MODEL LIBT - LIBRA SERIES TIMERS (LCD & LED)

- *ONE OR TWO PRESET VERSIONS*
- *11 SELECTABLE TIME RANGES*
- *0.5" (12.7 mm) HIGH LIQUID CRYSTAL DISPLAY OR 0.4" (10.2 mm) HIGH LED DISPLAY*
- *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*
- *MEETS DIN PANEL MOUNT SPECIFICATIONS*
- *REMOTE RESET CAPABILITY*
- *INSTANTANEOUS & DELAYED CONTACTS*
- *NON-VOLATILE MEMORY (E^2PROM)*
- *SEALED FRONT PANEL CONSTRUCTION (NEMA 4/IP65)*
- *ABILITY TO LOCK OUT FRONT PANEL FUNCTIONS*
- *FRONT PANEL RESET ENABLE/DISABLE*

CAUTION: Read complete instructions prior to installation and operation of the unit.

CAUTION: Risk of electric shock.

DESCRIPTION

The Libra Series of presettable timers is an economical and reliable solution to one or two preset timing requirements. The LIBT1 and LIBT1E are the single preset timer versions and the LIBT2 and LIBT2E are the dual preset timer versions. All four units have a solid-state output and a form C relay output for each preset. These units feature a full complement of control inputs, programmable timed output values, non-volatile memory and many other features which will satisfy most any single or dual preset timer requirement.

The Libra Timers have two main timing actions, Reset to Zero *(RTZ) [Time Up]* and Reset to Preset *(RTP) [Time Down]*. With RTZ, the timer resets to zero, times up, and activates the outputs when the preset value*(s)* are reached. When RTP is used, the unit starts at the preset value, times down, and activates the output when zero is reached *(single preset unit)*. For the dual preset version, the time starts at preset 2 and times toward zero. Output 1 fires when the preset 1 value is reached and output 2 fires when the time reaches zero. There are ten modes of operation for the single preset unit and sixteen modes of operation for the dual preset unit.

The Libra Timers also have eleven different selectable time range values. These include: hours, minutes, or seconds; tenths of hours, minutes, or seconds; hundredths of hours, minutes, or seconds; and two chronometer time functions of minutes and seconds; and hours and minutes.

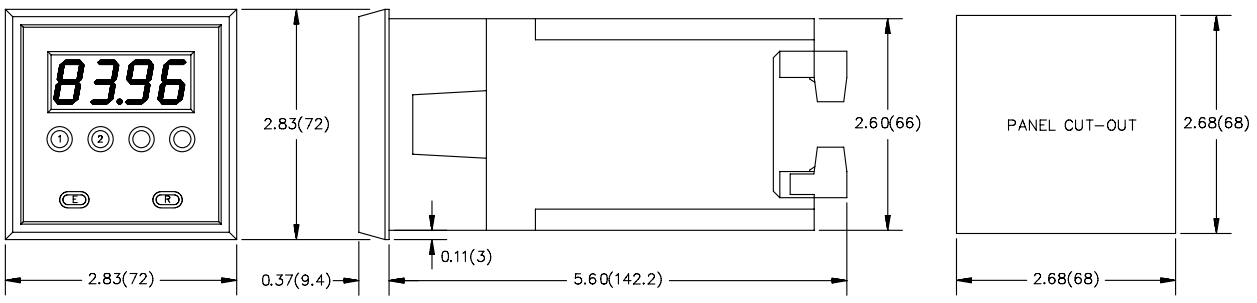
The timed output is programmed through the front panel buttons and can be programmed from 0.01 sec. to 99.99 sec. *(The unit's timed output is set at the factory to be 0.1 sec.)* The Libra timers have an internal non-volatile memory device which eliminates the need for battery back-up. When input power is lost, this device will maintain all data necessary for system operation. A Program Disable terminal is present, 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 timers 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 time or missing preset value*(s)*.

