preset Position: 1500

Bit Frame: [Clock 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22]

Counting Direction: CW (Encoder wire/pin inactive)
 CCW (Encoder wire/pin inactive) Encoder wire/pin active

SSI Code Type: Gray Binary

Position Error Bit: Fixed Directly added

SSI Mode: Asynchronous Synchronous

Buttons: Print, Reset to default settings

Operating mode: rotary axis

Programming

Operation Mode: Binary Scaling Parameter: Number of revolutions Numerator: 50 = 12.5 Number of revolutions
 Non-binary Number of revolutions Denominator: 4
 Round Axis Total measuring range: 100 = 8 Steps per revolution Preset Position: 1

Bit Frame: [Clock 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15]

Counting Direction: CW (Encoder wire/pin inactive)
 CCW (Encoder wire/pin inactive) Encoder wire/pin active

SSI Code Type: Gray Binary

Position Error Bit: Fixed Directly added

SSI Mode: Asynchronous Synchronous

Buttons: Print, Reset to default settings


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Recommended accessories

Mounting systems






Mounting brackets and plates

Mounting bracket

Figure	Brief description	Type	Part no.
	Mounting bracket for encoder with centering hub 20 mm, including mounting kit for face mount flange	BEF-WF-20	2066393

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Flanges

Figure	Brief description	Type	Part no.
	Stator coupling on hole circle 63 mm	BEF-DS08	2072206
	Flange adapter centering hub D20 to D24	BEF-FA-020-024	2072294
	Flange adapter centering hub D20 to D30	BEF-FA-020-030	2072295
	Flange adapter centering hub D20 to D36	BEF-FA-020-036	2072298
	Flange adapter centering hub D20 to D36, 2 mm high	BEF-FA-020-036-002	2072296
	Flange adapter centering hub D20 to D50	BEF-FA-020-050	2072297

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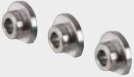
Other mounting accessories

Measuring wheels and measuring wheel systems

Figure	Brief description	Type	Part no.
	Measuring wheel with O-ring (NBR70) for 6 mm solid shaft, circumference 200 mm	BEF-MR006020R	2055222
	Measuring wheel with O-ring (NBR70) for 6 mm solid shaft, circumference 300 mm	BEF-MR006030R	2055634
	O-ring for measuring wheels (circumference 200 mm)	BEF-OR-053-040	2064061
	O-ring for measuring wheels (circumference 300 mm)	BEF-OR-083-050	2064076

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Servo clamps

Figure	Brief description	Type	Part no.
	Servo clamps, small, for servo flange (clamps, eccentric fastener), 3 pcs., without mounting material	BEF-WK-RESOL	2039082

