

# Total Counter/Time Counter (DIN 48 x 24) H7GP

## Compact Total Counters and Time Counters with Easy-to-read Displays and IP66G/ NEMA4 Water and Oil Resistance

- High-visibility, negative transmissive LCD display with 8.5-mm-high characters and built-in red LED backlight at low power consumption.
- Compact (80 mm) body.



## Model Number Structure

### Model Number Legend

H7GP-□□□  
1 2 3

#### 1. Classification

- C: Total counter
- T: Time counter

#### 2. Supply Voltage

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

#### 3. Case Color of Front Section

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

## Ordering Information

### List of Models

Supply voltage	6-digit total counter		6-digit time counter	
	Light gray	Black	Light gray	Black
100 to 240 VAC	H7GP-C	H7GP-CB	H7GP-T	H7GP-TB
12 to 24 VDC	H7GP-CD	H7GP-CDB	H7GP-TD	H7GP-TDB

# Specifications

## ■ Ratings

Item	6-digit total counter		6-digit time counter	
	H7GP-C	H7GP-CD	H7GP-T	H7GP-TD
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	48 x 24 x 80 mm (W x H x D)			
Mounting method	Flush mounting			
External connections	Screw terminals			
Degree of protection	Panel surface: JEM IP66G and NEMA Type 4 (indoors)			
Display	7-segment, negative transmissive LCD (with red backlight)			
Digits	6 digits (8.5-mm-high characters)			
Input mode	Up (increment)		Accumulative	
Max. counting speeds	30 Hz or 5 kHz (selected via DIP switch)		---	
Counting range	0 to 999999		---	
Time specification	---		0.1 to 99999.9 h/1 s to 99 h 59 min 59 s	
Timing accuracy	---		±100 ppm (–10°C to 55°C)	
Memory backup	EEP-ROM: 200,000 operations min.			
Input	Input signals	Count, reset, and key protection (see note 2)		Start, 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, reset, start	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 min.		
	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 re-sponse speed	Reset	20 or 1 ms (automatically switched according to counting speed)		20 ms
	Start	---		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

<b>Insulation resistance</b>	100 MΩ min. (at 500 VDC)
<b>Dielectric strength</b>	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) 1,000 VAC, 50/60 Hz for 1 min between power terminals and control input terminals (DC model)
<b>Impulse withstand voltage</b>	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)
<b>Noise immunity</b>	±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)
<b>Static immunity</b>	Display: Malfunction:8 kV Destruction:15 kV DIP switch: Malfunction:4 kV Destruction:8 kV
<b>Vibration resistance</b>	Destruction: 10 to 55 Hz with 0.75-mm single amplitude, four cycles each in three directions (8 minutes per cycle) Malfunction: 10 to 55 Hz with 0.5-mm single amplitude, four cycles each in three directions (8 minutes per cycle)
<b>Shock resistance</b>	Destruction: 294 m/s <sup>2</sup> each in three directions Malfunction: 196 m/s <sup>2</sup> each in three directions
<b>Ambient temperature</b>	Operating: -10°C to 55°C (with no icing) Storage: -25°C to 65°C (with no icing)
<b>Ambient humidity</b>	Operating: 35% to 85%
<b>EMC</b>	(EMI) EN61326 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)
<b>Approved standards</b>	UL508, CSA22.2 No.14, conforms to EN61010-1, VDE0106/P100
<b>Case color</b>	Rear section: Gray smoke; Front section: 5Y7/1 (light gray) or N1.5 (black)
<b>Weight</b>	Approx. 76 g

