

DIN 72 x 36-mm Total Counter/Time Counter with Easy-to-read Displays and Water and Oil Resistance Equivalent to IP66

- Large, easy-to-read displays: 15-mm-high characters for 6-digit models; 12-mm-high characters for 8-digit models.
- High-visibility, negative transmissive LCD display with built-in red LED backlight at low power consumption.
- IP66 with oil resistance and NEMA4 are achieved by unifying the front with the casing case and using oil-resistant materials and parts.
- Compact (66 mm) body.
- Switch 6-digit models between total counter and time counter operation.
- Just change a switch setting for either an NPN or PNP input.
- Supports both external resetting and manual resetting.
- Finger-protection terminal block cover prevents electrical shock and conforms to VDE0106, Part 100.
- Safety standards: UL, CSA, EMC (EN 61326), CE Marking.



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

H7HP-□□□□
1 2 3 4

1. Classification

- A: Total counter/time counter
- C: Total counter

2. Digits

- None: 6 digits
- 8: 8 digits

3. Supply Voltage

- None: 100 to 240 VAC
- D: 12 to 24 VDC

4. Case Color

- None: Light gray (Munsell 5Y7/1)
- B: Black

Ordering Information

List of Models

Supply voltage	6-digit total counter/time counter		8-digit total counter	
	Light gray	Black	Light gray	Black
100 to 240 VAC	H7HP-A	H7HP-AB	H7HP-C8	H7HP-C8B
12 to 24 VDC	H7HP-AD	H7HP-ADB	H7HP-C8D	H7HP-C8DB

Specifications

■ Ratings

Item	6-digit total counter/time counter		8-digit total counter	
	H7HP-A	H7HP-AD	H7HP-C8	H7HP-C8D
Rated supply voltage	100 to 240 VAC (50/60 Hz)	12 to 24 VDC (see note 1)	100 to 240 VAC (50/60 Hz)	12 to 24 VDC (see note 1)
External power supply	50 mA at 12 VDC	---	50 mA at 12 VDC	---
Operating voltage range	85% to 110% of rated supply voltage			
Power consumption	100 to 240 VAC: 6.5 VA max. 12 to 24 VDC: 0.6 W max.			
Dimensions	72 x 36 x 66 mm (W x H x D)			
Mounting method	Flush mounting			
External connections	Screw terminals			
Degree of protection	Panel surface: IP66 with oil resistance, NEMA 4 (indoors). Panel surface only: IEC IP66. IEC IP66			
Display	7-segment, negative transmissive LCD (with red backlight)			
Digits	6 digits (15-mm-high characters)		8 digits (12-mm-high characters)	
Function	Total counter/time counter (selected via DIP switch)		Total counter	
Input mode	Up/down (individual) (total counter), or accumulative (time counter)		Up/down (individual)	
Max. counting speeds	30 Hz or 5 kHz (selected via DIP switch)			
Counting range	-99999 to 999999		-9999999 to 99999999	
Time specification	0.1 to 99999.9 h/1 s to 99 h 59 min 59 s (selected via DIP switch)		---	
Timing accuracy	±100 ppm (-10°C to 55°C)		---	
Memory backup	EEP-ROM (overwrites: 200,000 times min.) that can store data for 20 years min.			
Input	Input signals	Count 1/start, count 2/gate, reset, and key protection (see note 2)		
	Input method	No-voltage input (NPN transistor input) or voltage input (PNP transistor input) (selected via DIP switch)		
	Count, start, gate, reset	No-voltage input (NPN transistor input) Short-circuit (ON) impedance: 1 kΩ max. Short-circuit (ON) residual voltage: 2 VDC max. Open (OFF) impedance: 100 kΩ min. Voltage input (PNP transistor input) Short-circuit (ON) impedance: 1 kΩ max. ON voltage: 9 to 24 VDC OFF voltage: 5 VDC max. Open (OFF) impedance: 100 kΩ max.		
	Key protection	No-voltage input (NPN transistor input) Short-circuit (ON) impedance: 1 kΩ max. Short-circuit (ON) residual voltage: 0.5 VDC max. Open (OFF) impedance: 100 kΩ min.		
Input response speed	Reset	Time counter: 20 ms; total counter: 20 ms or 1 ms (automatically switched according to counting speed)		
	Start	Time counter: 20 ms		
	Key protection	Approx. 1 s	Approx. 1 s	
Reset system	External and manual resets			

Note: 1. Contains 20% ripple (p-p) max.

