

# Plug-in Timing Relays



## Bulletin 700-HX

- Digital Timer
- 5 A Contact Rating
- Negative Transmissive LCD Display
- 10 Functions or Modes
- Environmentally Friendly—Flash Memory, No Battery
- NEMA B300 Rated
- NEMA 4 / IP66
- DIN or Panel Mount Capable
- SPDT

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#### Description

The Bulletin 700-HX Digital Timing Relays are programmable timing devices. They have a highly visible negative transmissive display. The timing digits are displayed in red and the set time digits are displayed in green. The easy to use front panel provides programming access to the 10 available modes of operation.

#### Conformity to Standards:

EN61010-1  
 IEC61010-1  
 VDE0106/P 100  
 NEMA 4/ IP66

#### Approvals:


CE Certified  
 UL508  
 CSA C22.2 No. 14  
 ACA

#### Your order must include:

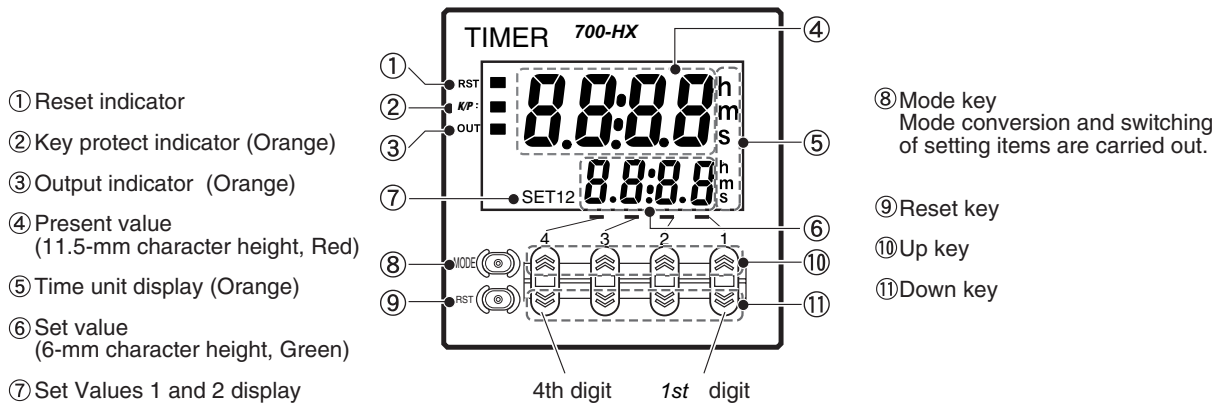
- Cat. No. of the timing relay plus suffixes of selection options.
- Cat. No. of socket required.
- If required, Cat. No. of any accessories.

“700-HX User Manual” Available At:

<http://www.theautomationbookstore.com>








Model	Output Modes	Timing Ranges	Sockets	Output	Pins	Cat. No.	Factory-stocked Item
 Cat. No. 700-HX...	A mode: Signal ON-Delay 1 A-1 mode: Signal ON-Delay 2 A-2 mode: Power ON-Delay 1 A-3 mode: Power On-Delay 2 B mode: Repeat Cycle 1 B-1 mode: Repeat Cycle 2 D mode: Signal OFF-delay E mode: One Shot F mode: Cumulative Twin Timer	0.000...9.999 s 0.000...99.99 s 0.000...999.9 s 0.000...9999 s 0.000...99 min. 59 s 0.000...999.9 min. 0.000...9999 min. 0.000...99 h 59 min. 0.000...999.9 h 0.000...9999 h	700-HN100 700-HN125	SPDT	8	700-HX86SA17	✓
						700-HX86SU24	✓


