Bayard-Alpert Pirani Gauge

BPG400
BPG400-SD
BPG400-SP

Technical Data

Function of the measuring range, the gauge has a continuous characteristic curve and its measuring signal is output in millions of the vacuum system.
The gauge functions with a Bayard-Alpert hot cathode ionization measurement system (for p < 5·10⁻⁵ mbar) and a Pirani measurement system (for p ≥ 5·10⁻⁵ mbar). The gauge can be switched on by the Pirani measurement system only below the switching threshold of 2·10⁻⁴ mbar (to prevent filament burnout). It is switched off when the pressure exceeds 2·10⁻⁴ mbar.

Trademark

Device** Open DeviceNet Vendor Association, Inc.

Safety

Information on preventing any kind of physical injury.

Personnel Qualifications

Skilled personnel

Validity

This document applies to products with the following part numbers (PN):
BPG400 (without display) 353-903 (DN 25 ISO KF) 353-902 (DN 40 CF-R)
BPG400 (with display) 353-903 (DN 25 ISO KF) 353-902 (DN 40 CF-R)
BPG400-SD (with Dewar interface and switching functions) 353-907 (DN 25 ISO KF) 353-906 (DN 40 CF-R)
BPG400-SP (with Port-Box interface and switching functions) 353-805 (DN 25 ISO KF) 353-806 (DN 40 CF-R)
The part number (PN) can be taken from the product name plate.

Intended Use

The BPG400, BPG400-SD and BPG400-SP gauges have been designed for vacuum measurement of gauges in the pressure range of 5·10⁻¹⁰ to 1000 mbar.

The user must not be used for manufacturing flammable or combustible gases in mixtures containing oxides (e.g. atmospheric oxygen) within the given range.
The gauges can be operated in connection with the VGC103 or VGC4xxx Vacuum Gauge Controller or with another instrument or control device.

LIABILITY AND WARRANTY

INFINITRON assumes no liability and the warranty becomes null and void if the end-user or third party:
- disregards the information in this document
- uses the product in a non-conforming manner
- makes any kind of changes (modifications, alterations etc.) to the product
- uses the product with accessories not listed in the product documentation

The end-user assumes the responsibility in conjunction with the process media used. Gauge failures due to contamination in wear and tear, as well as expendable parts (e.g. flanges), are not covered by the warranty.

Power Connection (BPG400)

The following information on the electrical connection refers to the wiring diagrams in BPG400 only ([1] and [2] for details on the electrical connection and additional functions of BPG400-SD and -SP).

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

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

Installation Vacuum Connection

DANGER: Protective ground (correctly) 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 connection according to DIN 50100:
- CF connection fulfill the requirement
- For gauges with a flange, use a conductive metallic clamping ring.

Caution

Vacuum component

Dangers and damage to the function of the vacuum chamber.

When handling vacuum components, take appropriate measures to ensure cleanliness and prevent damages.

Caution

Contact the safe area

Touching the product or parts thereof with bare hands increases the desorption rate.

Always wear clean, lint-free gloves and use clean tools when working in this area.

1) INFINITRON controls fulfill these requirements.

2) Consider the voltage drop on the sensor cable.

Electrical connection

The gauge may be mounted in any orientation. To keep combustibles and particles from getting into the gauge, the gauge should preferably be mounted in a horizontal to upright position.

The gauge should be equipped with a gasket grid for particle and condensate consuming applicators and to protect the vacuum system. This grid and the gasket is included as part of the optical option (a recommended (see [1])

Remove the protective lid and install the product to the vacuum system, preferably without applying vacuum grease.
EC Declaration of Conformity

We, INFICON, hereby declare that the equipment mentioned below comply with the provisions of the Directive relating to electromagnetic compatibility 2004/108/EC and the Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment 2011/65/EU.

Further Information

www.inficon.com

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Standards
Harmonized and international/national standards and specifications:
• EN 61000-6-2:2005 (EMC: generic emission standard)
• EN 61010-1:2010 (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 / Signatures
INFICON AG, Alte Landstraße 6, LI-9496 Balzers
11 November 2013 11 November 2013
Dr. Uwe Wächter Managing Director Marco Kain Product Manager

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Gas Type Dependence (BPG400)
The measurement value is gas dependent. The displayed reading applies to dry air, O₂, CO, and N₂. For other gases, it has to be converted (see “Technical Data” and [1]).

Adjusting the Gauge
The adjustment of BPG400-SD and -SP ([1] and [2]) is slightly different from the procedure for BPG400, which is described below.

The gauge is factory calibrated. If used under different climatic conditions, at extreme temperatures, through aging or contamination, the automatic curve can be offset and readjustment may be necessary. Only the Pirani element can be adjusted and only at atmosphere.

