Sapphire Capacitance Diaphragm Gauge | SPG5A/6A

The SPG5A/6A is a capacitance diaphragm vacuum gauge that uses a sapphire capacitance pressure sensor to achieve high accuracy and reliability, compact size, and light weight. Self-heating and nonself-heating models are available. The SPG5A/6A is especially suited for use in semiconductor manufacturing.

Specifcations

Pressure range	0-100 Pa, 0-200 Pa, 0-300 Pa, 0-1000 Pa, 0-2000 Pa, 0-3000 Pa, 0-10000 Pa, 0-20000 Pa, 0-100 kPa 0-133.32 Pa, 0-266.64 Pa, 0-399.96 Pa, 0-1333.2 Pa, 0-2666.4 Pa, 0-3999.6 Pa, 0-13332 Pa, 0-26664 Pa, 0-133.32 kPa				
Self-heating temperature	No self-heating/125/150/160/180/200 °C				
Accuracy	0.25% of rdg.: no self-heating or self-heating temperature under 160 °C 0.5% of rdg.: models with self-heating temperature of 160 °C or more				
Resolution	1/10000 FS				
Operating temperature range	SPG5A (standard model) Self-heating models: 10 to 45 °C (0.5 m/s min. cooling air is required at 35 °C or more) Nonself-heating models: 0 to 60 °C SPG6A (extra high-temperature model) 10 to 65 °C (when mounted vertically), 10 to 70 °C (when mounted horizontally) (0.5 m/s min. cooling air is required at 45 °C or more)				
Operating humidity range	10 to 90%RH (without condensation)				
Storage temperature and humidity range	-20 to +80 °C, 10 to 95%RH (without condensation)				
Response time	35 ms				
Gas-contacting materials	Sapphire, Inconel, SUS316L				
Internal capacity	4.6 cm^3: ½ inch gauge port connection 7 cm^3: 8 VCR connection 7 cm^3: NW16 connection 5 cm^3: IDF 2S ferrule connection				
Allowable pressure*1	200 kPa abs max.: Models with pressure range of 100 kPa or more 110 kPa abs max.: Models with pressure range of less than 100 kPa				
Marginal pressure*2	300 kPa abs max.				
Burst pressure*3	700 kPa abs max.				
Input power supply	Voltage range: ±15 Vdc ±10% (dual power supplies) or 24 Vdc ±10% (single power supply) Allowable ripple voltage: 0.5 V p-p max.				
Power consumption/power current*4*5	Self-heating temperature	Power consumption		Power current	
		During normal operation	During warm-up	With 15 Vdc supply	With 24 Vdc supply
	(Non-self-heating model)	3 W max.	3 W max.	0.12 A max.	0.14 A max.
	125 °C	10 W max.	14 W max.	0.6 A max.	0.7 A max.
	150 °C	12 W max.	16 W max.	0.6 A max.	0.8 A max.
	160 °C	13 W max.	17 W max.	0.7 A max.	0.8 A max.
	180 °C	15 W max.	19 W max.	0.8 A max.	0.9 A max.
	200 °C	16 W max.	23 W max.	0.9 A max.	1.1 A max.
Output signal	0 to 10 Vdc Allowable load resistance: 10 kΩ min. Measurement output range: -0.5 to +11 Vdc*6 Output during warm-up or abnormal status: Output depends on the measured pressure*7				
I/O connector	D-sub 15-pin connector (male), retaining screw #4-40UNC				
Mass	450 g: ½ inch gauge port connection 520 g: 8 VCR connection 470 g: NW16 connection 650 g: IDF 2S ferrule connection				
Warm-up time	30 min (nominal), 1 h max.				
Zero point adjustable range	±20% FS				
Coupling	½ inch gauge port, 8 VCR (female) equivalent, NW16, IDF2S ferrule				
Leak rate	1×10^{-10} Pa m^3/s or less				
Mounting angle	Unrestricted*8				
Allowable cable length	10 m max.				

*1. At the allowable pressure, the performance level of this unit can be maintained. However, if the SPG is repeatedly subjected to the allowable pressure, adjust the zero point periodically.
*2. At the marginal pressure, this unit will continue to function. If the SPG is subjected to the marginal pressure, readjust the zero point. If more accurate measurement is required, return the unit to Azbil Corporation for calibration. If the marginal pressure is exceeded, the proper operation of this unit can no longer be guaranteed. In this case, replace the unit with a new one.
*3. The burst pressure is the pressure at which this device will break. To avoid an accident, never apply pressure equaling or exceeding the burst pressure.
*4. Use an appropriate power supply with a rated current exceeding the max. power current value.
*5. PID control is used to regulate the temperature and keep the rate of current supplied to the heater as constant as possible. Additionally, the maximum power current is varied depending on the power voltage, so that power consumption remains constant even during warm-up, irrespective of the power voltage. (Self-heating models)
*6. Since a negative voltage is generated inside this unit, a negative voltage output is available even with only a single-output power supply.
*7. The conditions and voltage can be changed using the Smart Loader.
*8. This unit was calibrated at the factory in a vertical position. Shift of the zero point may have occurred, depending on the mounting angle. In such a case, accuracy can be recovered by adjusting the zero point after installation. Vertical installation is recommended to prevent contaminants from accumulating on the sensor unit.

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Model No. configuration

Ex.: SPG5AT11HD500500

Basic model No.	Type	Added function	Pressure range	Self-heating temperature	Coupling	Event 1 setting	Event 2 setting	Description
SPG								Sapphire capacitance diaphragm gauge
	5							Standard model
	6							Extra high-temperature model*1
		A						Event confguration model
			□□□					Refer to the table on the left
				R				Without self-heating function
				D				125 °C
				E				150 °C
				F				160 °C
				G				180 °C
				H				200 °C
					A			½ inch gauge port
					D			8 VCR (female) equivalent (SUS316L with electrolytic grinding)
					E			NW16
					J			IDF 2S ferrule
					P			½ inch gauge port, with traceability certifcate
					S			8 VCR (female) equivalent (SUS316L with electrolytic grinding), with traceability certifcate
					T			NW16, with traceability certifcate
					Y			IDF 2S ferrule, with traceability certifcate
						***		**.*% FS Always OFF if “NNN” is specifed.
							***	**.*% FS Always OFF if “NNN” is specifed.

*1. Available only for self-heating models.

Pressure code	FS pressure ranges (absolute pressure)		Pressure code	FS pressure ranges (absolute pressure)	
T10	133.32	Pa	P12	100	Pa
T20	266.64	Pa	P22	200	Pa
T30	399.96	Pa	P32	300	Pa
T11	1333.2	Pa	P13	1000	Pa
T21	2666.4	Pa	P23	2000	Pa
T31	3999.6	Pa	P33	3000	Pa
T12	13332	Pa	P14	10000	Pa
T22	26664	Pa	P24	20000	Pa
T13	133.32	kPa	P15	100	kPa

Note: For details about other pressure ranges, contact the Sales Dept. at Azbil Corporation.