

## Bulletin 700-HR

- Dial Timing Relays
- 5 A Contact Rating
- Multiple Programmable Timing Ranges
- Tube Base Pin Style Terminals
- Multi-Voltage Inputs
- Timed Contacts and Instantaneous Contacts
- Transistor Outputs
- Single Function and Multi-Function
- Up to 10 Different Operating Modes
- 0.05 s...300 h Timing Range

### TABLE OF CONTENTS

Description	Page	Description	Page
Product Selection .....	121	Timing Charts .....	128
Accessories .....	125	Approximate Dimensions .....	132
Specifications .....	127		

#### Description

The Bulletin 700-HR Multi-Function, Multi-Range Timing Relays are available with 16 programmable timing ranges with calibrated scales. They have seven programmable timing modes: ON-Delay, OFF-Delay, Repeat Cycle ON, Repeat Cycle OFF, Signal ON/OFF, ON-Delay One Shot, and One Shot. They are tube based relays with 8 and 11 pin style terminations.

The Bulletin 700-HRC/HRM Multi-Range Timing Relays are ON-Delay only, and are available with multiple timing ranges with calibrated scales. They are tube based relays with pin style terminations and timed and instantaneous SPDT contact.

The Bulletin 700-HRF Twin Timers are Repeat Cycle -ON and -OFF delay only. They are tube based relays with pin style terminations with DPDT timed contacts.

The Bulletin 700-HRY Star-Delta Timers are Multi-Function, Multi-Range Timing Relays with SPST timed and instantaneous contacts. They are tube based relays with 8-pin style terminations.

The Bulletin 700-HRQ True OFF-Delay Timing Relay are available with DPDT outputs. They are tube-based relays with 8- and 11- pin style terminations and provide a reset option.

#### Conformity to Standards:

EN 60947-5-1, EN 50081-2, EN 50082-2, IEC 947, VDE 0435, CSA 22.2, UL 508




#### Approvals:

CSA Certified, File LR60859, UL Recognized, File E14840, Guide NKCR 2 CE Marked (per EU Low Voltage Directive 73/23 EEC 93/68 EEC: per Electromagnetic Compatibility Directive 89/336 EEC 92/31 EEC 93/681 EEC), 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.

**Bulletin 700 Multi-Function, Multi-Range Dial Timing Relays with Pin Style Terminations**




	Timing Mode	Timing Range	Sockets	Pins	Input Voltage	Contact Outputs	Cat. No.	Factory-stocked Item
 <p><b>Multifunction Timer</b>                      Cat. No. 700-HR, -HRP, -HRS, -HRT, -HRV</p>	A,D,E, B,B2,C	0.05 s....300 h	700-HN101 700-HN126 700-HN129	11	24...48V AC 12...48V DC	DPDT	700-HR52TU24	✓
						Transistor	700-HRV52TU24 ①	
	A, E,B2,J		24...48V AC 100...125V DC	DPDT	<b>700-HR52TA17</b>	✓		
				DPDT	700-HRV52TA17 ①			
			24...48V AC/DC	SPDT Timed + Instantaneous Contact	700-HRS42TU24	✓		
				SPDT Timed + Instantaneous Contact	700-HRT4TTU24 ①			
100...240V AC 100...125V DC	SPDT Timed + Instantaneous Contact	700-HRP42TU24 ①	✓					
	DPDT	700-HRP42TA17	✓					
 <p><b>ON-Delay Timer</b>                      Cat. No. 700-HRM, -HRC</p>	A	0.05 s....300 h	700-HN100 700-HN125 700-HN108	8	24...48V AC/DC	SPDT Timed + Instantaneous Contact	700-HRS42TU24	✓
						DPDT	700-HRM12TU24	✓
					100...240V AC	DPDT	700-HRM12TA17	✓
						SPDT Timed + Instantaneous Contact	700-HRC12TA17	✓
 <p><b>Twin Timer</b>                      Cat. No. 700-HRF...</p>	B	0.05 s....30 h	700-HN100 700-HN125 700-HN108	8	12V DC	DPDT	700-HRF72DZ12	
		0.05 s....30 h	700-HN100 700-HN125 700-HN108	8	24V AC/DC	DPDT	700-HRF72DU25	✓
		0.05 s....30 h	700-HN100 700-HN125 700-HN108	8	48...125V DC	DPDT	700-HRF72DZ45	
		0.05 s....30 h	700-HN100 700-HN125 700-HN108	8	100...240V AC	DPDT	700-HRF72DA18	✓

① Voltage Input


**Timing mode description**

<b>A</b>	<b>D</b>	<b>E</b>	<b>B</b>	<b>B2</b>	<b>C</b>	<b>J</b>
ON-delay	OFF-delay	One Shot	Repeat Cycle OFF-start	Repeat Cycle ON- start	Signal ON/OFF-delay	ON-delay One Shot