2. Only a non-voltage input (NPN transistor) is possible for the key protection input. The key protection input will be a non-voltage input even if the NPN/PNP input mode is set to PNP. Key protection is used to prohibit operating the Reset Key. The reset input terminals will still be functional.

■ Characteristics

Insulation resistance	100 MΩ min. (at 500 VDC)
Dielectric strength	2,000 VAC, 50/60 Hz for 1 min between current-carrying terminal and exposed non-current-carrying metal parts (AC model) 1,000 VAC, 50/60 Hz for 1 min between current-carrying terminal and exposed non-current-carrying metal parts (DC model) 2,000 VAC, 50/60 Hz for 1 min between power terminals and control input terminals (AC model)
Impulse withstand voltage	3 kV (between power terminals) (1 kV for 12-to-24-VDC models) 4.5 kV (between current-carrying terminal and exposed non-current-carrying metal parts) (1.5 kV for 12-to-24-VDC models)
Noise immunity	±1.5 kV (between AC power terminals), ±480 V (between DC power terminals), ±480 V (between input terminals); square-wave noise by noise simulator (pulse width: 100 ns/1 μs, 1-ns rise)
Static immunity	Display: Malfunction: 8 kV Destruction: 15 kV DIP switch: Malfunction: 4 kV Destruction: 8 kV
Vibration resistance	Destruction: 10 to 55 Hz with 0.75-mm single amplitude, 2 hours each in three directions Malfunction: 10 to 55 Hz with 0.5-mm single amplitude, 10 minutes each in three directions
Shock resistance	Destruction: 294 m/s ² each in three directions Malfunction: 196 m/s ² each in three directions
Ambient temperature	Operating: -10°C to 55°C (with no icing) Storage: -25°C to 65°C (with no icing)
Ambient humidity	Operating: 35% to 85%
EMC	(EMI) E61326 Emission Enclosure: EN55011 Group 1 class A Emission AC Mains: EN55011 Group 1 class A (EMS) EN61326 Immunity ESD: EN61000-4-2: 4 kV contact discharge (level 2) 8 kV air discharge (level 3) Immunity RF-interference: EN61000-4-3: 10 V/m (Amplitude-modulated, 80 MHz to 1 GHz) (level 3); 10 V/m (Pulse-modulated, 900 MHz ±5 MHz) (level 3) Immunity Conducted Disturbance: EN61000-4-6: 10 V (0.15 to 80 MHz) (according to EN61000-6-2) Immunity Burst: EN61000-4-4: 2 kV power-line (level 3); 2 kV I/O signal-line (level 4) Immunity Surge: EN61000-4-5: 1 kV line to lines (power and output lines) (level 2); 2 kV line to ground (power and output lines) (level 3) Immunity Voltage Dip/Interruption: EN61000-4-11: 0.5 cycle, 100% (rated voltage)
Approved standards	UL508 (note 1), CSA C22.2 No.14 (note 1), conforms to EN61010-1, VDE0106/P100
Case color	Rear section: Gray smoke; Front section: 5Y7/1 (light gray) or N1.5 (black)
Weight	Approx. 115 g

Note: 1. UL508 and CAN/CSA-C22.2 No.14 certification conditions

- Power supply 100 to 240VAC types
Ambient temperature 30°C Single mounting
- Power supply 12 to 24VDC types
Ambient temperature 40°C Single mounting

