

Self-powered Tachometer H7ER

- Revolutions displayed up to five digits.
- Dual revolution display according to encoder resolution used; 1000 s⁻¹/1000 min⁻¹ or 1000.0 s⁻¹/1000.0 min⁻¹
- Switchable dual revolution display type available (-NV1 models); extended up to 10000 min⁻¹



Model Number Structure

Model Number Legend

H7ER - N -

1 2 3 4

- 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

Ordering Information

Tachometers

Count input	Display	Max. revolutions displayed (applicable encoder resolution)			
		1000 s ⁻¹ (1 pulse/rev.), 1000 min ⁻¹ (60 pulse/rev.)		1000.0 s ⁻¹ (10 pulse/rev.), 1000.0 min ⁻¹ (600 pulse/rev.) ←→ 10000 min ⁻¹ (60 pulse/rev.) (switchable)	
		Light-gray body	Black body	Light-gray body	Black body
PNP/NPN universal DC voltage input	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)

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	H7ER-NV-□ H7ER-NV-□H	H7ER-N-□	H7ER-NV1-□ H7ER-NV1-□H
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)	1,000 s ⁻¹ (When encoder resolution of 1 pulse/rev is used.) 1,000 min ⁻¹ (When encoder resolution of 60 pulse/rev is used.)		1,000.0 s ⁻¹ (When encoder resolution of 10 pulse/rev is used.) 1,000.0 min ⁻¹ (When encoder resolution of 600 pulse/rev is used.) ←→ 10,000 min ⁻¹ (When encoder resolution of 60 pulse/rev is used.) (Switchable with switch)
Attachment	Waterproof packing, flush mounting bracket, revolution unit labels (see note 5)		
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. 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 "min⁻¹" labels are included.

■ Ratings

Item	H7ER-NV□-□ H7ER-NV□-□H	H7ER-N-□
Supply voltage	Backlight model: 24 VDC (0.3 W max.) (for backlight lit) 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)	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	4-digit models: 1 kHz 5-digit models: 10 kHz	1 kHz
Minimum signal width	10 kHz: 0.05 ms 1 kHz: 0.5 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	H7ER-NV□-□ H7ER-NV□-□H	H7ER-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 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
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 and count input terminals/reset terminals for backlight models	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	
Noise immunity	Square-wave noise generated by noise simulator (pulse width: 100 ns/1 μs, 1-ns rise)	
	±600 V (Between count input terminals) ±480 V (Between the backlight power supply terminals for backlight models)	±500 V (Between count input 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 with waterproof packing Terminal block: IP20	
Weight (see note)	No-backlight model: Approx. 60 g Backlight model: Approx. 65 g	

Note: Weight includes waterproof packing and flush mounting bracket.

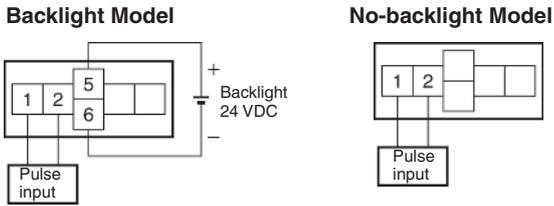
■ Reference Value

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 Tachometer rotated horizontally 180°

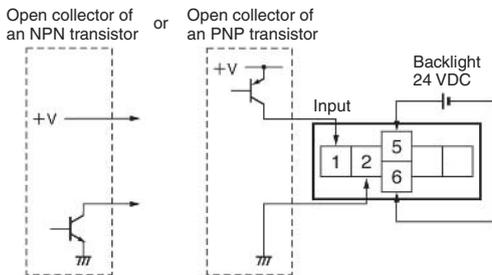


Connections

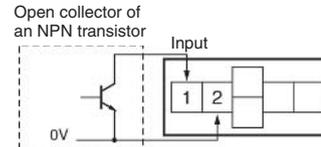
H7ER Tachometer

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

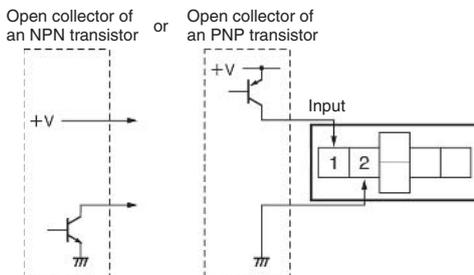
PNP/NPN Universal DC Voltage Input Models With Backlight Transistor Input



