Datasheet AGP3000

Pirani vacuum gauge

- High precision vacuum measurement
- long-term stable and reliable performance
- installation simple and convenient
- rapid response to meet the control application
- TFT - LCD color screen display
- digital communication interface, and support the MODBUS RTU protocol
- 0 ~ 10 V analog signal output

Summary

AGP3000 is a Pirani vacuum gauge, belonging to the heat conduction Pirani resistance gauge. The product uses Wheatstone bridge, heat conduction characteristics of gas under different pressure and other principles to detect the size of the air pressure. The product comes with color screen display and key control, can provide analog voltage output. AGP3000 adopts MEMS sensor chip independently designed by our company, which gives greater space for optimization and improvement in function and performance. It has the characteristics of high precision, excellent stability and good repeatability.Before leaving the factory, the precision, repeatability, response time and other indicators of AGP3000 have been strictly calibrated.

Application

AGP3000 Pirani vacuum gauge based on the principle of thermal conductivity is suitable for low and medium vacuum degree measurement scenarios, such as vacuum baking, vacuum packaging, vacuum coating, vacuum heat treatment, vacuum brazing, vacuum coating, metal smelting, semiconductor equipment and other industries.

Figure 1. AGP3000 Pirani vacuum gauge physical picture

1. Appearance and Structure

Figure 2 shows the exterior structure of the AGP3000, including the LCD display and operation keys. The working interface includes test, calibration, and other functions. The three action keys from left to right represent the up or left, down or right, and OK keys, respectively.

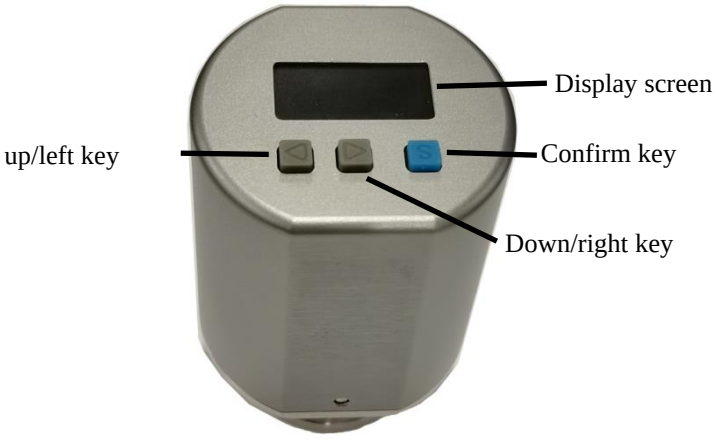


Figure 2. Structure diagram of AGP3000

2. Specifications and Dimensions

The main dimensions of AGP3000 are shown in Figure 3 below.

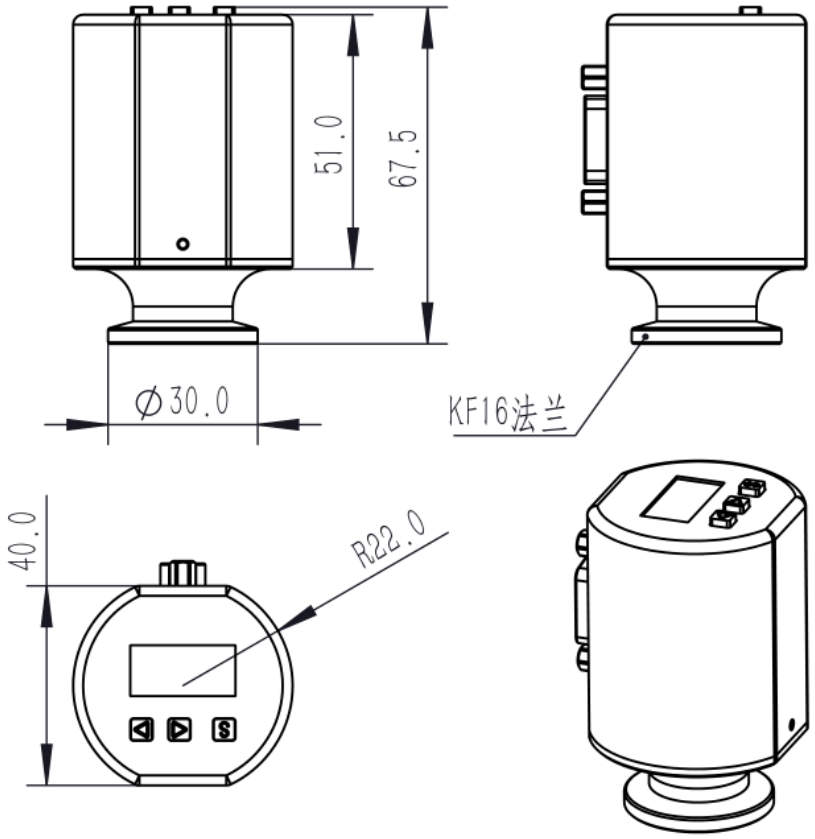


Figure 3. AGP3000 specification size (Unit: mm, tolerance: ±0.5mm)

3. Wiring and Interface

3.1 Wiring

Figure 4 shows the DB9 nine-hole female connector used by AGP3000 product, and the definition of part of the lead cable is shown in Table 1.