**Bulletin 700-HR**  
**Plug-in Timing Relays**  
**Product Selection, Continued**

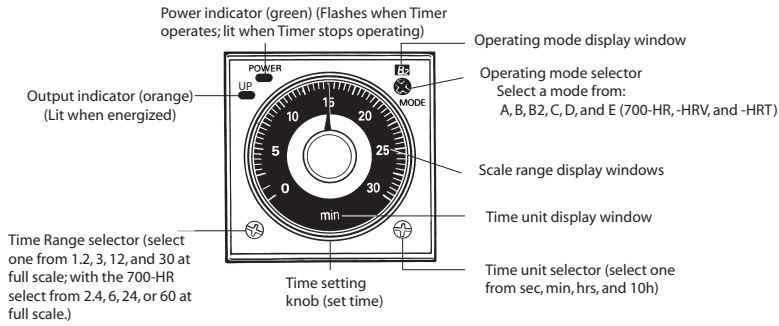
	Timing Mode	Timing Range	Sockets	Pins	Input Voltage	Contact Outputs	Cat. No.	Factory-stocked Item
<b>Twin Timer</b>  Cat. No. 700-HRF...	<b>B2</b>	0.05 s...30 h	700-HN100 700-HN125 700-HN108	8	12V DC	DPDT	700-HRF82DZ12	
		0.05 s...30 h	700-HN100 700-HN125 700-HN108	8	24V AC/DC	DPDT	700-HRF82DU25	
		0.05 s...30 h	700-HN100 700-HN125 700-HN108	8	48...125V DC	DPDT	700-HRF82DZ45	
		0.05 s...30 h	700-HN100 700-HN125 700-HN108	8	100...240V AC	DPDT	700-HRF82DA18	✓
<b>Star-Delta Timer</b>  Cat. No. 700-HRY...	<b>Star-Delta</b>	0.5 s...120 s	700-HN100 700-HN125 700-HN108	8	100...120V AC	SPDT Timed + Instantaneous Contact	700-HRY6FA12	✓
					200...240V AC		700-HRY6FA22	✓
<b>True OFF-Delay Timer</b>  Cat. No. 700-HRQ...	<b>True OFF-Delay</b>	.05 s...12 s	700-HN100 700-HN125 700-HN108	8	100...120V AC	DPDT	700-HRQN2GA12	✓
					200...240V AC	DPDT	700-HRQN2GA22	
			700-HN101 700-HN126 700-HN129	11	100...120V AC	DPDT	700-HRQR2GA12 ①	
					200...240V AC	DPDT	700-HRQR2GA22 ①	
		.05 min... 12 min.	700-HN100 700-HN125 700-HN108	8	100...120V AC	DPDT	700-HRQN2HA12	✓
					200...240V AC	DPDT	700-HRQN2HA22	
		700-HN101 700-HN126 700-HN129	11	100...120V AC	DPDT	700-HRQR2HA12 ①		
				200...240V AC	DPDT	700-HRQR2HA22 ①		
.05 s...12 s	700-HN100 700-HN125 700-HN108	8	24V AC/DC	DPDT	700-HRQN2GU25			
			700-HN101 700-HN126 700-HN129	11	24V AC/DC	DPDT	700-HRQR2GU25 ①	

① Indicates True OFF-delay timer with reset

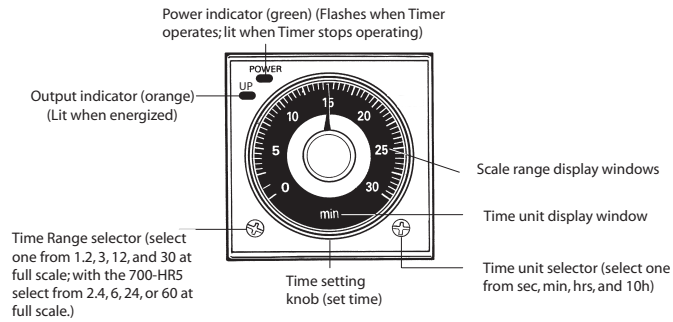
	Timing Mode	Timing Range	Sockets	Pins	Input Voltage	Contact Outputs	Cat. No.	Factory-stocked Item
 <p><b>True OFF-Delay Timer</b> Cat. No. 700-HRQ...</p>	<b>True OFF-Delay</b>	.05 min....12 min.	700-HN100 700-HN125 700-HN108	8	24V AC/DC	DPDT	700-HRQN2HU25	
			700-HN101 700-HN126 700-HN129	11	24V AC/DC	DPDT	700-HRQR2HU25 ①	
		.05 s...12 s	700-HN100 700-HN125 700-HN108	8	48V DC	DPDT	700-HRQN2GZ48	
			700-HN101 700-HN126 700-HN129	11	48V DC	DPDT	700-HRQR2GZ48 ①	
		.05 min....12 min.	700-HN100 700-HN125 700-HN108	8	48V DC	DPDT	700-HRQN2HZ48	
			700-HN101 700-HN126 700-HN129	11	48V DC	DPDT	700-HRQR2HZ48 ①	
		.05 s...12 s	700-HN100 700-HN125 700-HN108	8	100...125V DC	DPDT	700-HRQN2GZ11	
			700-HN101 700-HN126 700-HN129	11	100...125V DC	DPDT	700-HRQR2GZ11 ①	
		.05 min....12 min.	700-HN100 700-HN125 700-HN108	8	100...125V DC	DPDT	700-HRQN2HZ11	
			700-HN101 700-HN126 700-HN129	11	100...125V DC	DPDT	700-HRQRHZ11 ①	

