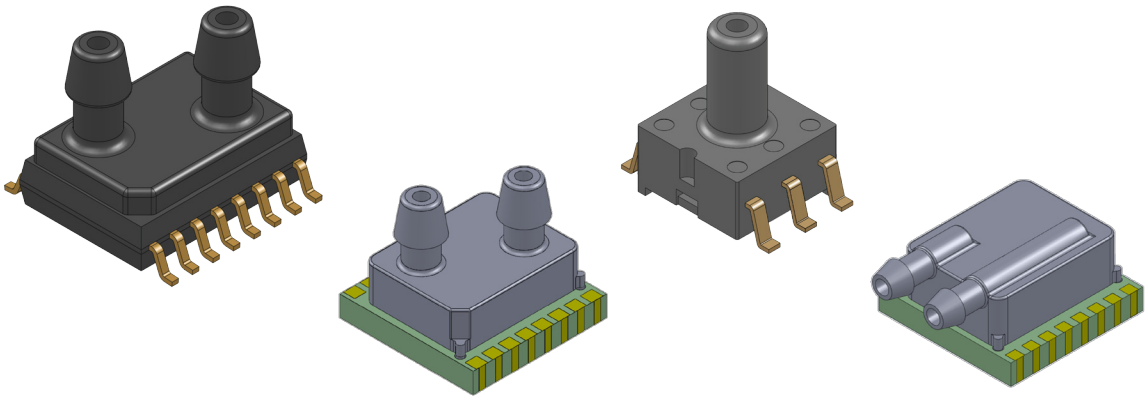
BLCR Series - Basic Low Pressure Compact Sensor Series



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Introduction

The BLCR Series Basic Sensor is based on a Dual Die Reference technology to reduce all output offset or common mode errors. It also incorporates All Sensors CoBeam² Technology to reduce the overall supply voltage while maintaining comparable output levels to traditional equivalent basic sensing elements. This lower supply voltage gives rise to improved warm-up shift while the CoBeam² Technology itself reduces package stress susceptibility resulting in improved overall long term stability. The technology also vastly improves position sensitivity to nearly unmeasurable levels.

This series is intended for use with non-corrosive, non-ionic working fluids such as air and dry gases. The output is also ratiometric to the supply voltage and is operable from 1.8 to 3.3 volts DC.

https://www.allsensors.com/products/blcr-series

For All Sensors Corporation's most recent quality certification documents, please visit www.allsensors.com

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Features

- Pressure Ranges from 1 to 30 inH2O
- Low Supply Voltage (1.8V to 3.3V)
- 0.1% Linearity Typical
- Improved Front to Back Linearity
- Less Position Sensitivity
- Improved Warm-Up Shift Distribution
- Reduced TCO

Applications

- Medical Breathing
- Environmental Controls
- HVAC

Pressure Sensor Maximum Ratings

Supply Voltage (Vs)	6 Vdc
Common Mode Pressure	5 psig
Lead Temperature (soldering 2-4 sec.)	270°C
Maximum Device Temperature	245°C

Environmental Specifications

Temperature Ranges

Operating	-25°C to 85°C
Storage	-40°C to 125°C

Humidity Limits (non condensing) 0 to 95% RH

Standard Pressure Ranges

Low Pressure Products

Device	Operating Range [A]		Proof Pressure		Burst Pressure	
BLCR-L01D	± 1 inH2O	0.25 kPa	100 inH2O	24.91 kPa	150 inH2O	37.36 kPa
BLCR-L05D	± 5 inH2O	1.25 kPa	200 inH2O	49.82 kPa	300 inH2O	74.72 kPa
BLCR-L10D	± 10 inH2O	2.49 kPa	200 inH2O	49.82 kPa	300 inH2O	74.72 kPa
BLCR-L20D	± 20 inH2O	4.98 kPa	200 inH2O	49.82 kPa	500 inH2O	124.54 kPa
BLCR-L30D	± 30 inH2O	7.47 kPa	200 inH2O	49.82 kPa	800 inH2O	199.27 kPa

Note A: Ranges in kPa are expressed as an approximate value.

