



ARS60-AAA18000

ARS60

ABSOLUTE ENCODERS

SICK
Sensor Intelligence.



Illustration may differ



Ordering information

| Type | Part no. |
|----------------|----------|
| ARS60-AAA18000 | 1036303 |

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

Detailed technical data

Performance

| | |
|---|--|
| Number of steps per revolution (max. resolution) | 18,000 |
| Measuring step | 360° / number of steps |
| Measuring step deviation | 0.005° binary number of steps 0.016° non-binary number of steps |
| Error limits G | 0.035° (binary number of steps) ¹⁾ 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 | SSI |
| 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, 12-pin, radial |
| Supply voltage | 10 ... 32 V |
| Operating current | Typ. 60 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 |

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).

| | |
|--------------------------------|--------------------------|
| Actuation of set button | $\geq 100 \text{ ms}^2)$ |
|--------------------------------|--------------------------|

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 | Blind hollow shaft |
| Shaft diameter | 15 mm ¹⁾ |
| Weight | Approx. 0.3 kg ²⁾ |
| Housing material | Aluminum die cast |
| Start up torque | Typ. 0.6 Ncm |
| Operating torque | Typ. 0.4 Ncm |
| Permissible movement static | $\pm 0.3 \text{ mm}$ (radial) $\pm 0.5 \text{ mm}$ (axial) |
| Permissible movement dynamic | $\pm 0.1 \text{ mm}$ (radial) $\pm 0.2 \text{ mm}$ (axial) |
| Operating speed | $\leq 3,000 \text{ min}^{-1}$ |
| Moment of inertia of the rotor | See figure |
| Bearing lifetime | 3.6×10^9 revolutions |
| Angular acceleration | $\leq 500,000 \text{ rad/s}^2$ |

¹⁾ Collets for 6, 8, 10, 12, 14 mm and 1/4", 3/8" and 1/2" as accessories, separate order item. For 15 mm shaft diameter collet is not needed.

²⁾ Based on devices with male connector.

Ambient data

| | |
|--------------------------------------|---|
| EMC | According to EN 61000-6-2 and EN 61000-6-3 ¹⁾ |
| Enclosure rating | IP65, male connector (IEC 60529) ²⁾ IP66, cable (IEC 60529) |
| 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.

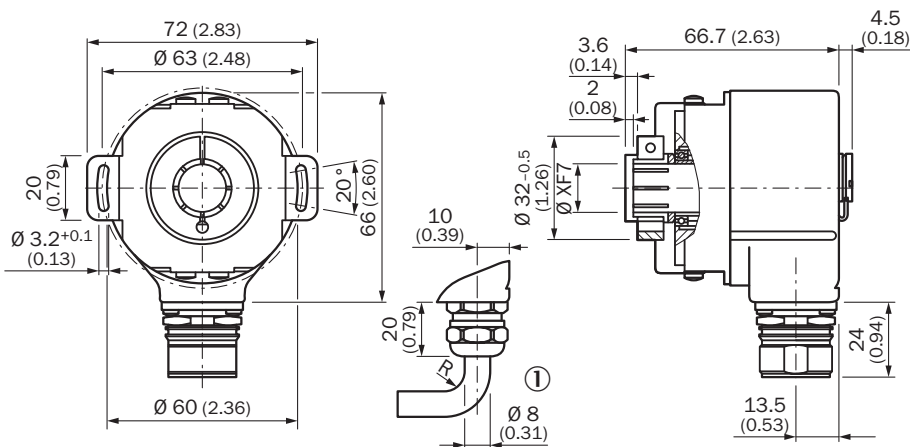
²⁾ With mating connector fitted.

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 |

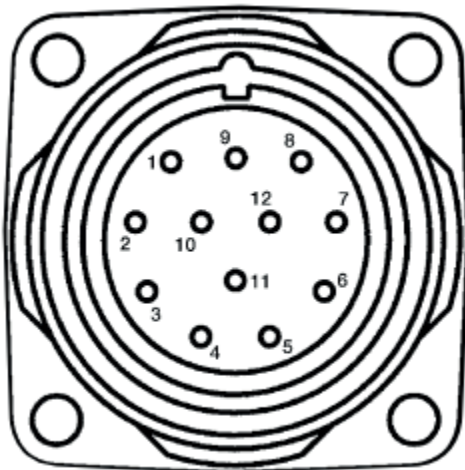
Dimensional drawing (Dimensions in mm (inch))