① Indicates True OFF-delay timer with reset

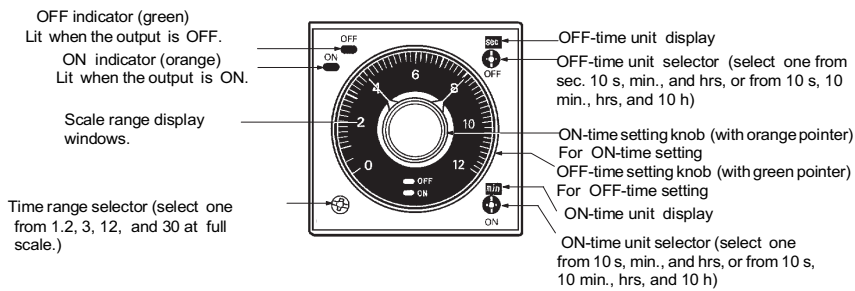
**700-HR Multifunction Timer**



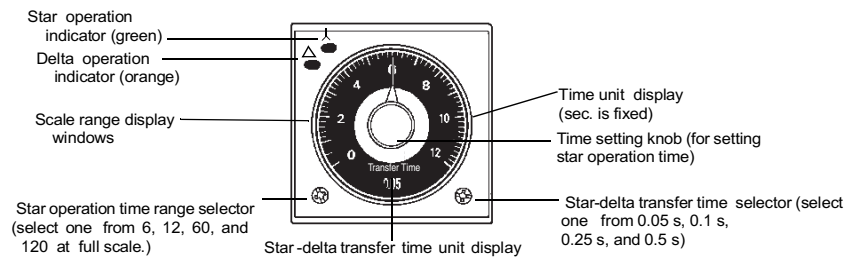
**700-HRC -HRM ON-Delay Timer**



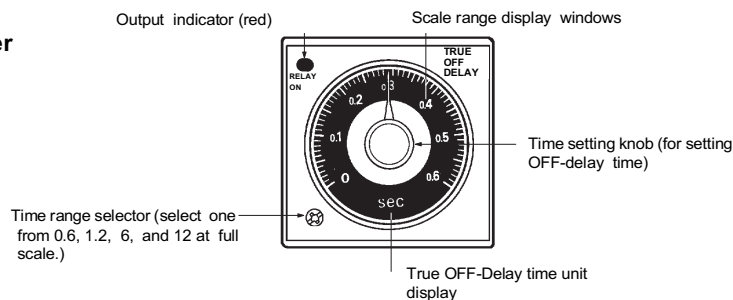
**700-HRF Twin Timer**










**700-HRY Star-Delta Timer**




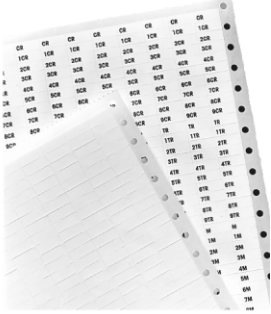


**700-HRQ True OFF-Delay Timer**



	Description	Pkg. Qty.	Cat. No.	Factory Stock Item
 Cat. No. 700-HN100	<b>Screw Terminal Tube Base Sockets — Panel or DIN Rail Mounting Guarded Terminal Construction</b> 8-pin for use with Bulletin 700-HR and 700-HX timing relays. Order must be for 10 sockets or multiples of 10.	10	700-HN100	✓
 Cat. No. 700-HN125	<b>Screw Terminal Tube Base Sockets — Panel or DIN Rail Mounting Open Style Construction</b> 8-pin for use with Bulletin 700-HRM, and -HRC timing relays. Order must be for 10 sockets or multiples of 10. No retainer clip required.	10	700-HN125	✓
 Cat. No. 700-HN101	<b>Screw Terminal Tube Base Sockets — Panel or DIN Rail Mounting Guarded Terminal Construction</b> 11-pin for use with Bulletin 700-HR timing relays. Order must be for 10 sockets or multiples of 10. No retainer clip required.	10	700-HN101	✓
 Cat. No. 700-HN126	<b>Screw Terminal Tube Base Sockets — Panel or DIN Rail Mounting Guarded Terminal Construction</b> 11-pin for use with Bulletin 700-HR timing relays. Order must be for 10 sockets or multiples of 10.	10	700-HN126	✓
 Cat. No. 199-DR1	<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.	10	199-DR1	✓
 Cat. No. 700-HN108	<b>Specialty Socket</b> 8-pin backwired socket with solder terminals for use with Bulletin 700-HR timing relays. Order must be for 10 sockets or multiples of 10.	10	700-HN108	✓
 Cat. No. 700-HN129	<b>Specialty Socket</b> 11-pin backwired socket with solder terminals for use with Bulletin 700-HR timing relays. Order must be for 10 sockets or multiples of 10.	10	700-HN129	✓

**Bulletin 700-HR**  
**Plug-in Timing Relays**  
**Accessories, Continued**

	Description	Pkg. Qty.	Cat. No.	Factory-stocked Item
 Cat. No. 700-HN130	<b>Frame Adapter</b> For flush or door mounting of all Bulletin 700-HR timers.	1	700-HN130	✓
 Sample Retainer Clips	<b>Retainer Clip for Cat. Nos. 700-HN100 and -HN101 Sockets with all 700-HR Timing Relays</b> Secures timer in socket. Order must be for 10 clips or multiples of 10.  Note: Not required for installation	10	700-HN131	✓
 Cat. No. 700-HN132	<b>Protective Cover</b> 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.	1	700-HN132	✓
	<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.	10	700-N40	
	<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.	10	700-N41	

**Bulletin 700-HR Multi-function, Multi-Range Dial Timing Relay, Socket, Retainer Clip Reference Chart**

Timer Type	Socket Cat. No.	Retainer Clip Cat. No.
700-HR, HRQR2, HRV HRT6	700-HN101 ②	700-HN131
	700-HN126 ②	Not Required ❶
	700-HN129 ②	Not Applicable
700-HRC/HRF/HR5, HRT4, HRM, HRP	700-HN100 ③	700-HN131(See note above)
	700-HN108 ③	Not Applicable
	700-HN125 ③	Not Required ❶

- ❶ Design of these sockets holds the timing relays securely and does not require retainer clips.
- ❷ 11 pins.
- ❸ 8 pins.

