

**NEW**

**LOOP POWERED (& USB POWERED) LCD BARGRAPH FOR  
MIL-SPEC - NUCLEAR & HI-REL. INDUSTRIAL  
>20 INPUT SIGNAL CONDITIONERS**

**MODEL  
LBD****FEATURES:**

- Powered or Powerless™
- RS232, 485, USB, I/O
- 101 Bars, & 4 1/2 Digits LCD Display
- Bi-Polar With Center Zero
- Optional Automatic Tricolor Backlight
- Fits Industry's Standard 5.7 X 1.77" Cutout
- NEMA 3, Front Panel, 2.5" Deep
- No Input Reflected Noise
- Remote Display With Serial Input
- Optional Relay or O.C.T. Outputs (4)
- Four Alarm Annunciators
- Stand Alone Or DCS/SCADA Use
- Replaces GE/Yokogawa 180; Prime, Signal, Int'l. Inst., Bowmar #1151, Westinghouse/Weschler VX251, Dixon/Ametek BB101, A &M/Weston, Tripllett, Takemoto, NES and Other 6" Type, but is Lifetime Warranted!
- See **EBD** For LED Version

**SPECIFICATIONS @ 25°C****Loop Powered Models:**

- Burden: 4.5V Max. (7V for "S" Version)
- Max. Input Current: 36mA
- Min. Input Current: 3.6mA
- Accu. & Lin.: ±0.05% of F.S.
- Span Adj.: ±3000 Counts of F.S.
- Zero Adj.: ±3000 Counts of Zero
- Standard Cal.: 4-20 = 0-10000/100%
- Serial I/O: RS232E

**OTHER SPECIFICATIONS**

- Viewing Angle: 6 O'Clock ± 45°
- Bars: 101 Each 1" Wide
- Digits (5) & Annunciators (4): 0.4" High
- Input Type: Differential & Single Ended.
- RS232E: Parasitic 300-9600KB

**USB OR EXTERNALLY POWERED MODELS**

- Loop Burden: 1V @ 20mA, VinZ: 10MOhms
- Relays: 4 Ea. 1 Amp SPDT (200mA @ 5VDC) or O.C.T. 30V/100mA
- Backlight: Automatic/Manual Tricolor Red, Green, Orange (20mA @ 5VDC)
- Power For Transmitter: 30VDC @ 30mA (200mA) or
- Isolated Retransmission: 4-20mA, 500 Ohm Max. (200mA)
- Fully Loaded I @ 5VDC: 750mA

**ENVIRONMENTAL:**

- \*Op/Storage Temp.: -10 + 70°C/-20 + 80°C
- \*Humidity: 5-95RH Non-Condensing
- \*MTBF: >100,000 Hours

**DESCRIPTION**

The Innovator & Leader on Automatic Tricolor Bargraphs, now offers you the latest technology for replacement and new applications. The New **LBD** Series uses a highly integrated DSP and Nanowatt microcontroller along with a proven software package approved and used by the Military & Nuclear Industries on its popular **HI-Q** Series.

**SIGNAL CONDITIONERS:** 20+ signal conditioners are available (more soon). See ordering information and description section.

The **LBD** is available in 2 basic versions:

1. **Loop Powered:** Uses **NANOWATT** Technology for display, RS232E I/O and Automatic Tricolor Backlight.

2. **Externally Powered:**

**ANALOG INPUTS:** Industry's standard 4-20mA, mA and VDC are included. Custom signal conditioners for %RH, pH, TC, RTD, RMS, S-G and more are available on request.

**MATH FUNCTIONS:** RTD, TC & X-Y linearization plus Tare, Offset, Scale, Peak and more are programmable via simple commands. (Needs Serial I/O).

**CONTROL OUTPUTS:** 4 each relays or 4 open collector transistors for High, High-High, Low and Low-Low Control. (Needs Serial I/O)

**ANALOG OUTPUT:** Optional isolated 0-1mA, 4-20mA, 0-20mA or 0-5VDC with 16 Bit resolution. (Needs Serial I/O)

**SERIAL I/O** Standard is RS232 with optional RS485 or **USB**. You can even power the **LBD** via the **USB** port (2W Max.).