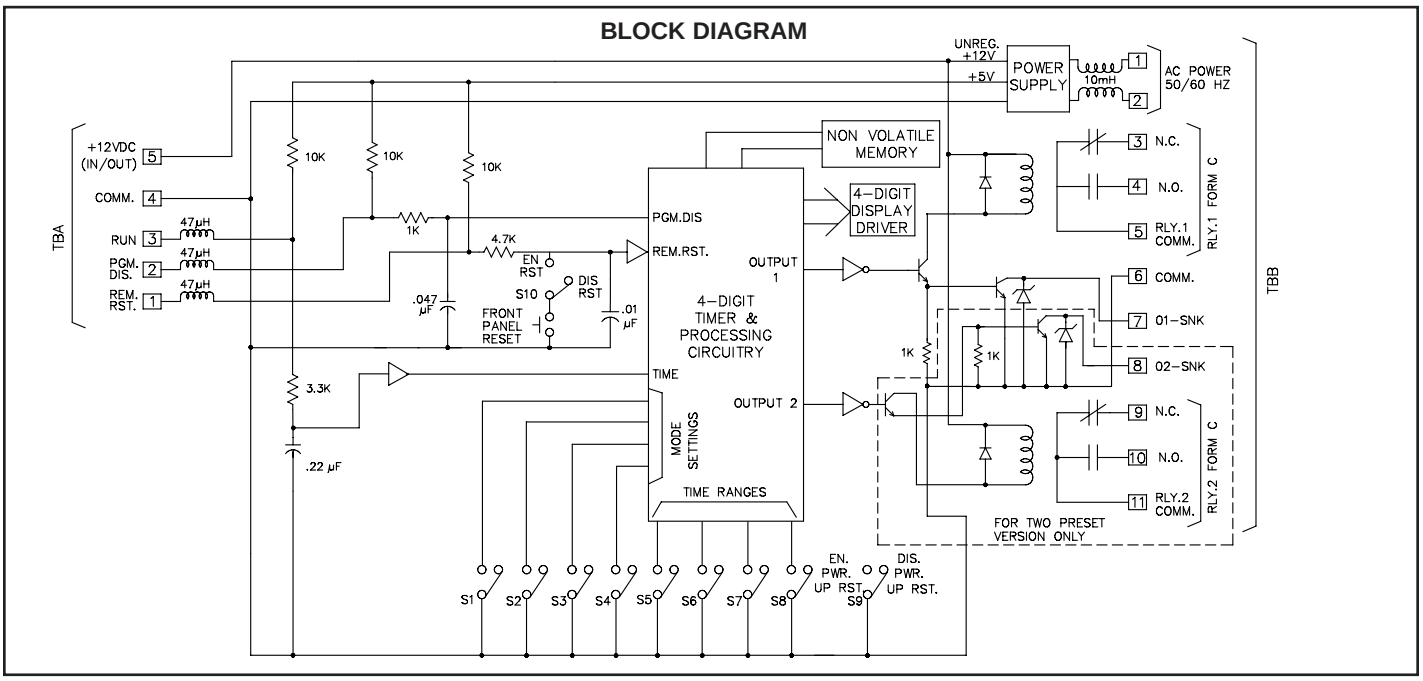
Power, input, and output connections are made via removable terminal blocks located at the rear of the unit. These blocks can accept one #14 AWG stripped wire. DIP switches at the rear of the unit are used to set the time ranges and to set the desired operating modes.

The Libra Series timers 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.

DIMENSIONS In inches (mm)

Note: Recommended minimum clearance (behind the panel) for mounting clip installation is 2.7"(69)H x 4.5"(114)W.





SPECIFICATIONS

1. **DISPLAY:**
   4-digit, 0.5" *(12.7 mm)* high LCD display.
   4-digit, 0.4" *(10.2 mm)* high LED display.
2. **POWER REQUIREMENTS:**
   AC Operation: 115/230 VAC (±10%), 50/60 Hz, 6 VA *(LCD)* or 9 VA *(LED).*
   DC Operation: 11 to 14 VDC @ 0.2A max *(LCD)* or 0.3 A max *(LED).*
3. **SENSOR POWER:** 10 to 16 VDC @ 150 mA.
4. **RUN INPUT:** Can accept switch contact closure and NPN Open Collector outputs and similar types of current sinking inputs. V_{IL} = 1 V max., internally pulled up to 5 VDC through a 10 KΩ resistor (I_{SNK} = 0.5 mA). Response time = 5 msec to 15 msec. *(These units operate with VCM [E-H] modules.)*
5. **TIME ACCURACY:** ±0.01%
6. **CONTROL INPUTS:**
   Remote Reset: Active low (V_{IL} = 1 V max.), internally pulled up to 5 VDC through a 10 KΩ resistor (I_{SNK} = 0.5 mA). Response time = 10 msec. A low will reset the unit and deactivate the outputs.
   Program Disable: Active low (V_{IL} = 0.5 V max.), internally pulled up to 5 VDC through a 10 KΩ resistor (I_{SNK} = 0.5 mA). A low will inhibit the changing of presets and timed outputs, as well as the testing of outputs in self-test.
7. **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, ±0.01% - 10 msec. The timed output is set for 0.1 sec at the factory.
8. **MEMORY RETENTION:** The Libra Timers have a "no power E^2PROM" which maintains all information when the input power is removed. The life expectancy of this device is at least 10,000 power down cycles and length of memory retention for a single power down can be as long as 10 years.
9. **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.
10. **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), IEC529