Figure 4. DB9 nine-hole female connector cable

Table 1 DB9 outgoing line definition

Parameter	Comment
Orange line	9~24V power supply positive pole
Green line	9~24V power supply negative pole
White line	Signal negative pole
Black line	Signal positive pole

3.2 Interface

AGP3000 suction port interface type is standard KF16 flange, its material is 304 stainless steel, the surface is electropolishing processing process, can realize the requirements of high vacuum seal, with convenient installation, easy disassembly, joint deformation and other characteristics, is widely used in low, and high vacuum system. Make sure to use KF16 flange interface when using this product.

4. Technical indicators and mechanical parameters

Table 2 Technical indicators and mechanical parameters of AGP3000

Parameter	Comment
Measuring range (N_2 and air)	5×10^{-5} ~1×10^{3} mbar
Accuracy (N_2)	5×10^{-4} ~ 1×10^{-3} mbar(The error is ±10% of the reading)
	1×10^{-3} ~ 100 mbar(The error is ±5% of the reading)
	100 ~1000 mbar(The error is ±25% of the reading)
Repeatability (N_2)	1×10^{-3} ~ 100 mbar(The error is ±2% of the reading)
Supply voltage	9~24VDC
Power consumption	1W
Barometric calibration range	1~1000 mbar

Parameter	Comment
Analog output	0.61 ~10 VDC，Log. 1.286 VDC/decimal
Case material	aluminum

Note：

(1) The accuracy and repeatability values are typical values measured at room temperature nitrogen atmosphere after zero adjustment.

(2) For a complete list of all materials exposed to treated gases, please contact ASAIR

5. Operation

5.1 Pressure Output

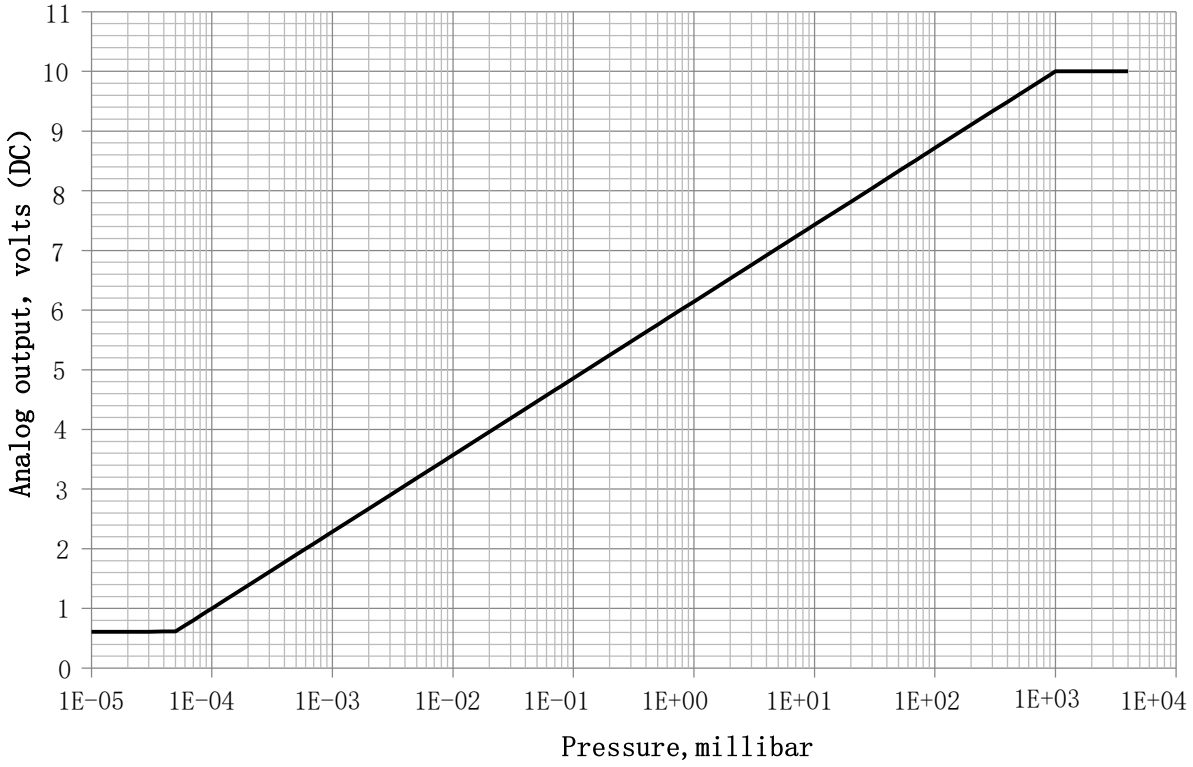
The AGP3000 provides a pressure measurement output as an analog voltage value. Please refer to Chapter 5.2 for details.

