Description
The AP2 pressure sensor series is composed of a silicon piezoresistive pressure sensing chip and a signal conditioning integrated circuit. The low-level signal from the sensing chip is amplified, temperature compensated, calibrated and finally converted to a high level analog output voltage that is proportional with the applied pressure. The AP2 series measures gauge pressure.

Features
- Amplified and temperature compensated analog output
- High accuracy ±1.5 %FS
- Supply voltage 3.0, 3.3 & 5.0 Vdc
- Low supply current Max 2 mA at 3.3 Vdc
- Operating temperature -40 to 125°C
- Wide compensated temperature 0 to 85°C
- Pins & Package compatible with Fujikura’s XFPM integrated pressure sensor
- Customization available

Applications
- Battery-operated Devices
- Medical Devices
- Industrial Pneumatic Devices
- Consumer Devices

✓ RoHS Compliant

Device Lineup

<table>
<thead>
<tr>
<th>Model</th>
<th>Pin Direction</th>
<th>Pressure Type</th>
<th>Supply Voltage</th>
<th>Accuracy</th>
<th>Pressure Range -100 -50 0 25 50 100 200 500 700 1000 kPa</th>
</tr>
</thead>
<tbody>
<tr>
<td>AP2</td>
<td>Normal or Opposite</td>
<td>Gauge</td>
<td>5.0 Vdc or 3.3 Vdc</td>
<td>±1.5 %FS</td>
<td>62.5%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3.0 Vdc</td>
<td>±2.0 %FS</td>
<td>Same as the above</td>
</tr>
</tbody>
</table>

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**Device Name Code**

- **Model**
  - AP2ON
  - AP2KG
  - AP2STICK

- **Supply voltage**
  - 0: 5.0 Vdc
  - 1: 3.3 Vdc
  - 2: 3.0 Vdc

- **Pressure type**
  - G: Gauge/Positive
  - V: Gauge/Negative
  - W: Gauge/Bi-pressure

- **Pressure value**
  - 025K: 25 kPa
  - 050K: 50 kPa
  - 100K: 100 kPa
  - 200K: 200 kPa
  - 500K: 500 kPa
  - 700K: 700 kPa
  - 001M: 1 MPa

- **Packing style**
  - Blank: Tray
  - STICK: Stick

**Block Diagram**

- **Pin 1**: VSS
- **Pin 2**: VOUT
- **Pin 3**: VDD
- **Pin 5**: NC
- **Pin 6**: NC
- **Temp Sensor**
- **ADC**
- **DSP**
- **DAC**
- **Sensor Bridge**
- **Pre-Amp**
- **EEPROM**
- **OSC**
- **POR**
- **MUX**

**Output Characteristics**

- **Pressure Code**: 050KV, 100KV
- **Output**
  - **Min. Popt**
  - **Max. Popt**
  - **SV**
  - **Vfs**
  - **Voff**

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# Absolute Maximum Ratings

<table>
<thead>
<tr>
<th>Item</th>
<th>Symbol</th>
<th>Rating</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply Voltage</td>
<td>VDDmax</td>
<td>6</td>
<td>Vdc</td>
</tr>
<tr>
<td>Load Pressure</td>
<td>Pmax+</td>
<td>See Pressure Range Table</td>
<td></td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>Topt</td>
<td>-40 to +125</td>
<td>°C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>Tsstg</td>
<td>-40 to +125</td>
<td>°C</td>
</tr>
</tbody>
</table>

## General Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Symbol</th>
<th>AP20+</th>
<th>AP21+</th>
<th>AP22+</th>
<th>Sensor Code</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply Voltage</td>
<td>VDD</td>
<td>5.0±0.25</td>
<td>3.0±0.15</td>
<td>3.0±0.15</td>
<td>Vdc</td>
<td></td>
</tr>
<tr>
<td>Type of Pressure</td>
<td></td>
<td>Gauge pressure</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pressure Media</td>
<td></td>
<td>Non-corrosive gases</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compensated Temperature</td>
<td></td>
<td>0 to +85 °C</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating Humidity</td>
<td>Hopt</td>
<td>30 to 85 (non-condensing)</td>
<td>%RH</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storage Humidity</td>
<td>Hstg</td>
<td>30 to 85 (non-condensing)</td>
<td>%RH</td>
<td></td>
<td></td>
<td></td>
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</table>

## Pressure Range

<table>
<thead>
<tr>
<th>Item</th>
<th>Symbol</th>
<th>025KG</th>
<th>050KG</th>
<th>100KG</th>
<th>200KG</th>
<th>500KG</th>
<th>700KG</th>
<th>1001MG</th>
<th>1500KG</th>
<th>3000KG</th>
<th>5000KG</th>
<th>7000KG</th>
<th>10000KG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absolute Maximum Load Pressure</td>
<td>Pmax+</td>
<td>+50</td>
<td>+100</td>
<td>+200</td>
<td>+400</td>
<td>+1000</td>
<td>+1400</td>
<td>+1500</td>
<td>+100</td>
<td>+200</td>
<td>+200</td>
<td>+100</td>
<td>+50</td>
</tr>
<tr>
<td>Measurement Pressure</td>
<td>Popt</td>
<td>Min. Max.</td>
<td>+25</td>
<td>+50</td>
<td>+100</td>
<td>+200</td>
<td>+500</td>
<td>+700</td>
<td>+1000</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

