SMT3151TGP/TAP Direct Mount Pressure / Absolute Pressure Transmitter (T Type)

Description

Pressure (gauge)/absolute pressure transmitter is a pressure signal measured at the reference end of atmospheric pressure (or vacuum) with only one port connected to the process pipe.

Its working principle is that when the silicon monocrystalline material is subjected to the action of external force to produce extremely small strain, the electronic energy level state of its internal atomic structure will change, resulting in the drastic change of its resistivity. This physical effect is called piezoresistive effect. Based on piezoresistive effect principle, an integrated process technology is adopted to make strain resistance along the characteristic crystal direction of monocrystalline silicon wafer after doping and diffusion, forming the Wheatstone bridge, and then a diffused silicon sensor integrating force sensitivity and force-electricity conversion detection is made.

When the pressure directly or indirectly ACTS on the surface of the silicon wafer and causes the diaphragm to produce tiny deformation, the high-precision circuit measuring the deformation of the silicon wafer transforms the tiny deformation into a voltage signal proportional to the pressure. After temperature and pressure compensation, this voltage signal is converted into industrial standard 4-20ma current signal or 1-5v voltage signal using a dedicated chip.

Since the measuring diaphragm detecting circuit uses an integrated circuit and contains a linear and temperature compensating circuit internally, high precision and high stability can be achieved, and it is convenient for use in various complicated industrial environments.

Technical Performance

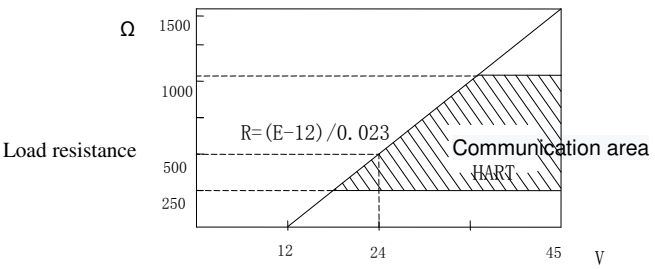
Use object: liquid, gas or steam

Measuring range: see the selection specification table

Output signal: 4-20mA dc. Output, superimposed HART protocol digital signal (two-wire system)

Power source: external power supply 24V dc. Power supply range 12V ~ 45V

Load characteristics:



The power supply voltage

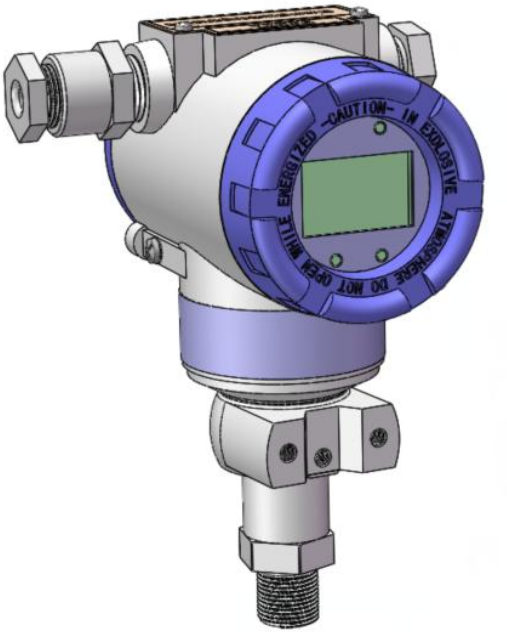
Installation in dangerous places:

Flameproof ExdIIBT5Gb;(explosion-proof certificate no. :CE16.1163)

Intrinsically safe ExiaIICT4/T5/T6Ga;

（explosion-proof certificate no. : CE15.2354X）；

Migration features:



At the minimum range (the range compression ratio is 40:1), the maximum positive transfer zero point is 39/40 times the upper limit of the range, the maximum negative transfer zero point can be the lower limit of the range, the absolute pressure transmitter has no negative transfer.(regardless of the output form, the upper and lower limits of the range shall not exceed the limit of the range after positive and negative migration)

Temperature range:

Electronic circuit board work in: - 40 ~ 85 ℃;

Sensitive components work in :- 40 ~ 85 ℃;

Storage temperature :- 40 ~ 85 ℃;

With digital display: - 25 ~ 75 ℃ (run);

- 40 ~ 85 ℃ (no damage);

Relative humidity: 0 ~ 95%

Overpressure limit: 2~5 times the maximum range of pressure transmitter is not damaged.

Volume change: less than 0.16cm3

Damping: the time constant is adjustable from 0.1 to 32.0s.

Startup time: 3s, no preheating required.

Technical Index

(Unmigration, 316 stainless steel isolation diaphragm and other standard test conditions.)

Accuracy: ±0.1%, ±0.075%

Stability: ±0.2%/12 months of the maximum range

Temperature effect：including zero and range for maximum temperature error of ±0.2% / 20 ℃

Power supply impact: less than 0.005% / V of the output range.

Vibration effect: in any axial direction, the frequency is 200Hz, and the error is ±0.05% / g of the maximum range.

Load effect: as long as the input transmitter voltage is higher than 12V, there is no load effect in the load working area.

Influence of installation location: zero error of no more than 0.10kpa can be generated at the maximum, which can be eliminated by correction without any impact on the range; The measuring body has no influence on relative flange rotation.