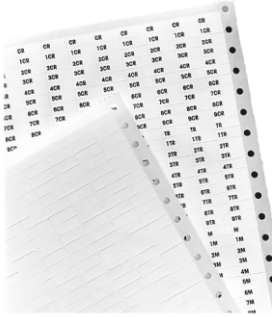

**General Timer Functions**



## Plug-in Timing Relays

## Accessories

	Description	Pkg. Qty.	Cat. No.	Factory-stocked Item
 <p>Cat. No. 700-HN100</p>	<p><b>Screw Terminal Tube Base Sockets — Panel or DIN Rail Mounting Guarded Terminal Construction</b> 8-pin for use with Bulletin 700-HX timing relays. Order must be for 10 sockets or multiples of 10.</p>	10	700-HN100	✓
 <p>Cat. No. 700-HN125</p>	<p><b>Screw Terminal Tube Base Sockets — Panel or DIN Rail Mounting Open Style Construction</b> 8-pin for use with Bulletin 700-HX timing relays. Order must be for 10 sockets or multiples of 10. No retainer clip required.</p>	10	700-HN125	✓
 <p>Cat. No. 199-DR1</p>	<p><b>DIN Rail Mounting Pack</b> Standard 35 x 7.5 mm DIN Rail, 1 meter long, 10 rails per package. Order must be for 10 rails or multiples of 10.</p>	10	199-DR1	✓
 <p>Cat. No. 700-HN108</p>	<p><b>Specialty Socket</b> 8-pin backwired socket with solder terminals for use with Bulletin 700-H timing relays. Order must be for 10 sockets or multiples of 10.</p>	10	700-HN108	✓
 <p>Cat. No. 700-HN129</p>	<p><b>Specialty Socket</b> 11-pin backwired socket with solder terminals for use with Bulletin 700-H timing relays. Order must be for 10 sockets or multiples of 10.</p>	10	700-HN129	✓
 <p>Sample Retainer Clips</p>	<p><b>Retainer Clip for Cat. No. 700-HN100 Socket with all 700-HR and 700-HX Timing Relay</b> Secures timer in socket. Order must be for 10 clips or multiples of 10.</p> <p>Note: Not required for installation</p>	10	700-HN131	✓
 <p>Cat. No. 700-HN130</p>	<p><b>Frame Adapter</b> For flush or door mounting of all Bulletin 700-HR and -HX timers.</p>	1	700-HN130	✓

	Description	Pkg. Qty.	Cat. No.	Factory-stocked Item
 <p data-bbox="251 432 423 457">Cat. No. 700-HN132</p>	<p data-bbox="513 296 686 321"><b>Protective Cover</b></p> <p data-bbox="513 323 1094 426">Helps prevent tampering of timing and mode settings. Provides a degree of protection against water and dirt from entering the front of the relay. For use with all Bulletin 700-HRs and -HX timing relays.</p>	1	700-HN132	✓
	<p data-bbox="513 480 1094 611"><b>Pre-printed identification tags</b> — contains 10 sheets of pre-printed and blank tags. Each sheet contains 13 sets of the markings CR...9CR, TR...9TR, M...9M, F, R, 1S, and 117 blank tags. Tags are peel-off with sticky backing for easy placement on relays.</p>	10	700-N40	
	<p data-bbox="513 659 1094 762"><b>Blank identification tags</b> — contains 10 sheets of blank identification tags for customer specialized printing. Each sheet contains 546 blank tags. Tags are peel-off with sticky backing for easy placement on relays.</p>	10	700-N41	

