

AFM60E-S4AA000S15

AFS/AFM60 SSI

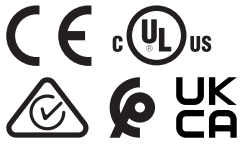
ABSOLUTE ENCODERS

SICK
Sensor Intelligence.

Illustration may differ

Ordering information

Type	part no.
AFM60E-S4AA000S15	1081202

Other models and accessories → www.sick.com/AFS_AFM60_SSI

Detailed technical data

Features

Special device	✓
Specialty	Customer specific Encoder flange: face mount flange with servo slot Shaft sealing: IP67 on the shaft, starting torque < 1 Ncm Plug, M23, 12-pin, radial, customized pin assignment Optional accessory: customer specific half-shell servo clamps (please order separately: 2088848 BEF-WG-SF050S1)
Standard reference device	AFM60E-S4AA004096, 1037435

Safety-related parameters

MTTF_D (mean time to dangerous failure)	250 years (EN ISO 13849-1) ¹⁾
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¹⁾ This product is a standard product and does not constitute a safety component as defined in the Machinery Directive. Calculation based on nominal load of components, average ambient temperature 40 °C, frequency of use 8760 h/a. All electronic failures are considered hazardous. For more information, see document no. 8015532.

Performance

Number of steps per revolution (max. resolution)	4,096 (12 bit)
Number of revolutions	4,096 (12 bit)
Max. resolution (number of steps per revolution x number of revolutions)	12 bit x 12 bit (4,096 x 4,096)
Error limits G	0.2° ¹⁾
Repeatability standard deviation σ_r	0.002° ²⁾

¹⁾ In accordance with DIN ISO 1319-1, position of the upper and lower error limit depends on the installation situation, specified value refers to a symmetrical position, i.e. deviation in upper and lower direction is the same.

²⁾ In accordance with DIN ISO 55350-13; 68.3% of the measured values are inside the specified area.

Interfaces

Communication interface	SSI
Initialization time	50 ms ¹⁾
Position forming time	< 1 µs
Code type	Gray
Code sequence parameter adjustable	CW/CCW (V/R) parameter adjustable

¹⁾ Valid positional data can be read once this time has elapsed.

²⁾ Minimum, LOW level (Clock +): 250 ns.

Clock frequency	$\leq 1 \text{ MHz}^{2)}$
Set (electronic adjustment)	H-active (L = 0 - 3 V, H = 4,0 - U_s V)
CW/CCW (counting sequence when turning)	L-active (L = 0 - 1,5 V, H = 2,0 - U_s V)

¹⁾ Valid positional data can be read once this time has elapsed.

²⁾ Minimum, LOW level (Clock +): 250 ns.

Electronics

Connection type	Male connector, M23, 12-pin, radial
Supply voltage	4.5 ... 32 V DC
Power consumption	$\leq 0.7 \text{ W}$ (without load)
Reverse polarity protection	✓

Mechanics

Mechanical design	Solid shaft, face mount flange
Shaft diameter	10 mm
Shaft length	19 mm
Characteristics of the shaft	With flat
Weight	0.3 kg ¹⁾
Shaft material	Stainless steel
Flange material	Aluminum
Housing material	Aluminum die cast
Start up torque	$< 0.5 \text{ Ncm}$ (+20 °C)
Operating torque	$< 0.3 \text{ Ncm}$ (+20 °C)
Permissible shaft loading	80 N (radial) 40 N (axial)
Operating speed	$\leq 9,000 \text{ min}^{-1}^{2)}$
Moment of inertia of the rotor	6.2 gcm ²
Bearing lifetime	3.0×10^9 revolutions
Angular acceleration	$\leq 500,000 \text{ rad/s}^2$

¹⁾ Based on devices with male connector.

²⁾ Allow for self-heating of 3.3 K per 1,000 rpm when designing the operating temperature range.

