### Technical Data

<table>
<thead>
<tr>
<th>Internal volume</th>
<th>20 cm³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply</td>
<td>±10 bar (absolute) limited to over-gauges</td>
</tr>
</tbody>
</table>

#### Accuracy (N₂)

**Accuracy**

<table>
<thead>
<tr>
<th>Value</th>
<th>10⁻¹⁰</th>
<th>10⁻⁸</th>
<th>10⁻⁶</th>
<th>10⁻³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure</td>
<td>±10 mbar</td>
<td>±10 mbar</td>
<td>±10 mbar</td>
<td>±10 mbar</td>
</tr>
</tbody>
</table>

#### Dangers

**DANGER**

- In case of contact with the product, immediately consult a physician.
- Do not open any clamps while the vacuum system is pressurized.
- In the case of a failure, keep the protective lid on until the vacuum system is depressurized.
- The operating personnel must ensure that the user is aware of the dangers associated with the product.

#### Gas Type Dependence

Pressure p versus K (mean values)

- **Ar**: 1.0
- **Kr**: 1.5
- **Ar**: 2.0
- **He**: 2.0
- **O₂**: 2.0
- **H₂**: 2.0
- **CO**: 2.0
- **N₂**: 2.0

### Installation

**Vacuum Connection**

- Connect to the vacuum system using a vacuum hose.

**Vacuum Gauge Controller**

- Connect to the product according to the documentation.

**Protective Lid**

- Keep the protective lid on until the vacuum system is depressurized.

**AF 1**

- Designated for vacuum system pressure up to 1 bar.

**Warning**

- Do not exceed the maximum permissible pressure.

**AF 1.5**

- Designated for vacuum system pressure up to 1.5 bar.

**Warning**

- Do not exceed the maximum permissible pressure.

**Caution**

- Keep the protective lid on until the vacuum system is depressurized.

**Caution**

- Do not use in a non-conforming manner.

### Personal Qualifications

**Information on personnel qualifications**

- Check the information for personnel qualifications before handling the product.

### General Safety Instructions

#### Safety Symbols Used

- **DANGER**
- **WARNING**
- **Caution**

#### Personnel Qualifications

- **Skilled personnel**
- **Personnel with technical training**
- **Personnel with appropriate training**

#### Liability and Warranty

- **INFINCON** assumes no liability and the warranty becomes null and void if the end-user or third party:
  - damaged the information in this document
  - the product in a non-conforming manner
  - uses the product for non-intended purposes
  - uses the product with accessories not listed in the product documentation.

#### Functional Principle

- The gauges consist of two separate measurement systems (Plasmas and cold cathode system) whose signals are combined in such a way that one measurement signal is output. The measurement circuit is always on.
Ignition Delay
When cold cathode measurement systems are activated upon switching the gauge on, an ignition delay occurs, which is typically:
- 10⁻¹ mbar ≈ 1 second
- 10⁻² mbar ≈ 20 seconds
- 5×10⁻³ mbar ≈ 2 minutes

As long as the cold cathode measurement circuit has not yet ignited, the measurement value of the Pirani is output as a measuring signal. "Pirani underrange" is displayed for pressures >5×10⁻³ mbar.

Adjusting the Gauge
The gauge is factory-calibrated. If used under different climatic conditions, through extreme temperatures, aging or contamination, and after exchanging the sensor, the characteristic curve can be offset and readjustment may become necessary.

Operation
When the supply voltage is applied, the measuring signal is available between pins 3 and 5. Over the whole measurement range, the measuring signal is output as a logarithm of the pressure (measuring signal vs. pressure = "Technical Data").

Allow for a stabilizing time of 10 minutes. Once the gauge has been switched on, permanently leave it on irrespective of the pressure.

The Pirani measurement circuit is always on.

The cold cathode measurement circuit is controlled by the Pirani circuit and is activated only at pressures >1×10⁻³ mbar.

Gas Type Dependence
The measurement value depends on the type of gas being measured. The value displayed is accurate for dry air, O₂, CO and N₂. It can be mathematically converted for other gases ("Technical Data").

If the gauge is operated in connection with an INFICON vacuum gauge controller, a calibration factor can be entered for correction of the reading.

Maintenance, Troubleshooting
- ► Operating Manual (item 11)
- ► Calibration certificate (item 12)
- ► Wiring diagram (item 13)
- ► Technical data (item 14)
- ► Service information (item 15)
- ► ETL listed
- ► Safety and health information (item 16)
- ► Certification

ETL Certification
The products MPG400 and MPG401 are certified to the CAN/CSA Standard C23.2 No. 61010-1

EU Declaration of Conformity
We, INFICON hereby declare that the equipment mentioned below comply with the provisions of the following Directives:

- 2014/35/EU, O.J. L 65, 29.3.2014 (EMC directive: Directive relating to electromagnetic compatibility)

Inverted Magnetron Pirani Gauge
MPG400
MPG401

Part numbers
351-010 351-020
351-011 351-012 351-022

Standards
Harmonized and international/national standards and specifications:
- EN 61326-1-2:2005 (EMC: generic immunity standard)
- EN 61000-6-2:2005 (EMC: generic immunity standard)
- EN 61010-1:2010 (Safety requirements for electrical equipment for measurement, control and laboratory use)
- EN 61326-1-2:2013, Group 1, Class B (EMC requirements for electrical equipment for measurement, control and laboratory use)

Manufacturer / Signatures
INFICON AG, Alte Landwirtstraße 6, L-19486 Balzers
17 July 2017

Dr. Bernhard Andreani
Director Product Evolution
Markus Truniger
Product Manager

Keep the protective lid.
If adjustment should be possible after the gauge has been installed, be sure to install it so that potentiometers "<HV>" and "<ATM>" can be accessed with a screwdriver ("Adjusting the Gauge").

Electrical Connection
Make sure the vacuum connection is properly made ("Vacuum Connection").

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

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