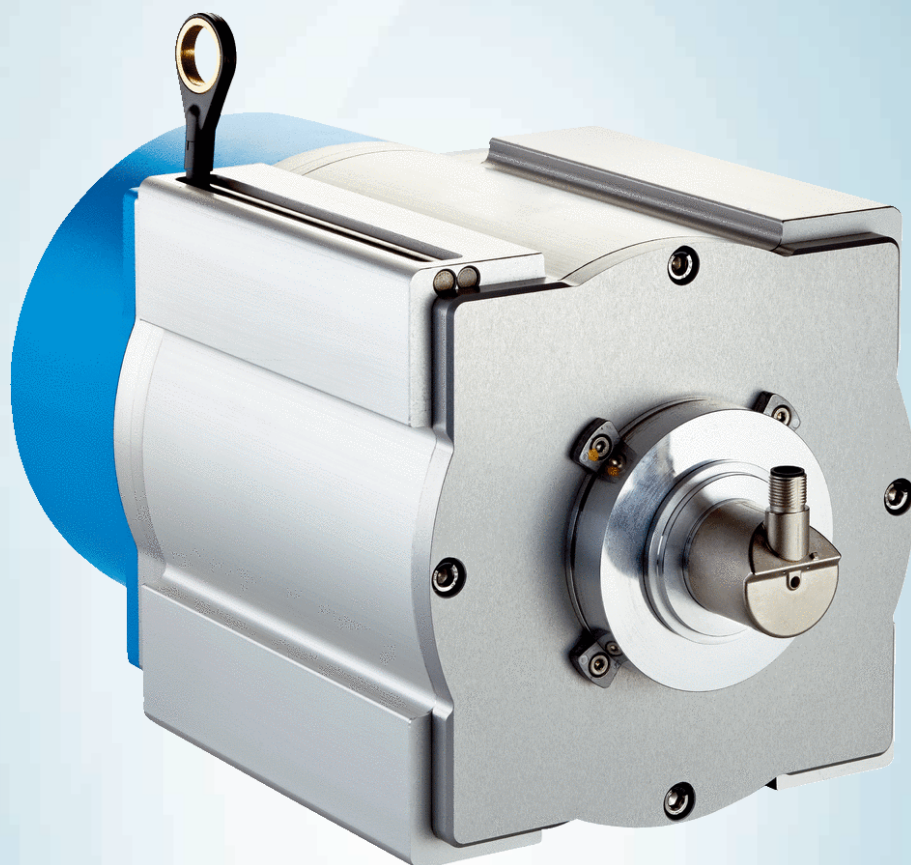


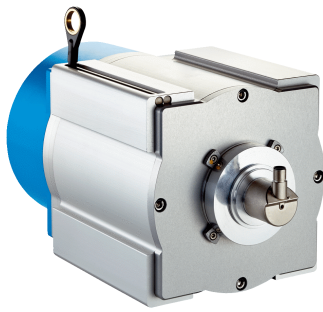


# BTF19-Q1RM5061

HighLine

WIRE DRAW ENCODERS

**SICK**  
Sensor Intelligence.



### Ordering information

| Type           | part no. |
|----------------|----------|
| BTF19-Q1RM5061 | 1097321  |

**Included in delivery:** AHM36B-S3QC012x12 (1), MRA-F190-150D2 (1), BEF-FA-020-050WDE (1)

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



### Detailed technical data

#### Safety-related parameters

|                                                          |                                          |
|----------------------------------------------------------|------------------------------------------|
| <b>MTTF<sub>D</sub> (mean time to dangerous failure)</b> | 240 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.

