

Instruction Manual

JSL-71A Easy Timer with Dual Settings

Version 2.0 (Feb, 2021)

1. Overview

This JSL-71A timer can count from 0.01 second to 9999 minutes. Operating function modes include single delay, double delay, and cycle delay. It can count-down or count-up. The timer can be activated automatically when powering up, by front key pad, or via remote switch. Two different time delay settings can be programmed. User can switch the setting with a single key press. Lock function can be activated to prevent any accidental change.

User can also program the display unit for dispensing purpose, to convert the counting unit from time to a user defined unit such as weight or volume. For details, please see section 7.

2. Specification

Timer range: 0.01s ~ 99.99s, 1s ~ 99m59s, 1m ~ 9999m, 1m ~ 99h59m

Timer mode: single delay, double delay, cycle delay

Timer trigger: power on, front key pad, or remote switch

Timer accuracy: < 1 s/day.

Power supply: 90 – 260 VAC or DC.

Power consumption: < 2 W

Relay output: 7 A @ 240 VAC, 10 A @ 120 VAC and 24 VDC

Relay life: 100,000 times.

Operating temperature: 0 - 60°C.

Humidity: 0 - 95%RH

Panel cutout: 44.5 x 44.5 mm

Outer dimension: 48 x 48 x 85 mm.

3. Front Panel

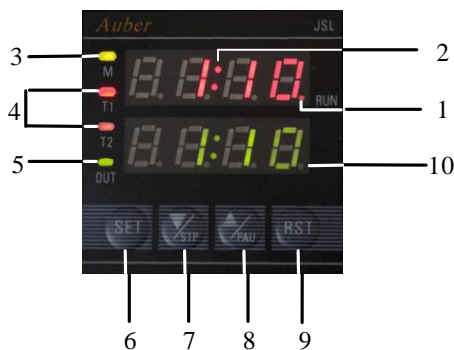


Figure1. Front panel

1. RUN indicator: (Red dot at the lower right corner). ON when timer starts running. OFF when timer stops.
2. Time unit indicator: ON when time units are M:S or H:M. OFF when time unit is M or S.
3. Time range indicator: ON when the time base is H:M (Hours: Minutes) or M(Minutes). OFF when the time base is M:S (Minutes : Seconds) or S(Seconds).
4. Timer indicators: T1 for first delay time, T2 for second delay time.
5. OUT indicator: ON when relay is on. OFF when relay is off.

6. SET key. When timer is not running, press it will switch between first delay time setting (T1) and second delay time setting (T2); press and hold it for 3 second will enter the programming mode.
7. Down key / STP key: Lower the time setting value or stop the timer (for special stop function please see note2 on page 5/5 for details). In the programming mode, press it will go to the next programming value.
8. Up key / PAU key: When timer is not running, press it will increase the time setting value. When timer is running, press and hold it will pause the timer. The timer will continue running after this key is released. In the programming mode, press it will go to the previous programming value.
9. RST key: Reset key. When timer is running, press it will restart the timer. If "RUN" parameter is set to RST, press it will start the timer after powered up.
10. LED digital display. During normal operation as a timer, the top displays the actual time; the bottom displays the set value. In programming mode, the top displays setting parameters; the bottom displays programming value.

4. Terminal Assignment

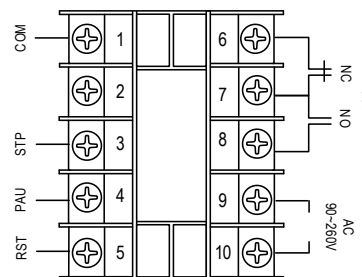


Figure 2. Terminal assignment of JSL-710.

Details:

Power for the timer needs to be connected to terminal 9 and 10. The voltage should be in the 90 to 260 VAC range.

Terminal 6, 7 and 8 are for relay output. Terminal 6 is normally-closed (NC) contact. Terminal 8 is normally-open (NO) contact. Terminal 7 is common contact of the terminal 6 and 8. When the relay is energized (or when the OUT LED is on), terminal 8 connects to terminal 7, and terminal 7 disconnects terminal 6; When the relay is NOT energized (or when the OUT LED is off), terminal 6 connects to terminal 7, and terminal 7 disconnects terminal 8. The relay is a "dry switch" that does not provide power by itself. Please see the wiring example below.

