Self-powered Total Counter
H7EC

- Eight-digits, counting range 0 to 99999999.
- Dual input speed: 30 Hz ←→ 1 kHz (except for AC/DC multi-voltage input models)

Model Number Structure

■ Model Number Legend

H7EC - N □ - □ □
1 2 3

1. Count Input
None: No-voltage input
V: PNP/NPN universal DC voltage input
FV: AC/DC multi-voltage input

2. Case Color
None: Light gray
B: Black

3. Display
None: 7-segment LCD without backlight
H: 7-segment LCD with backlight

Ordering Information

■ Total Counters

Count input	Max. counting speed	Display	Model	
			Light-gray body	Black body
PNP/NPN universal DC voltage input	30 Hz ←→ 1 kHz (switchable)	7-segment LCD with backlight	H7EC-NV-H	H7EC-NV-BH
		7-segment LCD	H7EC-NV	H7EC-NV-B
AC/DC multi-voltage input	20 Hz	7-segment LCD	H7EC-NFV	H7EC-NFV-B
No-voltage	30 Hz ←→ 1 kHz (switchable)	7-segment LCD	H7EC-N	H7EC-N-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	H7EC-NV-□ H7EC-NV-□H	H7EC-NFV-□	H7EC-N-□
Operating mode	Up type		
Mounting method	Flush mounting		
External connections	Screw terminals, optional Wire-wrap Terminals (see note 1)		
Reset	External/Manual reset		
Number of digits	8		
Count input	PNP/NPN universal DC voltage input	AC/DC multi-voltage input	No-voltage input
Display	7-segment LCD with or without backlight, zero suppression (character height: 8.6 mm) (see note 2)		
Max. counting speed	30 Hz/1 kHz	20 Hz	30 Hz/1 kHz
Case color	Light gray or black (-B models)		
Attachment	Waterproof packing, flush mounting bracket		
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. Separately ordered Wire-wrap Terminals (Y92S-37) are required.

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

■ Ratings

Item	H7EC-NV-□ H7EC-NV-□H	H7EC-NFV-□	H7EC-N-□
Supply voltage	Backlight model: 24 VDC (0.3 W max.) (only for backlight) No-backlight model: Not required (powered by built-in battery)	Not required (powered by built-in battery)	
Count 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.	
Max. counting speed (see note)	30 Hz or 1 KHz (Switchable with switch)	20 Hz	30 Hz or 1 KHz (Switchable with switch)
Minimum signal width	20 Hz: 25 ms 30 Hz: 16.7 ms 1 KHz: 0.5 ms		
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%		

Note: ON/OFF ratio 1:1

■ Characteristics

Item	H7EC-NV-□ H7EC-NV-□H	H7EC-NFV-□	H7EC-N-□
Insulation resistance	100 MΩ min. (at 500 VDC) between current-carrying metal parts and exposed non-current-carrying metal parts, and between the backlight power supply terminal and count 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 count input terminals and reset terminals	100 MΩ min. (at 500 VDC) between current-carrying metal parts and exposed non-current-carrying metal parts
Dielectric strength	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 terminal and count input terminals/ reset terminals for backlight models	3,700 VAC, 50/60 Hz for 1 min between current-carrying metal parts 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 count 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
Impulse withstand voltage	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 input terminals and reset terminals	4.5 kV between current-carrying terminal and exposed non-current-carrying metal parts
Noise immunity	Square-wave noise generated by noise simulator (pulse width: 100 ns/1 μs, 1-ns rise)		
	±600 V (Between count input terminals/ Between reset terminals) ±480 V (Between the backlight power supply terminals for backlight models)	±1.5 kV (Between count input terminals) ±500 V (Between reset terminals)	±500 V (Between count input terminals/ Between reset terminals)
Static immunity	±8 kV (malfunction)		
Vibration resistance	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		
Shock resistance	Malfunction: 200 m/s^2 3 times each in 6 directions Destruction: 300 m/s^2 3 times each in 6 directions		
EMC	(EMI) EN61326 Emission Enclosure: 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)		
Degree of protection	Front panel: IP66, NEMA4 Terminal block: IP20		
Weight (see note)	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

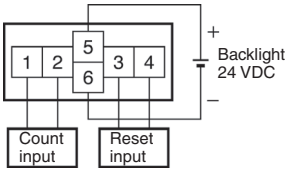
Item	Value	Note
Battery life	7 years min. with continuous input at 25°C (lithium battery)	The battery life is calculated according to the conditions in the left column and therefore is not a guaranteed value. Use these value as reference for maintenance or replacement.