#### Performance

|                                         |                          |
|-----------------------------------------|--------------------------|
| <b>Measurement range</b>                | 0 m ... 50 m             |
| <b>Encoder</b>                          | Absolute encoders        |
| <b>Resolution (wire draw + encoder)</b> | 0.12 mm <sup>1) 2)</sup> |
| <b>Repeatability</b>                    | ≤ 5 mm <sup>3)</sup>     |
| <b>Linearity</b>                        | ≤ ± 2 mm <sup>3)</sup>   |
| <b>Hysteresis</b>                       | ≤ 10 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>   | IO-Link / IO-Link V1.1 / COM3 (230,4 kBaud) |
| <b>Programmable/configurable</b> | ✓                                           |

#### Electronics

|                          |                                       |
|--------------------------|---------------------------------------|
| <b>Connection type</b>   | Male connector, M12, 4-pin, universal |
| <b>Supply voltage</b>    | 18 V ... 30 V                         |
| <b>Power consumption</b> | ≤ 1.5 W (without load)                |

## Mechanics

|                                                 |                                                           |
|-------------------------------------------------|-----------------------------------------------------------|
| <b>Weight</b>                                   | 16.62 kg                                                  |
| <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>                      | 18 N ... 37 N <sup>1)</sup>                               |
| <b>Length of wire pulled out per revolution</b> | 491.5 mm                                                  |
| <b>Life of wire draw mechanism</b>              | Typ. 1,000,000 cycles <sup>2)</sup> <sup>3)</sup>         |
| <b>Actual wire draw length</b>                  | 50.2 m                                                    |
| <b>Wire acceleration</b>                        | 18 m/s <sup>2</sup>                                       |
| <b>Operating speed</b>                          | 4 m/s                                                     |
| <b>Mounted encoder</b>                          | AHM36 IO-Link Basic, AHM36B-S3QC012X12, 1092014           |
| <b>Mounted mechanic</b>                         | MRA-F190-150D2, 6028630                                   |

<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.

## Ambient data

|                                    |                                                        |
|------------------------------------|--------------------------------------------------------|
| <b>EMC</b>                         | According to EN 61000-6-2, EN 61000-6-3 and EN 61131-9 |
| <b>Enclosure rating</b>            | IP31, mounted mechanic<br>IP65, Encoder (IEC 60529)    |
| <b>Operating temperature range</b> | -20 °C ... +70 °C                                      |

## Certificates

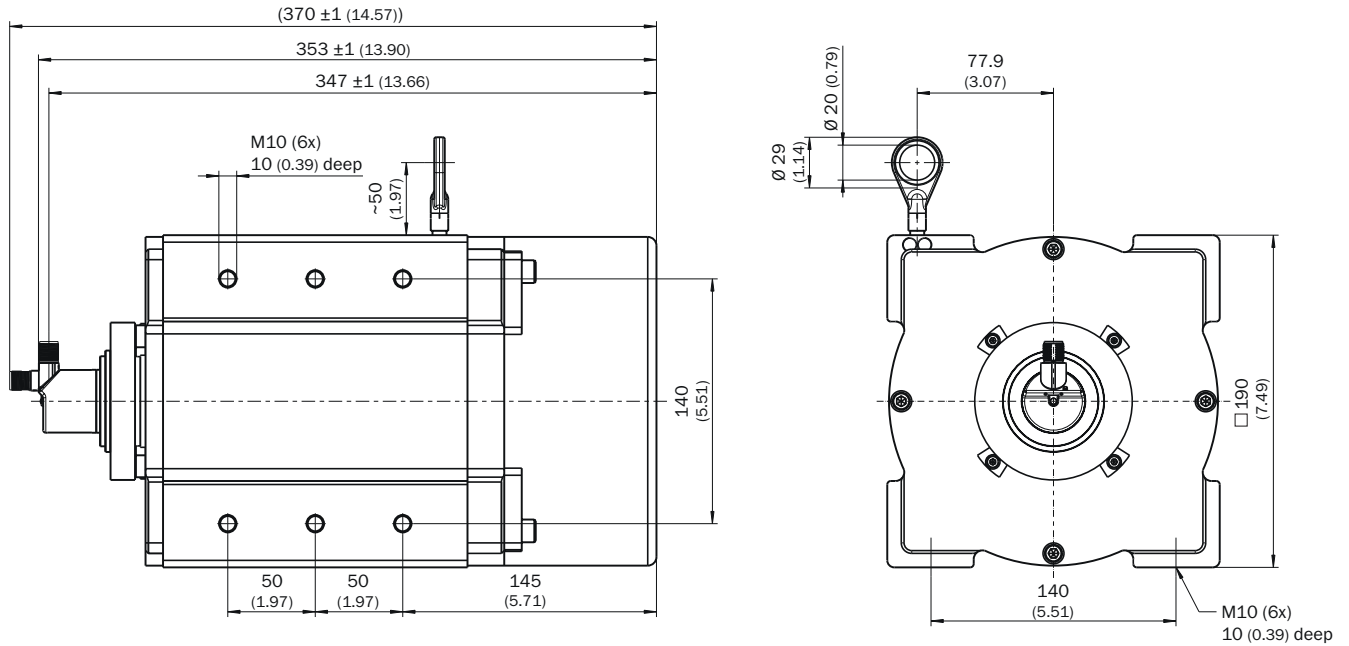
|                                           |   |
|-------------------------------------------|---|
| <b>EU declaration of conformity</b>       | ✓ |
| <b>UK declaration of conformity</b>       | ✓ |
| <b>ACMA declaration of conformity</b>     | ✓ |
| <b>Moroccan declaration of conformity</b> | ✓ |
| <b>China RoHS</b>                         | ✓ |