Terminal 5 is the reset terminal that has the same function as the RST key in the front panel. Terminal 4 is the pause/mute terminal that function the same as the "PAU" key in the front panel. Terminal 3 is the stop terminal that function the same as the "STP" key in the front panel. Terminal 1 is the common contacts of the terminal 3/4/5. There are two ways to operate terminal 3, 4 and 5.

1) Connecting a normally open (NO) momentary push button switch between the terminal (3, 4 or 5) to the COM (1). Please note, the function starts when you release (or open) the button of the switch, not when you press down the switch.

2) Connecting a DC logic signal (TTL or CMOS or voltage in the range from 3 to 30 VDC) between the terminal (3, 4 or 5) to the COM (1). Please note, the function is rising-edge triggered. The logic signal should normally be at high level. The function starts when the signal goes from low to high. If you have an inverted logic signal, you need to connect a NPN transistor between terminal and COM; add 10Kohm resistor to the gate for signal input.

5. How to Set the Timer and Relay Delay Time T1/T2

When timer is not running, press "SET" key to shift between relay delay time T1 and T2. Simply press up/ down key will increase/decrease the set value of each delay time. (hold up/down key to speed up changing).

For how to program the relay delay time in different relay output mode, please see the definition of **Func** in next section.

6. Timer Programming

Press and hold SET key for 3 seconds to enter programming mode. For each parameter setting, use up/down key to select different programming values. Press SET key to confirm and move on to next parameter. See figure 3 next page for the procedure. For the definition of each programming value, see following section.

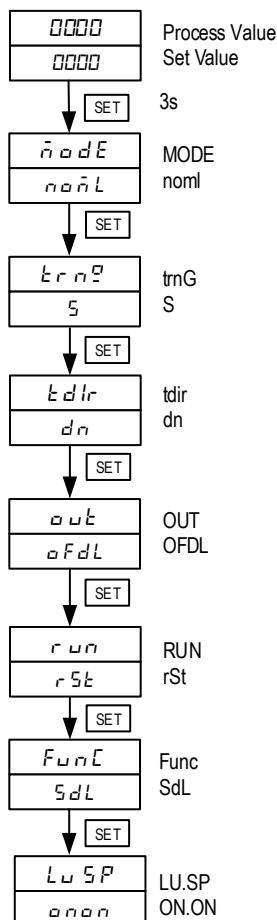


Figure 3. Flow chart of programming

Definition of Programming Values:

ModE: Timer mode selection

noml: Normal mode. The mode uses hour, minute and second as its counting unit (same as JSL-71A timer).

SU: Special unit mode. User can define the counting unit. Please see section 7.

trnG: Timer range (this parameter is enabled if you set mode to noml)

S: 0.01 s ~ 99.99 s;

M:S: 1 s ~ 99 m 59 s;

M: 1 m ~ 9999 m;

H:M: 1 m ~ 99 h 59 m.

tdir: Timing direction

up: Counting up

dn: Counting down

OUT: Relay output mode

OFDL (off delay): Relay will be on at the start of timer and off when time reach the set point.

ONDL (on delay): Relay will stay off at the start of timer and on when time reach the set

RUN: Timer starting run mode

PU (power up): Timer starts when powered up

rSt (reset): Timer starts when reset button is pressed and released

Func: Timer operating function mode

sdL (single delay): Relay turns on at the beginning of relay delay time T1/T2(OFDL); Relay turns on at the end of relay delay time T1/T2(ONDL). It will not change until the timer is reset or repowered again.

In Single Delay ON mode, a special parameter for stop function, STOP, will show up in the parameter menu. For details please refer to note 2 at the end of the manual, page 5/5.

Dint (delayed interval): Relay turns on at the end of T1 time delay then off at the end of T2 time delay (OFDL); Relay turns off at the end of T1 time delay then on at the end of T2 time delay (ONDL). There is no repeat.

