

# Self-powered Time Counter H7ET

- Seven digits, time range 0 to 3999d23.9h.
- Dual time range: 999999.9h ↔ 3999d23.9h or 999h59m59s ↔ 9999h59.9m



## Model Number Structure

### Model Number Legend

H7ET - N   -    
                   1    2        3    4

#### 1. Count Input

- None: No-voltage input
- V: PNP/NPN universal DC voltage input
- FV: AC/DC multi-voltage input

#### 2. Time Range

- None: 999999.9h/3999d23.9h
- 1: 999h59m59s/9999h59.9m

#### 3. Case Color

- None: Light gray
- B: Black

#### 4. Display

- None: 7-segment LCD without backlight
- H: 7-segment LCD with backlight

## Ordering Information

### Time Counters

Timer input	Display	Time range			
		999999.9h ↔ 3999d23.9h (switchable)		999h59min59s ↔ 9999h59.9min (switchable)	
		Light-gray body	Black body	Light-gray body	Black body
PNP/NPN universal DC voltage input	7-segment LCD with backlight	H7ET-NV-H	H7ET-NV-BH	H7ET-NV1-H	H7ET-NV1-BH
	7-segment LCD	H7ET-NV	H7ET-NV-B	H7ET-NV1	H7ET-NV1-B
AC/DC multi-voltage input	7-segment LCD	H7ET-NFV	H7ET-NFV-B	H7ET-NFV1	H7ET-NFV1-B
No-voltage input	7-segment LCD	H7ET-N	H7ET-N-B	H7ET-N1	H7ET-N1-B

### Accessories (Order Separately)

Lithium Battery	Y92S-36	
Wire-wrap Terminal (set of two terminals)	Y92S-37	
Compact Flush Mounting Bracket (See note.)	Y92F-35	
Flush Mounting Adapter	26 mm × 45.3 mm	Y92F-75
	27.5 mm × 52.5 mm	Y92F-76
	24.8 mm × 48.8 mm	Y92F-77B

**Note:** The New H7E models are supplied with a Y92F-34 Mounting Bracket.

# Specifications

## ■ General

Item	H7ET-NV-□ H7ET-NV-□H	H7ET-NFV-□	H7ET-N-□	H7ET-NV1-□ H7ET-NV1-□H	H7ET-NFV1-□	H7ET-N1-□
Operating mode	Accumulating					
Mounting method	Flush mounting					
External connections	Screw terminals					
Reset	External/Manual reset					
Display	7-segment LCD with or without backlight, zero suppression (character height: 8.6 mm) (see note 1)					
Number of digits	7					
Time range	0.0h to 999999.9h ↔ 0.0h to 3999d23.9h (switchable with switch)			0s to 999h59min59s ↔ 0.0min to 9999h59.9min (switchable with switch)		
Timer input	PNP/NPN universal DC voltage input	AC/DC multi-voltage input	No-voltage input	PNP/NPN universal DC voltage input	AC/DC multi-voltage input	No-voltage input
Case color	Light gray or black (-B models)					
Attachment	Waterproof packing, flush mounting bracket, time unit labels (see note 2)					
Approved standard	UL863, CSA C22.2 No.14, Lloyds Conforms to EN61010-1/IEC61010-1 (pollution degree2/overvoltage category III) Conforms to VDE0106/P100					

Note: 1. Only PNP/NPN universal DC voltage input models (-H models) have a backlight.

2. "-hours", "-d-h", "-h-m", and "-h-m-s" labels are included.

