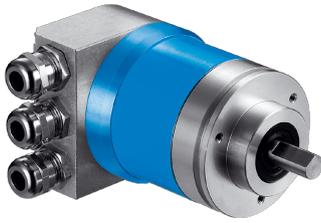


ATM60-P4H13X13

ATM60

ABSOLUTE ENCODERS

SICK
Sensor Intelligence.



Ordering information

| Type | part no. |
|----------------|----------|
| ATM60-P4H13X13 | 1030013 |

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

Illustration may differ



Detailed technical data

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 | 8,192 (13 bit) |
| Max. resolution (number of steps per revolution x number of revolutions) | 13 bit x 13 bit (8,192 x 8,192) |
| 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 | PROFIBUS DP |
| Communication Interface detail | DPV0 |
| Data protocol | Profile for encoders (07hex) – Class 2 |
| Address setting | 0 ... 127, DIP switches or protocol |
| Data transmission rate (baud rate) | 9.6 kBaud ... 12 MBaud, automatic detection |
| Initialization time | 1,250 ms ¹⁾ |
| Position forming time | 0.25 ms |
| Status information | LED green (operation), LED red (bus activity) |
| Bus termination | DIP switch ²⁾ |

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

²⁾ Should only be connected in the final device.

| | |
|------------------------------------|------------------------------------|
| Set (electronic adjustment) | Via PRESET push button or protocol |
|------------------------------------|------------------------------------|

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

²⁾ Should only be connected in the final device.

Electronics

| | |
|------------------------------------|---------------------------|
| Connection type | Bus adapter ¹⁾ |
| Supply voltage | 10 ... 32 V |
| Power consumption | ≤ 2 W (without load) |
| Reverse polarity protection | ✓ |

¹⁾ Order bus adapter separately.

Mechanics

| | |
|---------------------------------------|---|
| Mechanical design | Solid shaft, face mount flange |
| Shaft diameter | 10 mm |
| Shaft length | 19 mm |
| Weight | 0.59 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⁾ IP66, 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) |
| Resistance to vibration | 20 g, 10 Hz ... 2,000 Hz (EN 60068-2-6) |

¹⁾ With mating connector fitted.

Certificates

| | |
|---|---|
| EU declaration of conformity | ✓ |
| UK declaration of conformity | ✓ |
| ACMA declaration of conformity | ✓ |
| Moroccan declaration of conformity | ✓ |
| China RoHS | ✓ |
| cULus certificate | ✓ |

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 |

Encoders with a PROFIBUS connection adapter have screw connections (metric/PG) for connecting the bus and supply cables. The bus adapter from the complete device is screwed on to connect the cables. The adjacent figure shows the pin assignment within the bus adapter.

| | | | | | |
|---|---|---|---|-------------------|------------------------|
| 7 | - | - | 1 | 2P5 ¹⁾ | + 5 V (potential free) |
| 8 | - | - | 3 | 2M ¹⁾ | 0 V (potential free) |
| - | 2 | 1 | - | N.C. | - |
| - | 4 | 3 | - | N.C. | - |
| - | - | 5 | 5 | Screen | Housing potential |

¹⁾Use for external bus terminations or to supply the sender/receiver with a optical fiber transmission