**POWER INPUT:** Standard is 5VDC with optional isolated 6-32VDC, 90-265VAC or USB powered.

**POWER OUTPUT FOR 4-20mA TRANSMITTER:** Only available with **External Power** either non-isolated 28VDC @ 20mA or isolated 30V @ 20mA. See Control Outputs and Note 7.

**520-748-7900**

FAX: 520-790-2808  
E-MAIL: sales@otekcorp.com  
http://www.otekcorp.com

**OTEK**™  
CORP.  
SINCE 1974

4016 E. TENNESSEE ST.  
TUCSON, AZ. 85714 U.S.A.

MADE  
IN  
USA



## LBD Series continued

### HOW IT WORKS:

**Current Loop Powered:** We use a Zener to clamp the voltage to 5V max. and monitor the Loop's current (we invented it in 1974). (Digit 2, Option 0).

**VDC Signal Powered:** We monitor the voltage with high impedance and clamp it to a safe level to power the **LBD**. (Digit 2, Option 2).

**AC Signal Powered:** For VAC & Hz we use a capacitor limiting rectifier to power the **LBD** and monitor the VAC with an RMS-DC converter. For Hz we use an F-V for accurate conversion. For A.A.C. we invented (Pat. #: 4,908,569) a C-V converter to extract the current from your C.T. for power and monitor the signal with RMS-DC. (Digit 2, Options Q-T).

**Externally Powered:** Non-Isolated 5VDC or isolated 5-32VDC or 90-265VAC 50/60Hz is optional (Digit 3, Options 1-8). Max Power: 150mW. Plus Options.

**DISPLAY (Digit 4):** Standard is 0-FS signal=0-100% & 0-10,000 counts. Or use Option #9 and specify.

**Serial I/O:** When ordered, (Digit 5), the **CPU** controls the Baud Rate (300-9600 Baud), the relays, analog output, math functions, linearization polynomial (9th) & X-Y tables.

**Control & Power Out (Digit 6):** You can order 4-20mA as standard, or 0-5V, 0-20mA out or you can order the isolated 30VDC (3mA, Options 4, 7, 8) or Non-Isolated 28VDC out for your transmitter. (Option E).

**Relays/O.C.T. (Only for Powered Models):** Either four (4) relays (SPDT) rated contacts at 10A @ 120VAC resistive with ~10mS reponse, with built in varistors or 8 open collector transistors rated at 30 VDC/30mADC common emitter, with < 1 $\mu$ S response.

### **THE SIGNAL CONDITIONERS:** (2nd Digit)

**Option 0: 4-20mA Loop Powered:** First introduced in 1975, the current flows through a Zener and "Shunt" resistor. The Zener clamps the voltage to about 3.5 Volts and the voltage across the Shunt is measured and displayed. If the "burden" (3.5 - 4.5V) is too high for your application, use the externally powered version.  
**Accuracy:**  $\pm 0.05\%$  of F.S.

**Option 1: 4-30VDC Signal Powered:** Another OTEK innovation. The voltage signal powers an **LDO** to protect the **LBD** and a divider network is used to measure and display the signal. If the input resistance of this Option is too low (~ 500 Ohms), use powered models. Power Input must be Option 0 (Powerless).  
**Accuracy:**  $\pm 0.1\%$  of F.S.

**Option 2: 4-20mA Externally Powered:** It only drops 0.1V @ 20mA (5 Ohms) but the "**LBD**" needs 5VDC @ 30mA to operate (including the backlight). Power Input must be Option 1-8 (Powerless).  
**Accuracy:**  $\pm 0.05\%$  of F.S.

**Options 3-6: VDC & mADC Externally Powered:** Input impedance is 1 Mega Ohms on all VDC ranges and 100 Ohm on 2mA and 1 Ohm on 200 mADC ranges.  
**Accuracy:**  $\pm 0.05\%$  of F.S.