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



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

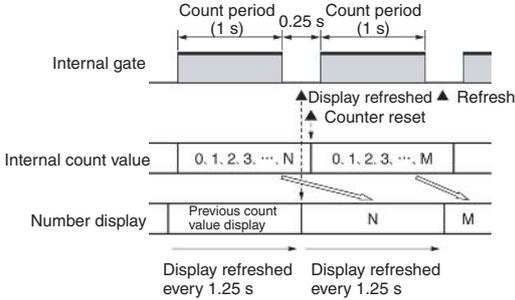


Operation

Operating Modes

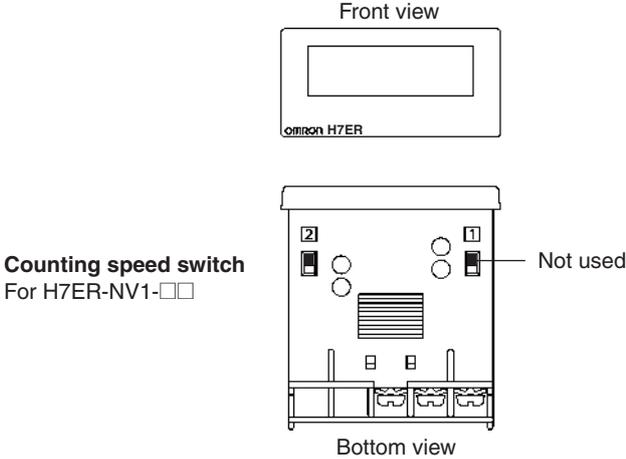
H7ER Tachometer

Incrementing Operation
Within Unit Time (Up)



Counters

Nomenclature



Counting Speed Switch Settings and Unit Label Application

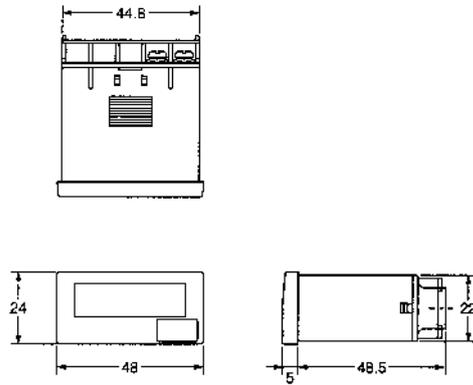
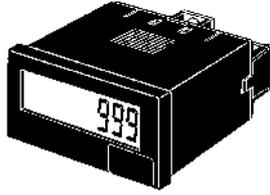
Model	Counting speed switch setting (see note)	Max. revolutions displayed	Applicable encoder resolution	Applicable unit label
H7ER-NV1-□□	Front panel ↑  Concave side	10000 min ⁻¹ (default setting)	60 pulse/rev.	"min ⁻¹ " or "rpm"
	↓  Concave side	1000.0 min ⁻¹	600 pulse/rev.	"min ⁻¹ " or "rpm"
	Terminal block	1000.0 s ⁻¹	10 pulse/rev.	"s ⁻¹ " or "rps"
H7ER-N-□ H7ER-NV-□□	No setting is required	1000 min ⁻¹	60 pulse/rev.	"min ⁻¹ " or "rpm"
		1000 s ⁻¹	1 pulse/rev.	"s ⁻¹ " or "rps"

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

Dimensions

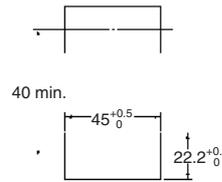
Note: All units are in millimeters unless otherwise indicated.

H7ER-N

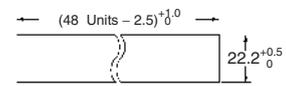


Panel Cutout

Separate mounting

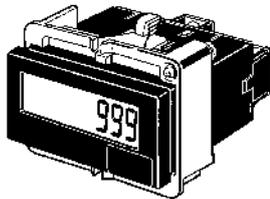
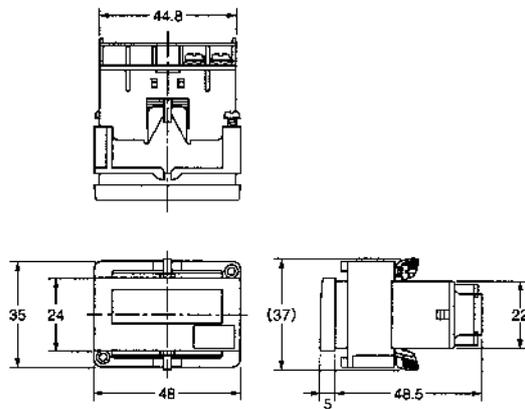
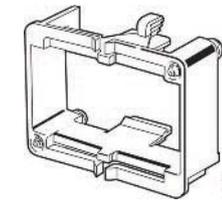


Dense mounting



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.