**Bulletin 700-HX**  
**Plug-in Timing Relays**  
**Specifications ❶**

Electrical Ratings		
Pilot Duty Rating		NEMA B300
Rated supply voltage		100 to 240V AC, 24V AC/12 to 24V DC (50/60Hz) (permissible ripple: 20%(p-p) max.)
Operating voltage range		85%...110% of rated supply voltage
Power consumption	100...240V AC	4.3 VA
	24V AC/12...24V DC	3.4 VA/1.7 W
Inrush Current	100...240V AC	3 A
	24V AC/12...24V DC	5 A
▶ ◀ 120V AC		30 A
Make 240V AC		15 A
◀ ▶ 120V AC		3 A
Break 240V AC		1.5 A
Hp at 120V AC		1/4 Hp
Hp at 240V AC		1/3 Hp
Mechanical		
Mounting method		Flush mounting, surface mounting, DIN mounting
Display		7-segment, negative transmissive LCD; t Present value (red, 8 mm high characters); Set value (green, 4 mm high characters)
Digits		4 digits
Timer	Output modes	N, F, C, or K
	Time ranges	0.000...9.999 s, 0.00...99.99 s, 0.0...999.9 s, 0...9999 s, 0 min. 00 s...99 min. 59 s, 0.0...999.9 min., 0 h 00 min....99 h 59 min., 0.0 h...999.9 h, 0 h...9999 h
	Timer modes	Elapsed time (Up), remaining time (Down), selectable
	Output modes	A, A-1, A-2, A-3, B, B-1, D, E, F, Z, ton or toff
Inputs	Input signals	Start, reset
	Input method	No-voltage input via:NPN transistor or switching of contact
	Start, reset, gate	Minimum input signal width: 1 or 20 ms (selectable)
	Power reset	Minimum power-opening time: 0.5 s (Except for A-3, B-1, and F mode)
Control output		SPDT contact output: 5 A at 250V AC, resistive load (cosine=1) Minimum applied load: 10 mA at 5 V DC (failure level: P, reference value)
External Power Supply		No
Key Protect		Yes
Memory backup		EEP-ROM (overwritten 200,000 times min.), which can store data for 20 years min.
Accuracy of Operating Time and Setting Error ❶		Power-ON start: +/-0.01% +/-50 ms max. * to be rated against set value Signal start: +/- 0.005 +/-30 ms max. * to be rated against set value Signal start at transistor output model: +/- 0.005% +/-3 ms max. ❷ If the set value is within the sensor w

❶ The values are based on the set value.

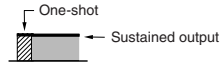
❷ The value is applied for a minimum pulse width of 1 ms.

Characteristics		
Insulation resistance		100 MΩ min. (at 500V DC)
Dielectric strength		2000V AC, 50/60Hz for 1 min. between current-carrying terminals and non-current-carrying metal parts (1000V AC for 24V AC/12 to 24V DC type), 1000 VAC, 50/60 Hz for 1 min. between non-continuous contacts
Noise immunity		'±-1.5 kV (between power terminals) for 100 to 240 VAC, +480V for 24VAC/12 to 24VDC, and ±600V (between input terminals), square-wave noise by noise simulator (pulse width: 100 ns/1 μs, 1-ns rise)
Static immunity		±8 kV (malfunction), ±15 kV (destruction)
Vibration resistance	Malfunction	10...55 Hz with 0.35 mm single amplitude each in three directions for 10 min.
Shock resistance	Malfunction	98 m/s <sup>2</sup> (approx. 10 G) each in three directions
Life expectancy	Mechanical	10 million operations min.
	Electrical	100,000 operations min. (5 A at 250V AC, resistive load)
EMC		(EMI) EN61326 Emission Enclosure: EN55011 Group1 class A Emission AC mains: EN55011 Group1 class A (EMS) EN61326 Immunity ESD: EN61000-4-2: 4 kV contact discharge (level2) 8 kV air discharge (level3) Immunity RF-interference: EN61000-4-3: 10 V/m
Approved standards		UL508, CSA C22.2 No.14 Conforms to EN61010-1/IEC61010-1 (Pollution degree 2/overvoltage category II) Conforms to VDE0106/P 100 (Finger Protection), conforms to NEMA output rating (N/F)
Enclosure ratings		Panel surface: IP66 and NEMA Type 4 (indoors) ❶
Weight		Approx. 100 g

❶ An attached waterproof packing is necessary to ensure IP66 waterproofing between the 700-HX and installation pan.

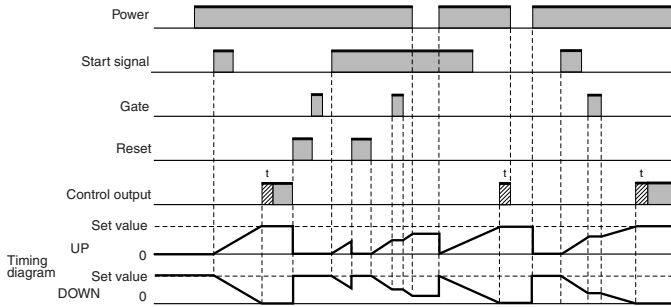
**Bulletin 700-HX**  
**Plug-in Timing Relays**  
**Operating Modes**

**Timing Charts**



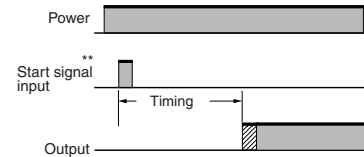
One-shot outputs can be set to 0.1 s, 0.5 s, 1s, 5 s, 10 s, 20 s.