### **Options 7, 8 & A:**

**V & mA RMs:** Here we use a **True RMS-DC** Converter for accurate ( $\pm 0.05\%$ ) measurement of sine waves up to 10KHz ( $\pm 0.1\%$  for 10-20KHz) and SCR;s fired to  $\pm 1\%$ . Input impedances vs. range are the same as for VDC & mADC ranges.  
**Warning: No Isolation!**

**Accuracy:**  $\pm 0.05\%$  of F.S.

**Option 9: Custom:** Use this option to describe any custom input, scale or modification to the **LBD** and contact us for feasibility and cost.

**Option B: 5Amps AC:** Specifically for current transformers (**C.T.**) this option requires an externally mounted (supplied) 0.05 Ohm, 0.1% 5 Watt resistor. You can mount the "Shunt" at your **C.T.** or next to the **LBD** but make sure the connections are "Perfect" to electrical codes. The C.T. might have "**Lethal**" **High Voltage** without a "Shunt" (Open) and the **LBD** will "Smoke".

### **Option B: 5Amps AC (Continued):**

See OTEK's New **ACS & CTT** models for **C.T.** powered instruments (Pat. # 7,626,378) or use option "R."

**Warning: No Isolation!**  
**Accuracy:**  $\pm 0.05\%$  of F.S.

**Option C: Strain-Gage (<1000 Ohm Type):** Here we use a high accuracy and stability constant current (~1mA) source, and a differential amplifier to convert the 2 or 3mV/V (typical) sensitivity of your "Loadcell". **Specify** your Strain-Gage sensitivity and full scale and the **LBD's** display at Zero and Full Scale Please!

**Accuracy:**  $\pm 0.05\%$  of F.S.

**LBD Series continued**

**Option D: Strain-Gage ( $\geq 1K < 5K$  Ohm):** These are typically "Monolithic" **S-G** that require constant voltage (preferably) excitation. We use 4.096V for high stability and accuracy. **Specify** your S-G impedance and sensitivity and the **LBD's** display at Zero and Full Scale.

**Accuracy:**  $\pm 0.1\%$  of F.S.

Note on S-G: Some S-G offer +/- 1VDC or 4-20mA condition output. Use Option 9 and specify.

**Option E: RTD (PT100):** We excite your 2, 3 or 4 wire RTD with 200 $\mu$ A to avoid the "self heating" effect. The range of the **LBD** is the same as your **RTD** typically -200 $^{\circ}$ C to +800 $^{\circ}$ C (-328 + 1562 $^{\circ}$ F). You can place the decimal point at will (typically -200.0 to 800.0 (-328.0 to 1562.0)). The **PT100** has a temperature coefficient of 0.00385 Ohms/Ohm/ $^{\circ}$ C. To change from  $^{\circ}$ C to  $^{\circ}$ F or PT100 to ANSI 392, use simple commands via serial port.

**Accuracy:**  $\pm 0.5\%$  of F/C plus sensor's error.

Note: For 2 wire, jump - S to -E and +S to +E. For 3 wire only jump -S to -E.

**Option F: RTD (PT1000):** Same as PT100 except it is 1000 Ohms at 0 $^{\circ}$ C instead of 100 Ohms @ 0 $^{\circ}$ C. The same technique is used. For copper **RTD** (10 Ohm), contact **OTEK**. Same connection as Option E apply.

**Accuracy:**  $\pm 0.5\%$  of F/C plus sensor's error.

Note: For long distances use a 4-20mA transmitter such as our **900** or **LPT** series.

**Options G&H: Frequency Input:** We use an **E-V** to accept frequencies from 40 - 20KHz and amplitudes from 1-400V peak or dry contact or open collector transistor (O.C.T.). For 50 or 60Hz power line frequency measurement. Use Option "H" or "S."

