

SIER ELECTRONICS CO., LTD

SPT3051S Smart Pressure Transmitter

Features

- Utilizes reliable silicon or capacitive sensors
- Stable, reliable, shock-resistant, with good interchangeability
- Powerful interface operation functions
- Optional signal output
- Adjustable zero and full scale
- LCD display
- Multiple installation options available



Applications

- Oil and gas industry
- Chemical industry
- Pharmaceutical industry
- Water treatment industry
- Food and beverage industry
- Laboratory and scientific research
- Power industry
- Metallurgical industry

Introduction

The SPT3051S Smart Pressure Transmitter is a multifunctional digital instrument designed with advanced, mature, and reliable silicon or capacitive sensor technology, combined with cutting-edge micro-controller technology and sensor digital conversion technology. The core component, the micro-controller, ensures the transmitter's superior quality with its powerful functionality and high-speed operation capabilities. The overall design framework emphasizes reliability, stability, high precision, and intelligence.

The transmitter features a powerful interface operation function. The digital instrument can display pressure, percentage, and current, as well as provide a 0~100% analog indication. Key operations allow for easy setup of basic parameters such as zero migration, range setting, and damping setting without the need for a standard pressure source, greatly facilitating on-site debugging. Integrated application-specific integrated circuits (ASICs) are used in signal conversion, signal acquisition, and current output control, ensuring the transmitter's stability, reliability, shock resistance, and good interchangeability.

Specifications

GP Accuracy	$\pm 0.075\%$ FS $\pm 0.1\%$ FS $\pm 0.25\%$ FS upper limit of range
AP Accuracy	$\pm 0.1\%$ FS $\pm 0.25\%$ FS upper limit of range
GP Range	-1...0~0.001...400 bar

SPT21WSP-C Level Transmitter Datasheet

AP Range	0...0.3~30bar
Long-term Stability	$\leq \pm 0.2\% \text{FS/year}$
Installation Position Effect	Can be installed in any position, with a maximum deviation of 1000bar, adjustable via zeroing function
Vibration Effect	Tested according to GB/T18271.3/IEC61298-3, $< 0.1\% \text{SPAN}$
Output Signal	4mA~20mA DC + HART
Protection Level	IP67

Accuracy

Based on standard and test reference conditions, including linearity (BFSL), hysteresis, and repeatability.

Calibration temperature: $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$, based on zero calibration.

GP	TD ≤ 5	$\pm 0.1\%$	0.4 bar, 2.5 bar
		$\pm 0.075\%$	10 bar, 30 bar, 100 bar, 400 bar
	TD > 5	$\pm (0.025+0.015\text{TD}) \%$	0.4 bar, 2.5 bar
		$\pm (0.0025+0.0145\text{TD}) \%$	10bar,30bar,100bar,400bar
AP	TD ≤ 5	$\pm 0.2\%$	0.4 bar, 2.5 bar
		$\pm 0.1\%$	10 bar, 100 bar
	TD > 5	$\pm (0.025+0.035\text{TD}) \%$	0.4 bar, 2.5 bar
		$\pm (0.025+0.015\text{TD}) \%$	10 bar, 100 bar

Note:TD (Turn down) refers to the range ratio, TD=Maximum range / Current range, where Maximum range = URL (Upper Range Limit, same as factory calibration range), and Current range = SPAN (equivalent to |URV - LRV|).

Environmental Temperature Impact

Product Type	Impact	Range
GP	$\pm (0.075+0.0375\text{TD}) \%$ 10°C of SPAN	0.4 bar, 2.5 bar, 10 bar, 30 bar, 100 bar, 400 bar
AP	$\pm (0.125+0.075\text{TD}) \%$ 10°C of SPAN	0.4bar
	$\pm (0.115+0.065\text{TD}) \%$ 10°C of SPAN	2.5 bar, 10 bar,100 bar

Electromagnetic Compatibility Impact

Item	Test Item	Standard	Test Condition	Performance Level
1	Radiated Emission (housing)	GB/T 9254.1/CISPR 32	30MHz~1000MHz	Pass
2	Conducted Emission (DC Power Port)	GB/T 9254.1/CISPR 32	0.15MHz~30MHz	Pass
3	Electrostatic Discharge (ESD) Immunity	GB/T 17626.2/IEC61000-4-2	8kV(contact), 8kV(air)	A
4	Radiated RF Electromagnetic Field Immunity	GB/T 17626.3/IEC61000-4-3	10V/m (80MHz~1GHz)	A

