

# PC11-BQ Fully Welded Pressure Sensor

## Feature

- Focusing on customer customization
- High reliability pressure chip
- Fully welded with joints, small-sized structure
- High performance and reliability
- Wide temperature compensation
- Gauge pressure, absolute pressure, sealing pressure
- Optional constant current and constant voltage excitation
- 18 months warranty period

## Applications

- Supporting pressure transmitter manufacturers
- Supporting liquid level transmitter manufacturers
- Fire protection and medical oxygen pressure matching
- Combustible gas detection

## Industry

- Pressure control equipment
- Hydraulic equipment
- Liquid level control equipment
- Gas equipment
- Low temperature equipment



PC11-BQ1 model



PC11-BQ2 model



PC11-BQ3 model



PC11-BQ model

## Product overview

The PC11-BQ pressure sensor has provided customers with four designs, and it has successfully provided over a hundred customers with such a solution: welding the pressure core body and interface pressure head together, fundamentally eliminating the problem of "O" ring sealing leakage. It has high reliability, and is compact in size, making it the best choice for making highly reliable and high-quality pressure and liquid level transmitters. In order to provide a clearer description of this model of product, the information clearly defines which designs cannot be changed and which personalized designs are made by customers based on their actual needs. By integrating the advantages of Wotian with the needs of your company, a perfect product is formed.

BQ1 and BQ2 are suitable for making shell diameters  $\phi$  24mm or  $\phi$  27mm. The total length of BQ2 is shorter than BQ1 for a 27mm pressure transmitter.

BQ3 is suitable for making outer diameter  $\phi$  19mm liquid level transmitter.

BQ4 is suitable for making shells with a minimum diameter of  $\phi$  19mm pressure transmitter or outer diameter  $\phi$  15.8mm liquid level transmitter.

This model of product is mainly customized by customers.

**Notes:**

- 1 Do not touch the diaphragm with hard objects, which may cause damage to the diaphragm.
- 2 Please read the Instruction Manual of the product carefully before installation and check the relevant information of the product.
- 3 Strictly follow the wiring method for wiring; otherwise it may cause product damage or other potential faults.
- 4 Misuse of the product may cause danger or personal injury.

Except for the dimensions marked with \*, it is not recommended to change. Other requirements should be customized according to customer needs as much as possible.

At the same time, Wotian has prepared a small number of standard shelf products for customers to purchase directly.

**Notes:**

- 1 Do not misuse documentation.
- 2 The information presented in this product sheet is for reference only. Do not use this document as a product installation guide.
- 3 Complete installation, operation, and maintenance information is provided in the instructions of the product.
- 4 Misuse of the product may cause danger or personal injury.

### Electrical performance parameters

Range range and pressure mode	BQ1 model: -100~0~10kPa... 25MPa (gauge pressure, absolute pressure, sealing pressure). BQ2 model: -100~0~10kPa... 25MPa (gauge pressure, absolute pressure, sealing pressure). BQ3 model: 0-10kPa... 100kPa (gauge pressure). BQ4 model: -100~0~100kPa... 25MPa (gauge pressure, absolute pressure, sealing pressure).
Incentive	The recommended constant current compensation is 1.5mA; 10V recommended for constant voltage compensation; Both constant current and constant voltage excitation without compensation are acceptable.
Impedance	Constant current: 2k $\Omega$ ~5k $\Omega$ ; Constant voltage: 3k $\Omega$ ~18k $\Omega$ .
Electrical connections	Gold-plated Kovar pins or silicone flexible wires
Compensation temperature	0 $^{\circ}\text{C}$ ~60 $^{\circ}\text{C}$ (range $\leq$ 70kPa)- 10 $^{\circ}\text{C}$ ~70 $^{\circ}\text{C}$ (other ranges).
Operation temperature	-40 $^{\circ}\text{C}$ ~ 120 $^{\circ}\text{C}$
Storage temperature	-40 $^{\circ}\text{C}$ ~ 120 $^{\circ}\text{C}$
Insulation resistance	$\geq$ 200M $\Omega$ /250VDC
Response time	$\leq$ 1ms (rising to 90% FS)
Measurement medium	All liquids and gases compatible with 316L
Mechanical vibration	20g (20~5000HZ)
Impact	100g (10ms)
Durability	$1 \times 10^6$ (cycles)

