



# BTFO8-N1BM0299

HighLine

WIRE DRAW ENCODERS

**SICK**  
Sensor Intelligence.



### Ordering information

| Type           | Part no. |
|----------------|----------|
| BTF08-N1BM0299 | 1060967  |

**Included in delivery:** AFM60A-S1NB018x12 (1), MRA-F080-102D2 (1)

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

Other models and accessories → [www.sick.com/HighLine](http://www.sick.com/HighLine)



### Detailed technical data

#### Performance

|   |                            |
|---|----------------------------|
| <b>Measurement range</b>                | 0 m ... 2 m                |
| <b>Encoder</b>                          | Absolute encoders          |
| <b>Resolution (wire draw + encoder)</b> | 0.0008 mm <sup>1) 2)</sup> |
| <b>Repeatability</b>                    | ≤ 1 mm <sup>3)</sup>       |
| <b>Linearity</b>                        | ≤ ± 2 mm <sup>3)</sup>     |
| <b>Hysteresis</b>                       | ≤ 2 mm <sup>3)</sup>       |

<sup>1)</sup> The values shown have been rounded.

<sup>2)</sup> 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).

<sup>3)</sup> Value applies to wire draw mechanism.

#### Interfaces

|                                  |          |
|----------------------------------|----------|
| <b>Communication interface</b>   | PROFINET |
| <b>Programmable/configurable</b> | ✓        |

#### Electrical data

|  |  |
|--|--|
| <b>Connection type</b>                       | Male connector, Female connector, 1x, 2x, M12, M12, 4-pin, 4-pin, axial, axial |
| <b>Supply voltage</b>                        | 10 V DC ... 30 V DC  |
| <b>Power consumption</b>                     | ≤ 3 W (without load)   |
| <b>MTTFd: mean time to dangerous failure</b> | 80 years (EN ISO 13849-1) <sup>1)</sup>  |

<sup>1)</sup> 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

|               |        |
|---------------|--------|
| <b>Weight</b> | 1.5 kg |
|---------------|--------|

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

<sup>2)</sup> Average values, which depend on the application.

<sup>3)</sup> 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.

|   |   |
|---|---|
| <b>Measuring wire material</b>                  | Highly flexible stranded steel 1,4401 stainless steel V4A |
| <b>Measuring wire diameter</b>                  | 1.35 mm   |
| <b>Weight (measuring wire)</b>                  | 7.1 g/m   |
| <b>Housing material, wire draw mechanism</b>    | Aluminum (anodized), aluminum die cast (nickel-plated)    |
| <b>Spring return force</b>                      | 6 N ... 14 N <sup>1)</sup>                                |
| <b>Length of wire pulled out per revolution</b> | 200 mm  |
| <b>Life of wire draw mechanism</b>              | Typ. 1,000,000 cycles <sup>2) 3)</sup>                    |
| <b>Actual wire draw length</b>                  | 2.2 m   |
| <b>Wire acceleration</b>                        | 40 m/s <sup>2</sup>                                       |
| <b>Operating speed</b>                          | 8 m/s   |
| <b>Mounted encoder</b>                          | AFM60 PROFINET, AFM60A-S1NB018X12, 1059040                |
| <b>Mounted mechanic</b>                         | MRA-F080-102D2, 6028625                                   |

<sup>1)</sup> These values were measred at an ambient temperature of 25 °C. There may be variations at other temperatures.

<sup>2)</sup> Average values, which depend on the application.

