

Rotary position sensor with ohmic signal output



Measuring principle	Change in resistance on the voltage divider
Measuring range	10° ... 320° in 10° steps (linear acquisition angle)
Rotation angle	360° without mechanical limitation
Output signal	2 signal outputs: 0 ... 2 kΩ Resolution ∞
Operating temperature	-40 ... 70 °C
Protection class	IP66 as per DIN VDE 0470 (IP68 on request)
Electrical connection	Design 1: Terminals for max. 4 mm ² , with M20 screw connection as per DIN EN 50262 Design 2: 6 x 0.33 mm ² fixed connection cables, 3 m in length, M16 screw connection as per DIN EN 50262



Rotary position sensor DWA

Scope of application

The type DWA rotary position sensors are robust, maintenance-free sensors that are particularly used in the Shipbuilding industry and machinery and plant engineering industry to convert the mechanical rotation angle of a shaft into an electrical signal (e.g. for measuring the rudder angle or adjusting the pitch).

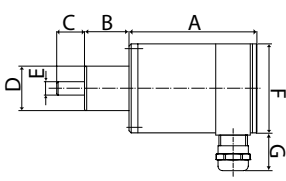
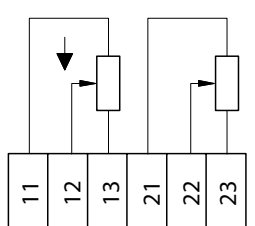
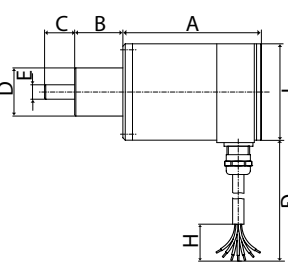
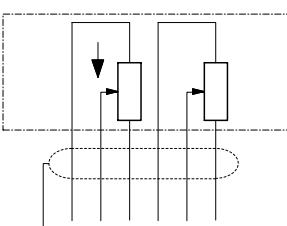
Measuring principle

The instrument shaft is connected to a double sensor. Depending on requirements, the angle position that can be acquired electronically (10° ... 320° in 10° steps (linear acquisition angle)) must be selected and adjusted within a mechanical revolution (using a round bracket for mechanically adjusting a freely selectable reference position). The version with ohmic resistor connection provides a passive electrical signal.

Special features

- 360° rotation angle without mechanical limitation
- Reference positions easy to adjust mechanically
- Maintenance-free operation
- No reference run necessary
- Potential-separated channels

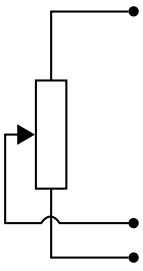
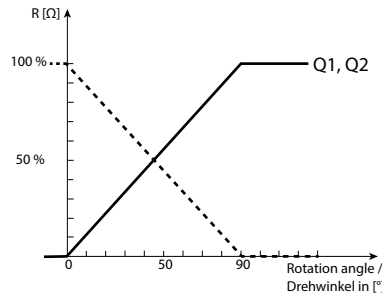
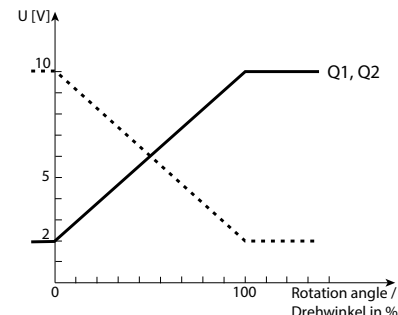
Dimensioned drawing, connection and wiring diagrams

Design DWA....-1: for terminals up to max. 4 mm ²		Design DWA....-2: with fixed connection cable	
			