CYCL (cycle): Repeat relay on and off in cycle. Relay turns on at the end of T1 time delay then off at the end of T2 time delay (OFDL); Relay turns off at the end of T1 time delay then on at the end of T2 time delay (ONDL). It will repeat this cycle until power is off.

LU.SP: Key locker for the two key pads in the middle.

This parameter determines if the two keys in the middle will be locked for timer value setting or stop/pause function. For some applications that repeat the same time setting, user may want the lower and up key to be locked to prevent any accidental change. For other applications, user may want the Stop and Pause function to be deactivated to prevent stopping the timer by accident. LU.SP represents Lower, Up, Stop and Pause function. OF means the function is turned off and ON means the function is turned on.

LU.SP set to OF.ON means the lower and up keys are deactivated (turned off), but Stop and Pause keys are still functional (turned on)

ON.OF means lower and up keys are functional, but Stop and Pause functions are turned off.

OF.OF means lower and up keys, Stop and Pause functions are all locked up.

ON.ON means lower and up keys, Stop and Pause functions are all functional.

Note 1: When the Stop and Pause are locked from the front keys, the Stop and Pause function can still be executed from the back terminals.

Note 2: Running the single delayed on mode

When running the Single Delay On mode, depending on the applications, user may want the relay to stay at off (initial state), or, stay on (final state) when the operation is interrupted by stop function. e.g, A) some user uses the timer to turn on a buzzer at the end of a process for notification purpose. He wants to be able to disable the buzzer (change to initial state) by simply pushing a button once he acknowledged the notification. B) Some user wants to delay the process of turning on an oven. But sometimes, he may want to cancel the delay (change to the final state) to start the oven by pushing the stop key. In order to satisfy these two conflict requirements, a special parameter for stop function, STOP, will show up in the parameter menu when both ONDL (on delay) and SDL (single delay) are selected,

STOP can be selected as 0 (default) or 1. When it is set to 0, during the delay, stop signal will set relay to the final state (pulled-in). When it is set to 1, during the delay, stop signal will set the relay to the initial state (dropped-out).

When the time delay is finished and relay pulled in, user can reset the relay to the initial state by sending a stop signal, regardless of the STOP setting. However, if the LU of the LU.SP parameter is set to ON, "V/stp" key is used for timer adjustment. Only the back STP terminal can be used for reset the relay. In order to use the "V/stp" key to reset the relay when time delay is finished, user needs to set LU to OF.

Following table summarizes the relationship between the relay status, parameters and how stop is executed. Where, I: initial state. F: final state. RUN: timer is running. Finish: time delay finished. Front: stop by the V/stp key. Back, stop from back terminal.

| | Front | | Back | |
|--------|-------|-----------|-------|--------|
| LU=OFF | Run | Finish | Run | Finish |
| STOP=0 | F | I | F (I) | I |
| STOP=1 | I | I | I | I |
| LU=ON | | | | |
| STOP=0 | F | No change | F (I) | I |
| STOP=1 | I | No change | I | I |

7. Programming for Display Unit

This timer allows the user to convert the counting unit from time to a user defined unit, such as weight or volume. For example, assuming it takes 37 seconds to deliver one gallon of water. User can define a counting unit called "Gallon", and one "Gallon" equals to 37 seconds. For dispensing 3.3 gallon of water, user can simply input 3.3 "Gallon" instead of inputting 121 seconds. No need to convert 3.3 gallon to 121 seconds on user side.

To convert display unit from time to weight or volume, press and hold SET key for 5 seconds, there will be a parameter "ModE" for display mode selection. You can select from $\bar{n} \bar{o} \bar{n} \bar{L}$ (normal) or $S \bar{u}$ (special unit). When selecting $\bar{n} \bar{o} \bar{n} \bar{L}$, the timer will count by time, using hour, minute, and second as the counting unit. When selecting $S \bar{u}$, the following parameter will be pop up as you pressing the SET key:

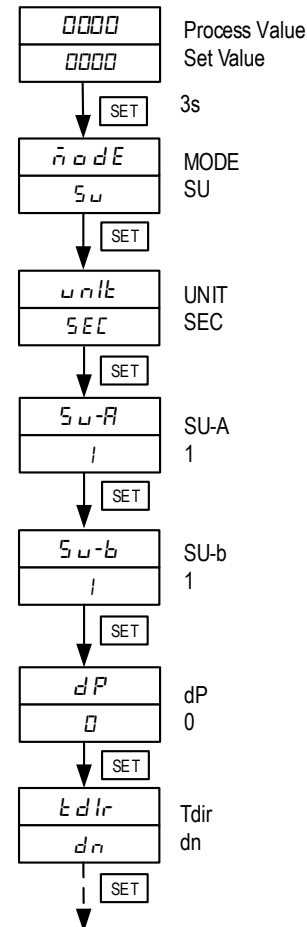


Figure 4. Special unit mode

Definition of Programming Values:

UNIT: This is the time unit you want to use for the unit conversion. You can select either minute (MIN) or second (SEC).

SU-A: Conversion constant A. It is going to be multiplied to the original time unit. Range: 1 – 1000.

SU-b: Conversion constant B. It is going to be used to divide the original value. Range: 1 – 1000.

dP: Decimal point of the special unit to be displayed. e. g. If dP = 0, the unit will be display as integer. If dP = 1, the unit will be displayed with one digits after the decimal point (0.0).

The relation between the SU, SU-A and SU-B is:

$$SU = T * A / B,$$

Where SU is the user defined special unit. T is the original time, A is the conversion constant A, B is the conversion constant B.

Application example:

Using the timer to control a solenoid valve for filling the tank automatically. The water pressure is stable. It is known that water flow rate is 1.25 gallons per minute. We want to fill that tank by set the number of gallon instead of time.

In this case, it takes 48 seconds to fill one gallon ($60 / 1.25 = 48$). So, we need to set a user defined time unit that is equal to 48 seconds. We also want to have 0.1 Gallon resolution. Here are the settings:

Unit = Sec, SU-A = 48, SU-b = 1. dP = 1.

Note:

Both constant A and B are integer number. If the conversion unit is not an integer, you need to use both A and B to achieve that. For example, if you want to multiply the time by 1.25, set A = 125 and B = 100.

8. Wiring Examples

1) Signal controlled by switches.

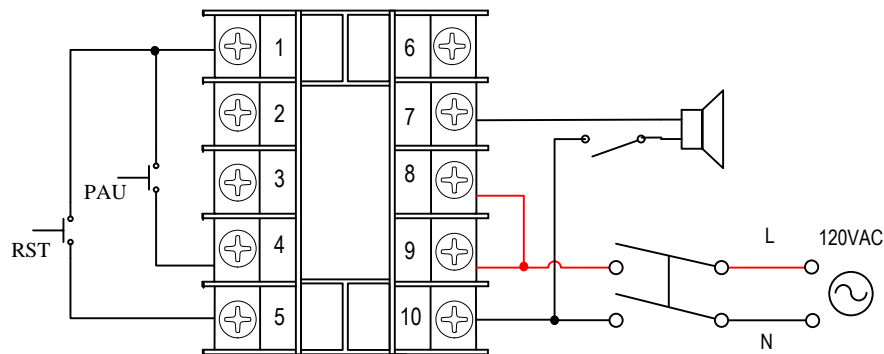


Figure 4. Wiring example of JSL-71A. Power (120 or 240V AC) is sent to terminal 9 and 10. The external reset (RST) and pause (PAU) switch should be momentary type. They are needed only if you want to control the timer remotely. Otherwise, you can use the front keys on the timer. These switches can also be replaced with a control signal from computer or other control devices. **The alarm speaker used in this example is also optional. It is to show how to wire the output. You can substitute it with any output such as a coffee grinder.** The output terminals (#6, 7 and 8) are from a "C form" internal relay. It is a dry switch that does not provide the power by itself. In this case, the alarm is powered by the 120VAC. The external switch connected to the alarm is for disabling the sound if needed.

