Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of "Quality Parts,Customers Priority,Honest Operation,and Considerate Service",our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

## Contact us

# Preset Counter/Timer (48 × 24)
# H8GN

## A DIN 48 × 24 Preset Counter. Compact, Yet Equipped with Communication.

- Only 48 × 24 × 83 mm (W × H × D)
- Switch between 4-digit preset counter and 4-digit timer operation.
- While using the preset counter, it is possible to switch the display to monitor the totalizing count value (8 digits).
- Built-in prescaling for counter operation.
- ON/OFF-duty adjustable flicker mode that can be used to perform cyclic control is available for timer operation.
- SV can be changed using front panel keys to any of four values preset in SV-banks.
- Water-proof structure to NEMA4X/IP66.
- Conforms to UL, CSA, and IEC safety standards as well as CE Marking.

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

| ⚠ | Refer to *Safety Precautions* on page 7. |
| --- | --- |

# Model Number Structure

## ■ Model Number Legend

H8GN-AD-☐
     1  2

**1. Supply Voltage**
D:    24 VDC

**2. Communications Output Type**
None: Communications not supported
FLK:  RS-485

# Ordering Information

## ■ List of Models

| Supply voltage | Output | Communications | |
| --- | --- | --- | --- |
| | | No communications | RS-485 |
| 24 VDC | Contact output (SPDT) | H8GN-AD | H8GN-AD-FLK |

# Specifications

## ■ Ratings

| Rated supply voltage | | 24 VDC |
|---|---|---|
| Operating voltage range | | 85% to 110% of rated supply voltage |
| Power consumption | | 1.5 W max. (for max. DC load) (Inrush current: 15 A max.) |
| Mounting method | | Flush mounting |
| External connections | | Screw terminals (M3 screws) |
| Terminal screw tightening torque | | 0.5 N·m max. |
| Attachment | | Waterproof packing, flush mounting bracket |
| Display | | 7-segment, negative transmissive LCD; time display (h, min, s); CMW, OUT, RST, TOTAL<br>Present value (red, 7-mm-high characters); Set value (green, 3.4-mm-high characters) |
| Digits | | PV: 4 digits<br>SV: 4 digits<br>When total count value is displayed: 8 digits<br>(Zeros suppressed) |
| Memory backup | | EEPROM (non-volatile memory) (number of writes: 100,000 times) |
| Counter | Maximum counting speed | 30 Hz or 5 kHz (See note.) |
| | Counting range | −999 to 9,999 |
| | Input modes | Increment, decrement, individual, quadrature inputs |
| | Output modes | N, F, C, or K |
| Timer | Time ranges | 0.000 to 9.999 s, 0.00 to 99.99 s, 0.0 to 999.9 s, 0 to 9999 s, 0 min 00 s to 99 min 59 s, 0.0 to 999.9 min, 0 h 00 min to 99 h 59 min, 0.0 h to 999.9 h, 0 h to 9999 h |
| | Timer modes | Elapsed time (Up), remaining time (Down) |
| | Output modes | A, B, D, E, F, or Z |
| Inputs | Input signals | For Counter: CP1, CP2, and reset<br>For Timer: Start, gate, and reset |
| | Input method | No-voltage input (contact short-circuit and open input)<br>Short-circuit (ON) impedance: 1 kΩ max. (Approx. 2 mA runoff current at 0 Ω)<br>Short-circuit (ON) residual voltage:2 VDC max.<br>Open (OFF) impedance: 100 kΩ min.<br>Applied voltage: 30 VDC max. |
| | Start, reset, gate | Minimum input signal width: 1 or 20 ms (selectable) |
| | Power reset | Minimum power-opening time: 0.5 s |
| Control output | | SPDT contact output: 3 A at 250 VAC/30 VDC, resistive load (cosφ = 1) |
| Minimum applied load | | 10 mA at 5 VDC (failure level: P, reference value) |
| Reset system | | External, manual, and power supply resets (for timer in A, B, D, E, or Z modes) |
| Sensor waiting time | | 260 ms max. (Inputs cannot be received during sensor wait time if control outputs are turned OFF.) |

**Note:** The figures given for maximum counting speed are for incrementing or decrementing operation with a prescale value of ×1. If prescaling is used and 5 kHz is set, the maximum counting speed will be reduced to about half. The maximum counting speed will also be reduced to about half when the up/down mode is selected.

# ■ Characteristics

| Timer function | Accuracy of operating time and setting error (including temperature and voltage effects) | Signal start: ± 0.03% ± 30 ms max.<br>Power-ON start: ± 0.03% ± 50 ms max. |
|---|---|---|
| Insulation resistance | | 100 MΩ min. (at 500 VDC) |
| Dielectric strength | | 1,500 VAC, 50/60 Hz for 1 min between output terminals and non-current-carrying metal parts<br>510 VAC, 50/60 Hz for 1 min between current-carrying terminals (except output terminals) and non-current-carrying metal parts<br>1,500 VAC, 50/60 Hz for 1 min between output terminals and current-carrying terminals (except output terminals)<br>500 VAC, 50/60 Hz for 1 min between communications terminals and current-carrying terminals (except output terminals)<br>1,000 VAC, 50/60 Hz for 1 min between contacts not located next to each other |
| Noise immunity | | Square-wave noise by noise simulator;<br>±480 V (between power terminals), ± 600 V (between input terminals) |
| Static immunity | | ± 8 kV (malfunction), ± 15 kV (destruction) |
| Vibration resistance | Malfunction | 10 to 55 Hz with 0.35-mm single amplitude each in three directions for 10 min |
| | Destruction | 10 to 55 Hz with 0.75-mm single amplitude each in three directions for 2 h |
| Shock resistance | Malfunction | 100 m/s$^2$, 3 times each in six directions |
| | Destruction | 300 m/s$^2$, 3 times each in six directions |
| Life expectancy | Mechanical | 10 million operations |
| | Electrical | 100,000 operations min. (3 A at 250 VAC, resistive load) (See note 1.) |
| Ambient temperature | Operating | −10°C to 55°C (with no icing or condensation) |
| | Storage | −25°C to 65°C (with no icing or condensation) |
| Ambient humidity | | 25% to 85% |
| EMC | | (EMI): EN61326-1 (See note 2.)<br>Emission Enclosure: EN55011 Group 1 Class A<br>(EMS): EN61326-1 (See note 2.)<br>Immunity ESD: EN61000-4-2: 4 kV contact discharge (level 2); 8 kV air discharge (level 3)<br>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)<br>Immunity Conducted Disturbance: EN61000-4-6: 3 V (0.15 to 80 MHz) (level 2)<br>Immunity Burst: EN61000-4-4: 2 kV power-line (level 3); 1 kV I/O signal-line (level 4); 1 kV communications-line (level 3)<br>Immunity Surge: EN61000-4-5: 1 kV between lines (power and output lines) (level 3); 2 kV between grounds (power and output lines) (level 3) |
| Approved standards | | UL508, CSA C22.2 No.14<br>Conforms to EN61010-1/IEC61010-1 (Pollution degree 2/overvoltage category II)<br>Conforms to VDE0106/P 100 (Finger Protection) |
| Case color | | Rear section: Gray smoke; Front section: N1.5 (black) |
| Degree of protection | | Panel surface: IP66 and NEMA Type 4X (indoors)<br>Rear case: IP20<br>Terminal block: IP20 |
| Weight | | Approx. 80 g |

**Note: 1.** Refer to the *Life-test Curve*.
   **2.** Industrial electromagnetic environment (EN/IEC 61326-1 Table 2)

# ■ Communications Specifications

| Transmission path connections | Multidrop |
|---|---|
| Communications method | RS-485 (two-wire, half duplex) |
| Synchronization method | Start-stop synchronization |
| Baud rate (See note.) | 1,200/2,400/4,800/9,600 bit/s |
| Transmission code | ASCII |
| Data bit length (See note.) | 7 or 8 bits |
| Stop bit length (See note.) | 1 or 2 bits |
| Error detection | Vertical parity (none, even, or odd) (See note.)<br>Block check character (BCC) |
| Flow control | Not supported. |
| Interface | RS-485 |
| Retry function | Not supported. |
| Communications buffer | 40 bytes |
| Reading and writing from H8GN | Reading present value and totalizing count value; reading/writing preset and set values; switching between SV-banks; switching between communications write-enabled/write-prohibited; reading/writing other initial and advanced function setting parameters |

**Note:** The baud rate, data bit length, stop bit length, and vertical parity can be individually set using the communications setting level.

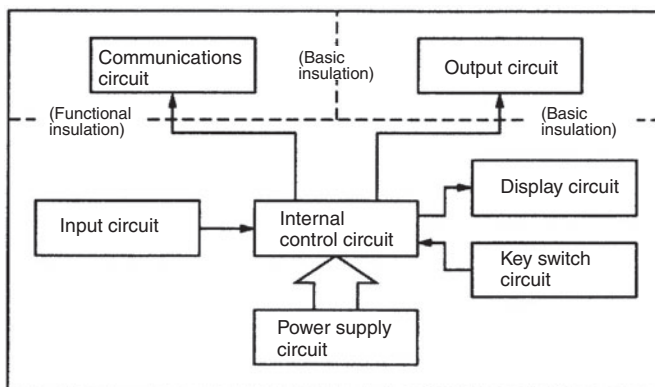# ■ Life-test Curve (Reference Values)

## Resistive Load
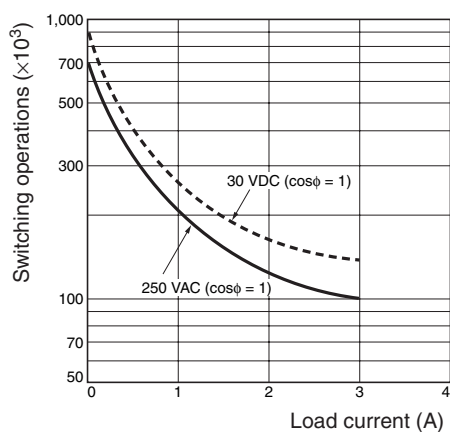


Reference: <u>A maximum current of 0.15 A can be switched at 125 VDC (cos$\phi$ = 1)</u> and a maximum current of 0.1 A can be switched if L/R is 7 ms. In both cases, <u>a life of 100,000 operations can be expected.</u> The minimum applicable load is 10 mA at 5 VDC (failure level: P).

