

## PRF13-C1AM0520

HighLine

**WIRE DRAW ENCODERS** 





#### Ordering information

Туре	part no.
PRF13-C1AM0520	1034330

Included in delivery: DFS60B-S1MA10000 (1), MRA-F130-105D2 (1)

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



#### Detailed technical data

#### Safety-related parameters

MTTF <sub>D</sub> (mean time to dangerous failure)	300 years (EN ISO 13849-1) 1)

<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

Measurement range	0 m 5 m
Encoder	Incremental encoders
Resolution (wire draw + encoder)	0.03 mm <sup>1) 2)</sup>
Repeatability	≤ 1 mm <sup>3)</sup>
Linearity	≤ ± 2 mm <sup>3)</sup>
Hysteresis	≤ 2 mm <sup>3)</sup>

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

#### Interfaces

Communication interface	Incremental / TTL / RS-422
Programmable/configurable	<b>√</b>
Factory setting	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

Connection type	Male connector, M23, 12-pin, radial
Supply voltage	10 V 32 V

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

<b>Power consumption</b> ≤ 0.7 W (without load)
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#### Mechanics

Weight	3.1 kg
Measuring wire material	Highly flexible stranded steel 1,4401 stainless steel V4A
Measuring wire diameter	1.35 mm
Weight (measuring wire)	7.1 g/m
Housing material, wire draw mechanism	Aluminum (anodised), plastic
Spring return force	15 N 20 N <sup>1)</sup>
Length of wire pulled out per revolution	334.1 mm
Life of wire draw mechanism	Typ. 1,000,000 cycles <sup>2) 3)</sup>
Actual wire draw length	5.2 m
Wire acceleration	70 m/s <sup>2</sup>
Operating speed	8 m/s
Mounted encoder	DFS60, DFS60B-S1MA10000, 1056866
Mounted mechanic	MRA-F130-105D2, 6028626

 $<sup>^{1)}</sup>$  These values were measred at an ambient temperature of 25  $\,^{\circ}$  C. There may be variations at other temperatures.

#### Ambient data

EMC	According to EN 61000-6-2 and EN 61000-6-3
Enclosure rating	IP64, mounted mechanic IP67, Encoder (IEC 60529) 1)
Operating temperature range	-30 °C +70 °C

<sup>&</sup>lt;sup>1)</sup> With mating connector fitted.

#### Certificates

EU declaration of conformity	1
UK declaration of conformity	✓
ACMA declaration of conformity	1
Moroccan declaration of conformity	1
China RoHS	✓

#### Classifications

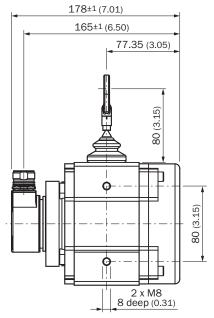
ECLASS 5.0	27270590
ECLASS 5.1.4	27270590
ECLASS 6.0	27270590
ECLASS 6.2	27270590
ECLASS 7.0	27270590
ECLASS 8.0	27270590
ECLASS 8.1	27270590
ECLASS 9.0	27270590
ECLASS 10.0	27270613

 $<sup>^{2)}\,\</sup>mbox{Average}$  values, which depend on the application.

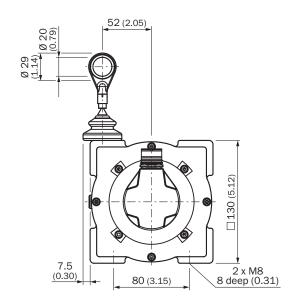
<sup>3)</sup> The service life depends on the type of load. This is influenced by environmental conditions, the installation location, the measuring range in use, the traversing speed, and acceleration.

ECLASS 11.0	27270503
ECLASS 12.0	27270503
ETIM 5.0	EC001486
ETIM 6.0	EC001486
ETIM 7.0	EC001486
ETIM 8.0	EC001486
UNSPSC 16.0901	41112113

#### **Dimensional drawing**



Dimensions in mm (inch)



#### Anschlussbelegung



view of M23 male device connector on encoder

PINMale connector M12, 8-pin	PINMale connector M23, 12-pin	Wire colors (ca- ble connection)	TTL/HTL signal	Sin/Cos 1.0 V <sub>PP</sub>	Explanation
1	6	Brown	_A	COS-	Signal wire
2	5	White	Α	COS+	Signal wire
3	1	Black	_B	SIN-	Signal wire
4	8	Pink	В	SIN+	Signal wire
5	4	Yellow	-Z	-Z	Signal wire

PINMale connector M12, 8-pin	PINMale connector M23, 12-pin	Wire colors (ca- ble 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 1)	Orange	O-SET 1)	N.c.	Set zero pulse <sup>1)</sup>
Shielding	Shielding	Shielding	Shielding	Shielding	Screen connect- ed to housing on encoder side. Con- nected to ground on control side.

