

ESS319-I2C Digital Pressure Sensor



■ Range: -100kPa...0kPa~10kPa...100MPa
 ■ Output: I2C
 ■ Accuracy: $\pm 0.5\%$ /FS(pressure); $\pm 0.5^\circ\text{C}$ (temperature)
 ■ Pressure Type: Gauge/Absolute
 ■ Power Supply: 3.3V/5V

Description

ESS319-I2C Digital Pressure Sensor can transfer the measurement signals of pressure and liquid level to I2C digital output. With the fast and accurate interface, the ESS319-I2C is used to build an Internet of Things using a microcontroller. It can read data and control power on and off to reduce power consumption through microprocessor operation.

ESS319-I2C Digital Pressure Sensor is available ranges from -100KPa to 100MPa.

Key Features & Benefits

- Digital compensation for sensor offset, sensitivity, temperature drift and nonlinearity
- 32-bit customer ID field for module traceability
- Digital output of temperature and pressure in I2C bus mode
- Fast power-on to data output response: 3ms
- Low power consumption, sleep mode operation, as low as 5 μA , current consumption depends on the programmed sampling rate
- Operating temperature: -40°C to $+85^\circ\text{C}$
- Wide supply voltage capability: 3.3V/5V

Standard Range

Range	Overload	Output/F.S (mV)	Typical Value(mV)	Pressure
0~10KPa	300%	35~60	45	G
0~20KPa	300%	70~110	90	G/A
0~35KPa	300%	55~80	70	G/A/D
0~70KPa	300%	55~80	60	G/A/D
0~100KPa	300%	60~85	75	G/A/D
0~200KPa	300%	60~85	75	G/A/D
0~400KPa	300%	60~80	70	G/A/D
0~600KPa	200%	90~120	100	G/A/D

Technical Parameters

Parameters	Typ.	Max.	Unit
Nonlinearity	0.2	0.5	%FS
Hysteresis	0.05	0.1	%FS
Repeatability	0.05	0.1	%FS
Zero Output	± 1	± 2	mV DC
FS Output	100		mV DC
Input/ Output	2.6	3.8	k Ω
Zero Temp. Drift*	± 0.15	± 0.8	%FS, @25°C
Sensitivity Temp. Drift*	± 0.2	± 0.7	%FS, @25°C

0~1.0 MPa	200%	125~185	150	G/A/D
0~1.6 MPa	200%	80~120	100	G/A/D
0~2.0 MPa	200%	50~70	60	G/A/D
0~3.5 MPa	200%	100~120	110	G/A/D
0~7.0 MPa	200%	120~150	135	G/A
0~10 MPa	200%	180~230	200	G/A
0~25 MPa	150%	140~170	150	S
0~40 MPa	150%	230~280	250	S
0~60 MPa	150%	100~160	130	S
0~100 MPa	150%	100~150	120	S

Notes: G for Gauge pressure; A for Absolute pressure; D for Differential pressure; S for Sealed gauge.

Long-term Stability	0.1	%FS/year
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Range -100kPa~100MPa

*The typical value of 0~10kPa and 0~20kPa's zero temperature drift and sensitivity temperature drift is 0.4%FS@25°C, max value is 1.6%FS@25°C



Construction Performance

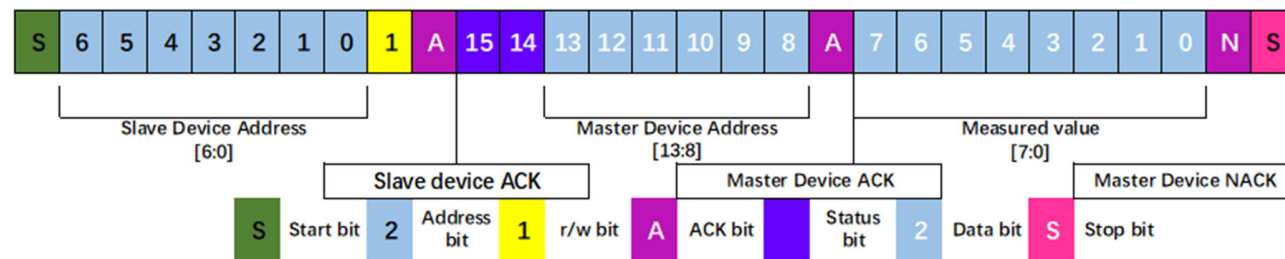
- Diaphragm:** Stainless Steel 316L
- Housing:** Stainless Steel 316L
- Pressure leading tube:** Stainless Steel 316L
- O Ring:** Φ16*1.8mm (nitrile rubber or viton)
- Measuring Medium:** Which is compatible with SS316L, viton, nitrile rubber
- Packing Medium:** Silicon Oil
- Net weight:** 20~30g

