New Product

# Multifunction Counter/Tachometer
## H7CX-□-N

## Ultra-compact Counter Provides More Complete Functionality.

### Basic Features
- Short body with depth of only 59 mm (for 12 to 24-VDC Models with Screw Terminals).*1
- Better readability with character height of 12 mm on 4-digit models and 10 mm on 6-digit models.
- The present value display characters can be switched between red, green, and orange.*2

### Safety and Reliability
- New set value limit and counter functions have been added.

### Other Features
- Front Panel can be changed to white or light gray.*3
- New models with two tachometer inputs and two tachometer outputs have been added to the series.*4

*1.For 100 to 240-VAC Models with Screw Terminals: 78 mm, Models with Sockets: 63.7 mm (case dimension).
*2.The H7CX-A11 and H7CX-R11 have only red characters.
*3.The Front Panel can be replaced with an optional Front Panel (except for Tachometer-only Models).
*4.Only one prescale value provided.

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 52.

# Features

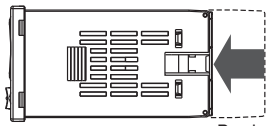
## Basic Features

### Ultra Short Body

The body depth has been greatly reduced. Helps in making thinner control panels.

12 to 24-VDC Models with Screw Terminals: 59 mm
100 to 240-VAC Models with Screw Terminals: 78 mm*
Models with Sockets: 63.7 mm (case dimension)

* Power supply circuit and input circuits are isolated for safety and reliability.

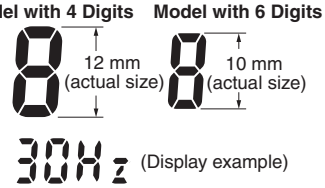


New models Previous models

### Easier to Read

For better readability, the character height for the present value display is 12 mm on models with 4 digits, the largest class in the industry. The wide viewing angle and brightness provide excellent visibility. The number of display segments has also been increased to make settings easier to understand, and the present value display can be switched between red, green, and orange so that output status can be seen from a distance.

**Model with 4 Digits** **Model with 6 Digits**



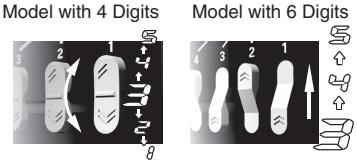

(Display example)

**Note:** The display color can be switched on all models except for the H7CX-A11 and H7CX-R11.

### The Easiest Operation

Operation is simplified by the Up/Down Key for each digit on 4-digit models and Up Key for each digit on 6-digit models.

Model with 4 Digits Model with 6 Digits



## Safety and Reliability

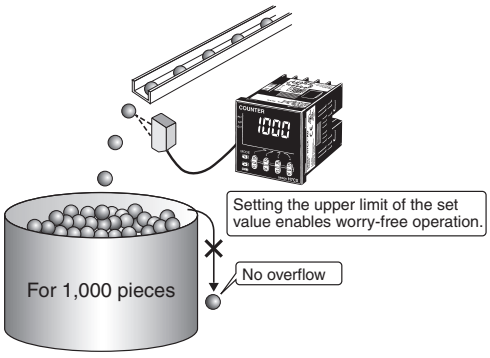
### Isolated Power Supply and Input Circuits

Power supply circuit and input circuits are isolated inside the Counter/Tachometer. Previous non-isolated counters had wiring restrictions and could be damaged if wired incorrectly. The H7CX removes these worries.

**Note:** Except 12 to 24-VDC models.

### Set Value Limit

You can set an upper limit for the set value to prevent unexpected operation of output devices caused by setting mistakes.



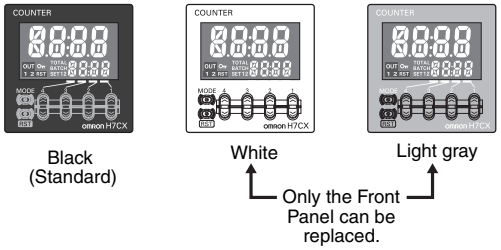

### Output Counter

The output counter counts the number of times the output turns ON (alarms can be displayed and the count can be monitored in increments of 1,000 operations). This counter is useful in managing the service life of the Counter/Tachometer or the load.

## Other Features

### The front color can be changed simply by replacing the Front Panel.

The Front Panel can be replaced with an optional Front Panel (sold separately) with a different color to match the installation site. Select from black, white, and light gray (except for models with tachometer function only).




### Universal NPN/PNP Input

DC 2-wire sensors can be connected for a wide range of input devices.

### Waterproof, Dust-proof Structure (UL508 Type 4X and IP66)

Worry-free application is possible in locations subject to water.
**Note:** When the Y92S-29 Waterproof Packing is used.

### Key Protection

Select from any of seven protection patterns. Use the best one for the application.

### New Functions

Many useful functions have been added, including a Twin Counter Mode and many tachometer functions to handle even more applications.
New Tachometer Functions

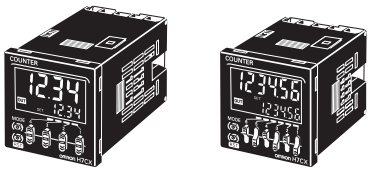
- Control with two independent inputs (independent measurements, differential, absolute ratio, and error ratio)
- Peak/bottom hold function
- Output hysteresis setting
- Output OFF delay
- Switching the measurement method (pulse cycle/pulse width)
- Startup time
- Auto-zero time
- Averaging method/Number of averaging times
- AMD-compatible Mode

