



# PFG13-P1AM05PP

EcoLine

WIRE DRAW ENCODERS

**SICK**  
Sensor Intelligence.



Illustration may differ



### Ordering information

Type	Part no.
PFG13-P1AM05PP	1075498

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

### Detailed technical data

#### Performance

<b>Measurement range</b>	0 m ... 5 m
<b>Reproducibility</b>	≤ 0.5 mm <sup>1) 2)</sup>
<b>Linearity</b>	≤ ± 3 mm <sup>1) 3)</sup>
<b>Hysteresis</b>	≤ 1.5 mm <sup>1) 4)</sup>
<b>Resolution (wire draw + encoder)</b>	0.023 mm <sup>5) 6)</sup>

<sup>1)</sup> Value applies to wire draw mechanism.

<sup>2)</sup> Reproducibility, repetition accuracy, or even repeatability is defined as the maximum scatter from consecutive positioning operations from a single direction to a point, carried out under identical conditions.

<sup>3)</sup> The accuracy of wire draw encoders is primarily described by the linearity. This indicates the maximum deviation for the measurement of a defined measuring path. In contrast to repeatability, this relates to the measuring range covered and not to a positioning point.

<sup>4)</sup> The hysteresis is defined as the maximum scatter from consecutive positioning operations from different directions to a point, carried out under identical conditions.

<sup>5)</sup> The values shown have been rounded.

<sup>6)</sup> Example calculation based on the PFG08 with HTL Push Pull: 230 mm (wire draw length per revolution - see Mechanical data): 16,384 (pulses per revolution) = 0.014 mm (resolution of wire draw + encoder combination).

#### Interfaces

<b>Encoder</b>	Incremental encoders
<b>Electrical interface</b>	TTL/HTL
<b>Connection type</b>	Male connector M23, 12-pin, radial

#### Electrical data

<b>Maximum output frequency</b>	≤ 800 kHz
<b>Reference signal, position</b>	90°, electronically, gated with A and B / Sinus and Cosinus
<b>Reference signal, number</b>	1, electronically, gated with A and B / Sinus and Cosinus
<b>Initialization time</b>	≤ 32 ms, 30 ms, with mechanical zero pulse width <sup>1) 1)</sup>

<sup>1)</sup> Valid positional data can be read once this time has elapsed.

<sup>2)</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.

<sup>3)</sup> The value applies to the mounted encoder.

<b>Supply voltage</b>	4.5 V ... 32 V
<b>Power consumption</b>	0.7 W
<b>MTTFd: mean time to dangerous failure</b>	300 years <sup>2) 3)</sup>

<sup>1)</sup> Valid positional data can be read once this time has elapsed.

<sup>2)</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.

<sup>3)</sup> The value applies to the mounted encoder.

## Mechanical data

<b>Weight (including encoder)</b>	1.1 kg
<b>Weight (mechanics)</b>	800 g
<b>Measuring wire material</b>	Highly flexible stranded steel 1.4401 stainless steel V4A
<b>Weight (measuring wire)</b>	1.2 g/m
<b>Housing material, wire draw mechanism</b>	Plastic, Noryl
<b>Length of wire pulled out per revolution</b>	385 mm
<b>Spring return force</b>	4.5 N ... 7 N <sup>1)</sup>
<b>Life of wire draw mechanism</b>	Typ. 1 million cycles <sup>2) 3)</sup>
<b>Actual wire draw length</b>	5.2 m
<b>Measuring wire diameter</b>	0.55 mm
<b>Wire acceleration</b>	4 m/s <sup>2</sup>
<b>Operating speed</b>	4 m/s
<b>Mounted encoder</b>	DFS60
<b>Pulses per revolution</b>	65,536
<b>Part number encoder</b>	1036760
<b>Mounted mechanic</b>	MRA-G130-105D3
<b>Part number mechanic</b>	5322779

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

<sup>2)</sup> A cycle consists of the wire being pulled out and drawn in.

