Micro Structural Pressure Sensor

The range is 0psi to 1psi to 0psi to 100psi

ASDX DO series

characteristic

- There are absolute pressure type, differential pressure type and gauge pressure type● Calibrated output with temperature compensation
- Pressure ranges from 0psi to 1 psi to 0psi to 100psi
- Response time 8ms
- Standard DIP packaging
- ASIC enhanced output
- ^{2} I-Collaboration Agreement
- There is temperature compensation

Typical applications

- Flow calibrator
- Ventilation and air volume monitor
- Gas flow meter
- dialysis apparatus
- Sleep apnea monitoring and treatment device
- HVAC (heating, ventilation and air conditioning) control device
- Barometric measurements
- air-operated controller

The ASDX DO series pressure sensors feature an integrated application-specific circuitry(ASIC), which has undergone comprehensive calibration with temperature compensation. These sensors are packaged in standard DIP configurations, enabling digital correction of sensor bias, sensitivity, temperature coefficients, and nonlinearity. The ASDX series employs I ^{2} C-compatible protocols, allowing seamless integration with mainstream microcontrollers and microprocessors without requiring additional components or electronic circuits.

The dual-line I ^{2} C interface features a serial clock input (SCL) and a digital output port. This pressure sensor delivers calibrated readings in 16-bit resolution, providing calibrated pressure values. It is suitable for measuring absolute pressure, differential pressure, and gauge pressure. The absolute pressure sensor incorporates an internal vacuum reference, enabling direct output of signals proportional to absolute pressure values. The differential pressure variant allows simultaneous pressure application on either side of the sensing diaphragm, making it capable of measuring both gauge pressure and differential pressure.

All ASDX DO pressure sensors deliver an accuracy of ±2.0% across their full measurement range, featuring a single 5V DC power supply. Designed and manufactured in compliance with ISO 9001 standards, this series is suitable for non-corrosive, non-ionized working fluids such as air and dry gases.

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outline specification

service voltage （Vs）	4.75 Vdc to 5.25 Vdc
Maximum supply voltage*	6.50 Vdc
current consumption	6 mA (typical value)
Output current-sinking current	Maximum 2 mA
Output current-source current	Maximum 2 mA
Wire welding temperature	250℃[482°F] at 2s to 4s

Environmental indicators (all installations)

temperat-ure	
compensation range	0℃to 85℃[32°F to 185°F]
working range	-20℃ to 105℃ [−4°F to 221°F]
Storage scope	-40℃ to 125℃ [-40°F to 257°F]
vibrate	10g at 20Hz to 2000Hz
lash	100g hold 11ms
life length	At least 1 million cycles

Performance characteristics **4R DO (1,5) series**

characte-ristic	symbol	least value	representative value	crest value	unit
Zero pressure bias	Hoff	158	19A	1DB	Next, the 16th
Full scale (2)	Hfss		CCC		Next, the 16th
Output at full scale pressure	Hfso	E25	E66	EA8	Next, the 16th
Accuracy (3)	-	-	-	±2.0	full scale %H
Response time(4)	-	-	8	11	ms

Performance characteristics **4D DO (1,5) series**

characte-ristic	symbol	least value	Typical values (5)	crest value	unit
Zero pressure bias	Hoff	7BE	800	841	Next, the 16th
Full scale (2)	Hfss		CCC		Next, the 16th
Output at full scale pressure (P2) (6)	Hfso	E25	E66	EA8	Next, the 16th
Output at full scale pressure (P1) (6)	Hfso	158	19A	1DB	Next, the 16th
Accuracy (3)	-	-	-	±2.0	full scale %H
Output resolution	-	-	12	-	Posi-tion
Response time(4)	-	-	8	11	ms

Technical specifications have a focus on:

Note **1:** Reference conditions (unless otherwise noted): supply voltage, Vs = 5.00±0.01Vdc; Ta = 25℃[77°F]. Output can be proportional within the supply voltage range (Vs).

Note **2:** Range is the algebraic difference between the output voltage at the highest rated pressure and the output voltage at the lowest pressure. The range is proportional to the supply voltage.

Note **3:** Precision refers to the combined error caused by bias, range calibration, linearity, pressure lag and temperature effects.

Linearity is the degree of deviation measured with a straight line as the basis.