**Note:** Refer to *"Model Configuration"* below, for details on applicable functions.

# Model Number Structure

## Model Configuration

**H7CX Series**

| Model | | H7CX-A-series Multifunction Preset Counter | | | H7CX-R-series Digital Tachometer | |
|---|---|---|---|---|---|---|
| | |  | | | | |
| **Classification** | | Preset counter | | Preset counter/tachometer | Tachometer | |
| **Model** | | **H7CX-A□-N** | **H7CX-A4W□-N** | **H7CX-AW□-N/-AU□-N** | **H7CX-R11□-N** | **H7CX-R11W□-N** |
| **Function** | **1-stage preset counter** | Yes | Yes | Yes | No | |
| | **2-stage preset counter** | No | Yes | Yes | No | |
| | **Total and preset counter** | Yes | Yes | Yes | No | |
| | **Batch counter** | No | Yes | Yes | No | |
| | **Dual counter** | No | Yes | Yes | No | |
| | **Twin counter** | No | Yes | Yes | No | |
| | **Tachometer** | No | No | Yes*1 | Yes | |
| **Tachometer input** | | No | No | Yes<br>1 input or 2 inputs (independent measurements, differential, absolute ratio value, and error ratio value) | Yes<br>1 input | Yes<br>2 inputs (independent measurement) only |
| **Settings** | | 1-stage | 2-stage | | 1-stage | |
| **External connections** | | 11-pin socket | Screw terminals | | 11-pin socket | |
| **Display color of present value** | | Red | Red, green, or orange | | Red | |
| **Display digits** | | 4 or 6 digits | 4 digits | 6 digits | 6 digits | |

*1. Set the tachometer input mode from the function setting mode to switch to the tachometer function.

## Model Number Legend (Not all possible combinations of functions are available.)

**H7CX-□□□□□□-N**
**1 2 3 4 5 6**

### 1. Type

| Symbol | Meaning |
|---|---|
| A | Standard type |
| R | Tachometer |

### 2. External connections

| Symbol | Meaning |
|---|---|
| None | Screw terminals |
| 11 | 11-pin socket |

### 3. Digits

| Symbol | Meaning |
|---|---|
| None | 6 digits |
| 4 | 4 digits |

### 4. Settings

| Symbol | Meaning |
|---|---|
| None | 1-stage setting |
| U | Factory-set to 1-stage setting |
| W | Factory-set to 2-stage setting* |

* The H7CX-R11W□ is a 1-stage (2 inputs and outputs) rather than a 2-stage Counter.

### 5. Output type

| Symbol | Meaning |
|---|---|
| None | Contact output or contact output + transistor output |
| S | Transistor output |

### 6. Supply voltage

| Symbol | Meaning |
|---|---|
| None | 100 to 240 VAC at 50/60 Hz |
| D | 12 to 24 VDC |
| D1 | 12 to 24 VDC/24 VAC at 50/60 Hz |

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

# Ordering Information

## List of Models

| Type | Classification | Configuration | External connections | Settings | Display digits | Outputs | Power supply voltage | Model |
|---|---|---|---|---|---|---|---|---|
| H7CX-A Series | Preset counter | • 1-stage preset counter<br>• Total and preset counter | 11-pin socket | 1-stage | 4 digits | Contact output (SPDT) | 100 to 240 VAC | **H7CX-A114-N** |
| | | | | | | Transistor output (SPST) | | **H7CX-A114S-N** |
| | | | | | | Contact output (SPDT) | 12 to 24 VDC/24 VAC | **H7CX-A114D1-N** |
| | | | | | 6 digits | Contact output (SPDT) | 100 to 240 VAC | **H7CX-A11-N** |
| | | | | | | Transistor output (SPST) | | **H7CX-A11S-N** |
| | | | | | | Contact output (SPDT) | 12 to 24 VDC/24 VAC | **H7CX-A11D1-N** |
| | | | | | | Transistor output (SPST) | | **H7CX-A11SD1-N** |
| | | | Screw terminals | | 4 digits | Contact output (SPDT) | 100 to 240 VAC | **H7CX-A4-N** |
| | | | | | | Transistor output (SPST) | | **H7CX-A4S-N** |
| | | | | | | Contact output (SPDT) | 12 to 24 VDC | **H7CX-A4D-N** |
| | | | | | | Transistor output (SPST) | | **H7CX-A4SD-N** |
| | | | | | 6 digits | Contact output (SPDT) | 100 to 240 VAC | **H7CX-A-N** |
| | | | | | | Transistor output (SPST) | | **H7CX-AS-N** |
| | | | | | | Contact output (SPDT) | 12 to 24 VDC | **H7CX-AD-N** |
| | | | | | | Transistor output (SPST) | | **H7CX-ASD-N** |
| | | • 1-stage preset counter<br>• 2-stage preset counter<br>• Total and preset counter<br>• Batch counter<br>• Dual counter<br>• Twin counter | | 2-stage | 4 digits | Contact output (SPST + SPDT) | 100 to 240 VAC | **H7CX-A4W-N** |
| | | | | | | Transistor output (DPST) | 12 to 24 VDC | **H7CX-A4WSD-N** |
| | Preset counter/ Tachometer | • 1-stage preset counter<br>• 2-stage preset counter<br>• Total and preset counter<br>• Batch counter<br>• Dual counter<br>• Twin counter<br>• Tachometer | | | 6 digits | Contact output (SPST + SPDT) | 100 to 240 VAC | **H7CX-AW-N** |
| | | | | | | Transistor output (DPST) | | **H7CX-AWS-N** |
| | | | | | | Contact output (SPST + SPDT) | 12 to 24 VDC/24 VAC | **H7CX-AWD1-N** |
| | | | | | | Transistor output (DPST) | | **H7CX-AWSD1-N** |
| | | | | | | | 12 to 24 VDC | **H7CX-AWSD-N** |
| | | | | | | Contact output (SPDT) + Transistor output (SPST) | 100 to 240 VAC | **H7CX-AU-N** |
| | | | | | | Contact output (SPDT) + Transistor output (SPST) | 12 to 24 VDC/24 VAC | **H7CX-AUD1-N** |
| | | | | | | Transistor output (DPST) | | **H7CX-AUSD1-N** |
| H7CX-R Series | Tachometer | • Tachometer | 11-pin socket | 1-stage (1 input and output) | 6 digits | Contact output (SPDT) | 100 to 240 VAC | **H7CX-R11-N** |
| | | | | | | | 12 to 24 VDC/24 VAC | **H7CX-R11D1-N** |
| | | | | 1-stage (2 inputs and outputs) | | Contact output (SPDT + SPST) | 100 to 240 VAC | **H7CX-R11W-N** |
| | | | | | | | 12 to 24 VDC/24 VAC | **H7CX-R11WD1-N** |

**Note: 1.** The functions that are provided depend on the model. Check detailed specifications before ordering.
**2.** Refer to page page 37 and later for information on H7CX-R Tachometers.

