Product information
universal pressure transmitter

pressure transmitter is carefully designed, with compact structure and excellent quality. It is very suitable for general industry and has high cost performance.
It also has the advantages of output signal, measuring range, pressure interface, electrical connection and so on, which is convenient to match the site under different working conditions.
Range: - 100KPA ~ 0 ~ 100MPa (see range selection table for details)
Output: 4 ~ 20mA, RS485, 0 ~ 10VDC, 0 ~ 5VDC, 1 ~ 5VDC, 0.5 ~ 2.5vdc
Power supply: 9 ~ 36VDC, 15 ~ 36VDC, 3 ~ 5VDC
Accuracy: 0.1% FS, 0.25% FS, 0.5% FS, 1% FS
In addition, we can also provide customized products to meet the application needs of customers in a short time according to their applications.

Typical application

▲General industry.

Instructions

series pressure transmitter can measure absolute pressure, negative pressure and gauge pressure according to different models. It is suitable for pressure measurement of liquid or gas and process industry. The operator is responsible for checking whether the equipment is suitable for the working conditions of the application. If you have any questions, please contact our sales department to ensure the correct application of the transmitter. The company does not assume any responsibility for the impact caused by improper model selection.
The user must ensure that the measured medium is compatible with the contact material of the transmitter.
⚠ Warning!
Improper use can lead to danger!

Icon description

⚠ Danger! - A dangerous situation that could result in death or serious injury.
⚠ Warning! - A potentially hazardous situation that could result in death or serious injury.
! Be careful! A potentially hazardous situation that could result in minor injury.
☞ Reminder! - A potentially hazardous situation that could result in personal injury.
⚠ Tips! - Tips and information to ensure trouble free operation of the equipment.
User
⚠ Warning! This information is applicable to technicia

Product features

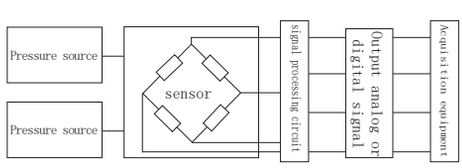
a) Diaphragm isolation technology
b) Integrated chip, wide voltage power supply
c) Compact structure and convenient installation
d) Frequency cut-off design, strong anti-interference ability and lightning protection
e) Current limiting, voltage limiting and reverse connection protection
f) High precision, good stability, fast response and impact resistance

Product overview

series pressure transmitter adopts OEM pressure sensor with stainless steel isolation diaphragm as signal measuring element, which has been automatically tested by computer and compensated for zero point and sensitivity temperature in a wide temperature range by laser resistance adjustment process. The amplification circuit is located in the stainless steel shell, which converts the sensor signal into standard output signal, gives full play to the technical advantages of the sensor, and makes series pressure transmitter have excellent performance. It has strong anti-interference, overload and impact resistance, small temperature drift, high stability and high measurement accuracy. It is an ideal pressure measuring instrument in the field of industrial automation.

Working principle

The pressure sensor diffuses a Wheatstone bridge on the monocrystalline silicon chip. The pressure of the measured medium (gas or liquid) changes the resistance value of the bridge wall (piezoresistive effect) to generate a differential voltage signal. This signal is transformed into a standard analog signal (as shown in the figure below) or digital signal through a special amplifier.



Technical parameter

Measuring medium: liquid or gas (compatible with contact material)
Range range ＜ 10KPA (non conductor, non corrosive, non explosive gas, humidity ≤ 90% RH, no condensation).
Pressure range: - 100kPa ~ 0 ~ 100MPa (see range selection table for details)
Pressure mode: gauge pressure, absolute pressure and negative pressure
Medium temperature: - 40 ~ 85 ℃
On time: 20ms
Stability: ± 0.1% FS / year
Temperature drift: ± 0.01% FS / ℃ (within the temperature compensation range) ± 0.05% FS / ℃ (outside the temperature compensation range)
Protection grade: IP65 (no display) IP54 (with display) Note: the above protection grade refers to the degree reached after the electrical connection is complete
Durability: $10X10^6$cycles(number of cycles from lower range to upper range)
Overall weight: no display ≈ 190g, with display ≈ 270g

