

## Precision angle sensor PWG series

**PWG 50 S 120** (120°)

**PWG 50 S 200** (200°)

**PWG 50 S 350** (350°)

### Technical Description

The angle sensor is developed for rough operation under extreme environmental conditions in mobile applications. Angle ranges of  $\pm 60^\circ$ ,  $\pm 100^\circ$  or  $\pm 175^\circ$  can be recorded.

The main application is the measurement of the steering angle in safety related electronic-hydraulic steering systems direct on the wheel boogie.

Equipped with a conductive plastic resistance element and a long term stabile multiple finger wiper, the angle sensor is suitable for durable operation even under challenging conditions.

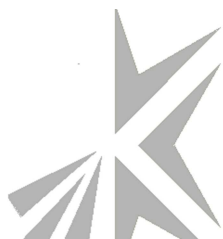
A tough full metal housing, continuous stainless steel shaft with double ball bearing and a large distance of the bearing places as well as an interlocking top cover protect the wiper from outer force effects. Hermetic sealing as well as the accuracy and reliability of the absolute analog angle measurement are further special characteristics.

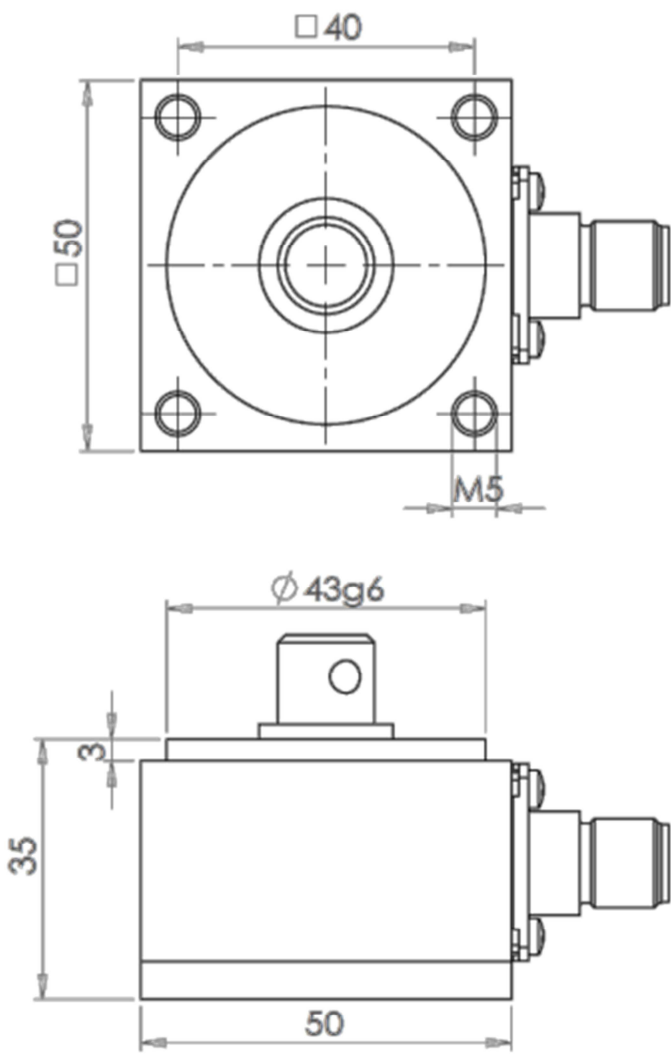
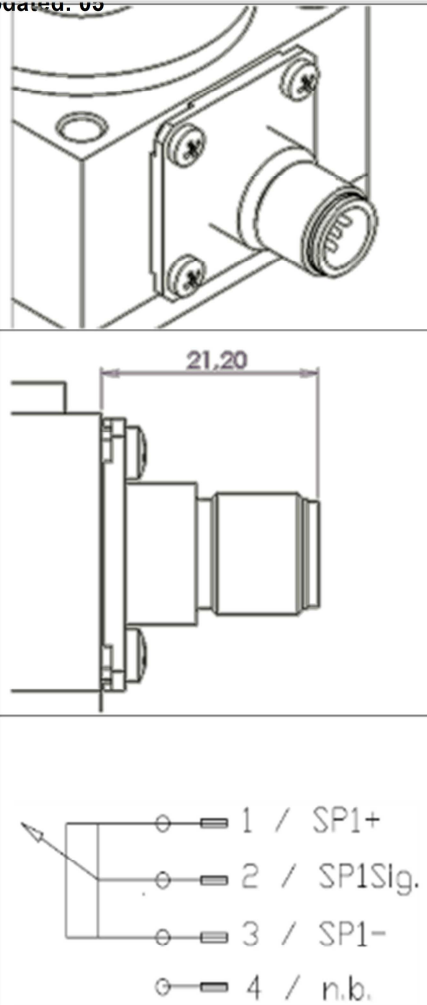
The massive and compact cube construction allows the direct installation at the axle without additional protective measures.

