

# Angle Displacement Sensor Potentiometer

Model 8820

|           |           |
|-----------|-----------|
| Code:     | 8820 EN   |
| Delivery: | ex stock  |
| Warranty: | 24 months |



- Measuring range 350°
- Non-linearity 0.5%
- Duration 100 x 10<sup>6</sup> movements
- Low torque
- Continuous rotation possible
- Exceptionally inexpensive
- Options: IP65, non-linearity 0.05%

## Application

As an angle sensor that is both accurate and economical, this rotary potentiometer is suitable for all types of analog angle measurement up to 350°.

Typical fields of application include:

- ▶ Position feedback in servo-systems
- ▶ Pendulum weighing machines
- ▶ Cam and butterfly flap positions
- ▶ Jockey roller controllers
- ▶ Measuring the tension of threads and tape
- ▶ Trigonometric measurements at joints

## Description

The heart of the potentiometric angular displacement sensors is an extremely precise, low-wear resistor track made of plastic. Due to its high resistance to abrasion, the sensors are particularly suitable for measurements for the purpose of quality assurance in ongoing production, where a long service life and large numbers of rotations are required.

The potentiometric angular displacement sensor uses a multi-finger slider system with precious metal contacts. This ensures good contact even when moving at high speed and in the presence of vibrations.

The high-precision resistor tracks are pressed in a laser-controlled process and are therefore remarkably flat. This provides ideal conditions for a long service life.

The stainless steel shaft is supported by close-tolerance, low-friction, stainless steel ball bearings with double sealing discs.

**Technical Data**

**Electrical values**

|   |                        |
|---|------------------------|
| Maximum operating voltage:                                  | 50 V                   |
| Resistance:   | 4.7 kΩ                 |
| Tolerance of resistance:                                    | ± 20 %                 |
| Recommended current in slider circuit (refer to drawing 1): | ≤ 0.1 μA               |
| Maximum current in slider circuit:                          | 10 mA                  |
| Power consumption at 40 °C (0 W at 125 °C):                 | 3 W                    |
| Insulation resistance:                                      | > 100 MΩ at 500 V, 2 s |
| Voltage strength:   | 500 V AC, 50 Hz, 2 s   |

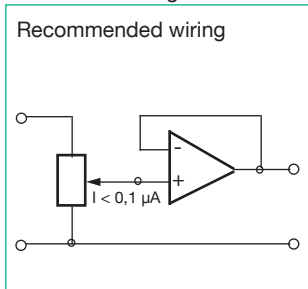
**Environmental conditions**

|  |                       |
|--|-----------------------|
| Range of temperature:                      | - 55 °C ... +100 °C   |
| Temperature coefficient of resistance:     | max. -200 ± 200 ppm/K |
| Temperature coefficient of output voltage: | < 1.5 ppm/K           |

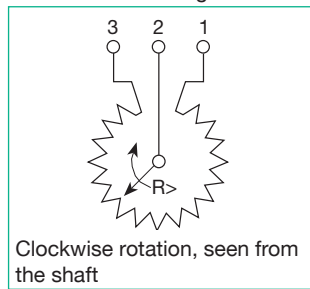
**Mechanical values**

|                                      |  |
|--------------------------------------|--|
| Measurement range:                   | 350° ± 4°  |
| Non-linearity:                       | < ± 0.5 % F.S.   |
| Hysteresis:                          | ≤ 15" angle measurement  |
| Resolution:                          | 0.01°  |
| Area of rotating:                    | 360° rotatable in clockwise direction,<br>inside the measurement range rotatable in any direction. |
| Torque:                              | ≤ 0.2 Ncm  |
| Adjustment speed:                    | max. 600 RPM   |
| Axial load of shaft:                 | max. 2.5 N   |
| Radial load of shaft:                | max. 2.5 N   |
| Vibration:                           | 5 Hz ... 2 kHz, max. 20 g / max. 0.75 mm   |
| Shock resistance:                    | 50 g, 11 ms  |
| Durability:                          | > 100 x 10 <sup>6</sup> movements at slider current < 0.1 μA<br>in the range                       |
| Bearing:                             | precision bearing with double protection made of<br>stainless steel                                |
| Material:                            | Housing flange: anodized aluminium,<br>Shaft: stainless steel AISI 316                             |
| Electrical connection (see drawing): | 3 pins for soldering, gold-plated  |
| Protection class:                    | according to EN 60529 IP40   |
| Weight:                              | 90 g   |

