



ARS60-F1A02048

ARS60

ABSOLUTE ENCODERS

SICK
Sensor Intelligence.



Ordering information

Type	part no.
ARS60-F1A02048	1033822

Other models and accessories → www.sick.com/ARS60

Illustration may differ



Detailed technical data

Safety-related parameters

MTTF_D (mean time to dangerous failure)	300 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)	2,048 (11 bit)
Measuring step	360° / number of steps
Measuring step deviation	0.005° binary number of steps
Error limits G	0.035° (binary number of steps) ¹⁾
Repeatability standard deviation σ_r	0.005° 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	Parallel data world
Initialization time	80 ms ¹⁾
Code type	Gray
Code sequence parameter adjustable	CW (clockwise) increasing when viewing the clockwise rotating shaft
Measured value backlash	0.005°
Response threshold	0.003°

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

Electronics

Connection type	Male connector, M23, 21-pin, radial
Supply voltage	10 ... 32 V
Operating current	Typ. 90 mA

¹⁾ Only with shaft stationary (note initialisation time).

Switching level of control inputs	Logic H = 0.7 x U _S , Logic L = 0 V ... 0.3 x U _S
Actuation of set button	≥ 100 ms ¹⁾

¹⁾ Only with shaft stationary (note initialisation time).

Mechanics

Mechanical design	Solid shaft, Servo flange
Shaft diameter	6 mm
Shaft length	10 mm
Characteristics of the shaft	With flat
Weight	Approx. 0.3 kg ¹⁾
Housing material	Aluminum die cast
Start up torque	Typ. 0.25 Ncm
Operating torque	Typ. 0.2 Ncm
Permissible shaft loading	20 N (radial) 10 N (axial)
Operating speed	≤ 6,000 min ⁻¹ with shaft seal ≤ 10,000 min ⁻¹ without shaft seal ²⁾
Moment of inertia of the rotor	48 gcm ²
Bearing lifetime	3.6 x 10 ⁹ revolutions
Angular acceleration	≤ 500,000 rad/s ²

¹⁾ Based on devices with male connector.

²⁾ If the shaft seal has been removed by the customer.

Ambient data

EMC	According to EN 61000-6-2 and EN 61000-6-3 ¹⁾
Enclosure rating	IP65, male connector (IEC 60529) ²⁾
Permissible relative humidity	90 % (Condensation not permitted)
Operating temperature range	-20 °C ... +85 °C
Storage temperature range	-40 °C ... +100 °C, without package
Resistance to shocks	50 g, 11 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⁾ With mating connector fitted.

Certificates

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

Classifications

ECLASS 5.0	27270502
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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



PIN assignment



PIN	Wire colors (ca- ble connection)	SignalBinary	SignalGray	SignalBCD	
1	Violet	2 ⁰	G ⁰	2 ⁰ v. 10 ⁰	-
2	White/brown	2 ¹	G ¹	2 ¹ v. 10 ⁰	-
3	White/green	2 ²	G ²	2 ² v. 10 ⁰	-
4	White/yellow	2 ³	G ³	2 ³ v. 10 ⁰	-
5	White/grey	2 ⁴	G ⁴	2 ⁰ v. 10 ¹	-
6	White/pink	2 ⁵	G ⁵	2 ¹ v. 10 ¹	-
7	White/blue	2 ⁶	G ⁶	2 ² v. 10 ¹	-
8	White/red	2 ⁷	G ⁷	2 ³ v. 10 ¹	-
9	White/black	2 ⁸	G ⁸	2 ⁰ v. 10 ²	-
10	Brown/green	2 ⁹	G ⁹	2 ¹ v. 10 ²	-
11	Brown/yellow	2 ¹⁰	G ¹⁰	2 ² v. 10 ²	-
12	Brown/gray	2 ¹¹	G ¹¹	2 ³ v. 10 ²	-
13	Brown/pink	2 ¹²	G ¹²	2 ⁰ v. 10 ³	-
14	Brown/blue	2 ¹³	G ¹³	2 ¹ v. 10 ³	-
15	Brown/red	2 ¹⁴	G ¹⁴	2 ² v. 10 ³	-
16	Green	Parity		Parity	
17	Pink		Store		-
18	Yellow		Enable		-
19	Brown	CW/CCW (V/R)			-
*	Gray	SET			-
20	Blue	GND			-
21	Red	U _S			-

Diagrams



Recommended accessories

Other models and accessories → www.sick.com/ARS60

	Brief description	Type	part no.
connectors and cables			
	• Connection type head A: Flying leads • Connection type head B: Flying leads • Signal type: Parallel • Items supplied: By the meter • Cable: 22-wire, PUR, halogen-free • Description: Parallel, shielded	LTG-2622-MW	6027532
	• Connection type head A: Female connector, M23, 21-pin, straight • Signal type: SSI • Description: SSI, shielded • Connection systems: Crimp contacts	DOS-2321-G	6027539
	• Connection type head A: Female connector, M23, 21-pin, straight • Connection type head B: Flying leads • Signal type: Parallel • Cable: 1.5 m, 22-wire, PUR, halogen-free • Description: Parallel, shielded	DOL-2321-G1M5PA4	2029218
	• Connection type head A: Female connector, M23, 21-pin, straight • Connection type head B: Flying leads • Signal type: Parallel • Cable: 3 m, 22-wire, PUR, halogen-free • Description: Parallel, shielded	DOL-2321-G03MPA4	2029219
	• Connection type head A: Female connector, M23, 21-pin, straight • Connection type head B: Flying leads • Signal type: Parallel • Cable: 5 m, 22-wire, PUR, halogen-free • Description: Parallel, shielded	DOL-2321-G05MPA4	2029220
	• Connection type head A: Female connector, M23, 21-pin, straight • Connection type head B: Flying leads • Signal type: Parallel • Cable: 10 m, 22-wire, PUR, halogen-free • Description: Parallel, shielded	DOL-2321-G10MPA4	2029221
	• Connection type head A: Female connector, M23, 21-pin, straight • Connection type head B: Flying leads • Signal type: Parallel • Cable: 20 m, 22-wire, PUR, halogen-free • Description: Parallel, shielded	DOL-2321-G20MPA4	2029222

	Brief description	Type	part no.
Mounting systems			
	Description: Mounting bell for encoder with servo flange, 50 mm spigot Items supplied: Mounting kit included	BEF-MG-50	5312987
	Description: Half-shell servo clamps (2 pcs.) for servo flanges with a 50 mm centering hub	BEF-WG-SF050	2029165
	Description: Servo clamps, large, for servo flange (clamps, eccentric fastener), 3 pcs, without mounting material Items supplied: Without mounting hardware	BEF-WK-SF	2029166
shaft adaptation			
	Product segment: Shaft adaptation Product: Shaft couplings Description: 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°C to $+120^\circ\text{C}$, max. torque 120 Ncm; material: stainless steel bellows, aluminum hub	KUP-0606-B	5312981
	Product segment: Shaft adaptation Product: Shaft couplings Description: 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°C to $+120^\circ\text{C}$, max. torque 120 Ncm; material: stainless steel bellows, aluminum hub	KUP-0610-B	5312982
	Product segment: Shaft adaptation Product: Shaft couplings Description: 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° to $+80^\circ\text{C}$, max. torque 60 Ncm; material: aluminum flange, glass fiber-reinforced polyamide membrane and hardened steel coupling pin	KUP-0610-F	5312985

SICK AT A GLANCE

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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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