	700-HR, -HRS, -HRV	700-HRP	700-HRC	700-HRM	700-HRF	700-HRY	700-HRQ	700-HRT (Transistor Outputs)
<b>Electrical Ratings</b>								
Pilot Duty Rating	NEMA B300							—
Thermal Current ( $I_{th}$ )	5 A							100 mA
►][◀ 120V AC Make 240V AC	30 A							—
◄][► 120V AC Break 240V AC	15 A							—
	3 A							—
	1.5 A							—
Hp at 120V	1/6 Hp	1/4 Hp		1/6 Hp		1/4 Hp	1/6 Hp	—
Hp at 240V	1/3 Hp							—
Accuracy of operating time	±0.2% FS max. (±0.2%±10 ms max. in a range of 1.2 s)							
Setting error	±5% FS ±50 ms (The value is ±5% FS +100 ms to -0 ms max. when the C, D, or G mode signal of the 700-HRVs are OFF.)							
Reset time	Min. power-opening time: 0.1 s max. Min. pulse width: 0.05 s (cat nos. 700-HR52TA17, 700-HR52TU24, 700-HRT6TTU24)							
Reset voltage	10% max. of rated voltage							
Influence of voltage	±0.2% FS max. (±0.2%±10 ms max. in a range of 1.2 s)							
Influence of temperature	±1% FS max. (±1%±10 ms max. in a range of 1.2 s)							
<b>Design Specifications</b>								
Dielectric strength	2,000V AC (1,000 VAC for 700-HRT), 50/60 Hz for 1 min. (between current-carrying metal parts and exposed non-current-carrying metal parts) 2,000V AC (1,000 VAC for 700-HRT), 50/60 Hz for 1 min. (between control output terminals and operating circuit) 2,000V AC, 50/60 Hz for 1 min. (between contacts of different polarities) 1,000V AC, 50/60 Hz for 1 min. (between contacts not located next to each other) 2,000V AC, 50/60 Hz for 1 min. (between input and control output terminals and operation circuit)							
<b>Mechanical</b>								
Vibration resistance	Malfunction: 10...55 Hz with 0.5 mm double amplitude each in three directions for ten minutes each							
Shock resistance	Malfunction: 100 m/s <sup>2</sup> (10 G)		98 m/s <sup>2</sup> (10 G)		294 m/s <sup>2</sup> (10 G)	98 m/s <sup>2</sup> (10 G)	100 m/s <sup>2</sup> (10 G)	
<b>Environmental</b>								
Noise immunity	±1.5 kV for ±600V DC				±400V for 12V DC		±1kV for 48V DC	±1.5 kV for ±600 V DC
Static immunity	Malfunction: 8 kV							
Ambient temperature	Operating: -10°...55°C (with no icing) Storage: -25°...65°C (with no icing)							
Ambient humidity	Operating: 35...85%							
<b>Construction</b>								
Life expectancy (operations min.)	Mechanical:20,000,000. (under no load at 1,800 operations/h Electrical: 100,000 (5 A at 250V AC, resistive load at 1,800 operations/h)					Mech: 10 <sup>7</sup> Electrical: 10 <sup>4</sup>	Mech: 20 <sup>7</sup> Electrical: 10 <sup>4</sup>	
EMC	(EMI) Emission Enclosure: Emission AC Mains: (EMS) Immunity ESD:		EN50081-2 EN55011 Group 1 class A EN55011 Group 1 class A EN50082-2 EN61000-4-2:		4 kV contact discharge (level 2) 8 kV air discharge (level 3) ENV50140:10 V/m (80 MHz...1 GHz) (level 3) ENV50204:10 V/m (900±5 MHz) (level 3) 10 V (0.15...80 MHz) (level 3) 2 kV power-line (level 3) 2 kV I/O signal-line (level 4) 1 kV line to line 2 kV line to ground (level 3)			
Degree of protection	IP40 (panel surface)							
Weight	Approx. 90 g							



# Plug-in Timing Relays

## Bulletin 700-HR Timer Wiring Diagrams and Timing Charts

### Multifunction and ON-Delay Timer

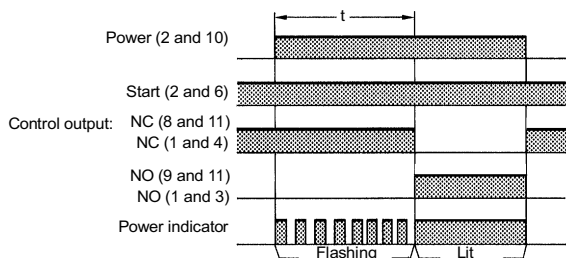
#### Application Examples

##### A Mode: Signal ON-Delay

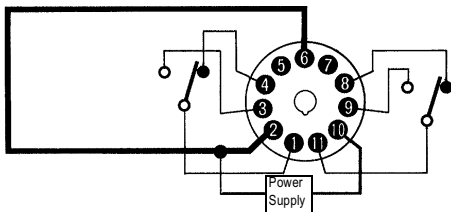
ON-delay operation (A mode) is a basic mode.

##### 1. Power-ON Start/Power-OFF Reset

The Power-ON start/Power-OFF reset operation is a standard operating method.

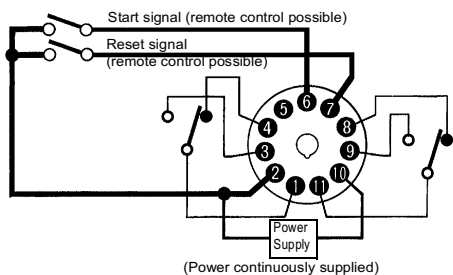
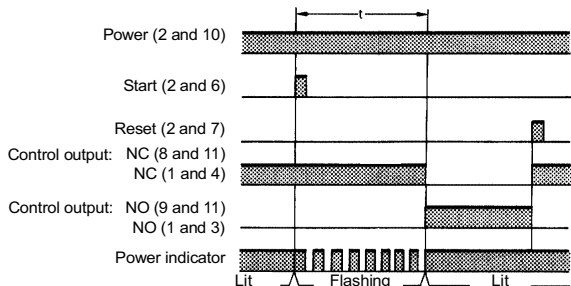


Externally short-circuited



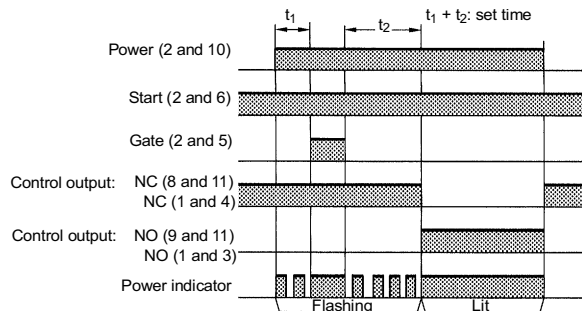
##### 2. Signal Start/Signal Reset

The Signal start/Signal reset operation is useful for remote control of the Timer.