### Structural performance parameters

Diaphragm material	316L
Material of inlet head	SS304 或 SS316L
Infusion of liquid	silicone oil

### Basic parameters

Project	Condition	Minimum	Typical	Maximum	Unit	Notes
Nonlinear	Other ranges	-0.3	$\pm$ 0.2	0.3	%FS	Note (1)
	25MPa	-0.4		0.4		
Hysteresis		-0.05	$\pm$ 0.03	0.05	%FS	
Repeatability		-0.05	$\pm$ 0.03	0.05	%FS	

Zero point output signal		-2	±1	2	mV	
Full range output signal	10kPa	30	45	80	mV	Motivation: 1.5mA 1.5mA 10V 10V
	Other ranges	60	90	150	mV	
	10kPa	30	45	80	mV	
		98	100	102	mV	
Zero temperature drift	10kPa	-2	±1.5	2	%FS	Note (2)
	Other ranges	-1.5	±0.75	1.5		
Sensitivity temperature drift		-1.5	±0.75	1.5	%FS	Note(2)
Thermal hysteresis		-0.075	±0.05	0.075	%FS	Note(3)
Long term stability		-0.3	±0.2	0.3	%FS/Year	

Note: (1) Calculated based on BFSL least squares method.

Within the compensation temperature range, 0 °C~60 °C and -10 °C~70 °C refer to 30 °C.

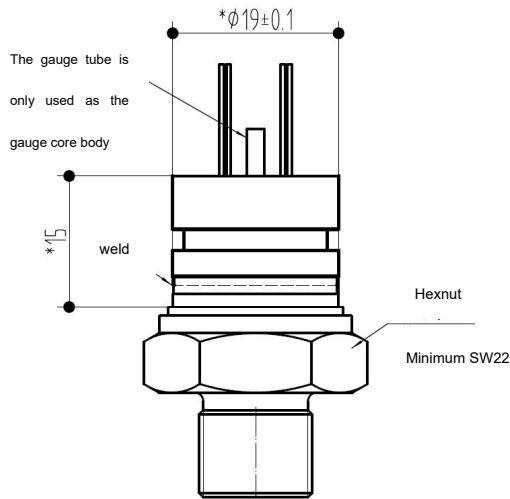
After passing through high and low temperatures, return to the reference temperature.

### Structure and dimensions

The size marked with \* cannot be changed, and the remaining parts can be customized according to customer needs.

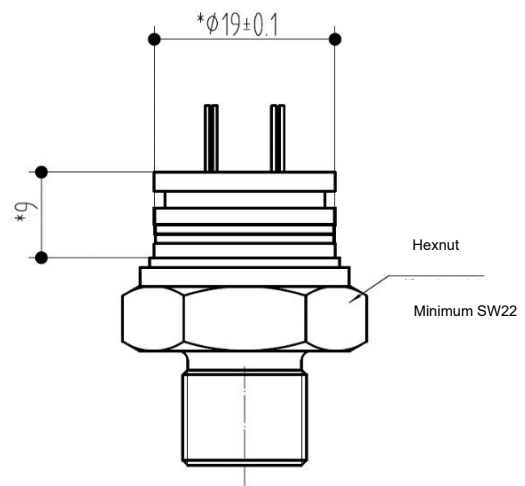
Unit (mm)

**PC11-BQ1 model**



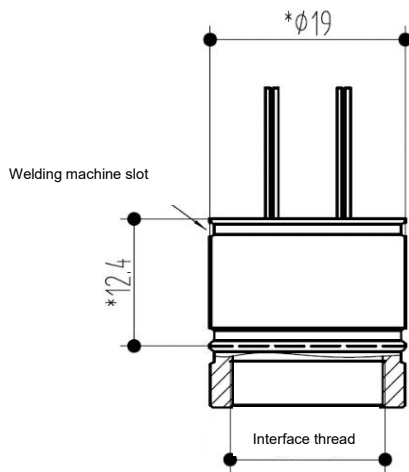
Recommended use: M20 × 1.5, G1/2, NPT1/2, G1/4, NPT1/4, front threads can be customized according to customer actual needs.