Drawing 1



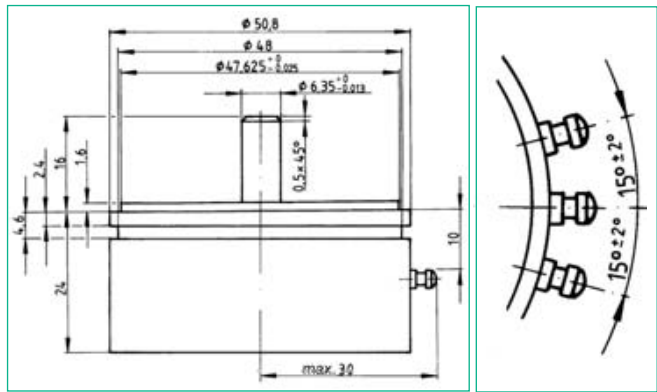
Drawing 2



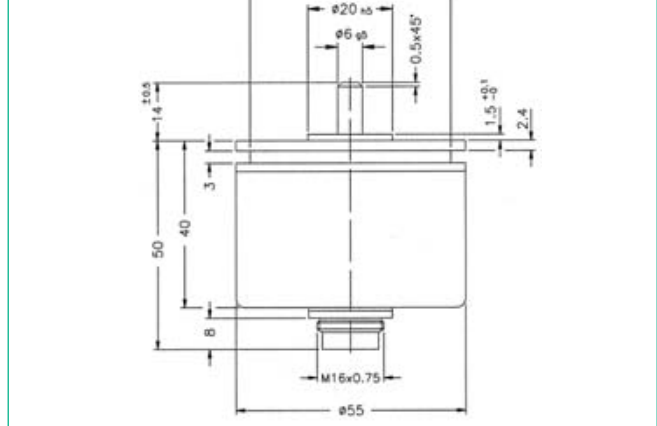
**Note:**

The technical data quoted are only evident if the sensors are used properly. Their outstanding properties are only available when the loading of the slider in the voltage divider is kept < 0.1 μA. If the measuring chain draws higher currents, the use of an operational amplifier as a voltage follower (I < 0.1 μA) is necessary (see drawing 1 above).

**Dimensional drawing  
Model 8820-5350**



**Model 8820-5350-V500**

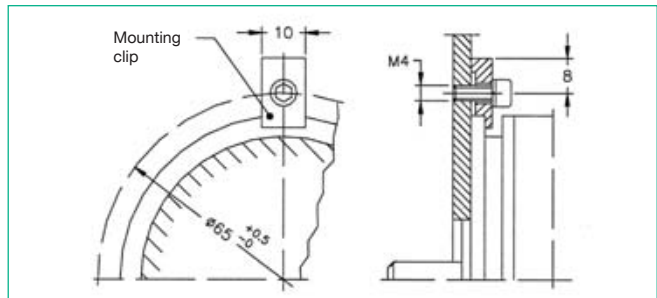


**Order Information**

Potentiometric angle displacement sensor, measurement range 350°  
**Model 8820-5350**  
Potentiometric angle displacement sensor, measurement range 350°, IP65, with connector  
**Model 8820-5350-V500**

**Accessories**

**1 set of mounting angles with screws** (3 are part of delivery)  
**Model 8820-Z001**



**for model 8820-5350**

**Connection cable** to burster desktop devices, length 3 m, with 12 pin connector **Model 99141-000F-0090030**  
**Connection cable** to DIGIFORCE® 9310, length 3 m, with 9 pin Mini D connector **Model 99209-000F-0090030**  
**Connection cable** to panel devices (both ends open for soldering), length 3 m **Model 9900-K009/99E**

Supply units, amplifiers and control units like modular amplifier model 9243, digital indicator model 9180 or profibus module 9221  
**refer to section 9 of the catalog.**

**Options**

Accuracy ± 0.05 % F.S. **Model 8820-5350-V501**  
Connector and protection class IP65 **Model 8820-5350-V500**  
(Mating connector model 9991 is part of delivery)  
Dimensional drawing, refer to above