



# BTF13-P1BM2025

HighLine

WIRE DRAW ENCODERS

**SICK**  
Sensor Intelligence.



### Ordering information

Type	Part no.
BTF13-P1BM2025	1060997

**Included in delivery:** A3M60B-S1PB013x13 (1), MRA-F130-120D1 (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 ... 20 m
<b>Encoder</b>	Absolute encoders
<b>Resolution (wire draw + encoder)</b>	0.04 mm <sup>1) 2)</sup>
<b>Repeatability</b>	≤ 2 mm <sup>3)</sup>
<b>Linearity</b>	≤ ± 2 mm <sup>3)</sup>
<b>Hysteresis</b>	≤ 5 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>	PROFIBUS DP
<b>Programmable/configurable</b>	✓

#### Electrical data

<b>Connection type</b>	Male connector, Female connector, 2x, 1x, M12, M12, 5-pin, 5-pin, axial, axial
<b>Supply voltage</b>	10 V ... 32 V
<b>Power consumption</b>	≤ 1.5 W (without load)
<b>MTTFd: mean time to dangerous failure</b>	60 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>	5.28 kg
<b>Measuring wire material</b>	Highly flexible stranded steel 1,4401 stainless steel V4A
<b>Measuring wire diameter</b>	0.81 mm

<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>Weight (measuring wire)</b>	2.6 g/m
<b>Housing material, wire draw mechanism</b>	Aluminum (anodised), plastic
<b>Spring return force</b>	10 N ... 20 N <sup>1)</sup>
<b>Length of wire pulled out per revolution</b>	332.4 mm
<b>Life of wire draw mechanism</b>	Typ. 1,000,000 cycles <sup>2) 3)</sup>
<b>Actual wire draw length</b>	20.2 m
<b>Wire acceleration</b>	30 m/s <sup>2</sup>
<b>Operating speed</b>	6 m/s
<b>Mounted encoder</b>	A3M60, A3M60B-S1PB013X13, 1051018
<b>Mounted mechanic</b>	MRA-F130-120D1, 6028628

<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

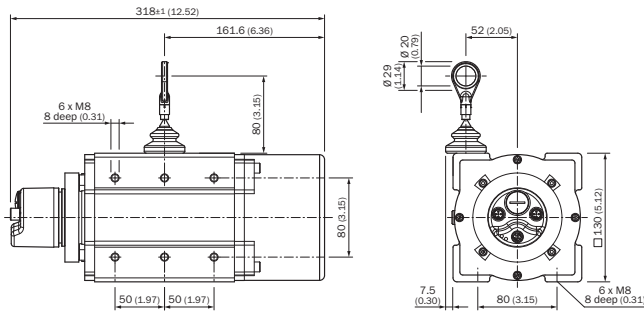
<b>EMC</b>	According to EN 61000-6-2 and EN 61000-6-3
<b>Enclosure rating</b>	IP64, mounted mechanic IP67, Encoder (IEC 60529) <sup>1)</sup>
<b>Operating temperature range</b>	-10 °C ... +70 °C

<sup>1)</sup> With mating connector fitted.

### 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))







### 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 ... 20 m	MRA-F130-120D1	6028628
<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-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
<b>Plug connectors and cables</b>			
	<ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Flying leads</li> <li>• <b>Connection type head B:</b> Flying leads</li> <li>• <b>Signal type:</b> PROFIBUS DP</li> <li>• <b>Cable:</b> 2-wire, PUR</li> <li>• <b>Description:</b> PROFIBUS DP, shielded</li> </ul>	LTG-2102-MW	6021355