**Accuracy:**  $\pm 0.05\%$  of F.S.

**Option J: Thermocouple (Type J):** This **TC** has a range of -210 to +760 $^{\circ}$ C (-350 + 1390 $^{\circ}$ F). Its color is white (+) and Red (-), cold junction (CJ) is inside the **LBD** at the connector base. Make sure the connections from the **LBD** and your **TC** are as close to the **LBD's** entrance as possible to avoid errors. If you short out the **LBD's** +**TC** & -**TC** together, the **LBD** will read the ambient temperature due to its built-in C.J.C. (Cold Junction Compensation).

**NOTE:** You can change from  $^{\circ}$ C to  $^{\circ}$ F and TC type via simple commands on serial port.

**Accuracy:**  $\pm 2^{\circ}$  F/C of signal input.

**Option K: TC (Type K):** This is yellow (+) and red (-) and has a range of -270 + 1370 $^{\circ}$ C (-440 + 2500 $^{\circ}$ F). The same notes as Option J.

**Accuracy:**  $\pm 2^{\circ}$  F/C of signal input

**For Other TC use #9 and Specify.**

**Option L: %RH:** This conditioner is designed to interface to a typical (capacitance type) 2-3pF/% of **RH** made by several manufacturers. Use Option 9 and contact **OTEK** to specify your sensor's specifications.

**Accuracy:**  $\pm 2\%$  RH of signal input.

**Option M: pH (Acidity):** We use a FET input ( $10^{15}$ ) amplifier and calibrate the **LBD** for 0-14.00 pH using the Industry's standard  $\pm 413$  mV =  $\pm 7$ pH coefficient.

Note: Not temperature compensated. Standard display is 0-100% and 0-10,000 counts or use Digit 9, Option 9 and specify.

**Accuracy:**  $\pm 0.05\%$  of F.S.

**Option N: ORP (Oxygen Reduction Potential):** Our FET amplifier ( $10^9$ ) accepts the industry standard 2000mV F.S. of the probe and the **LBD** displays it in % (0-100.00%).

**Accuracy:**  $\pm 0.05\%$  of F.S.

**Option P: Hi Speed Peak & Hold (P&H):** Now you can capture fast transients greater than 5 microseconds (even faster soon) with resolution greater than 0.1% of F.S. and retention of greater than 10 years (Due to OTEK's new and patent-pending **P&H Option**).

**Input:** 2VDC/mADC F.S. (Specify Range). Contact OTEK for V/mA RMS or Loop Powered.

**Accuracy:** +/- 0.1% of F.S. +/- 1 Digit

**Linearity & Resolution:** +/- 0.1% of F.S.

**Response time:** >200KHz (<5us)

**Retention:** >10 years (with power on)

## LBD SERIES continued

**Note: Options Q-T only available with Powerless™ Signal power input (Option 0, Digit 3).**

(PAT. #: 4,908,569)

### **Option O: VAC Signal Powered:**

**Warning! No Isolation!** This option uses the AC Voltage Signal to power the **LBD**. Since the **LBD** uses about 30mA @ 5VDC, we use a coupling capacitor AC-DC converter to generate 5VDC and not to "Load" the signal with a transformer. Consequently, your signal source should be capable of producing about 150mW without overloading it, otherwise use Options 7 or 8 (externally powered). Range: 50-150VAC; Method: RMS Calibrated; Accuracy & Linearity:  $\pm 0.5\%$  of F.S. Best and safest when driven by a P.T. (Potential Transformer. ***Always turn power off before connecting!***

### **Option R: AAC Signal Powered:**

**Warning! No Isolation!** (Pat. #: 7,626,378)

**OTEK's** Patented technique permits the extraction of power from a regular **C.T.** (Current Transformer) to power the **LBD** without distorting the signal. Since this option is designed to be powered from a C.T., it should not be connected directly to the mains without limiting the current and proper electrical grounding. **Lethal Voltage** might be present at the C.T. secondary (output) if the secondary is open.

