### Model selection table

<table>
<thead>
<tr>
<th>SPG6C</th>
<th>SPG6B</th>
<th>SPG7A</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>I</strong></td>
<td><strong>B</strong></td>
<td><strong>C</strong></td>
</tr>
<tr>
<td><strong>SPG</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SPG5C</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SPG6</strong></td>
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<td></td>
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<tr>
<td><strong>SPG5</strong></td>
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<td></td>
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<tr>
<td><strong>SPG7</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SPG6C</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SPG6B</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SPG7A</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Possible model No. combinations

<table>
<thead>
<tr>
<th><strong>I</strong></th>
<th><strong>B</strong></th>
<th><strong>C</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SPG</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SPG5C</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SPG6</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SPG5</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SPG7</strong></td>
<td></td>
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</tbody>
</table>

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Feature

01 Better product quality

Vacuum gauges are often used in harsh environments where various factors can cause the zero point to shift, affecting controllability and thus the quality of the final product. The sapphire capacitance diaphragm gauge is built to keep the zero point from shifting.

Pressure sensing is in the center, where deposition has the least effect.

Deposition on the pressure sensor during the film deposition process in semiconductor manufacturing causes the zero point to shift. Since deposition is most likely to occur in the corners, we put the pressure sensor in the center.

Resistant to effects of the vacuum-atmosphere cycle

Alternating exposure of pressure sensors to vacuum and atmosphere leads to zero point shift. The use of sapphire, which has excellent mechanical strength, in this pressure sensor makes it less susceptible to this type of stress.

Almost unaffected by temperature changes

In ordinary diaphragm gauges, changes in ambient temperature and in the temperature of the pressure sensor cause the output and zero point to shift. For stable measurement in spite of such changes, temperature sensors are located both at the base and at the pressure sensor, and the output is corrected for temperature changes.

Feature

01 Better product quality

Stable zero point means stable control, helping to assure product quality.

Feature

02 Better productivity

Reduces equipment downtime, raising productivity.

Feature

03 Better process

Information visualization, from test runs to actual operation.
This gauge reduces equipment downtime, and is equipped with functions to cut wasted time.

### Feature 02 Better productivity

**Faster zero point adjustment**

Zero point is simple to adjust

When the sapphire capacitance diaphragm gauge is in its normal mode, a 3-second press of a button adjusts the zero point. There is no need to fiddle with the zero point using a precision screwdriver. Fine adjustment of the zero point can also be done.

**Wider zero point adjustment range**

The zero point adjustment range is a wide ±20%FS, allowing long replacement/calibration intervals and lower running costs.

**Simple zero adjustment with the push of a button**

Zero point adjustment button

**Quick warm-up**

Microprocessor-based digital PID calculation speeds warm-up, cutting down the startup time.

**Calibration and adjustment**

We have in-house calibration equipment for calibration and adjustment.

### Feature 03 Better process

We help to improve your processes by visualizing various types of information that conventionally could only be inferred from changes in the pressure signal.

**Monitoring/operation/setting tools**

By connecting a dedicated PC loader, it is easy to display the desired information and to change settings. The loader also makes it possible to provide process improvement information and to significantly reduce the load during loop checks.

#### Data that can be displayed

- Measurement data
  - Measured pressure, output voltage, pressure sensor temperature, electronic circuit temperature, power-supply voltage, etc.
- Product status
  - Warm-up state, faults, alarms, events, etc.
- Abnormal status
  - Fault state (heater, memory, circuit), alarm state (temperature, power supply), etc.

#### Changing settings

- Output scaling, output voltage if state is abnormal
- Event type and setting

#### Reduction of load during loop check

- Loop check by inputting dummy measured pressure
- Loop check by manual output at 0 to 10 V

#### Display the information you want

**Status display**

LEDs show event output status and vacuum gauge status at a glance.

**Examples of status indication**

- Lit green: Normal state
- Lit orange: Warm-up in progress
- Lit red: Abnormal
- Blinking green: Zero point adjusted at ±5%FS or less
- Blinking orange: Zero point adjusted at ±5–20%FS

**Can output 3 events**

Equipped with 3 event relays that can be used for interlocks, this gauge outputs equipment status and alarms.