Performance Characteristics for BLCR Series

All parameters are measured at 3.3 volt excitation and room temperature unless otherwise specified. Pressure measurements are with positive pressure applied to PORT B (the only port for the single port configuration).

Parameter	Min	Typ	Max	Units	Notes
Output Span (FSS)					
L01D	3.71	-	6.35	mV	4
L05D	14.85	-	27.23	mV	4
L10D	14.85	-	36.3	mV	4
L20D	14.85	-	36.3	mV	4
L30D	11.14	-	40.84	mV	4
Offset Voltage @ Zero Diff. Pressure	-	-	±10.0	mV	-
Offset Temperature Shift (0°C-70°C)	-	±4.0	-	µ V/°C	1
Offset Warm-up Shift	-	±10.0	-	µ V	-
Offset Position Sensitivity (1g)	-	±20.0	-	µ V	2, 6
Linearity, Hysteresis Error	-	0.10	±0.5	%FSS	3
Response Time (10% to 90% Pressure Response)	-	100.0	-	µ S	-
Front to Back Linearity	-	0.25	-	%FSS	5
Temperature Effect on Resistance (0°C-70°C)	-	2,800	-	ppm/°C	-
Temperature Effect on Span (0°C-70°C)	-	-2,000	-	ppm/°C	-
Input Resistance	-	1.7	-	k Ω	-
Output Resistance	-	1.7	-	k Ω	-

Specification Notes

NOTE 1: Shift is relative to 25°C.

NOTE 2: Shift is within the first hour of excitation applied to the device.

NOTE 3: Measured at one-half full scale rated pressure using best straight line curve fit.

NOTE 4: The span is the algebraic difference between full scale output voltage and the offset voltage.

NOTE 5: Front-Back Linearity computed as: $$Lin_{FB} = \left(\left| \frac{Span_{PortB}}{Span_{PortA}} \right| - 1 \right) \cdot 100\%$$

Soldering Recommendations

1) Solder parts as a second operation only.
2) For D4 package post reflow, wait for 72 hours before performing any calibration operations.
3) For all other packages post reflow, wait for 36 hours before performing any calibration operations.
4) Perform spot cleaning as necessary only by hand. **DO NOT** wash or submerge device in cleaning liquid.
5) Max 270°C lead temperature (soldering 2-4 sec.)

If these devices are to be subjected to solder reflow assembly or other high temperature processing, they must be baked for 1 hour at 125°C within 24 hours prior to exposure. Failure to comply may result in cracking and/or delamination of critcal interfaces within the package, and is not covered by warranty.

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How To Order

For example, **BLCR-L01D-D4-P** defines an All Sensors' BLCR Basic Output Low Pressure Compact Series sensor, 1 inH_2O differential pressure range, D4 package, with Parylene coating.

BLCR - L01D - D4 - P

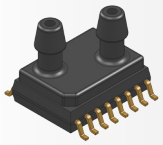
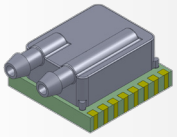
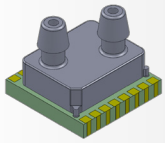
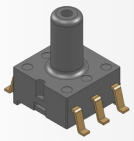
Product Series

BLCR	Basic Output Low Pressure Compact Series

Pressure Ranges

L01D	±1 inH2O
L05D	±5 inH2O
L10D	±10 inH2O
L20D	±20 inH2O
L30D	±30 inH2O

Package Selection

D4	
LD2	
LD4	
U2	

Coating

P	Parylene Coating
(Blank)	No Parylene Coating

Where:
Pressure Range (D4, LD2, LD4 Packages - Differential Only): L01D, L05D, L10D, L20D, L30D
Pressure Range (U2 Package - Gage Only): L01D, L05D, L10D, L20D, L30D

Example:

BLCR-L01D-D4-P	With Parylene Coating
BLCR-L01D-D4	No Parylene Coating

Parylene Coating:

Parylene coating provides a moisture barrier and protection from some harsh media.
Unlike other pressure sensor suppliers offering a Parylene coating, All Sensors performs this process in-house and uses an advanced production system to achieve the highest accuracy and reliability. This avoids transferring products out of and back to the pressure sensor manufacturing facility, provides complete quality control and improves the delivery time to customers. Specially designed masking techniques allow All Sensors to apply a cost-effective, high-volume Parylene coating in-house.