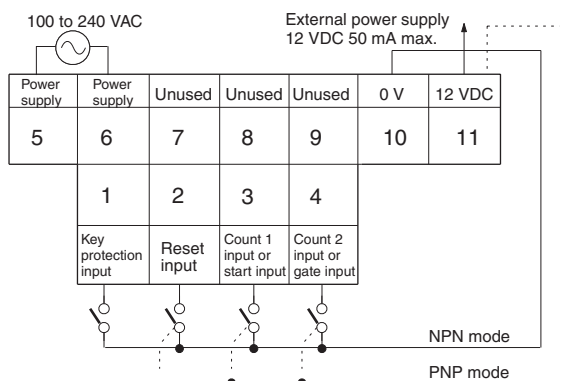
Connections

Terminal Arrangement

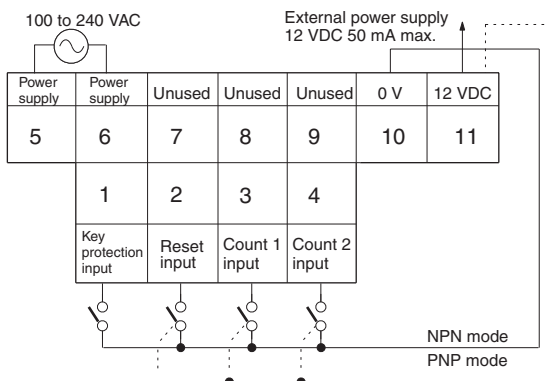
- Note:** 1. Incremented for count 1 (CP1) inputs; decremented for count 2 (CP2) inputs.
 2. Non-contact input is also available.

AC Models

H7HP-A

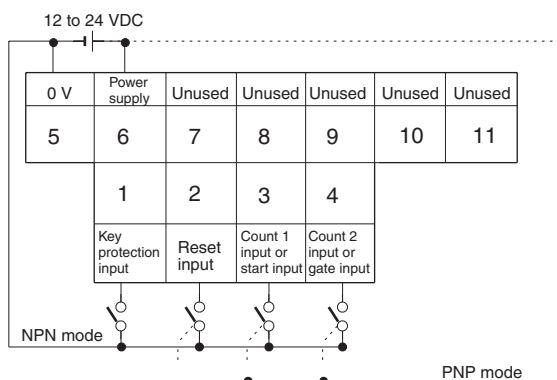


H7HP-C8

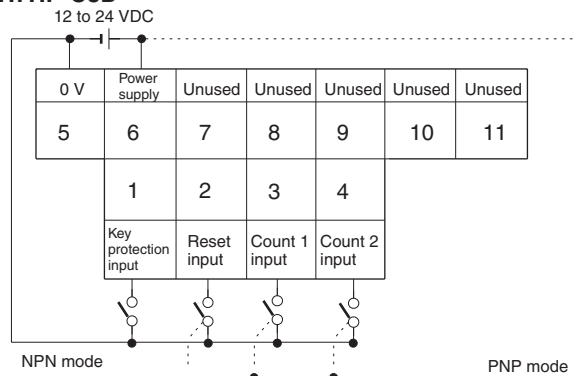


DC Models

H7HP-AD



H7HP-C8D



Operation

DIP Switch Settings

Switches 1 to 4 are all set to OFF before shipping.



H7HP-A

Pin no.	Item	OFF	ON
1	Function	Total counter	Time counter
2	Counting speed (note)	30 Hz	5 kHz
	Time range (note)	99999.9 h	99 h 59 min 59 s
3	Input mode (note)	NPN	PNP
4	Unused	---	---

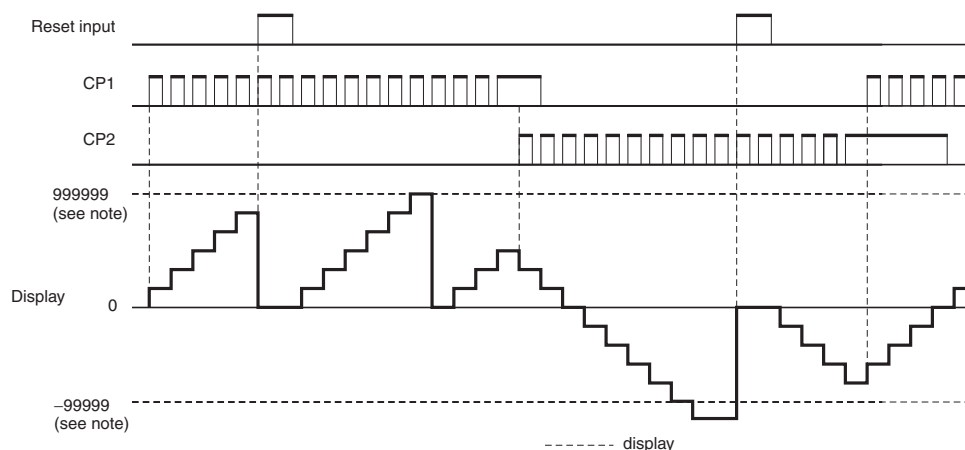
H7HP-C

Pin no.	Item	OFF	ON
1	Unused	---	---
2	Counting speed (note)	30 Hz	5 kHz
3	Input mode (note)	NPN	PNP
4	Unused	---	---

Note: When the setting has been changed, turned power off and on to continue. The display will show "0" when the power is turned back on.

