

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).

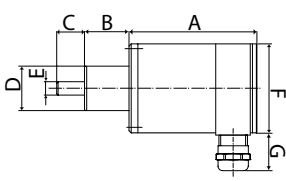
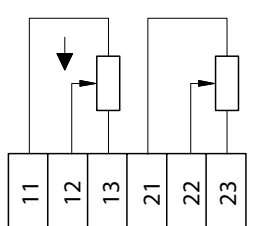
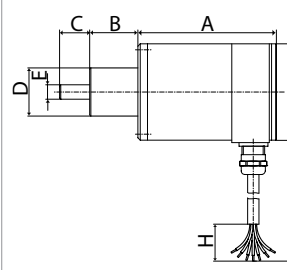
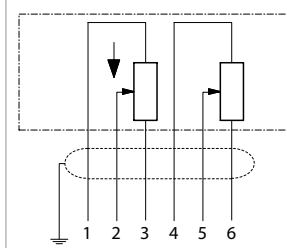
Measuring principle

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

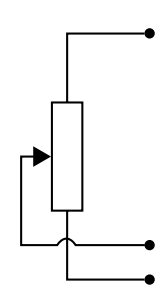
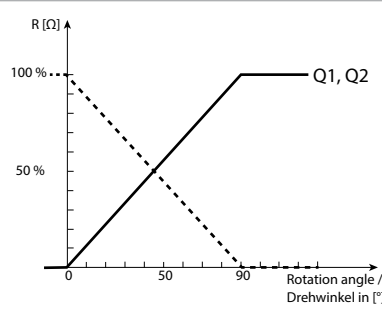
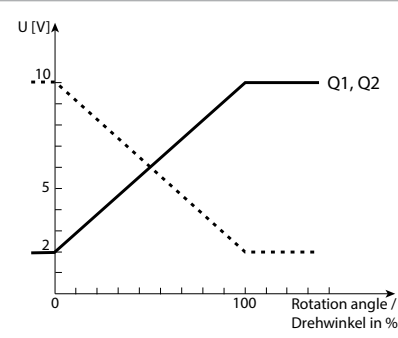
Dimensioned drawing, connection and wiring diagrams

Design DWA....-1: for terminals up to max. 4 mm ²		Design DWA....-2: with fixed connection cable	
			
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	Wiring diagram 11: R10 12: R1M 13: R11 21: R20 22: R2M 23: R21 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)	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	Wiring diagram 1: Brown; R10 2: White; R1M 3: Green; R11 4: Pink; R20 5: Yellow; R2M 6: Grey; R21 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)

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.