# Accessories (Order Separately)

## Front Panels (Replacement Part)

| Model | Color | Applicable Counters | Page |
|---|---|---|---|
| Y92P-CXC4G | Light gray (5Y7/1) | 4-digit Counter | 12 |
| Y92P-CXC4S | White (5Y9.2/0.5) | | |
| Y92P-CXC4B | Black (N1.5) | | |
| Y92P-CXC6G | Light gray (5Y7/1) | 6-digit Counter | |
| Y92P-CXC6S | White (5Y9.2/0.5) | | |
| Y92P-CXC6B | Black (N1.5) | | |

**Note: 1.** You can change the color of the Front Panel when mounting the Counter. The Counter is shipped with a black (N1.5) Front Panel.
**2.** "COUNTER" is printed on the front of Replacement Front Panels.

## Soft Cover

| Model | Remarks | Page |
|---|---|---|
| Y92A-48F1 | --- | 12 |

## Hard Cover

| Model | Remarks | Page |
|---|---|---|
| Y92A-48 | --- | 12 |

## Flush Mounting Adapter

| Model | Remarks | Page |
|---|---|---|
| Y92F-30 | Included with models with screw terminals. | 12 |
| Y92F-45 | Use this Adapter to install the Counter/ Tachometer in a cutout previously made for a DIN 72 × 72 mm device (panel cutout: 68 × 68 mm). | |

## Waterproof Packing

| Model | Remarks | Page |
|---|---|---|
| Y92S-29 | Included with models with screw terminals. | 12 |

## Connection Sockets

| Model | Classification | Connectable Counter/ Tachometers | Remarks | Page |
|---|---|---|---|---|
| P2CF-11 | Front-connecting Socket | H7CX-□11□-N | --- | 13 |
| P2CF-11-E | Front-connecting Socket (Finger-safe Type) | | Round crimp terminals cannot be used on Finger-safe Sockets. Use forked crimp terminals. | |
| P3GA-11 | Back-connecting Sockets | | A Y92A-48G Terminal Cover can be used with the Socket to create a finger-safe construction. | |

## Terminal Covers for P3GA-11 Back-connecting Socket

| Model | Remarks | Page |
|---|---|---|
| Y92A-48G | --- | 13 |

## H7CX-A□-N Multifunction Preset Counter

- Easy to check the output status from a long distance with changing display colors*1 (red, green, and orange).
- Includes total and preset counter, batch counter, dual counter, twin counter, and tachometer.*2

*1. Not supported by the H7CX-A11□-N.
*2. The functions that can be selected depend on the model.

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

# Specifications

## Ratings

| Item | Models | H7CX-A114□-N | H7CX-A11□-N | H7CX-A4□-N | H7CX-A□-N | H7CX-A4W□-N | H7CX-AW□-N/-AU□-N |
|---|---|---|---|---|---|---|---|
| Classification | | Preset counter | | | | | Preset counter/ tachometer |
| Configuration | | 1-stage preset counter, 1-stage preset counter with total counter (selectable)*1 | | | | 1-stage/2-stage preset counter, total and preset counter*1, batch counter, dual counter, and twin counter (selectable) | 1-stage/2-stage preset counter, total and preset counter*1, batch counter, dual counter, twin counter, and tachometer (selectable) |
| Ratings | Power supply voltage*2 | • 100 to 240 VAC, 50/60 Hz<br>• 24 VAC, 50/60 Hz or 12 to 24 VDC | | • 100 to 240 VAC, 50/60 Hz<br>• 12 to 24 VDC | | | • 100 to 240 VAC at 50/ 60 Hz<br>• 24 VAC at 50/60 Hz or 12 to 24 VDC<br>• 12 to 24 VDC |
| | Operating voltage fluctuation range | 85% to 110% of rated supply voltage (12 to 24 VDC: 90% to 110%) | | | | | |
| | Power consumption | Approx. 9.4 VA at 100 to 240 VAC, Approx. 7.2 VA/4.7 W at 24 VAC/12 to 24 VDC, Approx. 3.7 W at 12 to 24 VDC | | | | | |
| Mounting method | | Flush mounting or surface mounting | | Flush mounting | | | |
| External connections | | 11-pin socket | | Screw terminals | | | |
| Degree of protection | | IEC IP66, UL508 Type 4X (indoors) for panel surface only and only when Y92S-29 Waterproof Packing is used. | | | | | |
| Input signals | | CP1, CP2, reset, and total reset | | | | CP1, CP2, reset 1, and reset 2 | |
| Counter | Maximum counting speed | 30 Hz (minimum pulse width: 16.7 ms) or 10 kHz (minimum pulse width: 0.05 ms) (selectable) (ON/OFF ratio 1:1) *Common setting for CP1 and CP2 | | | | | |
| | Input mode | Increment, decrement, increment/decrement (UP/DOWN A (command input), UP/DOWN B (individual inputs), or UP/DOWN C (quadrature inputs)) | | | | | |
| | Output mode | N, F, C, R, K-1, P, Q, A, K-2, D, and L. | | | | N, F, C, R, K-1, P, Q, A, K-2, D, L, and H. | |
| | One-shot output time | 0.01 to 99.99 s | | | | | |
| | Reset system | External (minimum reset signal width: 1 ms or 20 ms, selectable), manual, and automatic reset (internal according to C, R, P, and Q mode operation) | | | | | |
| Tachometer | | Refer to the separate table for tachometer function ratings. | | | | | |
| Prescaling function | | Yes (0.001 to 9.999) | Yes (0.001 to 99.999) | Yes (0.001 to 9.999) | Yes (0.001 to 99.999) | Yes (0.001 to 9.999) | Yes (0.001 to 99.999) |
| Decimal point adjustment | | Yes (rightmost 3 digits) | | | | | |
| Sensor waiting time | | 290 ms max. (Control output is turned OFF and no input is accepted during sensor waiting time.) | | | | | |
| Input method | | No-voltage (NPN) input/voltage (PNP) input (switchable)<br>No-voltage inputs:<br>ON impedance: 1 kΩ max. (Leakage current: 12 mA at 0 Ω)<br>ON residual voltage: 3 V max.<br>OFF impedance: 100 kΩ min.<br>Voltage input:<br>High (logic) level: 4.5 to 30 VDC<br>Low (logic) level: 0 to 2 VDC (Input resistance: approx. 4.7 kΩ) | | | | | |
| External power supply | | 12 VDC (±10%), 100 mA (except for H7CX-A□D models) Refer to *Precautions for Correct Use* on page page 53 for details. | | | | | |
| Control output | | • 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)<br>• Transistor output: NPN open collector, 100 mA at 30 VDC, Residual voltage: 1.5 VDC max. (approx. 1 V), Leakage current: 0.1 mA max. | | | | | |
| Display*3 | | 7-segment, negative transmissive LCD<br>Character height<br>Count value: 12 mm (red)<br>Set value: 6 mm (green) | 7-segment, negative transmissive LCD<br>Character height<br>Count value: 10 mm (red)<br>Set value: 6 mm (green) | 7-segment, negative transmissive LCD<br>Character height<br>Count value: 12 mm (red, green, or orange selectable)<br>Set value: 6 mm (green) | 7-segment, negative transmissive LCD<br>Character height<br>Count value: 10 mm (red, green, or orange selectable)<br>Set value: 6 mm (green) | 7-segment, negative transmissive LCD<br>Character height<br>Count value: 12 mm (red, green, or orange selectable)<br>Set value: 6 mm (green) | 7-segment, negative transmissive LCD<br>Character height<br>Count value: 10 mm (red, green, or orange selectable)<br>Set value: 6 mm (green) |
| Digits | | 4 digits<br>–999 to 9999<br>(–3 digits to +4 digits) | 6 digits<br>–99999 to 999999<br>(–5 digits to +6 digits) | 4 digits<br>–999 to 9999<br>(–3 digits to +4 digits) | 6 digits<br>–99999 to 999999<br>(–5 digits to +6 digits) | 4 digits<br>–999 to 9999<br>(–3 digits to +4 digits) | 6 digits<br>–99999 to 999999<br>(–5 digits to +6 digits), tachometer: 0 to 999999 |
| Memory backup | | EEPROM (overwrites: 100,000 times min.) that can store data for 10 years min. | | | | | |
| Operating temperature range | | –10 to 55°C (–10 to 50°C if Counter/Tachometers are mounted side by side) (with no icing or condensation) | | | | | |
| Storage temperature range | | –25 to 70°C (with no icing or condensation) | | | | | |
| Operating humidity range | | 25% to 85% | | | | | |
| Case color | | Black (N1.5) (Optional Front Panels are available to change the Front Panel color to light gray or white.) | | | | | |
| Attachments | | --- | | Flush mounting adapter, waterproof packing, terminal cover | | | Flush mounting adapter, waterproof packing, terminal cover, label for DIP switch settings |