**Output mode A Mode: Signal ON-Delay (Timer resets when power comes ON.)**



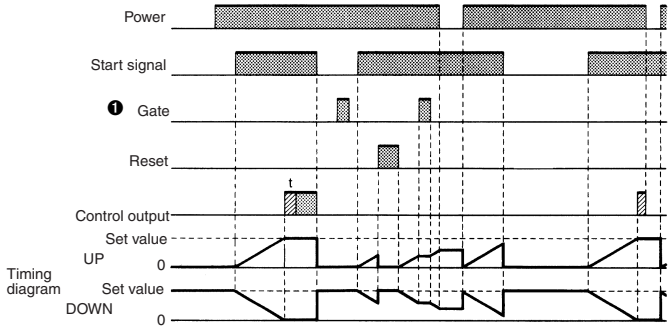
Timing starts when the start signal goes ON. While the start signal is ON, the timer starts when power comes ON or when the reset input goes OFF. The control output is controlled using a sustained or one-shot time period.

**Basic Operation**



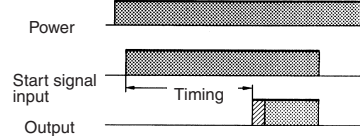
\* Output is instantaneous when setting is 0.  
 \*\* Start signal input is enabled during timing.

**Output Mode A-1: Signal ON-Delay 2 (Timer resets when power comes ON.)**



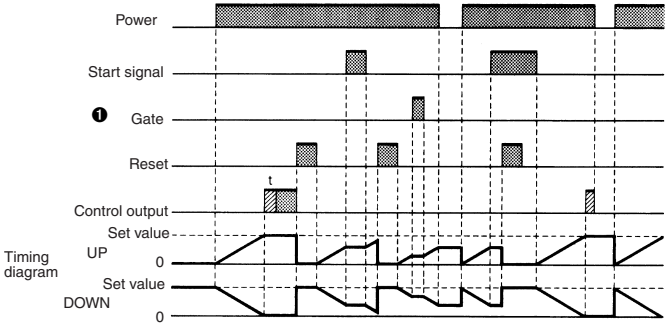
Timing starts when the start signal goes ON, and is reset when the start signal goes OFF. While the start signal is ON, the timer starts when the power comes ON or when the reset input goes OFF. The control output is controlled using a sustained or one-shot time period.

**Basic Operation**



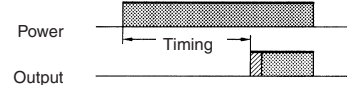
\*Output is instantaneous when setting is 0.

**Output mode A-2: Power ON Delay 1 (Timer resets when power comes ON)**



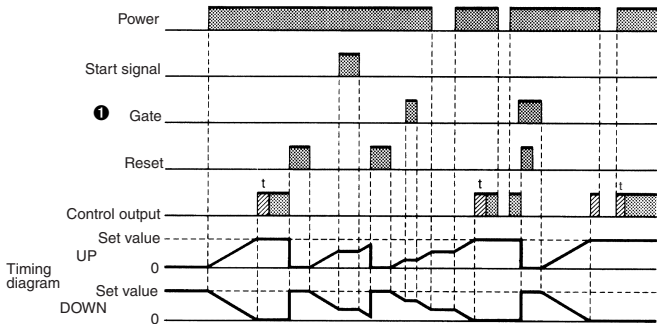
Timing starts when the reset input goes OFF. The start signal disables the timing function (i.e., same function as the gate input). The control output is controlled using a sustained or one-shot time period.

**Basic Operation**



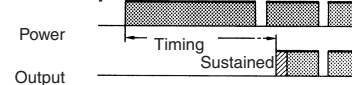
\*Output is instantaneous when setting is 0.

**Output mode A-3 Power ON Delay 2 (Timer does not reset when power comes ON)**



Timing starts when the reset input goes OFF. The start signal disables the timing function (i.e., same function as the gate input). The control output is controlled using a sustained or one-shot time period.

