## Self-powered Tachometer

 New H7ER- Revolutions displayed up to five digits.
- Dual revolution display according to encoder resolution used; $1000 \mathrm{~s}^{-1} / 1000 \mathrm{~min}^{-1}$ or $1000.0 \mathrm{~s}^{-1} / 1000.0 \mathrm{~min}^{-1}$
- Switchable dual revolution display type available (-NV1 models); extended up to $10000 \mathrm{~min}^{-1}$


For the most recent information on models that have been certified for safety standards, refer to your OMRON website.

## Model Number Structure

## Model Number Legend

Note: Some configurations are not available.


1. Count Input

None: No-voltage input
V: PNP/NPN universal DC voltage input
2. Number of Digits

None: 4 digits
1: 5 digits
3. Case Color

None: Light gray
B: Black
4. Display

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

Note: Estimates can be provided for coatings and other specifications that are not given in the datasheet. Ask your OMRON representative for details.

## Ordering Information

- Tachometers

| Count input | Display | Max. revolutions displayed (applicable encoder resolution) |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | $1000 \mathrm{~s}^{-1}$ (1 pulse/rev.), $1000 \mathrm{~min}^{-1}$ (60 pulse/rev.) |  | $\begin{aligned} & 1000.0 \mathrm{~s}^{-1}(10 \text { pulse/rev.), } \\ & 1000.0 \mathrm{~min}^{-1}(600 \text { pulse } / \text { rev. }) \leftarrow \rightarrow \\ & 10000 \mathrm{~min}^{-1}(60 \text { pulse } / \mathrm{rev} .)(\text { switchable }) \end{aligned}$ |  |
|  |  | Light-gray body | Black body | Light-gray body | Black body |
| PNP/NPN universal DC voltage input (4.5 to 30 VDC) | 7-segment LCD with backlight | H7ER-NV-H | H7ER-NV-BH | H7ER-NV1-H | H7ER-NV1-BH |
|  | 7-segment LCD | H7ER-NV | H7ER-NV-B | H7ER-NV1 | H7ER-NV1-B |
| No-voltage input | 7-segment LCD | H7ER-N | H7ER-N-B | --- | --- |

## Accessories (Order Separately)

| Name | Model |
| :--- | :--- |
| Compact Flush Mounting Bracket | Y92F-35 |
| Flush Mounting Bracket (See note 1) | Y92F-34 |
| Wire-wrap Terminal (set of two terminals) | Y92S-37 |
| Lithium Battery (See note 2) | Y92S-36 |
| Waterproof Packing (See note 1) | Y92S-32 |

Note: 1. Provided with H7ER. (Order additional Brackets separately as required.)
2. Built into H7ER. Order replacements using the above model number before the service life expires.

## Specifications

General

| Item | H7ER-NV-H7ER-NV- $\square$ H | H7ER-N- $\square$ | H7ER-NV1 <br> H7ER-NV1- $\square$ |
| :---: | :---: | :---: | :---: |
| Operating mode | Up type |  |  |
| Mounting method | Flush mounting |  |  |
| External connections | Screw terminals, Wire-wrap Terminals (see note 3) |  |  |
| Display | 7-segment LCD with or without backlight, zero suppression (character height: 8.6 mm ) (see note 4) |  |  |
| Number of digits | 4 |  | 5 |
| Count input | PNP/NPN universal DC voltage input | No-voltage input | PNP/NPN universal DC voltage input |
| Max. counting speed | 1 kHz |  | 10 kHz |
| Max. revolutions displayed (see note 5, 6) | $1,000 \mathrm{~s}^{-1}$ (When encoder resolution of 1 pulse/rev is used.) <br> $1,000 \mathrm{~min}^{-1}$ (When encoder resolution of 60 pulse/ rev is used.) |  | $1,000.0 \mathrm{~s}^{-1}$ (When encoder resolution of 10 pulse/rev is used.) <br> $1,000.0 \mathrm{~min}^{-1}$ (When encoder resolution of 600 pulse/rev is used.) <br> $\leftarrow \rightarrow 10,000 \mathrm{~min}^{-1}$ (When encoder resolution of 60 pulse/rev is used.) (Switchable with switch) |
| Attachment | Waterproof packing, Y92F-34 Flush Mounting Bracket, revolution unit labels (see note 5) |  |  |
| Approved standard | UL863, CSA C22.2 No.14, Lloyds <br> Conforms to EN61010-1/IEC61010-1 (Pollution degree2/overvoltage category III) Conforms to VDE0106/P100 |  |  |