Backlash refers to the maximum output difference between pressurization and depressurization at any point within the working pressure range.

Calibration errors include bias values and deviations between full scale and standard values.

Note 4: The response time for a step change from 4:0 psi to full scale pressure is 10% to 90% of the rise time.

Note 5: Read operation: *start, subordinate address, R / W 1, data byte 1 (MSB), confirmation bit, data byte 2 (LSB).*

The correct output value for pressure is an unsigned 12-bit signal. The slave address is F0h. Acknowledgment bit-Pulls the data line to LOW (low) level, triggering the master device to generate additional clock pulses. Note 6: This refers to the sensor's output value when maximum positive pressure is applied at either the rear (P2) or front (P1) of the sensor.

Note 7: If the maximum burst pressure is exceeded, the package may leak or burst, or cause the pressure sensing chip to rupture, even if for a short period of time.

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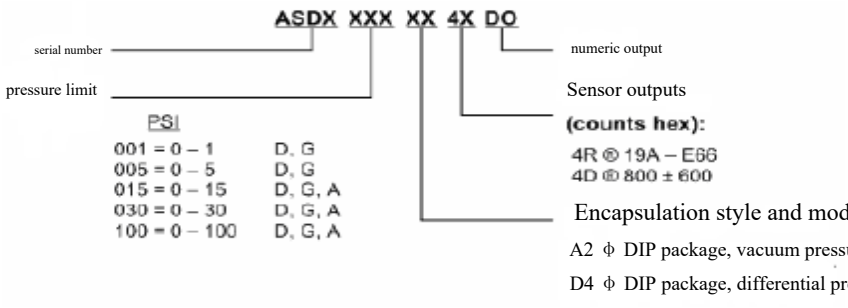
Pressure range specifications

identification of product	pressure limit	Explosive pressure (6)
ASDX001	0 psi to 1.0 psi	5 psi
ASDX005	0 psi to 5.0 psi	20 psi
ASDX015	0 psi to 15 psi	30 psi
ASDX030	0 psi to 30 psi	60 psi
ASDX100	0 psi to 100 psi	150 psi

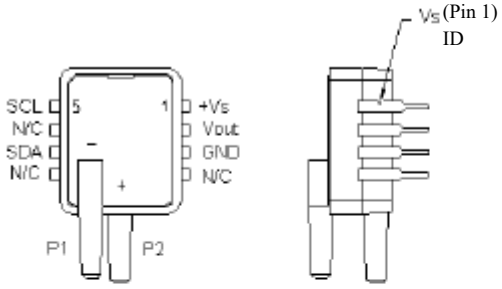
Order instructions-Description of part number



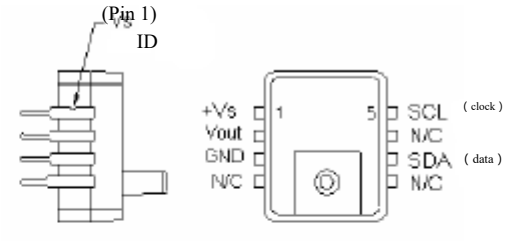
For example: Part number **ASDX015A24RDO** = ASDX series, 15 psi absolute pressure, Type A2 packaging, 19A-E66 counts (count) output, digital transmission

Connect wires (1)(2)(3)(4)

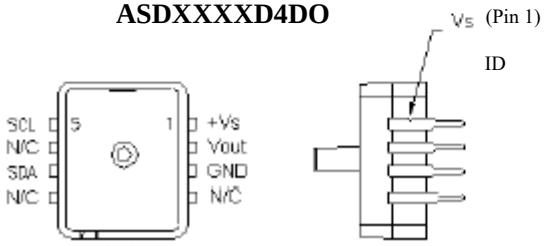
ASDXXXXG2DO



ASDXXXXA2DO



ASDXXXXD4DO



Note **1:** Pin 6 must be in the off state.

Note **2:** Use a 220 nF capacitor between +Vs and GND (ground) and a 15 nF capacitor between Vout and GND.

Note **3:** This sensor has no reverse polarity protection. Electrical faults may occur due to incorrect use of excitation voltage or incorrect pin grounding. Electrical faults may also occur if the supply voltage exceeds the maximum value.

Note **4:** N/C means not connected. Grounding or connection to other potentials may damage the sensor.

