Hybrid track

Penny+Giles proven long life hybrid potentiometer track technology (conductive plastic on wire), provides high stability under extremes of temperature and humidity, with virtually infinite resolution and a track life in excess of 50 million operations. With minimal hysteresis and electrical noise and a self-compensating effect for track wear, this technology allows designers to achieve improved control system accuracy and long-term integrity without increasing system costs.

**Features**
- Electrical angles from 10 to 350°
- Rugged housing and shaft design
  - Sealing up to IP68M
- Crush-proof mounting flange
- Choice of two shaft attachments
- Duplex shaft bearing support
- Cable integrally moulded
  - M12 connector
- Rapid despatch of any option
- CE approved

**Benefits**
- Maximum sensitivity in all applications
- Suitable for extreme environments
- Operation in hostile environments including submersion
- Allows re-use without damage
- Interchangeable with existing installations
- Optimum performance under vibration
- Secure sealing with excellent strain relief
- Easy installation with mating cabled socket
- Eliminates customer inventory
- Confidence in EMC performance

ATEX 94/9/EC (100a) and ATEX 1999/92/EC (137) Directives

Penny+Giles SRS280 and SRS880 products are potentiometers and as such are classed as ‘simple apparatus’ according to the definition in paragraph 3.21 (a) of BS EN 60079-14:1997.

‘Simple apparatus’ is not certified, but may be used as part of an intrinsically safe circuit providing it is used with a suitable interface of associated apparatus (e.g. a safety barrier).

A full declaration of compliance can be supplied on request.
**SRS880 submersible rotary sensor**

The SRS880 submersible rotary sensor has been specially developed to meet the harsh operating environments in heavy duty industrial position sensing applications, including construction, agricultural and military vehicles, steelworks and power generating plants. The sensor is sealed to meet IP68M protection.

**Choice of mounting**

The sensor can be mounted by three M6 clearance holes through the body, or alternatively by three M6 threaded attachment holes in the front face. The sensor shaft has a flat on the diameter that would allow it to be secured by a locking screw, or an optional lever kit can be used to attach to the moving surface via a selection of M8 threaded holes.

**Rugged design - superior protection**

The rugged, 88mm diameter housing in a choice of aluminium or stainless steel, includes a stainless steel operating shaft supported by a heavy duty, twin ball-race bearing system for maximum strength. Environmental protection is achieved by a unique double sealing system that allows the sensor to operate fully submersed to 2m.

**Crush proof inserts**

The sensor housing is a high strength glass-filled engineering polymer that has the added feature of stainless steel inserts around the mounting screw area so preventing damage to the flange by over-tightening. This permits the sensor to be re-used after installation and allows minute adjustments to be made.

**Shaft attachment**

The sensor shaft has the option of two attachment formats that are interchangeable with existing installations. The sprung shaft style is a one-piece design that eliminates failures caused by two-piece designs. The shaft can be sealed to meet IP50 or IP68 protection.

**Cable outlet**

The sensor rear housing has an integrally moulded cable fully sealed to IP68, effectively eliminating the need to over-fit a moulded boot to improve sealing, thus saving the user time and cost. To facilitate the addition of supplementary heatshrink sleeving over the cable, a small lip on the moulding assists attachment at the sensor housing. Cable lengths of 0.5m and 2m can be specified.

**SRS280 sealed rotary sensor**

The SRS280 sealed rotary sensor has been specially developed to meet the harsh requirements of today’s automotive, motorsport and industrial position sensing applications. Interchangeable with the popular 38mm fixing centres format, several innovative features are included to increase reliability and performance over similar devices already in service.
PERFORMANCE

ELECTRICAL

- Electrical angle ±2°
- Resistance ±20% Ω
- Hysteresis (repeatability) ±°
- Accuracy
- Power dissipation at 20°C W
- Applied voltage maximum Vdc
- Resolution
- Output smoothness
- Insulation resistance
- Operating mode
- Wiper circuit impedance

10 to 350 in 10° increments
14.3 per degree
< 0.03
< 1 degree (e.g. ±0.3% over 330°, ±1% over 100°)
0.003 W per angular degree
0.2 per angular degree
Virtually infinite
To MIL-R-39023 grade C 0.1%
Greater than 100MΩ at 500Vdc
Voltage divider only - see Circuit Recommendation below
Minimum of 100 x track resistance or 0.5MΩ (whichever is greater)

MECHANICAL

- Mechanical angle °
- Mounting
- Operating torque maximum gm cm
- Shaft velocity maximum °/sec
- Weight g
- Phasing

360, continuous
Use 2 x M4 socket head cap screws and M4 washer - maximum tightening torque 2Nm
100
120
3000
32 (cable option A), 64 (cable option B)
When shaft flat (or shaft ident mark) is facing the cable exit, wiper is at mid travel
The sensor housing allows for ±10° adjustment via the mounting flange slots