<sup>3)</sup> 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

|                                    |   |
|------------------------------------|---|
| <b>EMC</b>                         | According to EN 61000-6-2 and EN 61000-6-3 <sup>1)</sup>          |
| <b>Enclosure rating</b>            | IP64, mounted mechanic<br>IP67, Encoder (IEC 60529) <sup>2)</sup> |
| <b>Operating temperature range</b> | -30 °C ... +70 °C   |

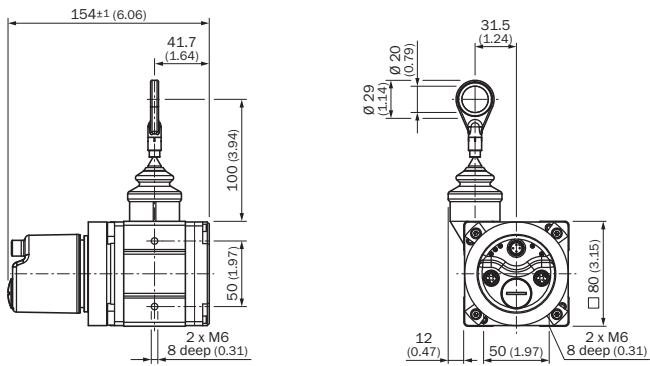
<sup>1)</sup> The EMC according to the standards quoted is achieved if screened cables are used.

<sup>2)</sup> With mating connector fitted.

### Classifications

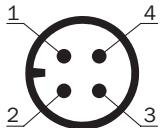
|                       |          |
|-----------------------|----------|
| <b>eCl@ss 5.0</b>     | 27270590 |
| <b>eCl@ss 5.1.4</b>   | 27270590 |
| <b>eCl@ss 6.0</b>     | 27270590 |
| <b>eCl@ss 6.2</b>     | 27270590 |
| <b>eCl@ss 7.0</b>     | 27270590 |
| <b>eCl@ss 8.0</b>     | 27270590 |
| <b>eCl@ss 8.1</b>     | 27270590 |
| <b>eCl@ss 9.0</b>     | 27270590 |
| <b>eCl@ss 10.0</b>    | 27270613 |
| <b>eCl@ss 11.0</b>    | 27270503 |
| <b>eCl@ss 12.0</b>    | 27270503 |
| <b>ETIM 5.0</b>       | EC001486 |
| <b>ETIM 6.0</b>       | EC001486 |
| <b>ETIM 7.0</b>       | EC001486 |
| <b>ETIM 8.0</b>       | EC001486 |
| <b>UNSPSC 16.0901</b> | 41112113 |

### Dimensional drawing (Dimensions in mm (inch))



### PIN assignment

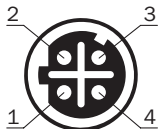
Male connector



Supply voltage

| PIN | Wire color | Signal                       |
|-----|------------|------------------------------|
| 1   | Brown      | U <sub>S</sub> 10 V ... 30 V |
| 2   | White      | Not assigned                 |
| 3   | Blue       | GND                          |
| 4   | Black      | Not assigned                 |

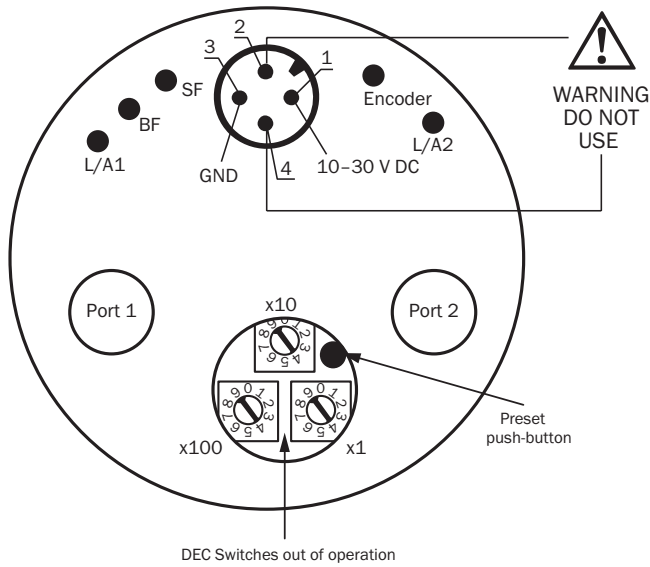
Female connector



Port 1, Port 2







| PIN | Wire color | Signal |
|-----|------------|--------|
| 1   | Yellow     | T x D+ |
| 2   | White      | R x D+ |
| 3   | Orange     | T x D- |
| 4   | Blue       | R x D- |

