DPF sensors



DPS-VGPC **Series**

PROFINET®

Dynamic Dual-Axis Inclinometer with PROFINET

DPS-VGPC

Dynamic Dual-Axis Inclinometer with PROFINET



Product Presentation

The DPS-VGPC series of dynamic tilt sensors offers a cost-effective solution for measuring the roll and pitch angles of moving platforms, as well as inertial parameters such as angular velocity and acceleration. Attitude estimation is performed using a 6-state Kalman filter, providing reliable tilt measurements even under motion and vibration conditions.

The sensors incorporate high-quality MEMS accelerometers and gyroscopes, combined with advanced compensation algorithms to ensure accurate and stable measurements. Their robust, hermetically sealed housing makes them suitable for demanding industrial environments.

The series is available in three versions to suit different application and communication requirements:

- Standard version – Analog output: Two independent 4–20 mA outputs, one for each measurement axis (roll and pitch).
- Modbus version – Digital communication: Modbus communication interface for integration with industrial monitoring and control systems.
- PROFINET version – Industrial Ethernet: PROFINET communication interface for direct integration with compatible PLCs and industrial automation networks.

All three versions are based on the same dynamic tilt measurement technology, allowing users to select the most suitable interface according to their application requirements.

Key Property

- Nonlinear compensation, orthogonal compensation
- Supports Profinet communication functionality
- Spin drift compensation
- Specialized bias-tracking algorithm for drift elimination
- 4–20 mA current output
- Modbus output
- Profinet output
- Wide temperature range: -40 °C to +85 °C
- High-performance Kalman filtering algorithm

Application Area

- Vessels and ships
- construction machinery
- Stable platform
- agricultural machinery
- ROV Underwater Robot Navigation
- Autonomous driving
- robot
- Cranes

Product features

Electrical specifications

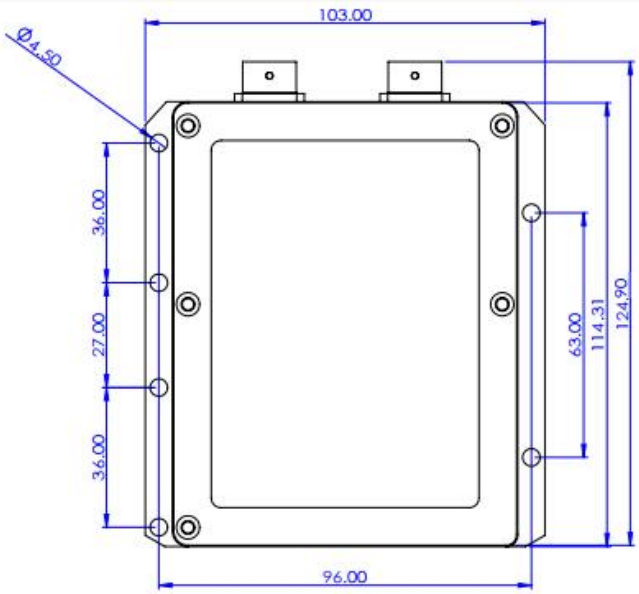
Parameter	Minimum	Maximum
Supply voltage (VDC)	12	36
Operating current (mA)	20mA	60mA
Analog output load (Ω)	0	500
Operating temperature (°C)	−40	85
Storage temperature (°C)	−55	100

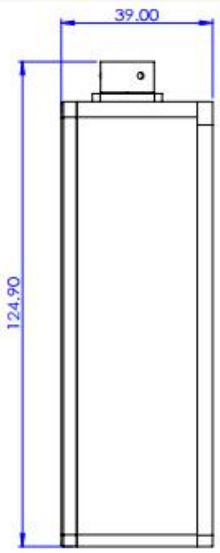
performance index

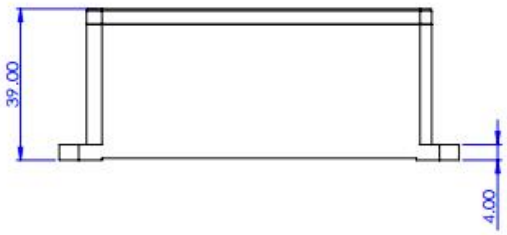
Performance Specifications – DPS-VGPC PROFINET		
Category	Parameter	Specification
Attitude Measurement	Dynamic accuracy	0.3°
	Static accuracy	0.01°
	Angular resolution	0.01°
	Pitch measurement range	±90°
	Roll measurement range	±180°
	Measurement update rate	100 Hz (10 ms)
Physical Characteristics	Dimensions (L × W × H)	124.6 × 103 × 39 mm
	Weight (before potting)	Approx. 300 g
	Protection rating	IP67
PROFINET Interface	Communication protocol	PROFINET IO
	Conformance Class	Class B (manufacturer-declared)
	Physical interface	Ethernet RJ45
	Process data	Pitch angle and roll angle
	Additional process data	Available upon request
	GSDML file	Available
	PROFINET communication cycle	10ms
	RT / IRT support	Available
General Specifications	MTBF	=90,000 hours
	Electromagnetic compatibility	GB/T 17626 series
	Insulation resistance	≥100 MΩ
	Mechanical shock resistance	2000 g, 0.5 ms, 3 shocks/axis

