The **PPS71 PTS-C Geothermal Tools** are designed for extreme subsurface conditions. The robust electronics combined with vacuum flask technology allow these products to perform at 350 °C (662 °F) continuously, for four hours. The tool measures pressure, temperature, casing collar location, and flow profile and can be configured as either a memory tool or surface read out tool (SRO) tool. The measurements are done with a highly accurate silicon-sapphire (piezo) transducer, a fast response resistance temperature detector (RTD), the customer’s choice of either a continuous or fullbore spinner flowmeter and a highly sensitive CCL. The CCL has a magnet and central coil arrangement which amplifies current providing a readable voltage spike or “collar kick” as data, giving end users an important control for depth correlation.

### Pressure Measurement
- **Sensor Type:** Silicon-Sapphire
- **Pressure Range:** 5K psi | 10K psi
- **Accuracy:** ± 0.03% FS
- **Resolution:** 0.0003% FS

### Temperature Measurement
- **Sensor Type:** RTD (Pt1000; 4-wire)
- **Temperature Range:** 300 °C (572 °F) | 350 °C (662 °F)
- **Accuracy:** ± 0.5 °C
- **Resolution:** 0.01 °C

### Flow Measurement
- **Sensor Type:** Reed switch/magnetic
- **Flow Rate Range:** 5 – 7,000 RPM
- **Accuracy (≥ 20 RPS):** ± 0.5 revolution
- **Accuracy (≤ 20 RPS):** ± 0.25 revolution
- **Resolution (≥ 20 RPS):** 0.5 RPS
- **Resolution (≤ 20 RPS):** 0.1 RPS

### Environmental
- **Temperature Rating—Standard Housing:** 177 °C (350 °F)
- **Temperature Rating—Flask Housing:** 300 °C (572 °F) OD 1.56” | 350 °C (662 °F) OD 1.75”
- **Downhole Time (OD 1.75”):** 4 hours at 350 °C (662 °F) | 6 hours at 300 °C (572 °F)
  - 8 hours at 250 °C (482 °F) | 10 hours at 200 °C (392 °F)
- **Downhole Time (OD 1.56”):** 4 hours at 300 °C (572 °F) | 5.5 hours at 250 °C (482 °F)
  - 7.5 hours at 200 °C (392 °F)

### Features:
- Operating temperatures up to 350 °C (662 °F)
- Fast response RTD temperature sensor
- Continuous or full-bore spinners are available
- Operates in either memory or surface read out mode
- Surface read out mode using e-line is compatible with the Warrior or PPS SRO acquisition system
- Can be combined with PPS36 DepthWatcher if depth measurement is needed

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**PPS71 PTS-C Geothermal Tools - Memory / SRO**

Pioneer Petrotech Services Inc.
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## Memory Tool Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sampling Rate</td>
<td>0.1 s – 1.8 hrs/per sample</td>
</tr>
<tr>
<td>Data Sets</td>
<td>Time / Pressure / Temperature / Flow / CCL</td>
</tr>
<tr>
<td>Memory Capacity</td>
<td>2,000,000 data Sets</td>
</tr>
<tr>
<td>Communication Interface</td>
<td>USB</td>
</tr>
<tr>
<td>Communication Rate</td>
<td>115,200 bits/s</td>
</tr>
<tr>
<td>Operation Voltage</td>
<td>2.7 – 3.9 VDC</td>
</tr>
<tr>
<td>Battery</td>
<td>180 °C (356 °F) C-size Li-battery (5 A hr/3.6 V)</td>
</tr>
<tr>
<td>Connector</td>
<td>Lemo 6 pin with locker</td>
</tr>
</tbody>
</table>

## Surface SRO Interface

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transmitter Sampling Rate</td>
<td>0.1 s – 1.8 hrs/per sample</td>
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<tr>
<td>Communication Distance</td>
<td>7,000 meters</td>
</tr>
<tr>
<td>Data Transmission Rate</td>
<td>9,600 bits per second via standard electrical cable</td>
</tr>
<tr>
<td>Data Transmission Distance</td>
<td>Up to 7,000 meters via standard electrical cable</td>
</tr>
<tr>
<td>Compatibility</td>
<td>Warrior 8 and up</td>
</tr>
<tr>
<td>Communication Port</td>
<td>USB 2.0 to PC</td>
</tr>
<tr>
<td>Power Input</td>
<td>100 - 240 VAC</td>
</tr>
<tr>
<td>Surface Unit Power Output</td>
<td>+60 VDC</td>
</tr>
<tr>
<td>Working Temperature</td>
<td>-40 °C (-40 °F) to 85 °C (185 °F)</td>
</tr>
<tr>
<td>Humidity</td>
<td>90%</td>
</tr>
<tr>
<td>Condensation</td>
<td>No</td>
</tr>
<tr>
<td>Material</td>
<td>Aluminum</td>
</tr>
<tr>
<td>Connectors</td>
<td>1 AC Power, 1 DC Power, 1 USB Port and 1 Gauge Interface</td>
</tr>
<tr>
<td>Dimensions--inches</td>
<td>7.75 (196 mm) x 4 (101 mm) x 3.25 (82 mm)</td>
</tr>
<tr>
<td>Interface</td>
<td>USB 2.0</td>
</tr>
</tbody>
</table>

## Mechanical and Materials

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service</td>
<td>H₂S</td>
</tr>
<tr>
<td>Outside Diameter--inches</td>
<td>1.56 (39 mm) Memory Only</td>
</tr>
<tr>
<td>Overall Length Memory Tool--inches</td>
<td>66.7 (1,694 mm) 1.75&quot; OD tool with 2.125&quot; OD spinner</td>
</tr>
<tr>
<td></td>
<td>66.3 (1,684 mm) 1.75&quot; OD tool with 1.69&quot; OD spinner</td>
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<tr>
<td></td>
<td>66 (1,676 mm) 1.56&quot; OD tool with 1.44&quot; OD spinner</td>
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<tr>
<td>Overall Length SRO Tool--inches</td>
<td>111.9 (2,842 mm) with 2.125&quot; OD spinner</td>
</tr>
<tr>
<td></td>
<td>111.5 (2,832 mm) with 1.69&quot; OD spinner</td>
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<tr>
<td>Housing Material</td>
<td>Inconel 718</td>
</tr>
</tbody>
</table>

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