Ambient data

EMC	According to EN 61000-6-2 and EN 61000-6-3 ¹⁾
Enclosure rating	IP65, shaft side (IEC 60529) IP67, housing side (IEC 60529) ²⁾
Permissible relative humidity	90 % (Condensation not permitted)
Operating temperature range	0 °C ... +85 °C
Storage temperature range	-40 °C ... +100 °C, without package
Resistance to shocks	50 g, 6 ms (EN 60068-2-27)
Resistance to vibration	20 g, 10 Hz ... 2,000 Hz (EN 60068-2-6)

¹⁾ EMC according to the standards quoted is achieved if shielded cables are used.

²⁾ For devices with male connector: with mounted mating connector.

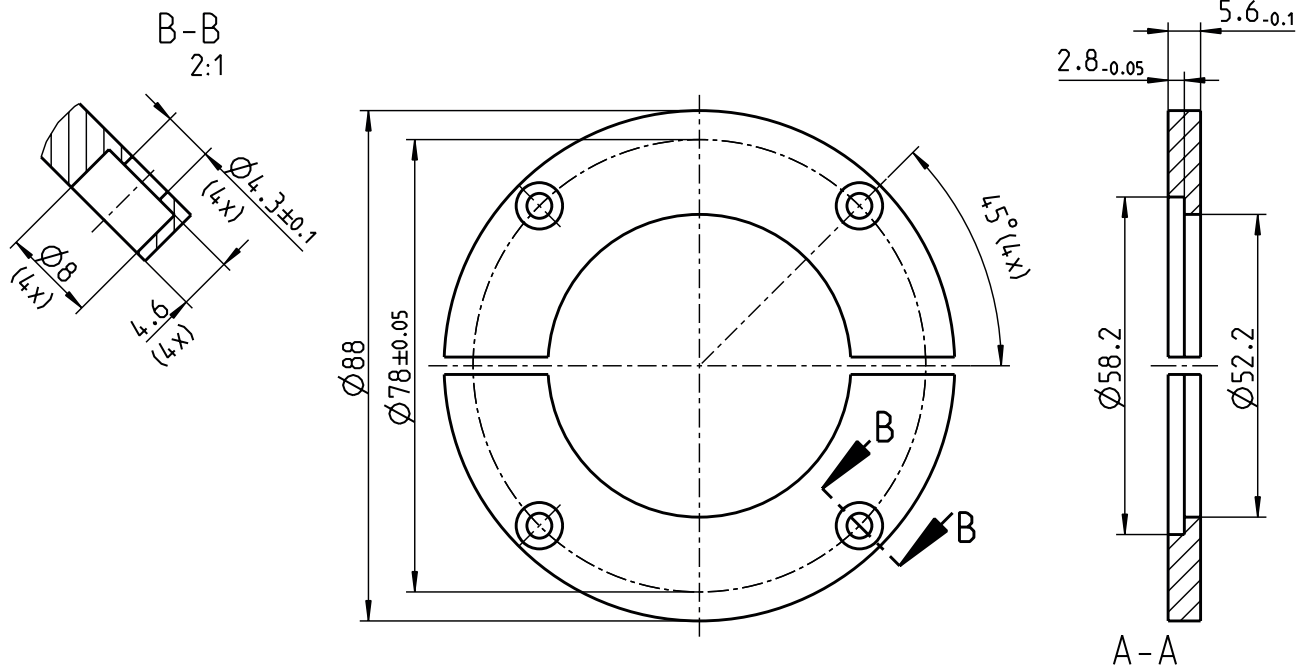
Certificates

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

Classifications

