

ESS501I Ceramic Pressure Sensor Module (with PCB)



▪ Range: 0~2bar~50bar ▪ Diaphragm Material: Ceramic Al₂O₃ 96% ▪ Integrated accuracy: 0.5% ▪ Output: 0.5-4.5Vdc

Description

Based on ESS501, ESS501I pressure sensors module is integrated with pcb which amplify the output from mv to analogy signal such as 0.5-4.5Vdc or 4-20mA.

Because of the Al₂O₃ ceramic excellent chemical resistance (aggressive gases, most of solvents and acids, etc.), no additional protection is normally required.

Key Features & Benefits

- Pressure range 0bar-50bar
- Excellent resistance to corrosion and abrasion
- Absolute measurement available
- Thermally compensated
- Extended customization
- Extended choice of measuring ranges

Application

- Cooling equipment & A/C system
- Automotive and vehicle
- Industrial process control
- HVAC system
- Refrigeration equipment
- Air conditioning unit

Technical Characteristics [for sensor element]

Parameter	Units	Description
Sensor type	-	Flush diaphragm, absolute (A), gauge (R) or sealed gauge (S)
Technology	-	Piezoresistive
Diaphragm material	-	Ceramic Al ₂ O ₃ 96% (standard), 99.6% or sapphire (on request)
Weight	g	≤ 8 (ceramic cell only)
Response time	ms	≤ 1
Supply voltage	VDC	2...30
Offset	mv/v	- 0.1 ± 0.1 (Other nominal values available on request)
Current cons.	mA	≤ 1.3 @ 10V
Operating	°C	-40...+135 (-40 °F...+275 °F)
Storage temperature	°C	-40...+150 (-40 °F...+302 °F)
Impedance	kΩ	11 ± 30%

Nominal pressure FSO	bar	0.5	1	2	5	10	20	50	100	200	400	600	800
	psi	7	14	29	73	145	290	725	1450	2900	5800	8700	11600
Overload pressure	bar	1	2	4	10	15	35	100	150	350	500	750	1000
	psi	14	29	58	145	217	507	1450	2175	5075	7250	10875	14500
Burst pressure	bar	2	3	6	15	25	65	120	200	500	650	950	1250
	psi	29	43	87	217	362	942	1740	2900	7250	9425	13775	18125
Vacuum capability	bar	-0.1	-0.5	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	psi	-1.4	-7	-14	-14	-14	-14	-14	-14	-14	-14	-14	-14
Type	-	R	A/R/S	A/R/S	A/R/S	A/R/S	A/R/S	A/R/S	S	S	S	S	S
Total thickness	mm	6.15	6.17	6.23	6.30	6.35	6.55	6.70	6.70	7.05	7.32	7.55	8.05
	in	0.242	0.2432	0.245	0.248	0.250	0.258	0.263	0.263	0.278	0.288	0.297	0.317
Sensitivity 2	mv/v	1.4-2.4	2.0-3.6	2.3-3.5	2.3-4.0	3.1-5.5	2.4-4.0	4.0-6.0	3.0-4.8	2.5-3.9	3.1-4.8	3.1-4.8	2.0-3.5
Accuracy 3	%/fs	0.4/0.9	0.3/0.9	0.3/0.6	0.2/0.4	0.2/0.5	0.2/0.5	0.2/0.5	0.2/0.5	0.4/0.9	0.5/1.0	0.5/1.0	0.5/1.0
Thermal offset shift (typ./max.)	%/fs/k	± 0.005 / ± 0.040					25 °C...85 °C			(77 °F...185 °F)			
Thermal span shift	%/fs/k	≤ ± 0.010					0 °C...70 °C			(32 °F...158 °F)			
		≤ ± 0.012					-25 °C...0 °C / 70 °C...85 °C			(-13 °F...32 °F / 158 °F...185 °F)			
		≤ ± 0.014					-40 °C...-25 °C / 85 °C...135 °C			(-40 °F...-13 °F / 185 °F...275 °F)			
Reliability tests 4	-	1000 hours @85 °C (185 °F) & 85 %RH					500 thermal shocks -40°C...+150 °C (-40 °F... +302 °F)						
		1000 hours burn-in @150 °C (302 °F)					10 million 0 bar to Pnom pressure cycles						

Tests performed at 25°C in Metallux housings, unless otherwise specified. Different housings may affect performances.

1. Psi values for reference only.
2. The sensitivity of each production batch is constant, within the indicated range and with minimal dispersion.
3. Accuracy = -(NonLinearity2+Hysteresis2 +NonRepeatability2, terminal based).
4. All technical characteristics will remain within indicated ranges performing the above-mentioned reliability tests.

Drawing

ESS501I Ceramic Piezo-resistive Pressure Sensor module Range: 0bar~50bar

<p>Top View</p>	<p>Schematics</p> <table border="1" style="width: 100%; text-align: center;"> <tr> <td>1</td> <td>2</td> <td>3</td> </tr> <tr> <td>“+”</td> <td>Signal output</td> <td>“-”</td> </tr> </table>	1	2	3	“+”	Signal output	“-”
1	2	3					
“+”	Signal output	“-”					

Ordering Procedure

ESS5	Ceramic Piezoresistive Pressure Sensor						
	Code	Model					
	01	Pressure Sensor					
	011	Pressure Sensor Module (with pcb)					
		Code	Span	Code	Span		
		R01	0...0.5 bar [0...7psi]	R07	0...50 bar [0...720psi]		
		R02	0...1 bar [0...14psi]	R08	0...100 bar [0...1450psi]		
		R03	0...2 bar [0...29psi]	R09	0...200 bar [0...2900psi]		
		R04	0...5 bar [0...72psi]	R10	0...400 bar [0...5800psi]		
		R05	0...10 bar [0...145psi]	R11	0...600 bar [0...8700psi]		
		R06	0...20 bar [0...290psi]	R12	0...800 bar [0...11600psi]		
		Code	Pressure Type				
		R	Gauge				
		A	Absolute				
		S	Sealed Gauge				
		Code	Sensitivity adjustment				
		0	Without				
		9	On request				
		Code	Output				
		0	0.5-4.5Vdc				
		1	0-5Vdc				
		2	0-10Vdc				
		9	4-20mA				
		Code	Termination type				
		01	5 pins 13 mm ± 0.5 mm, pitch 2.54 mm				
		31	5 pins 9 mm ± 0.5 mm, pitch 2.54 mm				
		02	4 pins 13 mm (without LO (-)) ± 0.5 mm, pitch 2.54 mm				
		32	4 pins 9 mm (without LO (-)) ± 0.5 mm, pitch 2.54 mm				
		03	5 pre-tinned soldering pads, pitch 2.54 mm				
		04	NOMEX™ cable 50.8 mm – 5 wires, pitch 2.54 ± 0.5 mm				
		05	PVC flat cable 50.8 mm – 5 wires, pitch 1.27 mm				
		09	Polyester cable 50.8 mm – 5 wires, pitch 2.54 mm				
		06	4 pins 13 mm ± 0.5 mm (without LO (+)) pitch 2.54 mm				
		36	4 pins 9 mm ± 0.5 mm (without LO (+)) pitch 2.54 mm				
		07	5 pins 13 mm ± 0.5 mm – open bridge, pitch 2.54 mm				
		37	5 pins 9 mm ± 0.5 mm – open bridge, pitch 2.54 mm				
		99	Others on request (please specify)				
		Code	Accuracy				
		1	0.5%				
		2	1.0%				
		9	Others on request (please specify)				
ESS5	011	R06	R	0	2	31	1

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