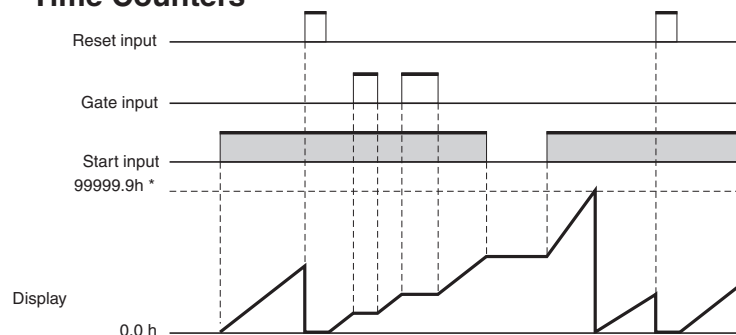
Operating Modes

Total Counters



Note: Display values are shown for a 6-digit model. The count value will return to "0" when "999999" is exceeded. The display and output are turned OFF when the power supply turns OFF, but the count value is stored internally.

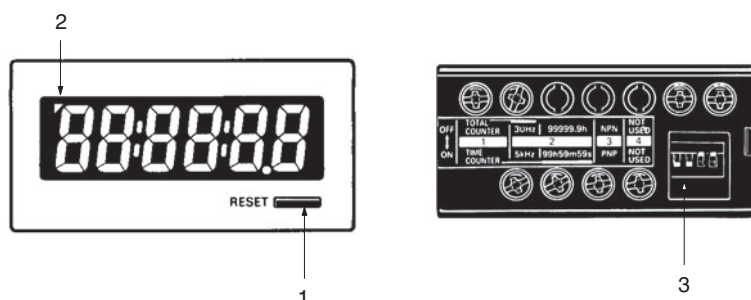
Time Counters



* Display values are shown for full scale set to 99999.9 h.

Note: The count value will return to "0" when "99999.9" is exceeded. The display and output are turned OFF when the power supply turns OFF, but the count value is stored internally.

Nomenclature



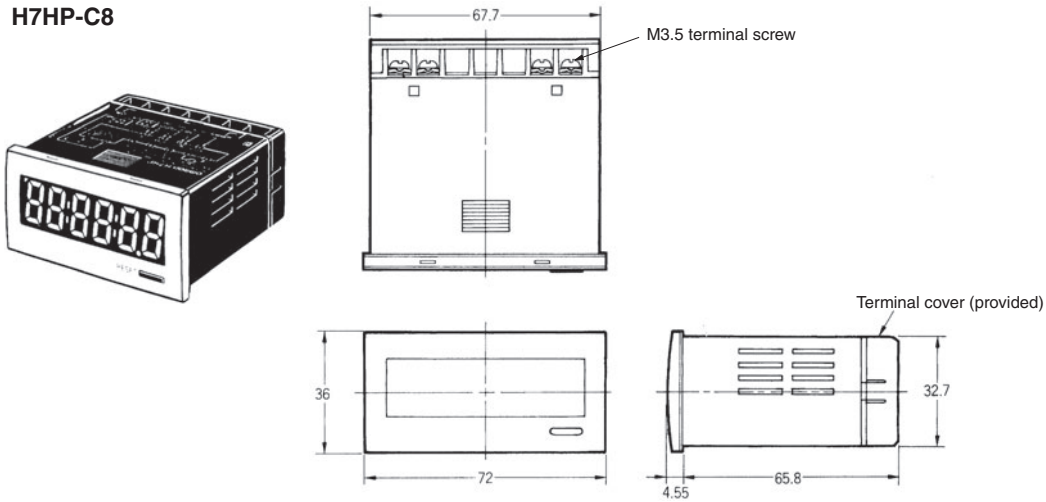
(The figure shows the DIP switch label stuck to the rear of the case.)

