

O P E R A T I N G M A N U A L

tina16e1

PSG050 /  
PSG051

Part Number  
399-500, 399-501, 399-502  
350-981, 350-980, 350-982

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Pirani Standard Gauges

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### General Note

The right of alterations in the design and the technical data is reserved.

The illustrations are not binding.

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# 1 Description

## 1.1 General

These Operating Instructions contain important information on the functions, installation, start-up and troubleshooting of the Pirani Standard Gauge PSG050 / PSG051.

**Caution** Indicates procedures that must strictly be observed to prevent damage to, or destruction of, the Pirani Standard Gauge.

The references to diagrams, e.g. (3/5), consist of the Fig. No. and the item No. in that order.

Unpack the Pirani Standard Gauge immediately after delivery, even if it is to be installed at a later date.

**Note**

Retain the packaging materials in the event of complaints about damage.

Carefully examine the visually. If any damage is discovered, report it immediately to the forwarding agent and insurer. If the gauge head has to be replaced, please get in touch with the orders department.

### 1.1.1 Purpose

The Pirani Standard Gauge are vacuum gauge heads which are operated in connection with the operating units VGC012 and VGC023.

The gauge head is used for the measurement of absolute pressures in the rough and fine vacuum range in accordance with the technical data of Section 1.2.

## 1.2 Technical data

***Pirani Standard Gauge PSG050***

Measurement range	0.5·10 <sup>-3</sup> to 10 <sup>3</sup> mbar
Filament temperature	110 °C
Permissible overload (absolute)	3 bar
Measurement volume	11 cm <sup>3</sup>
Connection flange	DN 16 KF or 1/8" NPT thread
Filament material	Tungsten

Material in contact with the medium  
 aluminium, glass, Vacon, tungsten,  
 chrome-nickel 8020, steel nickel-plated,  
 Epoxy adhesive

Operating temperature 0 to 40 °C

Max. ambient temperature 80 °C

***Pirani Standard Gauge PSG051***

Measurement range 0.5·10<sup>-3</sup> to 10<sup>3</sup> mbar

Filament temperature 110 °C

Permissible overload (absolute) 10 bar

Measurement volume 10 cm<sup>3</sup>

Connection flange DN 16 KF

Filament material Platinum

Material in contact with the medium  
 Stainless steel 1.4301, platinum,  
 chrome nickel 8020, ceramics Al<sub>2</sub>O<sub>3</sub>,  
 NiFe 42

Operating temperature 0 to 40 °C

Max. ambient temperature 80 °C

### 1.3 Technical description

The actual pressure sensing element within the PSG050 is a tungsten filament.

The PSG051 is made of stainless steel with a welded ceramics feedthrough. The sensing element within the PSG051 uses a platinum filament.

The gauge heads are supplied fully aligned. Any alignment or recalibration will - if at all necessary - be required only after a longer period of operation.

The gauge heads are temperature compensated for the range from 0 °C to 40 °C.

The measurement cells can be easily exchanged should this be required. After an exchange of the sensing cell a recalibration is required by adjusting two potentiometers within in the gauge head; see Section 2.2.

### 1.4 Equipment

#### 1.4.1 Supplied equipment

	Part Number
PSG050	399-500
PSG050 (NPT)	399-501
PSG051	399-502
Operating Instructions	tina16e1

