azbil Specification

Digital Pressure Detectors
(Intelligent Pressure Sensor and Switch)
SPS 300A, B

■ Features

The SPS 300A, B are microprocessor-based high accuracy and high function digital pressure detectors. Liquid-filled dual diaphragm (SUS316L) and a semiconductor-based pressure detection elements are incorporated into the pressure detection unit. These detectors are used for gauge pressure measurement.

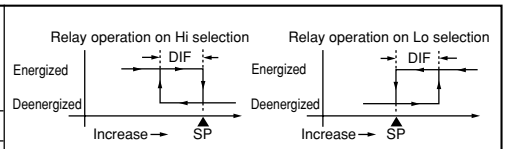
The SPS 300A is a pressure switch which offers two-stage relay contact (independent) outputs.

- High accuracy of ±0.25%FS and high speed response of 50ms (63% response).
- High reliability of more than one million pressure-cycle mechanical life.
- Rainproof structure.
- Key operation and high visibility large digital indication.
- Smart functions ensure applicability to a wide range of sites:
  ★ PV bias adjustable. ★ Adjustable indication figure

★ Adjustable filter constant ★ Peak hold
★ Keylock ★ Output scaling
★ Adjustable Hi-Lo relay action
★ Manual output setting possible

■ Specifications

Applicable fluids	Gas and liquid, except for corrosive fluid with pressure element (SUS316L)				**Fluid temperatures**	–20 to +60°C No freezing	
Pressure detection	**Structure of pressure receiving unit**	Barrier structure of oil-filled seal diaphragm			**Material of part which contacts liquids**	Diaphragm: SUS316L	
	Pressure detecting element	Piezo resistance type Silicon pressure detecting element				Pressure inlet: SUS316L	
Indication and setting	**Display**	Digital 4-digit 7-segment LEDs					
	Measuring range	See Table 1					
	Digit position change	To stop unstable display of digits during fine pressure fluctuation, the position of digits is shifted to the right so as not to display the least significant digit.					
	Input digital filter	0.00 to 99.99 sec. adjustable, first-order-lag filter system, filter off at 0.00					
	Response speed	Indication output	100ms	Input digital filter = 0.00 at 63% response			
		Current output	50ms				
		Relay contact output	50ms				
	Indication accuracy (Note 1)	Ambient temperature range / Pressure range	–20 to 0°C	0 to 50°c	50 to 60°C		
		Positive pressure range	±1%FS ± 1 digit	±0.25%FS ± 1 digit	±1%FS ± 1 digit		
		Negative pressure range	±2%FS ± 1 digit	±1%FS ± 1 digit	±2%FS ± 1 digit		
		Note 1: This indication accuracy is the total of the accuracy influenced by linearity, offset, hysterisis, etc. including those characteristics changed by power supply voltage fluctuations.					
Output	**Product name**	Intelligent pressure sensor			Intelligent pressure switch		
	Basic model No.	**SPS 300A**			**SPS 300B**		
	Output type	Current + relay contact (SPDT)			Relay contact (SPDT) + relay contact (SPDT)		
	Output rating	Current	Current value	4 to 20mA, external load resistance 300Ω max.	Relay contact	SP1	250Vac 3A, Resistive load (Note 2)
			Scaling	Adjustable scaling setting is possible.	Relay contact	SP2	250Vac 3A, Resistive load (Note 2)
			Manual	Manual setting of current output is possible.	Note 2: Mechanical life: 50,000,000 cycles Electrical life: 100,000 cycles		
		Relay contact	SP1	250Vac 3A Resistive load (Note 2)			

