



## Precision angle sensor PWG series

**PWG 79 R 120** (120° redundant)  
**PWG 79 R 200** (200° redundant)  
**PWG 79 R 350** (350° redundant)

### 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 redundantly.

With two independent resistance elements and wipers, the angle sensor complies the safety requirements according to SIL-3. In semi-redundant version to SIL-2.

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.

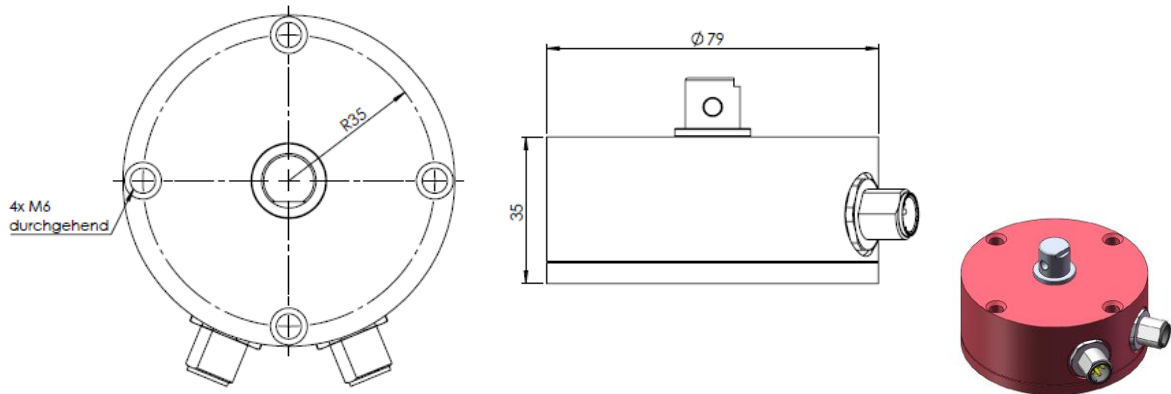
The massive and compact construction allows the direct installation at the axle without additional protective measures.

### Special features

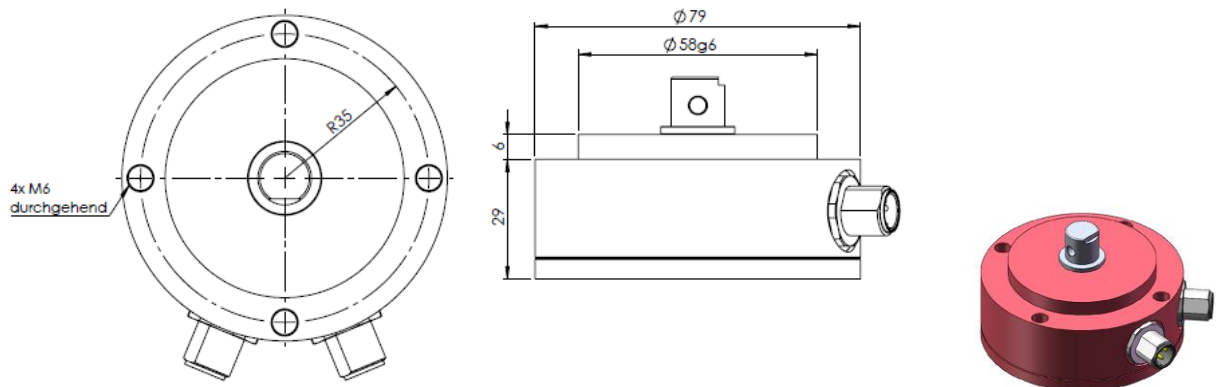
- Two independent measuring systems
- Extreme tough design
- Safety Integrity Level up to SIL 3.
- Absolute potentiometrical measuring system with highest lifetime.
- Increased corrosion protection by shaft made of stainless steel and anodized housing made out of massive aluminium.
- Accurate execution with very good linearity and temperature reliability.
- Absolute splash water proof
- With connector or PG gland available.
- Very high life time even at vibration-rich places.
- High resolution
- No mechanical turning limit

