

### Subminiature Total Counters With Improved Appearance and Features

- Large display with 8.6 mm (0.338 in) height
- Available with backlit LCD
- PNP/NPN DC voltage input available
- Eight-digits, counting range 0 to 99999999
- Key-protect switch to prevent front resetting
- Selectable input speed: 30 Hz or 1 kHz (except for AC/DC multi-voltage input models)
- NEMA 4/IP66 front
- Replaceable battery
- New black case



### Ordering Information

#### ■ TOTAL COUNTERS

| Count input                        | Max. counting speed         | Display                      | Part number |
|------------------------------------|-----------------------------|------------------------------|-------------|
| PNP/NPN universal DC voltage input | 30 Hz or 1 kHz (Selectable) | 7-segment LCD with backlight | H7EC-NV-BH  |
|                                    |                             | 7-segment LCD                | H7EC-NV-B   |
| AC/DC multi-voltage input          | 20 Hz                       | 7-segment LCD                | H7EC-NFV-B  |
| No-voltage                         | 30 Hz or 1 kHz (Selectable) | 7-segment LCD                | H7EC-N-B    |

#### ■ MODEL NUMBER LEGEND

##### 1. Count Input

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

##### 2. Display

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

##### 3. Case Color

B: Black

#### ■ ACCESSORIES (ORDER SEPARATELY)

| Item                                      | Part number       |          |
|---|-------------------|----------|
| Replacement Battery                       | Y92S-36           |          |
| Wire-wrap Terminal (set of two Terminals) | Y92S-37           |          |
| Flush Mounting Adapter                    | 26 mm × 45 mm     | Y92F-75  |
|   | 24.8 mm × 48.8 mm | Y92F-77B |

# Specifications

## ■ GENERAL

| Item                 | H7EC-NV-B<br>H7EC-NV-BH   | H7EC-NFV-B                | H7EC-N-B         |
|----------------------|---|---------------------------|------------------|
| 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 (character height: 8.6 mm) (See Note 2.)  |                           |                  |
| Max. counting speed  | 30 Hz/1 kHz   | 20 Hz                     | 30 Hz/1 kHz      |
| Case color           | black   |                           |                  |
| Attachment           | Waterproof packing, flush mounting bracket  |                           |                  |
| Approved standard    | UL508, CSA C22.2 No.14, Lloyds<br>Conforms to EN61010-1/IEC61010-1 (Pollution degree2/overvoltage category III)<br>Conforms to VDE0106/P100 |                           |                  |

- Note: 1. Wire-wrap Terminals (Y92S-37) can be ordered separately.  
2. Only PNP/NPN universal DC voltage input models (-H models) are available with a backlight.

## ■ RATINGS

| Item                             | H7EC-NV-B<br>H7EC-NV-BH   | H7EC-NFV-B   | H7EC-N-B  |
|----------------------------------|---|--|---|
| Supply voltage                   | Backlight model: 24 VDC (only for backlight)<br>No-backlight model: Not required (powered by battery)   | Not required (powered by battery)  |   |
| Count input                      | High (logic) level: 4.5 to 30 VDC<br>Low (logic) level: 0 to 2 VDC (Input impedance: Approx. 4.7 k $\Omega$ )                                   | High (logic) level: 24 to 240 VAC/VDC, 50/60 Hz<br>Low (logic) level: 0 to 2.4 VAC/VDC, 50/60 Hz   | No voltage input<br>Maximum short-circuit impedance: 10 k $\Omega$ max.<br>Short-circuit residual voltage: 0.5 V max. |
| Reset input                      |   | No voltage input<br>Maximum short-circuit impedance: 10 k $\Omega$ max.<br>Short-circuit residual voltage: 0.5 V max.<br>Minimum open impedance: 750 k $\Omega$ min. | Minimum open impedance: 750 k $\Omega$ min.   |
| Max. counting speed (see Note.)  | 30 Hz or 1 kHz (Selectable)   | 20 Hz  | 30 Hz or 1 kHz (Selectable)   |
| Minimum signal width             | 20 Hz: 25 ms<br>30 Hz: 16.7 ms<br>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 (14°F to 131°F) with no condensation or icing<br>Storage: -25°C to 65°C (-13°F to 149°F) with no condensation or icing |  |   |
| Ambient humidity                 | Operating: 25% to 85%   |  |   |

- Note: ON/OFF ratio 1:1

## ■ CHARACTERISTICS

| Item                      | H7EC-NV-B<br>H7EC-NV-BH  | H7EC-NFV-B  | H7EC-N-B   |
|---------------------------|--|---|--|
| Insulation resistance     | 100 M $\Omega$ 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 M $\Omega$ 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 M $\Omega$ 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<br>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<br>3 kV between input terminals and reset terminals   | 4.5 kV between current-carrying terminal and exposed non-current-carrying metal parts                              |
| Noise immunity            | Between input terminals: $\pm$ 600 V in normal mode, $\pm$ 1.5 kV in command mode<br>For backlight power supply (backlight model): $\pm$ 480 V in normal mode, $\pm$ 1.5 kV in command mode  | Between count input terminals: $\pm$ 1.5 kV in normal mode, $\pm$ 1.5 kV in command mode<br>Between reset input terminals: $\pm$ 500 V in normal mode, $\pm$ 1.5 kV in command mode   | $\pm$ 500 V in normal mode, $\pm$ 1.5 kV in command mode   |
| Static immunity           | $\pm$ 8 kV (malfunction)   |   |  |
| Vibration resistance      | Malfunction: 0.35-mm single amplitude at 10 to 55 Hz for 10 min each in 3 directions<br>Destruction: 0.375-mm single amplitude at 10 to 55 Hz for 2 hrs each in 3 directions   |   |  |
| Shock resistance          | Malfunction: 200 m/s <sup>2</sup> 3 times each in 6 directions<br>Destruction: 300 m/s <sup>2</sup> 3 times each in 6 directions   |   |  |
| Battery life              | 7 years min. with continuous input at 25°C (lithium battery)   |   |  |
| EMC                       | (EMI) EN50081-1<br>Emission Enclosure: EN55022 class B<br>(EMS) EN50082-2<br>Immunity ESD: EN61000-4-2: 4-kV contact discharge (level 2)<br>8-kV air discharge (level 3)<br>Immunity RF-interference from AM Radio Waves:<br>ENV50140: 10 V/m (80 MHz to 1 GHz) (level 3)<br>Immunity RF-interference from Pulse-modulated Radio Waves:<br>ENV50204: 10 V/m (900 MHz $\pm$ 5 MHz) (level 3)<br>Immunity Conducted Disturbance: ENV50141: 10 V (0.15 to 80 MHz) (level 3)<br>Immunity Burst: EN61000-4-4: 2-kV power line (level 3)<br>2-kV I/O signal line (level 4) |   |  |
| Enclosure rating          | Front panel: IP66, NEMA4<br>Terminal block: IP20   |   |  |
| Weight (See Note.)        | Non-backlight model: Approx. 60 g<br>Backlight model: Approx. 65 g   | Approx. 60 g  | Approx. 60 g   |

Note: Weight includes waterproof packing and panel mounting bracket.