**Always turn power off before connecting!** Range (at C.T. output): 0.1-5AAC; Overload: 50%/30 seconds; Peak: 100%/1 second; Conversion: True RMS; Accuracy & Linearity:  $\pm 0.05\%$  of F.S.; Burden on C.T.: <150mW. Hz: 45-65.

### **Option S: Hertz (Frequency) Signal Powered: Warning! No Isolation!**

This option uses the same power technique as Option Q above and the same precautions and warnings apply. Here we use a "Zero Crossing" detector and a F-V converter to give you the **A.C.** line frequency display with 0.1 Hz resolution. Range: VAC: 50-440VAC/ Frequency: 30-100Hz; Accuracy & Linearity:  $\pm 0.05\%$  of F.S. For 400 Hz line use #9 & specify range.

### **Option T: Signal Powered AC Watts:**

**Warning! No Isolation!** Here we combine the powerless VAC & AAC options to arrive at real power calculations through our **CPU** and **DAC**. The same warnings and precautions of Options Q & R apply. Range: VAC: 50-150; AAC: 0.1 - 5A; Frequency: 40-450Hz; Accuracy & Linearity:  $\pm 0.1\%$  of F.S.; Conversion: True RMS. Hz: 45-65.

Contact **OTEK** for other functions.

### **Power/Input (Digit 3):**

**Option 0: Powerless™:** The **LBD** is powered from the signal that it measures. **ONLY** available for options 0, 2, and Q through T of input signal (Digit 2).

**WARNING:** Any other I/Os are **NOT** isolated from signal. Options Q-T (Digits 2 & 3) could have lethal potentials!

### **Option 8: Non-Isolated 6-32 VDC:**

We use a switching LDO with a regulated output which accepts 6-32VDC at high efficiency (90%).

### **Option 1 & 6: Non-Isolated 5 VDC Power, USB Powered:**

All listed I/O options (except Powerless™) are available. Power requirements vary with options included. The **LBD** with No Control or Power Out (Digit 6, Option 0) requires under 150 mW (30 mA @ 5VDC) for LED and under 100 mW with LCD display. Please add all the options power to the basic **LBD**.

USB option is powered thru the USB connector.

### **Options 3-5 & 7: Isolated Power**

These options offer minimum isolation of 500 VAC or DC and their efficiency is about 80%. Again, add all the options. Selected power x1.2 to arrive at total power required. All input ranges are +/-5%.

### **Serial I/O (5th Digit):**

**Serial I/O:** WARNING: No Isolation From Signal.

**Option 1:** Parasitic RS232E. Only for powerless models (option 0 on 3rd digit).

**Option 2:** Same as Option 1.

**Option 3:** RS485: 1200-19.2kb, all ASCII (8N1) open protocol screw "conn."

**Option 4:** USB: 1200-19.2kb, all ASCII (8N1) open protocol "USB Type B."

Option 5: Ethernet: 10 BASE T, RJ45 full compliant. Free Driver.

Any terminal program (Hyperterminal, Procomm, Kermit) will work with OTEK's serial com. ports. For USB download out Driver at [www.otekcorp.com/Support/Downloads/PC-USB Driver](http://www.otekcorp.com/Support/Downloads/PC-USB Driver).

**LBD SERIES continued**

**Control & Power Out (Digit 6):**

**Option 1: Relays (4):** Standard outputs are rated at 1 amp at 120 VAC/30 VDC resistive load. Also applies to option 5 & 7 (Relays). Power required by each relay is 200 mW (40mA@5VDC) x 4=800 mW. (Contact OTEK for 10 A contacts).

**Option 2: Open Collector Transistors (O.C.T):**

Four O.C.T are included and all are common emitter (sinking) to digital ground. The 5 VDC internal power is available. Maximum current allowed per O.C.T. (From the internal 5 VDC) is 20mA/O.C.T. if external VCC is used, the maximum VCE is 30 VDC and 30 mA per O.C.T. Switching time is under one (1) uSecond.