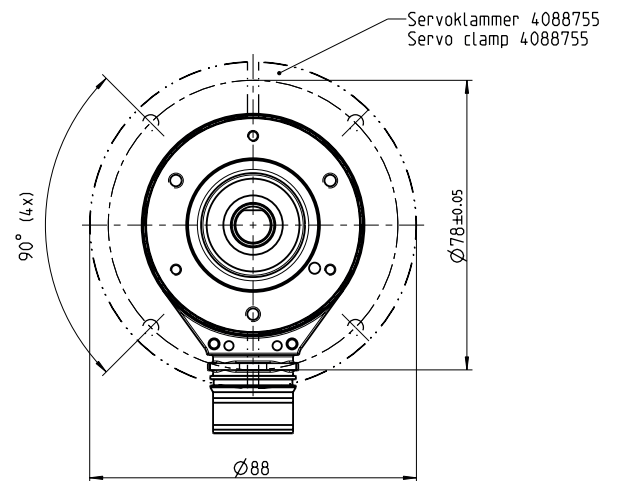
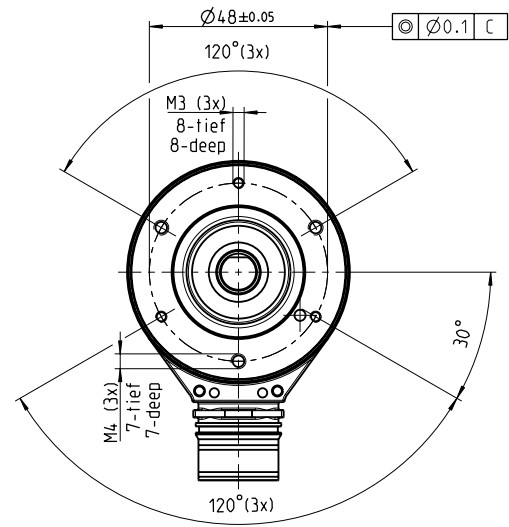
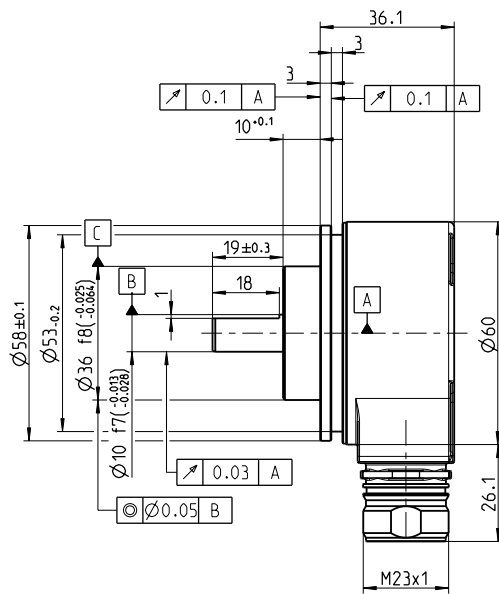
ECLASS 5.0	27270502
ECLASS 5.1.4	27270502
ECLASS 6.0	27270590
ECLASS 6.2	27270590
ECLASS 7.0	27270502
ECLASS 8.0	27270502
ECLASS 8.1	27270502
ECLASS 9.0	27270502
ECLASS 10.0	27270502
ECLASS 11.0	27270502
ECLASS 12.0	27270502
ETIM 5.0	EC001486
ETIM 6.0	EC001486
ETIM 7.0	EC001486
ETIM 8.0	EC001486
UNSPSC 16.0901	41112113

Dimensional drawing Half-shell servo clamps, 2088848 BEF-WG-SF050S1 (not included in scope of delivery of the Encoder, please order separately)



Dimensions in mm (inch)

Dimensional drawing

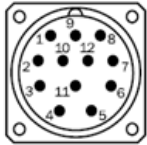


Dimensions in mm (inch)

