

ARS60-F4A08192

ARS60

ABSOLUTE ENCODERS

SICK
Sensor Intelligence.



Ordering information

| Type | Part no. |
|----------------|----------|
| ARS60-F4A08192 | 1031614 |

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

Illustration may differ



Detailed technical data

Performance

| | |
|---|---|
| Number of steps per revolution (max. resolution) | 8,192 (13 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.

Electrical data

| | |
|--|---|
| Connection type | Male connector, M23, 21-pin, radial |
| Supply voltage | 10 ... 32 V |
| Operating current | Typ. 90 mA |
| MTTFd: mean time to dangerous failure | 300 years (EN ISO 13849-1) ¹⁾ |
| 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 ²⁾ |

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.

²⁾ Only with shaft stationary (note initialisation time).

Mechanical data

| | |
|---------------------------------------|--|
| Mechanical design | Solid shaft, face mount flange |
| Shaft diameter | 10 mm |
| Shaft length | 19 mm |
| Weight | Approx. 0.3 kg ¹⁾ |
| Housing material | Aluminum die cast |
| Start up torque | Typ. 0.4 Ncm |
| Operating torque | Typ. 0.3 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 | 54 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.

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

PIN assignment



| PIN | Wire colors (cable connection) | Signal Binary | Signal Gray | Signal BCD |
|-----|--------------------------------|----------------|----------------|-----------------------------------|
| 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 |

| PIN | Wire colors (cable connection) | Signal Binary | Signal Gray | Signal BCD |
|-----|--------------------------------|----------------|-----------------|------------------------|
| 5 | White/grey | 2^4 | G ⁴ | $2^0 \text{ v. } 10^1$ |
| 6 | White/pink | 2^5 | G ⁵ | $2^1 \text{ v. } 10^1$ |
| 7 | White/blue | 2^6 | G ⁶ | $2^2 \text{ v. } 10^1$ |
| 8 | White/red | 2^7 | G ⁷ | $2^3 \text{ v. } 10^1$ |
| 9 | White/black | 2^8 | G ⁸ | $2^0 \text{ v. } 10^2$ |
| 10 | Brown/green | 2^9 | G ⁹ | $2^1 \text{ v. } 10^2$ |
| 11 | Brown/yellow | 2^{10} | G ¹⁰ | $2^2 \text{ v. } 10^2$ |
| 12 | Brown/gray | 2^{11} | G ¹¹ | $2^3 \text{ v. } 10^2$ |
| 13 | Brown/pink | 2^{12} | G ¹² | $2^0 \text{ v. } 10^3$ |
| 14 | Brown/blue | 2^{13} | G ¹³ | $2^1 \text{ v. } 10^3$ |
| 15 | Brown/red | 2^{14} | G ¹⁴ | $2^2 \text{ v. } 10^3$ |
| 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. |
|---|--|----------------|----------|
| Flanges | | | |
|  | Flange adapter, adaptation of face mount flange with 36 mm centering hub to 50 mm servo flange, aluminum, including 3 flat head screws M4 x 10, Aluminum, including 3 countersunk screws M3 x 10 | BEF-FA-036-050 | 2029160 |

| | Brief description | Type | Part no. |
|---|---|-------------------|----------|
|  | Flange adapter, adaptation of face mount flange with 36 mm centering hub to 60 mm square mounting plate, aluminum, including 3 flat head screws M4 x 8, Aluminum, including 3 countersunk screws M4 x 8 | BEF-FA-036-060REC | 2029162 |
|  | Flange adapter, adaptation of face mount flange with 36 mm centering hub to 58 mm square mounting plate with shock absorbers, aluminum, Aluminum | BEF-FA-036-060RSA | 2029163 |
|  | Flange adapter, adaptation of face mount flange with 36 mm centering hub to 100 mm servo flange with 60 mm centering hub, aluminum, Aluminum | BEF-FA-036-100 | 2029161 |
| Mounting brackets and plates | | | |
|  | Mounting bracket for encoder with spigot 36 mm for face mount flange, mounting kit included | BEF-WF-36 | 2029164 |
| Shaft adaptation | | | |
|  | 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 |
|  | 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 |
|  | 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° to $+120^\circ\text{C}$, max. torque 120 Ncm; material: stainless steel bellows, aluminum clamping hubs | KUP-1010-B | 5312983 |
|  | Spring washer coupling, shaft diameter 10 mm / 10 mm, maximum shaft offset, radial ± 0.3 mm, axial ± 0.4 mm, angle $\pm 2.5^\circ$, torsion spring stiffness 30 Nm/rad; material: aluminum flange, glass-fiber reinforced polyamide membrane and hardened steel coupling pin | KUP-1010-F | 5312986 |
|  | 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° to $+120^\circ\text{C}$, max. torque 120 Ncm; material: stainless steel bellows, aluminum clamping hubs | KUP-1012-B | 5312984 |
| Others | | | |
|  | <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 |
| | DOS-2321-G | DOS-2321-G | 6027539 |
| | DOL-2321-G1M5PA4 | DOL-2321-G1M5PA4 | 2029218 |
| | DOL-2321-G03MPA4 | DOL-2321-G03MPA4 | 2029219 |
| | DOL-2321-G05MPA4 | DOL-2321-G05MPA4 | 2029220 |
| | DOL-2321-G10MPA4 | 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 | DOL-2321-G20MPA4 | 2029222 |

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