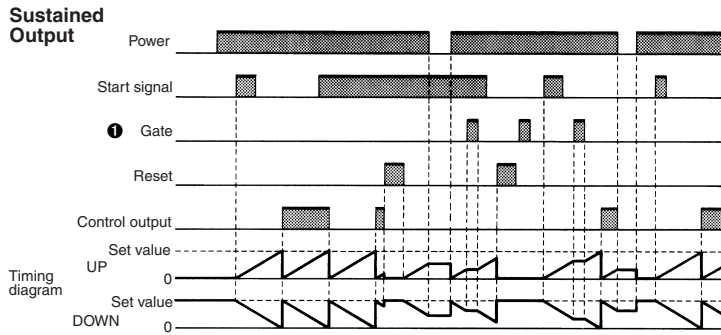
**Basic Operation**



\*Output is instantaneous when setting is 0.

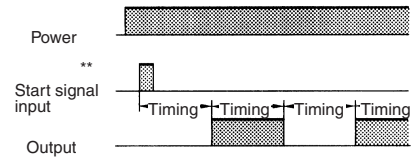
① Gate not included

**Output mode B: Repeat Cycle (Timer resets when power comes ON.)**



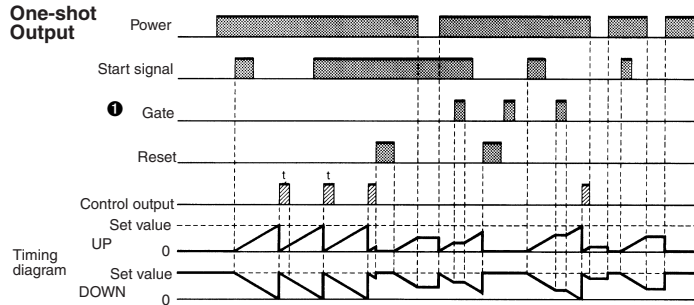
Timing starts when the start signal goes ON.  
 The status of the control output is reversed when time is up (OFF at start).  
 While the start signal is ON, the timer starts when the power comes ON or when the reset input goes OFF.

**Basic Operation**



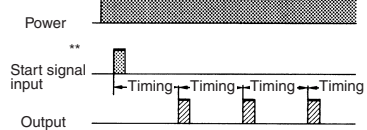
\* Normal output operation will not be possible if the set time is too short.  
 Set the value to at least 100 ms (contact output type).  
 \*\* Start signal input is disabled during timing.

**One-shot Output**



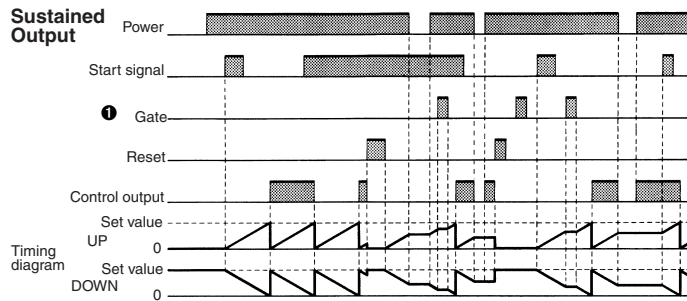
Timing starts when the start signal goes ON.  
 The control output is turned ON when time is up.  
 While the start signal is ON, the timer starts when the power comes ON or when the reset input goes OFF.

**Basic Operation**



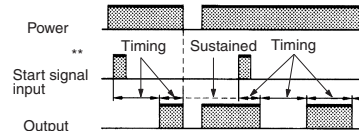
\* Normal output operation will not be possible if the set time is too short.  
 Set the value to at least 100 ms (contact output type).  
 \*\* Start signal input is disabled during timing.

**Output Mode B-1: Repeat Cycle 2 (Timer does not reset when power comes ON)**



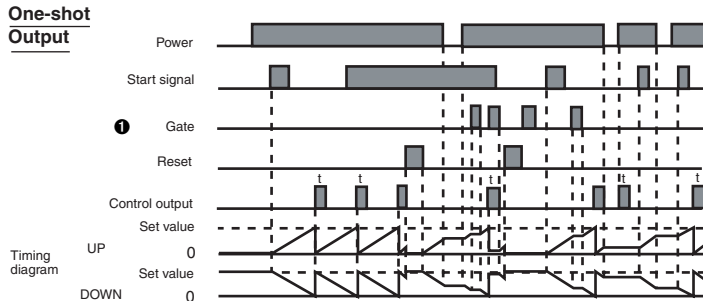
Timing starts when the start signal goes ON.  
 The status of the control output is reversed when time is up (OFF at start).  
 While the start signal is ON, the timer starts when the power comes ON or when the reset input goes OFF.