Note: 1. Reset is not available.
2. When there is no input, the display will be 0.0 or 0 .
3. Separately ordered Wire-wrap Terminals (Y92S-37) are required.
4. Only PNP/NPN Universal DC voltage input models have a backlight
5. "rpm", "rps", "s ${ }^{-1 "}$ and " $\mathrm{min}^{-1 "}$ labels are included.
6. " $s^{-1 "}$ in " $1,000 \mathrm{~s}^{-1 "}$ means the same thing as RPS. " $\mathrm{min}^{-1 "}$ means the same thing as RPM.

- Ratings

| Item | H7ER-NV H7ER-NV $\square$ - $\square$ H | H7ER-N- $\square$ |
| :---: | :---: | :---: |
| Supply voltage | Backlight model: 24 VDC (0.3 W max.) (for backlight lit) <br> No-backlight model: Not required (powered by builtin 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 <br> (Input impedance: Approx. $4.7 \mathrm{k} \Omega$ ) | No voltage input Maximum short-circuit impedance: $10 \mathrm{k} \Omega$ max. Short-circuit residual voltage: 0.5 V max. Minimum open impedance: $750 \mathrm{k} \Omega \mathrm{min}$. |
| Max. counting speed | 4-digit models: 1 kHz 5-digit models: 10 kHz | 1 kHz |
| Minimum signal width | $10 \mathrm{kHz}: 0.05 \mathrm{~ms}$ <br> $1 \mathrm{kHz}: 0.5 \mathrm{~ms}$ (See note.) |  |
| Terminal screw tightening torque | 0.98 N.m max. |  |
| Ambient temperature | Operating: $-10^{\circ} \mathrm{C}$ to $55^{\circ} \mathrm{C}$ (with no condensation or Storage: $\quad-25^{\circ} \mathrm{C}$ to $65^{\circ} \mathrm{C}$ (with no condensation or |  |
| Ambient humidity | Operating: 25\% to 85\% |  |

Note: 5 -digit models : $1 \mathrm{kHz} / 10 \mathrm{kHz}$ switchable.

## Characteristics

| Item | $\begin{aligned} & \text { H7ER-NV } \square-\square \\ & \text { H7ER-NV } \square-\square \mathbf{H} \end{aligned}$ | H7ER-N- $\square$ |
| :---: | :---: | :---: |
| Insulation resistance | $100 \mathrm{M} \Omega \mathrm{min}$. (at 500 VDC ) between current-carrying metal parts and exposed non-current-carrying metal parts, and between the backlight power supply and count input terminals/reset terminals for backlight models | $100 \mathrm{M} \Omega$ min. (at 500 VDC) between current-carrying metal parts and exposed non-current-carrying metal parts |
| Dielectric strength | 1,000 VAC, $50 / 60 \mathrm{~Hz}$ for 1 min between current-carrying metal parts and exposed non-current-carrying metal parts and between the backlight power supply and count input terminals/reset terminals for backlight models | 1,000 VAC, $50 / 60 \mathrm{~Hz}$ 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 |  |
| Noise immunity | Square-wave noise generated by noise simulator (pulse width: $100 \mathrm{~ns} / 1 \mu \mathrm{~s}$, 1-ns rise) |  |
|  | $\pm 600$ V (Between count input terminals) <br> $\pm 480 \mathrm{~V}$ (Between the backlight power supply terminals for backlight models) | $\pm 500 \mathrm{~V}$ (Between count input terminals) |
| Static immunity | $\pm 8 \mathrm{kV}$ (malfunction) |  |
| Vibration resistance | Malfunction: $0.15-\mathrm{mm}$ single amplitude at 10 to 55 Hz for 10 min each in 3 directions Destruction: $0.375-\mathrm{mm}$ single amplitude at 10 to 55 Hz for 2 hrs each in 3 directions |  |
| Shock resistance | Malfunction: $200 \mathrm{~m} / \mathrm{s}^{2} 3$ times each in 6 directions Destruction: $300 \mathrm{~m} / \mathrm{s}^{2} 3$ times each in 6 directions |  |
| EMC |  |  |
| Degree of protection | Front panel: IP66, NEMA4 with waterproof packing Terminal block: IP20 |  |
| Weight (see note 2.) | No-backlight model:Approx. 60 g Backlight model: Approx. 65 g |  |