## 2 Operation

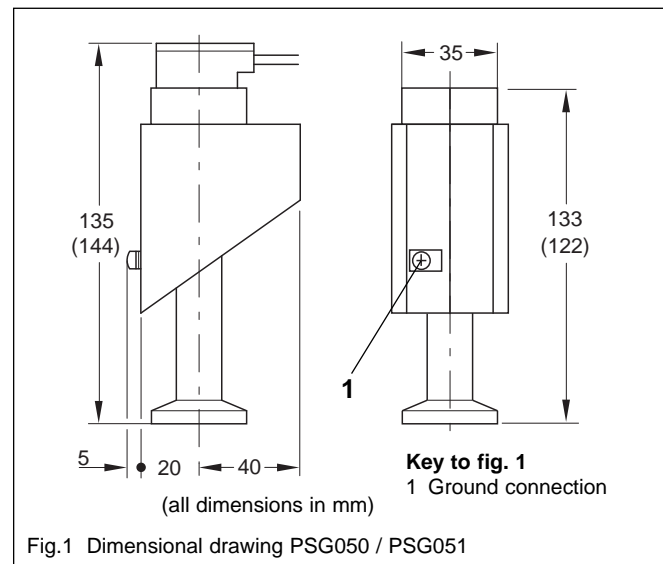
### 2.1 Connection of the gauge head

**Important** The gauge head must be installed in such a way, that when venting the vacuum system the admitted air may under no circumstances be directed straight at the gauge head. Otherwise the fine wire within the gauge head may be damaged.

Install the gauge head vertically, i.e. with the flange facing downwards. Dimensional drawing see Fig. 1. The dimensions given in brackets refer to the Pirani Standard Gauge PSG051. Otherwise the dimensions are the same for both gauge heads.

The maximum permissible ambient temperature for the gauge head is 80 °C. However, at this temperature the accuracy specified for the gauge head is no longer ensured, as the temperature compensation is only effective up to 40 °C.

If the gauge head is subjected to strong thermal radiation, it has to be protected by a suitable thermal screen. In case that heat is transferred to the gauge head via the connection cable, a section of the connection cable may be cooled by a cooling spiral.



Any contamination of the sensing cell will impair the accuracy of the pressure readings obtained. Thus special care must be taken in the presence of substances which can not be removed by solvents.

Suitable orifice plates or bends may be employed to keep any possible sources of contamination away from the gauge head.

Bent lines should be laid in such a way that no condensate can collect and in particular so that the vacuum line

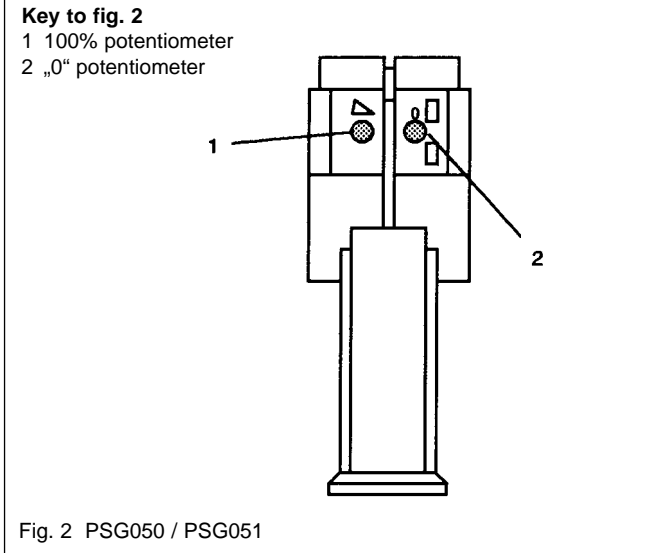
### Caution

The ground wire may only be connected if potential equalization between the flange of the vacuum apparatus and the operating unit is ensured. If necessary install the gauge head so that it is electrically isolated from the vacuum apparatus.

### Note

The „FIL pt“ setting applies when connecting a PSG051 as also described in the corresponding Operating Instructions.

The connecting plug can be safely attached to the gauge via the securing bow. To do so, push the bow over the connecting pug and let them snap in the provided holes which are in the shell.



is not blocked.

The gauge heads are connected to the operating unit via standard gauge head cables.

The ground lines which lead to the outside (black cable with lug) on the connectors of gauge head cables Part Number 399-600, 399-601 and 399-602, are used to provide a ground connection between the gauge head and the Controller.

