

Digital LCD Timer

Digital LCD Timer DIN size W48 × H48mm

■ Features

- 10 programmable output modes
- 10 programmable timing ranges
- Select the function by Digital S/W in front
- Power supply : 100–240VAC 50/60Hz / 24–240VDC
- Graphic output contact status display (NO/NC)
- BAR graph display of time progressing in 5% increments
- Compact size (Length:74mm)
- Selectable wide time range
- International approvals



⚠ Please read "Caution for your safety" in operation manual before using.



■ Ordering information

L E 3 S □

	Time-limit 1c (SPDT) □
A	Time-limit 2c (DPDT) □
B	Time-limit 1c, Instantaneous-contact 1c
S	DIN Size W48 × H48mm
3	999 (Digit)
E	Timer
L	LCD Display

■ Specifications

Model	LE3S	LE3SA	LE3SB
Function	Multi time range, Multi function	Multi time, Power ON Delay	
Display method	LCD Display (Character size : W4 × H8mm)		
Power supply	100–240VAC 50/60Hz / 24–240VDC		
Allowable voltage range	90 ~ 110% of rated voltage		
Power consumption	Approx. 3VA (240VAC 50/60Hz) Approx. 1W (240VDC)	Approx. 4VA (240VAC 50/60Hz) Approx. 1.5W (240VDC)	
Return time	Max. 100ms		
Min. input signal	START input	Min. 20ms	—
	INHIBIT input		
	RESET input		
Input	START input	● No-voltage input Short-circuit impedance: Max. 1kΩ Residual voltage: Max. 0.5VDC Open-circuit impedance: Min. 100kΩ	—
	INHIBIT input		
	RESET input		
Control output	Contact type	Time limit SPDT (1c)	Time limit DPDT (2c) Time limit SPDT (1c), Instantaneous SPDT (1c)
	Contact capacity	250VAC 5A resistive load	250VAC 3A resistive load
Relay life cycle	Mechanical	Min. 10,000,000 times	
	Electrical	Min. 100,000 times (250VAC 5A resistive load)	Min. 100,000 times (250VAC 3A resistive load)
Output mode	10 kinds of operation modes	Power ON Delay mode	
Ambient temperature	-10 ~ +55°C (at non-freezing status)		
Storage temperature	-25 ~ +65°C (at non-freezing status)		
Ambient humidity	35~85%RH		