*1. 1-stage preset counter and total counter functionality.
*2. Do not use the output from an inverter as the power supply.The ripple must be 20% maximum for DC power.
*3. The display is lit only when the power is ON. Nothing is displayed when power is OFF.

## Tachometer Function Ratings

| Model / Item | H7CX-A114□-N<br>H7CX-A11□-N<br>H7CX-A4□-N<br>H7CX-A□-N<br>H7CX-A4W□-N | H7CX-AW□-N/-AU□-N | | | |
|---|---|---|---|---|---|
| Input mode | No tachometer functionality | Selectable from independent measurements for 1 or 2 inputs, differential input for 2 inputs, absolute ratio for 2 inputs, and error ratio for 2 inputs. | | | |
| Pulse measurement method | | Periodic measurement | | Pulse width measurement | |
| Maximum counting speed | | 30 Hz (minimum pulse width: 16.7 ms) | 1-input mode: 10 kHz (minimum pulse width: 0.05 ms) Other modes: 5 kHz (minimum pulse width: 0.1 ms) | 30 Hz (minimum pulse width: 16.7 ms) | 1-input mode: 10 kHz (minimum pulse width: 0.05 ms) Other modes: 5 kHz (minimum pulse width: 0.1 ms) |
| Minimum input signal width | | --- | --- | 30 ms*1 | 1-input mode: 0.2 ms Other modes: 0.4 ms* |
| Measuring ranges | | 0.001 to 30.00 Hz | 1-input mode: 0.001 to 10 kHz, Other modes: 0.01 to 5 kHz | 0.030 to 999999 s | 1-input mode: 0.0002 to 99999 s Other modes: 0.0004 to 99999 s |
| Sampling period | | 200 ms min. | 200 ms min. or continuous selectable (minimum interval of 10 ms) | Continuous (minimum interval of 10 ms) | |
| Measuring accuracy | | ±0.1% FS ±1 digit max. (at 23 ±5°C) | | | |
| Output mode | | Input mode:<br>Not 2-input independent measurement: HI-LO, AREA, HI-HI, LO-LO<br>2-input independent measurement: HI-HI, LO-LO | | | |
| Auto-zero time | | 0.1 to 999.9s | | | |
| Startup time | | 0.0 to 99.9s | | | |
| Averaging | | Simple averaging/moving averaging selectable, Processing: OFF, 2, 4, 8, or 16 times | | | |
| Hold input | | Minimum input signal width: 20 ms | | | |

* An input OFF time of at least 20 ms is required.