**Three event outputs**

- Instrument abnormality
- Warm-up finished
- Upper/lower pressure limits, etc.

**Zero point adjustment button**

**Shorter time**

Warm-up time

- Standard: 30 min
- Max: 1 h

**Temperature (°C)**

Sapphire gauge

Conventional product

Calibration equipment
I  Sample applications

Use this gauge in systems like the following.

**Film deposition equipment**
- **Customer's comment**: Because the zero point does not shift much at all, wafer yield has improved and costs were significantly cut.

**Freeze-drying equipment**
- **Customer's comment**: Device has enabled stable control with less zero point shift.

**Vacuum furnace**
- **Customer's comment**: Test run time was significantly cut using the PC loader.

**Vacuum pump evaluation equipment**
- **Customer's comment**: Now with high-accuracy measurements we are able to do more correct evaluations.

### Vacuum gauge types and features

<table>
<thead>
<tr>
<th>Pressure level</th>
<th>Measurement range</th>
</tr>
</thead>
<tbody>
<tr>
<td>10^-1 Pa abs</td>
<td></td>
</tr>
<tr>
<td>10^-2 Pa abs</td>
<td></td>
</tr>
<tr>
<td>10^-3 Pa abs</td>
<td></td>
</tr>
<tr>
<td>10^-4 Pa abs</td>
<td></td>
</tr>
<tr>
<td>10^-5 Pa abs</td>
<td></td>
</tr>
<tr>
<td>10^-6 Pa abs</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name</th>
<th>Diaphragm gauges</th>
<th>Pirani gauges</th>
<th>Ionization vacuum gauges</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>±0.25% rdg</td>
<td>±0.5% rdg</td>
<td>±0.5% rdg</td>
<td>±0.25% rdg</td>
</tr>
<tr>
<td></td>
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</tbody>
</table>

### Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure range</td>
<td>0-30 Pa, 0-200 Pa, 0-133.32 Pa, 0-266.64 Pa, 0-1333.2 Pa, 0-2666.4 Pa, 0-3999.6 Pa</td>
</tr>
<tr>
<td>Self-heating temperature</td>
<td>Non-self-heating/45/100/125/150/180/200 °C</td>
</tr>
<tr>
<td>Accuracy</td>
<td>Accuracy</td>
</tr>
<tr>
<td>0.25 % Reading</td>
<td>10 Pa to 33.31 Pa</td>
</tr>
<tr>
<td>0.5 % Reading</td>
<td>100 Pa to 133.32 Pa</td>
</tr>
<tr>
<td>10 % Reading</td>
<td>100 Pa to 133.32 Pa</td>
</tr>
<tr>
<td>Temperature coefficients zero</td>
<td>Temperature coefficients zero</td>
</tr>
<tr>
<td>0.005 %FS/°C</td>
<td>10 Pa to 33.31 Pa</td>
</tr>
<tr>
<td>0.010 %FS/°C</td>
<td>100 Pa to 133.32 Pa</td>
</tr>
<tr>
<td>0.025 %FS/°C</td>
<td>200 Pa to 333.32 Pa</td>
</tr>
<tr>
<td>0.025 %FS/°C</td>
<td>200 Pa to 333.32 Pa</td>
</tr>
</tbody>
</table>

### External dimensions

Model SPG5 (standard model)  
Model SPG6 (extra high-temperature model)  
Model SPG7 (vacuum freeze-drying process model)

### Standards compliance
- CE-marked (EN 61326-1), KC-marked
- Non-self-heating or less than 160 °C
- No self-heating or less than 160 °C

1. At the allowable pressure, the performance level of the gauge can be maintained.
2. At the marginal pressure, the gauge will continue to function.
3. At the burst pressure, the gauge will break.
4. At the marginal pressure, the gauge will continue to function.
5. At the allowable pressure, the performance level of the gauge can be maintained.

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