**Basic Operation**



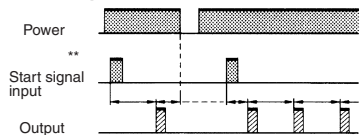
\* Normal output operation will not be possible if the set time is too short.  
 Set the value to at least 100 ms (contact output type).  
 \*\* Start signal input is disabled during timing.

**One-shot Output**



Timing starts when the start signal goes ON.  
 The control output comes ON when time is up.  
 While the start signal is ON, the timer starts when power comes ON or when the reset input goes OFF.

**Basic Operation**

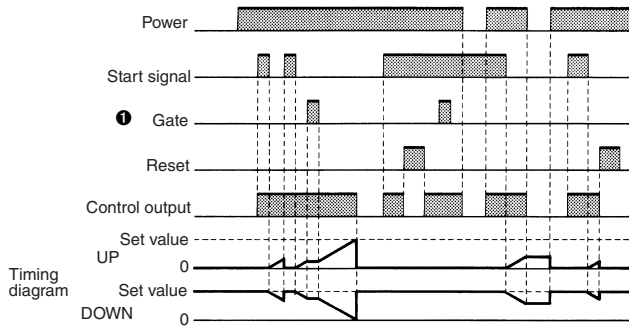


\* Normal output operation will not be possible if the set time is too short.  
 Set the value to at least 100 ms (contact output type).  
 \*\* Start signal input is disabled during timing.

① Gate not included.

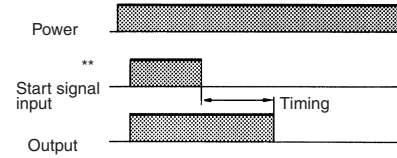


**Output mode D: Signal OFF-delay (Timer resets when power comes ON.)**



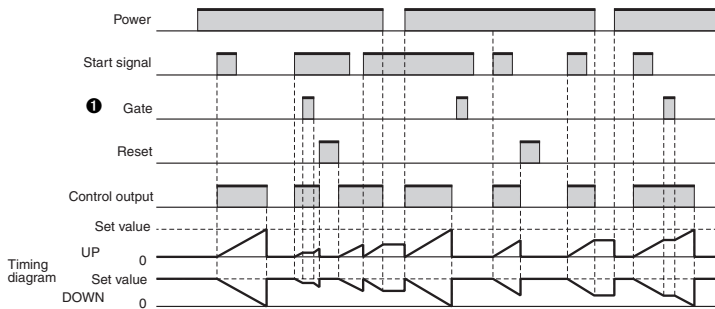
The control output is ON when the start signal is ON (except when the power is OFF or the reset is ON).  
 The timer is reset when the time is up.

**Basic Operation**



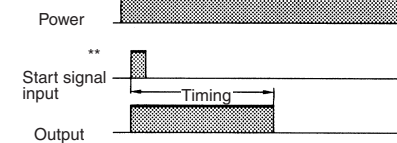
\* Output functions only during start signal input when setting is 0.  
 \*\* Start signal input is enabled during timing.

**Output mode E: Interval (Timer resets when power comes ON.)**



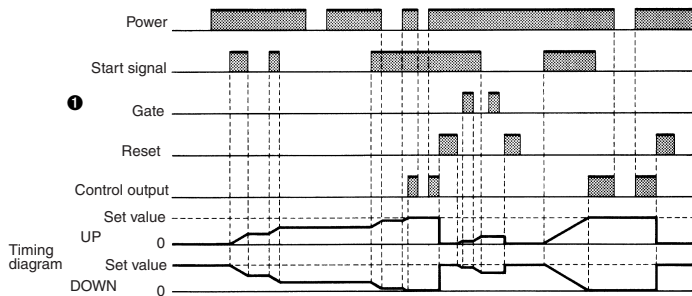
Timing starts when the start signal comes ON.  
 The control output is reset when time is up.  
 While the start signal is ON, the timer starts when power comes ON or when the reset input goes OFF.