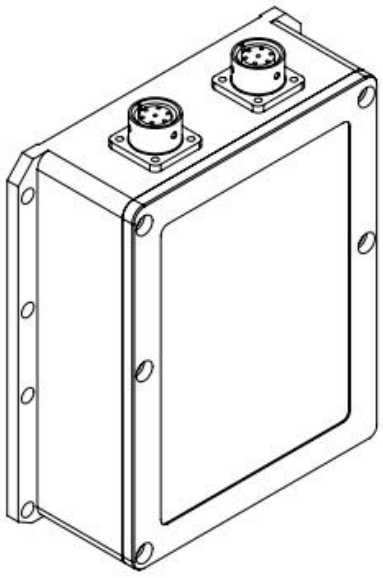
Encapsulated product dimensions

Product dimensions: L 124.9 × W 103 × H 39 (mm)









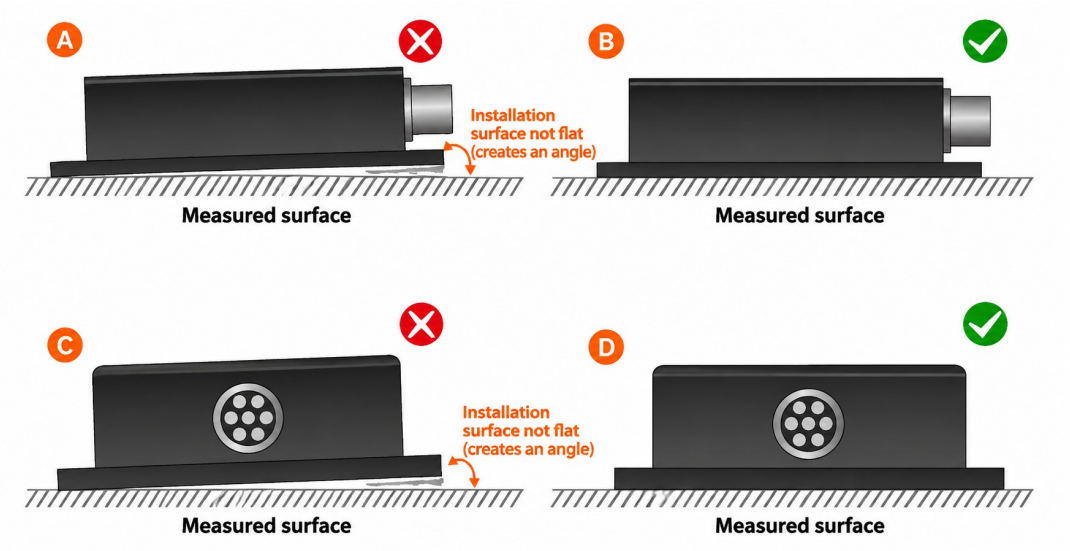
Product Installation

Proper installation is essential to ensure accurate tilt measurements and prevent mounting-related errors.

The sensor must be mounted on a flat, rigid surface, ensuring full contact between the sensor base and the mounting surface. Any gaps, unevenness or misalignment may introduce measurement errors.

Figures A and C illustrate incorrect installations, where the sensor is not properly seated against the mounting surface.

Figures B and D show the correct installation, with the sensor base fully supported and properly aligned with the measured structure.

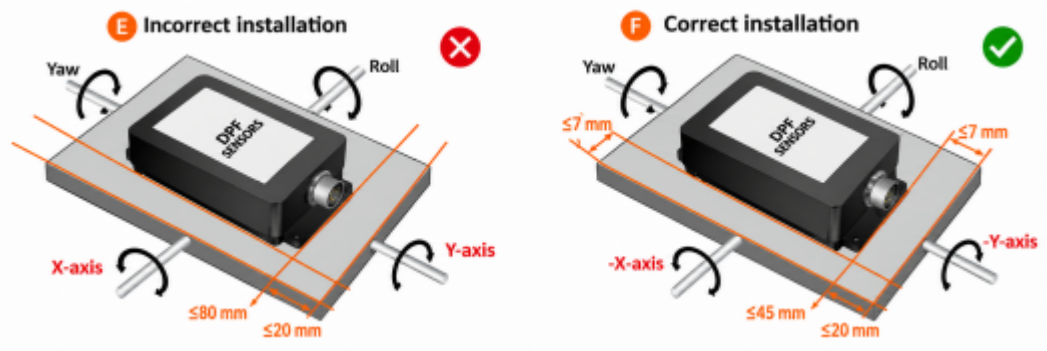


The sensor must be correctly aligned with the reference axes of the structure being measured to ensure accurate pitch and roll measurements.

During installation, the sensor's reference axes should be positioned parallel or perpendicular to the corresponding axes of the measured structure. Angular misalignment, as illustrated in Figure E, may introduce measurement errors or cause incorrect interpretation of the pitch and roll angles.

Figure F illustrates the correct alignment of the sensor with the structure.

The sensor can be installed in either a horizontal or vertical orientation. However, vertical installation requires a specific factory configuration.



Finally, the sensor must be securely fastened to the measured structure to ensure that both move together without any relative movement.

The mounting surface must be flat and rigid, with no gaps or looseness between the sensor and the structure.

Proper mechanical installation helps minimize measurement errors caused by mounting instability, unwanted vibrations, or relative movement between the sensor and the measured structure..