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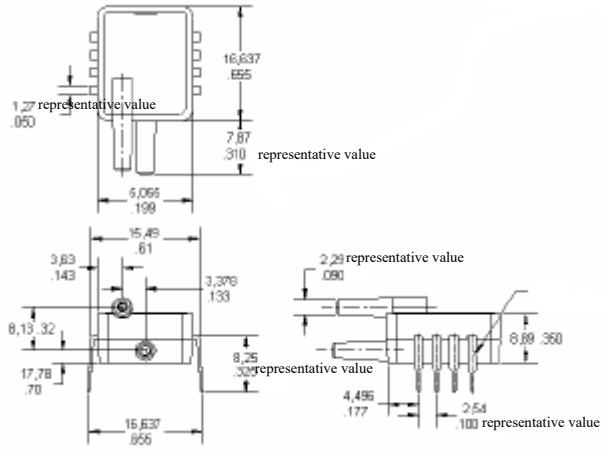
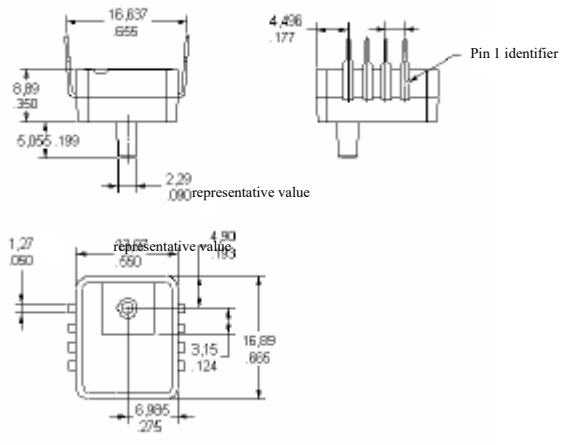
Size diagram-for reference only in **mm [in]**

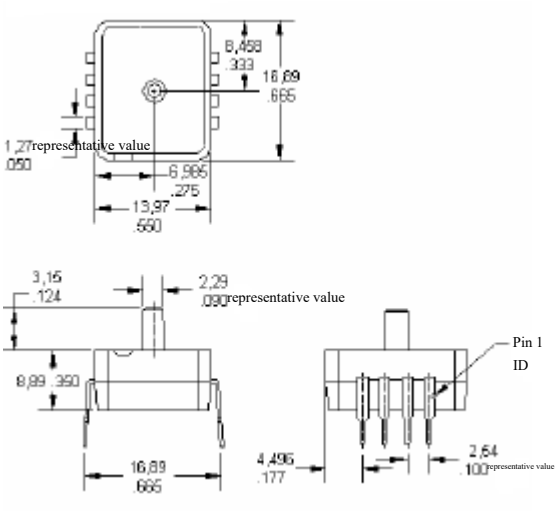
D4 packaging



G2 encapsulation

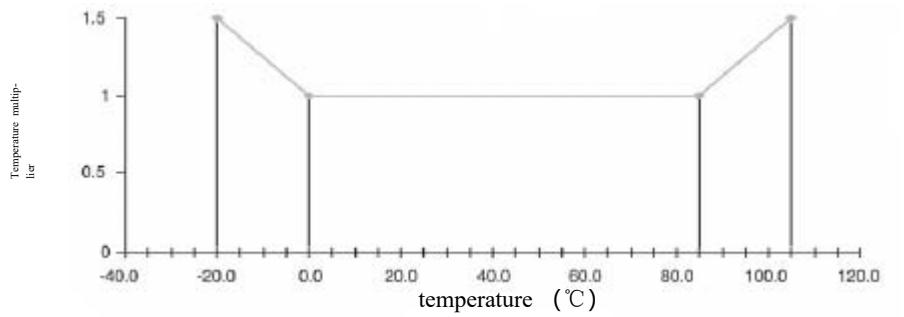


A2 Enclosure



Performance Characteristics of Pressure Sensor

Error band multiplier in the range of-20℃ to 105℃ [-4°F to 221°F]



