The Pirani Standard Gauges PVG-500 and PVG-502 have been designed for vacuum measurement of gases in the pressure range of $5 \times 10^{-4}$ to 1000 mbar. They must not be used for measuring flammable or combustible gases in mixtures containing solvents (e.g. atmospheric oxygen) within the explosion range.

They can be operated in connection with an Agilent controller or with another controller.

### Safety

**Symbols Used**

- **DANGER**: Information on preventing any kind of physical injury.
- **WARNING**: Information on preventing extensive equipment and environmental damage.
- **Caution**: Information on preventing any kind of physical injury.

**Personnel Qualifications**

All work described in this manual may only be carried out by persons who have suitable technical training and the necessary experience or who have been instructed by the end-user of the product.

**Validitity**

This document applies to products with the following part numbers:

- W filament: PVG500FP16 (DN 16 ISO-KF, with switching functions)
- PVG500FP16S (DN 16 ISO-KF, with switching functions)
- PVG500CF16 (DN 16 CF-R, with switching functions)
- PVG500CF16S (DN 16 CF-R, with switching functions)

### Liability and Warranty

Agilent assumes no liability and the warranty becomes null and void if the end-user or third parties:

- disregard the information in this document
- use the product in a non-conforming manner
- make any kind of deviations (modifications, alterations, etc.) on the product
- use the product with accessories not listed in the product documentation.

### Intended Use

The Pirani Standard Gauges PVG-500 and PVG-502 have been designed for vacuum measurement of gases in the pressure range of $5 \times 10^{-4}$ to 1000 mbar. They must not be used for measuring flammable or combustible gases in mixtures containing solvents (e.g. atmospheric oxygen) within the explosion range.

They can be operated in connection with an Agilent controller or with another controller.

### Technical Data

**Measurement principle**: thermal conductance according to Pirani

- **Accuracy (R%):**
  - $5 \times 10^{-4}$ to 100 mbar: $\pm 15\%$ of reading
  - $100$ to 1000 mbar: $\pm 10\%$ of reading

### Gas Type Dependence

<table>
<thead>
<tr>
<th>Gas Type</th>
<th>Calibration factor C</th>
<th>Gas Type</th>
<th>Calibration factor C</th>
</tr>
</thead>
<tbody>
<tr>
<td>He</td>
<td>0.9</td>
<td>Ne</td>
<td>1.0</td>
</tr>
<tr>
<td>Ar</td>
<td>0.8</td>
<td>N$_2$</td>
<td>0.5</td>
</tr>
<tr>
<td>CO$_2$</td>
<td>0.7</td>
<td>H$_2$</td>
<td>0.5</td>
</tr>
<tr>
<td>CO</td>
<td>0.5</td>
<td>water vapor</td>
<td>0.5</td>
</tr>
<tr>
<td>H$_2$O</td>
<td>0.5</td>
<td>steam</td>
<td>0.3</td>
</tr>
</tbody>
</table>

### Installation

**Vacuum Connection**

- KF connections fulfill this requirement.
- Use O-rings provided with an outer centering ring.

**Deflection ranges**

- Use PVG-500 CF-R with $p<1000$ mbar
- Use PVG-502 CF-R with $p<10$ Pa

**Measurement signal**

$U = 0.1 \times 10^5 p \times \tan^{-1}(p/100)$ and $U = 0.1 \times 10^4 p \times \tan^{-1}(p/10)$

**Part number (PN) can be taken from the product nameplate.**

**Intended Use**

- The Pirani Standard Gauges PVG-500 and PVG-502 have been designed for vacuum measurement of gases in the pressure range of $5 \times 10^{-4}$ to 1000 mbar.
- They must not be used for measuring flammable or combustible gases in mixtures containing solvents (e.g. atmospheric oxygen) within the explosion range.
- They can be operated in connection with an Agilent controller or with another controller.

**Caution**

- **DANGER**: The pressure gauge may only be connected to power supplies, instruments or control devices that conform to the requirements of a grounded earthed voltage (SELV). The connection to the gauge has to be fused $^{1)}$.