Connection diagram



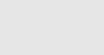






Recommended accessories

Other models and accessories → [www.sick.com/HighLine](http://www.sick.com/HighLine)

|   | Brief description  | Type                                       | Part no. |
|---|--|--|----------|
| <b>Wire draw mechanism</b>  |  |  |          |
|  | HighLine wire draw mechanism for servo flange with 6 mm shaft, measuring range 0 m ... 2 m   | MRA-F080-102D2                             | 6028625  |
| <b>Flanges</b>  |  |  |          |
|  | 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 M3 x 10 | BEF-FA-020-050WDE                          | 2073776  |
| <b>Other mounting accessories</b>   |  |  |          |
|  | 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-F080 (2 m and 3 m from HighLine series)  | MRA-F080-B                                 | 6045341  |
|  | Wire draw deflection pulley for wire draw mechanism MRA-F080 (2m and 3m from HighLine series)  | MRA-F080-R                                 | 6028632  |

|   | Brief description  | Type               | Part no. |
|---|--|--------------------|----------|
| <b>Plug connectors and cables</b>   |  |                    |          |
|    | Head A: female connector, M12, 4-pin, straight, A-coded<br>Head B: Flying leads<br>Cable: Sensor/actuator cable, PUR, halogen-free, unshielded, 2 m                    | YF2A14-020UB3XLEAX | 2095607  |
|   | Head A: female connector, M12, 4-pin, straight, A-coded<br>Head B: Flying leads<br>Cable: Sensor/actuator cable, PUR, halogen-free, unshielded, 5 m                    | YF2A14-050UB3XLEAX | 2095608  |
|   | Head A: female connector, M12, 4-pin, straight, A-coded<br>Head B: Flying leads<br>Cable: Sensor/actuator cable, PUR, halogen-free, unshielded, 10 m                   | YF2A14-100UB3XLEAX | 2095609  |
|   | Head A: female connector, M12, 4-pin, straight, A-coded<br>Head B: Flying leads<br>Cable: Sensor/actuator cable, PUR, halogen-free, unshielded, 25 m                   | YF2A14-250UB3XLEAX | 2095615  |
|    | Head A: female connector, M12, 4-pin, angled, A-coded<br>Head B: Flying leads<br>Cable: Sensor/actuator cable, PUR, halogen-free, unshielded, 2 m                      | YG2A14-020UB3XLEAX | 2095766  |
|   | Head A: female connector, M12, 4-pin, angled, A-coded<br>Head B: Flying leads<br>Cable: Sensor/actuator cable, PUR, halogen-free, unshielded, 5 m                      | YG2A14-050UB3XLEAX | 2095767  |
|   | Head A: female connector, M12, 4-pin, angled, A-coded<br>Head B: Flying leads<br>Cable: Sensor/actuator cable, PUR, halogen-free, unshielded, 10 m                     | YG2A14-100UB3XLEAX | 2095768  |
|   | Head A: female connector, M12, 4-pin, angled, A-coded<br>Head B: Flying leads<br>Cable: Sensor/actuator cable, PUR, halogen-free, unshielded, 25 m                     | YG2A14-250UB3XLEAX | 2095771  |
|   | Head A: male connector, M12, 4-pin, straight, D-coded<br>Head B: Flying leads<br>Cable: Ethernet, PROFINET, PUR, halogen-free, shielded, 2 m                           | YM2D24-020PN1XLEAX | 2106171  |
|   | Head A: male connector, M12, 4-pin, straight, D-coded<br>Head B: Flying leads<br>Cable: Ethernet, PROFINET, PUR, halogen-free, shielded, 5 m                           | YM2D24-050PN1XLEAX | 2106172  |
|   | Head A: male connector, M12, 4-pin, straight, D-coded<br>Head B: Flying leads<br>Cable: Ethernet, PROFINET, PUR, halogen-free, shielded, 10 m                          | YM2D24-100PN1XLEAX | 2106173  |
|  | Head A: male connector, M12, 4-pin, angled, D-coded<br>Head B: Flying leads<br>Cable: Ethernet, PROFINET, PUR, halogen-free, shielded, 5 m                             | YN2D24-050PN1XLEAX | 2106175  |
|   | Head A: male connector, M12, 4-pin, angled, D-coded<br>Head B: Flying leads<br>Cable: Ethernet, PROFINET, PUR, halogen-free, shielded, 25 m                            | YN2D24-250PN1XLEAX | 2106180  |
|  | Head A: male connector, M12, 4-pin, angled, D-coded<br>Head B: male connector, M12, 4-pin, angled, D-coded<br>Cable: PROFINET, PUR, halogen-free, shielded, 5 m        | SSL-1204-W05MZ     | 6050636  |
|  | Head A: male connector, RJ45, 4-pin, straight<br>Head B: male connector, M12, 4-pin, angled, D-coded<br>Cable: PROFINET, EtherCAT®, PVC, shielded, 30 m                | SSL-2J04-F30MZ     | 6059450  |
|  | Head A: male connector, M12, 4-pin, straight, D-coded<br>Head B: male connector, RJ45, 4-pin, straight<br>Cable: Ethernet, PROFINET, PUR, halogen-free, shielded, 2 m  | YM2D24-020PN1MRJA4 | 2106182  |
|   | Head A: male connector, M12, 4-pin, straight, D-coded<br>Head B: male connector, RJ45, 4-pin, straight<br>Cable: Ethernet, PROFINET, PUR, halogen-free, shielded, 10 m | YM2D24-100PN1MRJA4 | 2106185  |
|  | Head A: male connector, M12, 4-pin, angled, D-coded<br>Head B: male connector, RJ45, 4-pin, straight<br>Cable: Ethernet, PROFINET, PUR, halogen-free, shielded, 2 m    | YN2D24-020PN1MRJA4 | 2106162  |