Consult factory for applicability of Parylene for the target application and sensor type.

This option is only available for pressure ranges of ±10 inH2O and above.

Product Identification for D4 and U2 Packages

Products are labeled via laser marking, as seen in Figure 1.

Figure 2 details how to interpret the part marking code. Low pressure ranges from 1 to 30 inH2O are specified with code "L" and high pressure ranges from 5 to 150 psi are specified with code "H"

The pressure range will be indicated on the same line as the wafer number before the starting character "B."

If parylene coated, the part will be marked with a "P" on the top. Please refer to package drawings.

Example: BLCR-L10D-D4

Figure 1: Product Labeling

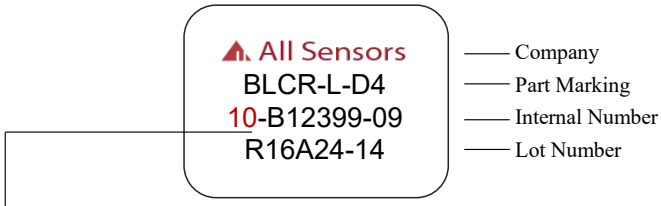


Figure 2: Part Marking

BLCR - L - D4

Series

Option
BLCR

Package

Option	Description
D4	SOIC, Dual Top Port, Differential Pressure
U2	SMT, Single Top Port, Gage Pressure

Pressure Type Identifier

Option	Description
L	1 to 30 inH2O

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Product Identification for LD2 and LD4 Packages

Products are labeled via laser marking, as seen in Figure 3.

If parylene coated, the part will be marked with a "P" on the top. Please refer to package drawings.

Example: BLCR-L01D-LD2

Figure 3: Product Labeling

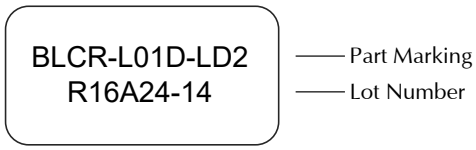
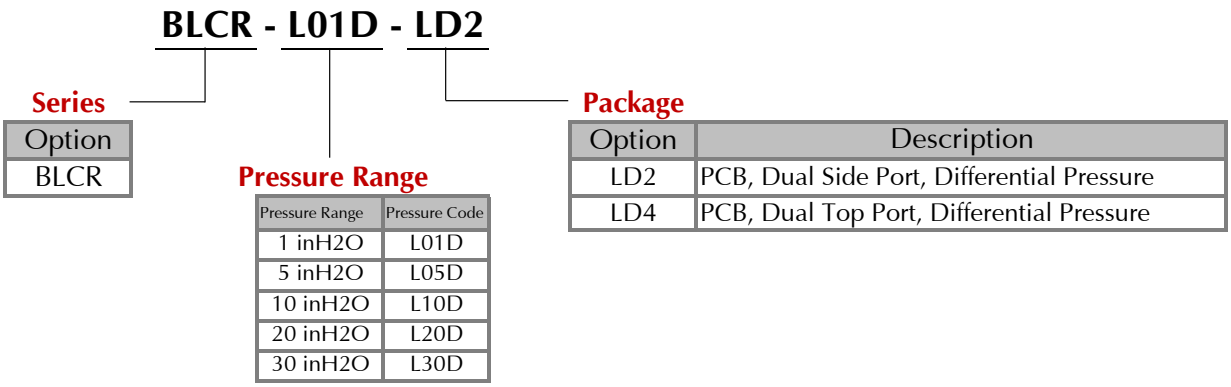