1. **Reset Key**
Resets the count value, but will not operate while the keys are protected.
2. **Key Protection Indicator**
Lit while the keys are protected (Reset Key is disabled.).
3. **DIP Switch**
Use to change a setting. Refer to *DIP Switch Settings* for details.

Dimensions

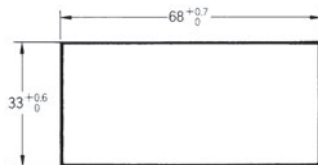
Note: All units are in millimeters unless otherwise indicated.

H7HP-A
H7HP-C8



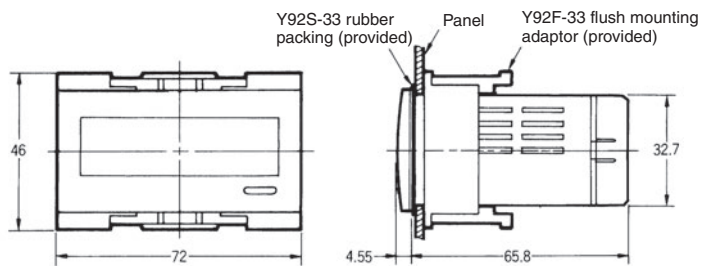
Panel Cutouts

Panel cutouts are as shown below (according to DIN43700).



- Note: 1. The mounting panel thickness should be 1 to 6 mm.
- 2. Water resistance will be lost if Counters are mounted side-by-side.

With Flush Mounting Bracket



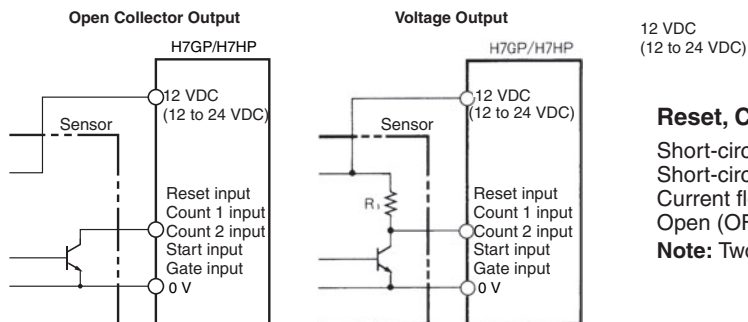
Connections (Common)

Input Connections

Note: The following is common for all H7GP/H7HP models.

No-voltage Input (NPN Input Mode)

Reset, Count 1, Count 2, Start, and Gate Inputs



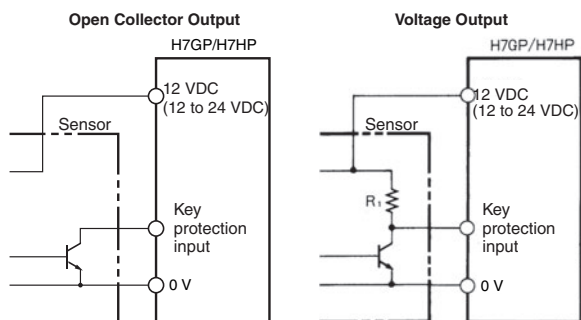
12 VDC
(12 to 24 VDC)

Reset, Count 1, Count 2, Start, and Gate Inputs Specification

Short-circuit (ON) impedance: 1 kΩ max.
 Short-circuit (ON) residual voltage: 2 VDC max.
 Current flow for 0-Ω short-circuit: Approx. 2 mA
 Open (OFF) impedance: 100 kΩ min.

Note: Two-wired sensors cannot be used.

Key Protection Input



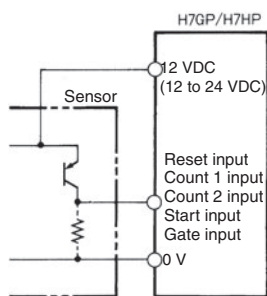
Key Protection Inputs Specification

Short-circuit (ON) impedance: 1 kΩ max.
 Short-circuit (ON) residual voltage: 0.5 VDC max.
 Current flow for 0-Ω short-circuit: Approx. 0.5 mA
 Open (OFF) impedance: 100 kΩ min.

Note: Two-wired sensors cannot be used.

