

SH316 PRESSURE TRANSMITTERS**MANUAL BOOK****General Information**

SH 316 series Diffusive silicon pressure transmitters choose imported qualified silicon pressure sensor components , and employ dedicated integration module , through fine temperature shift, zero and non-linearity compensation to realize accurate measurement of liquid, gas and steam.

Features

- Employing hi-quality sensor and exclusive V/I integrated circuit, little peripheral device, high reliability, simple and easy maintenance.
- Little volume, slight weight, convenient installation and debugging
- We provide common type, corrosion-proof, intrinsically safe explosion-proof type and isolation explosion-proof type
- Aluminum die casting outer shell, tri-terminal isolation, hi-temperature baking lacquer protective cover, firm and durable
- 4~20mA DC two-wire system, strong interference-resistant ability, long transmitting distance
- Digital display avaib
- Can be applied to measure viscous, crystallized and corrosive mediums

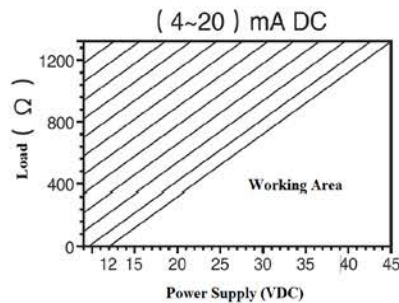
Technical Specification

Table1

Pressure Type	Gauge pressure(G),Absolute Pressure(A),Seal Pressure (S),Negative Pressure (N)
Compensation Temp.	(-10~70) °C
Working Temperature	(-20~85) °C , the medium should not be solidified.

Upper limit	Over Load	Stability
< 50Kpa	(2~5) times	< 0.5% FS/year
≥50Kpa	(1.5~3)times	< 0.2% FS/year

Load



1. Load is related to power supply, please refer to left figure, load impedance $R \leq (V-12)/0.026 \Omega$
2. When with digital display, the load ability will decrease
3. Explosive pressure transmitter power supply is carried out according to the related request.

Model Selection

Table2

Item	Code	Description
Type	A S N	4-20mA Output(0.5% accuracy)/2 wire Hart Protocol (0.25% accuracy)/ 2 wire Others(Specify)
Product	SH316	Diffusive silicon pressure transmitter
Sensor type	A1	Diffusive silicon sensor
Pressure Type	A G	Absolute pressure Gauge Pressure
Digital Display	1 3	Without display Digital Display
Measuring Range		Please refer to measuring range table 3
Process connections	1 2 3	M20* 1.5 1/2"NPT Others(please specify)
Explosion proof	N I E	Non explosion proof Intrinsically safe Exib II CT5 Explosion proof Exd II BT5
Electrical Connection	C H N	Direct cable (standard 1m cable) Hirschmann plug N(others ,please specify)
Others (options)	T R D	Tri-clamp connection (specify size) High Temp. Radiator (max bear 150℃) Diaphragm seals (specify size)

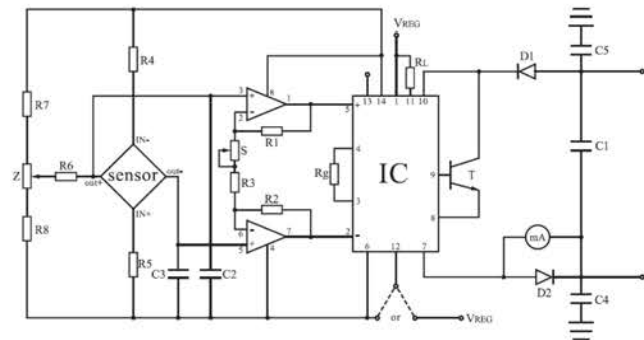
Measuring Range Table

Table 3

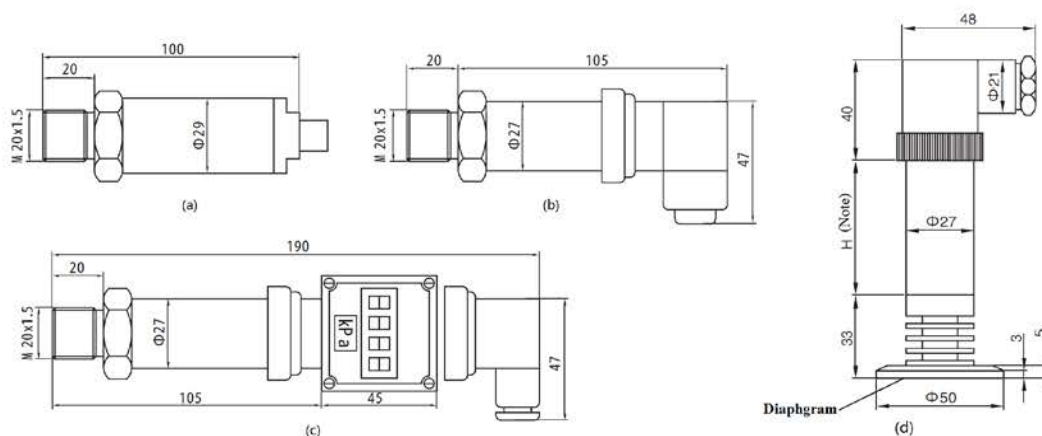
Gauge Pressure Code	Absolute Pressure Code	Measuring Range	Range Adjustment
G01		(0~4)kPa	(1.6~5)kPa
G02		(0~6)kPa	(4~10)kPa
G03		(0~10)kPa	(4~20)kPa
G04		(0~16)kPa	(6~20)kPa

