



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



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- Large 7-digit display
- Leading “0”s in the display are eliminated for easy reading
- Wide counting range

## PRODUCT TYPE

### 1) Non-voltage input type

Types	Part No.		Rated operating voltage	Max. current consumption	No. of digits	Counting speed	Input
	With manual reset	Without manual reset					
LC24-F Flush mounting type	LC24-F	LC24-F-N	Built-in battery (Battery life: 10 years)	—	7	30 cps	Non-voltage input
LC24-C PC board mounting type	LC24-C	—	3V DC (Uses manganese dioxide lithium battery)	20 $\mu$ A (When resetting: 200 $\mu$ A)			

### 2) Voltage input type

Types	Part No.		Rated operating voltage	No. of digits	Counting speed	Input
	With manual reset	Without manual reset				
LC24-F Flush mounting type	LC24-F-AL	LC24-F-AL-N	Built-in battery (Battery life: 6 years)	7	30 cps	100 to 120V AC/DC (Signal reset is controlled by non-voltage type input)
	LC24-F-AH	LC24-F-AH-N				200 to 240V AC/DC (Signal reset is controlled by non-voltage type input)
	LC24-F-DL	LC24-F-DL-N	Built-in battery (Battery life: 10 years)	70 cps	4.5 to 30V DC	

## SPECIFICATIONS

### Input signals

		Non-voltage input type		Voltage input type	
		Flush mounting type	PC board mounting type	AC/DC input type	DC input type
Operation signal	Min. operating signal width	16.7 ms (ON:OFF = 1:1)			7.15 ms (ON:OFF = 1:1)
	Input method	Non-voltage input: Contact/Open collector		ON: 100 to 120V AC/DC, 200 to 240V AC/DC OFF: 0 to 2V AC/DC	ON: 4.5 to 30V DC OFF: 0 to 2V DC
	Input impedance	Max. 1 k $\Omega$ when short-circuited Min. 100 k $\Omega$ when open-circuited			10 k $\Omega$
	Residual voltage	Max. 0.5 V			—
Signal reset	Min. signal reset width	20ms	500ms	20ms	
	Input method	Non-voltage input: Contact/Open collector			ON: 4.5 to 30V DC OFF: 0 to 2V DC
	Input impedance	Max. 1 k $\Omega$ when short-circuited Min. 100 k $\Omega$ when open-circuited			7.5 k $\Omega$
	Residual voltage	Max. 0.5V			—
Manual reset min. input width		20ms	500ms	20ms	

