Compact Pressure Transmitter

AT80MA is a series of high performance compact pressure Transmitter, by using ASIC signal conditioning chip and dry ceramic capacitive pressure sensor. It has features of anti-corrosion, anti-wear, shock resistance and vibration resistance. Its anti-overload capacity is up to 100 times of the range, completely solved poor overload in small range of other sensors. In addition to general ranges of normal sensors, its most outstanding characteristic is the positive and negative gauge pressure function. With high output and wide range, ATK80MA is especially suitable for manufacturing of high-performance industrial control pressure transmitter and harsh environment pressure measurement.

Application

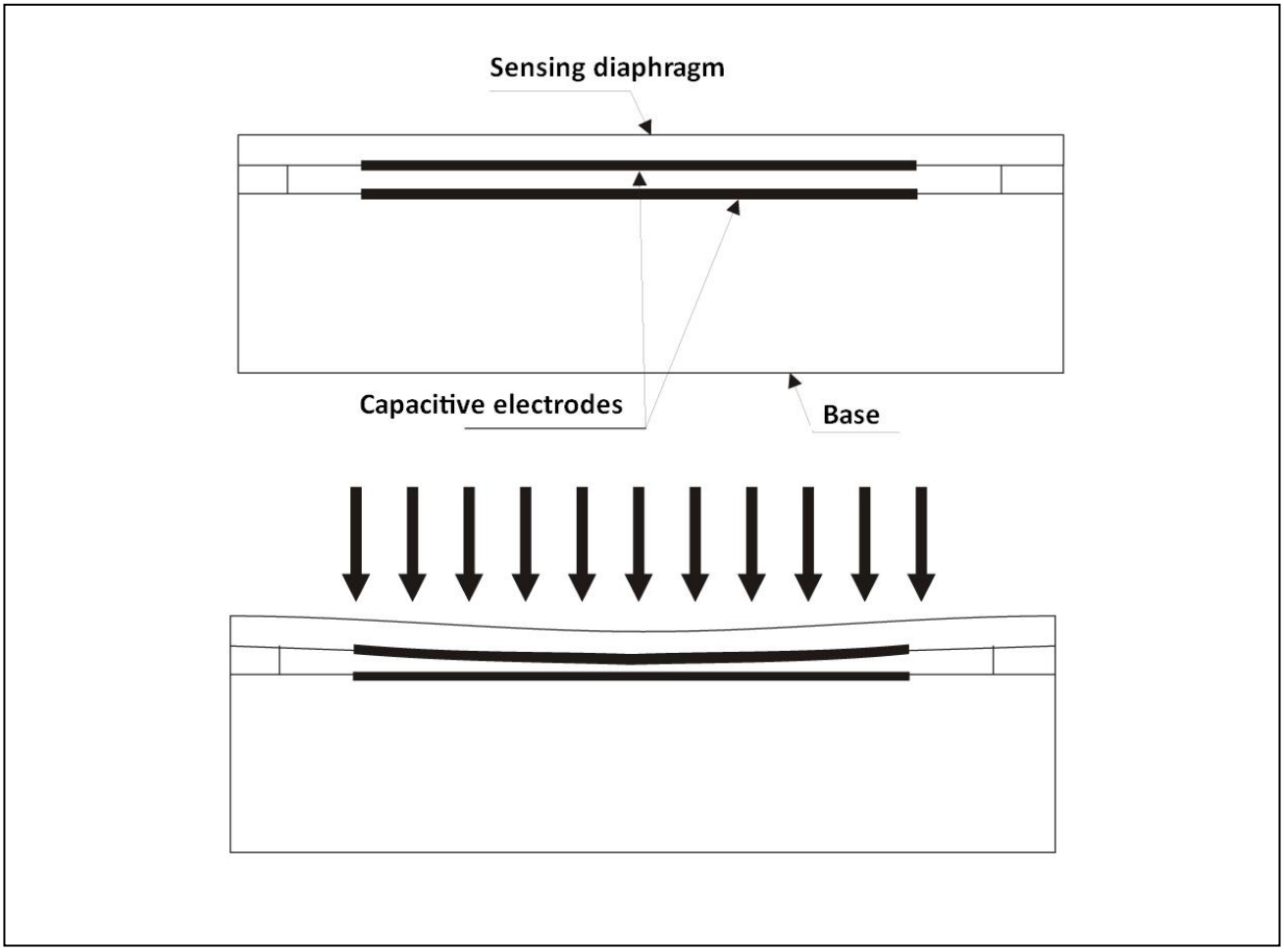
ATK80MA is solution for below applications:

- Pressure measurement of gas, vapor or liquid in various areas;
- Liquid level, volume or mass measurement;
- Integrated in a variety of user-defined solutions;
- Smart water and gas management, smart fire controlling, automotive electronics controlling, air compressor, HVAC, pump, valve and etc;

Features

- Specific high performance ASIC conditioning circuit;
- Dry ceramic capacitive pressure sensor;
- Robust ceramic capacitive sensitive membrane;
- Excellent anti-corrosive and anti-wear performance;
- Suitable for pollution and corrosive environment;
- Various electrical connectors optional;
- Rapid response, no hysteresis;
- Wide operating temperature range -40~135℃;
- Anti-icing;
- 0.5…4.5V and 4…20mA analog output or I2C and SPI digital output;
- Accurate, stable and reliable;

Working principle



ATK80MA series pressure transmitter uses W21 dry ceramic capacitive pressure sensor developed ATK as its measuring element. Dry ceramic capacitive pressure sensor has no liquid transfer. Process pressure acts directly on the front surface of the ceramic diaphragm. Capacitance change between the substrate electrode and the diaphragm electrode is proportional to the pressure value. The initial value of capacitance is fine adjusted by laser to be coincident as the proportion. When overloading, the film clings to the ceramic substrate without damage. When pressure resumes normal, its performance is not affected. W21 dry ceramic capacitive pressure sensor completely solved poor overload in low range shortcomings of diffused silicon sensor, and has been new generation products if diffused silicon sensor. The sensor has excellent temperature and time stability, and can contact with most media directly.

As no liquid transmission and no liquid filling in ceramic capacitive sensor, there will be no production process pollution. So it can be widely applied in food, medicine, refrigeration, automotive and etc. In addition to dry ceramic capacitive diaphragm, installation direction will not have any influence. Pressure transmitter with it as sensitive component can be widely used various pressure measurement situations.

Capacitive pressure sensor has excellent temperature stability; working with ASIC dedicated signal conditioning circuit, it can be temperature compensated in -40 ~ 125 ℃. The dual capacitance structure designed internally with main capacitor (Co) and reference capacitor (Cref) can offset most temperature and non-linearity errors.

Technical information

Performance

Input	
Pressure type	Gauge pressure, sealing pressure, absolute pressure
Measure range	0-0.5-~15MPa
Output	
Analog	0.5…4.5V, 4…20mA , 0…10 V, 1 …5V, 0…5V
Digital	I^2C, SPI
Accuracy	
0.5%	Linearity, hysteresis, repetitiveness：＜0.5% sensor full range
1%	Linearity, hysteresis, repetitiveness：＜0.1% sensor full range
Thermal effects	
Compensation Temperature	-20…70℃
Temperature effect	
Accuracy 0.5%	In compensation temperature, accuracy is ±0.5% for LRV & URV are lower than sensor full range
Accuracy 1%	In compensation temperature, accuracy is ±1% for LRV & URV are lower than sensor full range
Housing material	Stainless steel 304
Ingress protection	IP65/IP67

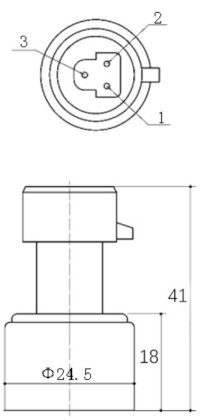
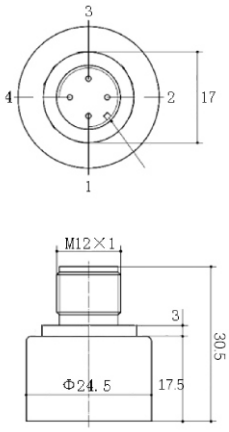
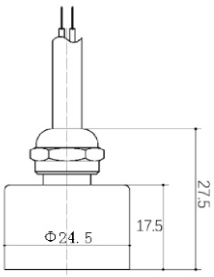
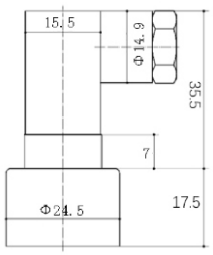
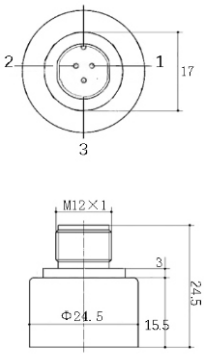
Power supply

Supply voltage	5V \24VDC regulated power supply
Supply voltage effect	5V supply voltage effect: min.3V/max.5.5V ● For 0.5…4.5V output sensor, voltage has no effect for linearity and temperature compensation, voltage is proportional to LRV and FRV. ● For I^2C and SPI digital output sensor, voltage has no effect for linearity, LRV, URV and compensation temperature. 24V supply power effect: min.9V/max30V ● For 4…20mA current output sensor, voltage has no effect for linearity, LRV, URV and compensation temperature.

