



MODEL LIBC - LIBRA SERIES COUNTERS (LCD & LED)



- ABILITY TO LOCK OUT FRONT PANEL FUNCTIONS
- SEALED FRONT PANEL CONSTRUCTION (NEMA 4/IP65)
- ONE OR TWO PRESET VERSIONS
- 0.5" HIGH LIQUID CRYSTAL DISPLAY OR 0.4" HIGH LED DISPLAY
- ACCEPTS INPUT COUNT RATE UP TO 2500 CPS
- BI-DIRECTIONAL COUNTING
- SOLID-STATE CURRENT SINK OUTPUT(S)
- FORM C RELAY OUTPUT(S)
- PROGRAMMABLE TIMED OUTPUT (0.01 sec to 99.99 sec.)
- SIMPLE FRONT PANEL FOR PROGRAMMING EASE
- FRONT PANEL PROGRAMMABLE DECIMAL POINTS
- MEETS DIN PANEL MOUNT SPECIFICATIONS
- REMOTE RESET CAPABILITY
- NON-VOLATILE MEMORY (E²PROM)
- ON-LINE SELF-TEST



DESCRIPTION

The Libra Series of presettable counters is an economical and reliable solution to one or two preset level requirements. The LIBC1 and LIBC1E are the single preset versions and the LIBC2 and LIBC2E are the dual preset versions. All four units have a solid-state output and a Form C relay output for each preset. These units feature input configuration programmability, a full complement of control inputs, programmable timed outputs, non-volatile memory, and many other features which will satisfy most any single or dual preset level requirement.

The Libra counters have two main counting actions, Reset to Zero (RTZ) and Reset to Preset (RTP). With RTZ, the counter resets to zero and counts up (if UP/DN terminal is at high level) and activates the outputs when the preset value(s) are reached. When RTP is used, the unit starts at the preset value and counts down (if the UP/DN terminal is at low level) and activates the output when zero is reached. For the 2-preset version, the count starts at preset 2 and counts toward zero. Output 1 fires when preset 1 value is reached and output 2 fires when the count reaches zero. There are eight modes of operation for the single preset unit and sixteen modes of operation for the dual preset unit.

The timed output is programmed through the front panel buttons and can be programmed from 0.01 sec. to 99.99 sec. (The unit's timed output is set at the factory to be 0.1 sec.) The Libra counters have an internal non-volatile memory

device which eliminates the need for battery back-up. When input power is removed, this device will maintain all data necessary for system operation. A Program Disable terminal is available, which is used to prevent accidental changes or tampering by unauthorized personnel to the preset(s) or timed output value(s). The front panel reset button can also be enabled or disabled by a rear panel DIP switch. These counters also have an on-line self-test, which checks all display driver and micro-processor hardware. The self-test can be run at any time without losing counts or missing a preset value.

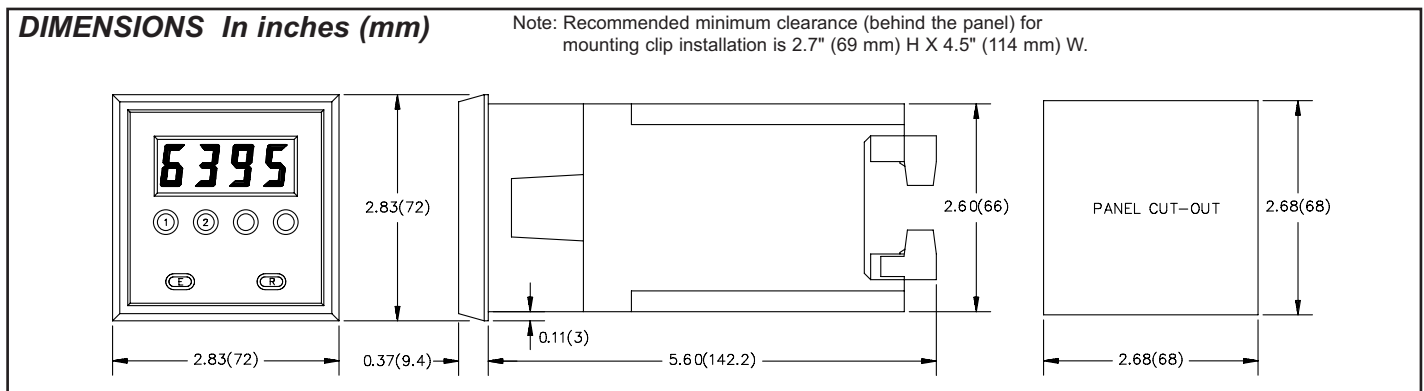
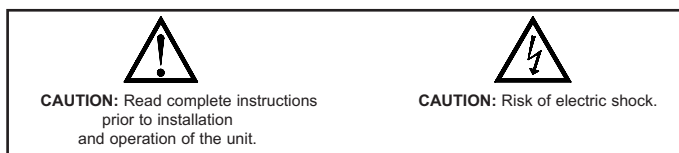
Power, input, and output connections are made via removable terminal strips located at the rear of the unit. These strips can accept one #14 AWG stripped wire. DIP switches at the rear of the unit are used to program the input configuration and to set the desired operating modes.