General tolerances according to DIN ISO 2768-mk

① R = min. bending radius 40 mm

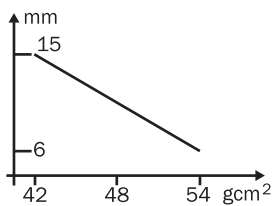
PIN assignment



| PIN 12-pin | Wire colors (cable connection) 11-wire | Signal |
|---------------|---|----------------|
| 1 | Blue | GND |
| 2 | White | Data + |
| 3 | Yellow | Clock + |
| 4 | N.c. | N.c. |
| 5 | Pink | CW/CCW (V/R) |
| 6 | N.c. | N.c. |
| 7 | N.c. | N.c. |
| 8 | Red | U _S |
| 9 | Orange | SET |
| 10 | Brown | Data - |
| 11 | Violet | Clock - |
| 12 | N.c. | N.c. |

Diagrams





Moment of inertia of the rotor







Blind hollow shaft

Recommended accessories

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

| | Brief description | Type | Part no. |
|---|---|----------------|----------|
| Plug connectors and cables | | | |
|  | Head A: cable Head B: Flying leads Cable: SSI, Incremental, HIPERFACE®, PUR, halogen-free, shielded | LTG-2308-MWENC | 6027529 |
|  | Head A: cable Head B: Flying leads Cable: SSI, Incremental, PUR, shielded | LTG-2411-MW | 6027530 |
|  | Head A: cable Head B: Flying leads Cable: SSI, Incremental, PUR, halogen-free, shielded | LTG-2512-MW | 6027531 |
|  | Head A: cable Head B: Flying leads Cable: SSI, TTL, HTL, Incremental, PUR, halogen-free, shielded | LTG-2612-MW | 6028516 |

| | Brief description | Type | Part no. |
|---|---|--|------------|
|  | Head A: female connector, M23, 12-pin, straight Head B: Flying leads Cable: SSI, PUR, halogen-free, shielded, 3 m | DOL-2312-G03MMA2 | 2029207 |
| | Head A: female connector, M23, 12-pin, straight Head B: Flying leads Cable: SSI, PUR, halogen-free, shielded, 5 m | DOL-2312-G05MMA2 | 2029208 |
| | Head A: female connector, M23, 12-pin, straight Head B: Flying leads Cable: SSI, PUR, halogen-free, shielded, 10 m | DOL-2312-G10MMA2 | 2029209 |
| | Head A: female connector, M23, 12-pin, straight Head B: Flying leads Cable: SSI, PUR, halogen-free, shielded, 1.5 m | DOL-2312-G1M5MA2 | 2029206 |
| | Head A: female connector, M23, 12-pin, straight Head B: Flying leads Cable: SSI, PUR, halogen-free, shielded, 20 m | DOL-2312-G20MMA2 | 2029210 |
| | Head A: female connector, M23, 12-pin, straight Head B: Flying leads Cable: SSI, PUR, halogen-free, shielded, 30 m | DOL-2312-G30MMA2 | 2029211 |
| |  | Head A: female connector, M23, 9-pin, straight Cable: HIPERFACE [®] , SSI, Incremental, shielded | DOS-2309-G |
| Head A: female connector, M23, 12-pin, straight Cable: HIPERFACE [®] , SSI, Incremental, shielded | | DOS-2312-G | 6027538 |
| Head A: female connector, M23, 12-pin, angled Cable: HIPERFACE [®] , SSI, Incremental, shielded | | DOS-2312-W01 | 2072580 |
|  | Head A: female connector, M23, 12-pin, straight Cable: HIPERFACE [®] , SSI, Incremental, shielded | STE-2312-G | 6027537 |
| Shaft adaptation | | | |
|  | Collet for blind hollow shaft, shaft diameter 6 mm, outer diameter 15 mm | SPZ-006-AD-A | 2029174 |
| | Collet for blind hollow shaft, shaft diameter 8 mm, outer diameter 15 mm | SPZ-008-AD-A | 2029176 |
| | Collet for blind hollow shaft, shaft diameter 10 mm, outer diameter 15 mm | SPZ-010-AD-A | 2029178 |
| | Collet for blind hollow shaft, shaft diameter 12 mm, outer diameter 15 mm | SPZ-012-AD-A | 2029179 |
| | Collet for blind hollow shaft, shaft diameter 1/2" (12.7 mm), outer diameter 15 mm | SPZ-1E2-AD-A | 2029180 |
| | Collet for blind hollow shaft, shaft diameter 1/4" (6.35 mm), outer diameter 15 mm | SPZ-1E4-AD-A | 2029175 |
| | Collet for blind hollow shaft, shaft diameter 3/8" (9.525 mm), outer diameter 15 mm | SPZ-3E8-AD-A | 2029177 |

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