# Connections

## ■ Block Diagram



## ■ I/O Functions

| Inputs | Counter inputs | CP1/CP2 | • Receive count signals.<br>• Receive increment, decrement, individual, and quadrature inputs.<br>• In increment mode and decrement mode, CP1 is used for the count input and CP2 is used for count prohibit input. |
|---|---|---|---|
| | | Reset | • Resets the present value. (Totalizing count value is not reset.)<br>(In increment mode or increment/decrement mode, the present value returns to 0; in Decrement Mode the present value returns to the set value.)<br>• The count input is not received during resetting.<br>• The RST indicator is lit during resetting. |
| | Timer inputs | Start | • Starts timing. |
| | | Reset | • Resets the timer. (In elapsed time mode the time returns to 0; in remaining time mode, the time returns to the set value.)<br>• During resetting, timing stops and the control output turns OFF.<br>• The RST indicator is lit during resetting. |
| | | Gate | • Prohibits timing operation. |
| Outputs | | OUT | • Output made according to the output mode setting when the set value is reached. |

## ■ Terminal Arrangement
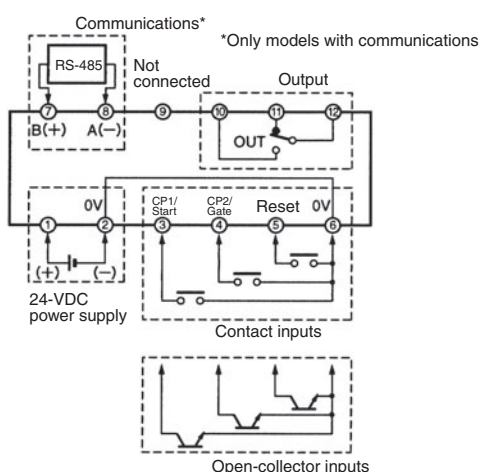


**Note:** (2) and (6) are connected internally.
Do not use unused terminals as relay terminals.

## ■ Wiring

Use the following type of crimp terminals for M3 screw.
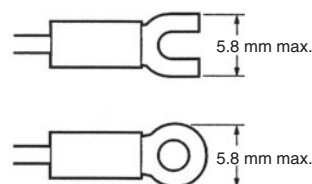
# Nomenclature

**No. 1 Display**
Displays the present value or parameter type. When totalizing count is displayed, the leftmost 4 digits of the 8-digit totalizing count will be displayed. (Zeros suppressed)

**Operation display 2**

| Indicator | Meaning |
|-----------|---------|
| CMW | Lit when communications writing is enabled. |
| RST | Lit during reset using reset input or Reset Key. |
| OUT | Lit when control output is ON. |
| TOTAL | Lit when totalizing count value is displayed. |

**Operation display 1**
Displays the time unit when the timer function has been selected.

**Example**

5 h 30 min

123.4 s

Flashes while timer is on 0.0 min, 0 h 00 min, 0.0 h, or 0 h.

omron H8GN

CMW RST OUT TOTAL

**No. 2 Display**
Displays set value or set value of the parameter.
Displays the rightmost 4 digits of the count value (8 digits) when the H8GN is used as a totalizing counter. (Zeros suppressed)

**Level Key**
Press this key to select the setup level. The setup level is selected in order "operation level" ←→ "adjustment level", "initial setting level" ←→ "communications setting level".

**Mode Key**
Press this key to select parameters within each level.

**Down Key**
Each press of this key decreases values displayed on the No. 2 display. Hold down this key continuously to decrease values quickly. Also returns setting items.

**Up/Reset Key**
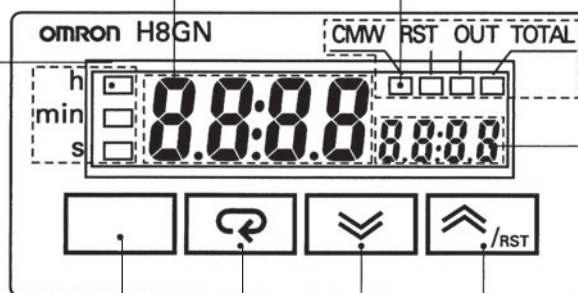Each press of this key increases values displayed on the No. 2 display. Hold down this key continuously to increase values quickly. Also advances setting items.
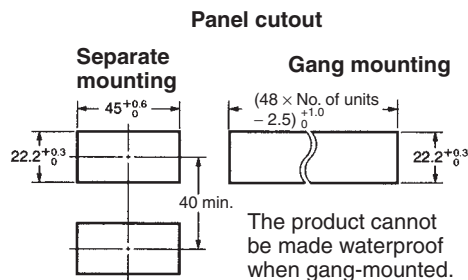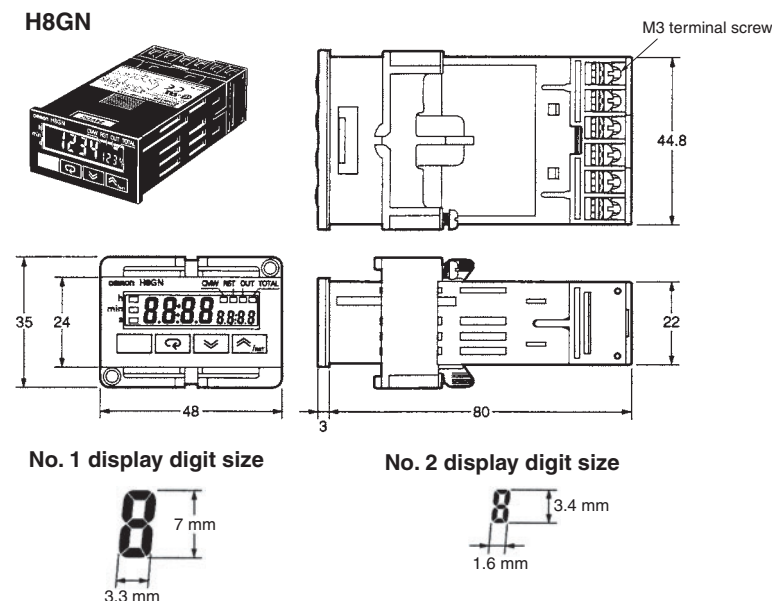
**Reset Function**
To reset the present value, press this key while the present value is displayed.
If this key is pressed while the totalizing count value is displayed, the totalizing count value and the present value will be reset.

# Dimensions

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

**H8GN**

M3 terminal screw

44.8

35   24

22

48

3

80

**No. 1 display digit size**

7 mm

3.3 mm

**No. 2 display digit size**

3.4 mm

1.6 mm

**Panel cutout**

**Separate mounting**

**Gang mounting**

$45^{+0.6}_{0}$

$(48 \times \text{No. of units} - 2.5)^{+1.0}_{0}$

$22.2^{+0.3}_{0}$

$22.2^{+0.3}_{0}$

40 min.

The product cannot be made waterproof when gang-mounted.

- Insert the H8GN in the square cutout, insert the adapter from the back, and push the H8GN into the cutout as far as possible. Use screws to secure the H8GN. To make the H8GN waterproof, insert waterproof packing and tighten the screws.

- When mounting two or more products in a cutout, be sure that the ambient temperature does not exceed the specifications.

- The mounting panel thickness must be 1 to 5 mm.

# Safety Precautions

Refer to *Safety Precautions for All Counters*.

⚠ **CAUTION**

Tighten the terminal screws to the specified torque (approx. 0.5 N·m). Fire or malfunction may result if the screws become loose.

Do not use the product in locations subject to flammable or explosive gases. Doing so may result in explosion.

The service life of the output relays depends on the switching capacity and switching conditions. Consider the actual application conditions and use the product within the rated load and electrical service life. Using the product beyond its service life may result in contact deposition or burning.

Do not disassemble, repair, or modify the product. Doing so may result in electric shock, fire, or malfunction.

Do not allow metal objects or conductive wires to enter the product. Doing so may result in electric shock, fire, or malfunction.

## Other Precautions

- Store at the specified temperature. If the H8GN has been stored at a temperature of less than −10°C, allow the H8GN to stand at room temperature for at least 3 hours before use.
- Use the product within the ratings specified for vibration, shock, submerging in water, and exposure to oil.
- Do not use the product in locations subject to dust, corrosive gases, or direct sunlight.
- Use the product within the ratings specified for temperature and humidity.
- The product is designed for 24 VDC. Applying voltages other than the rated one such as 100 to 240 VAC may damage the internal elements.
- Separate the input signal devices, input signal cables, and the product from the source of noise or high-tension cables producing noise.
- Separate the product from the source of static electricity when using the product in an environment where a large amount of static electricity is produced (e.g., forming compounds, powders, or fluid materials being transported by pipe).
- Do not expose the product to organic solvent such as thinner or benzine, strong alkali materials, or strong acid materials. Doing so may damage the product surface.

## Application Precautions

1. Do not use the product in locations where condensation may occur due to high humidity or where temperature changes are severe.
2. Be sure to wire terminals correctly, with the correct polarity.
3. Maintain the power supply voltage within the allowable ranges.
4. Connect the power supply through a relay or switch so that the voltage reaches a fixed value immediately. If the voltage increases gradually the power supply may be reset or outputs may turn ON.
5. When the power is turned ON, an inrush current (approx. 15 A) will flow momentarily. Depending on power supply capacities, the product may not start due to this leakage current. The power supply must be of a sufficiently large capacity.
6. For the main power supply or the power supply for input devices, use a power supply transformer whose primary side is insulated from the secondary side and whose secondary side is not grounded.
7. Leaving the H8GN with outputs ON at a high temperature for a long time may hasten the degradation of internal parts (such as electrolytic capacitors). Therefore, use the product in combination with relays and avoid leaving the product as long as more than 1 month with the output turned ON.