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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 $\pm 4^\circ$; max. speed 10,000 rpm, $-30^\circ\text{C} \dots +120^\circ\text{C}$, max. torque 80 Ncm; material: stainless steel bellows, aluminum hub	KUP-0606-B	5312981
	Bellows coupling, shaft diameter 6 mm / 10 mm, maximum shaft offset: radial ± 0.25 mm, axial ± 0.4 mm, angular $\pm 4^\circ$; max. speed 10,000 rpm, $-30^\circ\text{C} \dots +120^\circ\text{C}$, max. torque 80 Ncm; material: stainless steel bellows, aluminum hub	KUP-0610-B	5312982
	Bellows coupling, shaft diameter 10 mm/10 mm; maximum shaft offset: radial ± 0.25 mm, axial ± 0.4 mm, angular $\pm 4^\circ$; max. revolutions 10,000 rpm, $-30^\circ\text{C} \dots +120^\circ\text{C}$, max. torque 80 Ncm; material: stainless steel bellows, aluminum clamping hubs	KUP-1010-B	5312983
	Bellows coupling, shaft diameter 10 mm/12 mm; maximum shaft offset: radial ± 0.25 mm, axial ± 0.4 mm, angular $\pm 4^\circ$; max. revolutions 10,000 rpm, $-30^\circ\text{C} \dots +120^\circ\text{C}$, max. torque 80 Ncm; material: stainless steel bellows, aluminum clamping hubs	KUP-1012-B	5312984
	Double-loop coupling, shaft diameter 6 mm/10 mm, maximum shaft offset: radial ± 2.5 mm, axial ± 3 mm, angular $\pm 10^\circ$; max. speed 3,000 rpm, $-30^\circ\text{C} \dots +80^\circ\text{C}$, max. torque 1.5 Nm; material: polyurethane, galvanized steel flange	KUP-0610-D	5326697
	Double-loop coupling, shaft diameter 8 mm/10 mm, maximum shaft offset: radial ± 2.5 mm, axial ± 3 mm, angular $\pm 10^\circ$; max. speed 3,000 rpm, $-30^\circ\text{C} \dots +80^\circ\text{C}$, max. torque 1.5 Nm; material: polyurethane, galvanized steel flange	KUP-0810-D	5326704
	Double-loop coupling, shaft diameter 10 mm/10 mm, maximum shaft offset: radial ± 2.5 mm, axial ± 3 mm, angular $\pm 10^\circ$; max. speed 3,000 rpm, $-30^\circ\text{C} \dots +80^\circ\text{C}$, max. torque 1.5 Nm; material: polyurethane, galvanized steel flange	KUP-1010-D	5326703
	Double-loop coupling, shaft diameter 10 mm/12 mm, maximum shaft offset: radial ± 2.5 mm, axial ± 3 mm, angular $\pm 10^\circ$; max. speed 3,000 rpm, $-30^\circ\text{C} \dots +80^\circ\text{C}$, max. torque 1.5 Nm; material: polyurethane, galvanized steel flange	KUP-1012-D	5326702
	Spring washer coupling, shaft diameter 6 mm/10 mm, maximum shaft offset: radial ± 0.3 mm, axial ± 0.4 mm, angular $\pm 2.5^\circ$; max. speed 12,000 rpm, $-10^\circ\text{C} \dots +80^\circ\text{C}$, max. torque 60 Ncm; material: aluminum flange, fiber-glass reinforced polyamide membrane and tempered steel coupling pin	KUP-0610-F	5312985
	Spring washer coupling, shaft diameter 10 mm / 10 mm, maximum shaft offset: radial ± 0.3 mm, axial ± 0.4 mm, angular $\pm 2.5^\circ$; max. speed 12,000 rpm, $-10^\circ\text{C} \dots +80^\circ\text{C}$, max. torque 60 Ncm; material: aluminum flange, glass fiber-reinforced polyamide membrane and hardened steel coupling pin	KUP-1010-F	5312986




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Connectivity


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, PVC, shielded, 4 x 2 x 0.25 mm ² , Ø 7.0 mm	2 m	DOL-1208-G02MAC1	6032866
		5 m	DOL-1208-G05MAC1	6032867
		10 m	DOL-1208-G10MAC1	6032868
		20 m	DOL-1208-G20MAC1	6032869



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Female connectors (ready to assemble)

Figure	Brief description	Type	Part no.
	Head A: female connector, M12, 8-pin, straight, A encoded, shielded, for cable diameter 4 mm ... 8 mm Head B: - Operating temperature: $-40^\circ\text{C} \dots +85^\circ\text{C}$	DOS-1208-GA01	6045001



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Male connectors (ready to assemble)

Figure	Brief description	Type	Part no.
	Head A: male connector, M12, 8-pin, straight, A encoded, 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, shielded, for cable diameter 5.5 mm ... 10.5 mm Head B: - Operating temperature: -20 °C ... +130 °C	STE-2312-G	6027537

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Cables (ready to assemble)

Figure	Brief description	Length of cable	Type	Part no.
	Head A: cable Head B: cable Cable: suitable for drag chain, PUR, halogen-free, shielded, 4 x 2 x 0.15 mm ² , Ø 5.6 mm	By the meter	LTG-2308-MWENC	6027529
	Head A: cable Head B: cable Cable: suitable for drag chain, PUR, halogen-free, shielded, UV and saltwater-resistant, 4 x 2 x 0.25 mm ² + 2 x 0.5 mm ² + 2 x 0.14 mm ² , Ø 7.8 mm		LTG-2612-MW	6028516

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Connection cables with female and male connector

Figure	Brief description	Length of cable	Type	Part no.
	Head A: female connector, M12, 8-pin, straight Head B: male connector, D-Sub, 9-pin, straight Cable: PUR, halogen-free, shielded, 4 x 2 x 0.15 mm ²	0.5 m	DSL-2D08-G0M5AC2	2048439

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Other accessories

Programming and configuration tools

Figure	Brief description	Type	Part no.
	Programming unit USB, for programmable SICK encoders AFS60, AFM60, DFS60, VFS60, DFV60 and wire draw encoders with programmable encoder.	PGT-08-S	1036616
	Programming unit display for programmable SICK DFS60, DFV60, AFS/AFM60, AHS/AHM36 encoders, and wire draw encoders with DFS60, AFS/AFM60, and AHS/AHM36. Compact dimensions, low weight, and intuitive operation.	PGT-10-Pro	1072254

Dimensional drawings → [page K-725](#)→ For additional accessories, please see [page K-668 onwards](#)