## Classifications

|                     |          |
|---------------------|----------|
| <b>ECLASS 5.0</b>   | 27270590 |
| <b>ECLASS 5.1.4</b> | 27270590 |
| <b>ECLASS 6.0</b>   | 27270590 |
| <b>ECLASS 6.2</b>   | 27270590 |
| <b>ECLASS 7.0</b>   | 27270590 |
| <b>ECLASS 8.0</b>   | 27270590 |
| <b>ECLASS 8.1</b>   | 27270590 |
| <b>ECLASS 9.0</b>   | 27270590 |
| <b>ECLASS 10.0</b>  | 27270613 |
| <b>ECLASS 11.0</b>  | 27270503 |
| <b>ECLASS 12.0</b>  | 27270503 |

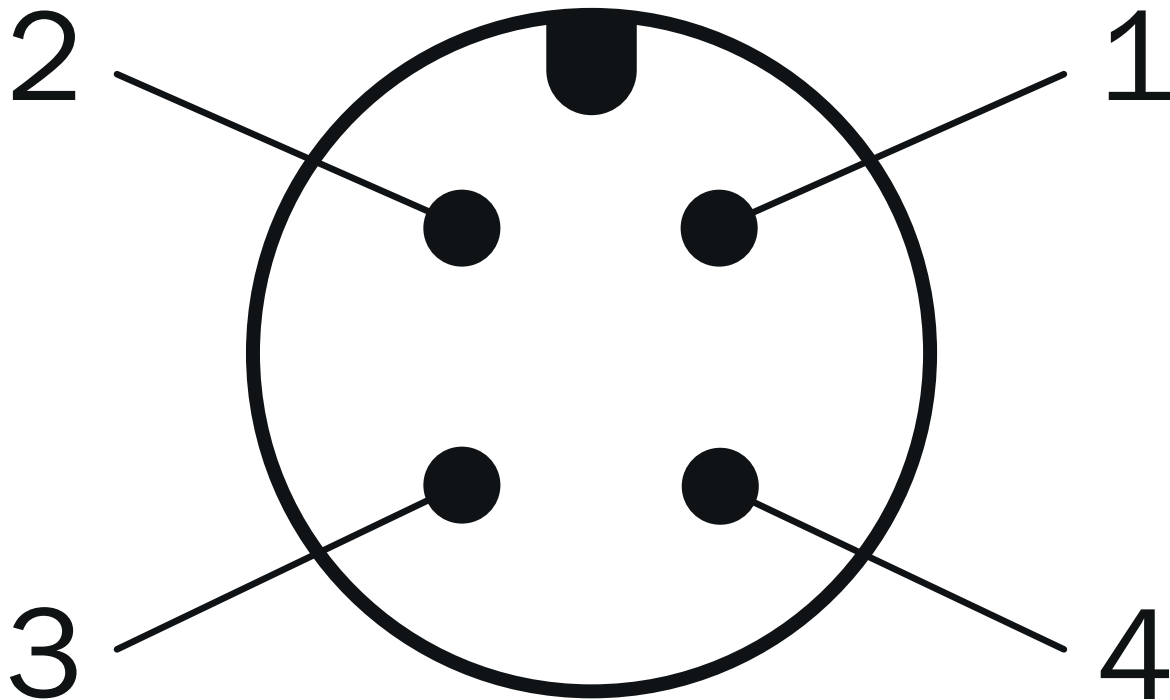
|                       |          |
|-----------------------|----------|
| <b>ETIM 5.0</b>       | EC001486 |
| <b>ETIM 6.0</b>       | EC001486 |
| <b>ETIM 7.0</b>       | EC001486 |
| <b>ETIM 8.0</b>       | EC001486 |
| <b>UNSPSC 16.0901</b> | 41112113 |