## Power Supplies

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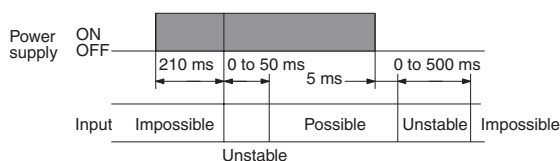


Turn the power ON and OFF using a relay with a rated capacity of 15 A minimum to prevent contact deterioration due to inrush current caused by turning the power ON and OFF.

When power is turned ON, a starting current flows momentarily. Therefore, pay attention to the overcurrent detection level of the power supply used.

## Timer Control with Power Start

To allow for the startup time of peripheral devices (sensors, etc.), the H8GN starts timing operation between 210 to 260 ms after power is turned ON (see diagram above). For this reason, in operations where timing starts from power ON, the time display will actually start from 258 ms. If the set value is 258 ms or less, the time until output turns ON will be a fixed value between 210 and 260. (Normal operation is possible for set value of 259 ms or more.) In applications where a set value of 258 ms or less is required, use start timing with signal input.

When the H8GN is used with power start in F mode (i.e., accumulative operation with output on hold), there will be a timer error (approximately 100 ms each time the H8GN is turned ON) due to the characteristics of the internal circuitry. Use the H8GN with signal start if timer accuracy is required.

## Using the Prescale Function

The count will become incorrect if the prescale value is not set correctly. Check the setting to be sure it is correct.

## Changing the Set Value

### In Counter Operation

When changing the set value during operation, the output will turn ON if the set value equals the present value.

### In Timer Operation

When changing the set value during operation, if the set value is changed in so that the conditions below are satisfied, the Timer operates in the same way as when the present value reaches the set value because a constant read-in system is in use. Depending on the output mode, this may result in output turning ON.

Timer mode UP:      Present value ≥ set value
Timer mode DOWN:Elapsed time ≥ set value
                    (Present value = 0)

**Note:** When in DOWN mode, the amount set value is changed is added to or subtracted from the present value.

## Operation with a Set value of 0

### In Counter Operation

The output will turn ON if the set value (0) equals the present value. The output will be OFF while the Reset Key is pressed or the reset input is ON.

### In Timer Operation

a) When the output mode is set to A, B (one-shot output), D, or F, output will turn ON when the start signal is input.

b) When the output mode is set to B (hold output), E, or Z, output will remain OFF even when the start signal is input.

## Response Delay Time When Resetting

The following table shows the delay from when the reset signal is input until the output is turned OFF.

| Minimum reset signal width | Output delay time |
|---|---|
| 1 ms | 3.7 to 6.0 ms |
| 20 ms | 19 to 21 ms |

## Output Delay Time

The following table shows the delay from when the timer value passes the set value until the output is produced.

**Actual Measurements in N or K Mode**

| Control output | Max. counting speed | Output delay time* |
|---|---|---|
| Contact output | 30 Hz | 17.3 to 18.9 ms |
|  | 5 kHz | 3.5 to 5.2 ms |

*The variation in delays is due to different modes and conditions.

## Mounting

Tighten the two mounting screws on the Adaptor. Tighten them alternately, a little at a time, so as to keep them at an equal tightness.
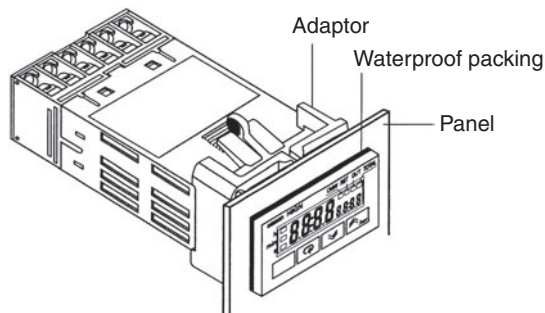


The H8GN's panel surface is water-resistive (conforming to NEMA 4X (indoors) and IP66). In order to prevent the internal circuit from water penetration through the space between the Counter and operating panel, attach a rubber packing (provided with the H8GN) between the Counter and operating panel and secure the rubber packing with the Flush-mounting Adaptor.



## Output

The SPDT (single-pole, double-throw) consists of an SPST-NO contact and an SPST-NC contact. Do not form a circuit with 3-point short-circuit (power short-circuiting with arc).
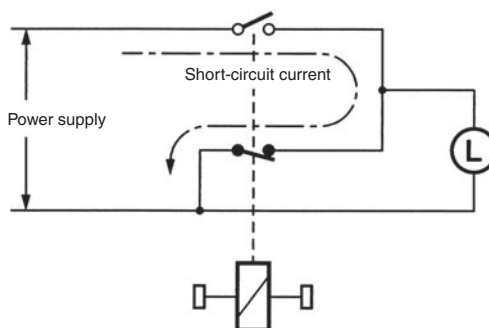


## Reference

For details about communications functions, refer to *H8GN Preset Counter/Timer User's Manual* (Cat. No. M066).

# Operating Procedures

## ■ Initial Setup

The [○] and [⊂⊋] Keys are used to switch between setup menus, and the amount of time that you hold the keys down for determines which setup menu you move to. This section describes two typical examples.

**Note:** In the following sections, "PV" is used to indicate a present value and "SV" to indicate a set value.

### 1. Using the H8GN as a Counter

**Typical Application Examples**

**1. Changing Set Values**

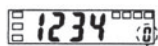Set value and selections in each display can be changed by pressing the [∧/RST] and [∨] Keys.

**2. Displays**
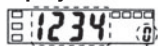
No. 1 display   No. 2 display

**Typical Application**

| Input mode | Individual input |
|---|---|
| Output mode | F (overcount) |
| Counting speed | 30 Hz |
| Input signal width | 20 ms |
| Decimal point | None |
| Prescale | None |

• **Setup Procedure**

**Power ON** | Power ON

**Operation Level**

Present value (PV)/set value (SV)
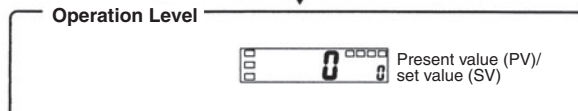
[○] Press the Level Key for at least 3 s. Operation stops.

**Initial Setting Level**

**Check Counter/Timer selection** — Check Counter/Timer selection — Function: Cnt

**Set input mode** — Use the [∧/RST] and [∨] Keys to set the input mode to individual mode. — Input mode: Ud-b
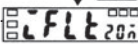
**Set output mode** — Use the [∧/RST] and [∨] Keys to set the output mode to F. — Output mode: F

**Check counting speed** — Check the counting speed. — Counting speed: 30H

**Check input signal width** — Check the input signal width. — Input signal width: 20nS

[○] Press the Level Key for at least 1 s. Operation starts.

**Operation Level**

**Set SV** — Press the [∧/RST] and [∨] Keys to change the set value to 100. — PV/SV: 100

**Reset PV** — Press the [∧/RST] Key. — PV: 0

**Start operation** | Operate
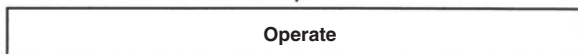
• **Confirming Set Values**

Set values are effective two seconds after key operation is stopped or when the [○] or [⊂⊋] Key is pressed.

## 2. Using the H8GN as a Timer

### Typical Application Examples

**1. Changing Set Values**
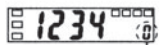


Set value and selections in each display can be changed by pressing the [↑] and [↓] Keys.

**2. Display**



No. 1 Display    No. 2 Display

### Typical Application Examples

| Time range | 0.0 to 999.9 s |
| --- | --- |
| Timer mode | DOWN (remaining time) |
| Output mode | A mode |
| Output time | Hold |
| Input signal width | 20 ms |

- **Setup Procedure**

**Power ON** — Power ON

**Operation Level**

Present value (PV)/ set value (SV)

Press the Level Key for at least 3 s. Operation stops.

**Initial Setting Level**

**Set Counter/Timer selection** — Use the [↑] and [↓] Keys to select the timer function. — **FUnC** Function: t í ñ

**Set time range** — Use the [↑] and [↓] Keys to set the time range to 999.9 s — **t í ñr** Time range: - - - . - s

**Check timer mode** — Use the [↑] and [↓] Keys to set the timer mode to remaining time. — **t í ññ** Timer mode: dóẙn

**Check output mode** — Check the output mode. — **oUt n** Output mode: **R**

**Check output time** — Check the output time. — **ot í n** Output time: 0.00 s

**Check input signal width** — Check the input signal width. — **í FLt** Input signal width: 20ñS

Press the Level Key for at least 1 s. Operation starts.

**Operation Level**

**Set SV** — Use the [↑] and [↓] Keys to set the SV to 10.0. — **0.0** PV/SV: 10.0

**Reset PV** — Press the [↑] Key. — **0.0** PV: 0.0

**Start operation** — Operate

- **Confirming Set Values**

Set values are effective two seconds after key operation is stopped or when the [○] or [↺] Key is pressed.

# ■ Setting Specifications after Turning ON Power

## Outline of Operation Procedure

### Key Operation

In the following descriptions, all the parameters are introduced in the display sequence. Some parameters may not be displayed depending on the protection settings and operating conditions.



**Note:** Of these levels, the initial setting level, communications setting level, and advanced function setting level can be used only when operation has stopped. Control output is stopped when these three levels are selected. When switched back to the operation level from one of these levels, operation will start.

## Description of Each Level

### Operation Level

- This level is displayed when you turn the power ON. You can move to the protect level, initial setting level, and adjustment level from this level.
- Normally, select this level during operation.
- During operation, the present value, set value, totalizing count value, and setting number of SV-bank can be monitored using the ⟳ Key.

### Adjustment Level

- To select this level, press the ⟲ Key once for less than one second.
- This level is for entering set value (SV 0 to 3) for operation. This level contains parameters for communications writing enable/disable, set value of SV-bank, and cycle time (timer Z mode).
- You can move to the top parameter of the operation level, protect level, or initial setting level from here.

### Initial Setting Level

- To select this level, press the ⟲ Key for at least three seconds in the operation level or adjustment level.
- This level is for selecting the function, input mode, time range, timer mode, output mode, output time, counting speed, input signal width, decimal point position, prescale value, and rising/falling edge for input signal.
- You can move to the advanced function setting level or communications setting level from this initial setting level. To return to the operation level, press the ⟲ Key for at least one second. To move to the communications setting level, press the ⟲ key once for less than one second.