Output	**Relay operation**	Hi	Deenergized on pressure raise, energized on pressure drop	Can be switched	
		Lo	Energized on pressure raise, deenergized on pressure drop		
	Differential	0 to 100%FS adjustable			
	Output/renewal cycle	25ms			
	Output accuracy (Note 3)	Ambient temperature range / Pressure range	–20 to 0°C	0 to 50°c	50 to 60°C
		Positive pressure range	±1%FS	±0.25%FS	±1%FS
		Negative pressure range	±2%FS	±1%FS	±2%FS
		Note 3: This indication accuracy is the total of the accuracy influenced by linearity, offset hysterisis, etc. including those characteristics change by power supply voltage fluctuations.			
Other functions	**Bias for measured value**	0 to 100%FS adjustable			
	Adjustment of measured value	Zero point and span adjustable for measured value			
	Peak hold	The highest pressure value applied in the past has been memorized and so can be confirmed by display. It is cleared when the power is turned off. The peak old function is not effective for approximately the initial 20 seconds after power is turned on.			
	Keylock	Used to protect the stored setpoint against change by incorrect operation or any other conditions. Contents for DISP or PARA mode can be displayed.			
	Self-diagnostics	Checksum is made between the user's and back-up setpoints, also between the manufacturer's and back-up setpoints. An alarm is output when an abnormal condition is discovered.			
	Alarm	Alarm code is displayed at overscale (above the value of table 1) or at abnormal fluid temperature (above +80°C or under –20°C)			
General specifications	**Breakage pressure**	3 times the maximum pressure of range but 1.5 times for the ranges of 0 to 300kPa, 0 to 3500kPa, –100 to +3500kPa, 0 to 3.5MPa, –0.1 to +3.5MPa, 0 to 3 bar, 0 to 35 bar and –1 to +35 bar.			
	Allowable pressure	1.1 times the maximum pressure of range but 1.0 times for the ranges of 0 to 300kPa, 0 to 3500kPa, –100 to +3500kPa, 0 to 3.5MPa, –0.1 to +3.5MPa, 0 to 3 bar, 0 to 35 bar and –1 to +35 bar.			
	Rated power supply voltage	100/200Vac 50 to 60Hz or 120/240Vac 50 to 60Hz			
	Allowable power supply voltage	100/200Vac: 82 to 110 / 164 to 220V 120/240Vac: 99 to 132 / 198 to 264V			
	Power consumption	7W max. at max. load and relay on or 20mA output			
	Insulation resistance	More than 50MΩ between primary power supply terminals and case, and also between primary and secondary power supply terminals by 500Vdc megger.			
	Dielectric strength	1 minute at 1500Vac or 1 second at 1800Vac between primary power supply terminals and case, and also between primary and secondary power supply terminals.			
		Note: A wall-mount model incorporates a lightning surge arrestor for the power supply. Current flows when voltage above 1000V is applied between the power supply terminals and case. Remove the dielectric strength test pin provided on the power supply board before the dielectric strength test is made. Return it to the original position after the test.			
	Lightning protection	Wall mount model: With a built-in lightning surge arrestor (10KV between power supply terminals, 6KV between power supply terminals and case).			
		Panel mount model: Without lightning arrestor			
	Ambient temperature	–20 to +60°C No freezing			
	Storage temperature	–20 to +80°C No freezing			
	Humidity	40°C, 90%RH max. (non-condensing)			
	Vibration resistance	4.9m/s^2 max. 0 to 60Hz, 2 hours each to each direction of X, Y, Z			
	Shock resistance	490m/s^2 max. 3 times 2 hours each to each direction of X, Y, Z			
	Construction	Case and cover: aluminium die-cast, door, window and nameplate: polycarbonate			
	Pressure inlet	Rc1/4 Note: When the fluid temperature is above 60°C, use a siphon to decrease the temperature below 60°C			
	Rating	JIS C 0920 class 3 rainproof (wall-mount type)			
	Body color	Case: gray Cover, window and nameplate: dark gray Door: gray semi-transparent			
	Weight	Approx. 1.1kg			
	Mounting position	Vertical			
	Installation status	Permanent connection type equipment			
	Installation category	Category II (IEC60364-4-443, IEC60664-1)			
	Pollution degree	Pollution degree 2			
	Applicable standard	EN61010-1, EN61326			
	Installation	Wall mount or panel mount			
	Standard accessories	Wall mount fittings (with pressure range indication label, M4 screws 4 pcs) Part No. **81446092-001** 1 set			
		Panel mount fittings (with pressure range indication label) Part No. **81446093-001** 1 set			
	Auxiliary parts (separate order)	Siphon Part No. **J-14026**			
		Cover packing replacement Part No. **81403871-001**			

Caution: Confirm the spec. carefully and use properly.

