



BTF13-A1AM0520

HighLine

WIRE DRAW ENCODERS

SICK
Sensor Intelligence.



Illustration may differ



Ordering information

| Type | Part no. |
|----------------|----------|
| BTF13-A1AM0520 | 1034300 |

Included in delivery: MRA-F130-105D2 (1), ATM60-A1A0-K19 (1)

Product is supplied fully assembled. See individual components for further technical data

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

Detailed technical data

Performance

BTF

| | |
|---|--------------------------|
| Measurement range | 0 m ... 5 m |
| Encoder | Absolute encoders |
| Resolution (wire draw + encoder) | 0.04 mm ^{1) 2)} |
| Repeatability | ≤ 1 mm ³⁾ |
| Linearity | ≤ ± 2 mm ³⁾ |
| Hysteresis | ≤ 2 mm ³⁾ |

¹⁾ The values shown have been rounded.

²⁾ Example calculation based on the BTF08 with PROFINET: 200 mm (wire draw length per revolution - see Mechanical data): 262,144 (number of steps per revolution) = 0.001 mm (resolution of wire draw + encoder combination).

³⁾ Value applies to wire draw mechanism.

Interfaces

BTF

| | |
|----------------------------------|-----|
| Communication interface | SSI |
| Programmable/configurable | ✓ |

Electrical data

BTF

| | |
|--|--|
| Connection type | Male connector, M23, 12-pin, radial |
| Supply voltage | 10 V ... 32 V |
| Power consumption | ≤ 0.8 W (without load) |
| MTTFd: 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.

Mechanical data

BTF

| | |
|---|---|
| Measuring wire material | Highly flexible stranded steel 1,4401 stainless steel V4A |
| Weight (measuring wire) | 7.1 g/m |
| Housing material, wire draw mechanism | Aluminum (anodised), plastic |
| Spring return force | 15 N ... 20 N ¹⁾ |
| Length of wire pulled out per revolution | 334.1 mm |
| Life of wire draw mechanism | Typ. 1,000,000 cycles ^{2) 3)} |
| Actual wire draw length | 5.2 m |
| Wire acceleration | 70 m/s ² |
| Operating speed | 8 m/s |
| Mounted encoder | ATM60 SSI, ATM60-A1A0-K19, 1034294 |
| Mounted mechanic | MRA-F130-105D2, 6028626 |

¹⁾ These values were measured at an ambient temperature of 25 °C. There may be variations at other temperatures.

²⁾ Average values, which depend on the application.

³⁾ The service life depends on the type of load. This is influenced by environmental conditions, the installation location, the measuring range in use, the traversing speed, and acceleration.

Ambient data

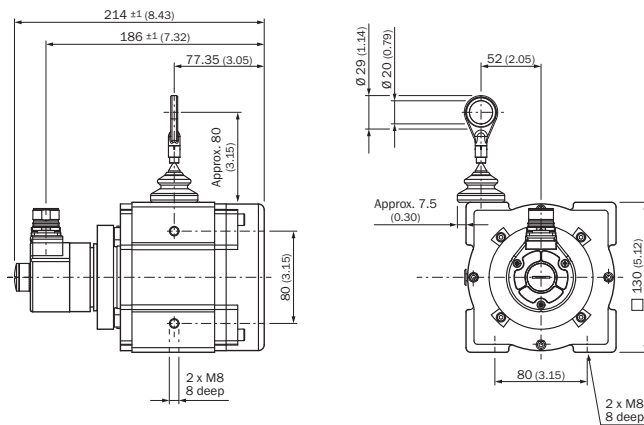
BTF

| | |
|------------------------------------|--|
| EMC | According to EN 61000-6-2 and EN 61000-6-3 |
| Enclosure rating | IP64 |
| Operating temperature range | -20 °C ... +70 °C |