	Brief description	Type	Part no.
	<ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M12, 5-pin, angled, 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, 2-wire, PUR, halogen-free</li> <li><b>Description:</b> Sensor/actuator cable, unshielded, Head A: female connector, M12, 5-pin, angled Head B: cable Cable: for power supply, PUR, halogen-free, shielded, 3 x 0.34 mm<sup>2</sup>, Ø 4.2 mm</li> <li><b>Note:</b> Voltage supply</li> <li><b>Application:</b> Zones with oils and lubricants</li> </ul>	DOL-1202-W05MC	6042067
	<ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M12, 5-pin, angled, 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, 2-wire, PUR, halogen-free</li> <li><b>Description:</b> Sensor/actuator cable, unshielded</li> <li><b>Note:</b> Voltage supply</li> <li><b>Application:</b> Zones with oils and lubricants</li> </ul>	DOL-1202-W10MC	6042068
	<ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M12, 5-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, 5-wire, PUR, halogen-free</li> <li><b>Description:</b> Sensor/actuator cable, shielded</li> <li><b>Application:</b> Zones with oils and lubricants, Drag chain operation, Robot</li> </ul>	YF2A25-050UB6XLEAX	2095733
	<ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M12, 5-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, 5-wire, PUR, halogen-free</li> <li><b>Description:</b> Sensor/actuator cable, shielded</li> <li><b>Application:</b> Zones with oils and lubricants, Drag chain operation, Robot</li> </ul>	YF2A25-100UB6XLEAX	2095734
	<ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M12, 5-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> 20 m, 5-wire, PUR, halogen-free</li> <li><b>Description:</b> Sensor/actuator cable, shielded</li> <li><b>Application:</b> Zones with oils and lubricants, Drag chain operation, Robot</li> </ul>	YF2A25-200UB6XLEAX	2095738
	<ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M12, 2-pin, straight, B-coded</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> Fieldbus, PROFIBUS DP</li> <li><b>Cable:</b> 5 m, 2-wire, PUR, halogen-free</li> <li><b>Description:</b> Fieldbus, PROFIBUS DP, shielded</li> <li><b>Application:</b> Drag chain operation, Zones with oils and lubricants</li> </ul>	YF2B22-050PB1XLEAX	2121936
	<ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M12, 2-pin, straight, B-coded</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> Fieldbus, PROFIBUS DP</li> <li><b>Cable:</b> 10 m, 2-wire, PUR, halogen-free</li> <li><b>Description:</b> Fieldbus, PROFIBUS DP, shielded</li> <li><b>Application:</b> Drag chain operation, Zones with oils and lubricants</li> </ul>	YF2B22-100PB1XLEAX	2106269
	<ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M12, 2-pin, straight, B-coded</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> Fieldbus, PROFIBUS DP</li> <li><b>Cable:</b> 15 m, 2-wire, PUR, halogen-free</li> <li><b>Description:</b> Fieldbus, PROFIBUS DP, shielded</li> <li><b>Application:</b> Drag chain operation, Zones with oils and lubricants</li> </ul>	YF2B22-150PB1XLEAX	2106272
	<ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M12, 2-pin, straight, B-coded</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> Fieldbus, PROFIBUS DP</li> <li><b>Cable:</b> 20 m, 2-wire, PUR, halogen-free</li> <li><b>Description:</b> Fieldbus, PROFIBUS DP, shielded</li> <li><b>Application:</b> Drag chain operation, Zones with oils and lubricants</li> </ul>	YF2B22-200PB1XLEAX	2106273

	Brief description	Type	Part no.
	<ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Female connector, M12, 2-pin, angled, B-coded</li> <li>• <b>Connection type head B:</b> Flying leads</li> <li>• <b>Signal type:</b> Fieldbus, PROFIBUS DP</li> <li>• <b>Cable:</b> 5 m, 2-wire, PUR, halogen-free</li> <li>• <b>Description:</b> Fieldbus, PROFIBUS DP, shielded</li> <li>• <b>Application:</b> Drag chain operation, Zones with oils and lubricants</li> </ul>	YG2B22-050PB1XLEAX	2106274
	<ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Female connector, M12, 2-pin, angled, B-coded</li> <li>• <b>Connection type head B:</b> Flying leads</li> <li>• <b>Signal type:</b> Fieldbus, PROFIBUS DP</li> <li>• <b>Cable:</b> 10 m, 2-wire, PUR, halogen-free</li> <li>• <b>Description:</b> Fieldbus, PROFIBUS DP, shielded</li> <li>• <b>Application:</b> Drag chain operation, Zones with oils and lubricants</li> </ul>	YG2B22-100PB1XLEAX	2106275
	<ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Male connector, M12, 2-pin, straight, B-coded</li> <li>• <b>Connection type head B:</b> Flying leads</li> <li>• <b>Signal type:</b> Fieldbus, PROFIBUS DP</li> <li>• <b>Cable:</b> 10 m, 2-wire, PUR, halogen-free</li> <li>• <b>Description:</b> Fieldbus, PROFIBUS DP, shielded</li> <li>• <b>Application:</b> Drag chain operation, Zones with oils and lubricants</li> </ul>	YM2B22-100PB1XLEAX	2106271
	<ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Male connector, M12, 2-pin, straight, B-coded</li> <li>• <b>Connection type head B:</b> Flying leads</li> <li>• <b>Signal type:</b> Fieldbus, PROFIBUS DP</li> <li>• <b>Cable:</b> 15 m, 2-wire, PUR, halogen-free</li> <li>• <b>Description:</b> Fieldbus, PROFIBUS DP, shielded</li> <li>• <b>Application:</b> Drag chain operation, Zones with oils and lubricants</li> </ul>	YM2B22-150PB1XLEAX	2106276
	<ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Male connector, M12, 2-pin, angled, B-coded</li> <li>• <b>Connection type head B:</b> Flying leads</li> <li>• <b>Signal type:</b> Fieldbus, PROFIBUS DP</li> <li>• <b>Cable:</b> 5 m, 2-wire, PUR, halogen-free</li> <li>• <b>Description:</b> Fieldbus, PROFIBUS DP, shielded</li> <li>• <b>Application:</b> Drag chain operation, Zones with oils and lubricants</li> </ul>	YN2B22-050PB1XLEAX	2106277
	<ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Male connector, M12, 2-pin, angled, B-coded</li> <li>• <b>Connection type head B:</b> Flying leads</li> <li>• <b>Signal type:</b> Fieldbus, PROFIBUS DP</li> <li>• <b>Cable:</b> 10 m, 2-wire, PUR, halogen-free</li> <li>• <b>Description:</b> Fieldbus, PROFIBUS DP, shielded</li> <li>• <b>Application:</b> Drag chain operation, Zones with oils and lubricants</li> </ul>	YN2B22-100PB1XLEAX	2106278
	<ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Female connector, M12, 5-pin, straight, B-coded</li> <li>• <b>Connection type head B:</b> Male connector, M12, 5-pin, straight, B-coded</li> <li>• <b>Signal type:</b> PROFIBUS DP</li> <li>• <b>Cable:</b> 10 m, 2-wire, PUR, halogen-free</li> <li>• <b>Description:</b> PROFIBUS DP, twisted pair, shielded</li> <li>• <b>Note:</b> Wire shield Al-Pt film, overall shield C-screen tin-plated</li> <li>• <b>Application:</b> Zones with oils and lubricants, Drag chain operation</li> </ul>	DSL-1205-G10MQ	6032640
	<ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Female connector, M12, 4-pin, straight</li> <li>• <b>Description:</b> Unshielded, Head A: female connector, M12, 4-pin, straight, unshielded, for power supply, for cable diameter 4 mm ... 6 mm Head B: -</li> <li>• <b>Connection systems:</b> Screw-type terminals</li> <li>• <b>Permitted cross-section:</b> ≤ 0.75 mm<sup>2</sup></li> </ul>	DOS-1204-G	6007302
	<ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Female connector, M12, 4-pin, angled</li> <li>• <b>Description:</b> Unshielded, Head A: female connector, M12, 4-pin, angled, unshielded, for power supply, for cable diameter 3 mm ... 6.5 mm Head B: -</li> <li>• <b>Connection systems:</b> Screw-type terminals</li> <li>• <b>Permitted cross-section:</b> ≤ 0.75 mm<sup>2</sup></li> </ul>	DOS-1204-W	6007303
	<ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Female connector, M12, 5-pin, straight, B-coded</li> <li>• <b>Signal type:</b> PROFIBUS DP</li> <li>• <b>Description:</b> PROFIBUS DP, shielded, Head A: M12 female connector, 5-pin, straight, B-coded, PROFIBUS DP, shielded, for cable diameter 4 mm ... 9 mm Head B: -</li> <li>• <b>Connection systems:</b> Screw-type terminals</li> <li>• <b>Permitted cross-section:</b> ≤ 0.75 mm<sup>2</sup></li> </ul>	DOS-1205-GQ	6021353