**Basic Operation**



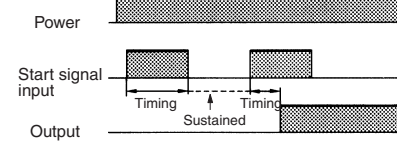
\* Output is disabled when the setting is 0.  
 \*\* Start signal input is enabled during timing.

**Output Mode F: Cumulative (Timer does not reset when power comes ON)**



Start signal enables timing (timing is stopped when the start signal is OFF or when the power is OFF).  
 A sustained control output is used.

**Basic Operation**



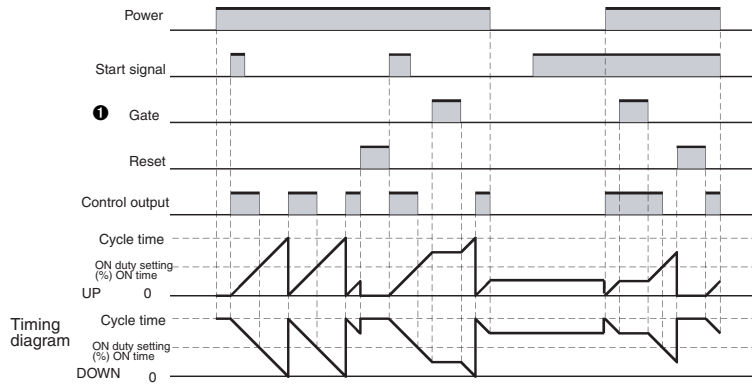
\*Output is instantaneous when setting is 0.

① Gate not included.

**Z Mode**

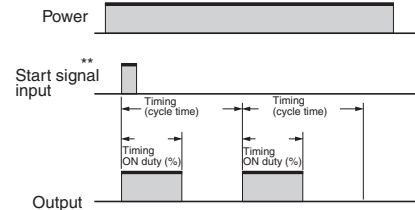
Output quantity can be adjusted by changing the cycle time set in the adjustment level to 1 and by changing the ON duty (%) set value. The set value shows the ON duty (%) and can be set to a value between 0 and 100 (%). When the cycle time is 0, the output will always be OFF. When the cycle time is not 0 and when ON duty has been set to 0 (%), the output will always be OFF. When ON duty has been set to 100 (%), the output will always be ON.

**Z mode: ON/OFF-duty Adjustable Repeat Cycle**



Timing starts when the start signal goes ON. The status of the control output is reversed when time is up (ON at start). While the start signal is ON, the timer starts when power comes ON or when the reset input goes OFF.

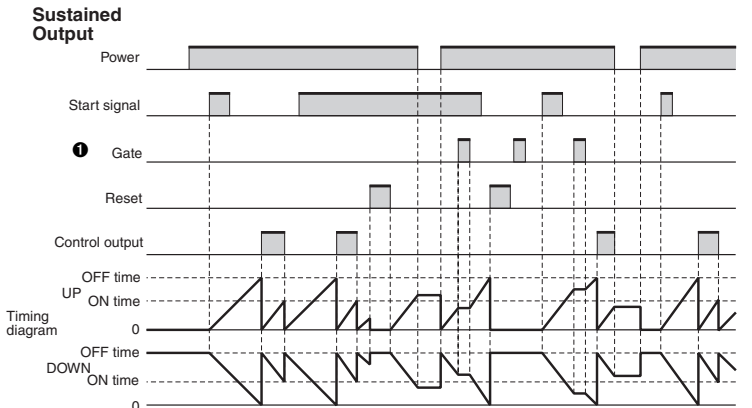
**Basic Operation**



\* Normal output operation will not be possible if the set time is too short. Set the value to at least 100 ms (contact output type).

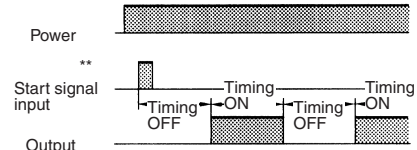
\*\* Start signal input is enabled during timing.