ELECTROMAGNETIC COMPATIBILITY

Immunity to EN 50082-2		
Electrostatic discharge	EN 61000-4-2	Level 2; 4 Kv contact[1] 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/O[2] Level 3; 2 Kv power
RF conducted interference	EN 61000-4-6	Level 3; 10 V/rms[2] 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

Note:

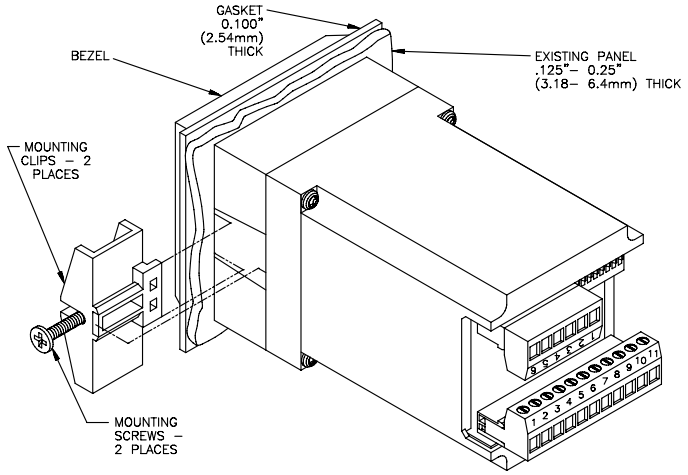
1. *Metal bezel of unit connected with ground lead from rear bezel screw to metal mounting panel.*
2. *When the unit is DC powered from terminal TBA pin 5 (common) and terminal TBB pin 6 (+12 VDC) a power line filter was installed, RLC #LFIL0000 or equivalent, so as not to impair the function of the unit.*

Refer to the EMC Installation Guidelines for additional information.

11. **ENVIRONMENTAL CONDITIONS:**
    Operating Temperature: 0°C to 50°C
    Storage Temperature: -40°C to 70°C
    Operating and Storage Humidity: 85% max (non-condensing) from 0 to 50°C
    Altitude: Up to 2000 meters
12. **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
13. **WEIGHT:** 1.5 lbs. *(0.68 kg) [LCD]*, 1.75 lbs. *(0.79 kg) [LED]*

SELECTION OF MODES OF OPERATION, TIME RANGE VALUE, POWER-UP RESET, & FRONT PANEL RESET

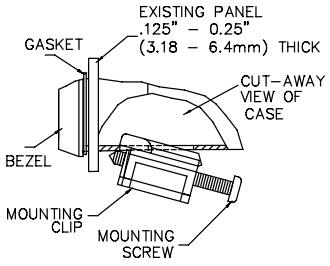
The selection of Modes of Operation, Time Range, Power-Up Reset, and Front Panel Reset is accomplished by a ten-position DIP switch, located at the rear of the unit, in the upper right-hand corner. DIP switches 1-4 are used to set the desired mode of operation, while DIP switches 5-8 are used to determine the time range setting. DIP switch 9 is used to determine whether the unit, on power-up, is to restore or reset the time value. When this switch is up, the time value, displayed before power loss, will be restored and will be operated on as before power loss. When the switch is down, the unit will reset the time value to either zero (RTZ) or to the preset value (RTP) when input power is restored. DIP switch 10 is used to enable or disable the front panel reset button. When the switch is up, the front panel reset button is disabled. When the switch is down, the front panel reset button is enabled. The selection of Mode of Operation will be discussed first followed by the selection of Time Range Value.



INSTALLATION

The Libra counters and timers are designed to be panel-mounted with a gasket to provide a water-tight seal. Two mounting clips and screws are provided for easy installation. Consideration should be given to the thickness of the panel. Too thin of a panel may distort and not provide a water-tight seal. (Recommended minimum panel thickness is 1/8".)

After the panel cut-out has been completed and deburred, carefully apply the gasket to the panel. DO **NOT** APPLY THE ADHESIVE SIDE OF THE GASKET TO THE COUNTER BEZEL. Insert the unit into the panel. As depicted in the drawing (at right), install the screws into the narrow end of the mounting clips. Thread the screws into the clips until the pointed end just protrudes through the other side. Install each of the two mounting clips by inserting the wide lip of the clips into the front end of the hole, located on either side of the case. Then snap the clip onto the case. Tighten the screws evenly to apply uniform compression, thus providing a water-tight seal. ***Caution**: Only minimum pressure is required to seal panel. Do **NOT** over-tighten mounting screws.*