(A) Counter

(B) Timer

(C) Temp. controller

(D) Power controller

(E) Panel meter

(F) Tacho/Speed/Pulse meter

(G) Display unit

(H) Sensor controller

(I) Proximity sensor

(J) Photo electric sensor


(K) Pressure sensor

(L) Rotary encoder

(M) 5-Phase stepping motor & Driver & Controller

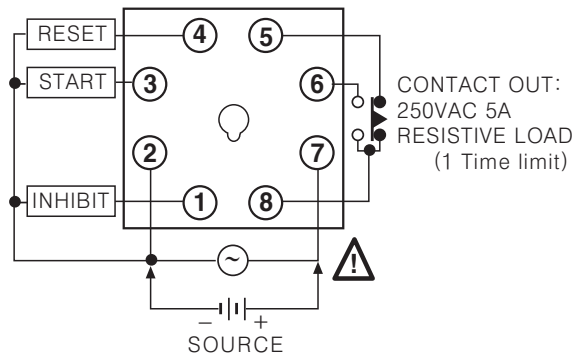
LE3S Series

Specifications

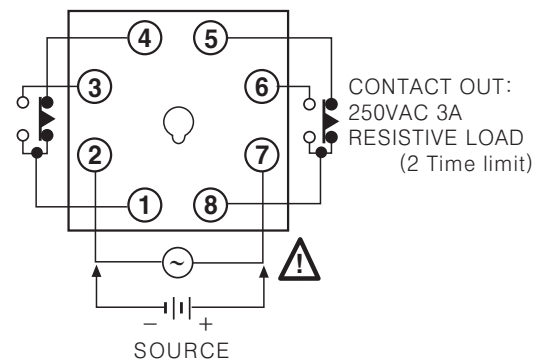
Model		LE3S	LE3SA	LE3SB
Repeat error	Max. $\pm 0.01\%$ $\pm 0.05\text{sec}$ (Power Start) Max. $\pm 0.005\%$ $\pm 0.03\text{sec}$ (Signal Start)			$\pm 0.01\%$ $\pm 0.05\text{sec}$
Setting error				
Voltage error				
Temperature error				
Insulation resistance		100M Ω (at 500VDC)		
Dielectric strength		2000VAC 50/60Hz for 1 minute		
Noise strength		$\pm 2\text{kV}$ the square wave noise(pulse width:1 μs) by the noise simulator		
Vibration	Mechanical	0.75mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 1hour		
	Malfunction	0.5mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 10 minutes		
Shock	Mechanical	300m/s ² (Approx. 30G) in X, Y, Z directions for 3 times		
	Malfunction	100m/s ² (Approx. 10G) in X, Y, Z directions for 3 times		
Approval			—	
Weight		Approx. 100g	Approx. 105g	

Connections

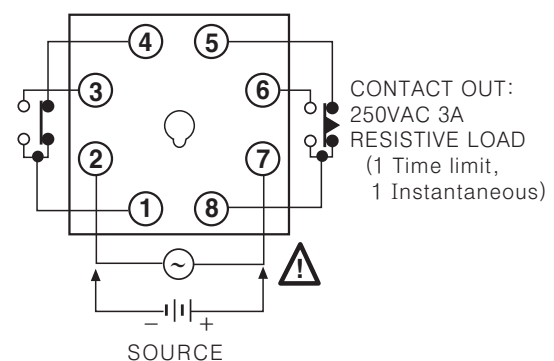
LE3S



LE3SA



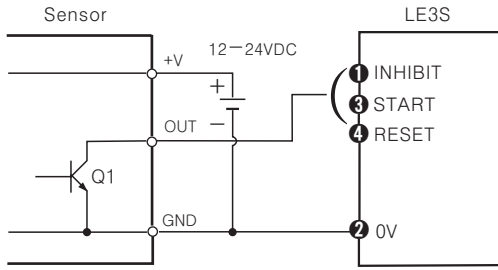
LE3SB



Digital LCD Timer

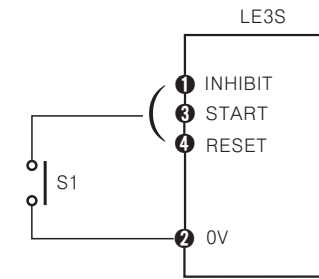
Input connections(LE3S Series)

◎Solid-state input

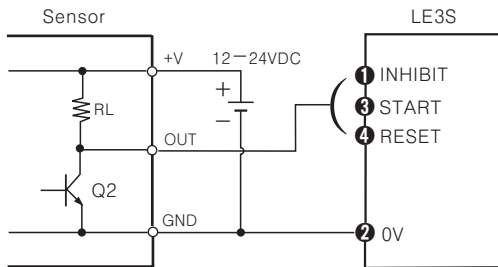


- Q1 is ON : Operating
- Sensor : NPN open collector output

◎Contact input



- S1 is ON : Operating
- S1 : Micro switch, Push button switch, Relay



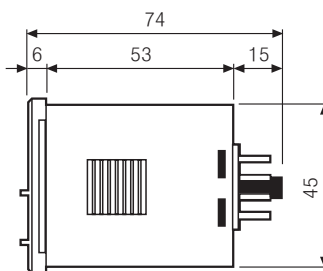
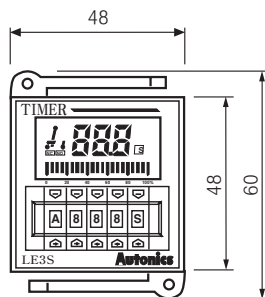
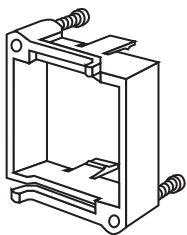
- Q1 is ON : Operating
- Sensor : NPN universal output