G05	A05	(0~20)kPa	(8~35)kPa
G06	A06	(0~25)kPa	(10~35)kPa
G07	A07	(0~30)kPa	(12~35)kPa
G08	A08	(0~35)kPa	(14~35)kPa
G09	A09	(0~40)kPa	(16~70)kPa
G10	A10	(0~60)kPa	(24~70)kPa
G11	A11	(0~100)kPa	(40~100)kPa
G12	A12	(0~160)kPa	(64~200)kPa
G13	A13	(0~200)kPa	(80~200)kPa
G14	A14	(0~250)kPa	(100~350)kPa
G15	A15	(0~400)kPa	(160~700)kPa
G16	A16	(0~600)kPa	(240~700)kPa
G17	A17	(0~1.0)MPa	(0.4~1.0)MPa
G18	A18	(0~1.6)MPa	(0.64~2.0)MPa
G19	A19	(0~2.0)MPa	(0.8~2.0)MPa
G20	A20	(0~2.5)MPa	(1.0~3.5)MPa
G21	A21	(0~4.0)MPa	(1.6~4.0)MPa
G22	A22	(0~6.0)MPa	(2.4~7.0)MPa
G23	A23	(0~10)MPa	(4.0~10)MPa
G24	A24	(0~20)MPa	(8.0~20)MPa
G25	A25	(0~30)MPa	(12~35)MPa
G26	A26	(0~40)MPa	(16~40)MPa
G27	A27	(0~60)MPa	(24~60)MPa
G28		(-2~2)kPa	(-1.6~2.5)kPa
G29		(-5~5)kPa	(-3.0~5.0)kPa
G30		(-10~10)kPa	(-6.0~10)kPa
G31		(-20~20)kPa	(-13~20)kPa
G32		(-50~50)kPa	(-33~50)kPa
G33		(-100~60)kPa	(-66~100)kPa
G34		(-100~100)kPa	(-66~100)kPa
G35		(-100~150)kPa	(-100~200)kPa
G36		(-100~300)kPa	(-100~350)kPa
G37		(-100~500)kPa	(150~500)kPa
G38		(-100~900)kPa	(0.24~1.0)MPa
G39		(-100~1.5)MPa	(0.5~1.9)MPa
G40		(-100~2.0)MPa	(0.5~2.0)MPa

Electrical Appliance Diagrams



Structure Size



Note: (a) Direct cable connection

(b) Hirschmann plug electrical connection without display

(c) Hirschmann plug electrical connection with display

(d) Tri-clamp connection = 70mm (standard), H varies from 48~75 mm according to measuring range and output signals.

Installation Requirement and Precautions for Use

1. Check the model, range and power supply of the transmitters and to see whether all is meet requirements in the field.
2. Install the instruments with M20*1.5(or G1.5) in the pipe or vessel, no mounting brackets are needed. Zero error may appear when installation positions are different; however, zero error can be calibrated and has no impact on the level range. To avoid solids or other viscous substance to block the pressure port of the transmitters and affect the accuracy, we strongly recommend the pressure port is straight down (or tilt down). When install or dismount the transmitters, wrenches can only use on hexagonal thread of the transmitters.
3. When measuring high temperature medium, please use impulse lines or other cooling devices to reduce the temperature.
4. The working environment for transmitters should be airy and dry, free from strong Magnetic field interface. When install the pressures in open air, prevent the transmitters from straight sun shine and raining.
5. Try to install the transmitters to where there is small temperature gradient and small temperature vibrations to avoid strong shock and impact on the transmitters.