**Option 3: Isolated 4-20 mA (Retransmission):** (Must include serial I/O options 1-5 Digit 5)

This option is offset & scaled via the serial port (digit 5) and can be configured for 4-20, 0-20 or 0-24 mA or 0-5 VDC via internal jumpers (standard is 4-20 mA). This option requires under 200 mA@5VDC internal power. Accuracy & linearity is +/- .1% of setting and can drive up to 1K ohms load. Also see Option B.

**Option 4: Isolated 30 VDC Output**

You can use it to excite your transmitter at up to 25mA. It consumes under one (1) watt at full load. Also see Option E.

**Option 5-8:** Combinations of Option 1-4.

Don't forget to add all power requirements of each option desired. Worst case: 2 watts.

**Option E: Non-Isolated 28 VDC & 4-20 mA Out.**

This option converts the LBD to a low-cost transmitting DPM. The output is referenced to the LBD's Signal input after it has been conditioned by the signal conditioner (such as strain-gage, Hz, PH, etc.), and it has its own zero and span potentiometers for your customized range. Standard connections are for sourcing with burden under 700 ohms @ 20 mA. In addition, this option gives you 28 VDC non-isolated to power your transmitter. For external compliance and sinking, select option #9 and specify "external compliance" (you supply the VDC power for the 4-20mA transmitter). Minimum voltage is 10 VDC plus your load. Max is 30 VDC plus your load. Accuracy and linearity is +/- 0.05% of full scale. Power requirement is 800mW@5VDC internal compliance or 50mW with external (yours) compliance.

**Range/Calibration (9th Digit):** 0-100% and 0-1,000 counts, or use #9 and specify (configurable).

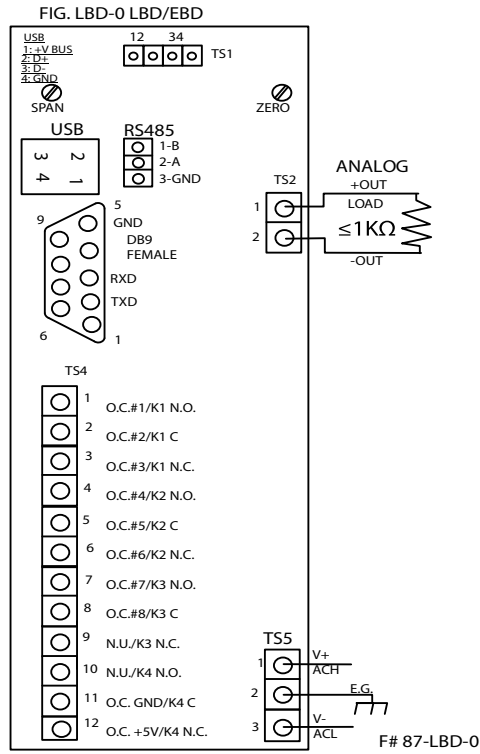
GREEN BACKLIGHT

YELLOW BACKLIGHT

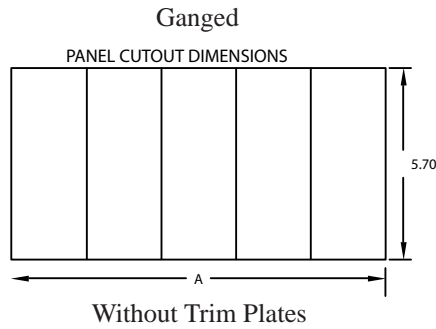
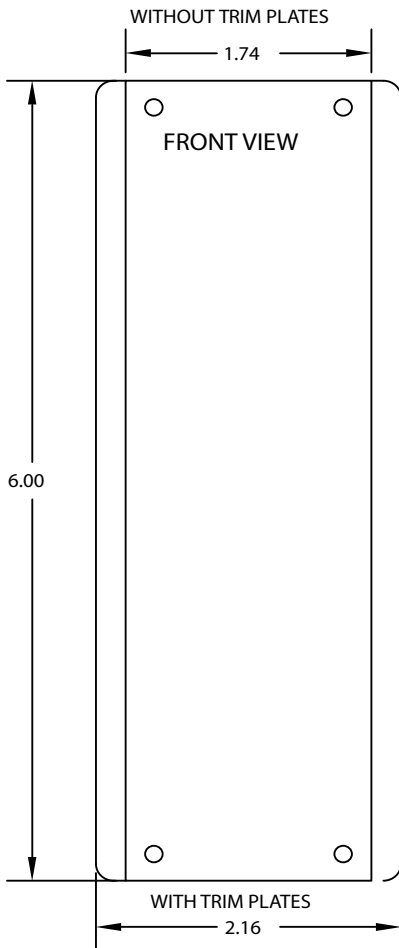
RED BACKLIGHT