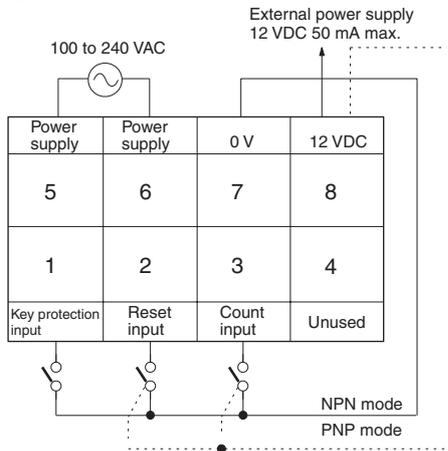
# Connections

## Terminal Arrangement

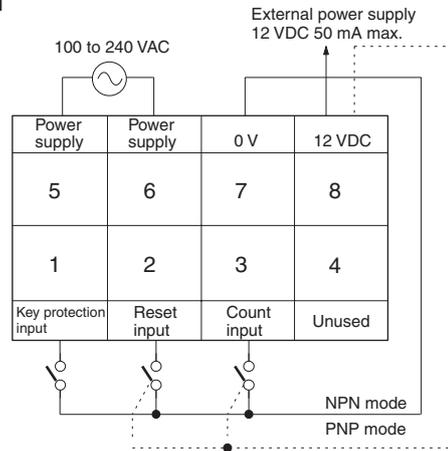
Note: Non-contact input is also available.

### AC Models

#### H7GP-C

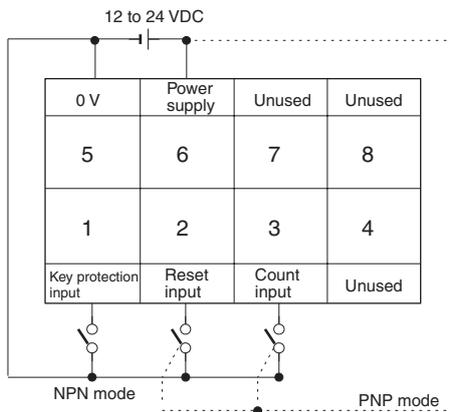


#### H7GP-T

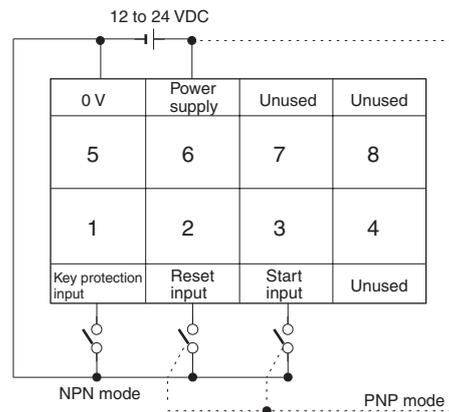


### DC Models

#### H7GP-CD



#### H7GP-TD



# Operation

## ■ DIP Switch Settings

Set all DIP switches before mounting the Counter to a control panel. All switches are set toward the display panel before shipping.

### H7GP-C/-CD

Switch	Item	Function	
		Display side	Terminal side
3 (On right side from front)	Input mode (note 1)	Display side	NPN
		Terminal side	PNP
4 (On left side from front)	Counting speed (note 1)	Display side	30 Hz
		Terminal side	5 kHz

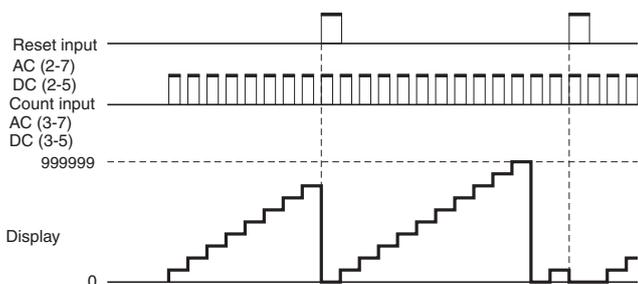
### H7GP-T/-TD

Switch	Item	Function	
		Display side	Terminal side
3 (On right side from front)	Input mode (note 1)	Display side	NPN
		Terminal side	PNP
4 (On left side from front)	Time range (note 1)	Display side	99999.9h (note 2)
		Terminal side	99 h 59 min 59 s

- Note: 1.** 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.
- 2.** The decimal point will flash every second when "99999.9 h" is set.

