



ARS60-F1A00009

ARS60

ABSOLUTE ENCODERS

SICK
Sensor Intelligence.



Ordering information

| Type | part no. |
|----------------|----------|
| ARS60-F1A00009 | 1036704 |

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⁾ |
|--|--|

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) | 9 |
| Measuring step | 360° / number of steps |
| Measuring step deviation | 0.016° non-binary number of steps |
| Error limits G | 0.046° (non-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 |
|-------------------|----------|

| | |
|-----------------------|----------|
| 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



Dimensions in mm (inch)

General tolerances according to DIN ISO 2768-mk

① R = min. bending radius 40 mm

Anschlussbelegung



| PIN | Wire colors (cable 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 | | | |
|  | <ul style="list-style-type: none"> • 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 |
|  | <ul style="list-style-type: none"> • Description: SSI, shielded • Connection type head A: Female connector, M23, 21-pin, straight, A-coded • Signal type: SSI • Connection systems: Crimp contacts | DOS-2321-G | 6027539 |
|  | <ul style="list-style-type: none"> • 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 • Application: Zones with oils and lubricants | DOL-2321-G1M5PA4 | 2029218 |
|  | <ul style="list-style-type: none"> • 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 • Application: Zones with oils and lubricants | DOL-2321-G03MPA4 | 2029219 |
|  | <ul style="list-style-type: none"> • 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 • Application: Zones with oils and lubricants | DOL-2321-G05MPA4 | 2029220 |
|  | <ul style="list-style-type: none"> • 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 • Application: Zones with oils and lubricants | DOL-2321-G10MPA4 | 2029221 |
|  | <ul style="list-style-type: none"> • 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 • Application: Zones with oils and lubricants | DOL-2321-G20MPA4 | 2029222 |

| | Brief description | Type | part no. |
|---|--|--------------|----------|
| Mounting systems | | | |
|  | <ul style="list-style-type: none"> Description: Mounting bell for encoder with servo flange, 50 mm spigot Items supplied: Mounting kit included | BEF-MG-50 | 5312987 |
|  | <ul style="list-style-type: none"> Description: Half-shell servo clamps (2 pcs.) for servo flanges with a 50 mm centering hub | BEF-WG-SF050 | 2029165 |
|  | <ul style="list-style-type: none"> 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 | | | |
|  | <ul style="list-style-type: none"> 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 |
|  | <ul style="list-style-type: none"> 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 |
|  | <ul style="list-style-type: none"> 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 |

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Comprehensive services complete our offering: SICK LifeTime Services provide support throughout the machine life cycle and ensure safety and productivity.

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