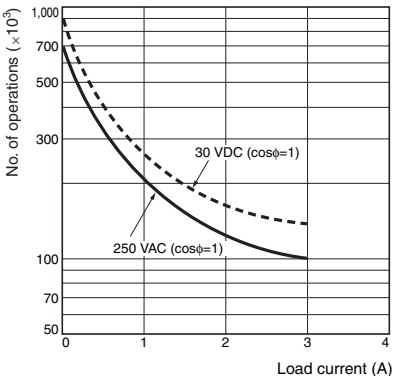
# Characteristics

| | | |
|---|---|---|
| Insulation resistance | | 100 MΩ min. (at 500 VDC) between current-carrying terminals and exposed non-current-carrying metal parts, and between non-continuous contacts |
| Dielectric strength | | 2,000 VAC, 50/60 Hz for 1 min between current-carrying metal parts and non-current-carrying metal parts<br>2,000 VAC, 50/60 Hz for 1 min between power supply and input circuit for all models except H7CX-□D□ (1,000 VAC for 24 VAC/12 to 24 VDC)<br>1,000 VAC (for H7CX-□SD□), 50/60 Hz for 1 min between control output, power supply, and input circuit (2,000 VAC for models other than H7CX-□SD□)<br>1,000 VAC, 50/60 Hz for 1 min between non-continuous contacts |
| Impulse withstand voltage | | 3.0 kV between power terminals (1.0 kV for models with 24 VAC/12 to 24 VDC or 12 to 24 VDC)<br>4.5 kV between current-carrying terminals and exposed non-current-carrying metal parts (1.5 kV for models with 24 VAC/12 to 24 VDC or 12 to 24 VDC) |
| Noise immunity | | ±1.5 kV between power terminals (±480 V for models with 12 to 24 VDC)<br>±600 V between input terminals<br>Square-wave noise by noise simulator (pulse width: 100 ns/1 μs, 1-ns rise) |
| Static immunity | | Malfunction: 8 kV<br>Destruction: 15 kV |
| Vibration resistance | Destruction | 10 to 55 Hz with 0.75-mm single amplitude each in three directions for 2 h each |
| | Malfunction | 10 to 55 Hz with 0.35-mm single amplitude each in three directions for 10 min each |
| Shock resistance | Destruction | 300 m/s² each in three directions |
| | Malfunction | 100 m/s² each in three directions |
| Life expectancy | | Mechanical: 10,000,000 operations min.<br>Electrical: 100,000 operations min. (3 A at 250 VAC, resistive load, ambient temperature condition: 23°C)* |
| Weight | | Approx. 130 g (Counter only) |

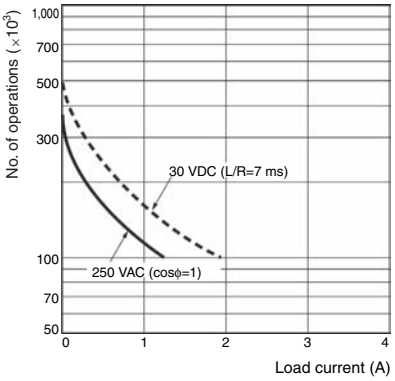
* Refer to the Life-test Curve.

## Life-test Curve (Reference Values)

### Resistive load




### Inductive load




A current of 0.15 A max. can be switched at 125 VDC (cosϕ=1) and current of 0.1 A max. can be switched if L/R=7 ms. In both cases, a life of 100,000 operations can be expected.

# Applicable Standards

| | | | |
|---|---|---|---|
| Approved safety standards | cULus (or cURus): UL508/CSA C22.2 No. 14 *1<br>EN 61010-1 (IEC 61010-1): Pollution degree 2/overvoltage category II<br>B300 PILOT DUTY<br>1/4 HP 120 VAC, 1/3 HP, 240 VAC, 3 A resistive load<br>VDE0106/P100 (finger protection) | | |
| EMC | (EMI) | EN61326-1 *2 | |
| | Emission Enclosure: | EN 55011 Group 1 class A | |
| | Emission AC mains: | EN 55011 Group 1 class A | |
| | (EMS) | EN61326-1 *2 | |
| | Immunity ESD: | EN 61000-4-2: | 4 kV contact discharge;<br>8 kV air discharge |
| | Immunity RF-interference: | EN 61000-4-3: | 10 V/m (Amplitude-modulated, 80 MHz to 1 GHz);<br>10 V/m (Pulse-modulated, 900 MHz ±5 MHz) |
| | Immunity Conducted Disturbance: | EN 61000-4-6: | 10 V (0.15 to 80 MHz) |
| | Immunity Burst: | EN 61000-4-4: | 2 kV power-line;<br>1 kV I/O signal-line |
| | Immunity Surge: | EN 61000-4-5: | 1 kV line to lines (power and output lines);<br>2 kV line to ground (power and output lines) |
| | Immunity Voltage Dip/Interruption: | EN 61000-4-11: | 0.5 cycle, 100% (rated voltage) |

*1. The following safety standards apply to models with sockets (H7CX-A11□ or H7CX-A114□).
cUL (Listing): Applicable when an OMRON P2CF(-E) Socket is used.
cUR (Recognition): Applicable when any other socket is used.
*2. Industrial electromagnetic environment (EN/IEC 61326-1 Table 2)

# I/O Functions

## Using as a Counter*1

| | | |
|---|---|---|
| **Inputs** | **CP1, CP2** | (1) In general (except for Dual Counter Mode)<br>• Reads counting signals.<br>• Increment, decrement, command, individual, and quadrature inputs accepted.<br>(2) When used as a dual counter or twin counter<br>• Reads CP1 count signals with CP1 input and CP2 count signals with CP2 input.<br>• Increment signals can be input. |
| | **Reset/reset 1** | (1) In general (except for Dual Counter Mode)<br>• Resets present value and outputs (OUT2 when using the batch counter)*2.<br>• Counting cannot be performed during reset/reset 1 input.<br>• Reset indicator is lit while reset input is ON.<br>(2) When used as a dual counter or twin counter.<br>• Resets the CP1 present value (to 0).<br>• Counting for CP1 input cannot be performed while the reset 1 input is ON.<br>• The reset indicator is lit while the reset 1 input is ON. |
| | **Total reset or reset 2** | The reset function depends on the selected configuration*3. |
| **Outputs** | **OUT1, OUT2** | Outputs signals according to the specified output mode when a set value is reached. |

*1. For information on operation of I/O functions, refer to pages page 22 to page 25.
*2. In increment mode or increment/decrement mode, the present value returns to 0; in decrement mode, the present value returns to the set value with 1-stage models, and returns to set value 2 with 2-stage models.
*3. Reset operates as described in the following table. (The reset indicator will not be lit.)

| Configuration | Reset operation |
|---|---|
| **1-stage/2-stage preset counter** | Does not operate (not used). |
| **Total and preset counter** | • Resets the total count value.<br>• The total count value is held at 0 while the total reset input is ON. |
| **Batch counter** | • Resets the batch count value and batch output (OUT1).<br>• The batch count value is held at 0 while the reset 2 input is ON. |
| **Dual counter** | • Resets the CP2 present value.<br>• Counting for CP2 input cannot be performed while the reset 2 input is ON. |
| **Twin counter** | • Resets the CP2 present value. |