## Housing variants

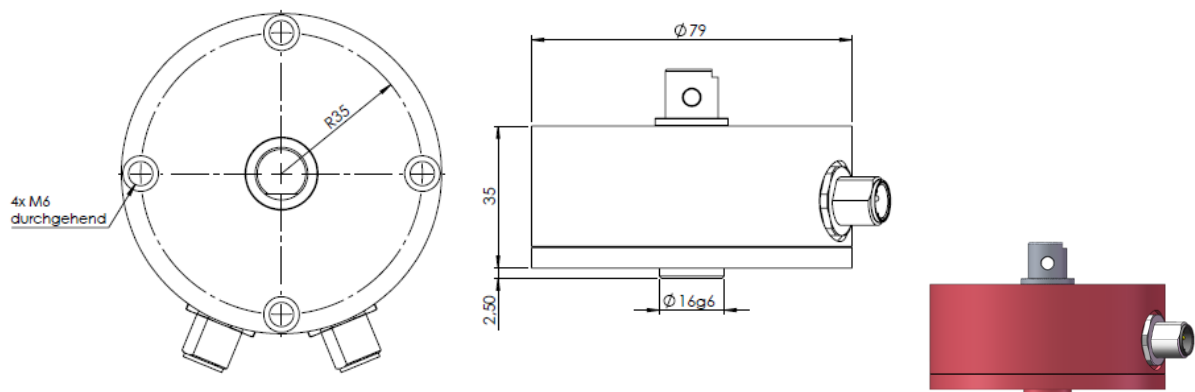
### Standard



### Centring flange $\Phi 58g6$

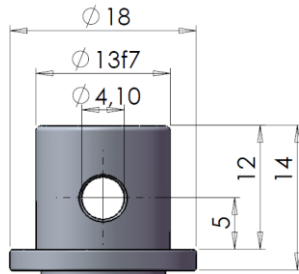


### Spigot $\Phi 16g6$

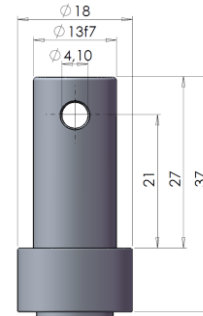


## Shaft types

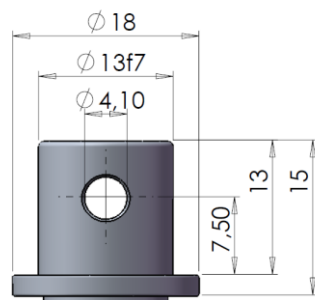
Shaft 1



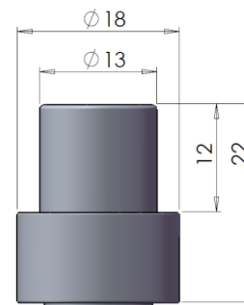
Shaft 2



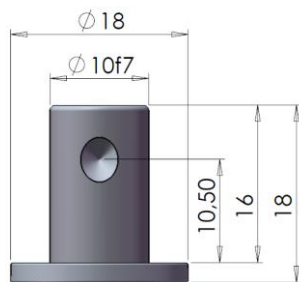
Shaft 3



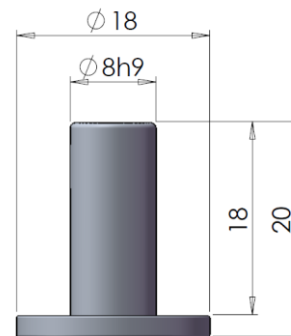
Shaft 4



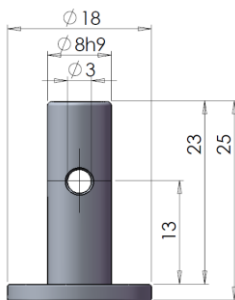
Shaft 5



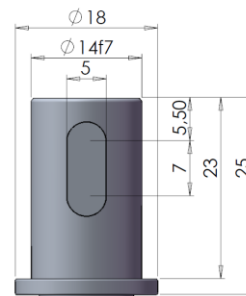
Shaft 6



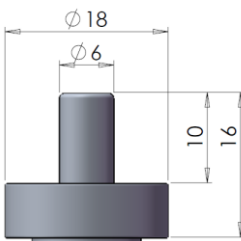
Shaft 7



Shaft 8



Shaft 9



### Accessory

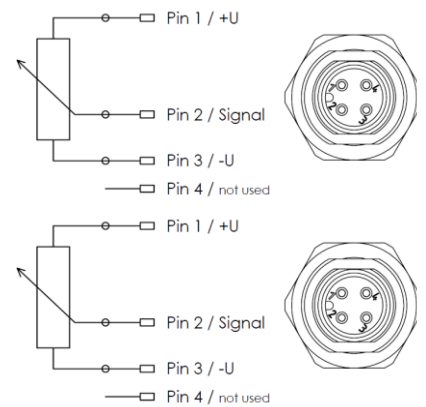
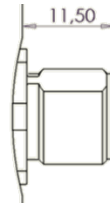
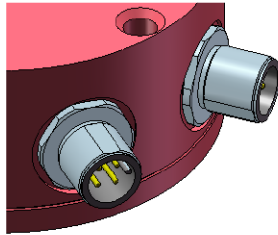
An extensive program of accessories enables a professional assembling in all imaginable installation



## Electrical connections / accessories

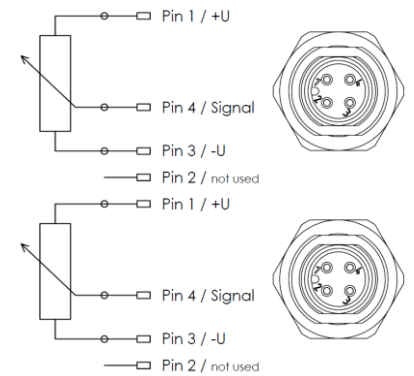
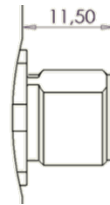
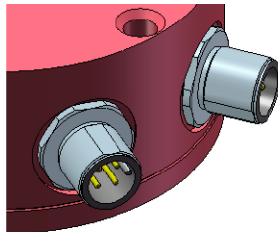
### Connector M12