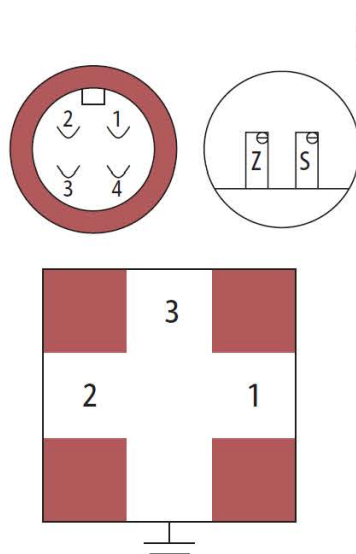
6. If the medium is viscous or has sediments, please choose non-chamber and uncovered-diaphragm structure type transmitters, and clean it regularly to avoid error. For any special working environment and working medium, please specify it when ordering.
7. If the transmitters work outside of the compensation temperature, the performance will reduce.
8. If there is strong change on the environment or medium temperature, the transmitters will have some change, when the working environment and medium environment is stable, the output signals will become stable.
9. Any personnel without special training please do not dismount the transmitters. If the transmitters is broken, please send back the transmitters to the factory or nearby repair company.
10. The transmitters are precise instruments; please calibrate the instruments regularly in related calibrated institute.

Warning:

Following situations can cause the transmitters broken

1. The measuring range exceeds overload ranges.
2. The power supply over 45V DC
3. Broke the pressure port with hard objects or the medium is solidified.
4. The medium is corrosive, such as beer, hydrogen, please specify it when ordering.

Wiring



- a. 2-wire (4-20mA) output
 - “1”-Power 24(+)VDC red
 - “2”-Output (4-20)mA Blue
- b. 3-wire output
 - (0-10)mA “1”-Power(+) Red
 - (4-20)mA “2”-Common ground white
 - (0-5)V “3”-Output (+) Blue
 - (1-5)V
- c. 4-wire output (0-5)V,(1-5)V,(4-20)mA,(0-10)mA,mV
 - “1”-Power (+) red “3”-Output (+) Blue
 - “2”-Power(-) white “4”-Output (-) Green

Calibration

1. All the transmitters have been calibrated before leaving the factory, and no calibration needed.
2. Calibration needed in following cases
 - a) Drop, vibration or crash during the transportation.
 - b) The transmitters have been kept without use for more than 6 months.
 - c) After long time operation, error appears.
 - d) Routine inspection
3. Calibration instruments

Product	Specification	Accuracy	Quantity
Stabilized voltage supply	(0-30)VDC/1ADC	±2%	1 unit
Digital Multimeter	(0-30)VDC/20mADC	±0.05%	1 unit

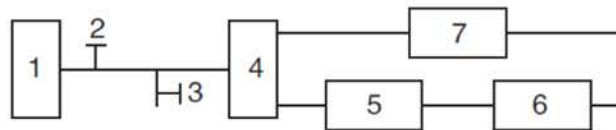
Pressure Signal Generator	As per pressure range	$\pm 0.05\%$	1 unit
Resistance box	ZX21/1000 Ω		1 unit

Note: Calibration instruments and environment should meet specifications of pressure transmitter's calibration regulations.

4. Calibration procedures

For example: Pressure transmitter, range(0-50)Kpa, output 4-20mA,accuracy 0.5 , B type connection box.

a) Connect the calibration instruments and transmitters as following:



1. Pressure Signal Generator	5. Resistance box (load)
2. Stop Valve	6. Ampere meter
3. Vent Valve	7. Stabilized voltage supply
4. Level transmitter	

- b) After open the housing of the transmitters, and we can see "S", "Z" adjusters.
- c) Add pressure on the transmitters for 3 times, and keep it for 10 second in rated pressure, return to zero point after each load.
- d) Close 2, open 3, and let the transmitters vent to air, adjust "Z" adjuster, and let the ampere meter show "4.00mA".
- e) Close 3, open 2, and add the transmitters with full range pressure, for example: 50kpa. When the pressure is stable, adjust "S" adjuster, and let the ampere meter show "20.00mA". (Note: zero point and full range output should be calibrated for several times)
- f) Calibration points should not be less than 5 points (including zero point and full range point).even selected the calibration points according the range. For each calibration point, it should be keep stable for 20 second then read the output value.
- g) Add the pressure step by step according to the selected points, when reaching the upper limit of the rated pressure; add the pressure to 110% of the rated range for 1 minute, then decrease the pressure to rated range, read the value after 20 second as the full range output value. Decrease the pressure to the lower limit of the range, and take it as a circulation. Each transmitter needs 3 circulations.
- h) After calibration, assemble the transmitters and fix each part tightly.

Warranty

Free charge repair for 12 months on conditions that: the defect products are caused by material or process which is not meeting the requirements of the contacts.

Diaphragm deformation or other improper usages to cause the broken is not belonging to free charge repair.