**Output mode T OFF: Twin Timer OFF start**



Timing starts when the start signal goes ON. The status of the control output is reversed when time is up (OFF at start). While the start signal is ON, the timer starts when the power comes ON or when the reset input goes OFF.

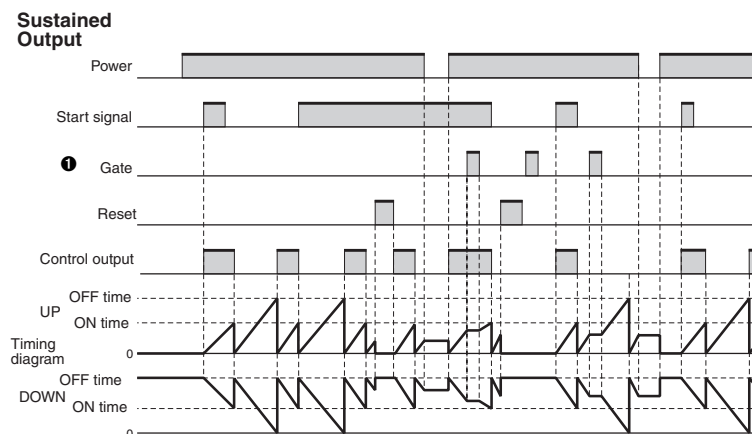
**Basic Operation**



\* Normal output operation will not be possible if the ON/OFF set time is too short. Set the value to at least 100 ms (contact output type).

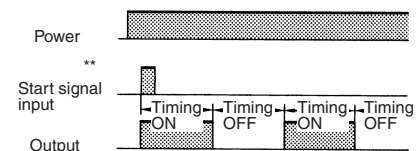
\*\* Start signal input is disabled during timing.

**Output mode T ON: Twin Timer ON start**



Timing starts when the start signal goes ON. The status of the control output is reversed when time is up (ON at start). While the start signal is ON, the timer starts when the power comes ON or when the reset input goes OFF.

**Basic Operation**



\* Normal output operation will not be possible if the ON/OFF set time is too short. Set the value to at least 100 ms (contact output type).

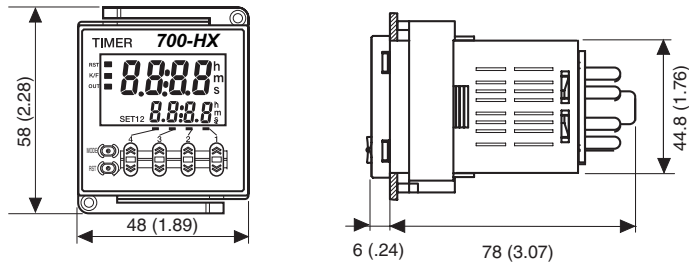
\*\* Start signal input is disabled during timing.

① Gate not included

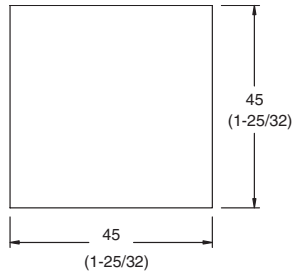
# Plug-in Timing Relays

## Approximate Dimensions

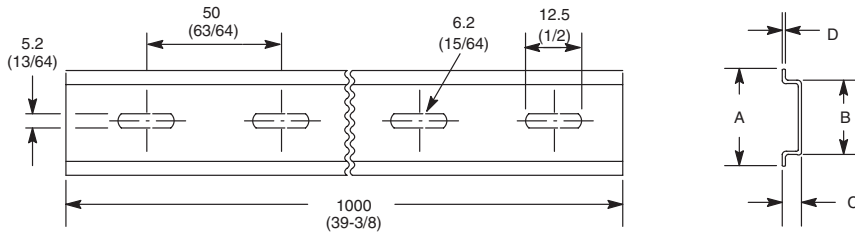
Dimensions are shown in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes.



Cat. No. 700-HX...



Cat. No. 700-HX...  
**Panel Cutout**



Cat. No. 199-DR1 DIN Mounting Rail Series B  
Cat. No. 199-DR4 DIN Mounting Rail Series B Has No Mounting Holes

## Terminal Arrangement