### Protect Level

- To select this level, simultaneously press the ⟲ and ⟳ Keys for at least three seconds (default value). This level is to prevent unwanted or accidental modification of parameters. Protected levels will not be displayed, and so the parameters in that level cannot be modified.

### Communications Setting Level

- To select this level, press the ⟲ Key once for less than one second in the initial setting level. When the communications function is used, set the communications conditions in this level. Communicating with a personal computer (host computer) allows set values to be read and written.

### Advanced Function Setting Level

- To select this level, you must change the initial settings/communications protection setting in the protect level to "0" and then enter the password ("−169") in the initial setting level.
- This level is for initializing settings, enabling SV-bank and totalizing counter use, setting display auto-return time, and move- to-protect-level time.
- You can move to the initial setting level from this level.

# Parameters

## Operation Level



(1) PV/SV

(2) PV

(3) Totalizing count value

(4) SV-bank

### 1. PV/SV

This display appears when the power is turned ON. No. 1 display shows the present value and No. 2 display shows the set value. The values displayed will be determined by the settings for Counter/Timer selection, time range, timer mode, and decimal point position made in the initial setting level.

Use the ⌃ and ⌄ Keys to change the settings.

### 2. PV

No. 1 display will show the present value and No. 2 display will remain blank. The values displayed will be determined by the settings for Counter/Timer selection, time range, timer mode, and decimal point position made in the initial setting level.

Press the ⌃ Key to reset the present value.

### 3. Totalizing Count Value

**The totalizing count value is displayed only if "totalizing counter used" in the advanced function setting level has been set to ON.**

The leftmost four digits of the 8-digit totalizing count value will be shown in No. 1 display and the rightmost four digits will be shown in No. 2 display.



=Totalizing count value: 12,345,687
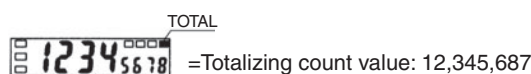
Press the ⌃ Key to simultaneously reset the totalizing count value and the present value.

⌃ Key during PV display  ⌃ Key during totalizing count value display

PV                          $0 \to 1 \to 2 \to 3 \to 0 \to 1 \to 2 \to 0 \to 1 \to 2$
Totalizing count value      $0 \to 1 \to 2 \to 3 \to 3 \to 4 \to 5 \to 0 \to 1 \to 2$

Refer to *Input/Output Mode Settings* on page 20 for information on totalizing counter operation.

### 4. SV-bank (n̄-SP)

**SV-bank is displayed only when "SV-bank used" in the advanced function setting level has been set to ON.**

Select the SV-bank (SV 0 to 3). To use the SV-bank function, the four set values (SV 0 to 3) can be set beforehand in the adjustment level. The keys on the front of the Unit can then be used during operation to switch between the set values. For models with built-in communications, communications can be used to switch between the set values.
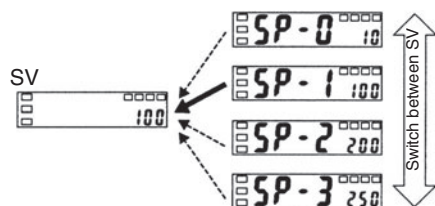


## Adjustment Level



(1) Communications writing control

(2) SV 0

(2) SV 1

(2) SV 2

(2) SV 3

(3) Cycle time
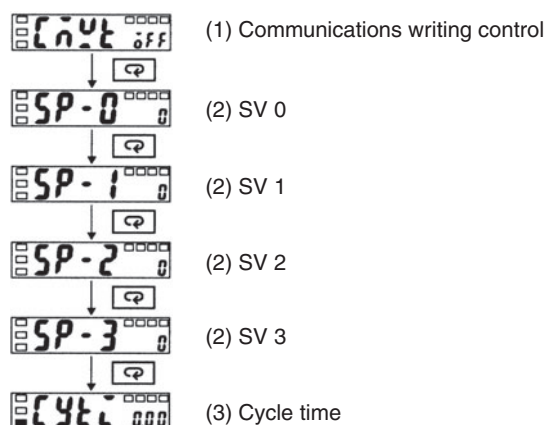
### 1. Communications Writing Control (Cn̄Yt)

**Communications writing control is displayed only for models with communications.**

Allows or prohibits communications to write data from a personal computer (host computer). Communications can be used to read data regardless of this setting.

### 2. SV 0 to 3 (SP-0, SP-1, SP-2, SP-3)

**SV 0 to 3 is displayed only when "SV-bank used" in the advanced function setting level has been set to ON.**
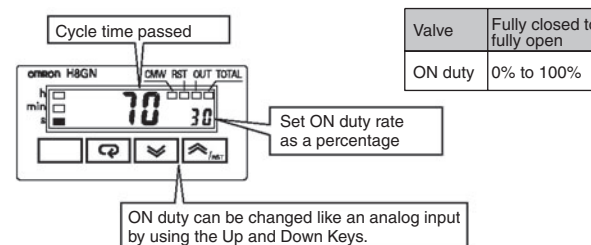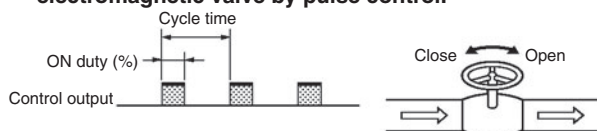
Used to set the set value when the SV-bank function is used. The operator can use the keys on the front to switch between the set values (SV 0 to 3). When the set value is changed in operation mode, the set value (SV 0 to 3) set in the adjustment level for SV-bank will also change.

### 3. Cycle Time (CYtc)

**Cycle time is displayed only when the "output mode for timer function" in the initial setting level has been set to "Z."**

Sets the cycle time used for ON/OFF-duty adjustable flicker mode (Z). Cyclic control can be performed easily in ON/OFF-duty adjustable flicker mode by first setting the cycle time in the adjustment level and by using the set value in operation level to change the ON-duty ratio.

**Controlling the flowrate by opening and closing the electromagnetic valve by pulse control.**



| Valve | Fully closed to fully open |
|---|---|
| ON duty | 0% to 100% |

ON duty can be changed like an analog input by using the Up and Down Keys.

Refer to *Input/Output Mode Settings* on page 21 for information on ON/OFF-duty adjustable flicker mode operation.

## Initial Setting Level

**FUnC** Cnt (1) Counter/Timer selection

**Cntn** UP (2) Input mode

**tinr** .... (3) Time range

**tinn** UP (4) Timer mode

**oUtn** n (5) Output mode for counter function

**oUtn** A (6) Output mode for timer function

**otin** 0.50 (7) Output time

**CntS** 30H (8) Counting speed

**iFLt** 20nS (9) Input signal width

**dP** .... (10) Decimal point position

**PSCL** 1.000 (11) Prescale value

**EdGE** UP (12) Input signal edge

**Anou** 0 (13) Move to advanced function setting level
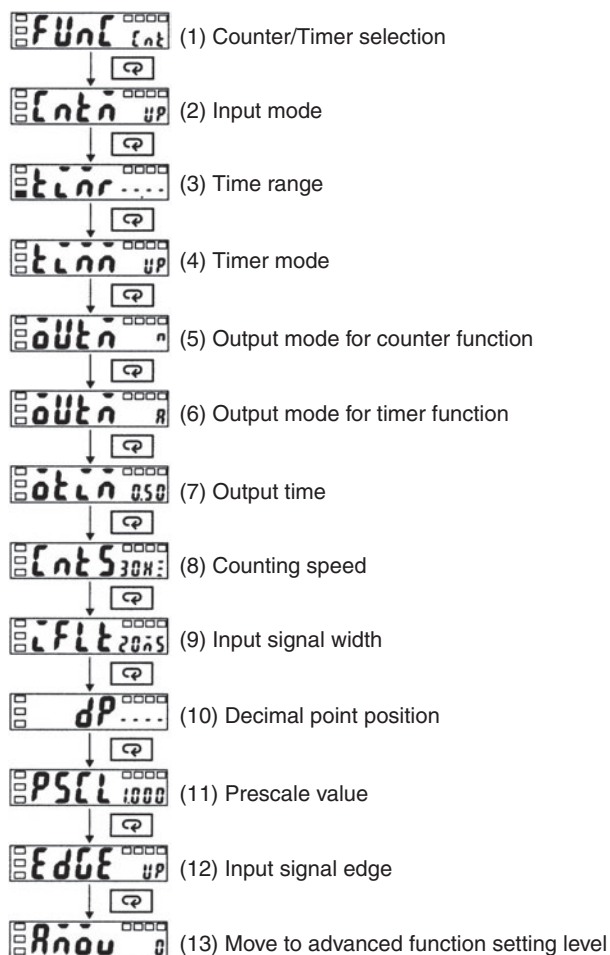
### 1. Counter/Timer Selection (FUnC)

Select to use the H8GN as either a counter or a timer.

### 2. Input Mode (Cntn)

**The input mode is displayed only when "Counter/Timer selection" in the initial setting level has been set to counter.**

When the H8GN is to be used as a counter, select increment, decrement, individual, or quadrature for the input mode. If increment or decrement is selected, the input signal edge for CP1 (count input) can be switched using the input signal edge setting.

Refer to *Input/Output Modes and Count Values* on page 19 for information on input mode operations.

### 3. Time Range (tinr)

**The time range is displayed only when "Counter/Timer selection" in the initial setting level has been set to timer.**

When the H8GN is to be used as a timer, set the time range to be timed.

### 4. Timer Mode (tinn)

**The timer mode is displayed only when "Counter/Timer selection" in the initial setting level has been set to timer.**

When the H8GN is to be used as a timer, set the elapsed or remaining time mode.

### 5. Output Mode for Counter Function (oUtn)

**The output mode is displayed only when "Counter/Timer selection" in the initial setting level has been set to counter.**

When the H8GN is to be used as a counter, set the output mode.
Refer to *Input/Output Mode Settings* on page 20 for information on output mode operations.

### 6. Output Mode for Timer Function (oUtn)

**The output mode is displayed only when "Counter/Timer selection" in the initial setting level has been set to counter.**

When the H8GN is to be used as a timer, set the output mode.