Voltage Input (PNP Input Mode)

Reset, Count 1, Count 2, Start, and Gate Inputs



Reset, Count 1, Count 2, Start, and Gate Inputs Specification

Short-circuit (ON) impedance: 1 kΩ max.
 ON voltage: 9 to 24 VDC
 OFF voltage: 5 VDC max.
 Open (OFF) impedance: 100 kΩ min.
 Input impedance: Approx. 3.8 kΩ

Note: Two-wired sensors cannot be used.

Safety Precautions (Common)

Refer to *Safety Precautions for All Counters*.

Note: The following is common for all H7GP/H7HP models.

⚠ CAUTION

This may occasionally cause electric shock, fire, or malfunction. Never disassemble, repair, or modify the H7GP/H7HP.

This may occasionally cause electric shock, fire, or malfunction. Do not allow metal fragments or lead wire scraps to fall inside the H7GP/H7HP.

■ Precautions for Safe Use

Observe the following items to ensure the safe use of this product.

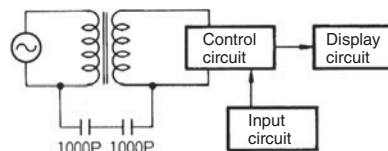
Environmental Precautions

- Store the H7GP/H7HP within the specified ratings. If the H7GP/H7HP has been stored at temperatures -10°C or lower, let it stand for 3 hours or longer at room temperature before turning ON the power supply.
- Use the H7GP/H7HP within the specified ratings for operating temperature and humidity.
- Do not operate the H7GP/H7HP in locations subject to sudden or extreme changes in temperature, or locations where high humidity may result in condensation.
- Do not use the H7GP/H7HP in locations subject to vibrations or shock. Extended use in such locations may result in damage due to stress.
- Do not use the H7GP/H7HP in locations subject to excessive dust, corrosive gas, or direct sunlight.
- Install the H7GP/H7HP well away from any sources of static electricity, such as pipes transporting molding materials, powders, or liquids.
- The H7GP/H7HP is not waterproof or oil resistant. Do not use it in locations subject to water or oil.
- The life expectancy of internal components may be reduced if the H7GP/H7HP is mounted side-by-side.
- Do not use organic solvents (such as paint thinner or benzene), strong alkaline, or strong acids because they will damage the external finish.

Usage Precautions

- Install a switch or circuit breaker that allows the operator to immediately turn OFF the power, and label it to clearly indicate its function.
- Be sure to wire the terminals correctly.
- Do not install input lines in the same duct or conduit as power supply or other high-voltage lines. Doing so may result in malfunction due to noise. Separate the input lines from high-voltage lines.
- Internal elements may be destroyed if a voltage outside the rated voltage is applied.
- Maintain voltage fluctuations in the power supply within the specified range.
- Use a switch, relay, or other contact so that the rated power supply voltage will be reached within 0.1 s. If the power supply voltage is not reached quickly enough, the H7GP/H7HP may malfunction or outputs may be unstable.

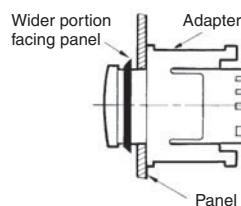
- Although the H7GP/H7HP power supply (primary side) is isolated from control circuits (secondary side) by a transformer, the primary and secondary sides of the transformer are linked by a capacitor, making it possible for high-frequency components to leak to the secondary side. Take adequate precautions against electrical shock. Do not connect input circuits to exposed parts (such as the machine body) and be sure that the power supply is turned off before wiring.



Flush Mounting

The panel surface is water-resistant (conforming to NEMA 4 and IP66). In order to prevent the internal circuit from water penetration through the space between the counter and operating panel, attach a rubber packing between the counter and operating panel and secure the rubber packing with the Y92F-3 flush-mounting adaptor.

Be sure the rubber packing is installed in the correct direction. The wider portion must be facing the panel when installed, as shown in the following illustration. Using a flat-head screwdriver, press in the Mounting Adapter until it cannot be pressed in any further in order to ensure water-resistant performance.



Other

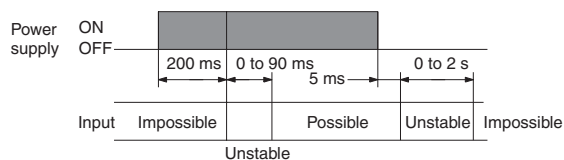
Oil resistance is not applicable to all types of oil. Be sure to test any specific oils before actual application.