●Input level

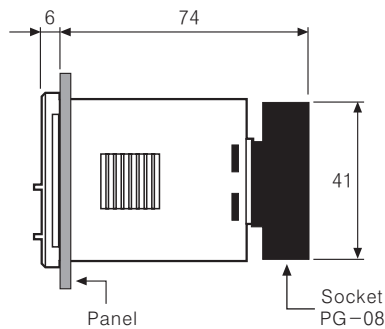
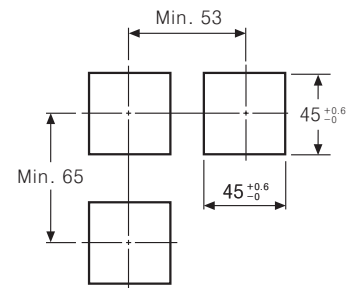
No voltage input	●ON(Short-level) · Residual voltage : Max. 0.5V · Impedance : Max. 1k Ω
	●OFF(Open-level) · Impedance : Min. 100k Ω
Contact input	Please use a contacts that can function reliably at 5VDC 1mA.

Dimensions

●Bracket



●Panel cut-out



Unit:mm

(A)
Counter

(B)
Timer

(C)
Temp.
controller

(D)
Power
controller

(E)
Panel
meter

(F)
Tacho/
Speed/
Pulse
meter

(G)
Display
unit

(H)
Sensor
controller

(I)
Proximity
sensor

(J)
Photo
electric
sensor

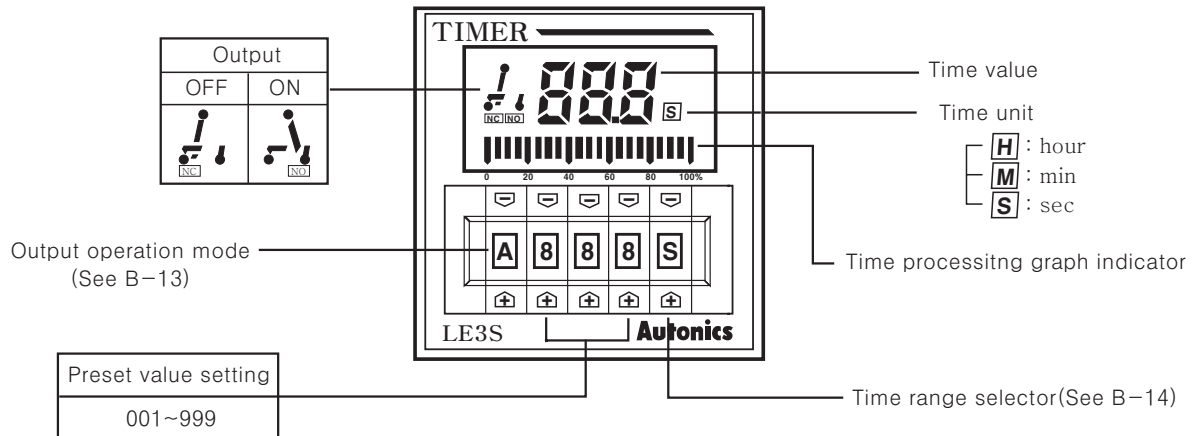
(K)
Pressure
sensor

(L)
Rotary
encoder

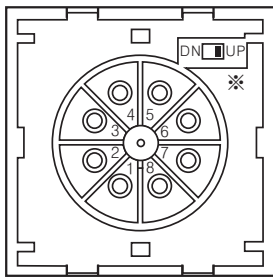
(M)
5-Phase
stepping
motor &
Driver &
Controller

LE3S Series

Front panel identification



Up/Down Mode



※ The output will operate as Up mode or Down mode according to location of Up/Down selection switch.