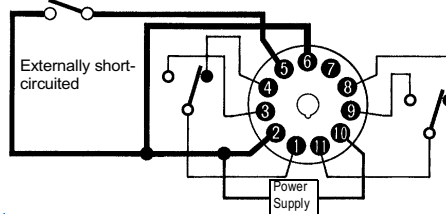


##### 3. Control of Integrated Time with Gate Signal

With a gate signal, the Power-ON start operation and Signal start operation can be controlled (the operation can be interrupted).



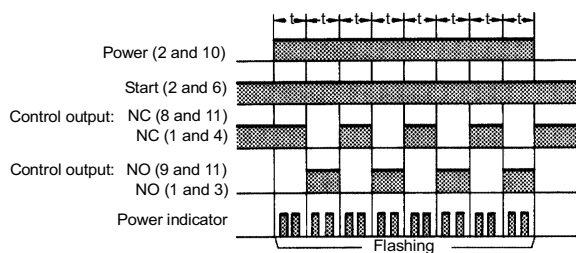
Gate signal (The operation is interrupted with the gate signal if the Timer detects an abnormal signal.)



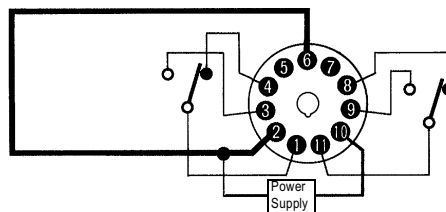
##### B/B2 Mode: Repeat Cycle

The Repeat Cycle operation in the B and B2 modes can be effectively applied to lamp or buzzer (ON and OFF) alarms or the monitoring of an intermittent operation with a display.

##### 1. Power-ON Start/Power-OFF Reset (in B Mode)



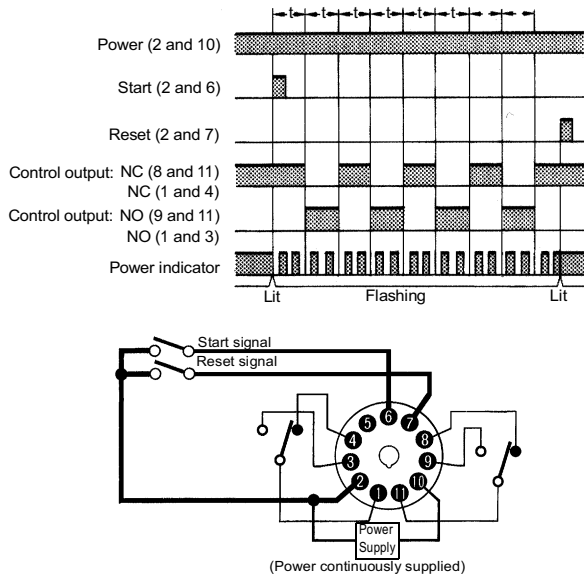
Externally short-circuited



**Multifunction and ON-Delay Timer, Continued**

**2. Signal Start/Signal Reset (in B Mode)**

If there is an abnormal signal, flashing starts. When the abnormal condition is restored, a reset signal stops the display flashing.

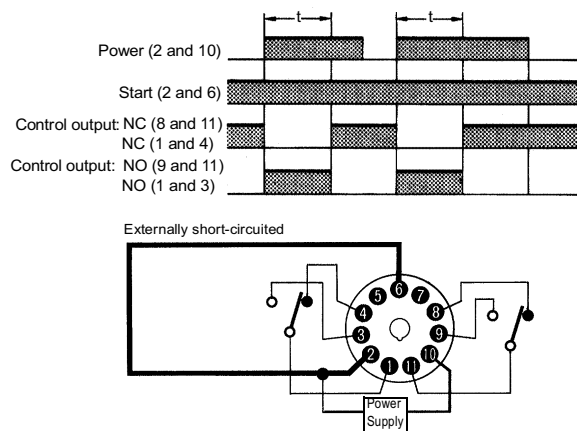


**C Mode: Signal ON/OFF-Delay**

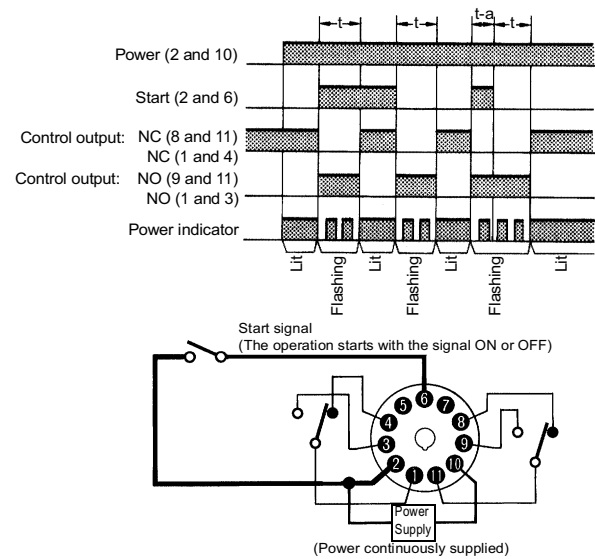
The Signal ON-/OFF-delay operation (C mode) is useful for the control of distribution of products on a production line into boxes by the specified number or time.

**1. Power-ON Start/Instantaneous Operation/Time-Limit Reset**

A set of these functions is useful for the operation of a machine for a specified period when power is ON.



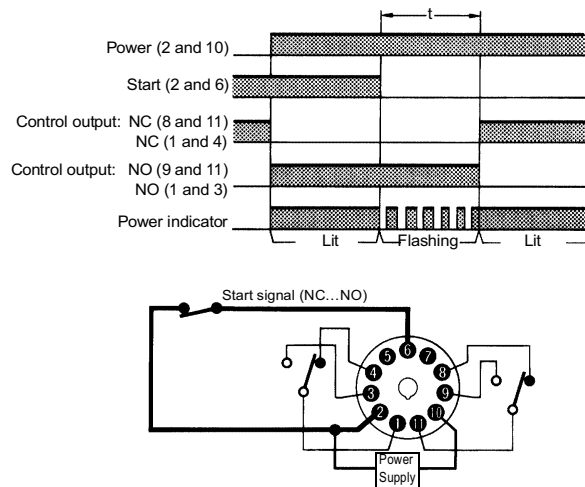
**2. Signal-ON-OFF Start/Instantaneous Operation/Time-Limit Reset**



**D Mode: Signal OFF-Delay**

Signal OFF-delay operation (D mode) can be effectively used to keep a load operating for a certain period. For example, this function enables the cooling fan for a lamp or heater to operate for a certain period after the lamp or heater is switched OFF.