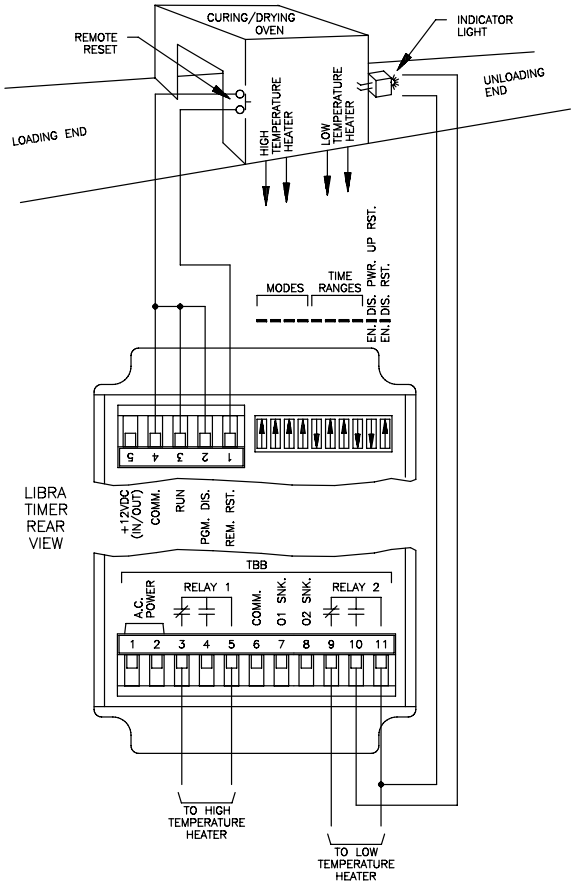
APPLICATION FOR DUAL LEVEL PRESET LIBRA TIMER

CURING/DRYING PROCESS CONTROL

In a typical manufacturing curing/drying process, it is required to control the duration of time heat is applied to the items within an oven. These items are to be heated at a high temperature for a long period of time (30 minutes). At the end of the curing/drying process, the heat is turned off and an indicator light is turned on, signaling the unloading attendant. The dual preset Libra timer will satisfy all these requirements.

The Libra timer is first set to minutes time range, which is time range 9. Next, the mode switches are set to Mode 0 (Latch Outputs at Presets, Manual Reset to Zero, Time Stops at Preset 2). Mode 0 is used because the outputs must latch on when the presets are reached (When the outputs latch on, the heaters de-energize). Also, the time increments will stop at preset 2. The power-up reset switch is set to "Enable", which causes the unit to start the cycle over in the event of an input power loss (when enabled, the unit will reset itself when input power is restored). The front panel reset button "EN./DIS." switch is "Disabled" to prevent accidental resetting (restarting) of the cycle. The "REM. RST." terminal is connected to a remote reset button located at the loading end of the oven. The "PGM. DIS." and the "RUN" terminals are tied to the "COMMON" terminal. With "PGM. DIS." tied low (this is done after preset 1 is set to 3 minutes and preset 2 is set to 33 minutes), the heating time periods cannot be changed. "RUN" is permanently tied low, which causes the unit to increment time (when Preset 2 is reached, Mode 0 will cause time accumulation to stop). The normally closed contact of Relay 1 is connected to the high temperature heater and the normally closed contact of Relay 2 is connected to the low temperature heater. The operation sequence is as follows:

The operator/attendant wheels a rack of items into the heating area (oven). Once the oven doors are closed, the operator/attendant presses the remote reset switch which starts the heating cycle (both high and low temperature heaters are turned on at this time). After three minutes have elapsed, output 1 fires, which opens the normally closed contact of Relay 1. (This turns off the high temperature heater.) After 30 minutes have elapsed, output 2 fires, which stops the time accumulation and opens the normally closed contact of Relay 2. (This turns off the low temperature heater.) Also, the normally open contact of Relay 2 closes, which then turns on the indicator light. (This signals the unloading attendant that the process is complete.)



ORDERING INFORMATION

MODEL NO.	DESCRIPTION	PART NUMBERS FOR AVAILABLE SUPPLY VOLTAGES	
		230 VAC	115 VAC
LIBT1	Single Preset LCD Libra Timer	LIBT1010	LIBT1000
LIBT2	Dual Preset LCD Libra Timer	LIBT2010	LIBT2000
LIBT1E	Single Preset LED Libra Timer	LIBT1E10	LIBT1E00
LIBT2E	Dual Preset LED Libra Timer	LIBT2E10	LIBT2E00
For more information on Pricing, Enclosures & Panel Mount Kits refer to the RLC Catalog or contact your local RLC distributor.			