2) Signal controlled by DC logic signal

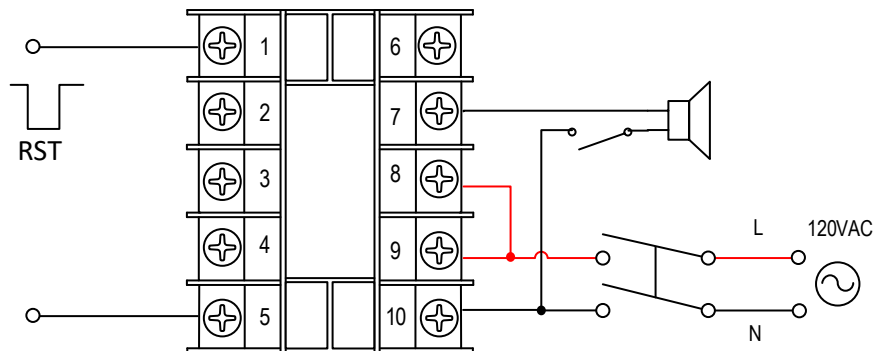


Figure 5. Rising-edge triggered signal

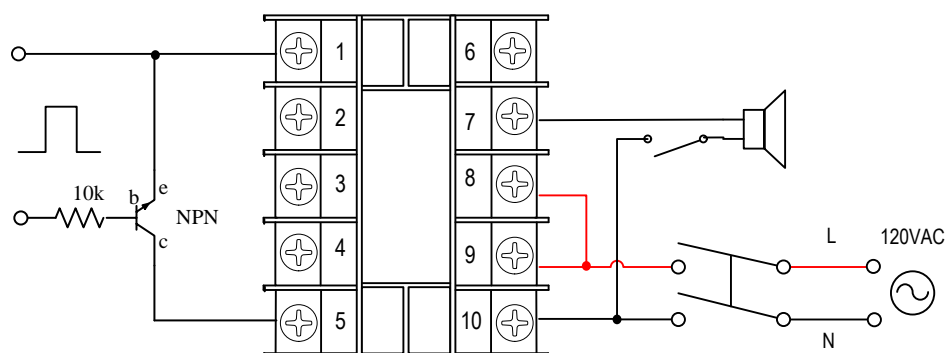