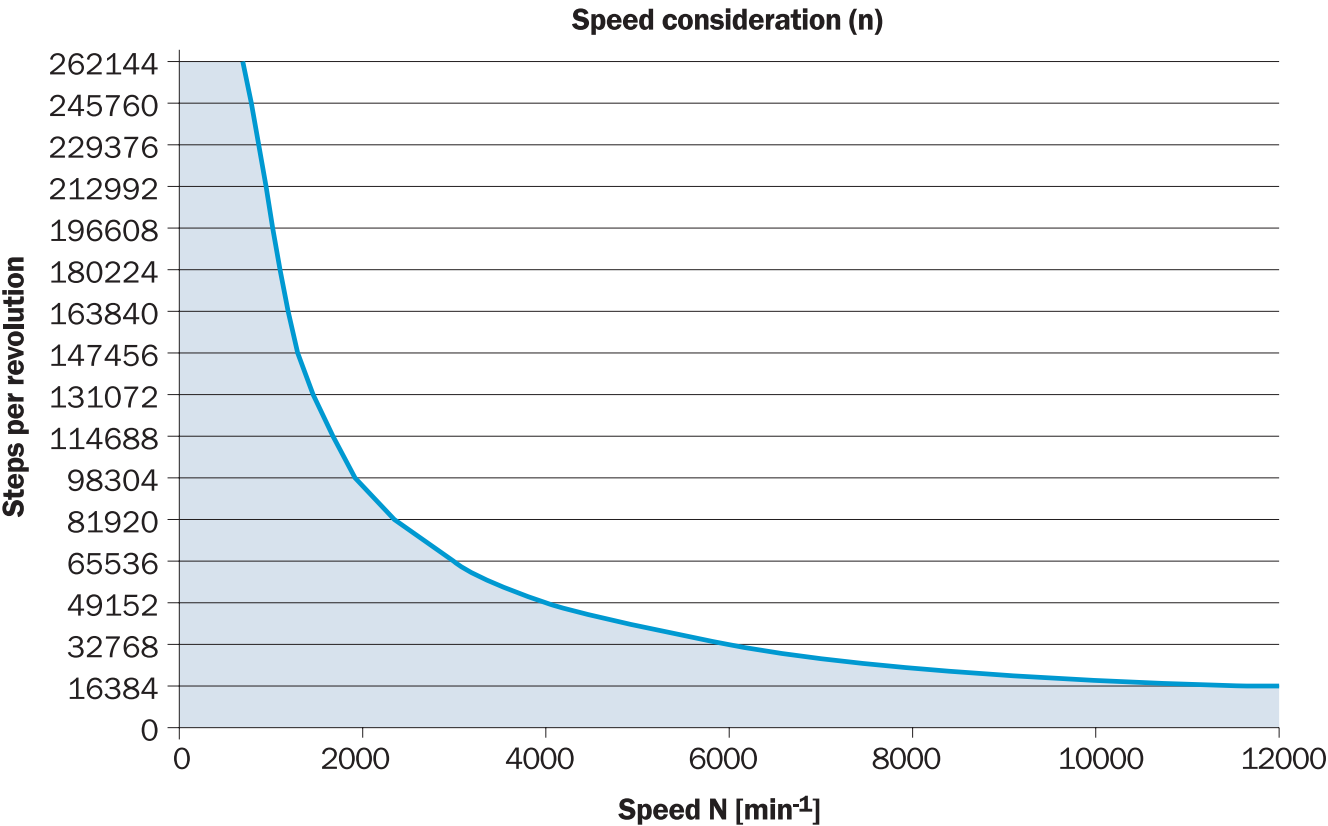
Anschlussbelegung

Connector M23, 12-pin Ssi/Gray

PIN	Signal	Explanation
1	GND	Ground connection
2	Data +	Interface signal
3	Clock +	Interface signal
4	N.C.	Not connected
5	CW/CCW_	Counting sequence when turning
6	N.C.	Not connected
7	N.C.	Not connected
8	U _S	Supply voltage
9	N.C.	Not connected
10	Data-	Interface signal
11	Clock -	Interface signal
12	SET	Electronic adjustment
	Screen	Screen on the encoder side connected to the housing. On the control side connected to earth



Diagrams



The maximum speed is also dependent on the shaft type.

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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.

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