**PC11-BQ2 model**



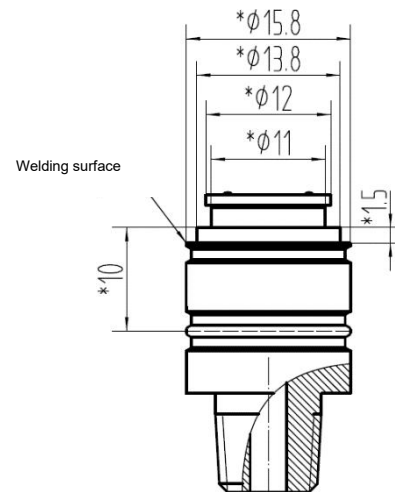
Recommended use: M20 × 1.5, G1/2, NPT1/2, G1/4, NPT1/4, front threads can be customized according to customer actual needs.

**PC11-BQ3 model**



Customizable front threads according to customer actual needs

**PC11-BQ4 model**



Customizable front threads according to customer actual needs

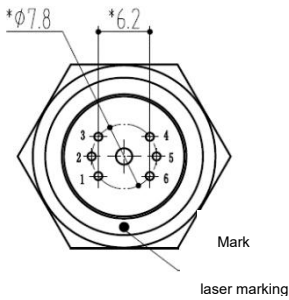
**Pressure range selection**

Range code	Pressure mode	Range range	Overload pressure	Burst pressure	Available models
10k	G	0~10kPa	300%FS	600%FS	BQ1、2、3model
20k	G	0~20kPa	300%FS	600%FS	BQ1、2、3model
35k	G	0~35kPa	300%FS	600%FS	BQ1、2、3model
70k	G	0~70kPa	300%FS	600%FS	BQ1、2、3model
100k	G、A	0~100kPa	200%FS	500%FS	BQ1、2、3、4model
160k	G	0~160kPa	200%FS	500%FS	BQ1、2、4model
250k	G	0~250kPa	200%FS	500%FS	BQ1、2、4model
400k	G	0~400kPa	200%FS	500%FS	BQ1、2、4model
600k	G	0~600kPa	200%FS	500%FS	BQ1、2、4model
1M	G	0~1MPa	200%FS	500%FS	BQ1、2、4model
1.6M	G、A、S	0~1.6MPa	200%FS	500%FS	BQ1、2、4model
2.5M	G、A、S	0~2.5MPa	200%FS	500%FS	BQ1、2、4model
4M	A、S	0~4MPa	200%FS	400%FS	BQ1、2、4model
6M	A、S	0~6MPa	200%FS	400%FS	BQ1、2、4model
10M	A、S	0~10MPa	200%FS	40MPa	BQ1、2、4model
16M	A、S	0~16MPa	200%FS	40MPa	BQ1、2、4model
25M	A、S	0~25MPa	150%FS	40MPa	BQ1、2、4model
(-100~0)k	G	-100~0kPa	200kPa	500kPa	BQ1、2、4model

Note: G gauge pressure, A absolute pressure, S sealing pressure

**Electrical connections**

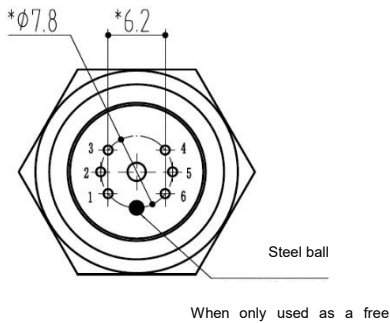
6-pin lead out for constant current compensation (6-pin lead out is not recommended for constant voltage compensation) Unit (mm)



Pin	Defination
3	Incentive positive (IN+)
5	Incentive Negative (IN -)
2	Output signal positive (OUT+)
4	Output signal negative (OUT -)
1、6	None

Uncompensated 6-pin lead out

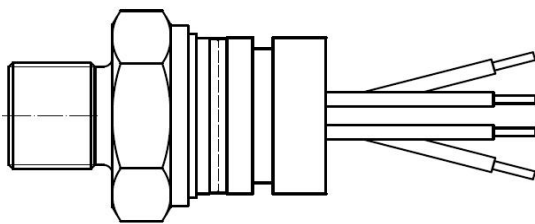
Unit (mm)