Table 1 Measuring range - Unit

kPa		bar		MPa	
Measuring range	Indication and setting range	Measuring range	Indication and setting range	Measuring range	Indication and setting range
0 to 100	−10.0 to +110.0	0 to 1	−0.100 to +1.100	—	—
0 to 200	−20.0 to +220.0	0 to 2	−0.200 to +2.200	—	—
0 to 500	−50.0 to +550.0	0 to 5	−0.500 to +5.500	—	—
0 to 1000	−100 to +1100	0 to 10	−1.00 to +11.00	0 to 1	−0.100 to +1.100
0 to 2000	−120 to +2200	0 to 20	−1.20 to +22.00	0 to 2	−0.120 to +2.200
0 to 3500	−120 to +3850	0 to 35	−1.20 to +38.50	0 to 3.5	−0.120 to +3.850
−100 to +100	−120.0 to +110.0	−1 to +1	−1.200 to +1.100	—	—
−100 to +1000	−120 to +1100	−1 to +10	−1.20 to +11.00	−0.1 to +1	−0.120 to +1.100
20 to 100	−10.0 to +110.0	0.2 to 1	−0.100 to +1.100	—	—
0 to 300	−30.0 to +330.0	0 to 3	−0.300 to +3.300	—	—
−100 to +2000	−120 to +2200	−1 to +20	−1.20 to +22.00	−0.1 to +2	−0.120 to +2.200
−100 to +3500	−120 to +3850	−1 to +35	−1.20 to +38.50	−0.1 to +3.5	−0.120 to +3.850

■ Model Selection Guide

I II III IV V

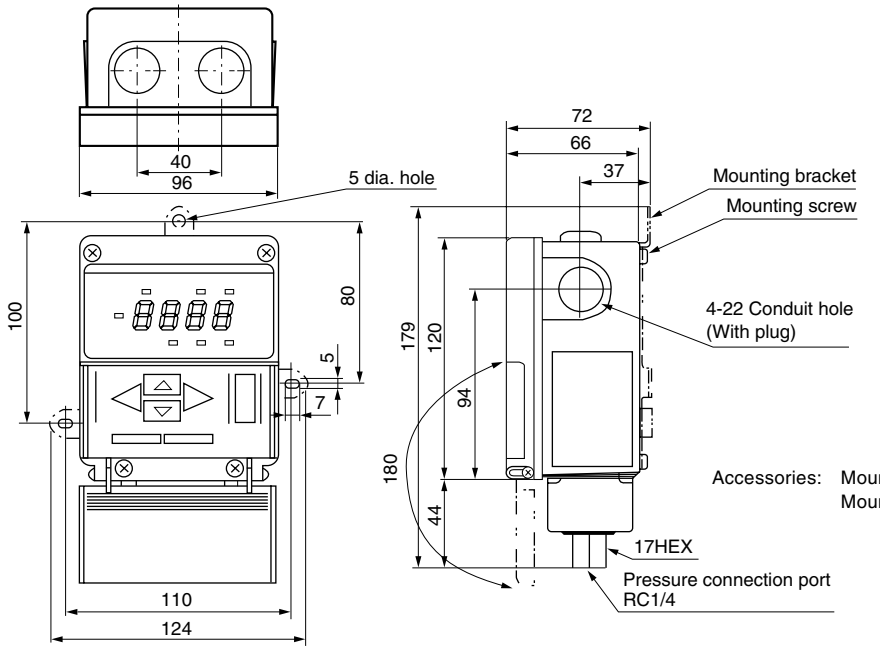
Example: SPS300A200A110

No.	Item	Code					Description
I	Basic Model No.	**SPS300A**					Intelligent Pressure Sensor
		SPS300B					Intelligent Pressure Switch
II	Range	Code	kPa	Code	bar	Code	MPa
		200	0 to 100	**800**	0 to 1	—	—
		201	0 to 200	**801**	0 to 2	—	—
		202	0 to 500	**802**	0 to 5	—	—
		203	0 to 1000	**803**	0 to 10	**903**	0 to 1
		204	0 to 2000	**804**	0 to 20	**904**	0 to 2
		205	0 to 3500	**805**	0 to 35	**905**	0 to 3.5
		206	−100 to +100	**806**	−1 to +1	—	—
		207	−100 to +1000	**807**	−1 to +10	**907**	−0.1 to +1
		208	20 to 100	**808**	0.2 to 1	—	—
		209	0 to 300	**809**	0 to 3	—	—
		210	−100 to +2000	**810**	−1 to +20	**910**	−0.1 to +2
		211	−100 to +3500	**811**	−1 to +35	**911**	−0.1 to +3.5
III	Mounting Method	**A**					Wall-mount
		B					Panel-mount
IV	Power supply	**1**					100/200Vac 50 to 60Hz
		2					120/240Vac 50 to 60Hz
V	Option	**10**					None
		1D					With data sheet
		1T					With tropicalization treatment
		1B					With data sheet and tropicalization treatment

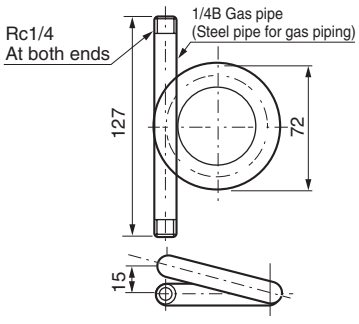
■ Dimensions

(Unit: mm)