## Electrical Characteristics

Load resistor RL = ∞, Ambient temperature Ta = 25°C

### Sensor Code = AP20+ VDD = 5.0 Vdc

<table>
<thead>
<tr>
<th>Item</th>
<th>Condition</th>
<th>Symbol</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Offset Voltage</td>
<td>Min. Popt</td>
<td>Voff</td>
<td>0.1325</td>
<td>0.2</td>
<td>0.2675</td>
<td>V</td>
</tr>
<tr>
<td>Full Scale Voltage</td>
<td>Max. Popt</td>
<td>Vfs</td>
<td>4.6325</td>
<td>4.7</td>
<td>4.7675</td>
<td>V</td>
</tr>
<tr>
<td>Span Voltage</td>
<td>Min. to max. Popt</td>
<td>SV</td>
<td>4.5</td>
<td>-</td>
<td>-</td>
<td>V</td>
</tr>
<tr>
<td>Accuracy</td>
<td>0 to 85°C</td>
<td>Error</td>
<td>-1.5</td>
<td>-</td>
<td>+1.5</td>
<td>%FS</td>
</tr>
<tr>
<td>Output Resolution</td>
<td>Vrss</td>
<td>Ic</td>
<td>-</td>
<td>2.5</td>
<td>-</td>
<td>mV</td>
</tr>
<tr>
<td>Supply Current</td>
<td></td>
<td></td>
<td>-</td>
<td>3</td>
<td>-</td>
<td>mAdc</td>
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### Sensor Code = AP21+ VDD = 3.3 Vdc

<table>
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<tr>
<th>Item</th>
<th>Condition</th>
<th>Symbol</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Offset Voltage</td>
<td>Min. Popt</td>
<td>Voff</td>
<td>0.2595</td>
<td>0.3</td>
<td>0.3405</td>
<td>V</td>
</tr>
<tr>
<td>Full Scale Voltage</td>
<td>Max. Popt</td>
<td>Vfs</td>
<td>2.9595</td>
<td>3.0</td>
<td>3.0405</td>
<td>V</td>
</tr>
<tr>
<td>Span Voltage</td>
<td>Min. to max. Popt</td>
<td>SV</td>
<td>2.7</td>
<td>-</td>
<td>-</td>
<td>V</td>
</tr>
<tr>
<td>Accuracy</td>
<td>0 to 85°C</td>
<td>Error</td>
<td>-1.5</td>
<td>-</td>
<td>+1.5</td>
<td>%FS</td>
</tr>
<tr>
<td>Output Resolution</td>
<td>Vrss</td>
<td>Ic</td>
<td>-</td>
<td>1.7</td>
<td>-</td>
<td>mV</td>
</tr>
<tr>
<td>Supply Current</td>
<td></td>
<td></td>
<td>-</td>
<td>2</td>
<td>-</td>
<td>mAdc</td>
</tr>
</tbody>
</table>

### Sensor Code = AP22+ VDD = 3.0 Vdc

<table>
<thead>
<tr>
<th>Item</th>
<th>Condition</th>
<th>Symbol</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Offset Voltage</td>
<td>Min. Popt</td>
<td>Voff</td>
<td>0.096</td>
<td>0.15</td>
<td>0.204</td>
<td>V</td>
</tr>
<tr>
<td>Full Scale Voltage</td>
<td>Max. Popt</td>
<td>Vfs</td>
<td>2.796</td>
<td>2.85</td>
<td>2.904</td>
<td>V</td>
</tr>
<tr>
<td>Span Voltage</td>
<td>Min. to max. Popt</td>
<td>SV</td>
<td>2.7</td>
<td>-</td>
<td>-</td>
<td>V</td>
</tr>
<tr>
<td>Accuracy</td>
<td>0 to 85°C</td>
<td>Error</td>
<td>-2.0</td>
<td>-</td>
<td>+2.0</td>
<td>%FS</td>
</tr>
<tr>
<td>Output Resolution</td>
<td>Vrss</td>
<td>Ic</td>
<td>-</td>
<td>1.5</td>
<td>-</td>
<td>mV</td>
</tr>
<tr>
<td>Supply Current</td>
<td></td>
<td></td>
<td>-</td>
<td>2</td>
<td>-</td>
<td>mAdc</td>
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</table>

### Common

<table>
<thead>
<tr>
<th>Item</th>
<th>for reference</th>
<th>tr</th>
<th>1</th>
<th>msec.</th>
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</thead>
<tbody>
<tr>
<td>Sampling Frequency</td>
<td>fs</td>
<td>-</td>
<td>1</td>
<td>kHz</td>
</tr>
<tr>
<td>Load Resistor</td>
<td>VOL - VSS or VDD - VOUT</td>
<td>RL</td>
<td>2.5</td>
<td>-</td>
</tr>
<tr>
<td>Load Capacitance</td>
<td>VOL - VSS</td>
<td>CL</td>
<td>-</td>
<td>15</td>
</tr>
</tbody>
</table>
Package Dimensions

Sensor Code: AP2*N

Sensor Code: AP2*R

Footprint (for reference)
Hole for Pressure Port Diameter is depending on your design.