Refer to *Input/Output Mode Settings* on page 20 for information on output mode operations.

### 7. Output Time (otin)

**The output time is displayed only when "output mode for counter function" in the initial setting level has been set to C or K or when "output mode for timer function" in the initial setting level has been set to A or B.**

When using one-shot output in the H8GN, set the output time for the one-shot output (0.01 to 99.99 s).

One-shot output can be used only when the C or K output mode is selected for counter function or A or B output mode is selected for timer function.

If the output time is set to "0" when selecting timer function, the output will be held. The output time cannot be set to "0" for counter function.

### 8. Counting Speed (CntS)

**The counting speed is displayed only when "Counter/Timer selection" in the initial setting level has been set to counter.**

When the H8GN is used as a counter, the operator can switch between maximum counting speeds (30 Hz/5 kHz) for CP1 and CP2.

Set to 30 Hz when using a contact for the input signal. When the counting speed is set to 30 Hz, input signal chattering is removed.

### 9. Input Signal Width (iFLt)

Switches between minimum input signal widths (20 ms/1 ms) for start, reset and gate inputs. All input signal widths are set together via external input.

When the counter function is selected, only the reset input is set, but when the timer function is selected the start, gate, and reset inputs are all set together.

Set to 20 ms when using a contact for the input signal. When the input signal width is set to 20 ms, input signal chattering is removed.

### 10. Decimal Point Position (dP)

**The decimal point position is displayed only when "Counter/Timer selection" in the initial setting level has been set to counter.**

This determines the decimal point position for PV, SV, SV-bank (SV 0 to 3), and totalizing count values. Press the ⏶ Key to move the decimal point to the left and press the ⏷ Key to move it to the right.
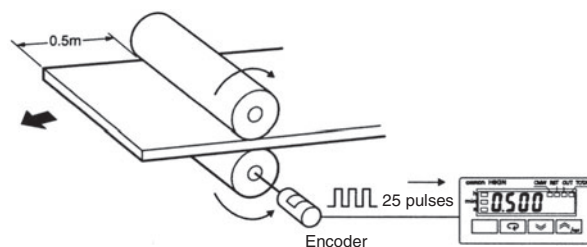
### 11. Prescale Value (PSCL)

**The prescale value is displayed only when "Counter/Timer selection" in the initial setting level has been set to counter.**

Converts the counter input pulse to any value within the setting range (0.001 to 9.999).

Example: To have a display of □□.□□ m for a system that outputs 25 pulses when the object has been moved forward 0.5 m, perform the following steps.

1. Set the decimal point position to before the second-last digit.
2. Set the prescale value to 0.02 (0.5 ÷ 25).



**Note:** The count will become incorrect if the prescale value is not set correctly. Check the setting to be sure it is correct.

**12.Input Signal Edge (**$EdGE$**)**

**The input signal edge will be displayed only when the "input mode" at the initial setting level has been set to increment or decrement.**

Switches the CP1 input edge when the H8GN is used as an incrementing or decrementing counter. In the counter increment or decrement modes, CP2 will function as the gate input and CP1 counting will be prohibited while CP2 is ON.

Refer to *Input/Output Modes and Count Values* on page 19 for information on input mode operations.

**13.Move to Advanced Function Setting Level (**$Ad\bar{o}u$**)**

**This will be displayed only when the "initial setting/communications protection" in protect level is set to 0.**

This setting enables the advanced function settings to utilize the counter/timer functions to the maximum. To move to the advanced function setting level, enter the password (−169) from the initial setting level.

## Advanced Function Setting Level

 (1) Parameter initialization

(2) SV-bank used

(3) Totalizing counter used

(4) Display auto-return time

(5) Move-to-protect-level time
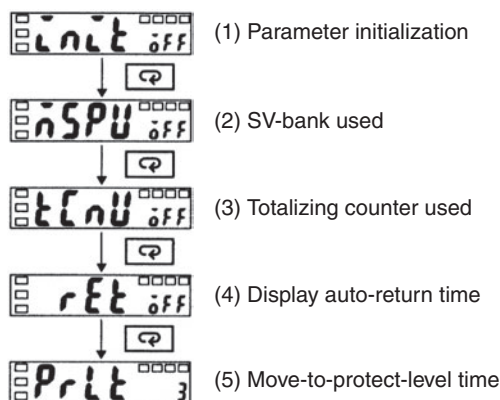
### 1. Parameter Initialization ($\iota_n\iota t$)

Used to return all settings to default values.

Turn ON parameter initialization and shift to another display to return all settings to default values.

### 2. SV-bank Used ($nSPU$)

Set "SV-bank used" to ON and operate the keys from the panel to switch between SV 0 to 3.

To use the SV-bank function, the set value (SV 0 to 3) must be set beforehand in the adjustment level. These set value are then used during operation by operating the keys on the front of the Unit.

### 3. Totalizing Counter Used ($tCnU$)

Set totalizing counter use to ON to display and enable use of the totalizing counter in the operation level. The present counter function will continue to function. (The preset function cannot be turned OFF.) The totalizing counter displays the leftmost four digits of the 8-digit totalizing count on No. 1 display and the rightmost four digits on No. 2 display to enable 8-digit counting.
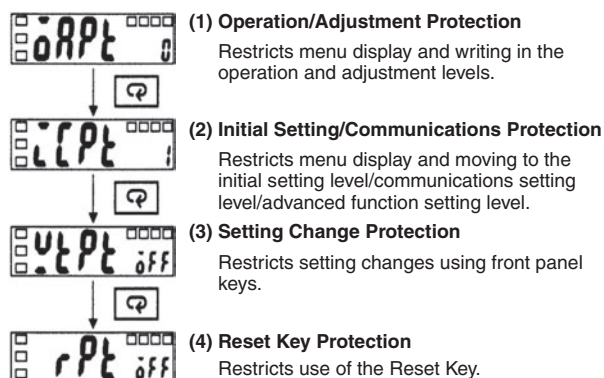
### 4. Display Auto-return Time ($rEt$)

If this function is used, the display in the operation and adjustment levels will automatically return to the PV/SV display if no key operations have been made for the set period. (setting range: 1 to 99 s.)

The time before auto-return of the display can be set here. If this setting is set to OFF, the auto-return function will not operate.

### 5. Move-to-protect-level Time ($PrLt$)

If the ◯ and ⊄ Keys are pressed for more than 3 seconds in the operation level, the display will move to the protect level. Use this setting to change the time that the key must be pressed to any time within the setting range (3 to 30 s).

## Protect Level



**(1) Operation/Adjustment Protection**

Restricts menu display and writing in the operation and adjustment levels.

**(2) Initial Setting/Communications Protection**

Restricts menu display and moving to the initial setting level/communications setting level/advanced function setting level.

**(3) Setting Change Protection**

Restricts setting changes using front panel keys.

**(4) Reset Key Protection**

Restricts use of the Reset Key.

### 1. Operation/Adjustment Protection ($oAPt$)

The following table shows the protection given for each setting level.

| Setting level | Operation level | | Adjustment level |
|---|---|---|---|
| | PV/SV | Other | |
| 0 | Not protected | Not protected | Not protected |
| 1 | Not protected | Not protected | No display, no level shift |
| 2 | Not protected | No display, no level shift | No display, no level shift |
| 3 | Display only | No display, no level shift | No display, no level shift |

Not protected: Display and setting changes are possible.
Display only: Display is possible.
No display, no level shift: Display and level shifts are not possible.
The initial setting level is 0 and no protection is given at this setting level.

### 2. Initial Setting/Communications Protection ($iCPt$)

Moving to initial setting, communications setting, or advanced function setting levels is restricted.

| Setting | Initial setting level | Communications setting level | Advanced function setting level |
|---|---|---|---|
| 0 | OK | OK | OK |
| 1 | OK | OK | NO |
| 2 | NO | NO | NO |

OK: Move to other levels possible
NO: Move to other levels not possible
The default setting is 1.

### 3. Setting Change Protection ($UtPt$)

Restricts setting changes using front panel keys.

| Setting | Meaning |
|---|---|
| OFF | Settings can be changed by key operation. |
| ON | Settings cannot be changed by key operation. (Only protect level settings can be changed.) |

The default setting is OFF.

### 4. Reset Key Protect ($rPt$)

Prohibits the use of the Reset Key.

| Setting | Meaning |
|---|---|
| OFF | PV and totalizing count values can be reset by the Reset Key. |
| ON | PV and totalizing count values cannot be reset by the Reset Key. |

The default setting is OFF.

# ■ Parameters

**Power ON**

Operation level — [○]+[⊡] Keys 3 s. min. (default value) → Adjustment level ⇄ Protect level

[○] Key less than 1 s.

[○]+[⊡] Keys 1 s. min.

[○] Key 1 s. min. / [○] Key 3 s. min.

Initial setting level ⇄ [○] Key less than 1 s → Communications setting level

[○] Key 1 s. min.

Password input set value "−169"

Advanced function setting level

Operation in progress
Operation stopped
No display due to model and settings
No display due to model and settings
← Level change

**Power ON**

[○] Key 1 s. min. → Operation level ← [○] Key less than 1s.

[○] Key 3 s. min.

**1000** PV/SV — See note 1.

**1000** PV — Press the [⋀] Key to reset the PV.

When totalizing counter selected: **100** Totalizing count value — Press the [⋀] Key to reset the totalizing count value and the PV simultaneously

When using SV-bank: **n-SP** SV-bank —
0 : SV 0
1 : SV 1
2 : SV 2
3 : SV 3

[○] Key 1 s. min. → **Initial setting level** ← [○] Key 1 s. min.

[○] Key 1 s. min. ← **Advanced function setting level**

**Advanced function setting level**

**init off** Parameter initialization
on : Initialize
off : Not initialize

**nSPU off** Use SV-bank
on : Use
off : Not use

When counter selected: **tCnU off** Use totalizing counter
on : Use
off : Not use

**rEt off** Display auto-return time
off : No auto-return
1~99 : 1 to 99 s.

**PrLt 3** Move-to-protect-level time
3~30 : 3 to 30 s.

**Note:** The parameters shown in reverse video are the default settings.

**Initial setting level**

Password input (−169) and move

**FUnC Cnt** Counter/Timer selection
Cnt : Counter
tin : Timer

When counter selected: **Cntn UP** Input mode
UP : Increment
doYn : Decrement
Ud-b : Individual
Ud-C : Quadrature

When timer selected: **tinr ....** Time range — See note 2.