<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

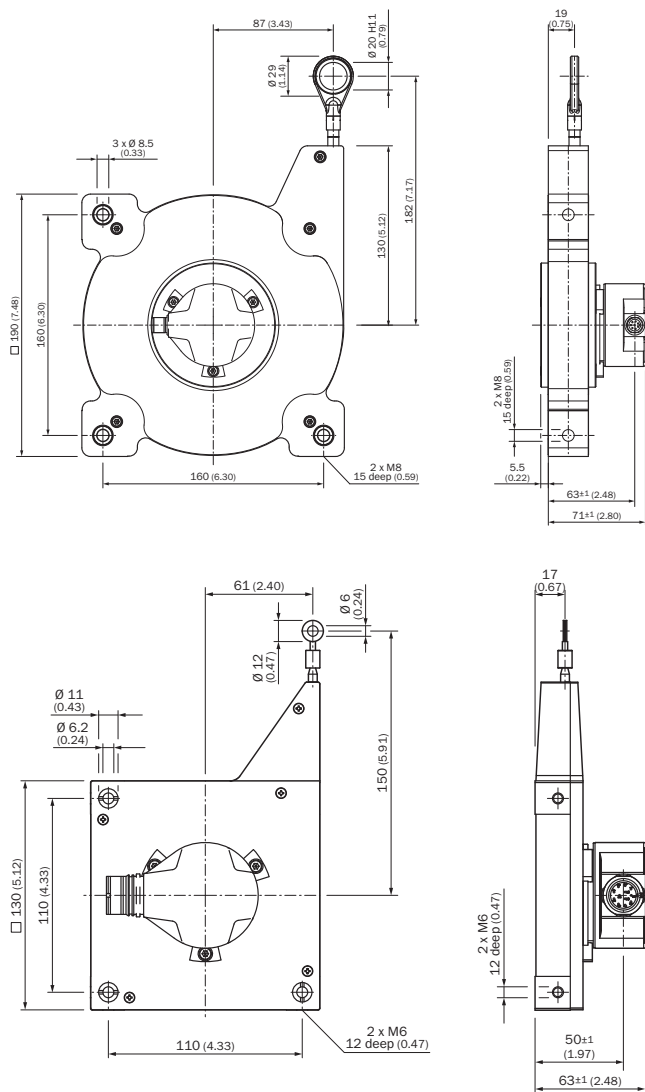
<b>EMC</b>	According to EN 61000-6-2 and EN 61000-6-3
<b>Enclosure rating encoder</b>	IP67
<b>Enclosure rating mechanic</b>	IP50
<b>Resistance to shocks</b>	60 g, 6 ms (DIN EN 60 068-2-27)
<b>Frequency range of resistance to vibrations</b>	20 g, 10 Hz ... 2,000 kHz (EN 60068-2-6)
<b>Working temperature range (encoder)</b>	-40 °C ... +100 °C
<b>Working temperature range (mechanics)</b>	-30 °C ... +70 °C
<b>Working temperature range (combination)</b>	Defined by the higher minimum and lower maximum value of the operating temperature of the encoder and the mechanism
<b>Relative humidity/condensation</b>	90 % (condensation of the optical scanning not permitted)

## Classifications

<b>ECL@ss 5.0</b>	27270590
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<b>ECI@ss 5.1.4</b>	27270590
<b>ECI@ss 6.0</b>	27270590
<b>ECI@ss 6.2</b>	27270590
<b>ECI@ss 7.0</b>	27270590
<b>ECI@ss 8.0</b>	27270590
<b>ECI@ss 8.1</b>	27270590
<b>ECI@ss 9.0</b>	27270590
<b>ETIM 5.0</b>	EC001486
<b>ETIM 6.0</b>	EC001486
<b>UNSPSC 16.0901</b>	41112113

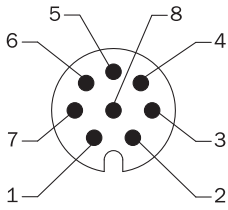
### Dimensional drawing (Dimensions in mm (inch))



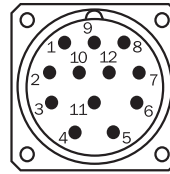
## PIN assignment

### Cable, 8-wire

View of M12 male device connector on encoder



View of M23 male device connector on encoder



PIN, 8-pin, M12 male connector	PIN, 12-pin, M23 male connector	Color of the wires for encoders with cable outlet	TTL/HTL signal	Sin/cos 1.0 V <sub>ss</sub>	Explanation
1	6	Brown	$\overline{A}$	COS-	Signal wire
2	5	White	A	COS+	Signal wire
3	1	Black	$\overline{B}$	SIN-	Signal wire
4	8	Pink	B	SIN+	Signal wire
5	4	Yellow	$\overline{Z}$	$\overline{Z}$	Signal wire
6	3	Violet	Z	Z	Signal wire
7	10	Blue	GND	GND	Ground connection of the encoder
8	12	Red	+U <sub>s</sub>	+U <sub>s</sub>	Supply voltage (volt-free to housing)
-	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>	-	0-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 0-SET function on PIN 7 on M23 male connector. The 0-SET input is used to set the zero pulse on the current shaft position. If the 0-SET input is connected to U<sub>s</sub> for longer than 250 ms after it had previously been unassigned for at least 1,000 ms or had been connected to the GND, the current position of the shaft is assigned to the zero pulse signal "Z".


## Maximum revolution range

Maximum revolution range



Recommended accessories

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

	Brief description	Type	Part no.
Programming and configuration tools			
	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.	PGT-10-Pro	1072254

## 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.

We have extensive experience in a wide range of industries and understand their processes and requirements. With intelligent sensors, we can deliver exactly what our customers need. In application centers in Europe, Asia and North America, system solutions are tested and optimized in accordance with customer specifications. All this makes us a reliable supplier and development partner.

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

For us, that is “Sensor Intelligence.”

## WORLDWIDE PRESENCE:

Contacts and other locations –[www.sick.com](http://www.sick.com)