|   | Brief description  | Type  | Part no. |
|---|--|---|----------|
|  | Head A: male connector, M12, 4-pin, angled, D-coded<br>Head B: male connector, M12, 4-pin, angled, D-coded<br>Cable: Ethernet, PROFINET, PUR, halogen-free, shielded, 2 m  | YN2D24-020PN1N2D24                            | 2106168  |
|  | Head A: male connector, M12, 4-pin, angled, D-coded<br>Head B: male connector, RJ45, 4-pin, straight<br>Cable: Ethernet, PROFINET, PUR, halogen-free, shielded, 5 m        | YN2D24-050PN1MRJA4                            | 2106163  |
|  | Head A: male connector, M12, 4-pin, angled, D-coded<br>Head B: male connector, RJ45, 4-pin, straight<br>Cable: Ethernet, PROFINET, PUR, halogen-free, shielded, 10 m       | YN2D24-100PN1MRJA4                            | 2106164  |
|  | Head A: male connector, M12, 4-pin, angled, D-coded<br>Head B: male connector, M12, 4-pin, angled, D-coded<br>Cable: Ethernet, PROFINET, PUR, halogen-free, shielded, 10 m | YN2D24-100PN1N2D24                            | 2106170  |
|  | Head A: female connector, M12, 4-pin, angled<br>Cable: unshielded  | DOS-1204-W                                    | 6007303  |
|  | Head A: male connector, M12, 4-pin, angled, D-coded<br>Cable: PROFINET, shielded   | STE-1204-WZ                                   | 6048262  |
|  | Head A: female connector, M12, 4-pin, D-coded<br>Head B: female connector, RJ45, 8-pin<br>Cable: Ethernet, shielded<br>Cabinet through                                     | Feedthrough female connector<br>Ethernet RJ45 | 6048180  |

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Comprehensive services complete our offering: SICK LifeTime Services provide support throughout the machine life cycle and ensure safety and productivity.

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