Electric & Environment Performance

- Power supply:** 5±0.1Vdc; 3.3±0.1Vdc;
- Insulation Resistance:** 500MΩ@500VDC
- Overpressure:** 1.5~3 times FS
- Vibration (20~500Hz):** 20G
- Storage Temp.:** -40~+125°C
- Operating Temp.:** -40~+85°C
- Compensation Temp.:** 0~50°C; -10~80°C
- @ 0 ~ 70 (7kPa,20 kPa,35 kPa)

Data Measurement & Communication Sequence

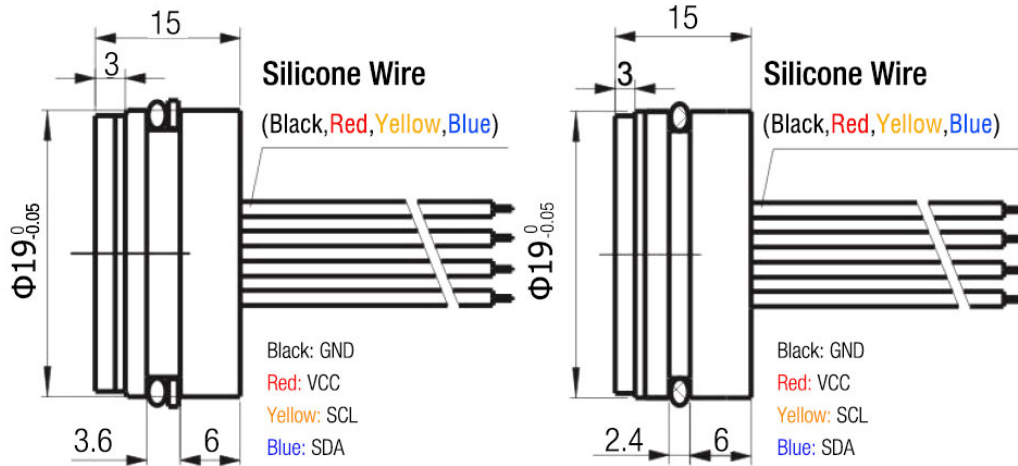
For read and write operations, the master device commands to start, and sends an ACK (acknowledgement) as a slave device to indicate success. The factory address of the slave device is 0x28, and the communication sequence is shown as below



Parameters	Typ	Unit
Zero pressure output(5%)	333	Hex
Zero pressure output(10%)	666	Hex
Full-scale pressure output (90%)	399A	Hex
Full-scale pressure output (95%)	3CCB	hex

Drawing

ESS319-I2C Digital Pressure Sensor Range: -100kPa...0kPa~10kPa...100MPa



Ordering Procedure

ESS3	High Stable OEM Piezoresistive Sensor						
	Code	Model					
	19-I2C	Digital Pressure Sensor					
		Cod	Span	Code	Span	Code	Span
		R01	0~10KPa	R07	0~400KPa	R13	0~7.0 MPa
		R02	0~20KPa	R08	0~600KPa	R14	0~10 MPa
		R03	0~35KPa	R09	0~1.0 MPa	R15	0~25 MPa
		R04	0~70KPa	R10	0~1.6 MPa	R16	0~40 MPa
		R05	0~100KPa	R11	0~2.0 MPa	R17	0~60 MPa
		R06	0~200KPa	R12	0~3.5 MPa	R18	0~100 MPa
		Code	Pressure Type				
		G	Gauge				
		A	Absolute				
		S	Sealed Gauge				
		Code	Power Supply				
		C	3.3V				
		E	5V				
		Code	Pressure connection				
		0	O-ring -NBR				
		1	O-ring -Viton				
		Code	Electric connection				
		1	Kovar pin				
		2	Rubber flexible silicon wires (10cm)				
ESS3	19-I2C	R10	G	E	0	2	

Note: ① Extremely attention must be paid to sensor installation process to avoid any miss conduction that affect the sensor performance, ② please protect the diaphragm and the compensated board carefully to prevent any damage. ③ Please contact us if your requested working temperature lower than -20°C