**1. Power-ON Start/Instantaneous Operation/Time-Limit Reset**

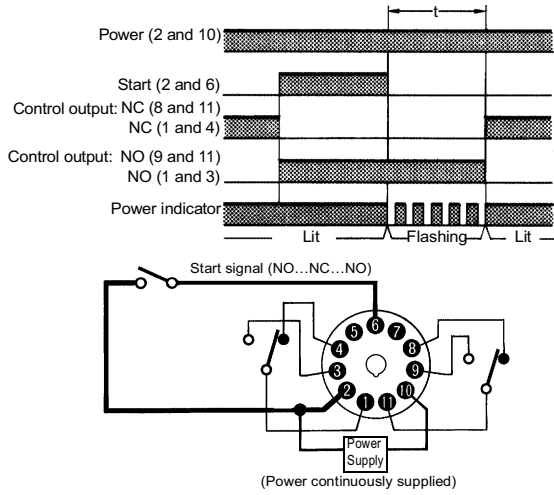


# Plug-in Timing Relays

## Bulletin 700-HR Timer Wiring Diagrams and Timing Charts, Continued

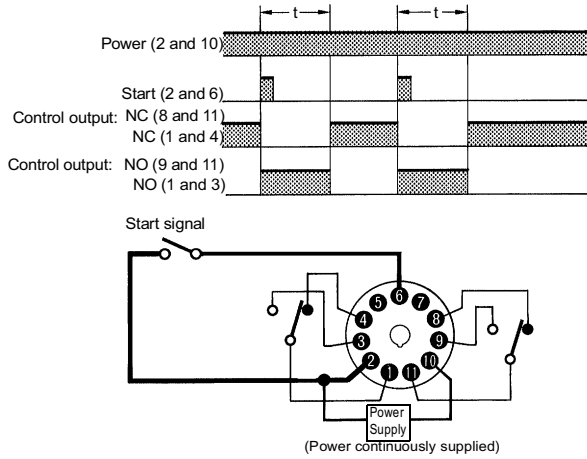
### Multifunction and ON-Delay Timer, Continued

#### 2. Signal Start/Instantaneous Operation/Time-Limit Reset



#### 2. Signal Start/Instantaneous Operation/Time-Limit Reset

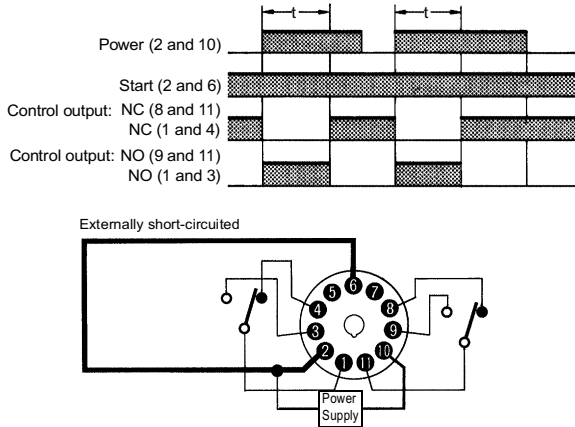
This function is useful for the repetitive control such as the filling of liquid for a specified period after each Signal start input.



### E Mode: One Shot

#### 1. Power-ON Start/Instantaneous Operation/Time-Limit Reset

This function is useful for the operation of a machine for a specified period after power is ON.

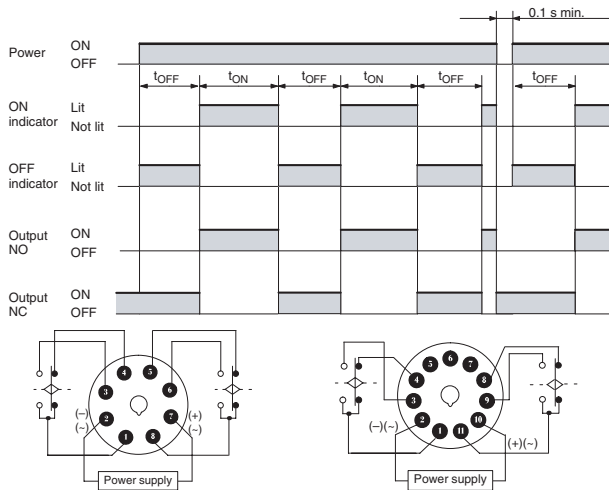


700-HRF Twin Timer, 700 -HRY Star-Delta Timer, and 700-HRQ Off-Delay Timer

**B Mode: Repeat Cycle Off-start (700-HRF)**

The Repeat Cycle operation in the B mode can be effectively applied to lamp or buzzer (ON and OFF) alarms or the monitoring of an intermittent operation with a display.