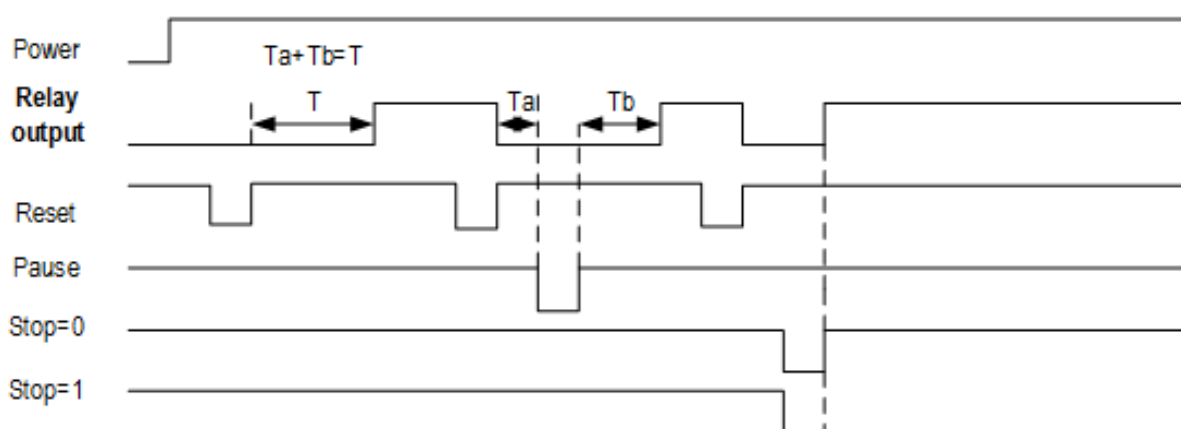
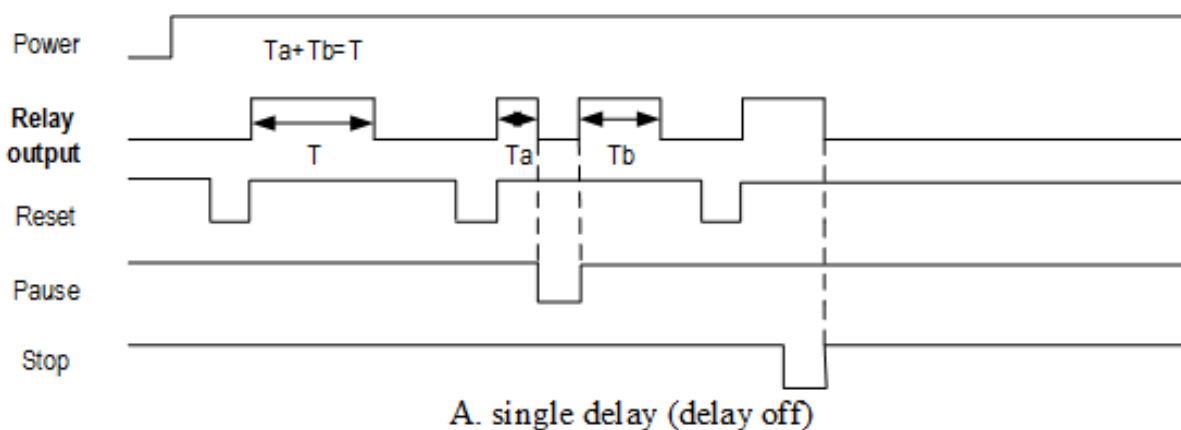
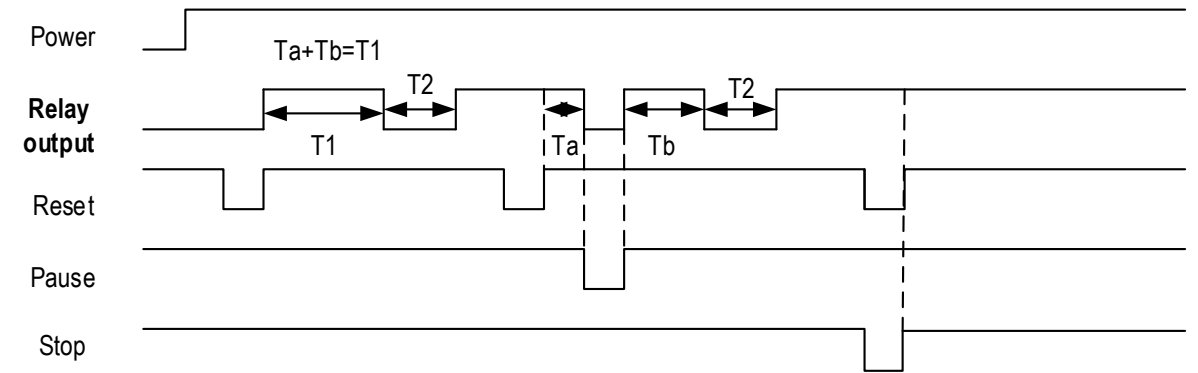