<sup>&</sup>lt;sup>1)</sup>For electrical interfaces only: M, U, V, W with 0-SET function on PIN 7 on M23 plug. The 0-SET input is used to set the zero pulse to the current shaft position. If the 0-SET input is applied to US 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

	Brief description	Туре	part no.
Mounting systems			
0	Description: 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
	Description: Compressed air attachment for MRA-F080 and MRA-F130 HighLine wire draw mechanism	MRA-F-P	6073769
	Description: 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
	Description: Wire draw deflection pulley for wire draw mechanism MRA-F130 (5m, 10m, 20m and 30m from HighLine series)	MRA-F130-R	6028631

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	Brief description	Туре	part no.	
programming	programming devices			
V C. SA	<ul> <li>Product segment: Programming devices</li> <li>Product family: PGT-10 Pro</li> <li>Description: 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>Items supplied: 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> <li>Product segment: Programming devices</li> <li>Product family: PGT-08-S</li> <li>Description: USB programming unit, for programmable SICK encoders AFS60, AFM60, DFS60, VFS60, DFV60 and wire draw encoders with programmable encoders. Not compatible with the portable SOPAS ET versions.</li> </ul>	PGT-08-S	1036616	
Wire draw mechanism				
	<ul> <li>Product segment: Wire draw mechanism</li> <li>Product family: Wire draw mechanism for wire draw encoders</li> <li>Description: HighLine wire draw mechanism for servo flange with 6 mm shaft, measuring range 0 m 5 m</li> <li>Items supplied: Without encoder</li> </ul>	MRA-F130-105D2	6028626	

	Brief description	Туре	part no.
connectors an	d cables		
	<ul> <li>Connection type head A: Female connector, M23, 12-pin, straight</li> <li>Connection type head B: Flying leads</li> <li>Signal type: Incremental</li> <li>Cable: 2 m, 11-wire, PUR</li> <li>Description: Incremental, shielded</li> </ul>	DOL-2312-G02MLA3	2030682
	<ul> <li>Connection type head A: Female connector, M23, 12-pin, straight</li> <li>Connection type head B: Flying leads</li> <li>Signal type: Incremental</li> <li>Cable: 7 m, 11-wire, PUR</li> <li>Description: Incremental, shielded</li> </ul>	DOL-2312-G07MLA3	2030685
	<ul> <li>Connection type head A: Female connector, M23, 12-pin, straight</li> <li>Connection type head B: Flying leads</li> <li>Signal type: Incremental</li> <li>Cable: 10 m, 11-wire, PUR</li> <li>Description: Incremental, shielded</li> </ul>	DOL-2312-G10MLA3	2030688
	<ul> <li>Connection type head A: Female connector, M23, 12-pin, straight</li> <li>Connection type head B: Flying leads</li> <li>Signal type: Incremental</li> <li>Cable: 15 m, 11-wire, PUR</li> <li>Description: Incremental, shielded</li> </ul>	DOL-2312-G15MLA3	2030692
	<ul> <li>Connection type head A: Female connector, M23, 12-pin, straight</li> <li>Connection type head B: Flying leads</li> <li>Signal type: Incremental</li> <li>Cable: 20 m, 11-wire, PUR</li> <li>Description: Incremental, shielded</li> </ul>	DOL-2312-G20MLA3	2030695
	<ul> <li>Connection type head A: Female connector, M23, 12-pin, straight</li> <li>Connection type head B: Flying leads</li> <li>Signal type: Incremental</li> <li>Cable: 25 m, 11-wire, PUR</li> <li>Description: Incremental, shielded</li> </ul>	DOL-2312-G25MLA3	2030699
	<ul> <li>Connection type head A: Female connector, M23, 12-pin, straight</li> <li>Connection type head B: Flying leads</li> <li>Signal type: Incremental</li> <li>Cable: 30 m, 11-wire, PUR</li> <li>Description: Incremental, shielded</li> </ul>	DOL-2312-G30MLA3	2030702
	<ul> <li>Connection type head A: Female connector, M23, 12-pin, straight</li> <li>Connection type head B: Flying leads</li> <li>Signal type: Incremental</li> <li>Cable: 1.5 m, 12-wire, PUR, halogen-free</li> <li>Description: Incremental, shielded</li> </ul>	DOL-2312- G1M5MA3	2029212
	<ul> <li>Connection type head A: Female connector, M23, 12-pin, straight</li> <li>Connection type head B: Flying leads</li> <li>Signal type: Incremental</li> <li>Cable: 3 m, 12-wire, PUR, halogen-free</li> <li>Description: Incremental, shielded</li> </ul>	DOL-2312- GO3MMA3	2029213
-	<ul> <li>Connection type head A: Female connector, M23, 12-pin, straight</li> <li>Connection type head B: Flying leads</li> <li>Signal type: Incremental</li> <li>Cable: 5 m, 12-wire, PUR, halogen-free</li> <li>Description: Incremental, shielded</li> </ul>	DOL-2312- G05MMA3	2029214
	<ul> <li>Connection type head A: Female connector, M23, 12-pin, straight</li> <li>Connection type head B: Flying leads</li> <li>Signal type: Incremental</li> <li>Cable: 10 m, 12-wire, PUR, halogen-free</li> <li>Description: Incremental, shielded</li> </ul>	DOL-2312- G10MMA3	2029215
	<ul> <li>Connection type head A: Female connector, M23, 12-pin, straight</li> <li>Connection type head B: Flying leads</li> <li>Signal type: Incremental</li> <li>Cable: 20 m, 12-wire, PUR, halogen-free</li> <li>Description: Incremental, shielded</li> </ul>	DOL-2312- G20MMA3	2029216
	<ul> <li>Connection type head A: Female connector, M23, 12-pin, straight</li> <li>Connection type head B: Flying leads</li> <li>Signal type: Incremental</li> <li>Cable: 30 m, 12-wire, PUR, halogen-free</li> </ul>	DOL-2312- G30MMA3	2029217

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	Brief description	Туре	part no.
	Description: Incremental, shielded		
	Connection type head A: Female connector, M23, 12-pin, straight, A-coded Signal type: HIPERFACE®, SSI, Incremental Description: HIPERFACE®, shieldedSSIIncremental Connection systems: Solder connection	DOS-2312-G02	2077057
(-)	Connection type head A: Female connector, M23, 12-pin, angled, A-coded Signal type: HIPERFACE®, SSI, Incremental Description: HIPERFACE®, shieldedSSIIncremental Connection systems: Solder connection	DOS-2312-W01	2072580

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