Reading becomes necessary if:
- at atmosphere the output voltage is <10 V or the display reading is “atmosphere
- when venting the vacuum system, the output voltage reaches 10 V before the measured pressure has reached atmosphere (Gauges with display will show the error “5” at atmosphere (Pirani sensor warning)).

Activate the gauge.

Connect the sensor cable to the gauge.

Secure the cable connector with the lock screws.

Connect the sensor cable to the controller.

Display (BPG400 with part numbers 353-501 and 353-503)

Pressure reading

Pressure unit

Function display

Emission 25 mA
Emission 5 mA
Degree
1000 mbar adjustment (Pirani)

Error display

no error
Grammar background illumination
Pirani sensor warning (red background illumination)
Pirani sensor error (red background illumination)

Increase the sensor cable to the controller.

Internal data connection failure (red background illumination)

Deinstallation

DANGER: contaminated parts

DANGER: contaminants 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.

Caution

Custom vacuum component

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

Caution

Custom dirt-sensitive area

Touching the product or parts thereof with bare hands increases the desorption rate.

Always wear clean, lint-free gloves and use clean tools when working in this area.

Operation

When the voltage is supplied, the measuring signal is available between pins 2 (+) and 12 (-) (Relationship: Measuring Signal – Pressure > “Technical Data” and [1]).

BPG400-SD and -SP can be also operated via the corresponding fieldbus interface (DeviceNet or Profibus – [1] and [2] for further details and functions).

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

Adjusting the Gauge

BPG400-SD and -SP ([1] and [2]) have a separate adjustment for the BA and Pirani sensors.

The adjustment is described below. The readjustment can be performed as described for the BPG400.

The adjustment of BPG400-SD and -SP ([1] and [2]) is slightly different from the procedure for BPG400, which is described below.

The gauge is factory calibrated. If used under different climatic conditions, at extreme temperatures, through aging or contamination, the automatic curve can be offset and readjustment may be necessary. Only the Pirani element can be adjusted and only at atmosphere.

Adjustment becomes necessary if:
- at atmosphere the output voltage is <10 V or the display reading is “atmosphere
- when venting the vacuum system, the output voltage reaches 10 V before the measured pressure has reached atmosphere (Gauges with display will show the error “5” at atmosphere (Pirani sensor warning)).

Activate the gauge.

Connect the sensor cable to the gauge.

Secure the cable connector with the lock screws.

Connect the sensor cable to the controller.

Display (BPG400 with part numbers 353-501 and 353-503)

Pressure reading

Pressure unit

Function display

Emission 25 mA
Emission 5 mA
Degree
1000 mbar adjustment (Pirani)

Error display

no error
Grammar background illumination
Pirani sensor warning (red background illumination)
Pirani sensor error (red background illumination)

Vent the vacuum system.

Put the gauge out of operation.

Unfasten the lock screws and unplug the sensor cable. (If you are using BPG400-SD or -SP, unfasten and unplug the interface cable too ([1] and [2]).

Adjustment completed

Remove the gauge from the vacuum system.

Disposal

DANGER: contaminated parts

Dangers of contaminated parts and products 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.

Caution

Custom vacuum component

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

Caution

Custom dirt-sensitive area

Touching the product or parts thereof with bare hands increases the desorption rate.

Always wear clean, lint-free gloves and use clean tools when working in this area.

Returning the Product

WARNING: forwarding contaminated products

Contaminated products (e.g. radioactive, toxic, caustic or biological hazard etc.) must be decontaminated in accordance with the relevant national regulations, separated according to their materials, and recycled.

Products or parts thereof (mechanical and electrical components, operating fluids etc.) can be detrimental to the environment.

WARNING: substances detrimental to the environment

Products returned to INFICON should preferably be free of harmful substances. Adhere to the relevant regulations and take the necessary precautions when handling contaminated parts.

DANGER: contaminated parts

Dangers of contaminated parts and products 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.

Caution

Custom vacuum component

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

Caution

Custom dirt-sensitive area

Touching the product or parts thereof with bare hands increases the desorption rate.

Always wear clean, lint-free gloves and use clean tools when working in this area.

Deinstallation

DANGER: contaminated parts

Dangers of contaminated parts and products 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 disassembling the product, separate its components according to the following criteria:

• Contaminated components

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 recycled.

• Other components

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

Display (BPG400 with part numbers 353-501 and 353-503)

Pressure reading

Pressure unit

Function display

Emission 25 mA
Emission 5 mA
Degree
1000 mbar adjustment (Pirani)

Error display

no error
Grammar background illumination
Pirani sensor warning (red background illumination)
Pirani sensor error (red background illumination)

Vent the vacuum system.

Put the gauge out of operation.

Unfasten the lock screws and unplug the sensor cable. (If you are using BPG400-SD or -SP, unfasten and unplug the interface cable too ([1] and [2]).

Adjustment completed

Remove the gauge from the vacuum system.