**1. Power-ON Start/Power-OFF Reset (in B Mode)**

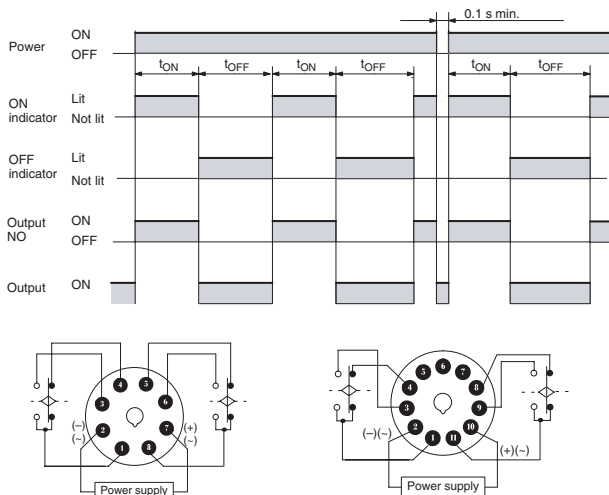


**B2 Mode: Repeat Cycle On-start (700-HRF)**

The Repeat Cycle operation in the B2 mode can be effectively applied to lamp or buzzer (ON and OFF) alarms or the monitoring of an intermittent operation with a display

**B2 Mode: Repeat Cycle On-start (700-HRF)**

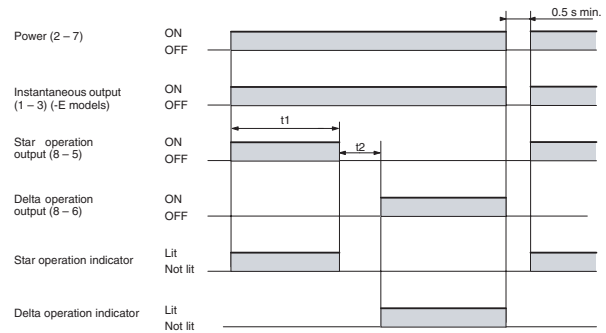
The Repeat Cycle operation in the B2 mode can be effectively applied to lamp or buzzer (ON and OFF) alarms or the monitoring of an intermittent operation with a display



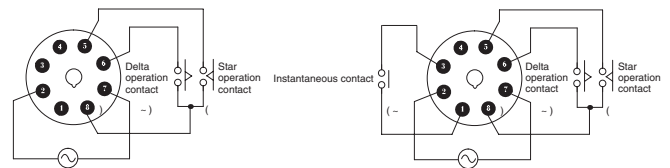
**E Mode: One Shot (700-HRY)**

**1. Power-ON Start/Instantaneous Operation/Time-Limit Reset**

This function is useful for the operation of a machine for a specified period after power is ON.



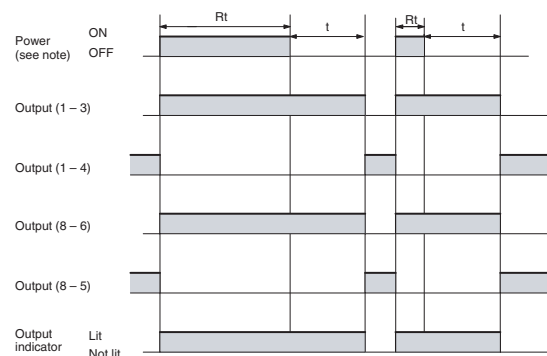
t1: Star operation time setting  
 t2: Star-delta transfer time



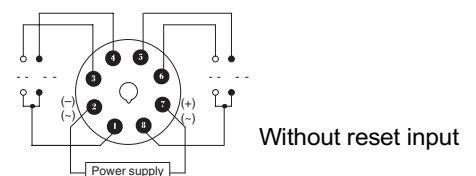
**D Mode: True OFF-Delay (700-HRQ)**

Signal OFF-delay operation (D mode) can be effectively used to keep a load operating for a certain period. For example, this function enables the cooling fan for a lamp or heater to operate for a certain period after the lamp or heater is switched OFF.

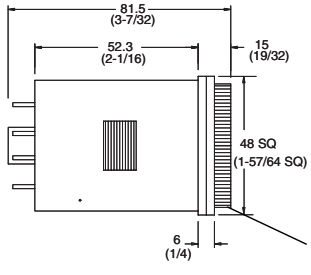
**1. Power-ON Start/Instantaneous Operation/Time-Limit Reset**



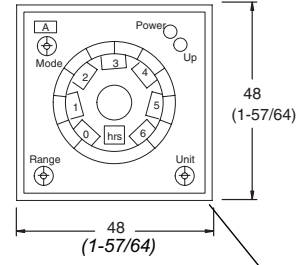
t: Set time  
 Rt: Minimum Power On



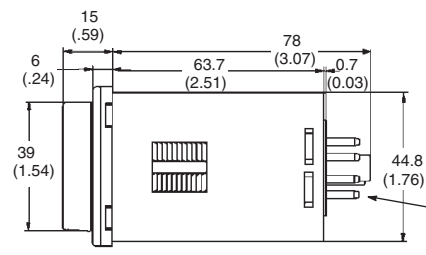
**Bulletin 700-HR**  
**Plug-in Timing Relays**  
 Approximate Dimensions



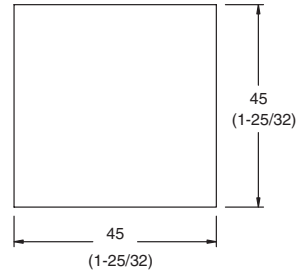
Cat. No. 700-HR, -HRM, -HRC,  
 -HRF,  
 -HRS, -HRV, -HRP  
**Timing Relay**



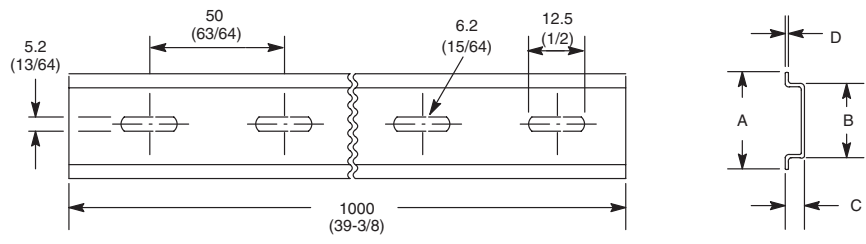
Cat. No. 700-HR.../HRM.../HRC.../HRF.../HRS.../HRV.../  
 -HRP.../HRY.../HRQ  
**Timing Relays**