## ■ Ratings

Item	H7ET-NV□-□ H7ET-NV□-□H	H7ET-NFV□-□	H7ET-N□-□
Supply voltage	Backlight model: 24 VDC (0.3 W max.) (for backlight) No-backlight model: Not required (powered by built-in battery)	Not required (powered by built-in battery)	
Timer input	High (logic) level: 4.5 to 30 VDC Low (logic) level: 0 to 2 VDC (Input impedance: Approx. 4.7 kΩ)	High (logic) level: 24 to 240 VAC/VDC, 50/60 Hz Low (logic) level: 0 to 2.4 VAC/VDC, 50/60 Hz	No voltage input Maximum short-circuit impedance: 10 kΩ max. Short-circuit residual voltage: 0.5 V max. Minimum open impedance: 750 kΩ min.
Reset input		No voltage input Maximum short-circuit impedance: 10 kΩ max. Short-circuit residual voltage: 0.5 V max. Minimum open impedance: 750 kΩ min.	
Minimum pulse width	1 s		
Reset system	External reset and manual reset: Minimum signal width of 20 ms		
Terminal screw tightening torque	0.98 N·m max.		
Ambient temperature	Operating: -10°C to 55°C (with no condensation or icing) Storage: -25°C to 65°C (with no condensation or icing)		
Ambient humidity	Operating: 25% to 85%		

■ Characteristics

Item	H7ET-NV□-□ H7ET-NV□-H□	H7ET-NFV□-□	H7ET-N□-□
<b>Time accuracy</b>	±100 ppm (25°C)		
<b>Insulation resistance</b>	100 MΩ min. (at 500 VDC) between current-carrying metal parts and exposed non-current-carrying metal parts, and between the backlight power supply and timer input terminals/reset terminals for backlight models	100 MΩ min. (at 500 VDC) between current-carrying metal parts and exposed non-current-carrying metal parts and between timer input terminals and reset terminals	100 MΩ min. (at 500 VDC) between current-carrying metal parts and exposed non-current-carrying metal parts
<b>Dielectric strength</b>	1,000 VAC, 50/60 Hz for 1 min between current-carrying metal parts and exposed non-current-carrying metal parts and between the backlight power supply and timer input terminals/reset terminals for backlight models	3,700 VAC, 50/60 Hz for 1 min between timer input terminals and exposed non-current-carrying metal parts 2,200 VAC, 50/60 Hz for 1 min between reset terminals and exposed non-current-carrying metal parts and between timer input terminals and reset terminals	1,000 VAC, 50/60 Hz for 1 min between current-carrying metal parts and exposed non-current-carrying metal parts
<b>Impulse withstand voltage</b>	4.5 kV between current-carrying terminal and exposed non-current-carrying metal parts	4.5 kV between current-carrying terminal and exposed non-current-carrying metal parts 3 kV between timer input terminals and reset terminals	4.5 kV between current-carrying terminal and exposed non-current-carrying metal parts
<b>Noise immunity</b>	Square-wave noise generated by noise simulator (pulse width: 100 ns/1 μs, 1-ns rise)		
	±600 V (Between timer input terminals/ Between reset terminals) ±480 V (Between the backlight power supply terminals for backlight models)	±1.5 kV (Between timer input terminals) ±500 V (Between reset terminals)	±500 V (Between timer input terminals/ Between reset terminals)
<b>Static immunity</b>	±8 kV (malfunction)		
<b>Vibration resistance</b>	Malfunction: 0.15-mm single amplitude at 10 to 55 Hz for 10 min each in 3 directions Destruction: 0.375-mm single amplitude at 10 to 55 Hz for 2 hrs each in 3 directions		
<b>Shock resistance</b>	Malfunction: 200 m/s <sup>2</sup> 3 times each in 6 directions Destruction: 300 m/s <sup>2</sup> 3 times each in 6 directions		
<b>EMC</b>	(EMI) Emission Enclosure: EN61326 EN55011 Group 1 class B (EMS) EN61326 Immunity ESD: EN61000-4-2: 4 kV contact discharge (level 2) 8 kV air discharge (level 3) Immunity RF-interference from AM Radio Waves: EN61000-4-3: 10 V/m (80 MHz to 1 GHz) (level 3) Immunity RF-interference from Pulse-modulated Radio Waves: EN61000-4-3: 10 V/m (900 MHz ± 5 MHz) (level 3) Immunity Conducted Disturbance: EN61000-4-6: 10 V (0.15 to 80 MHz) (level 3) Immunity Burst: EN61000-4-4: 2 kV power line (level 3) 2 kV I/O signal line (level 4)		
<b>Degree of protection</b>	Front panel: IP66, NEMA4 with waterproof packing Terminal block: IP20		
<b>Weight (see note)</b>	No-backlight model: Approx. 60 g Backlight model: Approx. 65 g	Approx. 60 g	Approx. 60 g