Up	Down
DN <input type="checkbox"/> UP <input type="checkbox"/>	DN <input type="checkbox"/> UP <input type="checkbox"/>

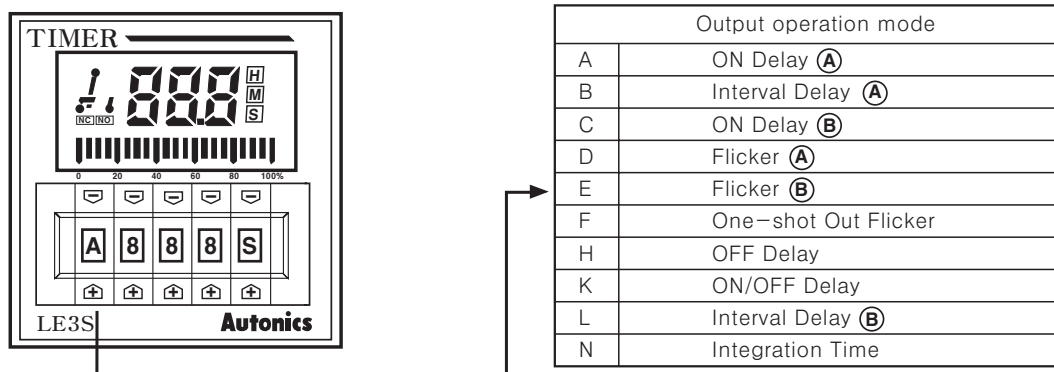
⚠ Power must be cut off.

● Factory specification

LE3S	LE3SA, LE3SB
Up/Down mode : Up	<ul style="list-style-type: none"> Up/Down mode : Up Output mode : Fixed A mode ※ Down mode is optional

Output operation mode selection

● Please select operation mode by pressing , keys located on left front panel.



※ See B-15 and B-16 for the specification information of output operation mode.

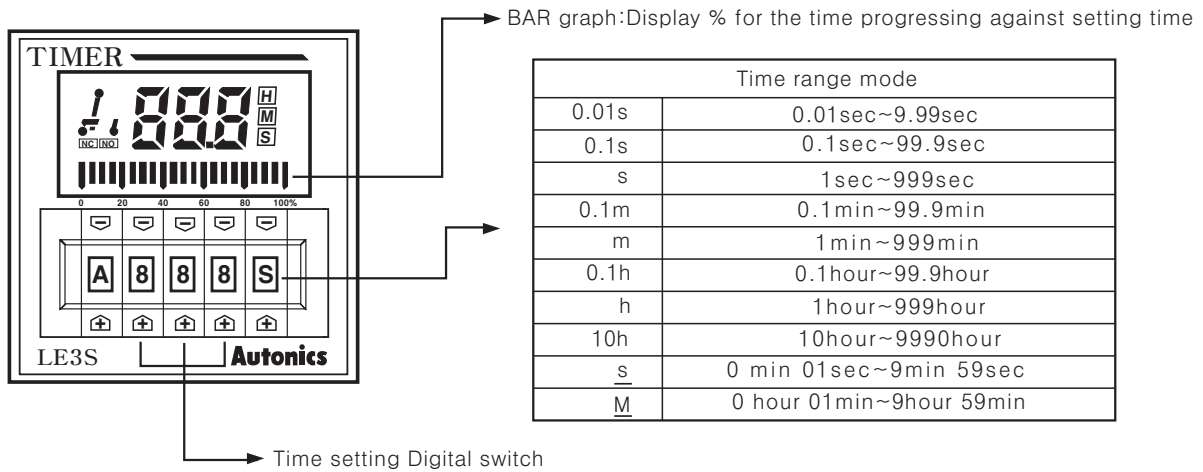
- On delay (A) of A mode and ON delay (B) of C mode are different
- Interval delay (A) of B mode and Interval delay (B) of L mode are different.
- Flicker (A) of D mode and Flicker (B) of E mode are different.

※ (A) mark from output operation mode is one of output operation mode and working with the time progressing when the start signal applied continuously.