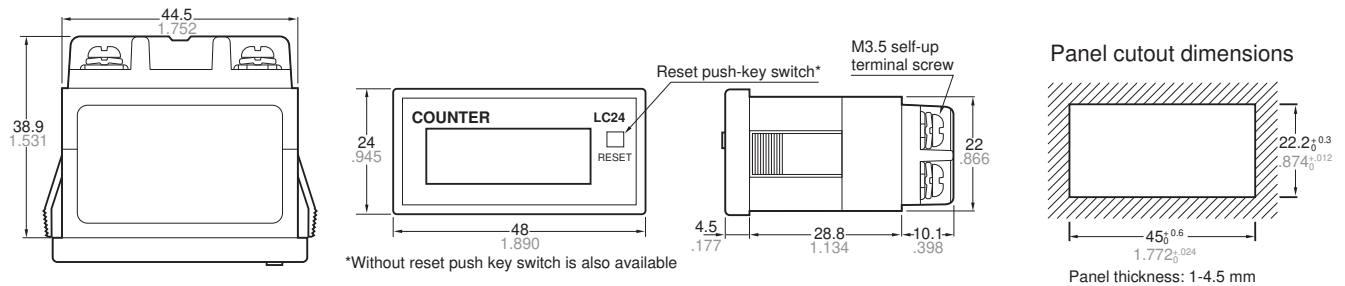
## Characteristics

	Non-voltage input type		Voltage input type	
	LC24-F Flush-mounting type	LC24-C PC board mounting type	AC/DC input type	DC input type
Rated operating voltage	Built-in battery	3V DC (manganese dioxide lithium battery)	Built-in battery	
Battery life	10 years	—	6 years	10 years
Shock resistance	Functional	10G (4 times on 3 axes)		
	Destructive	30G (5 times on 3 axes)		
Vibration resistance	Functional	10 to 55 Hz: 1 cycle/min double amplitude of 0.3 mm (10 min on 3 axes)		
	Destructive	10 to 55 Hz: 1 cycle/min double amplitude of 0.75 mm (1 h on 3 axes)		
Ambient temperature	-10 to +55°C +14 to 131°F			
Storage temperature	-25 to +65°C +13 to 149°F			
Ambient humidity	35 to 85% RH			
Counting direction	Addition (UP)			

## DIMENSIONS

LC24-F, flush mounting type (Common for non-voltage input type and voltage input type)

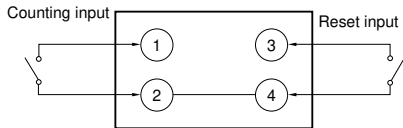
mm (inch)



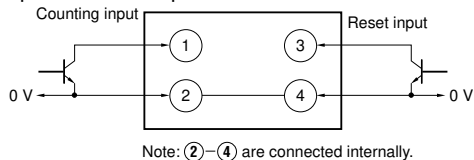
## WIRING DIAGRAM

1) Non-voltage input type

Contact input



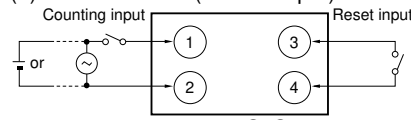
Open collector input



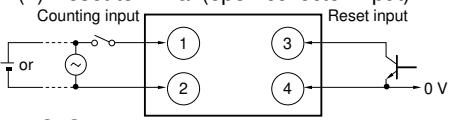
2) Voltage input type

• AC/DC voltage input

(1) Reset terminal (contact input)



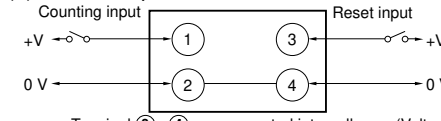
(2) Reset terminal (open collector input)



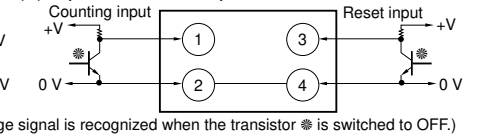
• Timing input terminals (1), (2) and reset input terminals (3), (4) are insulated internally.

• DC voltage input

(1) Contact input

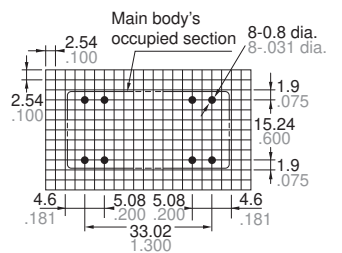
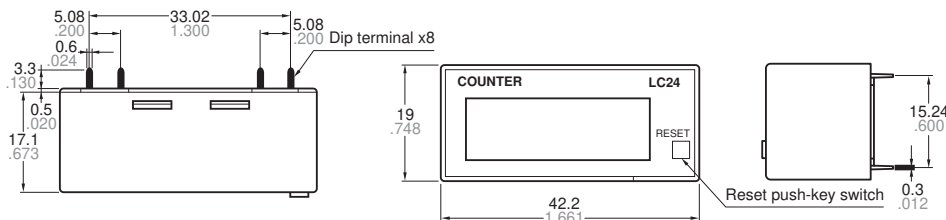


(2) Open collector input



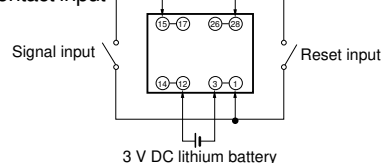
LH24-C, PC board mounting type

PC board pattern (Bottom view)

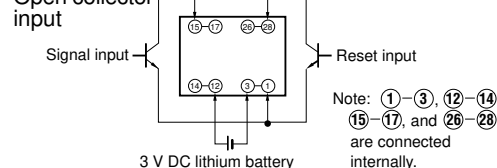


## WIRING DIAGRAM

Contact input



Open collector input



Note: (1)-(3), (12)-(14), (15)-(17), and (26)-(28) are connected internally.