Figure 4: Part Marking



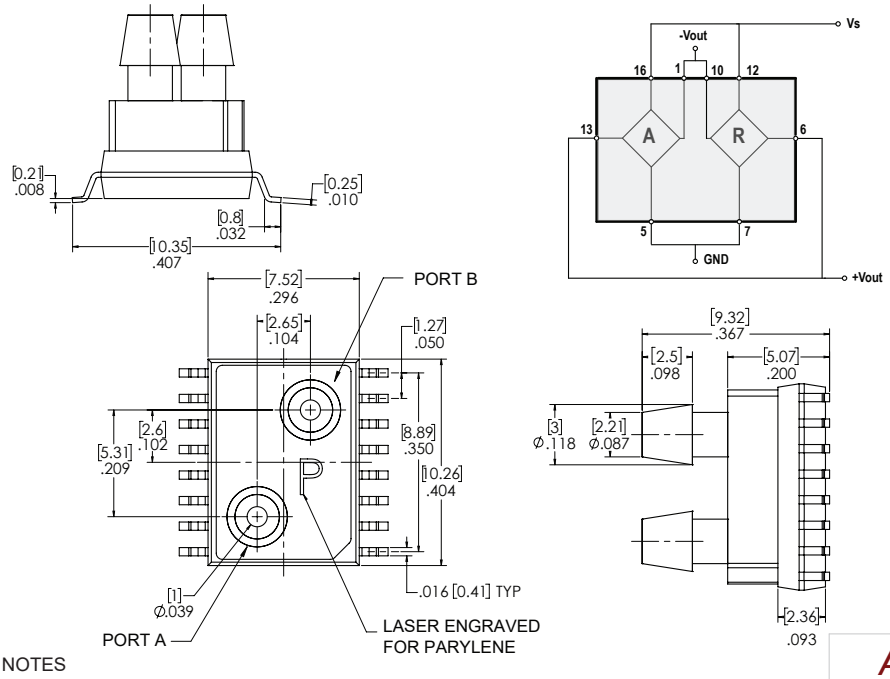
Option
BLCR

Pressure Range	Pressure Code
1 inH2O	L01D
5 inH2O	L05D
10 inH2O	L10D
20 inH2O	L20D
30 inH2O	L30D

Option	Description
LD2	PCB, Dual Side Port, Differential Pressure
LD4	PCB, Dual Top Port, Differential Pressure

Package Drawings

D4 Package



Pin	Definition
1	-OutA
2	N/C
3	N/C
4	N/C
5	GndA
6	-OutR
7	GndR
8	N/C
9	N/C
10	+OutR
11	N/C
12	+VsR
13	+OutA
14	N/C
15	N/C
16	+VsA

NOTES
1) Dimensions are in inches [mm].
2) Pins 12 and 16 must be connected for Vs input.
3) Pins 5 and 7 must be connected for Gnd.
4) Pins 1 and 10 must be connected for -Vout.
5) Pins 6 and 13 must be connected for +Vout.
6) For suggested pad layout, see drawing PAD-22.

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TITLE: D-Series Package

SIZE A | FILE NAME D4 Package

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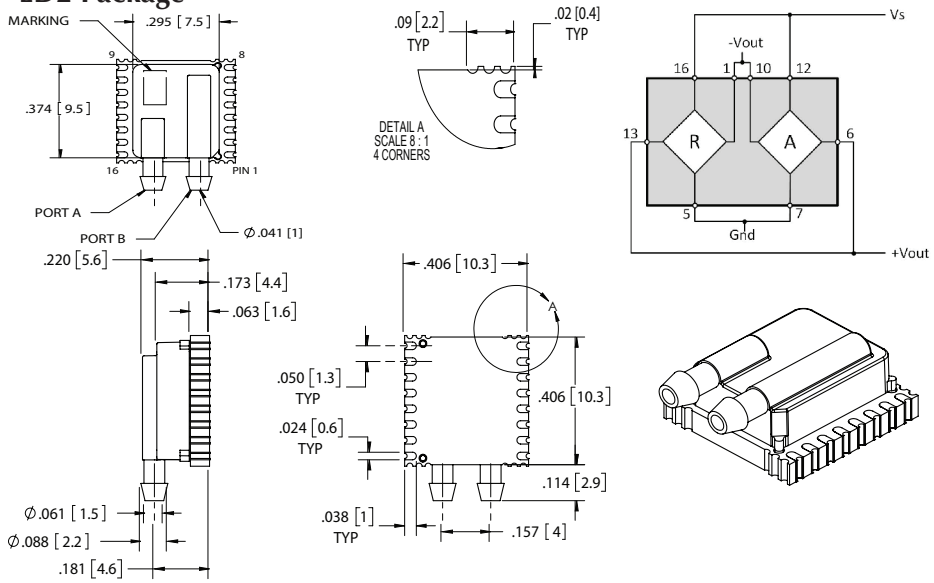
Package Drawings (cont'd.)