Output power supply

power supply / output	9～36VDC	15～36VDC	3～5VDC
4～20mA	No display	With display	×
RS485	No display	With display	No display
0～10VDC	×	With / without display	×
0～5VDC	With / without display	×	×
1～5VDC	With / without display	×	×
0.5～2.5VDC	×	×	No display

Accuracy class

Range range	Standard configuration (temperature compensation-10~70℃)	Optional (temperature compensation - 40 ~ 80 ℃)
range≥100kPa	0.25%FS	0.1%FS(except 0.5~2.5vdc output)
10kPa≤range＜100kPa	0.5%FS	0.25%FS(except 0.5~2.5vdc output)
range＜10kPa	1%FS	0.5%FS(except 0.5~2.5vdc output)

Meter accuracy	0.5% FS digital tube (LED) display

Note: reference conditions: temperature 15~25℃, atmospheric pressure 86~106kpa, humidity 45~75% RH.

Response frequency

RS485 output	high-precision	Absolute pressure and negative pressure	Range range≤10kPa	other
5Hz	30Hz	30Hz	30Hz	100Hz

Note: the smallest overlap shall prevail.

maximum power

output \ power	≤0.02Us(W)	≤0.015Us(W)	≤0.008Us(W)	≤0.001Us(W)
4～20mA	With/without display			
RS485	With display	No display		
0～10VDC	With display		No display	
0～5VDC	With display		No display	
1～5VDC	With display		No display	
0.5～2.5VDC				No display

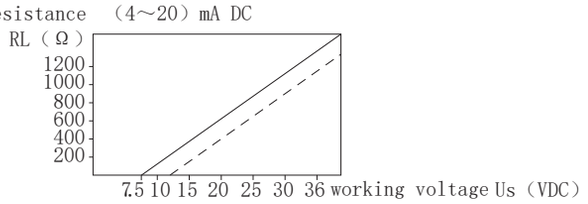
Note: US = supply voltage.

Load characteristics

Voltage type: ⩾ 10K Ω

Current type: load ⩽ {(us-7.5) ÷ 0.02} Ω (US = supply voltage)

Load resistance （4～20）mA DC



Note: - indicates no display, ---indicates yes display

Environment condition

Ambient temperature: - 40 ~ 85 ℃

Ambient humidity: 0% ~ 95% RH (no condensation and condensation)

Electromagnetic compatibility(EMC)

Serial number	Test items	Basic standards	Test conditions	Performance level
1	Radiated interference (enclosure)	GB/T 9254/CISPR22	30MHz-1000MHz	qualified
2	Conducted interference (DC power port)	GB/T 9254/CISPR22	0.15MHz-30MHz	qualified
3	Electrostatic discharge (ESD)	GB/T 17626.2/IEC61000-4-2	4kV(Contact), 8kV (air)	B(Note 2)
4	Radio frequency electromagnetic field immunity	GB/T 17626.3/IEC61000-4-3	10V/m(80MHz-1GHz)	A(Note 1)
5	Power frequency magnetic field immunity	GB/T 17626.8/IEC61000-4-8	30A/m	A(Note 1)
6	Electrical fast transient burst immunity	GB/T 17626.4/IEC61000-4-4	2kV(5/50ns, 100kHz)	B(Note 2)
7	Surge immunity	GB/T 17626.5/IEC61000-4-5	1kV(Between lines) 2kV(Between ground wires)(1.2us/50us)	B(Note 2)
8	Conducted interference immunity induced by RF field	GB/T 17626.6/IEC61000-4-6	3V(150kHz-80MHz)	A(Note 1)

Note 1: when the performance grade is a, the performance is normal within the limits of technical specifications.

Note 2: when the performance level is level B, the function or performance is temporarily reduced or lost, but can be recovered by itself, and the actual operation condition, storage and data will not change.