• The following table shows the delay from when the reset signal is input until the output is turned OFF. (Reference values)

| Minimum reset signal width | Output delay time |
|---|---|
| 1 ms | 0.8 to 1.2 ms |
| 20 ms | 15 to 25 ms |

## Operating Procedures (Tachometer Function)

| | | |
|---|---|---|
| **Inputs** | **CP1, CP2** | Reads counting signals. (The CP2 input can be used when the input mode is not 1-input mode.) |
| | **Reset/reset 1** | • Holds the measurement value and outputs. (The reset 2 input can be used when the input mode is 2-input independent measurement.)<br>• Functions as a hold input.<br>The measurement value (displayed value) and the outputs are held while the RST Key on the front panel is pressed.<br>• The reset indicator is lit when the value is being held. |
| **Outputs** | **OUT1, OUT2** | Outputs signals according to the specified output mode when a set value is reached. |

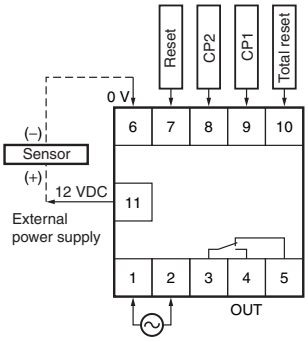
# Connections

## Terminal Arrangement

Confirm that the power supply meets specifications before use.

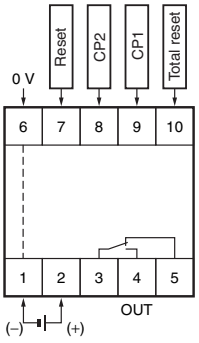
### H7CX-A-N/-A4-N

**1-stage Contact Output**




### H7CX-AD-N/-A4D-N

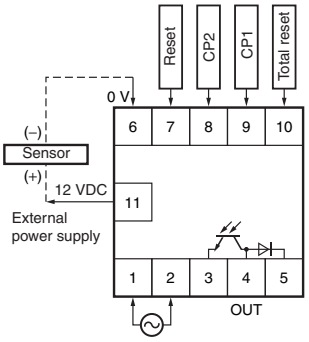
**1-stage Contact Output**




Terminals 1 and 6 are connected internally.

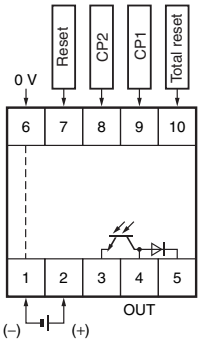
### H7CX-AS-N/-A4S-N

**1-stage Transistor Output**




### H7CX-ASD-N/-A4SD-N

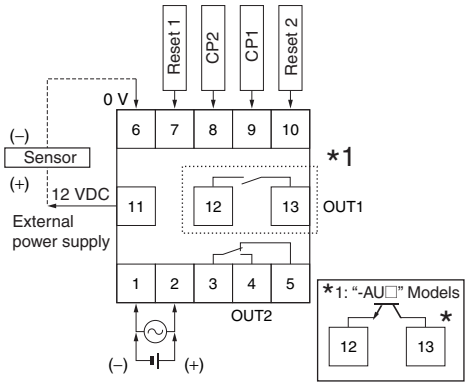
**1-stage Transistor Output**




Terminals 1 and 6 are connected internally.

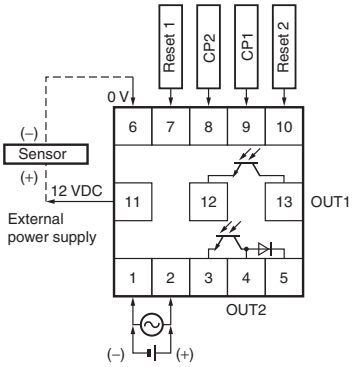
### H7CX-AW-N/-A4W-N/-AWD1-N/-AU-N/-AUD1-N

**2-stage Contact Output**



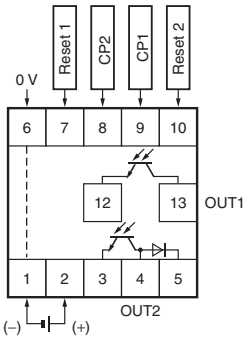

### H7CX-AWS-N/-AWSD1-N/-AUSD1-N

**2-stage Transistor Output**




### H7CX-AWSD-N/-A4WSD-N

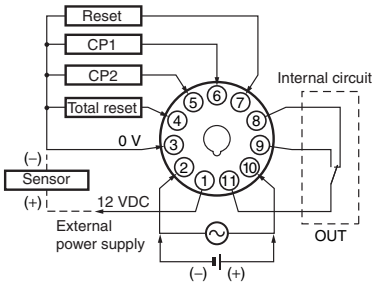
**2-stage Transistor Output**




Terminals 1 and 6 are connected internally.

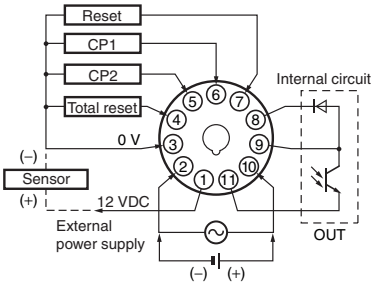
### H7CX-A11-N/-A114-N/-A11D1-N/-A114D1-N

**1-stage Contact Output**




### H7CX-A11S-N/-A114S-N/-A11SD1-N

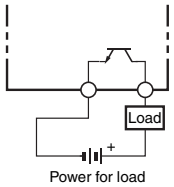
**1-stage Transistor Output**



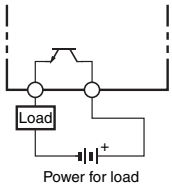

## Transistor Output

- The transistor output of the H7CX is isolated from the internal circuitry by a photocoupler, so the transistor output can be used as both NPN and PNP output.