## 2.2 Alignment

### 2.2.1 Alignment of the gauge head in connection with Vacuum Gauge Controller with analogue displays

Alignment is performed as follows:

Remove the caps covering the potentiometers on the gauge head.

Vent vacuum system and set 100 % potentiometer (2/1) so that the pointer of the control unit meter shows full-scale deflection, i.e. it should point to 100 on the linear scale.

Pump down vacuum system to a pressure below  $10^{-3}$  mbar and set „0“ potentiometer (2/2) so that the pointer is on 0 of the meter scale.

Vent vacuum system and recheck the 100 % adjustment. Correct deviation, if any, by means of potentiometer.

If a correction of the 100 % adjustment was necessary the zero adjustment must be repeated in any case.

After having completed the alignment fit the caps to cover the potentiometers.

### 2.2.2 Alignment of the gauge head in connection with operating units VGC012 or VGC023

For this refer to the alignment instructions given in the corresponding operating instructions.

## 3 Maintenance

### 3.1 Exchanging the sensing cell

#### Note

One half of the housing (3/1) is fitted with plastic catches (3/2) which must properly engage in the slots (3/8) provided in the other half of the housing (3/7) so as to firmly connect the two halves of the housing (3/1) and (3/7).

Apply a screwdriver to the upper slit on the longer front so as to disengage the plastic catch (3/2) by pushing it backwards. At the same time pull both halves of the shell (3/1) and (3/7) apart a little.

Next apply a screwdriver to the lower slit on the longer front so as to disengage the plastic catch by pushing it backwards. At the same time pull both halves of the shell apart a little more.

Repeat this for the shorter front.

Detach shell (3/1).

Remove the contact spring (3/4) by loosening the fixing screw (3/3)

Remove the sensing cell (3/11) together with the pcb. and plug (3/6) from the remaining shell.

Carefully separate the sensing cell (3/11) from the pcb. (3/6).

Remove the insulating plate (3/5) from the measurement cell.

Exchange the sensing cell.

#### Note

- Insert insulating plate (3/5) between printed circuit board and measurement cell.
- When installing a new sensing cell on the pcb. it is not required to maintain a particular polarity between the pins on the sensing cell and the mating connector.
- During assembly of the gauge head make sure that the holder (3/10) has been placed in the housing shell and that the temperature sensor is pressed against the sensing cell.

The gauge head is reassembled in the reverse order.



**Key to fig. 3**

- 1 One half of the housing  
with plastic catches
- 2 Plastic catch
- 3 Fixing screw
- 4 Contact spring
- 5 Insulating plate
- 6 Pcb. complete
- 7 One half of the housing  
with slots
- 8 Slots for opening  
the housing
- 9 Cap
- 10 Holder
- 11 Sensing cell

