Bayard-Alpert Pirani Gauge
Dual Filament Bayard-Alpert Pirani Gauge
BPG402-SL (without display, 1 switching function)
BPG402-S (with display, 1 switching function)
BPG402-S (without display, 1 switching function)

Validity
In all communications with INFICON, please specify the reference copy that information into the space provided.

Safety Symbols Used

Objective

Technical Data

Functional Principle
Over the whole measuring range, the gauge has a continuous characteristic curve and its measuring signal as output as logarithm of the pressure.
The gauge functions with a Bayard-Alpert hot cathode ionization measurement system (for p > 2·10⁻¹⁰ mbar) and a Pirani measurement system (for p > 5·10⁻¹⁰ mbar). In the overlapping pressure range of 2·10⁻¹⁰ … 5.5·10⁻⁹ mbar, Pirani and Pirani measurements are output. The accuracy of the readings is displayed on the gauge or can be read via the interfaces.

Material on the vacuum side

Personnel Qualifications
All work described in this document may only be carried out by personnel trained in technical training and the necessary experience or who have been instructed by the end-user of the product.

General Safety Instructions
- Adhere to the applicable regulations and take the necessary precautions for the process media used.

Gas Type Dependence
For gases other than air: the pressure in the indication range p > 10⁻⁸ mbar can be determined by a simple conversion:

Display (353-572, 353-573)
LCD matrix, 32×16 pixels, with backlight illumination
Dimensions
Pressure units
Selecting the pressure units
Dimensions
Pressure units
Selecting the pressure units

Liability and Warranty
INFICON assumes no liability and the warranty becomes null and void if the end-user or third parties:
- disregarded the information in this document

Installation
Vacuum Connection
Overpressure in the vacuum system = bar injury caused by released parts and harm caused by escaping process gases can result if clamps are opened while the vacuum system is pressurized. Do not open any clamps while the vacuum system is pressurized. Use the type clamps which are suited to overpressure.

Protective-grounded Inconel®-grounded products can be extremely hazardous in the event of a fault. The gauge must be electrically connected to the grounded vacuum chamber. This connection must conform to the requirements of a protective grounding according to EN 61010:
- CF connection [1] this requirement
- For gauges with a HF range, use a conductive metallic clamping ring.

Dirt and damages impair the function of the vacuum component. When handling vacuum components, take appropriate measures to ensure cleanliness and prevent damages.

Caution
Dirt sensitive area
- Touching the product or parts thereof with bare hands increases the desorption rate.
- Use clean gloves, wear protective clothing and use clean tools when working in this area.

DANGER
The gauge may be mounted in any orientation. To prevent condensates and particles from getting into the measuring input, preferably choose a horizontal orientation.

The gauge is supplied with a built-in grid. For potentially contaminating applications and to prevent the electrolyte against light and fast particles, install the optional top shield is recommended (see [1]).

DANGER
Vacuum connection free of greases. Remove the protective lid and install the gauge to the vacuum system. Keep the protective lid.

Gas Type Dependence
For gases other than air: the pressure in the indication range p > 10⁻⁸ mbar can be determined by a simple conversion:

Further information on the RS232 interface [1].
Power Connection (BPG402-S/-SL only)

- Make sure the vacuum connection is properly made (+ “Vacuum Connection”).
- If no connection cable is available, make one according to the following diagram.

Display

- Display (BPG402-SE with part numbers 353-072 and 353-073)
- Pressure reading
- Function display
- Error display
- Bayern-Alpert sensor error (red background illumination)
- Filament status indicator
- Filament status LED
- Emission
- Status LED
- Filament status
- Relay contact

Switching Function

The BPG402-S/-SL has a manually adjustable switching function with a normally open relay contact. The relay contact is accessible at the sensor cable connector (pins 1 and 4).

- The threshold value of the switching function can be set within the pressure range of 10-20 mbar...100 mbar via a potentiometer “SET POINT”.
- The following rule applies:

\[ U_{\text{Threshold}} = 0.75 \times U_{\text{Vacuum}} + 0.75 \times V \]

where \( U_{\text{Vacuum}} \) is the pressure unit dependent (+ “Relationship Measuring Signal – Pressure”).

Setting the Switching Function

- Put the gauge into operation.
- Connect the + lead of a voltmeter to the threshold measurement point Pin 3 and the – lead to a grounded point (e.g. connector case or flange of the gauge).

Maintenance, Troubleshooting

- In case of severe contamination or a malfunction, the sensor can be replaced (+ [1]).
- Gauge failures due to contamination or wear and tear, as well as expendable parts (e.g. filament), are not covered by the warranty.

Adjusting the Gauge

The gauge is factory calibrated. If used under different climatic conditions, at extreme temperatures, through aging or contamination and after exchanging the sensor, the characteristic curve can be offset and calibration may become necessary. Only the Piranelli element can be adjusted and only at atmospheric pressure.

- At the push of a button the digital value and thus the analog output are adjusted electronically to +10 V at atmospheric pressure.

Adjustment is necessary if:
- at atmospheric pressure, the output signal is +10 V
- the display reads atmospheric pressure (if the gauge has a display).
- at atmosphere, the digital value of the RS232C interface is +10 V.
- when the vacuum system is vented, the digital value of the RS232C interface reacts its maximum when the measured pressure has reached atmosphere.

- Turn the gauge off at the power supply.
- Using a screwdriver (max. ø2.5 mm), set the voltage (Setpoint) to the desired value \( U_{\text{Threshold}} \).

DANGER

- 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.

Deinstallation

- Connect the sensor cable to the gauge.
- Connect the sensor cable to the controller.
- Secure the cable connection with the lock screws.

Further Information

1. www.infincon.com
2. [1] info@infincon.com
3. [2] tina46d1 (German)
   tina47d1 (Italian)
4. BPG402-SE, BPG402-SL, BPG402-SP

EU Declaration of Conformity

We, INFINCON AG hereby declare that the equipment mentioned below complies with the provisions of the Directive relating to electromagnetic compatibility 2014/30/EU and the Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment 2011/65/EU.