※ (B) mark from output operation mode is one of output operation mode and working with the time progressing even the start signal is applied as One-shot signal. (One-shot input signal should be over 20ms)

Operation time and time specification mode selection

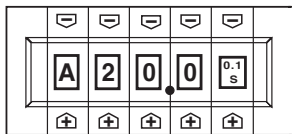
Please select time unit mode by pressing , keys located on right hand push buttons.



Operation time setting : Please select operation time by pressing , 3 keys located on middle front panel.

※EX) When using this unit with 20.0 sec of operation time.

After selecting as time range, then set operation time setting with digital switches as 20.0sec.
In this case it is convenient to put a decimal point as below picture.



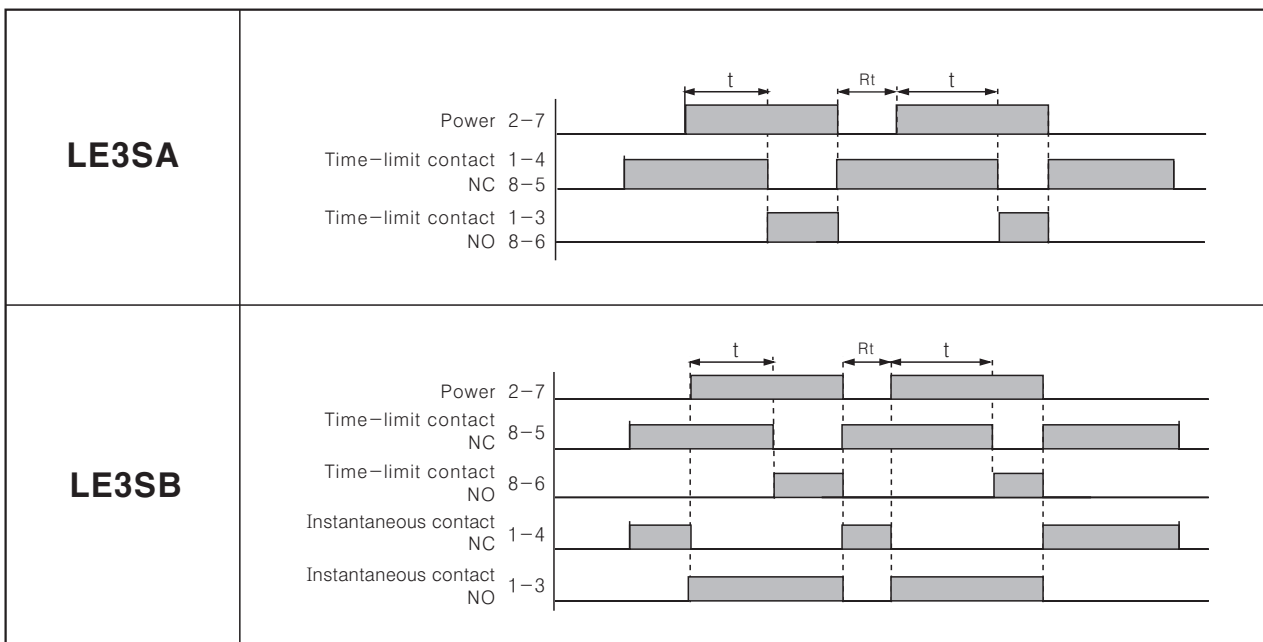
• Bar graph : Display the time processing rate of setting time by bar.
Setting value(Operation time) ÷ 20(Total bar)
= The time value of 1 Bar

Put a decimal point

Each bar on the bar graph represents 5% of the total setting value(Operation time) simply divide the setting value by 20 to determine the time value of each bar.