Recommended accessories

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

| | Brief description | Type | part no. |
|---|---|---------------------|----------|
| connectors and cables | | | |
|  | <ul style="list-style-type: none"> • Connection type head A: Female connector, M12, 4-pin, straight, A-coded • Description: Unshielded • Connection systems: Screw-type terminals • Permitted cross-section: ≤ 0.75 mm² | DOS-1204-G | 6007302 |
|  | <ul style="list-style-type: none"> • Connection type head A: Flying leads • Connection type head B: Flying leads • Signal type: PROFIBUS DP • Items supplied: By the meter • Cable: 2-wire, PUR • Description: PROFIBUS DP, shielded | LTG-2102-MW | 6021355 |
|  | <ul style="list-style-type: none"> • Connection type head A: Male connector, M12, 5-pin, straight, B-coded • Signal type: PROFIBUS DP • Description: PROFIBUS DP, shielded • Connection systems: Screw-type terminals • Permitted cross-section: ≤ 0.75 mm² | STE-1205-GQ | 6021354 |
|  | <ul style="list-style-type: none"> • Connection type head A: Female connector, M12, 5-pin, straight, B-coded • Signal type: PROFIBUS DP • Description: PROFIBUS DP, shielded • Connection systems: Screw-type terminals • Permitted cross-section: ≤ 0.75 mm² | DOS-1205-GQ | 6021353 |
|  | <ul style="list-style-type: none"> • Connection type head A: Female connector, M12, 5-pin, straight, B-coded • Connection type head B: Flying leads • Signal type: Fieldbus, PROFIBUS DP • Cable: 12 m, 2-wire, PUR, halogen-free • Description: Fieldbus, twisted pair, shielded, PROFIBUS DP • Connection systems: Flying leads • Application: Zones with oils and lubricants | DOL-1205-G12MQ | 6032636 |
|  | <ul style="list-style-type: none"> • Connection type head A: Female connector, M12, 4-pin, straight, A-coded • Connection type head B: Flying leads • Signal type: Sensor/actuator cable • Cable: 5 m, 4-wire, PVC • Description: Sensor/actuator cable, unshielded • Application: Uncontaminated zones, Zones with chemicals | YF2A14-050VB3XLEAX | 2096235 |
|  | <ul style="list-style-type: none"> • Connection type head A: Male connector, M12, 2-pin, straight, B-coded • Connection type head B: Flying leads • Signal type: Fieldbus, PROFIBUS DP • Cable: 15 m, 2-wire, PUR, halogen-free • Description: Fieldbus, shielded, PROFIBUS DP • Application: Drag chain operation, Zones with oils and lubricants | YM2B22-150P-B1XLEAX | 2106276 |
|  | <ul style="list-style-type: none"> • Connection type head A: Male connector, M12, 2-pin, straight, B-coded • Connection type head B: Flying leads • Signal type: Fieldbus, PROFIBUS DP • Cable: 5 m, 2-wire, PUR, halogen-free • Description: Fieldbus, shielded, PROFIBUS DP • Application: Drag chain operation, Zones with oils and lubricants | YM2B22-050P-B1XLEAX | 2106270 |
|  | <ul style="list-style-type: none"> • Connection type head A: Male connector, M12, 2-pin, straight, B-coded • Connection type head B: Flying leads • Signal type: Fieldbus, PROFIBUS DP • Cable: 10 m, 2-wire, PUR, halogen-free • Description: Fieldbus, shielded, PROFIBUS DP • Application: Drag chain operation, Zones with oils and lubricants | YM2B22-100P-B1XLEAX | 2106271 |
|  | <ul style="list-style-type: none"> • Connection type head A: Female connector, M12, 2-pin, straight, B-coded • Connection type head B: Flying leads • Signal type: Fieldbus, PROFIBUS DP • Cable: 10 m, 2-wire, PUR, halogen-free • Description: Fieldbus, shielded, PROFIBUS DP • Application: Drag chain operation, Zones with oils and lubricants | YF2B22-100P-B1XLEAX | 2106269 |
| | <ul style="list-style-type: none"> • Connection type head A: Female connector, M12, 2-pin, straight, B-coded • Connection type head B: Flying leads • Signal type: Fieldbus, PROFIBUS DP • Cable: 15 m, 2-wire, PUR, halogen-free • Description: Fieldbus, shielded, PROFIBUS DP | YF2B22-150P-B1XLEAX | 2106272 |

| | Brief description | Type | part no. |
|---|--|---------------------|----------|
| | <ul style="list-style-type: none"> Application: Drag chain operation, Zones with oils and lubricants | | |
| | <ul style="list-style-type: none"> Connection type head A: Female connector, M12, 2-pin, straight, B-coded Connection type head B: Flying leads Signal type: Fieldbus, PROFIBUS DP Cable: 20 m, 2-wire, PUR, halogen-free Description: Fieldbus, shielded, PROFIBUS DP Application: Drag chain operation, Zones with oils and lubricants | YF2B22-200P-B1XLEAX | 2106273 |
|  | <ul style="list-style-type: none"> Connection type head A: Female connector, M12, 2-pin, straight, B-coded Connection type head B: Flying leads Signal type: Fieldbus, PROFIBUS DP Cable: 5 m, 2-wire, PUR, halogen-free Description: Fieldbus, shielded, PROFIBUS DP Application: Drag chain operation, Zones with oils and lubricants | YF2B22-050P-B1XLEAX | 2121936 |
| integration modules and adapters | | | |
|  | | AD-ATM60-KA3PR | 2029225 |
|  | | AD-ATM60-SR3PR | 2031985 |
| 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 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: 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: 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: 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: 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 |
|  | <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: 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 |

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