**tinn UP** Timer mode
UP : Elapsed time
doYn : Remaining time

When counter selected: **outn n** Output mode for counter
n : N
F : F
C : C*
Y : K*

When timer selected: **outn A** Output mode for timer
A : A*
b : B*
d : D
E : E
F : F
: : Z

When the above C*, K*, A*, or B* mode selected: **otln 0.00** Output time
Counter 0.01~0.50~99.99 : 0.01 to 99.99 s
Timer 0.00~99.99 : 0.00 to 99.99 s
Output will be held if output time is 0.
Output time cannot be set to 0 when counter function is selected.

When counter selected: **CntS 30H:** Counting speed
30H: : 30 Hz
5YH: : 5 kHz

**iFLt 20nS** Input signal width (start, reset, gate)
20nS : 20 ms
1nS : 1 ms

When counter selected: **dP ....** Decimal point position
---- : 0
.... : 0.0
.... : 0.00
.... : 0.000

**PSCL 1.000** Prescale value
0.001~1.000~9.999 : 0.001 to 9.999

When increment or decrement selected in counter input mode: **EdGE UP** Input signal edge
UP : Counting on rising edge
doYn : Counting on falling edge

See note 3. **Anou 0** Move to advanced function setting level.

Adjustment level

$\square$ + $\square$ Key for more than set time (The default setting is 3 s.)

Protect level

$\square$ + $\square$ Key for 1 s. min.

Models with communications — **CnYt** oFF — Communications writing

on : Enabled
oFF : Disabled

When using SV-bank:

**SP-0** 0 — SV 0 — See note 1.

**SP-1** 0 — SV 1 — See note 1.

**SP-2** 0 — SV 2 — See note 1.

**SP-3** 0 — SV 3 — See note 1.

When timer output mode Z is selected — **CYtL** 000 — Cycle time — See note 1.

**oRPt** — Operation/ adjustment protection
0 : Level 0
1 : Level 1
2 : Level 2
3 : Level 3

**iCPt** — Initial settings/ communications protection
0 : Level 0
1 : Level 1
2 : Level 2

**YtPt** oFF — Setting changes protection
on : No key-operated setting changes
oFF : Key-operated setting changes allowed

**rPt** oFF — Reset Key protect
on : Reset Key disabled
oFF : Reset Key enabled

Communications setting level

Models with communications:

**U-no** 1 — Communications Unit No. — 0/1~99 : 0 to 99

**bPS** 96 — Baud rate
12 : 1,200 bps
24 : 2,400 bps
48 : 4,800 bps
96 : 9,600 bps

**LEn** 7 — Data length
7 : 7 bits
8 : 8 bits

**Sbit** 2 — Stop bits
1 : 1 bit
2 : 2 bits

**PrtY** EuEn — Parity
nonE : None
EuEn : Even
odd : Odd

**Note :** Settings made in the communications setting level are enabled when the power is turned ON again.

**Note:** 1. Counter (increment or decrement)
0~9999 : 0 to 9999
Counter (individual or quadrature)
-999~0~9999 : –999 to 9999
Timer (cycle time or mode other than output mode Z)
0.000~9.999 : 0.000 to 9.999 s
0.00~99.99 : 0.00 to 99.99 s
0.0~999.9 : 0.0 to 999.9s, min, h
0~9999 : 0 to 9999 s, h
0.00~99.59 : 0 min 00 s to 99 min 59 s
0.00~99.59 : 0 h 00 min to 99 h 59 min
Timer (output mode Z)
0~100 : 0% to 100% (ON duty)

2. Time range
: -.---s
: --.--s (default)
: ---.-s
: ----s
: --min--s
: ---.-min
: --h--min
: ---.-h
: ----h

3. Displayed when level 0 is selected for initial setting/ communications protection in the protect level.
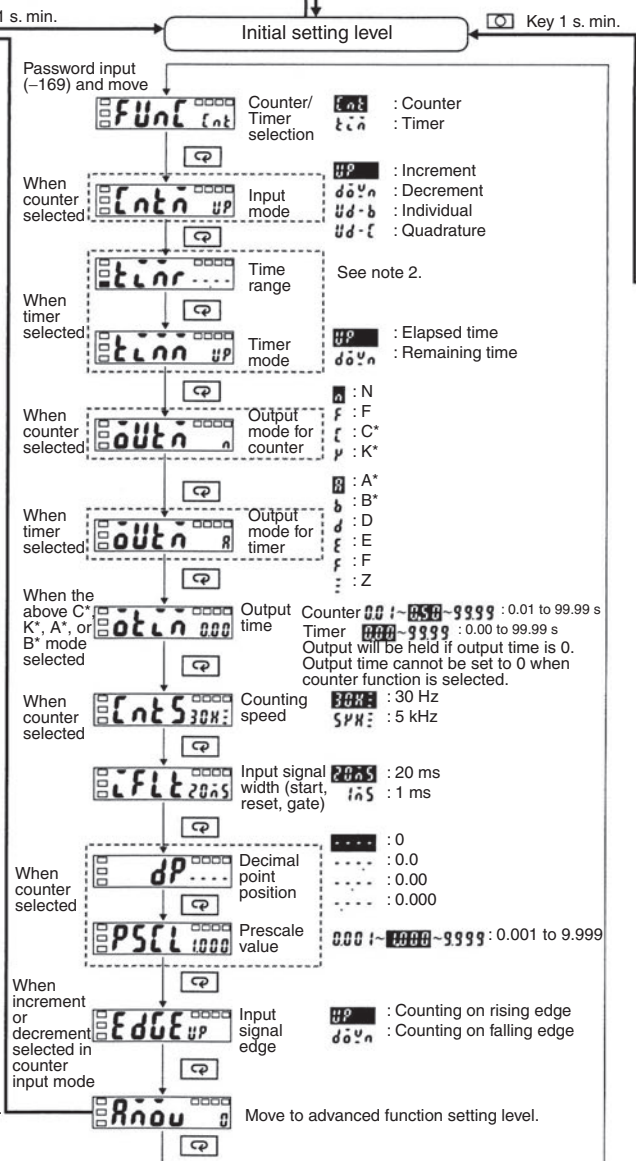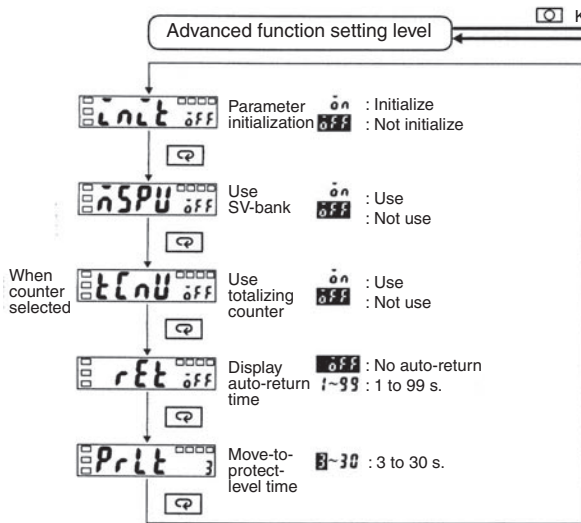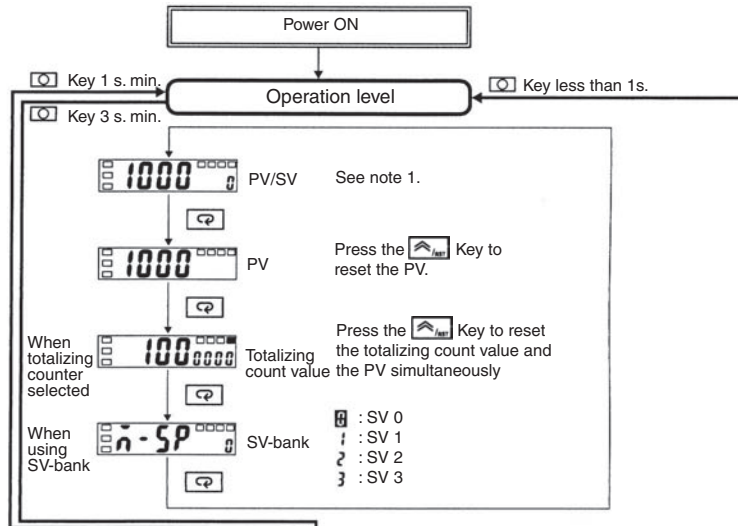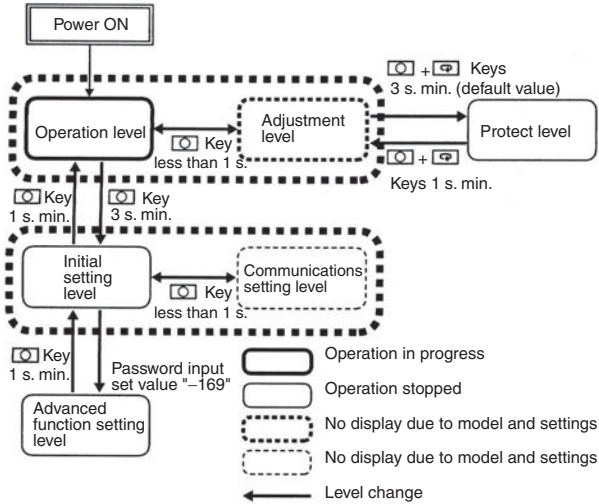
# ■ Operating Mode

## Input/Output Modes and Count Values

| Input edge | | Up (Increment) mode (*UP*) | Down (Decrement) mode (*doun*) |
|---|---|---|---|
| Input edge | UP | CP1: Count input, CP2: Count prohibit input, Count 0 1 2 3 4 5 | CP1: Count input, CP2: Count prohibit input, Count n n-1 n-2 n-3 n-4 n-5 0 |
| | DOWN | CP1: Count input, CP2: Count prohibit input, Count 0 1 2 3 4 5 | CP1: Count input, CP2: Count prohibit input, Count n n-1 n-2 n-3 n-4 n-5 0 |