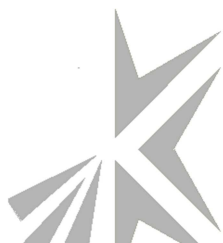
The stabile shaft allows a direct steering via a strong lever or tappet.

### Special features

- ☐ Extreme tough cube design
- ☐ Absolute potentiometric measuring system with highest life time.
- ☐ Increased corrosion protection by shaft made of stainless steel and anodised housing made out of massive aluminium.
- ☐ Accurate execution with very good linearity and temperature reliability.
- ☐ Absolute splash-proof
- ☐ With connector or PG gland available.
- ☐ Very high life time even at vibration-rich places.
- ☐ High resolution
- ☐ No mechanical turning limit



dimensions	electrical connection connector M12
 <p>Technical drawing of the PWG sensor showing top and side views with dimensions:</p> <ul style="list-style-type: none"> <li>Top view: Square mounting plate with side dimensions of 40 mm and 50 mm. Four mounting holes are located at the corners. A central circular feature is shown with a crosshair.</li> <li>Side view: Shows the sensor body with a total height of 35 mm. A mounting flange on top has a diameter of <math>\phi 43g6</math> and a thickness of 3 mm. The base width is 50 mm. An M5 threaded hole is indicated on the side.</li> </ul>	<p>updated: 03</p>  <p>Close-up of the M12 connector and a wiring diagram:</p> <ul style="list-style-type: none"> <li>Top view of the connector showing the M12 plug and the mounting plate.</li> <li>Side view of the connector showing the 21.20 mm distance between the mounting holes.</li> <li>Wiring diagram showing four pins:                     <ul style="list-style-type: none"> <li>1 / SP1+</li> <li>2 / SP1Sig.</li> <li>3 / SP1-</li> <li>4 / n.b.</li> </ul> </li> </ul>



<p>Shaft 01</p>	<p>Shaft 02</p>
<p>Shaft 03</p>	<p>Shaft 04</p>
<p>Shaft 05</p>	<p>Shaft 06</p>
<p>Shaft 07</p>	<p>Shaft 08</p>
<p>Shaft 09</p>	

Electrical data			
	PWG 50 S 120	PWG 50 S 200	PWG 50 S 350
Electrical function angle	120° ±2°	200° ±2°	350° ±2°
Nominal resistance	2kΩ	2kΩ	5kΩ
Independent linearity	" 0,2%	" 0,15%	" ± 0,1%
Nominal resistance tolerance	±15%		
Micro linearity	" 0,1%		
Resolution	practically infinite		
Temperature coefficient	5 ppm/°C (typ.)		
Slider rated current	10μA		
Max. permissible slider power	10mA (not for continuous operation)		
Max. power loss at +70°C	3W		
Max. permissible supply voltage	42V		
Isolation resistance	100 MΩ at 500VDC		
Disruptive strength	1000 Vrms, 3000Vrms at POM shaft		

Mechanical data	
Permissible operation and storage temp.	-40°C to +100°C
Protection mode	IP 67 with connector IP 69 with PG gland
Life time	>100 Mio. revolutions
Mechanical angle	360° rotatable
Max. adjustment speed	50Hz
Oscillation strength (5...2000Hz)	
Impact strength	50G/11ms
Max. axial load	300N
Max. radial load	400N
Max. torque	4Ncm (0,04Nm)
Corrosion resistance shaft	Stainless steel V2A (1.4305)
Corrosion resistance housing	Red anodized aluminum, sea water resistant
Weight	0,5kg

PWG      -    -

housing  
50 - 50x50x35

type  
S - Single

electrical function angle  
120 - 120°  
200 - 200°  
350 - 350°

centering  
1 - centering flange

shaft  
01 - Ø13x12    08 - Ø14x23 (flute)  
02 - Ø13x27    09 - Ø6x10  
03 - Ø13x13  
04 - Ø13x12  
05 - Ø10x16  
06 - Ø8x180  
07 - Ø8x23

connector  
01 - M12 (pin 1-2-3)  
02 - M12 (pin 1-3-4)

line type  
A - without cable (connector on housing)

shaft material  
0 - stainless steel V2A (1.4305)  
1 - POM

Preferential types are **in bold**, other versions on demand.



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