Connections

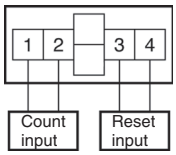
■ Terminal Arrangement

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

Backlight Model



No-backlight Model

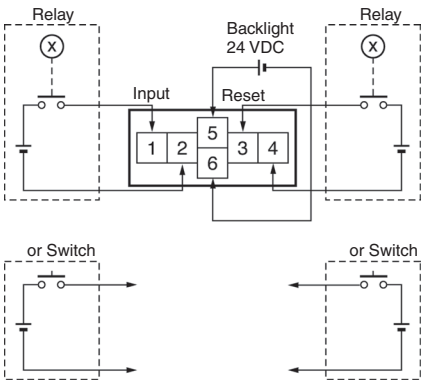


■ Connections

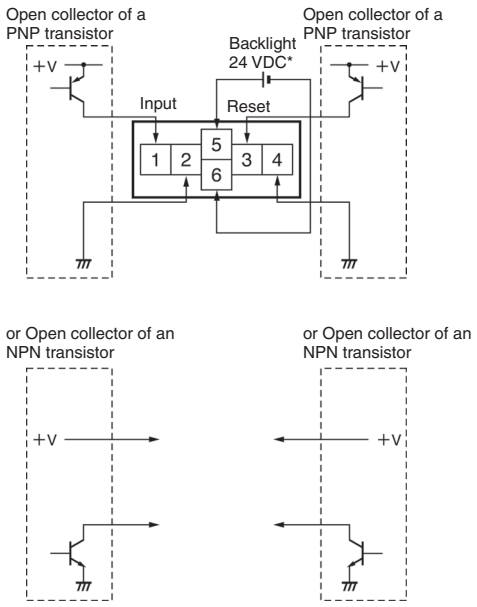
H7EC Total Counter

PNP/NPN Universal DC Voltage Input Model With Backlight

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



2. Solid-state Input



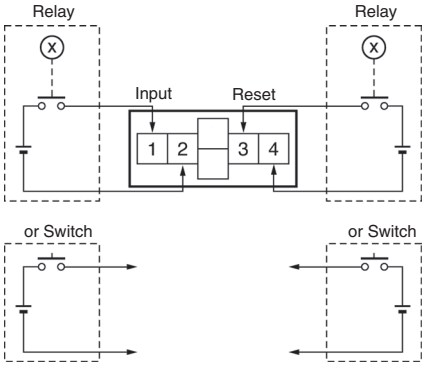
Note: 1. Terminals 2 and 4 (input circuit and reset circuit) are functionally isolated.

2. Select input transistors according to the following:
Dielectric strength of the collector ≥ 50 V
Leakage current < 100 μA

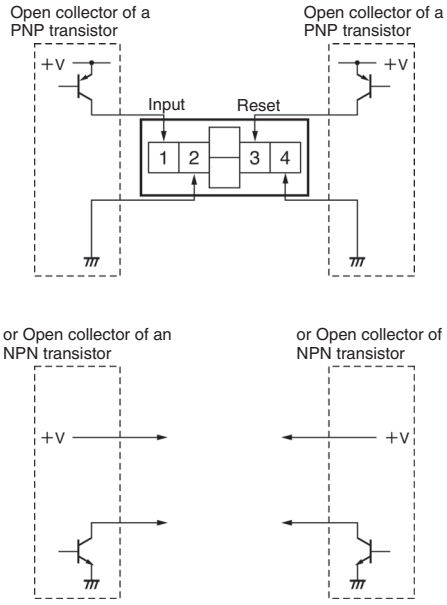
Note: *Recommended Power supply; eg. OMRON S8VS

PNP/NPN Universal DC Voltage Input Model Without Backlight

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



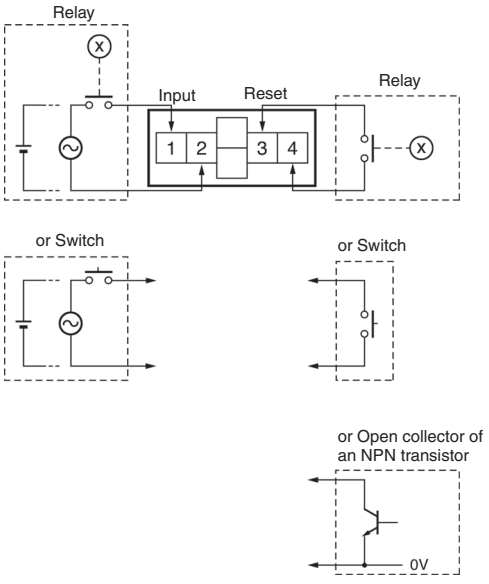
2. Solid-state Input



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 ≥ 50 V
Leakage current < 100 μA

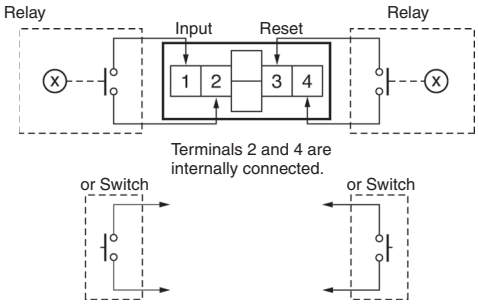
AC/DC Multi-voltage Input Model



Note: Select input transistors according to the following:
Dielectric strength of the collector ≥ 50 V
Leakage current < 1 μA