- **WARNING**: The pressure gauge may only be connected to power supplies, instruments or control devices that conform to the requirements of a grounded earthed voltage (SELV). The connection to the gauge has to be fused $^{1)}$.

- **Caution**: The pressure gauge may only be connected to power supplies, instruments or control devices that conform to the requirements of a grounded earthed voltage (SELV). The connection to the gauge has to be fused $^{1)}$.

- **WARNING**: The pressure gauge may only be connected to power supplies, instruments or control devices that conform to the requirements of a grounded earthed voltage (SELV). The connection to the gauge has to be fused $^{1)}$.

- **Caution**: The pressure gauge may only be connected to power supplies, instruments or control devices that conform to the requirements of a grounded earthed voltage (SELV). The connection to the gauge has to be fused $^{1)}$.

- **DANGER**: Injury caused by releasing parts and harm caused by escaping process media can lead to malfunctions or minor equipment damage. Do not open any clamps while the vacuum system is pressurized. Use O-rings provided with an outer centering ring.

### Notes

1. **Agilent controller** fulfills these requirements.
Power Connection

Make sure the vacuum connection is properly made (i.e., “Vacuum Connection”).

1. If no sensor cable is available, make one according to the following diagram.

2. Connect the sensor cable to the gauge and the controller.

3. Execute p to ≤ 10⁻⁴ mbar (recommended) or to a pressure in the range of 10⁻⁷ - 10⁻⁴ mbar and wait at least 2 minutes.

4. Press the button with a pin and the ATM adjustment is carried out. The gauge is adjusted to 1.2-10⁻⁴ mbar (1.2 mVDC) by default. By pressing the button, the pressure in the range is increased to 1.2-10⁻⁴ mbar until the button is released or the limit is reached.

5. Release the button. The gauge resumes operation after 5 s and the connected controller displays the current measurement value.

The adjustment procedure for SP2 is the same as described for SP1.

De-installation

DANGER: contaminated parts

Contaminated parts can be detrimental to health and environment. Before beginning to work, find out whether any parts are contaminated. Adhere to the relevant regulations and take the necessary precautions when handling contaminated parts.

Spares Parts

When ordering spare parts, always indicate:

- all information on the product nameplate
- description and ordering number according to the spare parts list
- SP1
- SP2

Maintenance, Repair

In case of severe contamination or a malfunction, the sensor can be replaced.

DANGER: sensor cable

Contaminated parts can be detrimental to health and environment.

Before beginning to work, find out whether any parts are contaminated. Adhere to the relevant regulations and take the necessary precautions when handling contaminated parts.

Separating the components

After de-assembling the product, separate its components according to the following criteria:

- Contaminated components (radioactive, toxic, caustic, or biological hazard etc.) must be decontaminated in accordance with the relevant national regulations, separated according to their materials, and disposed of.
- Other components

Such components must be separated according to their materials and recycled.

EC Declaration of Conformity

We, Agilent, hereby declare that the equipment mentioned below complies with the provisions of the Directive relating to electromagnetic compatibility 2004/108/EC.

Products

Pirani Standard Gauge

FVG-500

PVG-522

Standards

Harmonized and international/national standards and specifications:

- EN 61000-6-2:2005 (EMC: generic immunity standard)
- EN 61000-6-3:2007 (EMC: generic emission standard)
- EN 61010-1:2001 (Safety requirements for electrical equipment for measurement, control and laboratory use)
- EN 61326-1:2006 (EMC requirements for electrical equipment for measurement, control and laboratory use)

Manufacturer / Signature

Agilent Technologies, 121 Hartwell Avenue, Lexington, MA 02421, USA

John Ehmann

General Manager

Agilent Technologies, 121 Hartwell Avenue, Lexington, MA 02421, USA

Tel: +1 781 861 7200
Fax: +1 781 860 5437
vpl-customerservice@agilent.com

www.agilent.com