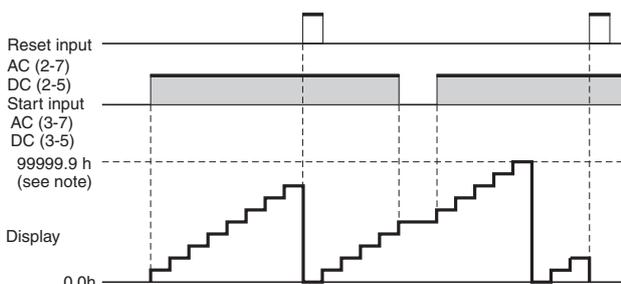
## ■ Operating Modes

### Total Counters



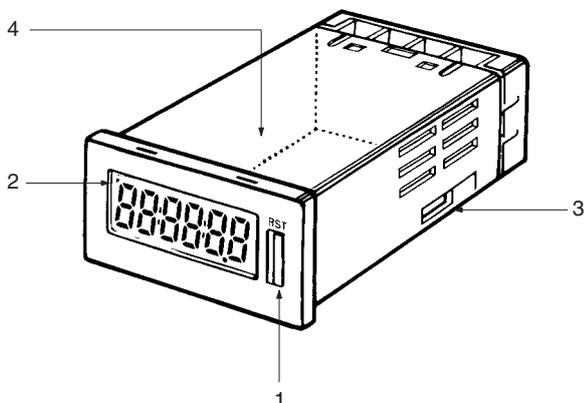
**Note:** The count value will return to "0" when "999999" is exceeded.

### Time Counters



**Note:** Display values are shown for full scale set to 99999.9 h. The count value will return to "0" when "99999.9" is exceeded.

## Nomenclature

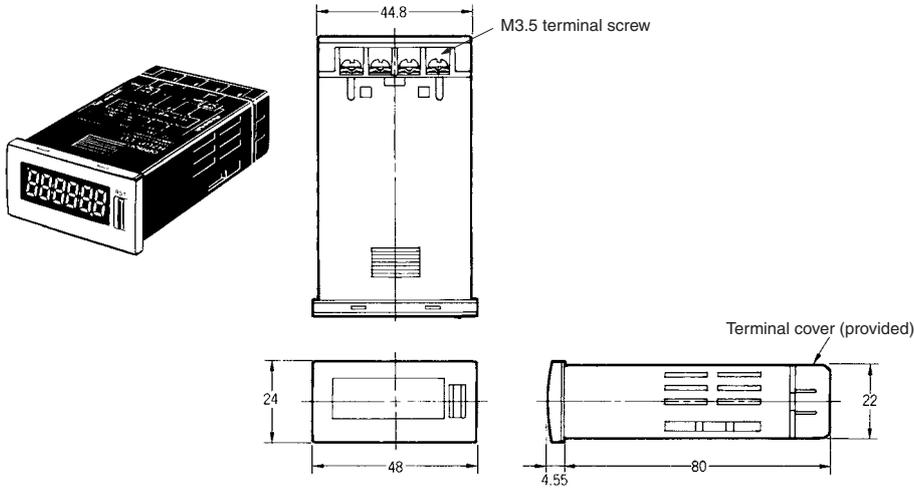


- Reset Key**  
Resets the count value, but will not operate while the keys are protected.
- Key Protection Indicator**  
Lit while the keys are protected. (Reset Key is disabled.)
- NPN/PNP DIP Switch**  
(Count or start with reset)  
When the setting has been changed, turned power off and on to continue. The display will show "0" when the power is turned back on. See below for details.
- Counting Speed DIP Switch (H7GP-C)**  
**Time Range DIP Switch (H7GP-T)**  
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. Refer to *DIP Switch Setting* for details.

# Dimensions

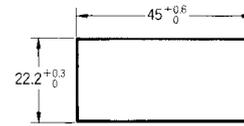
**Note:** All units are in millimeters unless otherwise indicated.

H7GP-C  
H7GP-T



### 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