Pin	Defination
3	Incentive positive (IN+)
1、6	Incentive Negative (IN -)
2	Output signal positive (OUT+)
4	Output signal negative (OUT -)
5	None

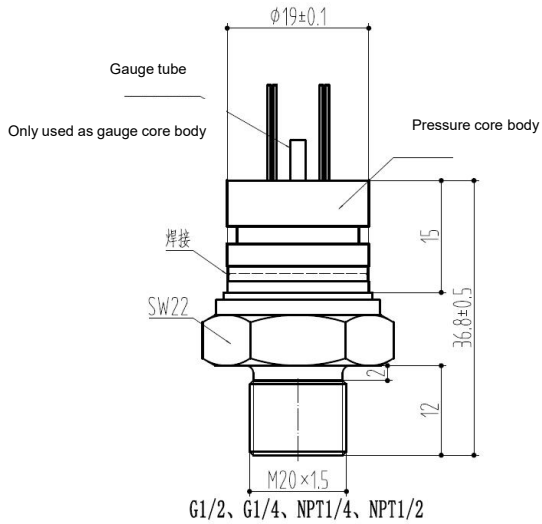
**Electrical connection (continued)**

4-wire lead out (default length of 110mm, can also be customized according to customer actual needs) Unit (mm)



Wire Color	Defination
Red	Incentive positive (IN+)
Blue	Incentive Negative (IN -)
Yellow	Output signal positive (OUT+)
White	Output signal negative (OUT -)

Whether compensated or not, the wiring definition for constant current compensation or constant voltage compensation is the same.



**PC11-BQ1**

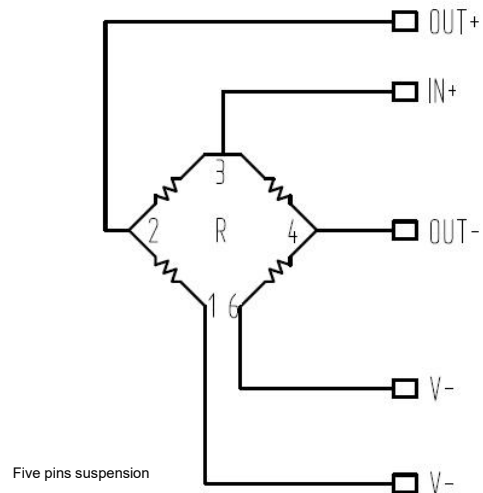
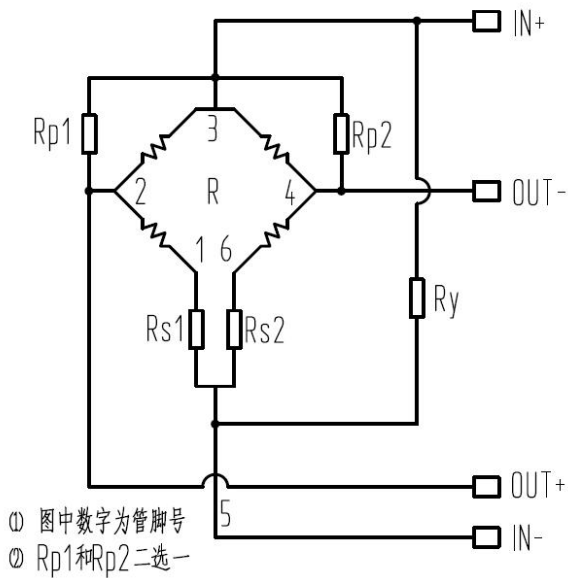
- 1、PC11-BQ1-35kG4WI1C-C1
- 2、PC11-BQ1-35kG4WI1C-C3
- 3、PC11-BQ1-100kG4WI1C-C1
- 4、PC11-BQ1-100kG4WI1C-C3
- 5、PC11-BQ1-1MG4WI1C-C1
- 6、PC11-BQ1-1MG4WI1C-C3
- 7、PC11-BQ1-25MS4WI1C-C1
- 8、PC11-BQ1-25MS4WI1C-C3

Contact customer service for more specifications.

