



Instruction Leaflet

Programmable Counter/Timer

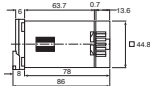
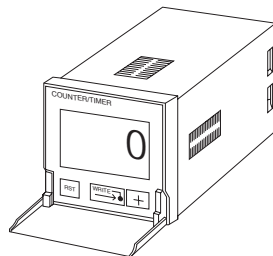
RS stock no. 312-353, 312-369

A range of solid-state counter/timers for industrial control applications in manufacturing, packaging and materials handling, also process timing and monitoring functions. Made in Japan.

- Easy to programme
- Four timer or counter modes
- Wide range of supply voltages
- Choice of a.c. or d.c. operation
- 6-digit LCD display
- Non-significant zeros suppressed
- Up or down counting to 10^6 operations
- Timing from 0.01s to 10^5 hrs
- 4 output, 3 input modes
- Manual and remote reset facilities
- Memory back-up via internal battery
- Time integrating facility
- Standard DIN 48 case
- 11-pin relay base
- DIN-rail, surface mounting or panel mounting hardware available
- UL and CSA approved

Dimensions

Warning: This product contains a 3V lithium polycarbon monofluoride type battery which must not be charged, cut open, disposed of in a fire, or subjected to direct mechanical shock.



RS stock no. 312-353 Voltage range: 24 to 240V a.c.

Omron reference: H8CA - SAL

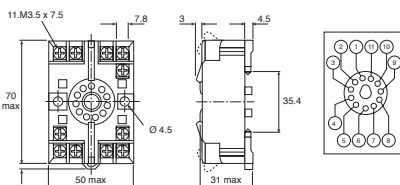
RS stock no. 312-369 Voltage range: 12 to 120V d.c.

Omron reference: H8CA - SDHS

Accessories



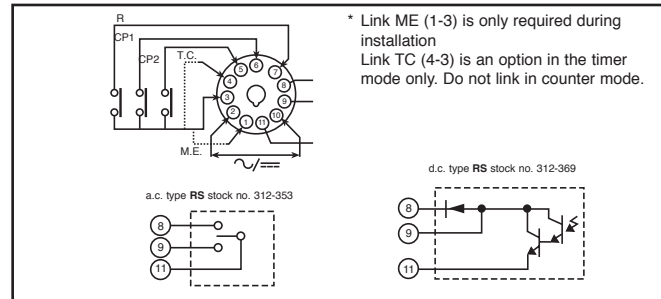
RS stock no. 342-922
Panel mounting adaptor
Omron reference: Y92F-30



RS stock no. 342-922
DIN rail/surface-mounting screw terminal with 11-pin socket base.
Omron reference: Y92F-30

Connections

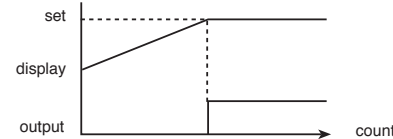
1. ME* - enables selection timer/counter mode
2. Supply
3. Input common
4. TC* - inhibits timer operation during supply failure
5. CP2 - see timer/counter input modes
6. CP1 - see timer/counter inputs modes
7. R - resets the timer/counter and turns the output off
8. See diagram (below)
9. See diagram (below)
10. Supply
11. See diagram (below)



Counter Operating mode N

The display increments when an input is received. On reaching the set value the output is turned on and the display is held. This continues until a reset is applied.

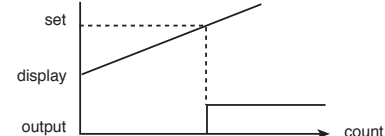
Figure 1



Operating mode F

Operation is for mode N except that when the set value is reached the display continues to increment.

Figure 2



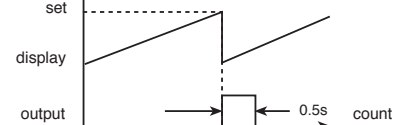
Operating mode C

The display increments until the set value is reached. At this point the output is turned on for a period of approx. 0.5sec., the counter is reset, and begins to count again.

Note: In this mode the unit should not be used in such a way that the set value is reached during the timed output.

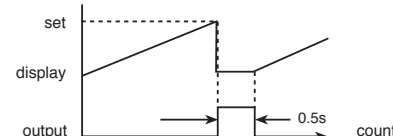
Operation is as for mode C except that the count is held at zero during the timed output period.

Figure 3



Operating mode R

Figure 4



Input mode A CP1 count input: counter increments or decrements when input is closed.

CP2 count direction: CP2 OFF gives count up: CP2 ON gives count down.

Input mode B CP1 count input: counter increments when input

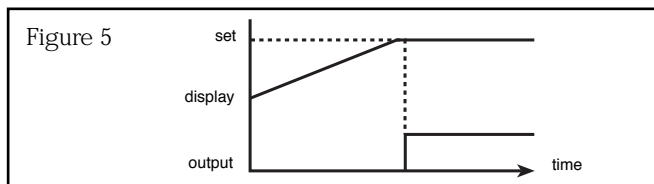
Input mode C CP1, CP2 Quadrature inputs from shaft encoder or similar. If CP1 leads CP2 then counter increments; if CP2 leads CP1 then counter decrements.

Note: Link TC should not be connected when in counter mode.

Timer

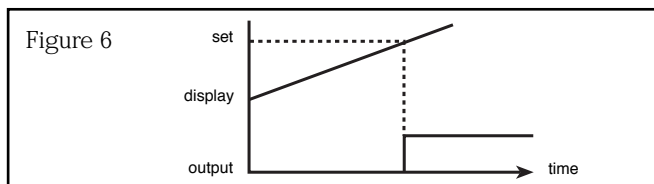
Operating mode N

The display shows the elapsed time until the set time is reached. At this point the output is turned on the display is held. This continues until a reset is applied.