ENVIRONMENTAL

- Life
  - unsealed shaft IP50
  - sealed shaft IP68
- Dither life
- Operational temperature °C
- Vibration
- Shock

Exceeds 20 million operations (10 x10⁶ cycles) of ±75°
20 million operations (10 x10⁶ cycles) of ±75°
200 million operations (100 x 10⁶ cycles) of ±3°, 60Hz
-40 to +130 (continuous)
RTCA-DO160D, 10Hz to 2000Hz (random), 12.61g rms - all axes
Survival to 2500g - all axes

CIRCUIT RECOMMENDATION

Hybrid track potentiometers feature a high wiper contact resistance, therefore operational checks should be carried out only in the voltage divider mode. Hybrid track potentiometers should be used only as voltage dividers, with a minimum wiper circuit impedance of 100 x track resistance or 0.5MΩ (whichever is greater). Operation with wiper circuits of lower impedance will degrade the output smoothness and affect the linearity.

OPTIONS

- Electrical angle
- Shaft style
- Shaft sealing
- Cable length

Can be supplied from 10° to 350° in 10° increments
D section, sprung shaft (S) or 2.4mm blade shaft (H)
IP50 or IP68
0.5m or 2m

AVAILABILITY

All standard configurations can be supplied rapidly from the factory - check with your local supplier for more details
**ORDERING CODES**

SRS280/ ...../ ...../ ...../.....

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Cable = 0.5m</td>
</tr>
<tr>
<td>B</td>
<td>Cable = 2m</td>
</tr>
<tr>
<td>50</td>
<td>Shaft sealing = IP50</td>
</tr>
<tr>
<td>68</td>
<td>Shaft sealing = IP68</td>
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</tbody>
</table>

**DIMENSIONS**

Note: Drawings not to scale

**SHAFT OPTIONS**

<table>
<thead>
<tr>
<th>Shaft Option</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>D shaft</strong></td>
<td>Cable exit: 4.500/4.450</td>
</tr>
<tr>
<td></td>
<td>Ears pre-sprung: 3.10/3.15</td>
</tr>
<tr>
<td></td>
<td>Flats: 2.465/2.415</td>
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</tbody>
</table>

**S shaft**

<table>
<thead>
<tr>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cable exit: 7.50</td>
</tr>
<tr>
<td>Flats: 2.400/2.390</td>
</tr>
<tr>
<td>Suggested mating drive for 'S' shaft</td>
</tr>
</tbody>
</table>

**H shaft**

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</tbody>
</table>

**ELECTRICAL CONNECTIONS**

3 core cable: PUR sheathed, with PTFE insulated 19/0.15 cores.

Viewed on shaft:
- Red - CW
- Black - Yellow
- Yellow - CW

Sensor is at mid electrical angle when shaft flat and cable exit are aligned as shown.
SRS 880 SUBMERSIBLE ROTARY SENSOR

PERFORMANCE

ELECTRICAL
Electrical angle ±2°
Resistance ±20% Ω
Hysteresis (repeatability)°
Accuracy
Power dissipation at 20°C W
Applied voltage maximum Vdc
Resolution
Output smoothness
Insulation resistance
Operating mode
Wiper circuit impedance

MECHANICAL
Mechanical angle°
Mounting
Operating torque max gm cm
Shaft velocity max°/sec
Weight g
Phasing

ENVIRONMENTAL
Sealing
Shaft seal life > 20 million operations (10 x 10^6 cycles) of ±75°
Operational temperature °C
-40 to +130 (continuous - sensor only)
Vibration
RTCA-DO160D, 10Hz to 2000Hz (random), 12.61g rms - all axes
Shock
Survival to 2500g - all axes
Explosive atmospheres
Classed as 'simple apparatus' under BS EN 60079-14:1997

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OPTIONS
Electrical angle
Cabled socket
Operating levers
Body material
Flameproof endosure

Can be supplied from 10° to 350° in 10° increments
2m or 5m cabled socket assemblies available (rated -25 to +90°C only)
Operating levers 155 or 230mm. See details on page 7
Available with anodised aluminium or corrosion resistant stainless steel housing
Please contact our sales team for details on our capabilities.

AVAILABILITY

All standard configurations can be supplied rapidly from the factory. Check with your local supplier for more details

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ORDERING CODES

Cabled socket
AL = Aluminium
SS = Stainless steel
00 = None
02 = 2m
05 = 5m

DIMENSIONS

Note: drawings not to scale

LEVER OPTIONS

Accessories (order separately)
Lever SA202195/MK1  L = 155
Lever SA202195/MK2  L = 230

ELECTRICAL CONNECTIONS

Straight cabled socket
E Series M12 to IEC 60947-5-2, PUR jacket
Conforms to VDE 0472 part 804 -25° to +90°C temperature range†

†Higher temperature rated versions are available.
Please consult with our sales team.
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Innovation In Motion