LE3SA, LE3SB output operation mode

※t=Setting time, Rt= Resetting time(Min. 100ms)



(A)
Counter

(B)
Timer

(C)
Temp.
controller

(D)
Power
controller

(E)
Panel
meter

(F)
Tacho/
Speed/
Pulse
meter

(G)
Display
unit

(H)
Sensor
controller

(I)
Proximity
sensor

(J)
Photo
electric
sensor

(K)
Pressure
sensor

(L)
Rotary
encoder

(M)
5-Phase
stepping
motor &
Driver &
Controller

LE3S Series

LE3S output operation mode

T=Preset value, T > Ta

Mode	Time chart
A ON Delay (A)	<p>1. Time progresses when START signal is ON. 2. The output will be ON when the preset value is equal to the display value. (Position ①) 3. When the RESET signal is ON, the display value is returned to the initial state. (Position ③) 4. When the preset value is equal to the display value, if START signal is OFF, the output turns off, the display value is held. (②area) ※If START signal is OFF when the output is OFF the display value is returned to initial state(Position ④).</p>
B Interval Delay (A)	<p>1. The output turns ON and time progresses when START signal is ON. 2. When the preset value is equal to the display value, the output will turn OFF and the display is held. (Position ①) 3. When the RESET signal is ON, the display value is returned to the initial state. (Position ②) ※If START signal is OFF when the output is OFF the display value is returned to initial state. (Position ③)</p>
C ON Delay (B)	<p>1. Time proceeds when START signal is ON. 2. When the preset value is equal to the display value the output will turn ON and the display is held. 3. When the RESET signal is ON, the display value is returned to the initial state. ※When start signal is applied repeatedly(Position ①), only the initial signal is recognized. ※Even if the START signal is not applied, time progresses. (Position ②)</p>
D Flicker (A)	<p>1. Time progresses repeatedly when the START signal is ON. 2. The output operates from NC to NO, and from NO to NC repeatedly. 3. If RESET signal is ON, it is returned to initial state. (Position ①) ※If the START signal is OFF, the display value and output is returned to initial state. (Position ②)</p>
E Flicker (B)	<p>1. Time progresses repeatedly when the START signal is ON. 2. The output operates from NC to NO, and from NO to NC repeatedly. 3. If RESET signal is ON, it is returned to initial state. (Position ③) ※When START signal is applied repeatedly, only the initial signal is recognized. (Position ①) ※Even if the START signal is not applied, time progresses. (Position ②)</p>

※Initial state : The output is OFF, the display value is "0". (At Up mode)

The output is OFF and the display value is the setting value(At Down mode)

※When using D, E output operation modes, if the time is set too short, the output may not work properly.
 Please set the time at least over 100ms.

LE3S output operation mode

$T = \text{Preset value}$, $T = T_1 + T_2 + T_3$, $T > T_a$

Mode	Time chart
F	
One-shot Out Flicker	<p>1. Time progresses from initial value to the preset value repeatedly and the output operates as one-shot (0.3sec), when the START signal is ON. (Position ①) 2. If the RESET signal is ON, it is returned to initial state. (Position ③) ※When START signal is applied repeatedly, only the initial signal is recognized. (Position ②)</p>
H	
OFF Delay	<p>1. The START signal & the output are ON at the same time. The output will return and the display value is held after the preset time. 2. If the RESET signal is ON, the display value is returned to initial state. ※If the START signal is applied continuously, the output will be ON but time is not progressing. (Position ①)</p>
K	
ON/OFF Delay	<p>1. When the START signal is ON the output is ON the output will be reset and display value is held when preset value is equal to display value. 2. The START signal turns OFF, the output turns ON, the output will be reset and display value is held when preset value is equal to display value, 3. If RESET signal is ON, it is returned to initial state. ※If START signal is applied repeatedly, output keeps ON but be sure that the time will be initialized.</p>
L	
Interval Delay ⓑ	<p>1. When START signal is ON, the output turns ON and the time is progressing at the same time. 2. When the time reaches at the preset value the output will be reset, and the display value is held. 3. If RESET signal is applied, the display value is returned to initial state. ※When START signal is applied repeatedly, only the initial signal is recognized. (Position ①)</p>
N	
Integration Time	<p>1. When START signal is ON, the time proceeds. 2. If START signal turns off before the display value reaches the preset value, the time(display value)will be held. 3. If RESET signal is ON, it is returned to initial state.</p>

※Initial state : The output is OFF, the display value is "0". (At Up mode)

The output is OFF and the display value is setting value. (At Down mode)

※When using F output operation modes, if the time is set too short, the output may not work properly.
 Please set the time at least over 100ms.