Footprint (for reference)

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We are here for you. Addresses and Contacts.

### Sales Germany & Austria

<table>
<thead>
<tr>
<th>Postcode Range</th>
<th>Type</th>
<th>Contact Person</th>
<th>Phone</th>
<th>Mobile</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>00000 – 31999</td>
<td>Geographical sensors</td>
<td>Kurt Stritzelberger</td>
<td>+49 89 260 52 80</td>
<td>+49 171 803 41 35</td>
<td><a href="mailto:kurt.stritzelberger@pewatron.com">kurt.stritzelberger@pewatron.com</a></td>
</tr>
<tr>
<td>38000 – 39999</td>
<td>Geographical sensors</td>
<td>Gerhard Vetter</td>
<td>+49 674 394 75 75</td>
<td>+49 163 762 74 30</td>
<td><a href="mailto:gerhard.vetter@pewatron.com">gerhard.vetter@pewatron.com</a></td>
</tr>
<tr>
<td>80000 – 99999</td>
<td>Geographical sensors</td>
<td>Thorsten Ravagni</td>
<td>+49 60 479 53 627</td>
<td></td>
<td><a href="mailto:thorsten.ravagni@pewatron.com">thorsten.ravagni@pewatron.com</a></td>
</tr>
</tbody>
</table>

### Sales Switzerland & Liechtenstein

<table>
<thead>
<tr>
<th>Postcode Range</th>
<th>Type</th>
<th>Contact Person</th>
<th>Phone</th>
<th>Mobile</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>30000 – 9999</td>
<td>Geographical sensors</td>
<td>Basil Frei</td>
<td>+41 44 877 35 18</td>
<td>+41 76 279 37 26</td>
<td><a href="mailto:basil.frei@pewatron.com">basil.frei@pewatron.com</a></td>
</tr>
<tr>
<td>10000 – 29999</td>
<td>Geographical sensors</td>
<td>Christian Mohrenstecher</td>
<td></td>
<td></td>
<td><a href="mailto:christian.mohrenstecher@pewatron.com">christian.mohrenstecher@pewatron.com</a></td>
</tr>
</tbody>
</table>

### Sales International Key Accounts

<table>
<thead>
<tr>
<th>Type</th>
<th>Contact Person</th>
<th>Phone</th>
<th>Mobile</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow / Level / Medical products</td>
<td>Peter Felder</td>
<td>+41 44 877 35 05</td>
<td>+41 79 406 49 83</td>
<td><a href="mailto:peter.felder@pewatron.com">peter.felder@pewatron.com</a></td>
</tr>
</tbody>
</table>

### Sales Other Countries / Product Management

<table>
<thead>
<tr>
<th>Type</th>
<th>Contact Person</th>
<th>Phone</th>
<th>Mobile</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure Sensors</td>
<td>Philipp Kistler</td>
<td>+41 44 877 35 03</td>
<td></td>
<td><a href="mailto:philipp.kistler@pewatron.com">philipp.kistler@pewatron.com</a></td>
</tr>
<tr>
<td>Flow / Level / Medical products</td>
<td>Dr. Thomas Clausen</td>
<td>+41 44 877 35 13</td>
<td></td>
<td><a href="mailto:thomas.clausen@pewatron.com">thomas.clausen@pewatron.com</a></td>
</tr>
<tr>
<td>Flow / Level / Medical products</td>
<td>Dr. Adriano Pittarelli</td>
<td>+49 8245 774 95 44</td>
<td></td>
<td><a href="mailto:adriano.pittarelli@pewatron.com">adriano.pittarelli@pewatron.com</a></td>
</tr>
</tbody>
</table>

### Geometrical sensors

<table>
<thead>
<tr>
<th>Type</th>
<th>Contact Person</th>
<th>Phone</th>
<th>Mobile</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angle sensors</td>
<td>Eric Letsch</td>
<td>+41 44 877 35 14</td>
<td></td>
<td><a href="mailto:eric.letsch@pewatron.com">eric.letsch@pewatron.com</a></td>
</tr>
<tr>
<td>Linear position sensors</td>
<td>Osman Coban</td>
<td>+41 71 635 363 898</td>
<td></td>
<td><a href="mailto:osman.coban@pewatron.com">osman.coban@pewatron.com</a></td>
</tr>
</tbody>
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