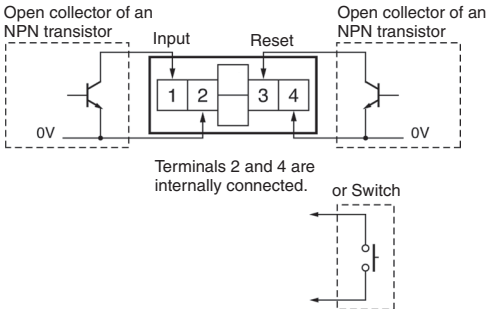
No-voltage Input Model

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



Note: Use Relays and Switches that have high contact reliability because the current flowing from terminals 1 or 3 is small. 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)



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 small thus allowing easy connection.

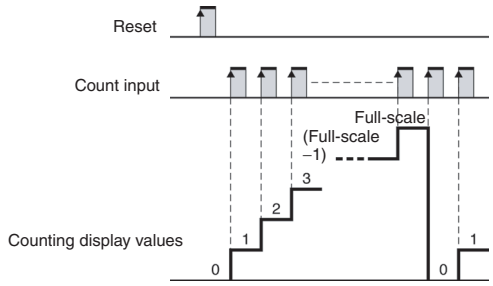
2. Select input transistors according to the following:
Dielectric strength of the collector ≥ 50 V
Leakage current < 1 μA

Operation

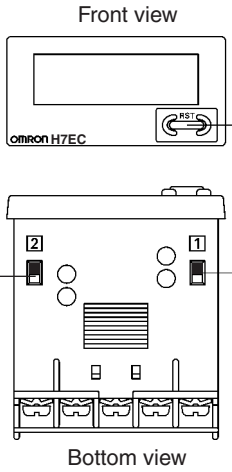
■ Operating Modes

H7EC Total Counter

Incrementing Operation (Up)



Nomenclature



Reset Key

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

Counting speed switch

For all models except for H7EC-NFV-□. If the counting speed setting is changed, the present value will not be held and so press the Reset Key on the front panel.

Setting (see note)	Counting speed
Front panel ↑ Concave side	30 Hz (default setting)
↓ Concave side Terminal block	1 kHz

Key-protect Switch

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

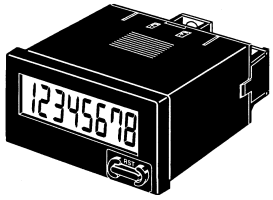
Setting (see note)	Key-protect
Front panel ↑ Concave side	OFF (default setting)
↓ Concave side Terminal block	ON

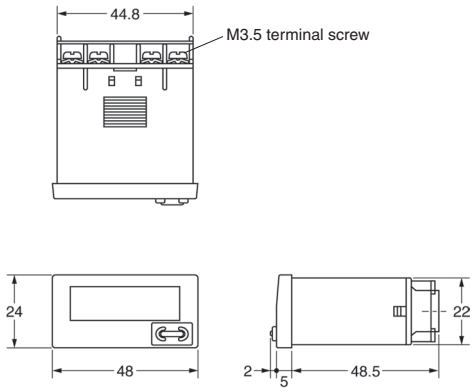
Note: Perform switch setting before mounting to a control panel.

Dimensions

Note: All units are in millimeters unless otherwise indicated.

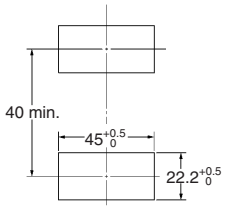
H7EC-N



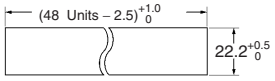


Panel Cutout

Separate mounting

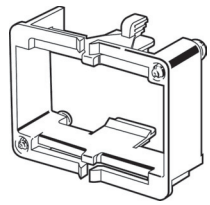


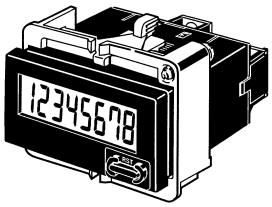
Dense mounting

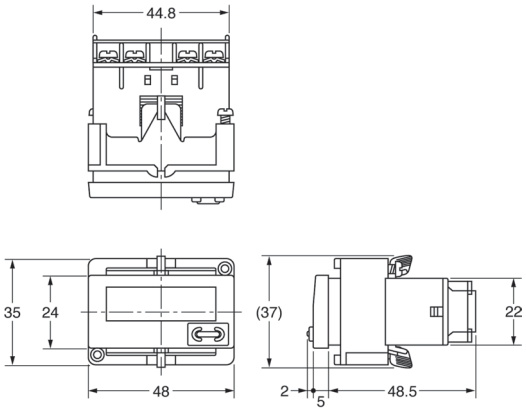


Waterproofing is not possible for dense mounting

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.