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5	Power Frequency Magnetic Field Immunity	GB/T 17626.8/IEC61000-4-8	30A/m	A
6	Electrical Fast Transient/Burst Immunity	GB/T 17626.4/IEC61000-4-4	4kV(5/50ns,100kHz)	A
7	Surge Immunity	GB/T 17626.5/IEC61000-4-5	1kV(Line to Line) 2kV(Line to Ground) (1.2/50μs)	A
8	Conducted RF Immunity	GB/T 17626.6/IEC61000-4-6	3V(150kHz~80MHz)	A

Note: Performance level A indicates normal performance within technical limits.

Range

Product Type	Nominal Range	Min.Range	Lower Range Limit (LRL)	Upper Range Limit (URL)	Overload
GP	0.4bar	0.02bar	-0.4bar	0.4bar	10bar
	2.5bar	0.125bar	-1bar	2.5bar	40bar
	10bar	0.5bar	-1bar	10bar	60bar
	30bar	1.5bar	-1bar	30bar	150bar
	100bar	5bar	-1bar	100bar	200bar
	400bar	50bar	-1bar	400bar	800bar
AP	0.4bar	0.2bar	0bar	0.4bar	10bar
	2.5bar	0.5bar	0bar	250kPa2.5bar	40bar
	10bar	2bar	0bar	10bar	60bar
	100bar	10bar	0bar	100bar	200bar

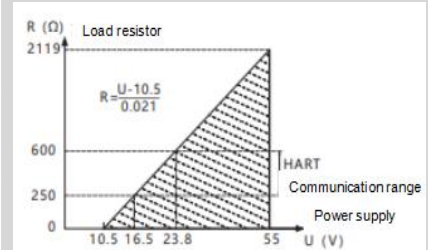
Set high and low limit requirements: The low range value (LRV) and high range value (URV) should be selected within the upper and lower limits of the range. When $|URV| \geq |LRV|$, it must satisfy $|URV| \geq$ the minimum range; when $|URV| \leq |LRV|$, it must satisfy $|LRV| \geq$ the minimum range. It is recommended to choose a range with the lowest possible range ratio.

Environmental Conditions

Item	Condition	
Operating Temperature Range	40℃ ~85℃ , LCD display: -20℃ ~70℃ , Low-Temperature LCD Display: -40℃ ~60℃	
Storage Temperature Range	-40℃ ~100℃ , LCD display: -40℃ ~85℃	
Medium Temperature Range	Filled with Silicone Oil: -40℃ ~105℃	
	Inert Filling Liquid: -45℃ ~85℃	
Operating Humidity Range	5%RH~100%RH@40℃	
Hazardous Locations	PCEC	Ex db IIC T6 Gb Ex ia IIC T4 Ga

Power and Load Conditions

Item	Operating Condition
Power Supply Voltage	HART Communication Protocol: 16.5V-55VDC
	Intrinsically Safe HART Communication
Load Resistance	0Ω~2119Ω for operation, 250Ω~600Ω for HART communication
Transmission Distance	< 1000m
Power Consumption	
4mA-20mA	≤ 500mW@24V DC, 20.8mA



Note:① HART communication protocol power supply voltage is optional at 10.5V.

Time Indicators

Total Damping Time Constant: Sum of electronic circuit damping time and sensor diaphragm damping time.

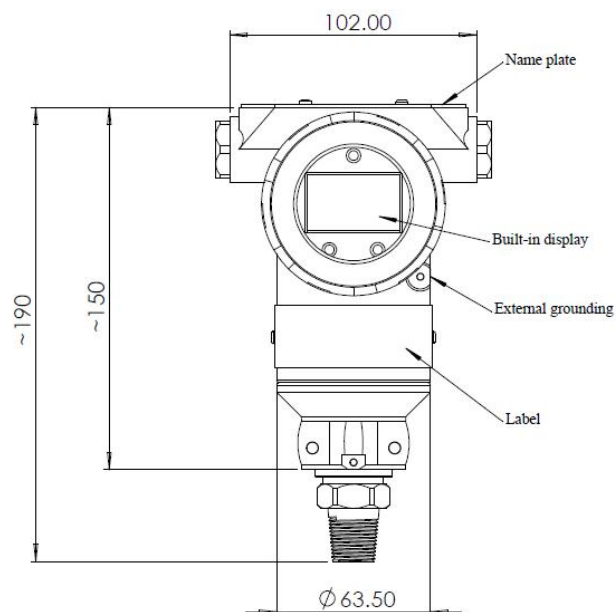
Electronic circuit damping time: 0s~100s adjustable.