REFLECTIVE (NO BACKLIGHT)



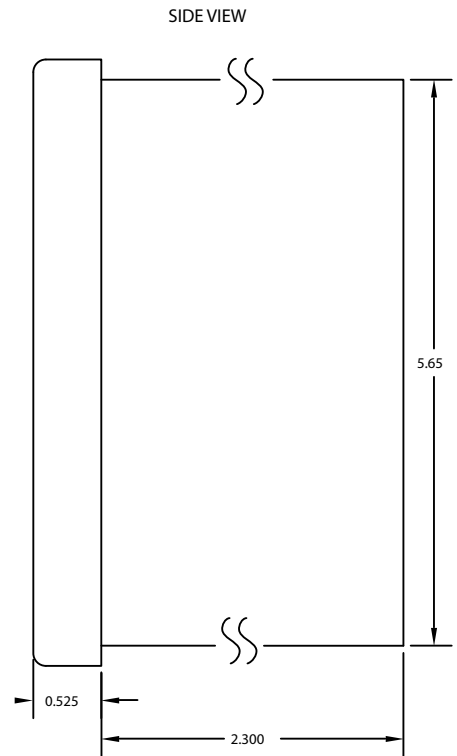


### LBD MECHANICAL INFORMATION



DIMENSION "A"	+0.03 -0.00	+0.76 -0.00
# UNITS	INCHES	mm
1	1.77	44.96
2	3.52	89.41
3	5.26	133.60
4	6.99	177.55
5	8.73	221.74

Plastic Trim Plates P/N 50-LBD-2  
Metal Trim Plates P/N 50-119-2



# LBD SERIES PRELIMINARY ORDERING INFORMATION

11-11-11



**NOTE: Please READ BEFORE building part number:**

1. If digit 3 is option 0 or 4, digit 2 must be options 0,1, Q, R, S or T (and conversely), digit 5 must be 1 and digit 6 must be 0.
2. See notes at bottom of page.