Cat. No. 700-HRY,  
 700-HRQ  
**Timing Relay**



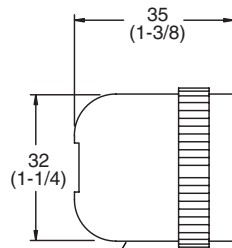
Cat. No. 700-HR...  
**Panel Cutout**



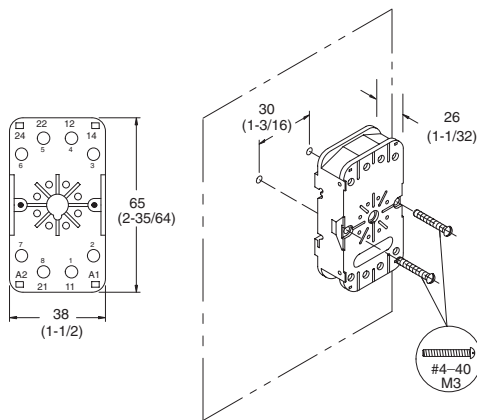
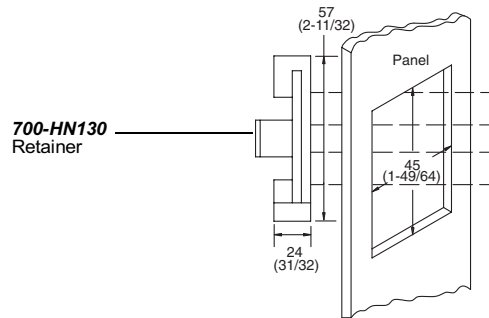
Cat. No. 199-DR1 DIN Mounting Rail Series B  
 Cat. No. 199-DR4 DIN Mounting Rail Series B Has No Mounting Holes

Cat. No.	A	B	C	D	Approx. Shipping Wt.
199-DR1	35 (1-3/8)	27 (1-1/16)	7.5 (19/64)	1.02 (1/64)	1.85 kg (4.07 lbs.) (10/pkg)
199-DR4	35 (1-3/8)	27 (1-1/16)	15 (19/32)	2.3 (3/32)	3.68 kg (8 lbs.) (5/pkg)

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

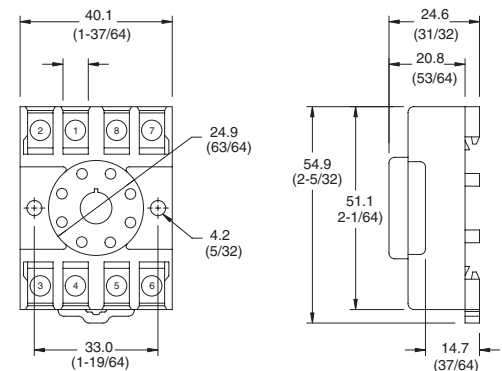


Cat. No. 700-HN129 — 11-Pin  
 Cat. No. 700-HN108 — 8-Pin  
 Socket



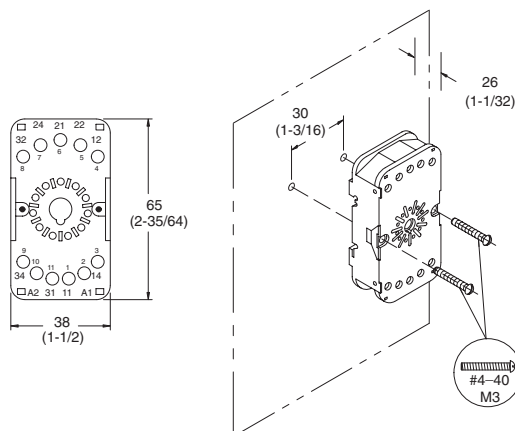
Cat. No. 700-HN100 Panel Mounting

Wire Size: 2 x 2.5 mm<sup>2</sup>  
 Single Wire — Up to #12 AWG  
 Double Wire — 2 x 2.5 mm<sup>2</sup> (#2–14 AWG... #2–20 AWG)  
 (Either Solid or Stranded)  
 Strip Length: 9 mm (3/8 in.) — Torque: 0.8 Nm (7 lb.-in.)



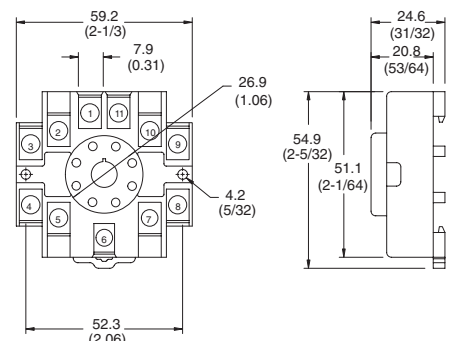
Cat. No. 700-HN125 ●

Wire Size: 2 x 2.5 mm<sup>2</sup>  
 Single Wire — Up to #12 AWG  
 Double Wire — 2 x 2.5 mm<sup>2</sup> (#2–14 AWG... #2–20 AWG)  
 (Either Solid or Stranded)  
 Strip Length: 9 mm (3/8 in.) — Torque: 0.8 Nm (7 lb.-in.)



Cat. No. 700-HN101 Panel Mounting

Wire Size: 2 x 2.5 mm<sup>2</sup>  
 Single Wire — Up to #12 AWG  
 Double Wire — 2 x 2.5 mm<sup>2</sup> (#2–14 AWG... #2–20 AWG)  
 (Either Solid or Stranded)  
 Strip Length: 9 mm (3/8 in.) — Torque: 0.8 Nm (7 lb.-in.)



Cat. No. 700-HN126 ●

Wire Size: 2 x 2.5 mm<sup>2</sup>  
 Single Wire — Up to #12 AWG  
 Double Wire — 2 x 2.5 mm<sup>2</sup> (#2–14 AWG... #2–20 AWG)  
 (Either Solid or Stranded)  
 Strip Length: 9 mm (3/8 in.) — Torque: 0.8 Nm (7 lb.-in.)

● Cat. No. 199-FSM Surge Suppressors fit on the coil terminals. See page 195.