(A)
Counter

(B)
Timer

(C)
Temp.
controller

(D)
Power
controller

(E)
Panel
meter

(F)
Tacho/
Speed/
Pulse
meter

(G)
Display
unit

(H)
Sensor
controller

(I)
Proximity
sensor

(J)
Photo
electric
sensor

(K)
Pressure
sensor

(L)
Rotary
encoder

(M)
5-Phase
stepping
motor &
Driver &
Controller

LE3S Series

■ Proper usage

⚠ Caution

It may give an electric shock if touch the input signal terminal (Between Start, Reset, Inhibit and ② terminal) when the power is supplied.

◎ Power connection

● Connect AC power line between (②-⑦) for LE3S AC power type.

But please aware power connection for DC power type. (② ← ⊖, ⑦ ← ⊕)

● When turning off power, be sure about inductive voltage, residual voltage between (②-⑦) terminals, it may cause problem with low voltage because power consumption is low and impedance is high. (If using power line in with another high voltage line or energy line in the same conduit, it may cause inductive voltage. Therefore please use separate conduit for power line).

● Power ripple should be under 10% and power supply should be within range of allowable voltage for DC power type.

● Please supply power quickly as using a switch or relay contact, otherwise it may cause timing error.

● When using SSR (Solid State Relay) for switching power source of Timer, dielectric strength voltage should be 2 times higher than power source.

◎ Input/Output

● Please check operation mode of this unit before connecting the power.

● If setting 「000」 for operation time, output may not work.

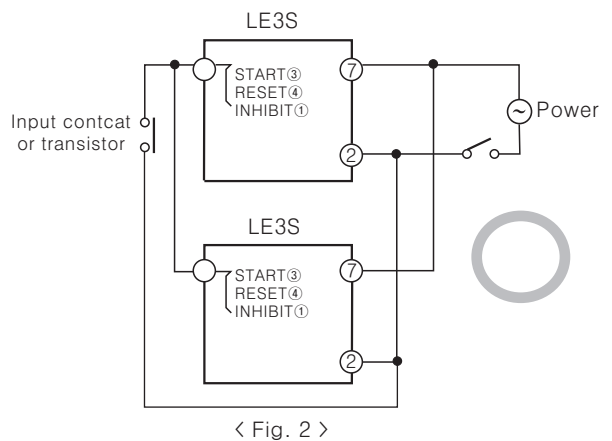
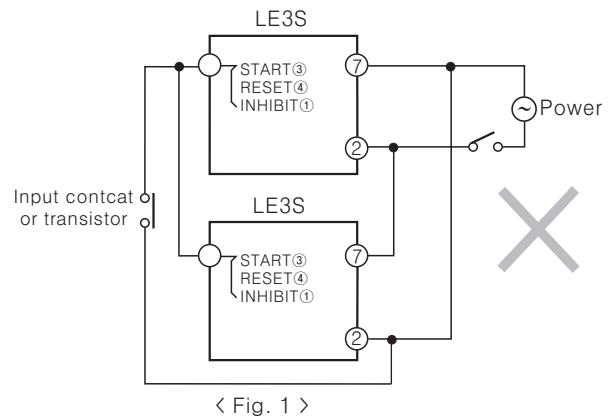
● When using a relay contact as input signal, please use a contact that can function reliable at 5VDC 2μA (Short circuited: Contact resistance under 1kΩ, Open circuit: Residual voltage under 0.5V).

● In case of connecting START terminal (③) and power terminal (②) of LE3S, do not start time at the same time applying power. Please use relay contact or transistor to start. (If starting time at the same time applying power, it will occur time error)

● Please supply power to LE3SA, LE3SB after checking operation specification.

● LE3S is transformer-less type, therefore please check following for connecting a relay contact, input signal and transistor.

① When connecting 2 or more than 2 Timers with 1 relay contact for input or transistor, please connect as following <Fig. 2 >.



② Please use transformer with primary and secondary isolated power for input.