Application and type selection：

Common pressure transmitter is the most commonly used test instrument in industrial process control. It is widely used in various automatic control systems, such as aerospace, military, petrochemical, chemical, oil Wells, electric power, ships, building materials, pipelines and many other industries. Generally used in liquid, gas or steam pressure or absolute pressure measurement, medium temperature is not too high, corrosion is not strong, viscosity is not high, not easy to crystallize and other environments

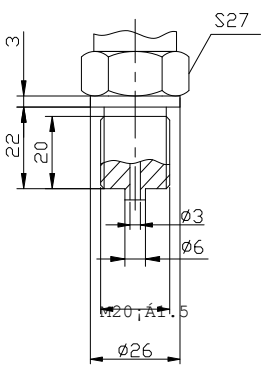
Attention to type selection:

Before selecting the type, the user shall

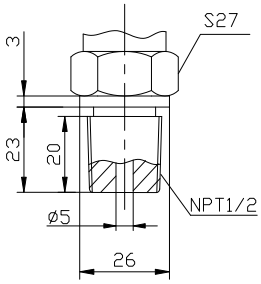
make clear the temperature, corrosion, measuring range, whether the measured medium is explosion-proof, whether the oil shall be forbidden, whether the medium is easy to crystallize or viscous, and whether the diaphragm flange connection is needed.

SM3151TGP/TAP Direct Mount Pressure / Absolute Pressure Transmitter Interface Thread Specifications

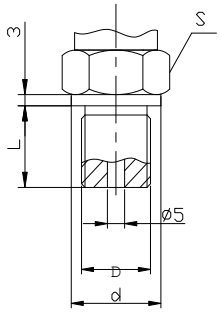
Common form pressure interface



M20×1.5
Corresponding
model L4



1/2NPT-14
Corresponding
model L5

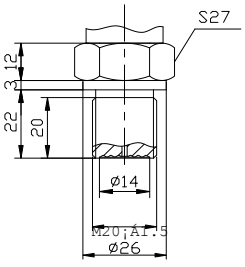


Pipe thread

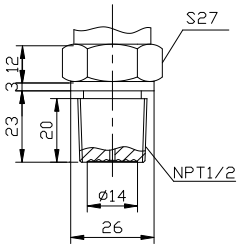
Corresponding models L7, L8 and L9

No. \ Size	D	d	S	L
1	G1/2	ø26	S27	According To the actual situation
2	G3/4	ø28	S34	
3	G1	ø35	S41	

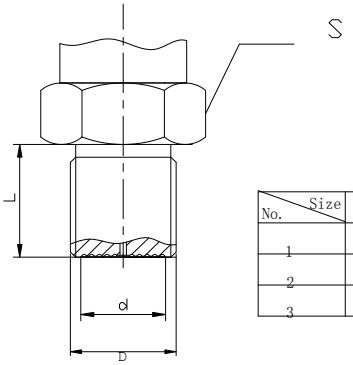
Flush membrane pressure connection interface



M20×1.5
Corresponding
model M4



1/2NPT-14
Corresponding
model M5



Pipe thread

Corresponding models M7, M8 and M9

No. \ Size	D	d	S	L
1	G1/2	ø14	S27	According To the actual situation
2	G3/4	ø20	S34	
3	G1	ø27	S41	

SM3151TGP/TAP Pressure/absolute pressure transmitter selection specifications table

Model	Transmitter type		
SM3151TGP SM3151TAP	Pressure transmitter Absolute pressure transmitter		
Code	Scale range		
1 2 3 4 5 6 7 8 9	0-3.5～35kPa 0-10～100kPa 0-35～350kPa 0-0.1～1.0MPa 0-0.35～3.5MPa 0-1.0～10MPa 0-2.1～21MPa 0- 4.1～41Mpa 0- 6.0～60MPa		
Code	Output form		
E	Linear output 4-20mAdc		
SF	Linear output 4-20mAdc+HART signal，Full function buttons on site		
F	MODBUS-485 signal		
代号	结构材料		
	Pressure connector	Isolation diaphragm	Filling liquid
22	316 Stainless steel	316 Stainless steel	Silicone oil
23	316 Stainless steel	Hastelloy C	Silicone oil
24	316 Stainless steel	Monel	Silicone oil
25	316 Stainless steel	Tantalum	Silicone oil
26	316 Stainless steel	Titanium	Silicone oil
27	316 Stainless steel	Ceramic	Dry
Code	Shell material	Conduit inlet dimensions	
A	Low copper aluminum alloy polyurethane coating	M20×1.5	
B	Low copper aluminum alloy polyurethane coating	1/2-14 NPT	
C	Stainless steel	M20×1.5	
D	Stainless steel	1/2-14 NPT	
Code	Pressure connection		
L4	M20×1.5 External thread	M4	M20×1.5 external thread flushing film

L5	1/2NPT-14 External thread	M5	1/2NPT-14 external thread flushing film
L6	1/2NPT-14 Internal thread	M6	1/2NPT-14 internal thread flushing film
L7	G1/2’’External thread	M7	G1/2’’External thread flushing film
L8	G3/4’’External thread	M8	G3/4’’ External thread flushing film
L9	G1’’External thread	M9	G1’’ External thread flushing film
LX	Other types of threads	MX	Other models of thread flushing film

Code	Optional parts
M4	LCD multi - power digital display head
B4	Pipe bending bracket
B5	Plate bending bracket
C02	M20 x 1.5 nut and Φ 14 pressure short tube
C12	1/2NPT-14 external thread and Φ14 pressure short tube
C22	1/4NPT-18 external thread and Φ14 pressure short tube
C32	1/4NPT-18 to M20×1.5 external thread
C42	1/2NPT-14 to M20×1.5 external thread
C43	1/2NPT-14 to 1/4NPT-18 internal thread
C44	1/2NPT-14 to 1/2NPT-14 external thread
C45	1/2NPT-14 to G1/2 external thread
X1	Oil ban
Da	Flameproof ExdIIBT5Gb;(explosion-proof certificate no. : CE16.1163)
Fa	Intrinsically safe ExiaIICT4 / T5 / T6Ga;(explosion-proof certificate no. : CE15.2354X)

Selection example：3151TGP4SF22AL2M4X1　　0～1000kPa