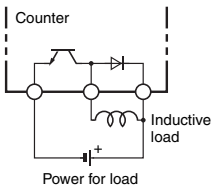
**NPN Output**



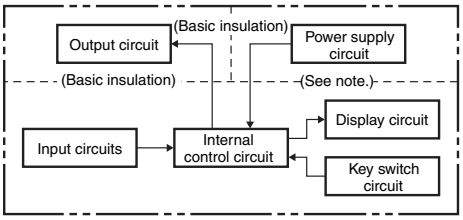

**PNP Output**




- The diode connected to the collector of the output transistor is used to absorb inverted voltage that is generated when an inductive load is connected to the H7CX.



## Block Diagram

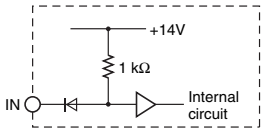



**Note:** All models except for H7CX-□D-N have basic insulation.

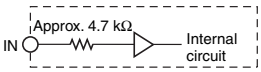
## Input Circuits

### CP1, CP2, Reset/Reset 1, and Total Reset/Reset 2 Input

**No-voltage Inputs (NPN Inputs)**




**Voltage Inputs (PNP Inputs)**

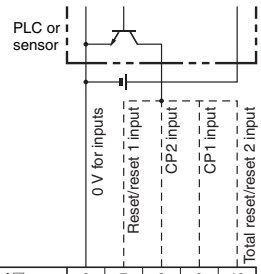



## Input Connections

The inputs of the H7CX-□-N are no-voltage (short-circuit or open) inputs or voltage inputs.

### No-voltage Inputs (NPN Inputs)

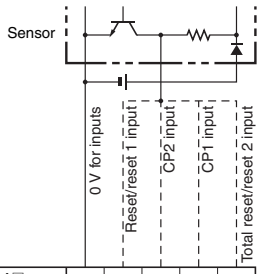
**Open Collector**




| | | | | | |
|---|---|---|---|---|---|
| H7CX-A□ | 6 | 7 | 8 | 9 | 10 |
| H7CX-A11□ | 3 | 7 | 5 | 6 | 4 |

**Note:** Operates with transistor ON.

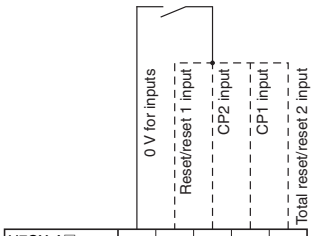
**Voltage Output**




| | | | | | |
|---|---|---|---|---|---|
| H7CX-A□ | 6 | 7 | 8 | 9 | 10 |
| H7CX-A11□ | 3 | 7 | 5 | 6 | 4 |

**Note:** Operates with transistor ON.

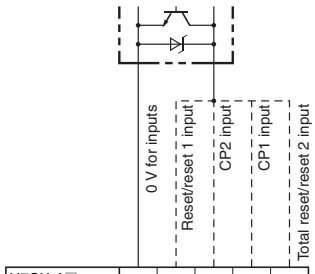
**Contact Input**




| | | | | | |
|---|---|---|---|---|---|
| H7CX-A□ | 6 | 7 | 8 | 9 | 10 |
| H7CX-A11□ | 3 | 7 | 5 | 6 | 4 |

**Note:** Operates with relay ON.

**DC Two-wire Sensor**




| | | | | | |
|---|---|---|---|---|---|
| H7CX-A□ | 6 | 7 | 8 | 9 | 10 |
| H7CX-A11□ | 3 | 7 | 5 | 6 | 4 |

**Note:** Operates with transistor ON.

#### No-voltage Input Signal Levels

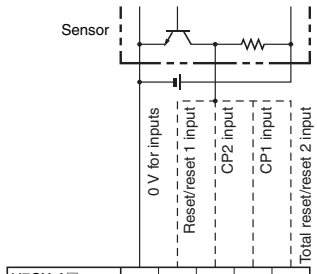
| | |
|---|---|
| **No-contact input** | Short-circuit level (transistor ON)<br>• Residual voltage: 3 V max.<br>• Impedance when ON: 1 kΩ max.<br>(The leakage current is approx. 12 mA when the impedance is 0 Ω.) |
| | Open level (transistor OFF)<br>• Impedance when OFF: 100 kΩ min. |
| **Contact input** | Use contacts which can adequately switch 5 mA at 10 V. |

**Note:** The DC voltage must be 30 VDC max.

| Applicable Two-wire Sensor |
|---|
| • Leakage current: 1.5 mA max.<br>• Switching capacity: 5 mA min.<br>• Residual voltage: 3 VDC max.<br>• Operating voltage: 10 VDC |

### Voltage Inputs (PNP Inputs)

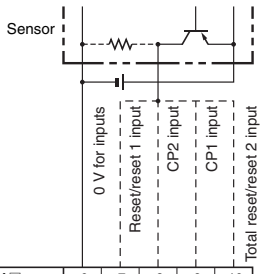
**No-contact Input (NPN Transistor)**




| | | | | | |
|---|---|---|---|---|---|
| H7CX-A□ | 6 | 7 | 8 | 9 | 10 |
| H7CX-A11□ | 3 | 7 | 5 | 6 | 4 |

**Note:** Operates with transistor OFF.

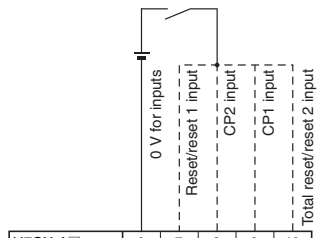
**No-contact Input (PNP Transistor)**




| | | | | | |
|---|---|---|---|---|---|
| H7CX-A□ | 6 | 7 | 8 | 9 | 10 |
| H7CX-A11□ | 3 | 7 | 5 | 6 | 4 |

**Note:** Operates with transistor ON.

**Contact Input**




| | | | | | |
|---|---|---|---|---|---|
| H7CX-A□ | 6 | 7 | 8 | 9 | 10 |
| H7CX-A11□ | 3 | 7 | 5 | 6 | 4 |

**Note:** Operates with relay ON.

#### Voltage Input Signal Levels

| |
|---|
| High level (input ON): 4.5 to 30 VDC |
| Low level (input OFF): 0 to 2 VDC |

**Note: 1.** The DC voltage must be 30 VDC max.
**2.** Input resistance: Approx. 4.7 kΩ

# Nomenclature

### Display Section

**1. Key Protect Indicator** (orange)

**2. Control Output Indicator** (orange)
OUT: (One-stage)
OUT: 1 2 (Two-stage)

**3. Reset Indicator** (orange)
(Lit when the reset input (1) or Reset Key is ON.)
Displayed only when the configuration selection mode is not tachometer mode.

