These sensors are suitable for use in all kinds of rough environment for example close to engines in automotive applications. The 3-pin AMP Junior-Timer connector offers a popular and reliable plug connection.

The use of an elastomer-damped precious metal multi-finger wiper ensures reliable contact even under most severe working conditions.

Special models with different electrical angles and contact versions are available.

Designed to convert rotary movement into a proportional voltage signal, these rotary sensors utilize proven conductive plastic technology.

The housing is made of a special high-grade temperature-resistant plastic material. Fixings with brass bushings allow simplicity of mounting. Effective design by use of the customer-sided bearing of the plugging shaft.

Due to the plugging shaft a fast and easy mounting is permitted. Despite of its compact and wear-free design the sensors are very robust against environmental influences like vibrations, temperature variations, dirt and humidity.

**Description**

<table>
<thead>
<tr>
<th>Housing</th>
<th>high-grade, temperature-resistant plastic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shaft coupling</td>
<td>high-grade plastic</td>
</tr>
<tr>
<td>Resistance element</td>
<td>conductive plastic</td>
</tr>
<tr>
<td>Wiper assembly</td>
<td>precious metal multi-finger wiper</td>
</tr>
<tr>
<td>Electrical connections</td>
<td>connector (male) with 3 pins AMP Junior Power Timer C-282191</td>
</tr>
<tr>
<td>Sealing</td>
<td>o-ring</td>
</tr>
</tbody>
</table>
Mechanical Data

Dimensions: see drawing
Mounting: with 2 cylinder head screws M4
Mechanical angle: ca. 132°
Max. permissible torque at end stops: 0.25 Nm
Weight: ca. 25 g
Connector: AMP Junior Power Timer C-282191

Electrical Data

Actual electrical angle: 120°, 104°, 120°, 117° ± 2°
Nominal resistance: 2, 2, 4, 4 kΩ
Resistance tolerance: ± 20%
Independent linearity: ± 2%
Repeatability: 1, 0°
Protective wiper resistor: 1,05 kΩ
Effective temperature coefficient of the output-to-applied voltage ratio: typical 15 ppm/K
Max. permissible applied voltage: 18, 18, 23, 23 V
Recommended operating wiper current: < 1 µA
Max. wiper current in case of malfunction: 10 mA
Insulation resistance: (500 VDC, 1 bar, 2 s) > 10 MΩ
Dielectric strength: (50 Hz, 2 s, 1 bar, 500 VAC) < 100 µA

Environmental Data

Temperature range: -40 ... +125 °C (max. 12 times over lifetime 150°C, 0.5 h)
Vibration: 5...2000 Hz, Amax = 0.75 mm, amax = 20 g
Life: 4 x 10^6 move-
mements
Operating speed: 100 min^-1
Protection class: up to IP 67 (mounted with o-ring)
IP 40 (shaft side)

Order designations

<table>
<thead>
<tr>
<th>Type</th>
<th>Art.nos.</th>
<th>Elect. angle</th>
<th>Output on</th>
<th>Resistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP5001</td>
<td>120</td>
<td>120°</td>
<td>pin 2</td>
<td>2 kΩ</td>
</tr>
<tr>
<td>SP5001</td>
<td>104</td>
<td>104°</td>
<td>pin 3</td>
<td>2 kΩ</td>
</tr>
<tr>
<td>SP5001</td>
<td>120</td>
<td>120°</td>
<td>pin 2</td>
<td>4 kΩ</td>
</tr>
<tr>
<td>SP5001</td>
<td>117</td>
<td>117°</td>
<td>pin 2</td>
<td>4 kΩ</td>
</tr>
<tr>
<td>SP5001</td>
<td>114</td>
<td>114°</td>
<td>pin 2</td>
<td>4 kΩ</td>
</tr>
</tbody>
</table>

other versions on request

Important

All the values given in this data sheet for linearity, lifetime and temperature coefficient in the voltage dividing mode are quoted for the device operating with the wiper voltage driving on operational amplifier working as a voltage follower, where virtually no load is applied to the wiper (I_wiper < 1 µA).

Necessary accessories

Delivery via Tyco-Electronics: Socket plug (female) AMP Junior Power Timer Art.No. 282191-1;
Single conductor sealing Art.No. 828904-1 for cable external diameter 1,2 ... 2,1 mm;
Contacts for cable diameter 0,5 ... 1,0 mm²;
Art.No. 929940-1;

Recommended accessories

Process-controlled indicators MAP... with display Signal conditioner MUW.../MUK... for standardized output signals.