过压与爆破

Pressure type	Range range	Overload pressure	Burst pressure	OO-ring
G	0＜FS≤70kPa	300%FS	600%FS	Nitrile rubber
G、A	0.07＜FS≤1MPa	200%FS	500%FS	Nitrile rubber
G、A	1＜FS≤2.5MPa	200%FS	500%FS	Nitrile rubber
S	2.5＜FS≤16MPa	200%FS	400%FS	Fluororubber
S	16＜FS≤25MPa	150%FS	400%FS	Fluororubber
S	25＜FS≤100MPa	150%FS	300%FS	Fluororubber
Positive and negative pressure	±4kPa	12kPa	20kPa	Nitrile rubber
	±20kPa	50kPa	200kPa	Nitrile rubber
	±100kPa	300kPa	600kPa	Nitrile rubber
	-100～160kPa	480kPa	900kPa	Nitrile rubber
	-100～250kPa	750kPa	1.25MPa	Nitrile rubber
	-100～400kPa	800kPa	2MPa	Nitrile rubber
	-100～600kPa	1.2MPa	3MPa	Nitrile rubber
	-0.1～1MPa	2MPa	5MPa	Nitrile rubber
	-0.1～1.6MPa	3MPa	9MPa	Nitrile rubber
	-0.1～2.5MPa	5MPa	12.5MPa	Nitrile rubber

⚠ Tips! Note ①: overload pressure, no damage but abnormal operation;

⚠ DANGER! Note ②: burst pressure, damage or damage relief.

⚠ Tips! Note ③: G gauge pressure, a absolute pressure and s sealing pressure.

Overall material

Diaphragm: 316L stainless steel (contact with the measured medium)

Process connection: 304 stainless steel (contact with the measured medium)

Shell: 304 stainless steel

Seal: pressure and burst chart (contact with measured medium)

Display housing: ABS engineering plastic (LED display)

Hesman joint: ABS engineering plastic

Mechanical stability

Seismic performance: 10g (20... 2000Hz), conforming to iec60068-2-6 standard

Impact resistance: 500g / MS, conforming to iec60068-2-27 standard

Electrical protection

Short circuit protection: permanent

Reverse pole protection: no damage, but does not work

Insulation resistance: ≥ 100m Ω 500VDC

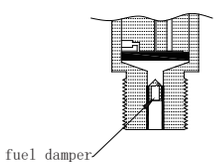
Insulation strength: 500VAC

Output limit

	Output minimum		Maximum output	
	N(Note 1)	other	N(Note 1)	other
4-20mA	4mA	3.8mA	20mA	26mA
RS485	0	0	2000	2000
0～10VDC	0.001VDC	0.001VDC	10VDC	12VDC
0～5VDC	0.001VDC	0.001VDC	5VDC	12VDC
1～5VDC	0.001VDC	0.001VDC	5VDC	5VDC
0.5～2.5VDC	0.05VDC	0.05VDC	5VDC	5VDC

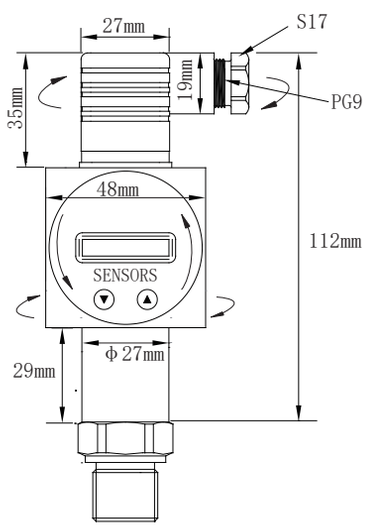
Note 1: n refers to high precision, absolute pressure, negative pressure and range range ≤ 10kPa.

fuel damper

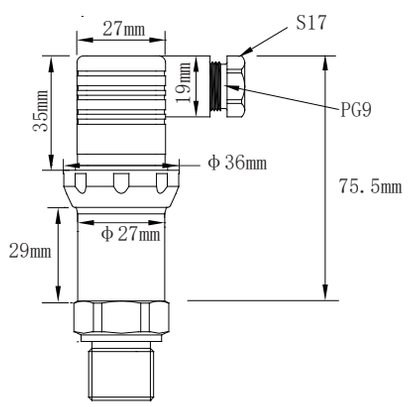


application
Cavitation, liquid hammer and peak pressure may occur in the liquid filling system, such as when the valve is closed quickly,
Or when the pump is started and shut down. It may mainly occur at the inlet end and outlet end, even if it works
The pressure is very low, and it is no exception. A pulse buffer is installed inside the sensor to solve this kind of problem.
Note: after adding a pulse buffer, the medium pulse frequency will drop below 30Hz.