Note: Weight includes waterproof packing and flush mounting bracket.

■ Reference Value

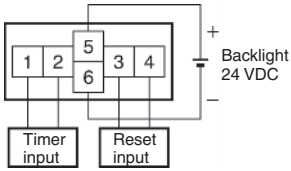
Item	Value	Note
Battery life	10 years min. with continuous input at 25°C (lithium battery)	The battery life is calculated according to the conditions in the left column and therefore is not a guaranteed value. Use these value as reference for maintenance or replacement.

# Connections

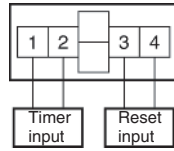
## Terminal Arrangement

Bottom view: View of the Time Counter rotated horizontally 180°

Backlight Model



No-backlight Model

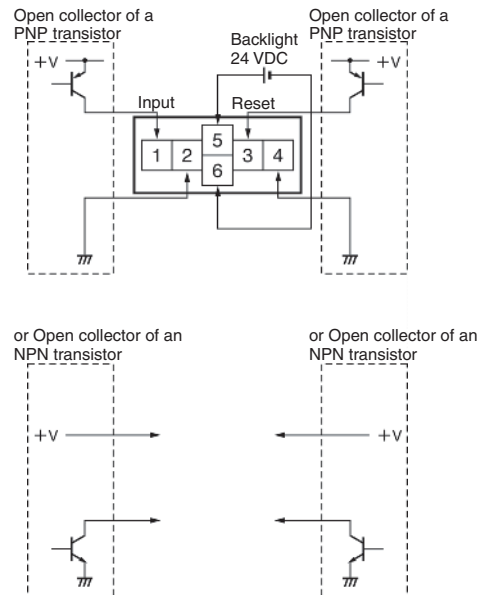
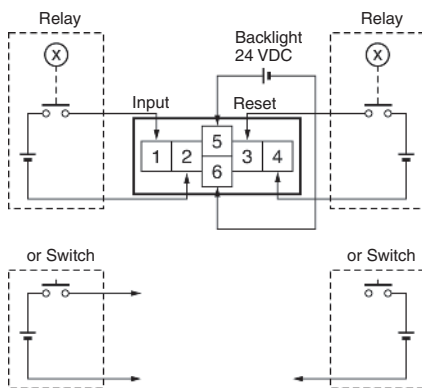


## Connections

### H7ET Time Counter

#### PNP/NPN Universal DC Voltage Input Model With Backlight

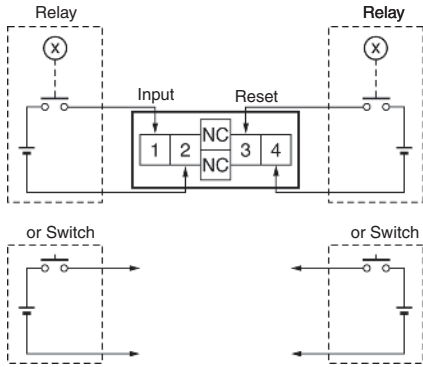
1. Contact Input (Input by a Relay or Switch Contact)
2. Solid-state Input



- Note:**
1. Terminals 2 and 4 (input circuit and reset circuit) are functionally isolated.
  2. Select input transistors according to the following:  
Dielectric strength of the collector  $\geq 50$  V  
Leakage current  $< 1 \mu\text{A}$