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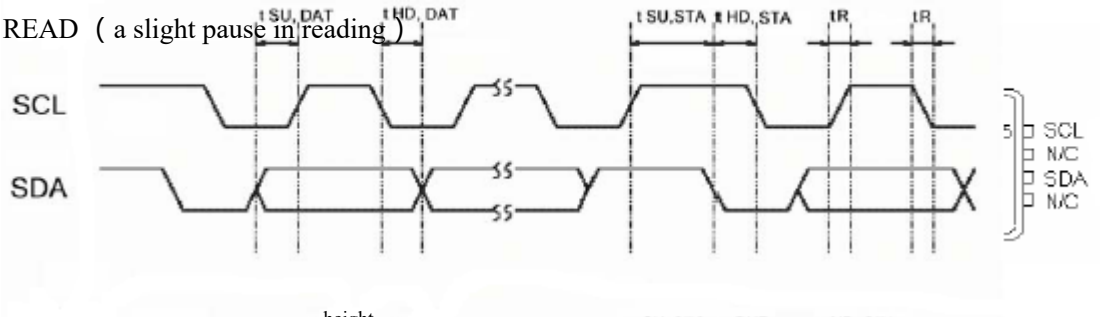
Serial interface parameters

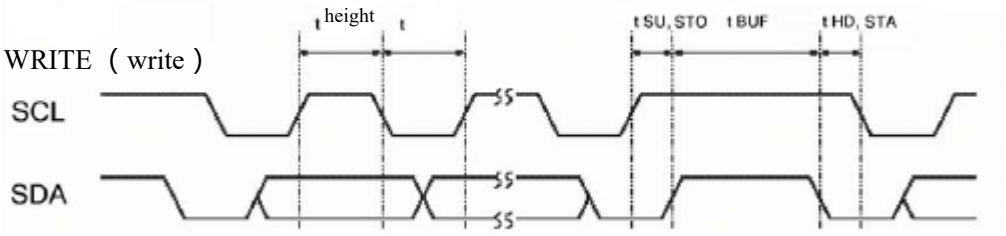
parameter	symbol	condition	least value	model	crest value	unit
high-level input	V_{IH}		4.5	-	1	Vs
Low-level input	V_{IL}		0	-	0.5	Vs
Low-level output	V_{OL}	Open circuit leakage current I_{OL} ϕ -4mA		-	0.1	Vs
action current	V_{OH}	Plug-in SCL and SDA	5	-	20	μA
load capacity SDA	CL_{-SDA}		-	-	400	pF
SCL clock pulse frequency	f_{SCL}		-	-	100	kHz
Bus idle time between STOP (stop) and START (start) states	T_{BUF}		4.7	-	-	μs
Duration (repeat) of START state	$t_{HD, STA}$	The first clock pulse	4.0	-	-	μs
SCL's LOW (low pulse frequency) time	t_{LOW}		4.7	-	-	μs
SCL's High (high pulse frequency) time	t_{HIGH}		4.0	-	-	μs
Establishment time (repeat) in START state	$t_{SU, STA}$		4.7	-	-	μs
Data persistence	$t_{HD, DAT}$		0	-	-	ns
Data establishment time	$t_{SU, DAT}$		250	-	-	ns
The rise time of both SDA and SCL	t_R		-	-	300	ns
The time of decline of both SDA and SCL			-	-	300	ns
Establishment time in STOP state	$t_{SU, STO}$		4	-	-	μs
Input filter peak suppression	t_{SP}	Inhibition of the peak of an SDA or SCL of a certain length	-	-	50	μs

Timing characteristics of serial interface

READ （a slight pause in reading）



WRITE （write）



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Order instructions, use the following part numbers when ordering

pressure limit	Differential type/ gauge pressure type	Tablet-type	Exhaust-type
0 psi to 1.0 psi	ASDX001D44R-DO	ASDX001G24R-DO	-
	ASDX001D44D-DO	-	-
0 psi to 5.0 psi	ASDX005D44R-DO	ASDX005G24R-DO	-
	ASDX005D44D-DO	-	-
0 psi to 15 psi	ASDX015D44R-DO	ASDX015G24R-DO	ASDX015A24R-DO
	ASDX015D44D-DO	-	-
0 psi to 30 psi	ASDX030D44R-DO	ASDX030G24R-DO	ASDX030A24R-DO
	ASDX030D44D-DO	-	-
0 psi to 100 psi	ASDX100D44R-DO	ASDX100G24R-DO	ASDX100A24R-DO

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