Outline and dimensions

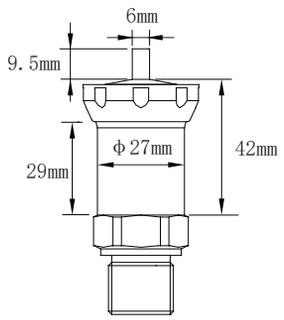


The outgoing line of hesman connector is displayed

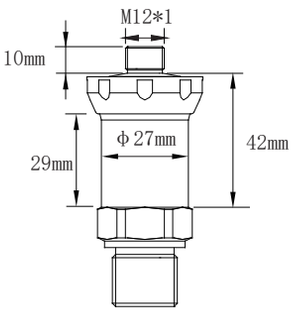


Hesman connector outlet

Note: the marked place can be rotated by 350 °

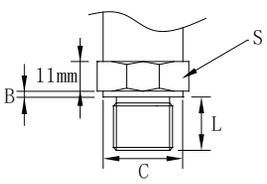


Direct outgoing line

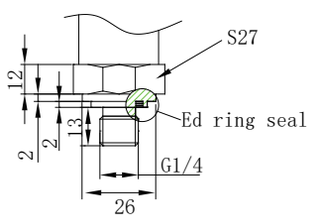


Aviation connector outgoing line

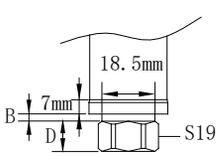
External thread size

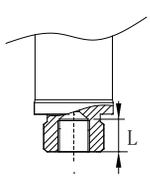


Thread specification	L（mm）	B（mm）	C（mm）	S（mm）
M10*1、M12*1.5、M14*1.5、M16*1.5	12	3	26	27
G1/8、G3/8、NPT1/8	12	3	26	27
M27*2、G3/4	20	0	0	36
ZG、R、PT、NPT1/4	15	3	26	27
M20*1.5、G、ZG、R、PT、NPT1/2	18	2	26	27



Internal thread size





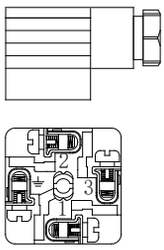
Thread specification	L (mm)	B (mm)	D (mm)
G1 / 4 internal thread	15	3	12

Wiring diagram

Hesman plug

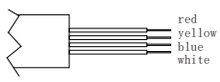
ID	2-Wire	3-Wire	4-Wire
1	Power supply+	Power supply+	Power supply+
2	Power supply-	OUT+	A
3		Power supply-	Power supply-
⏚	⏚	⏚	B

Note: the diameter of lock wire is 5 ~ 6.5mm



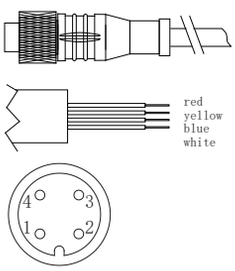
Direct outgoing line

ID	2-Wire	3-Wire	4-Wire
red	Power supply+	Power supply+	Power supply+
yellow		OUT+	A
blue	Power supply-	Power supply-	Power supply-
white			B



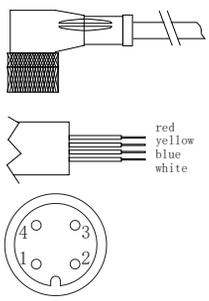
Aerial straight head belt line

ID	2-Wire	3-Wire	4-Wire
1/red	Power supply+	Power supply+	Power supply+
2/yellow		OUT+	A
3/blue	Power supply-	Power supply-	Power supply-
4/white			B



Aerial inserting elbow strip line

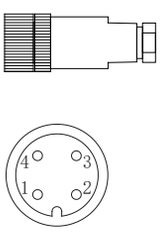
ID	2-Wire	3-Wire	4-Wire
1/red	Power supply+	Power supply+	Power supply+
2/yellow		OUT+	A
3/blue	Power supply-	Power supply-	Power supply-
4/white			B