### Dimensional drawing



Dimensions in mm (inch)

# Anschlussbelegung



| PIN | Wire color | Signal | Function                             |                                                                              |                                  |
|-----|------------|--------|--------------------------------------|------------------------------------------------------------------------------|----------------------------------|
| -   | -          | -      | Basic                                | Advanced                                                                     | Advanced Smart Task              |
| 1   | Brown      | L+     | Encoder supply voltage 18-30 V (+Us) |                                                                              |                                  |
| 2   | White      | I/Q    | Not connect-<br>ed - no function     | Multifunctional pin (configurable as<br>switching input or switching output) |                                  |
| 3   | Blue       | L-     |                                      |                                                                              |                                  |
| 4   | Black      | C/Q    | Encoder supply voltage 0 V (GND)     |                                                                              |                                  |
|     |            | -      | IO-Link communication                |                                                                              |                                  |
|     |            |        | -                                    |                                                                              | Switching out-<br>put (SIO mode) |

### Recommended accessories

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

|                                                                                   | Brief description                                                                                                                                                                                                                                                                                                                                | Type                                       | part no. |
|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|----------|
| Mounting systems                                                                  |                                                                                                                                                                                                                                                                                                                                                  |                                            |          |
|  | <ul style="list-style-type: none"> <li><b>Description:</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.</li> </ul>                                                                                                                            | Joint protection for wire rope BTF/PRF/MRA | 5318683  |
|  | <ul style="list-style-type: none"> <li><b>Description:</b> Compressed air attachment for MRA-F080... and MRA-F130... HighLine wire draw mechanism</li> </ul>                                                                                                                                                                                     | MRA-F-P                                    | 6073769  |
|  | <ul style="list-style-type: none"> <li><b>Description:</b> Flange adapter for HighLine wire draw mechanisms, adaption of face mount flange with centering hub 20 mm to 50 mm servo flange</li> <li><b>Material:</b> Aluminum</li> <li><b>Details:</b> Aluminum</li> <li><b>Items supplied:</b> Including 3 countersunk screws M3 x 10</li> </ul> | BEF-FA-020-050WDE                          | 2073776  |