■ Precaution for Correct Use

Power Supplies

When turning the power ON and OFF, input signal reception is possible, unstable, or impossible as shown in the diagram below.

Apply the power supply voltage through a relay or switch in such a way that the voltage reaches a fixed value immediately.



Self-diagnostic Function

The following displays will appear if an error occurs.

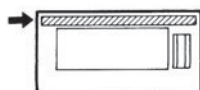
Display	Error	Correction
----	Less than -99999 (H7HP, 6-digit model) Less than -99999999 (H7HP, 8-digit model)	Press RST Key or reset input
E1	CPU	Press RST Key or turn power OFF and then ON
E2	Memory	

Labels

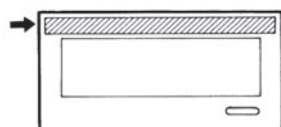
Unit labels are included with the H7GP/H7HP and DIP switch labels are included with the H7HP. Attach these labels as shown in the following illustrations.

Unit Labels

H7GP

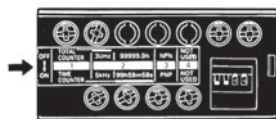


H7HP



DIP Switch Labels

H7HP



ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

In the interest of product improvement, specifications are subject to change without notice.

Terms and Conditions of Sale

1. **Offer; Acceptance.** These terms and conditions (these "**Terms**") are deemed part of all quotes, agreements, purchase orders, acknowledgments, price lists, catalogs, manuals, brochures and other documents, whether electronic or in writing, relating to the sale of products or services (collectively, the "**Products**") by Omron Electronics LLC and its subsidiary companies ("**Omron**"). Omron objects to any terms or conditions proposed in Buyer's purchase order or other documents which are inconsistent with, or in addition to, these Terms.
2. **Prices; Payment Terms.** All prices stated are current, subject to change without notice by Omron. Omron reserves the right to increase or decrease prices on any unshipped portions of outstanding orders. Payments for Products are due net 30 days unless otherwise stated in the invoice.
3. **Discounts.** Cash discounts, if any, will apply only on the net amount of invoices sent to Buyer after deducting transportation charges, taxes and duties, and will be allowed only if (i) the invoice is paid according to Omron's payment terms and (ii) Buyer has no past due amounts.
4. **Interest.** Omron, at its option, may charge Buyer 1-1/2% interest per month or the maximum legal rate, whichever is less, on any balance not paid within the stated terms.
5. **Orders.** Omron will accept no order less than \$200 net billing.
6. **Governmental Approvals.** Buyer shall be responsible for, and shall bear all costs involved in, obtaining any government approvals required for the importation or sale of the Products.
7. **Taxes.** All taxes, duties and other governmental charges (other than general real property and income taxes), including any interest or penalties thereon, imposed directly or indirectly on Omron or required to be collected directly or indirectly by Omron for the manufacture, production, sale, delivery, importation, consumption or use of the Products sold hereunder (including customs duties and sales, excise, use, turnover and license taxes) shall be charged to and remitted by Buyer to Omron.
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9. **Cancellation; Etc.** Orders are not subject to rescheduling or cancellation unless Buyer indemnifies Omron against all related costs or expenses.
10. **Force Majeure.** Omron shall not be liable for any delay or failure in delivery resulting from causes beyond its control, including earthquakes, fires, floods, strikes or other labor disputes, shortage of labor or materials, accidents to machinery, acts of sabotage, riots, delay in or lack of transportation or the requirements of any government authority.
11. **Shipping; Delivery.** Unless otherwise expressly agreed in writing by Omron:
 - a. Shipments shall be by a carrier selected by Omron; Omron will not drop ship except in "break down" situations.
 - b. Such carrier shall act as the agent of Buyer and delivery to such carrier shall constitute delivery to Buyer;
 - c. All sales and shipments of Products shall be FOB shipping point (unless otherwise stated in writing by Omron), at which point title and risk of loss shall pass from Omron to Buyer; provided that Omron shall retain a security interest in the Products until the full purchase price is paid;
 - d. Delivery and shipping dates are estimates only; and
 - e. Omron will package Products as it deems proper for protection against normal handling and extra charges apply to special conditions.
12. **Claims.** Any claim by Buyer against Omron for shortage or damage to the Products occurring before delivery to the carrier must be presented in writing to Omron within 30 days of receipt of shipment and include the original transportation bill signed by the carrier noting that the carrier received the Products from Omron in the condition claimed.