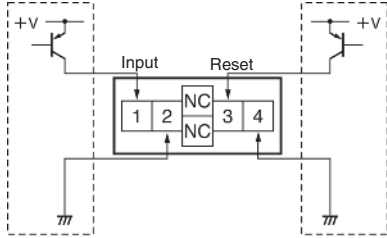
**PNP/NPN Universal DC Voltage Input Model Without Backlight**

1. Contact Input (Input by a Relay or Switch Contact)

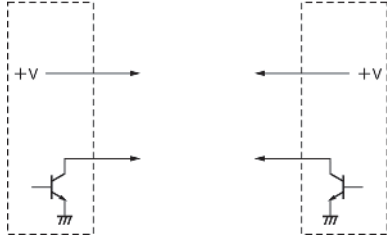


2. Solid-state Input

Open collector of a PNP transistor      Open collector of a PNP transistor



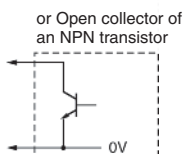
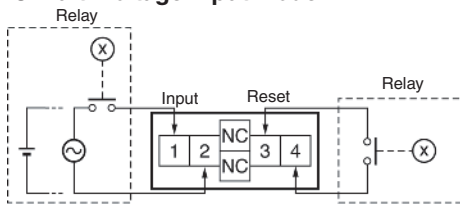
or Open collector of an NPN transistor      or Open collector of an NPN transistor



**Note:** 1. Terminals 2 and 4 (input circuit and reset circuit) are functionally isolated.

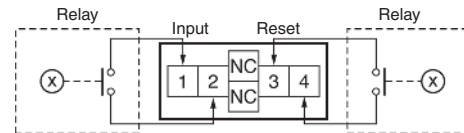
- 2. Select input transistors according to the following:  
 Dielectric strength of the collector  $\geq 50$  V  
 Leakage current  $< 1 \mu\text{A}$

**AC/DC Multi-voltage Input Model**



**No-voltage Input Model**

1. Contact Input (Input by a Relay or Switch Contact)



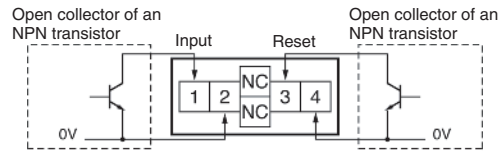
Terminals 2 and 4 are internally connected.



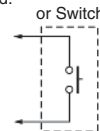
**Note:** Use Relays and Switches that have high contact reliability because the current flowing from terminals 1 or 3 is as small as approx.  $10 \mu\text{A}$ . It is recommended that OMRON's G3TA-IA/ID be used as the SSR.

2. Solid-state Input

(Open Collector Input of an NPN Transistor)



Terminals 2 and 4 are internally connected.



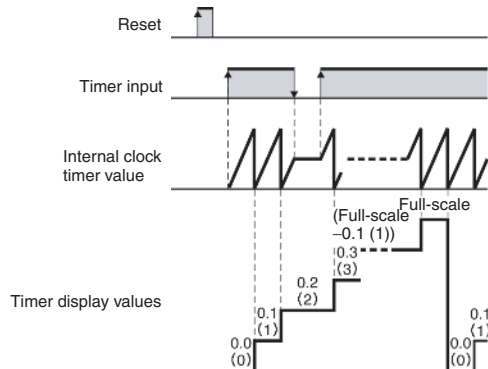
**Note:** 1. Residual voltage in the output section of Proximity Sensors or Photoelectric Sensors becomes less than 0.5 V because the current flowing from terminals 1 or 3 is as small as approx.  $10 \mu\text{A}$ , thus allowing easy connection.