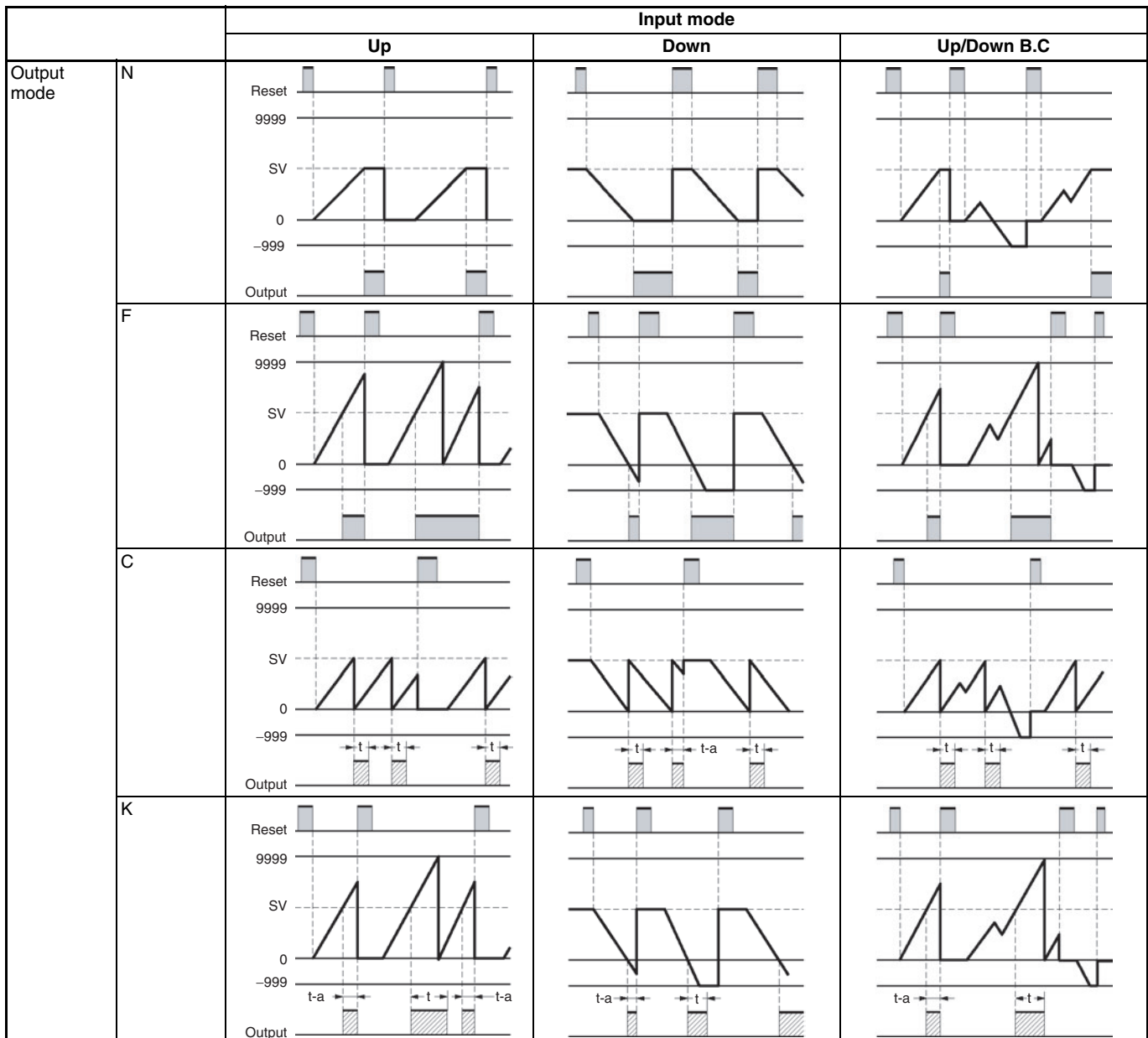| Up/Down B Individual input (*Ud-b*) | Up/Down C quadrature input (*Ud-C*) |
|---|---|
| CP1, CP2, Count 0 1 2 3 2 1 1 2 3 | CP1, CP2, Count 0 1 2 3 2 1 2 3 |

**Note: 1.** (A) indicates the minimum signal width and (B) requires at least 1/2 the minimum signal width. If these conditions are not met, a counting error (+1 or −1) may occur.

**2.** The following table explains the L and H symbols in the above graphics.

| Symbol | Input |
|---|---|
| H | Short-circuited |
| L | Open |

## Input/Output Mode Settings

### Counter Function

| | | Input mode | | |
|---|---|---|---|---|
| | | Up | Down | Up/Down B.C |
| Output mode | N |  |  |  |
| | F |  |  |  |
| | C |  |  |  |
| | K |  |  |  |

**Note: 1.** t: output time. $t - a < t$ : Less than the output time.
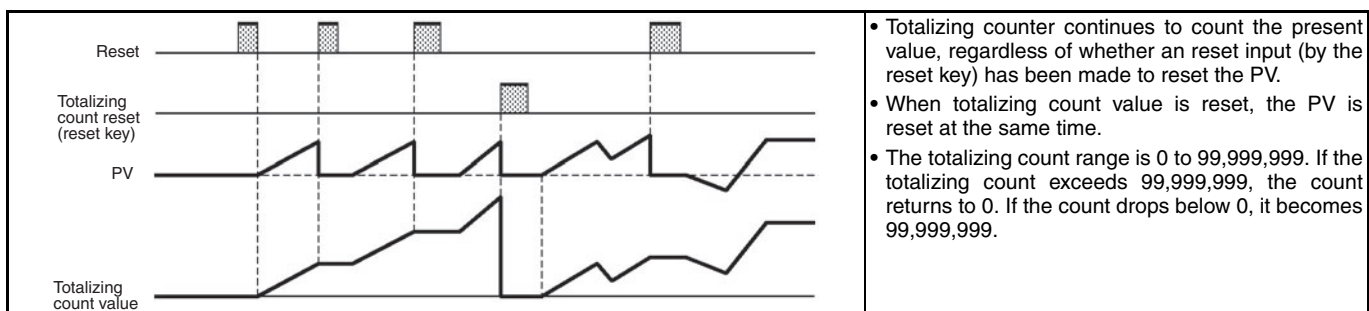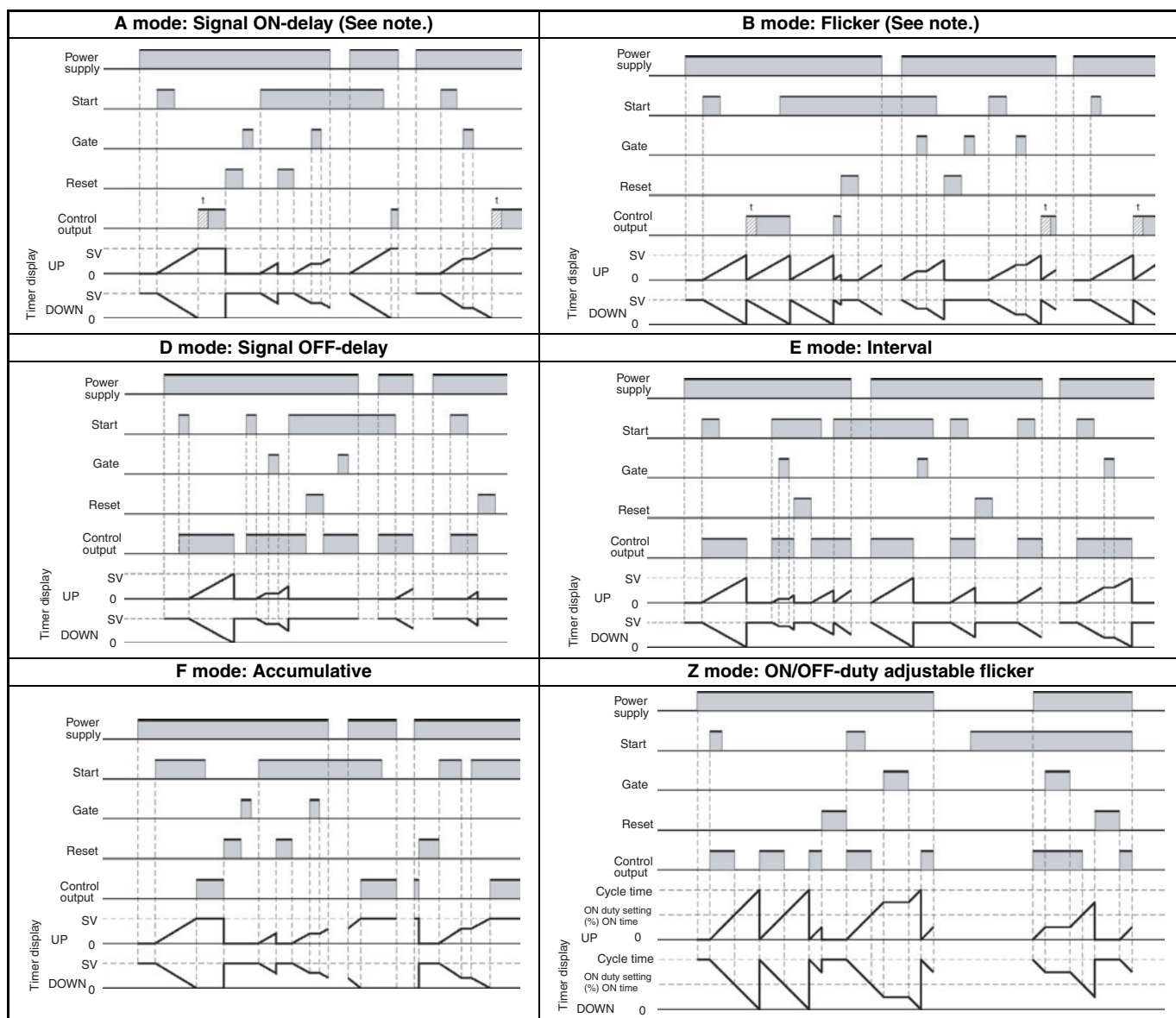
**2.** If there is a power failure during output ON, output will turn ON again when the power supply has recovered. For one-shot output, an output will be made again for the duration of the output time setting once the power supply has resumed.