Classifications

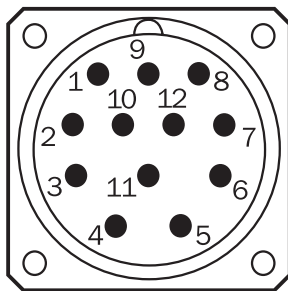
| | |
|-----------------------|----------|
| ECl@ss 5.0 | 27270590 |
| ECl@ss 5.1.4 | 27270590 |
| ECl@ss 6.0 | 27270590 |
| ECl@ss 6.2 | 27270590 |
| ECl@ss 7.0 | 27270590 |
| ECl@ss 8.0 | 27270590 |
| ECl@ss 8.1 | 27270590 |
| ECl@ss 9.0 | 27270590 |
| ECl@ss 10.0 | 27270613 |
| ECl@ss 11.0 | 27270503 |
| ETIM 5.0 | EC001486 |
| ETIM 6.0 | EC001486 |
| ETIM 7.0 | EC001486 |
| UNSPSC 16.0901 | 41112113 |

Dimensional drawing (Dimensions in mm (inch))



PIN assignment

View of M23 male device connector on encoder



View of M23 male device connector on encoder








| 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 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.

| PIN | Signal | Wire colors (cable connection) | Explanation |
|--|--------|--------------------------------|-------------|
| <p>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).</p> | | | |

Recommended accessories

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

| | Brief description | Type | Part no. |
|---|--|--|----------|
| Flanges | | | |
|  | Flange adapter for HighLine wire draw mechanisms, adaption of face mount flange with centering hub 20 mm to 50 mm servo flange, Aluminum, including 3 countersunk screws M4 x 10 | BEF-FA-020-050WDE | 2073776 |
| Other mounting accessories | | | |
|  | Joint ball for later insertion in wire end ring with 20 mm diameter. The use of this joint ball enables movement in multiple levels of freedom. | Joint protection for wire rope BTF/PRF/MRA | 5318683 |
|  | Compressed air attachment for MRA-F080... and MRA-F130... HighLine wire draw mechanism | MRA-F-P | 6073769 |
|  | Additional brush attachment for wire draw mechanism MRA-F130 (5 m, 10 m, 20 m and 30 m from HighLine series) | MRA-F130-B | 6038562 |
|  | Wire draw deflection pulley for wire draw mechanism MRA-F130 (5m, 10m, 20m and 30m from HighLine series) | MRA-F130-R | 6028631 |
| Plug connectors and cables | | | |
|  | Head A: female connector, M23, 12-pin, straight Head B: Flying leads Cable: SSI, RS-422, TTL, HTL, PUR, halogen-free, shielded, 3 m | DOL-2312-G03MMA1 | 2029201 |
| | Head A: female connector, M23, 12-pin, straight Head B: Flying leads Cable: SSI, RS-422, TTL, HTL, PUR, halogen-free, shielded, 5 m | DOL-2312-G05MMA1 | 2029202 |
| | Head A: female connector, M23, 12-pin, straight Head B: Flying leads Cable: SSI, RS-422, TTL, HTL, PUR, halogen-free, shielded, 10 m | DOL-2312-G10MMA1 | 2029203 |
| | Head A: female connector, M23, 12-pin, straight Head B: Flying leads Cable: SSI, RS-422, TTL, HTL, PUR, halogen-free, shielded, 1.5 m | DOL-2312-G1M5MA1 | 2029200 |
| | Head A: female connector, M23, 12-pin, straight Head B: Flying leads Cable: SSI, RS-422, PUR, halogen-free, shielded, 20 m | DOL-2312-G20MMA1 | 2029204 |
| | Head A: female connector, M23, 12-pin, straight Head B: Flying leads Cable: SSI, RS-422, PUR, halogen-free, shielded, 30 m | DOL-2312-G30MMA1 | 2029205 |
|  | Head A: female connector, M23, 12-pin, straight Head B: - Cable: HIPERFACE®, SSI, Incremental, shielded | DOS-2312-G | 6027538 |

| | Brief description | Type | Part no. |
|---|--|----------------|----------|
|  | Head A: female connector, M23, 12-pin, angled Head B: - Cable: HIPERFACE [®] , SSI, Incremental, shielded | DOS-2312-W01 | 2072580 |
|  | Head A: male connector, M23, 12-pin, straight Head B: - Cable: HIPERFACE [®] , SSI, Incremental, RS-422, shielded | STE-2312-G | 6027537 |
| Programming and configuration tools | | | |
|  | Programming tool for ATM60, ATM90, and KH53 | PGT-01-S | 1030111 |
| Wire draw mechanism | | | |
|  | HighLine wire draw mechanism for servo flange with 6 mm shaft, measuring range 0 m ... 5 m | MRA-F130-105D2 | 6028626 |

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