Aerial straight head

ID	2-Wire	3-Wire	4-Wire
1	Power supply+	Power supply+	Power supply+
2		OUT+	A
3	Power supply-	Power supply-	Power supply-
4			B

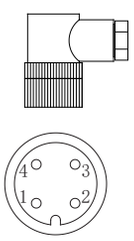
Note: the diameter of lock wire is 4 ~ 5mm



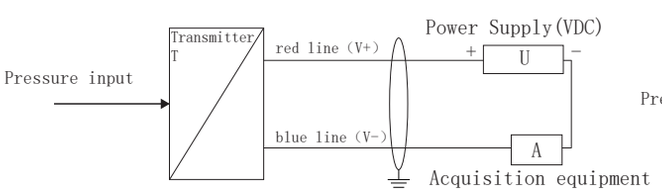
Aviation plug elbow

ID	2-Wire	3-Wire	4-Wire
1/red	Power supply+	Power supply+	Power supply+
2/yellow		OUT+	A
3/blue	Power supply-	Power supply-	Power supply-
4/white			B

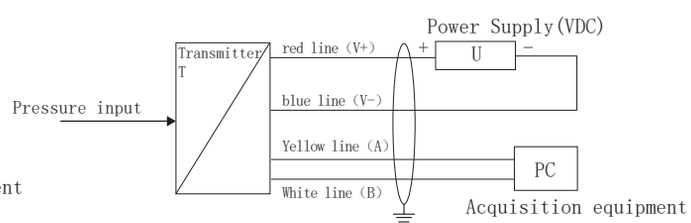
Note: the diameter of lock wire is 4 ~ 5mm



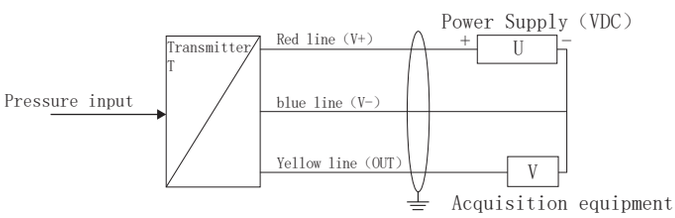
Current output wiring diagram (two-wire system)



RS485 (digital signal) output wiring diagram (four wire system)



Voltage output wiring diagram (three wire system)



☞ Represents shielded wire, and all marked grounding points must be effectively grounded. It is recommended to select shielded twisted pair signal cable for the best effect. In order to avoid grounding loop, the shielding layer adopts single end grounding, insulated floating grounding at the end of pressure transmitter and grounding at the end of control cabinet.

☞ The transmitter shell is grounded by default, so the field equipment shall be effectively grounded. If the field equipment cannot be grounded, the marked grounding point shall be effectively grounded.

Protocol description (limited to RS485 signal output, the address is 01 by default, and the data is hexadecimal)

Basic technical parameters of transmitter

This protocol complies with Modbus communication protocol and adopts the centralized RTU mode in Modbus protocol RS485 half duplex working mode

a) Output signal: RS485 (the distance can be up to 1000m. 32 channels at most)
b) Standard Modbus RTU protocol (03 function reads data, 06 function writes setting data)
c) Data format: 9600, N, 8,1 (9600bps, no verification, 8 data bits, 1 stop bit)
d) Measuring range: 0-x (MPa, kPa...)
e) Resolution: 0.05%
f) Output data: 0... 2000 (customized for other ranges)
g) Response frequency: ≤ 5Hz
h) Response speed: ≥ 10m

Modbus RTU read data 03 command description

	Device address	Function code	Data address	Number of read data	16crc code (low front high rear)
Host command	Address	03	00 00	CN	CRC0 CRC1
	Device address	Function code	Data byte	Sensor data	16crc code (low front high rear)
Host command	Address	03	02*CN	S_HN ,S_LN	CRC0 CRC1

Communication examples

The address of 0-1.6mpa sensor communication equipment is set to 01, i.e. [address] = 01 (
address range 01-254); At this time, crc0 = 84, crc1 = 0A.
Then the sending and returning data are as follows:
Send: 01 03 00 01 84 0A
Return: 01 03 02 AC B9 59
02ac is hexadecimal and converted to decimal 684;
Data output: 0-2000 corresponds to 0-1.6mpa, so the current pressure is p = 1.6 * 684 / 2000 = 0.5472mpa
Calculation formula: (upper range - lower range) ÷ 2000 * current data + lower range = current pressure value

