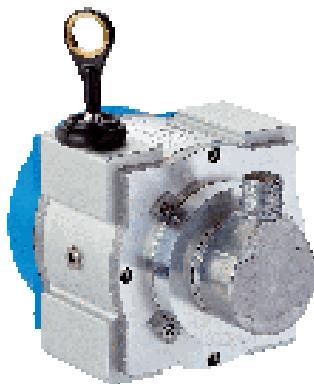


## PRF13-C1AM0520

HighLine

WIRE DRAW ENCODERS

**SICK**  
Sensor Intelligence.



## Ordering information

Type	part no.
PRF13-C1AM0520	1034330

**Included in delivery:** DFS60B-S1MA10000 (1), MRA-F130-105D2 (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>	300 years (EN ISO 13849-1) <sup>1)</sup>
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<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 ... 5 m
<b>Encoder</b>	Incremental encoders
<b>Resolution (wire draw + encoder)</b>	0.03 mm <sup>1)</sup> <sup>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 PRF08 with HTL Push Pull: 200 mm (wire draw length per revolution - see Mechanical data): 2,000 (pulses per revolution) = 0.1 mm (resolution of wire draw + encoder combination).

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

## Interfaces

<b>Communication interface</b>	Incremental / TTL / RS-422
<b>Programmable/configurable</b>	✓
<b>Factory setting</b>	The built-on DFS60 encoders are programmed to the specified number of lines and interface prior to delivery. The electrical interface (TTL/HTL) and the number of lines (up to max. 10,000 lines) can be set in accordance with customer requirements with our programming devices for DFS60 encoders, which are available separately.

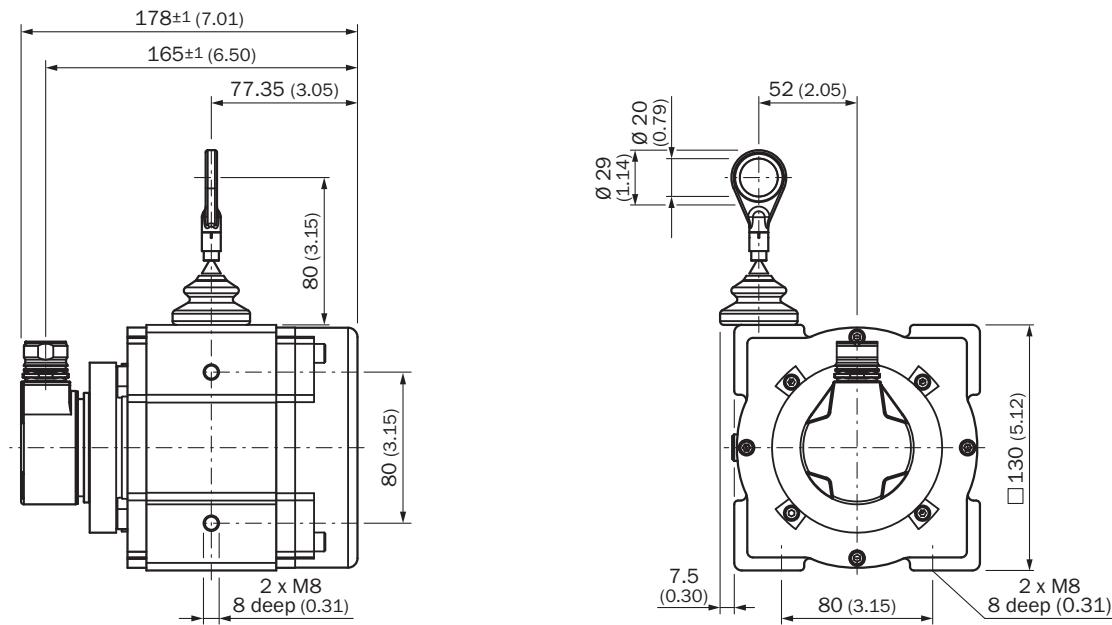
## Electronics

<b>Connection type</b>	Male connector, M23, 12-pin, radial
<b>Supply voltage</b>	10 V ... 32 V

<b>Power consumption</b>	≤ 0.7 W (without load)
Mechanics	
<b>Weight</b>	3.1 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 (anodised), plastic
<b>Spring return force</b>	15 N ... 20 N <sup>1)</sup>
<b>Length of wire pulled out per revolution</b>	334.1 mm
<b>Life of wire draw mechanism</b>	Typ. 1,000,000 cycles <sup>2) 3)</sup>
<b>Actual wire draw length</b>	5.2 m
<b>Wire acceleration</b>	70 m/s <sup>2</sup>
<b>Operating speed</b>	8 m/s
<b>Mounted encoder</b>	DFS60, DFS60B-S1MA10000, 1056866
<b>Mounted mechanic</b>	MRA-F130-105D2, 6028626
<p><sup>1)</sup> These values were measured at an ambient temperature of 25 °C. There may be variations at other temperatures.</p> <p><sup>2)</sup> Average values, which depend on the application.</p> <p><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.</p>	
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>	-30 °C ... +70 °C
<p><sup>1)</sup> With mating connector fitted.</p>	
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