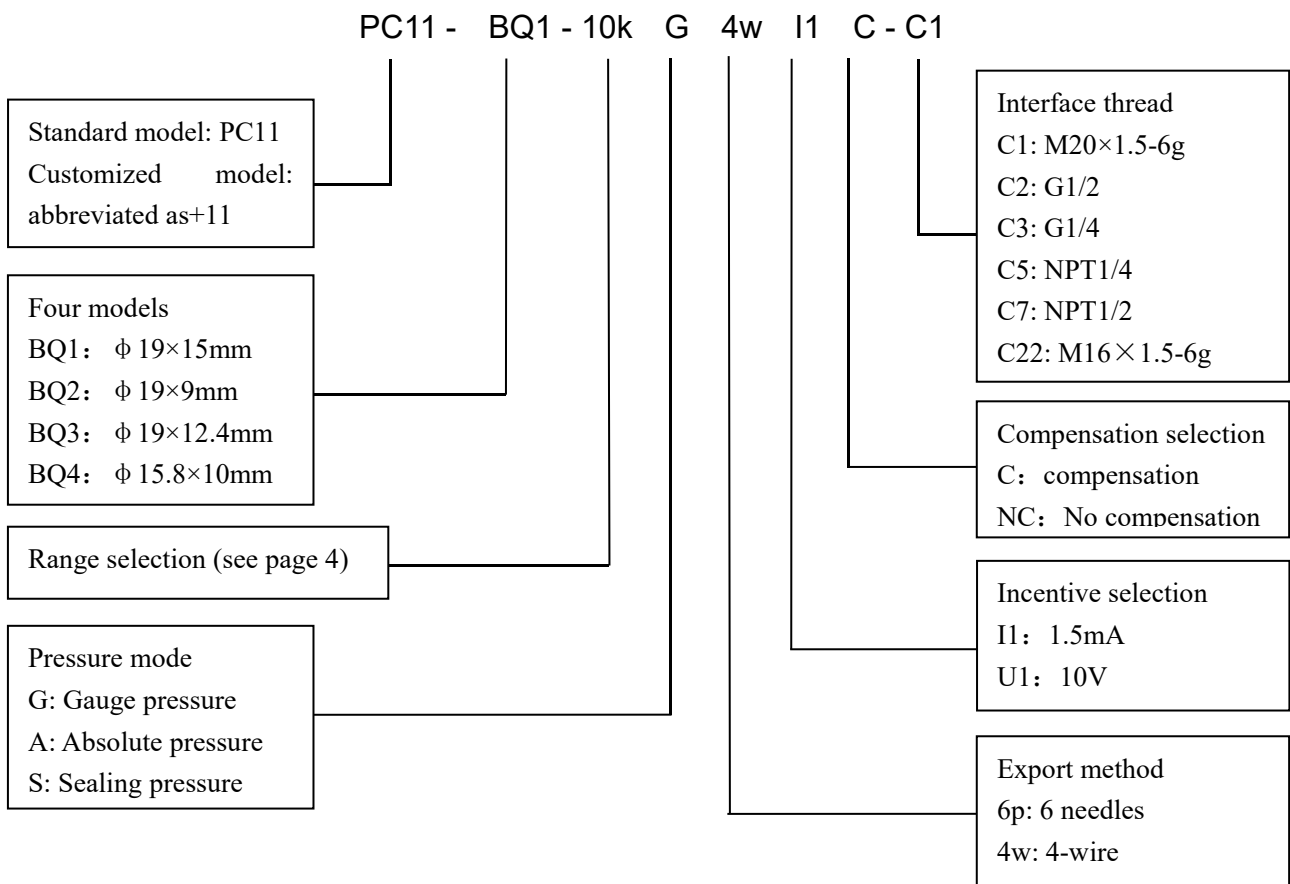
**Circuit diagram**

Circuit diagram of constant current compensation

Uncompensated circuit diagram



1-6 are pin numbers



Example 1: PC11-BQ1-10kG4wI1C-C1

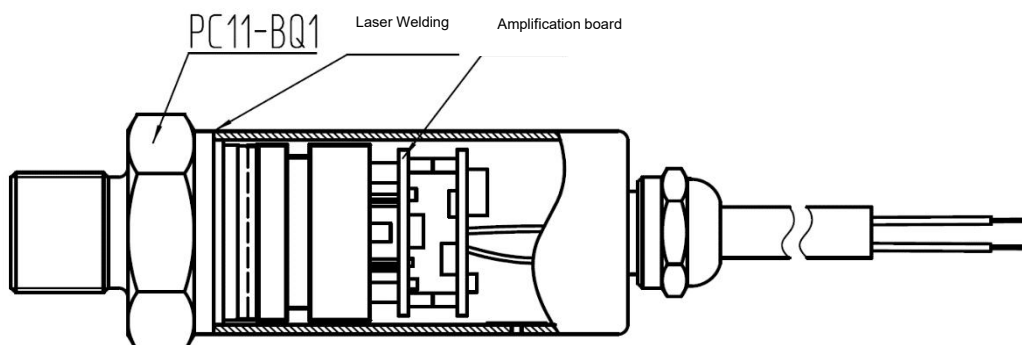
PC11-BQ1 pressure sensor, used  $\phi$  nineteen  $\times$  15 base, measuring range 10kPa, gauge pressure, 4-wire lead out, 1.5mA constant current excitation, temperature compensation, interface thread M20  $\times$  1.5-6g.

Example 2: XT11-BQ1-10kG4wI1C-C1

XT11-BQ1 pressure sensor customized for XT company, using  $\phi$  nineteen  $\times$  15 base, measuring range 10kPa, gauge pressure, 4-wire lead out, 1.5mA constant current excitation, temperature compensation, interface thread M20  $\times$  1.5-6g.

**Application Cases**

This is a typical application diagram, using PC11-BQ1 as a 4-20mA pressure transmitter with a welded casing.

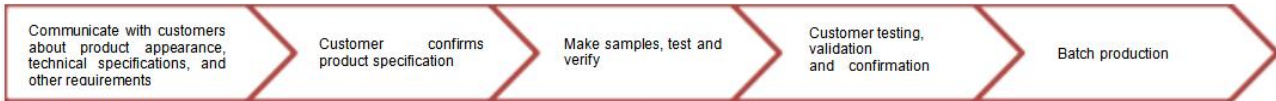




## Customized Guide

1. Customization content includes but is not limited to hexagonal size, hexagonal width, interface thread model and length, width of cutting groove, material of feed head, diameter of feed hole, compensation temperature range, extraction method, feed head material, etc.

### 2. Customization process



3. After the customer confirms the 3 customized samples, the minimum order quantity for bulk procurement is 100 pieces.

4. If your company's demand is not high, you can choose from the shelf product catalog without a minimum order quantity limit.

## Ordering tips

1 can be selected for over range or down range, with amplitude controlled within  $\pm 30\%$  FS.

The pressure methods include gauge pressure, absolute pressure, and sealing pressure.