SPS300$^{A}_{B}$□□□ A: Wall mount type



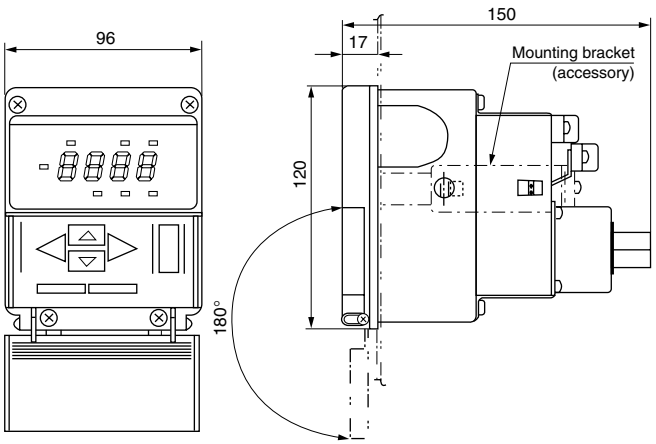
Siphon Part No. J-14026



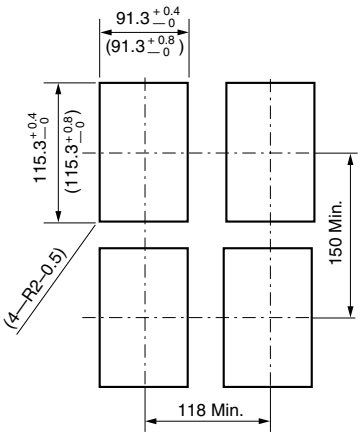
Accessories: Mounting bracket 1pc
Mounting screws (M4) 4pcs

(Unit: mm)

SPS300$_{B}^{A}$□□□ B: Panel mount model



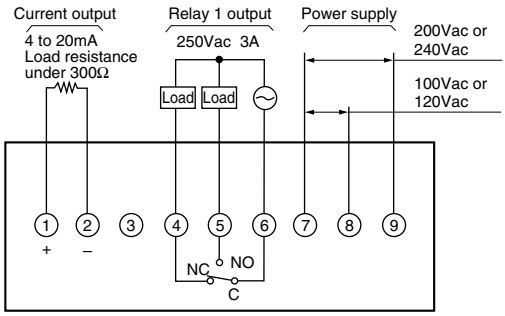
Panel Cutout



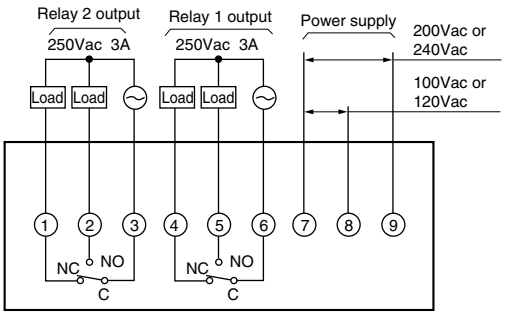
Note: ( ) shows the size wen dimensional tolerance of the cutout hole is $^{+0.8}_{-0}$.

■ Wiring

SPS 300A



SPS 300B



Precautions on Use

1. Confirm the SPS 300A/B specifications and its usage conforming to safety requirements.
2. The SPS 300A/B must be mounted vertically. Different mounting orientation might cause measurement errors.
3. SPS 300A/B must be secured firmly onto the wall or panel to avoid problems caused by vibration.
4. When the SPS 300A/B is used for non-compressible liquids such as water or oils, ensure caution while opening or closing the valves in order to avoid sensor damage caused by sudden pressure surges.
5. While mounting the pipe, grip the hexagonal nut of the pressure connection port and tighten it firmly to avoid leakage. Holding the case while tightening might cause damage.
6. After wiring, ensure that the power cable and the output signal cables are routed through different conduits.
7. If rain-proofing is required, seal the conduit hole with a water proof conduit.
8. To ensure rain-proofing, tighten the front cover firmly after wiring.
9. After turning ON the power supply of the system, wait for 10 minutes for the system to stabilize.

Please read the "Terms and Conditions" from the following URL before ordering or use:

http://www.yamatake.com/products/bi/order.html

Specifications are subject to change without notice.

Yamatake Corporation

Advanced Automation Company

1-12-2 Kawana, Fujisawa
Kanagawa 251-8522 Japan
URL:http://www.azbil.com

1st Edition: Issued in May 1994
4th Edition: Issued in Feb. 2010