LD2 Package



Pin	Definition
1	+OutR
2	N/C
3	N/C
4	N/C
5	GndR
6	+OutA
7	GndA
8	N/C
9	N/C
10	-OutA
11	N/C
12	VsA
13	-OutR
14	N/C
15	N/C
16	VsR

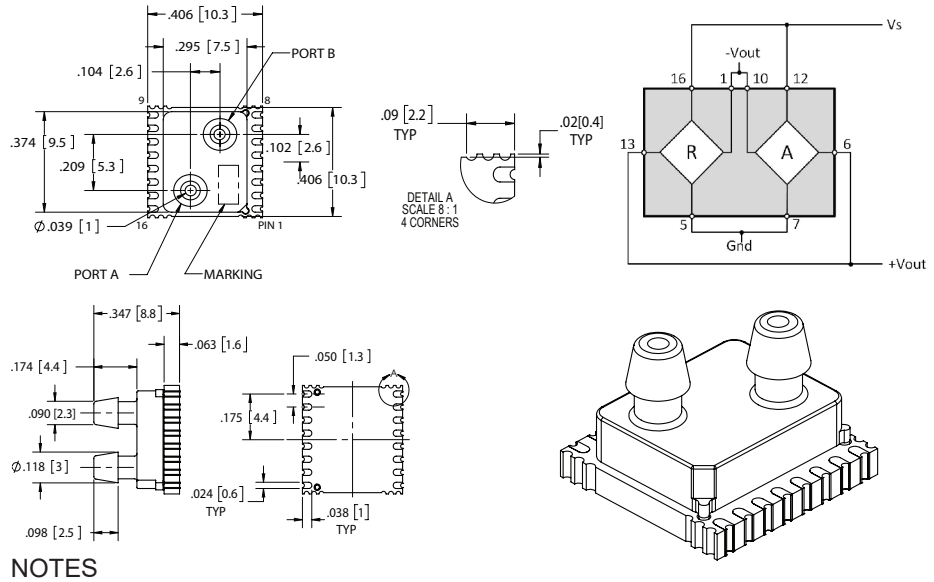
NOTES
1) Dimensions are in inches [mm].
2) Pins 12 and 16 must be connected for Vs input.
3) Pins 5 and 7 must be connected for Gnd.
4) Pins 1 and 10 must be connected for -Vout.
5) Pins 6 and 13 must be connected for +Vout.
6) For suggested pad layout, see drawing PAD-22.

ALL SENSORS

TITLE: LD-Series Package

SIZE A | FILE NAME LD2 Package

LD4 Package



Pin	Definition
1	+OutR
2	N/C
3	N/C
4	N/C
5	GndR
6	+OutA
7	GndA
8	N/C
9	N/C
10	-OutA
11	N/C
12	VsA
13	-OutR
14	N/C
15	N/C
16	VsR

NOTES
1) Dimensions are in inches [mm].
2) Pins 12 and 16 must be connected for Vs input.
3) Pins 5 and 7 must be connected for Gnd.
4) Pins 1 and 10 must be connected for -Vout.
5) Pins 6 and 13 must be connected for +Vout.
6) For suggested pad layout, see drawing PAD-22.