**3.** Output timing restarted during one-shot outputs is ignored.

### Totalizing Counter Operation



- Totalizing counter continues to count the present value, regardless of whether an reset input (by the reset key) has been made to reset the PV.
- When totalizing count value is reset, the PV is reset at the same time.
- The totalizing count range is 0 to 99,999,999. If the totalizing count exceeds 99,999,999, the count returns to 0. If the count drops below 0, it becomes 99,999,999.

# Timer Function



| A mode: Signal ON-delay (See note.) | B mode: Flicker (See note.) |
| D mode: Signal OFF-delay | E mode: Interval |
| F mode: Accumulative | Z mode: ON/OFF-duty adjustable flicker |

**Note:** One-shot output or HOLD output can be selected for output:

## Z Mode

Output quantity can be adjusted by changing the cycle time set in the adjustment level to 1 and by changing the ON duty (%) set value.

The set value shows the ON duty (%) and can be set to a value between 0 and 100 (%). When the cycle time is 0, the output will always be OFF. When the cycle time is not 0 and when ON duty has been set to 0 (%), the output will always be OFF. When ON duty has been set to 100 (%), the output will always be ON.
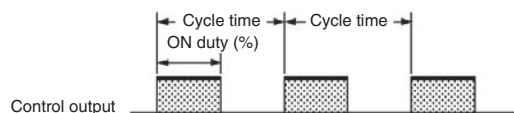
# ■ Troubleshooting

When an error occurs, the error code is displayed on the main display. Take countermeasures according to the code.

| No. 1 display | No. 2 display | Error contents | Countermeasure |
|---|---|---|---|
| E 111 | No display | Memory error (RAM) | Turn the power OFF and ON again. If normal operation is still not restored, it may be necessary to repair or replace the H8GN. If normal operation is restored by turning the power supply OFF and ON, it is possible that there is noise interference. Check that there is nothing in the vicinity that may be the source of noise. |
| E 111 | 5uñ | Memory error (EEP) | |
| E 1 | No display | CPU error | |
| - - - - Flashes | Set value displayed or no display | Present value under-flow | This is not an actual error. This display indicates that the present value has dropped to a value less than −999. Reset using reset input or pressing the Up Key when "– – – –" is displayed. |

**Note:** Error codes are displayed only if PV/SV or PV is being displayed.

# Additional Information

## ■ Parameters List

Fill in your set values in the *Set value* column of the following tables and utilize the tables for quick reference.

### Protect Level

| Parameter name | Parameter | Setting range | Default value | Unit | Set value |
|---|---|---|---|---|---|
| Operation/Adjustment Protection | *ōAPt* | *0* to *3* | *0* | | |
| Initial Setting/Communications Protection | *ĪCPt* | *0* to *2* | *1* | | |
| Setting Change Protection | *4tPt* | *ōn/ōFF* | *ōFF* | | |
| Reset Key Protection | *rPt* | *ōn/ōFF* | *ōFF* | | |

### Operation Level

| Parameter name | | | Parameter | Setting (display) range | Default value | Unit | Set value |
|---|---|---|---|---|---|---|---|
| Present value (PV)/ Set Value (SV) | PV | Counter | | *-999* to *9999/----* (PV<–999) | *0* | | |
| | | Timer | | *0.000* to *9.999* (Time range=-.---s) | *0.000* | Second | |
| | | | | *0.00* to *99.99* (Time range=--.--s) | *0.00* | Second | |
| | | | | *0.0* to *999.9* (Time range=---.-s) | *0.0* | Second | |
| | | | | *0* to *9999* (Time range=----s) | *0* | Second | |
| | | | | *0:00* to *99:59* (Time range=--min--s) | *0:00* | Minute: Second | |
| | | | | *0.0* to *999.9* (Time range=---.-min) | *0.0* | Minute | |
| | | | | *0:00* to *99:59* (Time range=--h--min) | *0:00* | Hour: Minute | |
| | | | | *0.0* to *999.9* (Time range=---.-h) | *0.0* | Hour | |
| | | | | *0* to *9999* (Time range=----h) | *0* | Hour | |
| | SV | Counter | | *0* to *9999* (Input mode=Up or Down) | *0* | | |
| | | | | *-999* to *9999* (Input mode=Individual or quadrature) | *0* | | |
| | | Timer (Output mode: A, B, D, E, F) | | *0.000* to *9.999* (Time range=-.---s) | *0.000* | Second | |
| | | | | *0.00* to *99.99* (Time range=--.--s) | *0.00* | Second | |
| | | | | *0.0* to *999.9* (Time range=---.-s) | *0.0* | Second | |
| | | | | *0* to *9999* (Time range=----s) | *0* | Second | |
| | | | | *0:00* to *99:59* (Time range=--min--s) | *0:00* | Minute: Second | |
| | | | | *0.00* to *999.9* (Time range=---.-min) | *0.0* | Minute | |
| | | | | *0:00* to *99:59* (Time range=--h--min) | *0:00* | Hour: Minute | |
| | | | | *0.00* to *999.9* (Time range=---.-h) | *0.0* | Hour | |
| | | | | *0* to *9999* (Time range=----h) | *0* | Hour | |
| | | Timer (Output mode: Z) | | *0* to *100* | *0* | % | |
| PV | | | | Same as for PV in the above PV/SV column. | | | |
| Totalizing count value | | | | *0* to *99999999* | *0* | | |
| SV-bank | | | *ō-SP* | *0/ 1/2/3* | *0* | | |

## Adjustment Level

| Parameter name | | Parameter | Setting range | Default value | Unit | Set value |
|---|---|---|---|---|---|---|
| Communications writing control | | *CʌʷE* | *ōn/ōFF* | *ōFF* | | |
| SV 0 | | *SP-0* | Same as for PV in the above PV/SV column. | | | |
| SV 1 | | *SP-1* | Same as for PV in the above PV/SV column. | | | |
| SV 2 | | *SP-2* | Same as for PV in the above PV/SV column. | | | |
| SV 3 | | *SP-3* | Same as for PV in the above PV/SV column. | | | |
| Cycle time | Timer (Output mode=Z) | *CʸEʌ* | *0.000* to *9.999* (Time range=-.---s) | *0.000* | Second | |
| | | | *0.00* to *99.99* (Time range=--.--s) | *0.00* | Second | |
| | | | *0.0* to *999.9* (Time range=---.-s) | *0.0* | Second | |
| | | | *0* to *9999* (Time range=----s) | *0* | Second | |
| | | | *0:00* to *99:59* (Time range=--min--s) | *0:00* | Minute: Second | |
| | | | *0.0* to *999.9* (Time range=---.-min) | *0.0* | Minute | |
| | | | *0:00* to *99:59* (Time range=--h--min) | *0:00* | Hour: Minute | |
| | | | *0.0* to *999.9* (Time range=---.-h) | *0.0* | Hour | |
| | | | *0* to *9999* (Time range=----h) | *0* | Hour | |

## Initial Setting Level

| Parameter name | | Parameter | Setting range | Default value | Unit | Set value |
|---|---|---|---|---|---|---|
| Counter/Timer selection | | *FUnC* | *CnE/Eʌ̄* | *CnE* | | |
| Input mode | | *CnEʌ̄* | *UP/dōʸn/Ud-b/Ud-C* | *UP* | | |
| Time range | | *Eʌ̄r* | -.---5/--.--5/---.-5/----5/--ʌ̄Cʌ̄--5/---.-ʌ̄Cʌ̄/--H--ʌ̄Cʌ̄/---.-H ----H | *--.--* | Second | |
| Timer mode | | *Eʌ̄ʌ̄* | *UP/dōʸn* | *UP* | | |
| Output mode for counter function | | *ōUEʌ̄* | *n/F/C/P* | *n* | | |
| Output mode for timer function | | *ōUEʌ̄* | *A/b/d/E/F/Z* | *A* | | |
| Output time | Counter | *ōEʌ̄* | *0.01* to *99.99* | *0.50* | Second | |
| | Timer | | *0.00* to *99.99* | *0.00* | Second | |
| Counting speed | | *CnE5* | *30HZ/5PHZ* | *30HZ* | | |
| Input signal width | | *ʌ̄FLE* | *20ʌ̄5/1ʌ̄5* | *20ʌ̄5* | | |
| Decimal point position | | *dP* | *----/---.-/--.--/-.---* | *----* | | |
| Prescale value | | *P5CL* | *0.001* to *9.999* | *1.000* | | |
| Input signal edge | | *EdGE* | *UP/dōʸn* | *UP* | | |
| Move to function setting level | | *Aʌ̄ōU* | *-999* to *9999* | *0* | | |

## Communications Setting Level

| Parameter name | Parameter | Setting range | Default value | Unit | Set value |
|---|---|---|---|---|---|
| Communications unit number | *U-nō* | *0* to *99* | *1* | | |
| Baud rate | *bP5* | *1.2/2.4/4.8/9.6* | *9.6* | kbps | |
| Communications data length | *LEn* | *7/8* | *7* | bit | |
| Stop bits | *5bʌ̄E* | *1/2* | *2* | bit | |
| Parity | *PrEʸ* | *nōnE/EuEn/ōdd* | *EuEn* | | |

## Advanced Function Setting Level

| Parameter name | Parameter | Setting range | | Default value | Unit | Set value |
|---|---|---|---|---|---|---|
| Parameter initialization | *init* | *on/oFF* | | *oFF* | | |
| SV-bank used | *nSPU* | *on/oFF* | | *oFF* | | |
| Totalizing counter used | *tCnU* | *on/oFF* | | *oFF* | | |
| Display auto-return time | *rEt* | *oFF/1* to *99* | | *oFF* | Second | |
| Move-to-protect-level time | *PrLt* | *3* to *30* | | *3* | Second | |

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.