Model: LBD-    -    -

<p><b>GRADE (1)</b></p> <p>I..... Industrial</p> <p>M..... Mil-Spec</p> <p>N..... Nuclear (Contact OTEK)</p> <p>S..... Intrinsically Safe</p> <p>9..... Custom (Contact OTEK)</p>	<p><b>ES. INPUT SIGNAL/Z in (2, 7)</b></p> <p>0..... 4-20mA Loop Powered</p> <p>1..... 4-30VDC Signal Powered</p> <p>2..... 4-20mA External Powered</p> <p>3..... 200mVDC/1M Ohms</p> <p>4..... 500 VDC/1M Ohms</p> <p>5..... 2mADC/100 Ohms</p> <p>6..... 200mADC/1 Ohms</p> <p>7..... 200mVRMS/1M Ohms</p> <p>8..... 500VRMS/1M Ohms</p> <p>9..... Custom (Contact OTEK)</p> <p>A..... 2mARMS/100 Ohms</p> <p>B..... 5ARMS/0.05 Ohms</p> <p>C..... Strain Gage &lt;1000 Ohms</p> <p>D..... Strain Gage &gt;1000 Ohms</p> <p>E..... 2, 3 or 4 Wires RTD PT100 (100 Ohms)</p> <p>F..... 2, 3, or 4 Wires RTD PT1000 (1K Ohms)</p> <p>G..... Frequency 40-20 KHz</p> <p>H..... Frequency 50-440HZ Line</p> <p>J..... TC Type J</p> <p>K..... TC Type K</p> <p>L..... %RH (Specify Sensor)</p> <p>M..... pH (0-14.00)</p> <p>N..... ORP (0-2000 mV)</p> <p>P..... High Speed Peak &amp; Hold, 2 V</p> <p>Q..... VAC Signal Powered (P.T.)</p> <p>R..... AAC Signal Powered (5A C.T.)</p> <p>S..... 50-440 Hertz Signal Powered (P.T.)</p> <p>T..... Watts AC Signal Powered (P.T. &amp; C.T.)</p>	<p><b>RANGE/CALIBRATION</b></p> <p>0..... Standard</p> <p>9..... Custom (Contact OTEK)</p> <p><b>SCALE PLATE</b></p> <p>0..... Standard (0-100%)</p> <p>9..... Custom (Contact OTEK)</p> <p><b>HOUSING</b></p> <p>0..... Plastic Without Trim Plates</p> <p>1..... Plastic With Trim Plates</p> <p>2..... Metal Without Trim Plates</p> <p>3..... Metal With Trim Plates</p> <p><b>CONTROL OUTPUTS (6)</b></p> <p>0..... None</p> <p>1..... (200mA) Relays (4 ea.)</p> <p>2..... (20mA) Open Collector Xtrs. (4 ea.)</p> <p>3..... (200mA) Retransmission (4-20mA)</p> <p>4..... (200mA) 30VDC For Transmitter</p> <p>5..... (400mA) Relays &amp; 4-20mA Out</p> <p>6..... (220mA) O.C.T. &amp; 4-20mA</p> <p>7..... (400mA) Relays &amp; 30VDC Out</p> <p>8..... (220mA) O.C.T. &amp; 30VDC Out</p> <p>9..... Custom (Contact OTEK)</p> <p>E..... (400mA) Non-Isol. 28VDC &amp; 4-20mA Out</p>	<p><b>SERIAL I/O (5) (3)</b></p> <p>1..... (None) Parasitic RS232E</p> <p>2..... (10mA) Standard RS232D</p> <p>3..... (10mA) RS485</p> <p>4..... (10mA) USB</p> <p>5..... (200mA) Ethernet</p> <p>9..... Custom (Contact OTEK)</p> <p><b>TRICOLOR (RGY) BACKLIGHT (4)</b></p> <p>0..... None</p> <p>1..... Included</p>
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<p><b>POWER INPUT (3)</b></p> <p>0..... Loop Powered</p> <p>1..... Non-Isolated 5VDC</p> <p>2..... Isolated 5VDC</p> <p>3..... Isolated 10-32VDC</p> <p>4..... Signal Powered (Powerless™)</p> <p>5..... Isolated 90-265VAC</p> <p>6..... USB Powered</p> <p>7..... Isolated 6-32VDC</p> <p>8..... Non-Isolated 6-32VDC</p> <p>9..... Custom (Contact OTEK)</p>
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- NOTES: \*=Options Power Consumption @5VDC**
1. Contact OTEK for other ranges and for M, N & S Versions. I.S. "Compliant By Design", No Certificate Available Until Further Notice. Otek will build to certain nuclear or MIL-standards but testing and confirmation of compliance, if required, will need to be done by a third party and at customer's expense.
  2. See description. Use #9 and specify for ranges not listed.
  3. USB Powered is limited to 0.5A @ 5V (V2.0). Contact OTEK for maximum loading. Requires Serial I/O. Use Option 4 for Signal Powered models.
  4. Standard Viewing Angle: "Straight On". Backlight requires Serial I/O.
  5. Only Option 1, Parasitic **RS232E** is available with **Signal Powered** Version.
  6. Power transmitter either **Non-Isolated** (Option E) or Isolated (Options 4, 7 or 8). ( )=current required @ 5VDC.
  7. Specify sensor manufacturer and type for pH and % RH.