The Libra Series counters have a metal die-cast front bezel, which is sealed, and meets NEMA 4/IP65 specifications for wash-down and/or dust when properly installed. Mounting clips are provided for easy panel installation.

SAFETY SUMMARY

All safety related regulations, local codes and instructions that appear in the manual or on equipment must be observed to ensure personal safety and to prevent damage to either the instrument or equipment connected to it. If equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Do not use this unit to directly command motors, valves, or other actuators not equipped with safeguards. To do so, can be potentially harmful to persons or equipment in the event of a fault to the unit.



ORDERING INFORMATION

MODEL NO.	DESCRIPTION	PART NUMBERS FOR AVAILABLE SUPPLY VOLTAGES	
		230 VAC	115 VAC
LIBC1	Single Preset LCD Libra Counter	LIBC1010	LIBC1000
LIBC2	Dual Preset LCD Libra Counter	LIBC2010	LIBC2000
LIBC1E	Single Preset LED Libra Counter	LIBC1E10	LIBC1E00
LIBC2E	Dual Preset LED Libra Counter	LIBC2E10	LIBC2E00

For more information on Pricing, Enclosures & Panel Mount Kits refer to the RLC Catalog or contact your local RLC distributor.

SPECIFICATIONS

- DISPLAY:** 4-digit, 0.5" (12.7 mm) high LCD display.
4-digit, 0.4" (10.2 mm) high LED display.
- POWER REQUIREMENTS:**
AC Operation: 115/230 VAC ($\pm 10\%$), 50/60 Hz, 6 VA (LCD) or 9 VA (LED).
DC Operation: 11 to 14 VDC @ 0.2 A max. (LCD) or 0.3 A max. (LED).
SENSOR POWER: +10 to 16 VDC @ 150 mA.
- COUNT INPUT:** Switch selectable to accept count pulses from a variety of sources including switch contacts, outputs from CMOS or TTL circuits, and all standard RLC sensors.
Current Sourcing - Unit provides 3.9 K Ω pull-down load for sensors with current sourcing outputs. (Max. input voltage 28 VDC @ 7 mA)
Current Sinking - Unit provides 7.8 K Ω pull-up load for sensors with current sinking outputs. (Max. sensor current, 1.6 mA)
Debounce - Damping capacitor provided for switch contact debounce. Limits count speed to 100 Hz max. and input pulse widths of 5 msec min.
Lo Bias - Input Trigger levels $V_{IL} = 1.5$ V, $V_{IH} = 3.75$ V.
Hi Bias - Input Trigger levels $V_{IL} = 5.5$ V, $V_{IH} = 7.5$ V.
Note: Bias levels $\pm 10\%$ @ 12 VDC sensor voltage. These levels vary proportionally with the sensor supply voltage.
- MAXIMUM COUNT RATES:**
High Frequency - 2.5 KHz max. for all electronic sensors under all modes of operation. Signals can be square wave inputs or inputs with negative going pulse widths, as short as 50 μ sec, with a total min. period of 400 μ sec.
Low Frequency - 100 Hz for switch contact closures. (Note: These units will operate with VCM [E-H] modules.)
- CONTROL INPUTS:**
Remote Reset - Active low ($V_{IL} = 0.5$ V max.), internally pulled up to 5 VDC through a 10 K Ω resistor ($I_{SNK} = 0.5$ mA). Response time = 10 msec. A low will reset the unit and deactivate outputs.
Program Disable - Active low ($V_{IL} = 0.5$ V max.), internally pulled up to 5 VDC through a 10 K Ω resistor ($I_{SNK} = 0.5$ mA). A low will inhibit the changing of presets, decimal point selection, and timed outputs, as well as testing outputs in self-test.
Up/Dn Control - Active low ($V_{IL} = 0.5$ V max.), internally pulled up to 5 VDC through a 10 K Ω resistor ($I_{SNK} = 0.5$ mA) Response Time = 150 μ sec. This input determines the direction of the count and is independent of Reset to Zero or Reset to Preset modes of operation. When input is low, count is down.
- OUTPUTS:**
Solid-State - Current sinking NPN open collector transistors. $I_{SNK} = 100$ mA max. $V_{OH} = 30$ VDC max. (Internal Zener diode protection). One solid-state output for each preset level. $V_{OL} = 1$ VDC max. @ 100 mA.
Relay(s) - Form C contacts max. rating 5 amps @ 120/240 VAC, 28 VDC (resistive load), 1/8 H.P. @ 120 VAC (inductive load). The operate time is 5 msec nominal and the release time is 3 msec nominal.
Relay Life Expectancy - 100,000 cycles at max. rating. (As load level decreases, life expectancy increases.)