Query example

Reading the current device address can only be completed independently by a single offline sensor
Send FF 03 00 0f 00 01 A1 D7 return FF 03 02 00 01 50 50
Then: the address of this device is 01 (hexadecimal)

Detailed description of Modbus RTU write 06 command

	Device address	Function code	Data address	new address	16crc code (low front high rear)
Host command	Address	06	00 0F	H L	CRC0 CRC1
	Device address	Function code	Data address	new address	16crc code (low front high rear)
Host command	Address	06	00 0F	H L	CRC0 CRC1

Modification example

If the 01 address is changed to 09 address:
Send 01 06 00 0f 00 09 79 CF return 01 06 00 0f 00 09 79 CF
Then the original address 01 is changed to 09 successfully. The modified address can be modified offline or online. After completion, it can work directly without power on again.

Ordering instructions

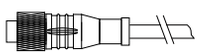
⚠Warning!
When ordering pressure transmitters, users should pay attention to selecting appropriate specifications according to the pressure, temperature and environmental conditions of the medium.

ordering information
Model / electrical connector / measuring range / output signal / connection mode / accuracy level / power supply voltage / Customization

enclosure(Purchase separately)

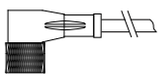
Electrical connection plug

M12-z aviation plug straight head connecting cable



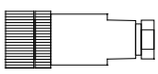
Main purpose: electrical connection

M12-w aviation plug elbow connecting cable



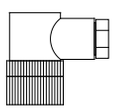
Main purpose: electrical connection

M12c-z aviation plug straight head



Main purpose: electrical connection

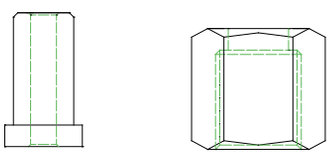
M12c-w aviation plug-in elbow



Main purpose: electrical connection

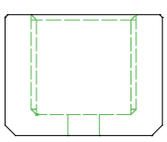
Welded base

Dz01 union welding base



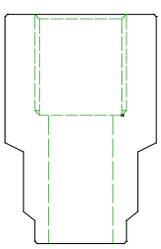
Main purpose: base welding and positioning

Dz05 column welding base



Main purpose: base welding

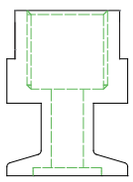
Dz03 pagoda welded base



Main purpose: base welding

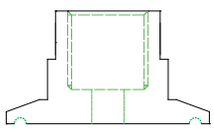
Adapter

Zb06 adapter kf16



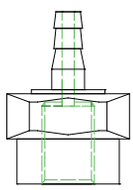
Main purpose: transfer and conversion

Zb08 adapter clamp



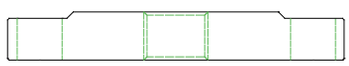
Main purpose: transfer and conversion

Zb05 pagoda mouth adapter



Main purpose: transfer and conversion

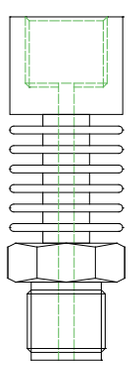
F101 adapter flange



Main purpose: transfer and conversion

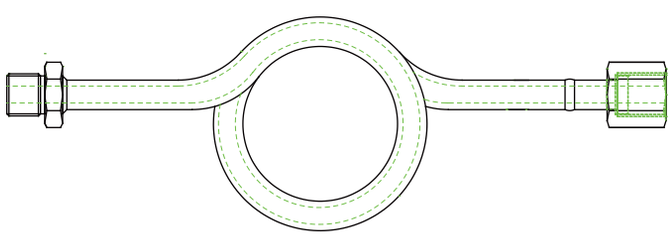
Heat transfer

Zb03 heat sink adapter



Main uses: switching and heat dissipation

Zb02 union buffer pipe



Main uses: switching, heat dissipation and buffering

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