5.2 Analog Output

AGP3000 can provide voltage output, voltage output is a function of pressure, function relationship is shown in Table 3, output is 1.286 volts DC/decimal.

Conversion formula: $P_{mbar} = 10^{((V_{output}-6.143)/1.286)}$ $V_{output} = log\,10(P_{mbar}) \times 1.286 + 6.143$

Table 3 Relationship between analog voltage output and pressure function



6. Working interface and Interface operation

After powering on the AGP3000, as shown in Figure 5, the display displays this main screen, which displays the current pressure value and the analog voltage output value. Press the left or right button to enter the first level menu, including calibration, other and back three functions. Select one of the functions, and then enter the corresponding second-level menu, and so on. At most three-level menus exist. In addition, when entering the menu of other functions, you can activate the calibration mode by pressing the left or right button several times. After returning to the level-1 menu, you can re-enter the calibration menu for calibration. Table 4 shows the specific operation mode and corresponding function description.

Figure 5. AGP3000 working interface

Table 4 Summary of interface operations

Level-1 Menu	Level-2 Menu	Level-3 Menu	function
Calibrate	Calibration point 0.1Pa	Return	Returns the upper level
		Calibrate	The interface displays the analog signal voltage value under the current pressure when the calibration point is 0.1Pa. Calibration can be performed at the same time point. (Need to activate the calibration function)
	Calibration point 100kPa	Return	Returns the upper level
		Calibrate	The interface displays the calibration point of 100kPa and the analog signal voltage value under the current pressure. Calibration can be performed at the same time point. (Need to activate the calibration function)
	Return	/	Back to Level 1 menu
Other	Display parameters. Press left or right button several times to enter the calibration mode	/	After the calibration mode is enabled, DEBUG is displayed at the bottom of the screen
	Return	/	Press the OK key to return to the main screen
Return	/	/	Return to the Main page

7. Use

7.1 Compliant Usage

A vacuum gauge is used to measure air pressure.

The vacuum gauge should be used in a relatively clean environment.

The vacuum gauge shall be used by personnel with appropriate technical training and necessary experience, or a person designated by the end user of the product.

Ensure that all vacuum seal objects and surfaces are clean, non-destructive and free of particles.

Please use KF16 flange joint.

The vacuum gauge and its sensors are designed to be mounted in any mounting orientation without compromising accuracy, but it is not recommended that the gauge be mounted upside down as dust and dirt may fall into the sensor.

7.2 Non-compliant Usage

The vacuum gauge shall not be used for measurements other than those described in this manual.

Do not use vacuum gauges in dirty or corrosive environments

Do not use a vacuum gauge in the presence of flammable gases or other explosive environments.

Do not install the replaced parts or modify the instrument without permission.

The use of vacuum timing should not exceed the maximum allowable pressure.

Warning and personal injury

Do not apply this product to safety protection devices or emergency stop equipment, and any other applications that may cause personal injury due to the product's failure. Do not use this product unless there is a special purpose or use authorization. Refer to the product data sheet and application guide before installing, handling, using or maintaining the product. Failure to follow this recommendation may result in death and serious personal injury.

The Company will not bear any compensation for personal injury and death arising therefrom, and will exempt the company's managers and employees, affiliated agents, distributors and any other claims that may arise therefrom, including: various costs, claims, lawyer fees, etc.

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Guangzhou Aosong Electronic Co., Ltd. provides the following quality guarantee to the direct buyers of its products (from the date of delivery), based on the technical specifications in the data manual of the products published by Aosong as the standard. Within the warranty period, if the product is confirmed to be defective, the company will provide free repair or replacement.

Description of warranty period

Accessories category	Shelf life
AGP3000 Pirani Vacuum Gauge	12 months
Wire or accessories	6 months

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