|                                                                                     | Brief description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Type               | part no. |
|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------|
| connectors and cables                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                    |          |
|    | <ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M12, 4-pin, straight, A-coded</li> <li><b>Description:</b> Unshielded</li> <li><b>Connection systems:</b> Screw-type terminals</li> <li><b>Permitted cross-section:</b> ≤ 0.75 mm²</li> </ul>                                                                                                                                                                                                                          | DOS-1204-G         | 6007302  |
|    | <ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M12, 4-pin, straight, A-coded</li> <li><b>Connection type head B:</b> Male connector, M12, 4-pin, straight, A-coded</li> <li><b>Signal type:</b> Sensor/actuator cable</li> <li><b>Cable:</b> 2 m, 4-wire, PUR, halogen-free</li> <li><b>Description:</b> Sensor/actuator cable, unshielded</li> <li><b>Application:</b> Uncontaminated zones, Zones with oils and lubricants, Robot, Drag chain operation</li> </ul>  | YF2A14-020UB3M2A14 | 2096000  |
|    | <ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M12, 4-pin, straight, A-coded</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> Sensor/actuator cable</li> <li><b>Cable:</b> 2 m, 4-wire, PUR, halogen-free</li> <li><b>Description:</b> Sensor/actuator cable, unshielded</li> <li><b>Application:</b> Uncontaminated zones, Zones with oils and lubricants, Robot, Drag chain operation</li> </ul>                                   | YF2A14-020UB3XLEAX | 2095607  |
|    | <ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M12, 4-pin, straight, A-coded</li> <li><b>Connection type head B:</b> Male connector, M12, 4-pin, straight, A-coded</li> <li><b>Signal type:</b> Sensor/actuator cable</li> <li><b>Cable:</b> 5 m, 4-wire, PUR, halogen-free</li> <li><b>Description:</b> Sensor/actuator cable, unshielded</li> <li><b>Application:</b> Uncontaminated zones, Zones with oils and lubricants, Robot, Drag chain operation</li> </ul>  | YF2A14-050UB3M2A14 | 2096001  |
|    | <ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M12, 4-pin, straight, A-coded</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> Sensor/actuator cable</li> <li><b>Cable:</b> 5 m, 4-wire, PUR, halogen-free</li> <li><b>Description:</b> Sensor/actuator cable, unshielded</li> <li><b>Application:</b> Uncontaminated zones, Zones with oils and lubricants, Robot, Drag chain operation</li> </ul>                                   | YF2A14-050UB3XLEAX | 2095608  |
|   | <ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M12, 4-pin, straight, A-coded</li> <li><b>Connection type head B:</b> Male connector, M12, 4-pin, straight, A-coded</li> <li><b>Signal type:</b> Sensor/actuator cable</li> <li><b>Cable:</b> 10 m, 4-wire, PUR, halogen-free</li> <li><b>Description:</b> Sensor/actuator cable, unshielded</li> <li><b>Application:</b> Uncontaminated zones, Zones with oils and lubricants, Robot, Drag chain operation</li> </ul> | YF2A14-100UB3M2A14 | 2096002  |
|  | <ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M12, 4-pin, straight, A-coded</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> Sensor/actuator cable</li> <li><b>Cable:</b> 10 m, 4-wire, PUR, halogen-free</li> <li><b>Description:</b> Sensor/actuator cable, unshielded</li> <li><b>Application:</b> Uncontaminated zones, Zones with oils and lubricants, Robot, Drag chain operation</li> </ul>                                  | YF2A14-100UB3XLEAX | 2095609  |
|  | <ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M12, 4-pin, straight, A-coded</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> Sensor/actuator cable</li> <li><b>Cable:</b> 0.6 m, 4-wire, PUR, halogen-free</li> <li><b>Description:</b> Sensor/actuator cable, unshielded</li> <li><b>Application:</b> Uncontaminated zones, Zones with oils and lubricants, Robot, Drag chain operation</li> </ul>                                 | YF2A14-C60UB3XLEAX | 2145654  |
|  | <ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M12, 4-pin, straight, A-coded</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> Sensor/actuator cable</li> <li><b>Cable:</b> 1 m, 4-wire, PUR, halogen-free</li> <li><b>Description:</b> Sensor/actuator cable, unshielded</li> <li><b>Application:</b> Uncontaminated zones, Zones with oils and lubricants, Robot, Drag chain operation</li> </ul>                                   | YF2A14-010UB3XLEAX | 2145655  |
|  | <ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M12, 4-pin, straight, A-coded</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> Sensor/actuator cable</li> <li><b>Cable:</b> 3 m, 4-wire, PUR, halogen-free</li> <li><b>Description:</b> Sensor/actuator cable, unshielded</li> <li><b>Application:</b> Uncontaminated zones, Zones with oils and lubricants, Robot, Drag chain operation</li> </ul>                                   | YF2A14-030UB3XLEAX | 2145656  |

|                                                                                   | Brief description                                                                                                                                                                                                                                                                                                                                    | Type           | part no. |
|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------|
| Wire draw mechanism                                                               |                                                                                                                                                                                                                                                                                                                                                      |                |          |
|  | <ul style="list-style-type: none"><li>• <b>Product segment:</b> Wire draw mechanism</li><li>• <b>Product family:</b> Wire draw mechanism for wire draw encoders</li><li>• <b>Description:</b> HighLine wire draw mechanism for servo flange with 6 mm shaft, measuring range 0 m ... 50 m</li><li>• <b>Items supplied:</b> Without encoder</li></ul> | MRA-F190-150D2 | 6028630  |

## SICK AT A GLANCE

SICK is one of the leading manufacturers of intelligent sensors and sensor solutions for industrial applications. A unique range of products and services creates the perfect basis for controlling processes securely and efficiently, protecting individuals from accidents and preventing damage to the environment.

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