Sensor Diaphragm (Sensor Isolation Diaphragm and Silicone Oil Filling) Damping Time: ≤ 0.2s

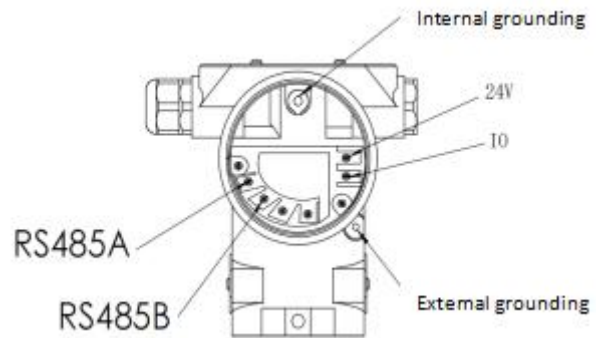
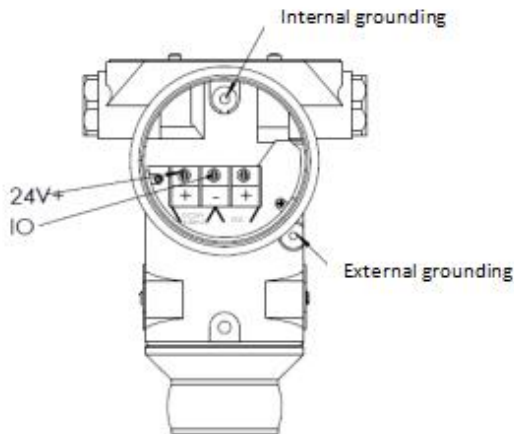
Power-On Start Time After Power Off: ≤ 6s

Factory Reset Time: ≤ 31s

Outline Dimension (unit: mm)



Electrical Connection



Ordering Guide

SPT3051S		Smart Pressure Transmitter		
		Code	Output	
		H	4mA ~ 20mADC with HART	
		N	4mA ~ 20mADC analog output	
		Code	Pressure range	
		Gauge		
		B	-600mm~0mm...60mm~600 mm H ₂ O/-60mbar~ 0mbar...6mbar~60mbar	
		C	-4000mm~0mm...200mm~4000 mm H ₂ O/-400mbar 0mbar...20mbar~400mbar	
		D	-25m~0m...0.25m~25 m H ₂ O/-2500mbar~0mbar...25mbar~2500mbar	
		F	-300kPa~0m...3m~300 mH ₂ O/-30bar~0bar...0.3bar~30bar	
		G	-1bar~0bar...1bar~100bar	
		H	-1bar~0bar...2.1bar~210bar	
		I	-1bar~0bar...4bar~400bar	
		J	-1bar~0bar...6bar~600bar	
		K	-1bar~0bar...8bar~800bar	
		L	-1bar~0bar...10bar~1000bar	
		Absolute		
		M	0mm...200mm~4000mm H ₂ O/0mbar...20mbar~400mbar	
		O	0mbar...25mbar~2500mbar	
		P	0bar...0.3bar~30bar	
		Code	Diaphragm material	Filling
		A	Stainless steel316L	silicone oil
		C	Hastelloy C	silicone oil
		X	Special material to be mentioned in order	
		Code	Process connection	
		C1	M20x1.5 male	

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C3	G1/2 male		
C5	1/4 NPT male		
C6	1/2 NPT male		
C16	Vacuum connector DIN 28403 KF16 / ISO 2861 ^[1]		
C22	1/2 NPT female		
CX	Other thread		
	Code	Process connection parts	
	N	None	
	O	No oil processing (For oxygen measurement: fluorocarbon oil filling, viton sealing ring)	
	Code	Mounting bracket	
	N	None	
	1	Stainless steel	
	2	Galvanized Carbon Steel	
	Code	Display	
	N	No display	
	1	LCD	
	2	LCD with back-light	
	Code	Others	
	N	None	
	A	Intrinsic safe	
	D	Exd	
	E	Exd version with Explosion-proof cable joint	
Code	Accuracy		
A	±0.075%FS		
B	±0.1%FS		
C	±0.25%FS		

SPT3051S	H	L	A	C1	N	N	1	N	A	The whole spec
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Contact

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