(1) Gauge pressure refers to a measurement based on the current atmospheric pressure, generally greater than the current atmospheric pressure; Negative pressure is a special case of gauge pressure, referring to the working conditions at the workplace that are lower than the current atmospheric pressure.

(2) Absolute pressure is based on vacuum.

(3) The sealing pressure is the absolute pressure used as the gauge pressure, but the benchmark is the production site air pressure; There is no gauge pressure above 6MPa, only sealing pressure.

The only non compensated pressure method is gauge pressure or absolute pressure, without sealing pressure.

3. Confirm the maximum overload of the system. The maximum overload of the system should be less than the overload protection limit of the sensor, otherwise it may affect the product's durability or even damage the product.

The commonly used compensation method for product 4 is 1.5mA constant current compensation, and it is recommended to choose it first; Both constant current and constant voltage excitation of the uncompensated core can be used, but it is recommended to select a constant current of 1.5mA. All test data is measured under this condition.

The production process of negative pressure products is different from positive pressure and requires a special process. Negative pressure cannot be replaced by gauge pressure. The negative pressure mentioned here refers to long-term working in a negative pressure state; If negative pressure occurs during the short period of operation of the gauge pressure product, such as when the valve is closed, it will not cause damage to the gauge pressure.

Wotian reserves the right to make any change in this publication without notice. The information provided is believed to be accurate and reliable as of this product sheet.



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