- 2. Select input transistors according to the following:  
 Dielectric strength of the collector  $\geq 50$  V  
 Leakage current  $< 1 \mu\text{A}$

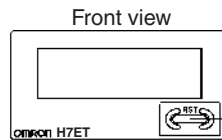
# Operation

## Operating Modes

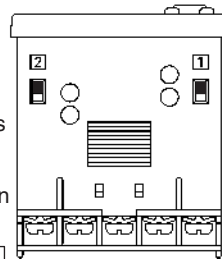
### H7ET Time Counter Incrementing Operation (Up)



## Nomenclature



**Reset Key**  
Reset the count value. Not operable under key-protect.



**Time-range switch**  
If the time-range setting is changed, the present value will not be held and so press the Reset Key on the front panel.

**Key-protect Switch**  
The Reset Key is not operable while the key-protect switch is set to ON.

Setting (see note)	Time range	
	H7ET-N□□-□□	H7ET-N□□1-□□
Front panel 	0.0h to 3999d23.9h	0s to 999h59min59s (default setting)
Terminal block 	0.0h to 999999.9h (default setting)	0.0min to 9999h59.9min

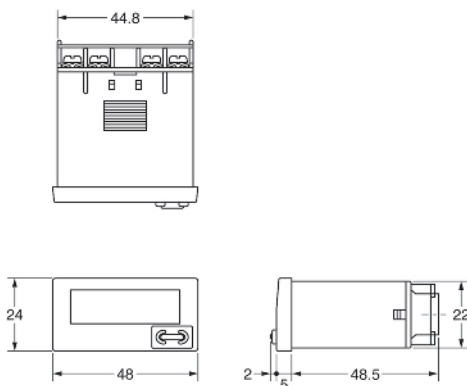
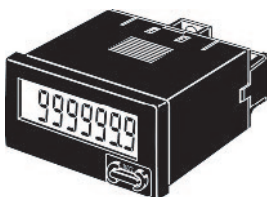
Setting (see note)	Key-protect
Front panel 	OFF (default setting)
Terminal block 	ON

**Note:** Perform switch setting before mounting to a control panel.

# Dimensions

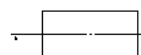
**Note:** All units are in millimeters unless otherwise indicated.

## H7ET-N

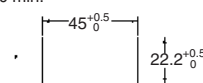


### Panel Cutout

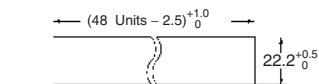
Separate mounting



40 min.

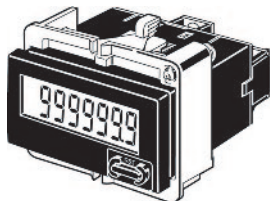
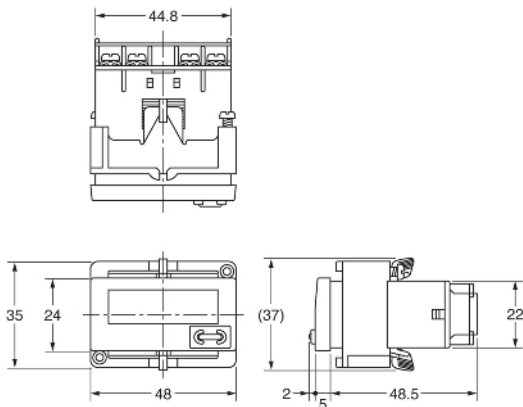
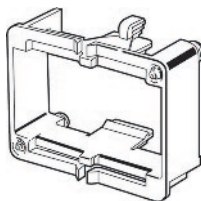


### Dense mounting



Waterproofing is not possible for dense mounting

### Dimensions with Flush Mounting Bracket



- When mounting, insert the Counter into the cutout, insert the adapter from the back and push in the Counter while making the gap between the front panel and the cutout panel as small as possible. Use screws to secure the Counter. If waterproofing is desired, insert the waterproof packing.
- When several Counters are installed, ensure that the ambient temperature will not exceed specifications.
- The appropriate thickness of the panel is 1 to 5 mm.

**Note:** A Compact Flush Mounting Bracket (Y92F-35) can also be used. Refer to *Accessories* for details.