	Brief description	Type	Part no.
	<ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Female connector, M12, 5-pin, angled, B-coded (B-inverse)</li> <li>• <b>Signal type:</b> PROFIBUS DP, PROFIBUS DP</li> <li>• <b>Description:</b> PROFIBUS DP, PROFIBUS DP, shielded, Head A: female connector, M12, 5-pin, angled, B-coded, shielded, for cable diameter 4 mm ... 8 mm Head B: -</li> <li>• <b>Connection systems:</b> Spring-cage connection</li> <li>• <b>Permitted cross-section:</b> 0.14 mm<sup>2</sup> ... 0.5 mm<sup>2</sup></li> </ul>	DOS-1205-WQ	6041429
	<ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Male connector, M12, 5-pin, straight, B-coded</li> <li>• <b>Signal type:</b> PROFIBUS DP</li> <li>• <b>Description:</b> PROFIBUS DP, shielded, Head A: male connector, M12, 5-pin, straight, B coded, shielded, for cable diameter 4 mm ... 9 mm Head B: -</li> <li>• <b>Connection systems:</b> Screw-type terminals</li> <li>• <b>Permitted cross-section:</b> ≤ 0.75 mm<sup>2</sup></li> </ul>	STE-1205-GQ	6021354
	<ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Male connector, M12, 5-pin, angled, B-coded</li> <li>• <b>Signal type:</b> PROFIBUS DP</li> <li>• <b>Description:</b> PROFIBUS DP, shielded, Head A: male connector, M12, 5-pin, angled, B coded, shielded, for cable diameter 4 mm ... 8 mm Head B: -</li> <li>• <b>Connection systems:</b> Spring-cage connection</li> <li>• <b>Permitted cross-section:</b> 0.14 mm<sup>2</sup> ... 0.5 mm<sup>2</sup></li> </ul>	STE-1205-WQ	6041428
	<ul style="list-style-type: none"> <li>• <b>Description:</b> Unshielded, A3M60 accessories sales set comprising: Female cable connector, supply voltage, M12, angled (6007303) female cable connector, M12, angled (6041429), male cable connector, M12, angled (6041428)</li> <li>• <b>Note:</b> Set of connectors</li> </ul>	DOS-3XM12-W	2058177
	<ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Male connector, M12, 4-pin, straight, B-coded</li> <li>• <b>Signal type:</b> PROFIBUS DP</li> <li>• <b>Description:</b> PROFIBUS DP, terminal resistor</li> </ul>	STE-END-Q	6021156



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

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