



ATM60-A4K0-K11

ATM60

ABSOLUTE ENCODERS

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Sensor Intelligence.



Illustration may differ

Ordering information

| Type | part no. |
|----------------|----------|
| ATM60-A4K0-K11 | 1035642 |

Other models and accessories → www.sick.com/ATM60

Detailed technical data

Features

| | |
|----------------------------------|-------------------------|
| Special device | ✓ |
| Standard reference device | ATM60-A4K12X12, 1030002 |

Safety-related parameters

| | |
|--|--|
| MTTF_D (mean time to dangerous failure) | 150 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) | 8,192 (13 bit) |
| Number of revolutions | 2,048 (11 bit) |
| Max. resolution (number of steps per revolution x number of revolutions) | 13 bit x 11 bit (8,192 x 2,048) |
| Resolution | Maximum permissible resolution: 25 bit (12 bit singleturn x 13 bit multiturn or 13 bit singleturn x 12 bit multiturn). |
| Measuring step | 0.043° |
| Error limits G | ± 0.25° ¹⁾ |
| Repeatability standard deviation σ_r | 0.1° 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 | 1,050 ms ¹⁾ |
| Position forming time | 0.15 ms |
| Parameterising data | Number of steps per revolution Number of revolutions Code type Electronic adjustment |
| Code type | Gray |

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

²⁾ Minimum, LOW level (Clock +): 500 ns.

| | |
|--|--|
| Code sequence parameter adjustable | CW/CCW (V/R) |
| Clock frequency | 1 MHz ²⁾ |
| Set (electronic adjustment) | H-active (L = 0 - 4,7 V, H = 10 - Us V) |
| CW/CCW (counting sequence when turning) | L-active (L = 0 - 1,5 V, H = 2,0 - Us V) |

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

²⁾ Minimum, LOW level (Clock +): 500 ns.

Electronics

| | |
|------------------------------------|-------------------------------|
| Connection type | Cable, 12-wire, radial, 1.5 m |
| Supply voltage | 10 ... 32 V |
| Power consumption | ≤ 0.8 W (without load) |
| Reverse polarity protection | ✓ |

Mechanics

| | |
|---------------------------------------|---|
| Mechanical design | Solid shaft, face mount flange |
| Shaft diameter | 10 mm |
| Shaft length | 19 mm |
| Weight | 0.5 kg ¹⁾ |
| Shaft material | Stainless steel |
| Flange material | Aluminum |
| Start up torque | 2.5 Ncm (+20 °C), with shaft seal 0.5 Ncm (+20 °C), without shaft seal ²⁾ |
| Operating torque | 1.8 Ncm (+20 °C), with shaft seal 0.3 Ncm (+20 °C), without shaft seal ²⁾ |
| Permissible shaft loading | 300 N (radial) 50 N (axial) |
| Operating speed | ≤ 6,000 min ⁻¹ ³⁾ |
| Moment of inertia of the rotor | 35 gcm ² |
| Bearing lifetime | 3.6 x 10 ⁹ revolutions |
| Angular acceleration | ≤ 500,000 rad/s ² |

¹⁾ Based on encoder with male connector.

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

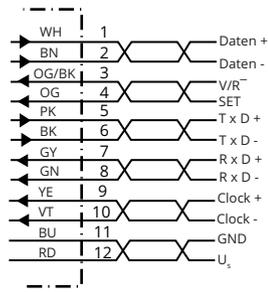
³⁾ Allow for self-heating of 3.3 K per 1,000 rpm when designing the operating temperature range.

Ambient data

| | |
|--------------------------------------|---|
| EMC | According to EN 61000-6-2 and EN 61000-6-3 |
| Enclosure rating | IP67, with shaft seal (IEC 60529) ¹⁾ IP43, without shaft seal, on encoder flange not sealed (IEC 60529) ¹⁾ IP65, without shaft seal, on encoder flange sealed (IEC 60529) ¹⁾ |
| Permissible relative humidity | 98 % |
| Operating temperature range | -20 °C ... +85 °C |
| Storage temperature range | -40 °C ... +100 °C, without package |
| Resistance to shocks | 100 g, 6 ms (EN 60068-2-27) |

¹⁾ With mating connector fitted.