Figure 6. Inverted logic signal

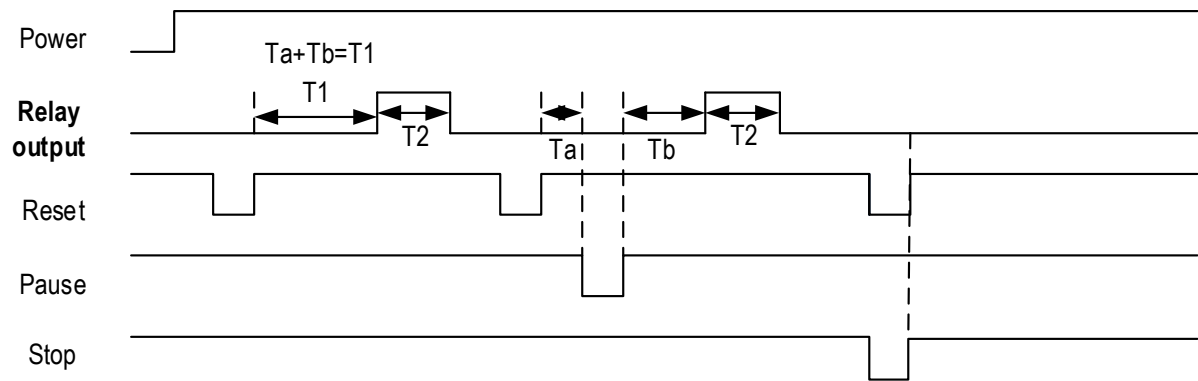
9. Timing Diagrams

Following diagrams show relay output ON/OFF time under different relay output modes and operating function modes. Please note: 1) "RUN" is set to "rSt" in following examples, powering up to start the timer is not discussed here. 2) Timer starts counting from the moment when reset key/switch is released or input (TTL) signal is from low to high. 3) Timer display stops counting as soon as stop key/ switch is pressed (from high to low), but relay output will only be triggered when stop key/switch is released (from low to high).

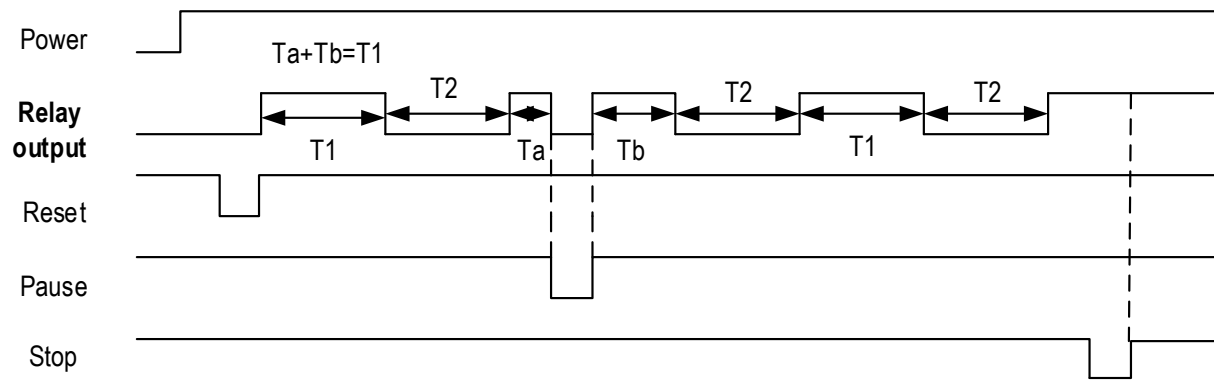




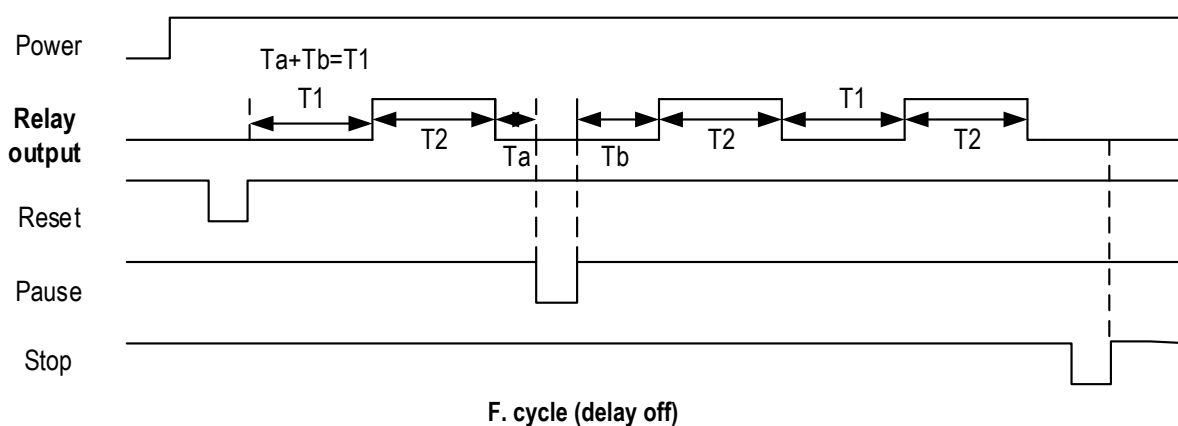
C. delay interval (delay on)



D. delay interval (delay off)



E. cycle (delay on)

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