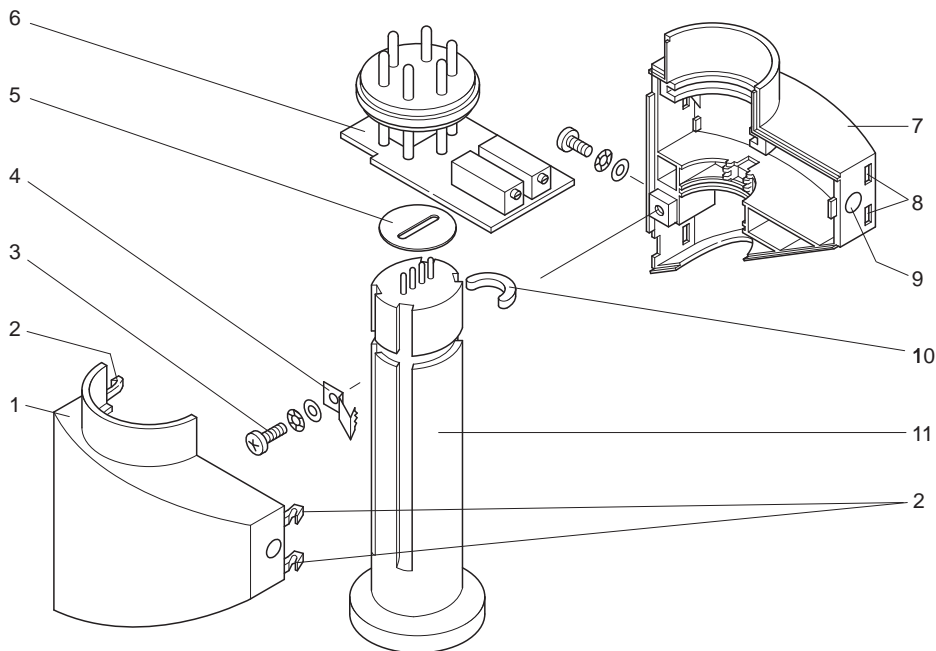


Fig. 3 Disassembled PSG050 / PSG051

### 3.2 Service at INFICON's

**Warning**

Contaminated products (e.g. radioactive, toxic, caustic or microbiological hazard) can be detrimental to health and environment.



Products returned to Inficon should preferably be free of harmful substances. Adhere to the forwarding regulations of all involved countries and forwarding companies and enclose a duly completed declaration of contamination (see Annex).

Products that are not clearly declared as „free of harmful substances“ are decontaminated at the expense of the customer.

Products not accompanied by a duly completed declaration of contamination are returned to the sender at his own expense.

## 4 Spare parts list

	Part Number
Sensor PSG050 (DN 16 KF)	350-980
Sensor PSG050 (1/8" NPT)	350-982
Sensor PSG051 (DN 16 KF)	350-981

## 5 Disposal

**Warning**

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.

**Warning**

Substance detrimental to the environment



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

Dispose of such substance in accordance with the relevant local regulations.

## **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 disposed of.

### **Other components**

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



# Declaration of Contamination

The service, repair, and/or disposal of vacuum equipment and components will only be carried out if a correctly completed declaration has been submitted. Non-completion will result in delay. This declaration may only be completed (in block letters) and signed by authorized and qualified staff.

**1 Description of product**

Type \_\_\_\_\_

Article Number \_\_\_\_\_

Serial Number \_\_\_\_\_

**2 Reason for return**

\_\_\_\_\_

\_\_\_\_\_

**3 Operating fluid(s) used (Must be drained before shipping.)**

\_\_\_\_\_

\_\_\_\_\_

**4 Process related contamination of product:**

toxic	no <input type="checkbox"/> 1)	yes <input type="checkbox"/>	
caustic	no <input type="checkbox"/> 1)	yes <input type="checkbox"/>	
biological hazard	no <input type="checkbox"/> 2)	yes <input type="checkbox"/> 2)	
explosive	no <input type="checkbox"/> 2)	yes <input type="checkbox"/> 2)	
radioactive	no <input type="checkbox"/> 2)	yes <input type="checkbox"/> 2)	
other harmful substances	no <input type="checkbox"/> 1)	yes <input type="checkbox"/>	

2) Products thus contaminated will not be accepted without written evidence of decontamination!

**5 Harmful substances, gases and/or by-products**

Please list all substances, gases, and by-products which the product may have come into contact with:

Trade/product name	Chemical name (or symbol)	Precautions associated with substance	Action if human contact

**6 Legally binding declaration:**

I/we hereby declare that the information on this form is complete and accurate and that I/we will assume any further costs that may arise. The contaminated product will be dispatched in accordance with the applicable regulations.

Organization/company \_\_\_\_\_

Address \_\_\_\_\_

Phone \_\_\_\_\_

Email \_\_\_\_\_

Name \_\_\_\_\_

Date and legally binding signature \_\_\_\_\_

Company stamp \_\_\_\_\_

The product is free of any substances which are damaging to health

yes



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