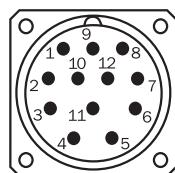
<b>ECLASS 11.0</b>	27270503
<b>ECLASS 12.0</b>	27270503
<b>ETIM 5.0</b>	EC001486
<b>ETIM 6.0</b>	EC001486
<b>ETIM 7.0</b>	EC001486
<b>ETIM 8.0</b>	EC001486
<b>UNSPSC 16.0901</b>	41112113

### Dimensional drawing



Dimensions in mm (inch)

### PIN assignment



view of M23 male device connector on encoder

PIN Male connector M12, 8-pin	PIN Male connector M23, 12-pin	Wire colors (cable connection)	TTL/HTL signal	sin/Cos 1.0 V <sub>PP</sub>	Explanation
1	6	Brown	¬A	COS-	Signal wire
2	5	White	A	COS+	Signal wire
3	1	Black	¬B	SIN-	Signal wire
4	8	Pink	B	SIN+	Signal wire
5	4	Yellow	¬Z	¬Z	Signal wire

PINMale connector M12, 8-pin	PINMale connector M23, 12-pin	Wire colors (cable connection)	TTL/HTL signal	Sin/Cos 1.0 V <sub>PP</sub>	Explanation
6	3	Purple	Z	Z	Signal wire
7	10	Blue	GND	GND	Ground connection
8	12	Red	+U <sub>S</sub>	+U <sub>S</sub>	Supply voltage
-	9	-	N.c.	N.c.	Not assigned
-	2	-	N.c.	N.c.	Not assigned
-	11	-	N.c.	N.c.	Not assigned
-	7 <sup>1)</sup>	Orange	O-SET <sup>1)</sup>	N.c.	Set zero pulse <sup>1)</sup>
Screen	Screen	Screen	Screen	Screen	Screen connected to housing on encoder side. Connected to ground on control side.

<sup>1)</sup>For electrical interfaces only: M, U, V, W with O-SET function on PIN 7 on M23 plug. The O-SET input is used to set the zero pulse to the current shaft position. If the O-SET input is applied to U<sub>S</sub> for longer than 250 ms after it has previously been open or applied to GND for at least 1,000 ms, the current shaft position is assigned zero pulse signal "Z".

## 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> Additional brush attachment for wire draw mechanism MRA-F130 (5 m, 10 m, 20 m and 30 m from HighLine series)</li> </ul>	MRA-F130-B	6038562
	<ul style="list-style-type: none"> <li><b>Description:</b> Wire draw deflection pulley for wire draw mechanism MRA-F130 (5m, 10m, 20m and 30m from HighLine series)</li> </ul>	MRA-F130-R	6028631

	<b>Brief description</b>	<b>Type</b>	<b>part no.</b>
programming devices			
	<ul style="list-style-type: none"> <li><b>Product segment:</b> Programming devices</li> <li><b>Product family:</b> PGT-10 Pro</li> <li><b>Description:</b> Programming unit display for programmable SICK DFS60, DFV60, AFS/AFM60, AHS/AHM36 encoders, and wire draw encoder with DFS60, AFS/AFM60 and AHS/AHM36. Compact dimensions, low weight, and intuitive operation.</li> <li><b>Items supplied:</b> 1 x PGT-10-Pro stand-alone programming tool, 4 x alkaline type batteries, 1.5 V Mignon (AA)</li> </ul>	PGT-10-Pro	1072254
	<ul style="list-style-type: none"> <li><b>Product segment:</b> Programming devices</li> <li><b>Product family:</b> PGT-08-S</li> <li><b>Description:</b> USB programming unit, for programmable SICK encoders AFS60, AFM60, DFS60, VFS60, DFV60 and wire draw encoders with programmable encoders</li> </ul>	PGT-08-S	1036616
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 ... 5 m</li> <li><b>Items supplied:</b> Without encoder</li> </ul>	MRA-F130-105D2	6028626