- Programmable Timed Output** - The timed output can be programmed from 0.01 sec to 99.99 sec, $\pm 0.01\%$ - 10 msec. The timed output is set for 0.1 sec at the factory.
- MEMORY RETENTION:** The Libra counters have a "no power E²PROM" which maintains all information when the input power is removed. The life expectancy of this device is at least 100,000 power down cycles and length of memory retention for a single power down can be as long as 10 years.
 - INPUT, POWER, AND OUTPUT CONNECTIONS:** There are two plug-in, compression type, barrier strips located at the rear of the unit. These strips can be removed from the rear of the unit for ease of wiring. After wiring is complete, the connector can be plugged back into the unit.
 - CERTIFICATIONS AND COMPLIANCES:**
SAFETY
Type 4 Indoor Enclosure rating (Face only), UL50
IEC 1010-1, EN 61010-1: Safety requirements for electrical equipment for measurement, control, and laboratory use, Part 1.
IP65 Enclosure rating (Face only), IEC 529
ELECTROMAGNETIC COMPATIBILITY
Immunity to EN 50082-2
Electrostatic discharge EN 61000-4-2 Level 2; 4 Kv contact¹
Level 3; 8 Kv air
Electromagnetic RF fields EN 61000-4-3 Level 3; 10 V/m
80 MHz - 1 GHz
Fast transients (burst) EN 61000-4-4 Level 4; 2 Kv I/O²
Level 3; 2 Kv power
RF conducted interference EN 61000-4-6 Level 3; 10 V/rms²
150 KHz - 80 MHz
Power frequency magnetic fields EN 61000-4-8 Level 4; 30 A/m
Emissions to EN 50081-2
RF interference EN 55011 Enclosure class B
Power mains class B

Notes:

- Metal bezel of unit connected with ground lead from rear bezel screw to metal mounting panel.
- When the unit is DC powered from terminal TBA pin 5 (common) and terminal TBB pin 6 (+12 VDC) a power line filter was installed, RLC #LFIL0000 or equivalent, so as not to impair the function of the unit.
Refer to the EMC Installation Guidelines for additional information.
- ENVIRONMENTAL CONDITIONS:**
Operating Temperature: 0 to 50°C
Storage Temperature: -40 to 70°C
Operating and Storage Humidity: 85% max. (non-condensing) from 0°C to 50°C.
Altitude: Up to 2000 meters
- CONSTRUCTION:** Metal die-cast bezel with black, high impact plastic insert. Front panel meets NEMA 4/IP65 requirements for indoor use when properly installed. (Panel gasket and mounting clips included with unit.) Installation Category II, Pollution Degree 2.
- WEIGHT:** 1.5 lbs. (0.68 k) [LCD], 1.75 lbs. (0.79 k) [LED]