PIN assignment



| PIN | Signal | Wire colors (cable connection) | Explanation |
|-----|-------------------|--------------------------------|-----------------------------------|
| 1 | GND | Blue | Ground connection |
| 2 | Data + | White | Interface signals |
| 3 | Clock + | Yellow | Interface signals |
| 4 | R x D + | Gray | RS-422 programming lines |
| 5 | R x D - | Green | RS-422 programming lines |
| 6 | T x D + | Pink | RS-422 programming lines |
| 7 | T x D - | Black | RS-422 programming lines |
| 8 | U _s | Red | Operating voltage |
| 9 | SET ¹⁾ | Orange | Electronic adjustment |
| 10 | Data - | Brown | Interface signals |
| 11 | Clock - | Purple | Interface signals |
| 12 | V/R ²⁾ | Orange-black | Sequence in direction of rotation |
| - | Screen | - | Housing potential |

SET = This input activates the electronic zero set. If the SET cable is set to U_s for more than 100 ms, the mechanical position corresponds to the 0 value, i.e., the predetermined SET value.

V/R = Forwards/Reverse: This input programs the counting direction for the encoder. When it is not connected, this input is set to HIGH. If the encoder shaft is rotated clockwise (to the right) as viewed when facing the shaft, it counts in ascending order. If it should count in ascending order when the shaft is rotated counterclockwise (to the left), then this connection must be permanently set to LOW level (GND).

Recommended accessories

Other models and accessories → www.sick.com/ATM60

| | Brief description | Type | part no. |
|---|---|-------------------|----------|
| Mounting systems | | | |
|  | <ul style="list-style-type: none"> Description: 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 Material: Aluminum Details: Aluminum Items supplied: Including 3 countersunk screws M3 x 10 | BEF-FA-036-050 | 2029160 |
|  | <ul style="list-style-type: none"> Description: 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 Material: Aluminum Details: Aluminum Items supplied: Including 3 countersunk screws M4 x 8 | BEF-FA-036-060REC | 2029162 |
|  | <ul style="list-style-type: none"> Description: Flange adapter, adaptation of face mount flange with 36 mm centering hub to 58 mm square mounting plate with shock absorbers, aluminum Material: Aluminum Details: Aluminum | BEF-FA-036-060RSA | 2029163 |
|  | <ul style="list-style-type: none"> Description: Flange adapter, adaptation of face mount flange with 36 mm centering hub to 100 mm servo flange with 60 mm centering hub, aluminum Material: Aluminum Details: Aluminum | BEF-FA-036-100 | 2029161 |
|  | <ul style="list-style-type: none"> Description: Mounting bracket for encoder with spigot 36 mm for face mount flange Items supplied: Mounting kit included | BEF-WF-36 | 2029164 |

| | Brief description | Type | part no. |
|---|--|--------------|----------|
| shaft adaptation | | | |
|  | <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 |
|  | <ul style="list-style-type: none"> Product segment: Shaft adaptation Product: Shaft couplings Description: 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 |
|  | <ul style="list-style-type: none"> Product segment: Shaft adaptation Product: Shaft couplings Description: 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 |
|  | <ul style="list-style-type: none"> Product segment: Shaft adaptation Product: Shaft couplings Description: 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 |
| programming devices | | | |
|  | <ul style="list-style-type: none"> Product segment: Programming devices Product family: PGT-01-S Description: Programming tool for ATM60, ATM90, and KH53 Items supplied: Power supply, interface, link cable, encoder cable, and software | PGT-01-S | 1030111 |
| connectors and cables | | | |
|  | <ul style="list-style-type: none"> Connection type head A: Female connector, M23, 12-pin, straight, A-coded Signal type: HIPERFACE[®], SSI, Incremental Description: HIPERFACE[®], shielded, SSI, Incremental Connection systems: Solder connection | DOS-2312-G | 6027538 |
|  | <ul style="list-style-type: none"> Connection type head A: Male connector, M23, 12-pin, straight, A-coded Signal type: HIPERFACE[®], SSI, Incremental, RS-422 Description: HIPERFACE[®], shielded, SSI, Incremental, RS-422 Connection systems: Solder connection | STE-2312-G | 6027537 |
|  | <ul style="list-style-type: none"> Connection type head A: Female connector, M23, 9-pin, straight, A-coded Signal type: HIPERFACE[®], SSI, Incremental Description: HIPERFACE[®], shielded, SSI, Incremental Connection systems: Solder connection | DOS-2309-G | 6028533 |
|  | <ul style="list-style-type: none"> Connection type head A: Female connector, M23, 12-pin, angled, A-coded Signal type: HIPERFACE[®], SSI, Incremental Description: HIPERFACE[®], shielded, SSI, Incremental Connection systems: Solder connection | DOS-2312-W01 | 2072580 |

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For us, that is “Sensor Intelligence.”

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