Note: 1. Industrial electromagnetic environment (EN/IEC 61326-1 Table 2)
2. Weight includes waterproof packing and flush mounting bracket.

## Reference Value

| Item | Value | Note |
| :--- | :--- | :--- |
| Battery life | 7 years min. with continuous input at $25^{\circ} \mathrm{C}$ <br> (lithium battery) | The battery life is calculated according to the conditions in the left column and <br> therefore is not a guaranteed value. Use these value as reference for mainte- <br> nance or replacement. |

## Connections

## Terminal Arrangement

Bottom view: View of the Tachometer rotated horizontally $180^{\circ}$

## Backlight Model



No-backlight Model


## - Connections

## H7ER Tachometer

Note: Select input transistors according to the following:
Dielectric strength of the collector $\geq 50 \mathrm{~V}$
Leakage current < $100 \mu \mathrm{~A}$ ( $1 \mu \mathrm{~A}$ for no-voltage input model)

PNP/NPN Universal DC Voltage Input Models With Backlight
Transistor Input


PNP/NPN Universal DC Voltage Input Models Without Backlight Transistor Input


No-voltage Input Model
Transistor Input (Open Collector of an NPN Transistor)


## Operation

## ■ Operating Modes

H7ER Tachometer
Incrementing Operation
Within Unit Time (Up)


## Nomenclature



Counting Speed Switch Settings and Unit Label Application

| Model | Counting speed switch setting (see note) | Max. revolutions displayed | Applicable encoder resolution | Applicable unit label |
| :---: | :---: | :---: | :---: | :---: |
| H7ER-NV1- $\square \square$ | Front panel | $\begin{aligned} & 10000 \mathrm{~min}^{-1} \\ & \text { (default setting) } \end{aligned}$ | 60 pulse/rev. | "min ${ }^{-1 "}$ or "rpm" |
|  |  | $1000.0 \mathrm{~min}^{-1}$ | 600 pulse/rev. | "min ${ }^{-1 "}$ or "rpm" |
|  |  | $1000.0 \mathrm{~s}^{-1}$ | 10 pulse/rev. | " $\mathrm{s}^{-1}$ " or "rps" |
| H7ER-N- <br> H7ER-NV- | No setting is required | $1000 \mathrm{~min}^{-1}$ | 60 pulse/rev. | "min ${ }^{-1}$ " or "rpm" |
|  |  | $1000 \mathrm{~s}^{-1}$ | 1 pulse/rev. | "s ${ }^{-1}$ " or "rps" |

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

## Dimensions

Note: All units are in millimeters unless otherwise indicated.
H7ER-N


Dimensions with Y92F-34 Flush Mounting Bracket


Panel Cutout
Separate mounting


Dense mounting


Waterproofing is not possible for dense mounting

- 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.