Operating condition： Temperature

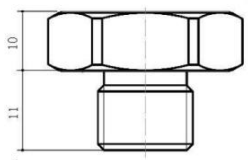
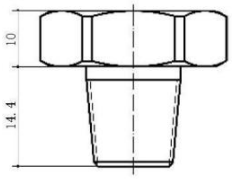
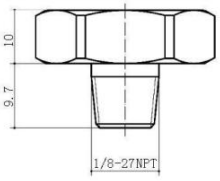
Process	-40 to 135℃
Storage	-45 to 85℃
Environment	-40 to 85℃

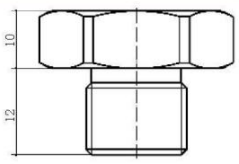
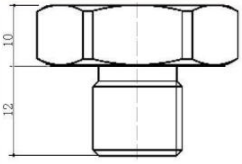
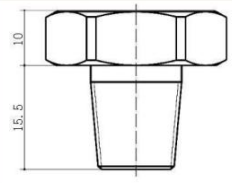
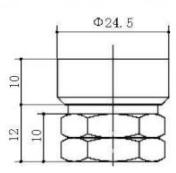
Electrical connection

Packard	M12*4P	Cable Outlet	Mini DIN43650	GX12-3
				
C1	**C2**	**C3**	**C4**	**C5**

Current (2 wire)	Voltage (3 wire)	Current (2 wire)	Voltage (3 wire)	I2C (4 wire)	Current (2 wire)	Voltage (3 wire)	Current (2 wire)	Voltage (3 wire)	Current (2 wire)	Voltage (3 wire)
Pin1: Supply V+ Pin2: Output Pin3: N/A	Pin1: Supply V+ Pin2: Common Pin3: Output	Pin1:Supply V+ Pin2: Output Pin3: N/A Pin4: N/A	Pin1:Supply V+ Pin2: Output Pin3:Common Pin4:N/A	Pin1: Supply V+ Pin2: SCL Pin3:Common Pin4:SDA	Red: Supply V+ Green: Output	Red: Supply V+ Green:Common Yellow: Output	Pin1:Supply V+ Pin2: Output Pin3: N/A	Pin1: Supply V+ Pin2: Common Pin3: Output	Pin1: Supply V+ Pin2: Output Pin3: N/A	Pin1: Supply V+ Pin2: Common Pin3: Output

Process connection

Thread	G1/4	1/4-18NPT	1/8-27NPT
Units in mm Hexagon is 25mm			
Code	P1	P2	P3

Thread	M14×1.5	M12×1.5	1/4-19PT	7/16-20UNF(female)
Units in mm Hexagon is 25mm				
Code	P4	P5	P6	P7

Ordering Information

Model	Product description
ATK80MA	**Pressure Transmitter**
Code	**Pressure type**
A	Absolute pressure
G	Gauge pressure
S	Sealing pressure
Code	**Accuracy**
F	0.5%
O	1%
Code	**Sensor range**
A	5bar
B	10 bar
C	20 bar
D	50 bar
E	100 bar
F	150 bar
Other ranges are in developing	
Code	**Output**
1	0.5...4.5V
2	4...20mA
3	I^2C
4	SPI
5	0...10V
6	1...5V
7	0...5V
X	Customization
Code	**Electrical connector**
C1	Packard
C2	M12*4P
C3	Cable outlet（pls put down cable length, such as 01 for 1 meters）
C4	Mini DIN43650
C5	GX12-3
CX	Customization
Code	**Process connector**
P1	G1/4
P2	1/4-18NPT
P3	1/8-27NPT
P4	M14×1.5
P5	M12×1.5
P6	1/4-19PT
P7	7/16-20UF(female)
PX	Customization
Pls contact ATK for other process connectors	
Typical model：ATK80MA GFB2 C301 P1_____C3 direct cable outlet length is 1 meter.	