<p>A: Length 115 mm B: Length 40 mm C: Length 25 mm D: Ø 40^{h8} mm E: Ø 12^{h9} mm F: Ø 80 mm G: Length 26 mm</p>		<p>A: Length 73 mm B: Length 30 mm C: Length 20 mm D: Ø 30^{h8} mm E: Ø 8^{f7} mm F: Ø 60 mm G: Length approx. 3 m H: 100 mm</p>	
<p>Wiring diagram</p> <p>11: R10 12: R1M 13: R11 21: R20 22: R2M 23: R21</p> <p>Information on the connection diagram: Tap-off point on the voltage divider in the arrow direction when the drive shaft is rotating clockwise (looking at the shaft)</p>		<p>Wiring diagram</p> <p>1: Brown; R10 2: White; R1M 3: Green; R11 4: Pink; R20 5: Yellow; R2M 6: Grey; R21</p> <p>Information on the connection diagram: Tap-off point on the voltage divider in the arrow direction when the drive shaft is rotating clockwise (looking at the shaft)</p>	

Type DWA... in version with ohmic signal output, passive electrical signal

A centre-tapped potentiometer serves as the measuring element. The change in resistance corresponds linearly to the angle position within the electrical acquisition range. A power supply is not necessary for this. The ohmic signal for the respective acquisition range of the DWA can be converted into a standard 2–10 VDC signal by means of a signal amplifier (e.g. NORIS SA502-3G) (see following figures).

Diagram of the DWA range

		
Electrical equivalent wiring diagram of the ohmic signal output	Example: DWA90 signal output, ohm / rotation angle (90° corresponds to 100% of the rotation angle); depending on the connection, the relationship of resistance / rotation angle is unidirectional to the right/left or in opposite directions.	Example: Output with SA502-3G signal amplifier, voltage / rotation angle; depending on the connection, the relationship of voltage / rotation angle is inverted.

Technical data

Technical data	
Measuring principle	Change in resistance on the voltage divider
Rotation angle	360° without mechanical limitation
Output signal	2 signal outputs: 0 ... 2 kΩ
Measuring range	10° ... 320° in 10° steps (linear acquisition angle)
Resolution	∞
Linearity tolerance	< +/- 3%
Load rating	0.28 W per channel (24 V at 2 kΩ @ 40°C); centre tap max. 1 μA
Vibration resistance	4 g DIN IEC 60068-T2-6 increased stress, characteristic curve 2 (10–100 Hz)
Shock resistance (impact)	300 m/s ² at 18 ms dwell time DIN IEC 60068-T2-27
Climatic test	DIN IEC 60068-T2-30
Operating temperature	-40 ... 70 °C
Storage temperature	-40 ... 70°C (max. peak values within 30 days/year at relative humidity of 5–95%)
Humidity	RH max. 96%
Insulation voltage	1 kV
Protection class	IP66 as per DIN VDE 0470 (IP68 on request)
Electrical connection	Design 1: Terminals for max. 4 mm ² , with M20 screw connection as per DIN EN 50262 Design 2: 6 x 0.33 mm ² fixed connection cables, 3 m in length, M16 screw connection as per DIN EN 50262
Service life	> 5 million revolutions / speed < 400 rpm
Installation position	Any (casing form can be rotated)
Approvals	CE, ABS, BV, DNV-GL, MED

Type code

Type code structure				
	DWA	90	-1	Example: DWA90-1
		Rotation angle		
		Design		
		Signal output		

DWA... type code				
Rotation angle	50	Rotation angle 50°		
	70	Rotation angle 70°		
	90	Rotation angle 90°		
	180	Rotation angle 180°		
	240	Rotation angle 240°		
	320	Rotation angle 320°		
	xxx	Customised rotation angle: 10° ... 360° in 10° steps (special type)		
Design		-1	Ø 80 mm design with terminals and Ø 40 mm connection pin	
		-2	Ø 60 mm design with cable and Ø 30 mm connection pin	
Output signal			If not marked: type -R with dual potentiometer 2 kΩ	
	DWA	--	--	Example: DWA90-1

Special types

If our standard types do not correspond with your expectations, we are pleased to develop a special solution together with you.