	Brief description	Type	part no.
connectors and cables			
	<ul style="list-style-type: none"><li><b>Connection type head A:</b> Female connector, M23, 12-pin, straight</li><li><b>Connection type head B:</b> Flying leads</li><li><b>Signal type:</b> Incremental</li><li><b>Cable:</b> 2 m, 11-wire, PUR</li><li><b>Description:</b> Incremental, shielded</li></ul>	DOL-2312-G02MLA3	2030682
	<ul style="list-style-type: none"><li><b>Connection type head A:</b> Female connector, M23, 12-pin, straight</li><li><b>Connection type head B:</b> Flying leads</li><li><b>Signal type:</b> Incremental</li><li><b>Cable:</b> 7 m, 11-wire, PUR</li><li><b>Description:</b> Incremental, shielded</li></ul>	DOL-2312-G07MLA3	2030685
	<ul style="list-style-type: none"><li><b>Connection type head A:</b> Female connector, M23, 12-pin, straight</li><li><b>Connection type head B:</b> Flying leads</li><li><b>Signal type:</b> Incremental</li><li><b>Cable:</b> 10 m, 11-wire, PUR</li><li><b>Description:</b> Incremental, shielded</li></ul>	DOL-2312-G10MLA3	2030688
	<ul style="list-style-type: none"><li><b>Connection type head A:</b> Female connector, M23, 12-pin, straight</li><li><b>Connection type head B:</b> Flying leads</li><li><b>Signal type:</b> Incremental</li><li><b>Cable:</b> 15 m, 11-wire, PUR</li><li><b>Description:</b> Incremental, shielded</li></ul>	DOL-2312-G15MLA3	2030692
	<ul style="list-style-type: none"><li><b>Connection type head A:</b> Female connector, M23, 12-pin, straight</li><li><b>Connection type head B:</b> Flying leads</li><li><b>Signal type:</b> Incremental</li><li><b>Cable:</b> 20 m, 11-wire, PUR</li><li><b>Description:</b> Incremental, shielded</li></ul>	DOL-2312-G20MLA3	2030695
	<ul style="list-style-type: none"><li><b>Connection type head A:</b> Female connector, M23, 12-pin, straight</li><li><b>Connection type head B:</b> Flying leads</li><li><b>Signal type:</b> Incremental</li><li><b>Cable:</b> 25 m, 11-wire, PUR</li><li><b>Description:</b> Incremental, shielded</li></ul>	DOL-2312-G25MLA3	2030699
	<ul style="list-style-type: none"><li><b>Connection type head A:</b> Female connector, M23, 12-pin, straight</li><li><b>Connection type head B:</b> Flying leads</li><li><b>Signal type:</b> Incremental</li><li><b>Cable:</b> 30 m, 11-wire, PUR</li><li><b>Description:</b> Incremental, shielded</li></ul>	DOL-2312-G30MLA3	2030702
	<ul style="list-style-type: none"><li><b>Connection type head A:</b> Female connector, M23, 12-pin, straight</li><li><b>Connection type head B:</b> Flying leads</li><li><b>Signal type:</b> Incremental</li><li><b>Cable:</b> 1.5 m, 12-wire, PUR, halogen-free</li><li><b>Description:</b> Incremental, shielded</li></ul>	DOL-2312-G1M5MA3	2029212
	<ul style="list-style-type: none"><li><b>Connection type head A:</b> Female connector, M23, 12-pin, straight</li><li><b>Connection type head B:</b> Flying leads</li><li><b>Signal type:</b> Incremental</li><li><b>Cable:</b> 3 m, 12-wire, PUR, halogen-free</li><li><b>Description:</b> Incremental, shielded</li></ul>	DOL-2312-G03MMA3	2029213
	<ul style="list-style-type: none"><li><b>Connection type head A:</b> Female connector, M23, 12-pin, straight</li><li><b>Connection type head B:</b> Flying leads</li><li><b>Signal type:</b> Incremental</li><li><b>Cable:</b> 5 m, 12-wire, PUR, halogen-free</li><li><b>Description:</b> Incremental, shielded</li></ul>	DOL-2312-G05MMA3	2029214
	<ul style="list-style-type: none"><li><b>Connection type head A:</b> Female connector, M23, 12-pin, straight</li><li><b>Connection type head B:</b> Flying leads</li><li><b>Signal type:</b> Incremental</li><li><b>Cable:</b> 10 m, 12-wire, PUR, halogen-free</li><li><b>Description:</b> Incremental, shielded</li></ul>	DOL-2312-G10MMA3	2029215
	<ul style="list-style-type: none"><li><b>Connection type head A:</b> Female connector, M23, 12-pin, straight</li><li><b>Connection type head B:</b> Flying leads</li><li><b>Signal type:</b> Incremental</li><li><b>Cable:</b> 20 m, 12-wire, PUR, halogen-free</li><li><b>Description:</b> Incremental, shielded</li></ul>	DOL-2312-G20MMA3	2029216
	<ul style="list-style-type: none"><li><b>Connection type head A:</b> Female connector, M23, 12-pin, straight</li><li><b>Connection type head B:</b> Flying leads</li><li><b>Signal type:</b> Incremental</li><li><b>Cable:</b> 30 m, 12-wire, PUR, halogen-free</li><li><b>Description:</b> Incremental, shielded</li></ul>	DOL-2312-G30MMA3	2029217

	<b>Brief description</b>	<b>Type</b>	<b>part no.</b>
	<ul style="list-style-type: none"> <li><b>Description:</b> Incremental, shielded</li> <li><b>Connection type head A:</b> Female connector, M23, 12-pin, straight, A-coded</li> <li><b>Signal type:</b> HIPERFACE®, SSI, Incremental</li> <li><b>Description:</b> HIPERFACE®, shieldedSSIIncremental</li> <li><b>Connection systems:</b> Solder connection</li> </ul>	DOS-2312-G02	2077057
	<ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M23, 12-pin, angled, A-coded</li> <li><b>Signal type:</b> HIPERFACE®, SSI, Incremental</li> <li><b>Description:</b> HIPERFACE®, shieldedSSIIncremental</li> <li><b>Connection systems:</b> Solder connection</li> </ul>	DOS-2312-W01	2072580

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