Line type: A  
Connector: 01



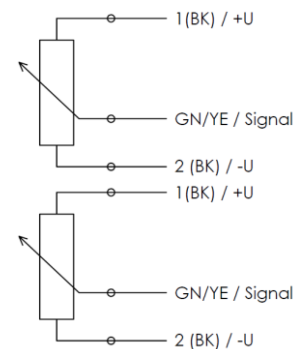
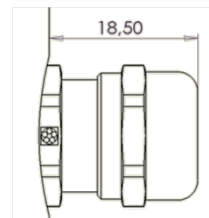
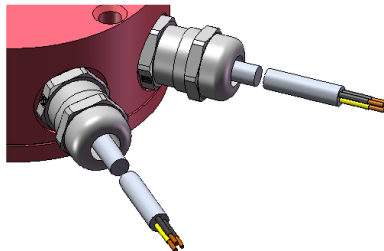
### Connector M12

Line type: A  
Connector: 02



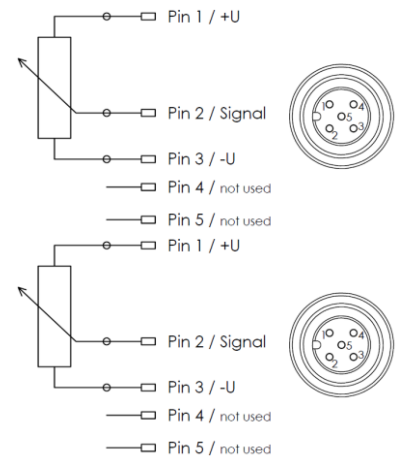
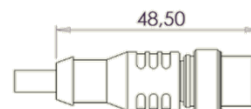
### Direct cable outlet

Line type C,  
connector 00



### Cable + M12 connector

Line type F,  
connector 01



## Technical data

### Electrical data

	PWG 79 R 120	PWG 79 R 200	PWG 79 R 350
Electrical function angle	120° ±2°	200° ±2°	350° ±2°
Nominal resistance	2kΩ	2kΩ	5kΩ
Independent linearity	≤±0,2%	≤±0,15	≤±0,1
Divergence output 1 to output 2	≤±0,3%	≤±0,25%	≤±0,2%
Nominal resistance tolerance	±15%		
Micro linearity	≤±0,1%		
Resolution	infinite		
Temperature coefficient	5 ppm/°C (typ.)		
Wiper rated current	10µA		
Max. permissible wiper current	10mA (not for continuous operation)		
Max. power loss at +70°C	3W		
Max. permissible supply voltage (+U)	42V		
Isolation resistance	>100 MΩ at 500VDC		
Disruptive strength	1000 Vrms, 3000Vrms with 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 x 10 <sup>6</sup> movements
Mechanical angle	360° rotatable
Max. adjustment speed	50Hz
Vibration IEC 60068-2-6	5...2000Hz, $A_{max} = 0,75mm$ , $a_{max} = 5g$
Shock IEC 60068-2-27	50G/6ms
MTTF	429 years
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 aluminium, sea water resistant
Weight	0,5kg

## Order code

PWG      -    -    -

**housing**  
79 - Ø79x35

**type**  
S - Single  
R - Redundant (SIL3)

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

**centering**  
0 - without centering  
1 - centering flange  
2 - spigot

**shaft**  
01 - Ø13x12    06 - Ø8x18  
02 - Ø13x27    07 - Ø8x23  
03 - Ø13x13    08 - Ø14x23 (flute)  
04 - Ø13x12    09 - Ø6x10  
05 - Ø10x16

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

**cable length**  
01 - 1m  
02 - 2m  
05 - 5m  
08 - 8m  
10 - 10m  
15 - 15m

**cable protection**  
0 - without cable protection  
1 - corrugated tube, NW10  
2 - hydraulic hose, DN12  
3 - armored conduit

**connector**  
00 - without connector  
01 - M12 (pin 1-2-3)  
02 - M12 (pin 1-3-4)  
03 - M12 (pin 1-2-3-4), half red. (SIL2)  
11 - APD DIN 72585 (4-pin), non-redundant  
12 - APD DIN 72585 (4-pin), half red. (SIL2)  
13 - APD DIN 72585 (7-pin), fully red. (SIL3)

**Line type**  
A - without cable (connector on housing)  
B - Ölflex FD 810 CY (3x0,5mm<sup>2</sup>), permanently laid  
C - Ölflex FD 855 CP (3x0,5mm<sup>2</sup>), flexible  
D - Ölflex FD 855 CP (3x0,5mm<sup>2</sup>), flexible, shield on housing  
E - LiFQ-PUR lengthwise waterproof (6x0,5mm<sup>2</sup>)  
F - WASS-PUR (4x0,34mm<sup>2</sup>)  
G - Ployflex FLRY11Y (6x0,5mm<sup>2</sup>)