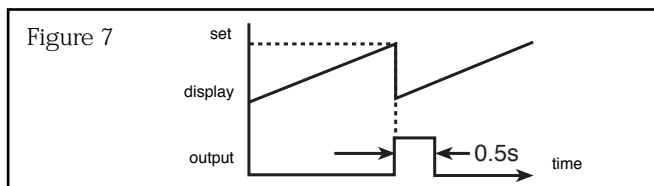
Operating mode F

Operation is for mode N except that the display continues to show the elapsed time when the set time is reached.



Operating mode C

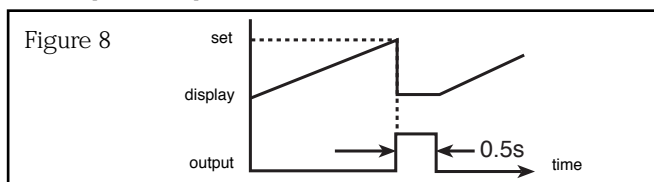
The display shows the elapsed time until the set time is reached. At this point the output is turned on for 0.5sec., the timer is reset, and timing begins again immediately.



Note: In this mode the unit should not be used in such a way that the set time is reached during the timed output period.

Operating mode R

Operation is as for mode C except that the timer is held in reset until the timed output has elapsed.



CP1 Initiates a timing sequence when the input is turned on. For single operations only, a single pulse is required. In modes C and R a continuous input will cause cyclic operation.

CP2 Gates the timing. When this input is on, the timing is suspended.

TC This input controls the timing action during power supply failure. If TC is on (connected to terminal 3) timing is suspended during power failure; if TC is off, timing will continue regardless of the power supply.

Setting up

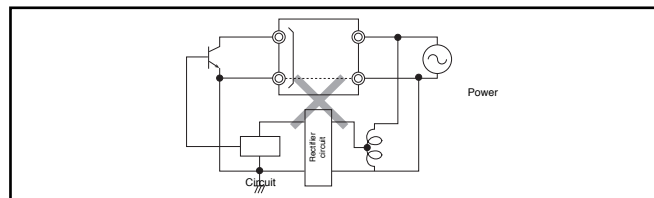
1. Link terminal 1 to terminal 3
 2. Use the $\boxed{+}$ key to stop through the modes i.e. counter or timer functions; hours, min, sec, are timer functions
 3. Press the $\boxed{\rightarrow}$ key to store the displayed mode
 4. Use the $\boxed{+}$ key to step through the input modes A, B, and C.
- Note:** Where the timer was previously selected, the display will show 'T' and no other mode will be possible
5. Press the $\boxed{\rightarrow}$ key to store the display mode
 6. Use the $\boxed{+}$ key to step through the output modes N, F, C and R
 7. Press the $\boxed{\rightarrow}$ key to store the display mode
 8. Disconnect terminal 1 from terminal 3

Set point 1. Ensure terminal 1 is disconnected from terminal 3

2. Press the $\boxed{\rightarrow}$ key
3. Use the $\boxed{+}$ key to select the desired value for most significant digit
4. Press the $\boxed{\rightarrow}$ key
5. Repeat steps 3 and 4 for each digit

Application notes

1. The timer can be gated through CP2, with CP1 serving as a trigger input, to perform a time integrating function.
2. This unit uses a transformerless power supply and inputs may therefore be at high potential. Extreme personal care should be exercised when connecting external components. Where possible an isolating transformer or low voltage supply should be used when connecting to low voltage switching devices or sensors. Ensure any devices connected to these input terminals have an insulation appropriate to the power supply voltage.
3. The internal circuit will be destroyed when either of the two mistakes indicated on the right figure are made. An isolating transformer is necessary, and the input should not be earthed.



4. Programming can take with power on or off. If you have the option we suggest power off.
5. Shorting link between 3 & 4 with TIMER function will halt the "time out". Terminals 3 & 4 should be open for COUNTER function.

Technical specification

Count range: _____ 0-999999 counts
 Time ranges: _____ 0.9999.99 secs
 _____ 0-99999.9 mins
 _____ 0-99999.9 hours

RS stock no. 312-353 312-369
Supply voltages: 24-240V a.c. 12-120V d.c.
Supply voltage range: 90% to 110% of rated voltage
Power consumption: 1.3VA at 240V 1W at 120V
Inrush current (0.5ms) 3.7A 2.3A
Supply frequency range: 50/60Hz -
Supply ripple factor: - 20% max.
Count speed: 30Hz 1kHz
Pulse width, min: 16.7ms 0.5ms
Short circuit impedance: 10k Ω max. (inputs 5,6,7) s/c current: 1mA max.

Short circuit residual voltage: _____ 0.5V max. (inputs 5,6,7)
 Open circuit impedance: _____ 500k Ω min. (inputs 5,6,7) o/c voltage: 20V max.

Reset time: _____ 20ms min
 Repeat accuracy: _____ +0.05% \pm 0.005 secs.
 Setting error: _____ \pm 0.1% \pm 0.005 secs.

Service life
 - mechanical: _____ 10⁷ operations
 - electrical: _____ 10⁶ operations at rated load

Output ratings: _____ **RS stock no.** 312-353: relay output, 3A resistor (SPCO)
 _____ **RS stock no.** 312-369: open collector transistor, 100mA at 30V (SPNO)

Ambient working temperature: _____ -10°C to +55°C

Ambient storage temperature _____ -25°C to +65°C

Weight _____ 112g