# OPERATION EXPLANATION

Addition <div style="border: 1px solid black; padding: 2px; display: inline-block;">UP</div>	<b>LC24-F type</b> <ul style="list-style-type: none"> <li>Counts when the operation signal is ON.</li> <li>While the reset input is ON, the signal time is not counted and the display is "0".</li> </ul>	<b>Example</b> 
	<b>LC24-C type</b> <ul style="list-style-type: none"> <li>Counts when the operation signal is ON.</li> <li>While the reset input is ON, the signal does not change.</li> </ul>	<b>Example</b> 

## CAUTIONS

### <Non-voltage input type>

- Since the current from the operation signal and reset input terminals [①-③ (flush mounting type), ⑮-⑱ (PC board mounting type)] is small, use relays and switches which have high-reliability contact performance.
- When input signals are triggered through the transistor's open collector, use a small signal transistor with an  $I_{CBO}$  less than  $1 \mu A$ , being sure to trigger them with no voltage across the collector.
- When connecting the signal input and reset input wires, do not run them parallel to high-voltage or power cables and avoid using the same conduit. Use shielded wires or metallic conduits which are as short as possible. If the floating capacitance of the wires exceeds  $500 \text{ pF}$  (approx.  $10 \text{ m}$  for parallel wires of  $2 \text{ mm}^2$ ), it will cause malfunctions.
- Lithium batteries are built in the flush mounting types. Never throw them into a fire. Do not dispose of them in trash intended to be incinerated.

### •PC board mounting type—

- After connecting the external power, be sure to reset it to make sure that "0" appears on the display.
- Battery life is calculated as follows:

$$t = \frac{A}{I}$$

- t: Battery life (h)
- I: Consumption current (mA)
- A: Battery capacity when the operating voltage becomes minimum.

- Hand soldering:

Soldering iron	30 W to 60 W
Iron tip temperature	Approx. $300^{\circ}\text{C}$ ( $572^{\circ}\text{F}$ )
Soldering time	Less than approx. 3 seconds

### <Voltage input type>

#### • AC/DC Voltage input type

- Apply voltage to the signal input terminal. Do not apply voltage to the reset input terminal. When voltage exceeding the range of the rated input voltage is applied to the signal input terminal, or if voltage is applied to the reset terminal, it may cause break-down of internal elements.
- Since the current from the reset input terminal is small, use relays and switches which have high-reliability contact performance.
- When reset is triggered through the transistor's open collector, use a small signal transistor with an  $I_{CBO}$  less than  $1 \mu A$ , being sure to trigger it with no voltage across the collector.
- For external reset, make a temporary short-circuit between the rear reset terminals [③-④].

#### • DC voltage input type

- When more than  $30 \text{ V DC}$  is applied to the signal or reset input terminals, it may cause breakdown of internal elements.
- For external reset, voltage is applied between the rear reset terminals [③-④] to the H level ( $4.5$  to  $30 \text{ V DC}$ ). In this case, connect (-) to terminal ④ and (+) to terminal ③. Since they are polarized, they will not operate with reverse polarity.

#### • Common

- When connecting the operation signal wires [①-②] and reset input wires [③-④], do not run them in parallel with high-voltage or power cables. Avoid running signal or reset wires in a power conduit. Use shielded wires or metal conduits which are as short as possible. If the floating capacitance of these wires exceeds  $500 \text{ pF}$  (approximately  $10 \text{ m}$  for parallel wires of  $2 \text{ mm}^2$ ), it will cause malfunctions.
- Lithium batteries are built in. Never throw them into a fire. Do not dispose of them in trash intended to be incinerated.