13. **Warranties.** (a) **Exclusive Warranty.** Omron's exclusive warranty is that the Products will be free from defects in materials and workmanship for a period of twelve months from the date of sale by Omron (or such other period expressed in writing by Omron). Omron disclaims all other warranties, express or implied. (b) **Limitations.** OMRON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, ABOUT NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OF THE PRODUCTS. BUYER ACKNOWLEDGES THAT IT ALONE HAS DETERMINED THAT THE PRODUCTS WILL SUITABLY MEET THE REQUIREMENTS OF THEIR INTENDED USE. Omron further disclaims all warranties and responsibility of any type for claims or expenses based on infringement by the Products or otherwise of any intellectual property right. (c) **Buyer Remedy.** Omron's sole obligation hereunder shall be, at Omron's election, to (i) replace (in the form originally shipped with Buyer responsible for labor charges for removal or replacement thereof) the non-complying Product, (ii) repair the non-complying Product, or (iii) repay or credit Buyer an amount equal to the purchase price of the non-complying Product; provided that in no event shall Omron be responsible for warranty, repair, indemnity or any other claims or expenses regarding the Products unless Omron's analysis confirms that the Products were properly handled, stored, installed and maintained and not subject to contamination, abuse, misuse or inappropriate modification. Return of any Products by Buyer must be approved in writing by Omron before shipment. Omron Companies shall not be liable for the suitability or unsuitability or the results from the use of Products in combination with any electrical or electronic components, circuits, system assemblies or any other materials or substances or environments. Any advice, recommendations or information given orally or in writing, are not to be construed as an amendment or addition to the above warranty. See <http://www.omron247.com> or contact your Omron representative for published information.
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15. **Indemnities.** Buyer shall indemnify and hold harmless Omron Companies and their employees from and against all liabilities, losses, claims, costs and expenses (including attorney's fees and expenses) related to any claim, investigation, litigation or proceeding (whether or not Omron is a party) which arises or is alleged to arise from Buyer's acts or omissions under these Terms or in any way with respect to the Products. Without limiting the foregoing, Buyer (at its own expense) shall indemnify and hold harmless Omron and defend or settle any action brought against such Companies to the extent based on a claim that any Product made to Buyer specifications infringed intellectual property rights of another party.
16. **Property; Confidentiality.** Any intellectual property in the Products is the exclusive property of Omron Companies and Buyer shall not attempt to duplicate it in any way without the written permission of Omron. Notwithstanding any charges to Buyer for engineering or tooling, all engineering and tooling shall remain the exclusive property of Omron. All information and materials supplied by Omron to Buyer relating to the Products are confidential and proprietary, and Buyer shall limit distribution thereof to its trusted employees and strictly prevent disclosure to any third party.
17. **Export Controls.** Buyer shall comply with all applicable laws, regulations and licenses regarding (i) export of products or information; (ii) sale of products to "forbidden" or other proscribed persons; and (iii) disclosure to non-citizens of regulated technology or information.
18. **Miscellaneous.** (a) **Waiver.** No failure or delay by Omron in exercising any right and no course of dealing between Buyer and Omron shall operate as a waiver of rights by Omron. (b) **Assignment.** Buyer may not assign its rights hereunder without Omron's written consent. (c) **Law.** These Terms are governed by the law of the jurisdiction of the home office of the Omron company from which Buyer is purchasing the Products (without regard to conflict of law principles). (d) **Amendment.** These Terms constitute the entire agreement between Buyer and Omron relating to the Products, and no provision may be changed or waived unless in writing signed by the parties. (e) **Severability.** If any provision hereof is rendered ineffective or invalid, such provision shall not invalidate any other provision. (f) **Setoff.** Buyer shall have no right to set off any amounts against the amount owing in respect of this invoice. (g) **Definitions.** As used herein, "including" means "including without limitation"; and "Omron Companies" (or similar words) mean Omron Corporation and any direct or indirect subsidiary or affiliate thereof.

Certain Precautions on Specifications and Use

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