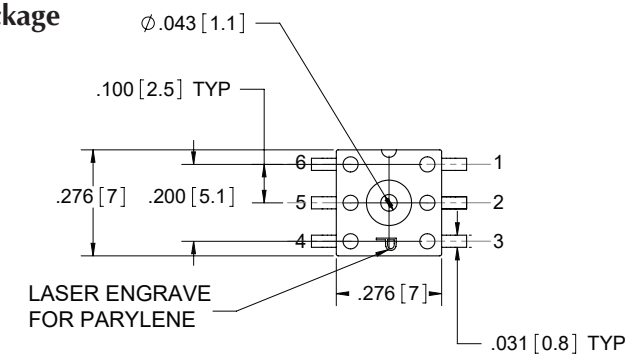
ALL SENSORS

TITLE: LD-Series Package

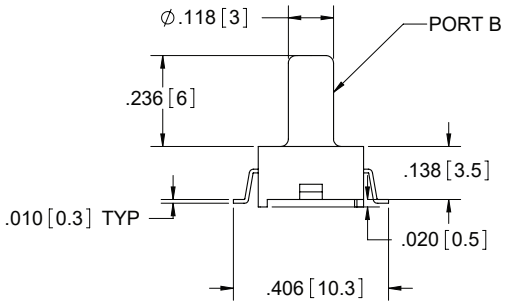
SIZE A | FILE NAME LD4 Package

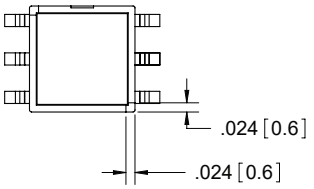
Package Drawings (cont'd.)

U2 Package



Pin	Definition
1	VsA
2	-Vout
3	VsR
4	-VoutR
5	GND
6	+VoutA





NOTES
1) Dimensions are in inches [mm].
2) For suggested pad layout, see drawing: PAD-24.
3) Pins 1 and 6 must be connected for Gnd.

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TITLE: U-Series Package

SIZE A | FILE NAME U2 Package

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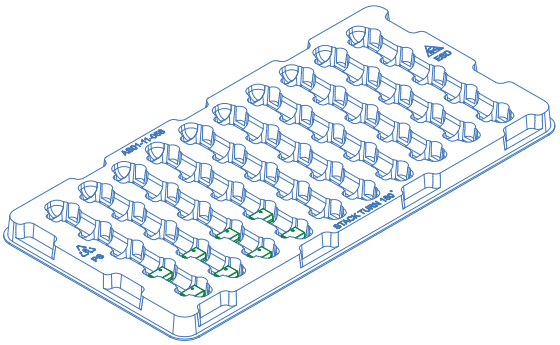
Packaging

TUBE

ARROW INDICATES SIDE OF PACKAGE WHERE PIN 1 IS LOCATED

Packages: U2, D4

TRAY



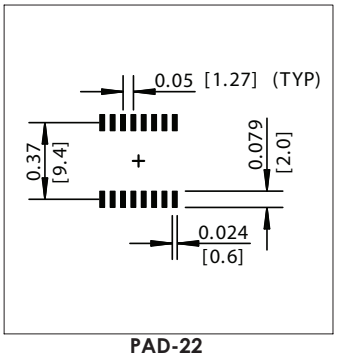
Packages: LD2 and LD4

Notes
1) Contact factory for alternate packing options.

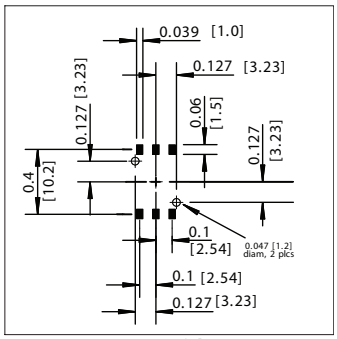
Pressure Tubing Recommendations

Tubing Recommendations				
Package Type	ID	OD	Material	
			Low Pressure	High Pressure
D4	3/32"	5/32"	Silicone	Polyurethane
LD2	1/16"	1/8"	Silicone	Polyurethane
LD4	3/32"	5/32"	Silicone	Polyurethane
U2	3/32"	5/32"	Silicone	Polyurethane

Suggested Pad Layouts



PAD-22



PAD-24

Dimensions are in inches [mm].