**4. Total Count Indicator**
(Lit when the total count value is displayed.)

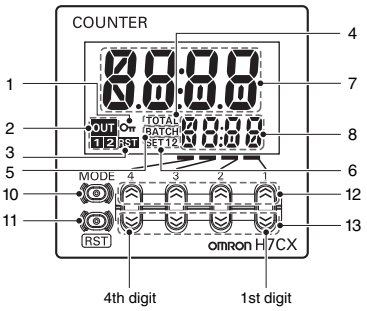
**5. Batch Indicator**
(Lit when the batch count value is displayed.)

**6. Set Value 1, 2 Stage Indicator**

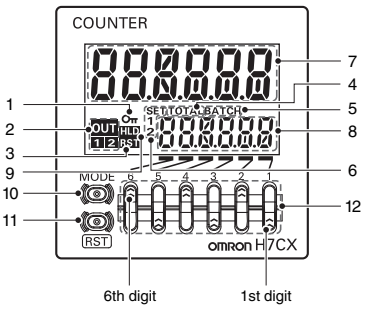
**7. Present Value (Main Display)**
(Character height: 12 mm (6-digit: 10 mm), red*)
* Characters on models with screw terminals (H7CX-A11□) can be switched between red, green, and orange.

**8. Set value (Sub-display)**
(Character height: 6 mm, green)

**9. Hold Display (orange)**
Displayed only when the configuration selection mode is not tachometer mode.



(Front view of 4-digit model)



(Front view of 6-digit model)

### Operation Keys

**10. Mode Key**
(Changes modes and setting items.)

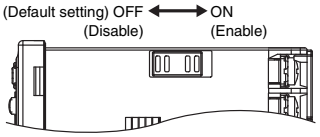
**11. Reset Key (See note.)**

**12. Up Keys 1 to 4**
(6-digit models: 1 to 6)

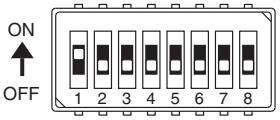
**13. Down Keys 1 to 4**

### Switches

**14. Key-protect Switch**

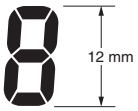



**15. DIP Switch**




**Model with 4 Digits**

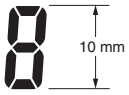
Character Size for Main Display



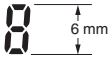

Character Size for Sub-display

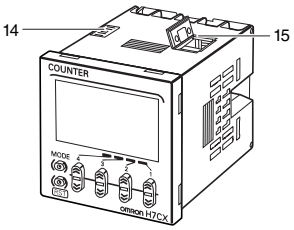
**Model with 6 Digits**

Character Size for Main Display




Character Size for Sub-display




**Note:** The reset functions depends on the selected configuration.

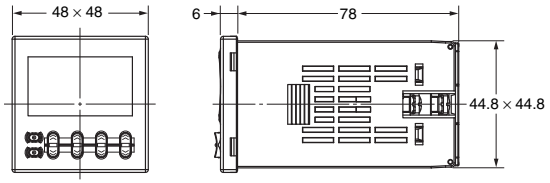
| Configuration | Reset operation |
|---|---|
| **1-stage/2-stage preset counter** | Resets the present value and outputs. |
| **Total and preset counter** | • Resets the present value and outputs.<br>• When the total count value is displayed, resets the present value, the total count value, and outputs. |
| **Batch counter** | • Resets the present value and OUT2.<br>• When the batch count value is displayed, resets the present value, the batch count value, and outputs. |
| **Dual counter** | Resets the CP1 present value, CP2 present value, dual count value, and outputs. |
| **Twin counter** | Resets the CP1 present value and output 1 when the CP1 present value is displayed.<br>Resets the CP2 present value and output 2 when the CP2 present value is displayed. |
| **Tachometer** | Holds the measurement value and outputs (hold function).<br>(When the input mode is 2-input independent measurement, the CP1 measurement value display will hold the CP1 measurement value and output 1 and the CP2 measurement value display will hold the CP2 measurement value and output 2.) |

# Dimensions

**(Unit: mm)**

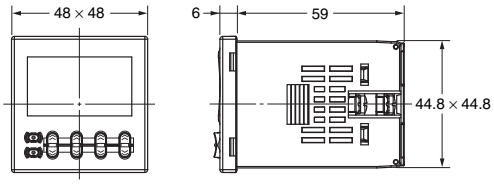
## Counters

**H7CX-A-N/-AS-N/-AW-N/-AWS-N/-AWD1-N/-AWSD1-N/-A4-N/-A4S-N/-A4W-N/-AU-N/-AUD1-N/-AUSD1-N**
**(Flush Mounting Models)**



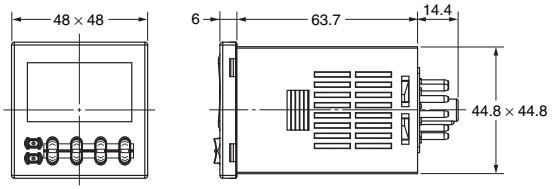

**Note:** M3.5 terminal screw (effective length: 6 mm)

### H7CX-AD-N/-ASD-N/-AWSD-N/-A4D-N/-A4SD-N/-A4WSD-N (Flush Mounting Models)



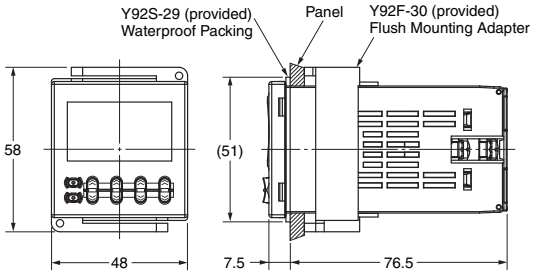

**Note:** M3.5 terminal screw (effective length: 6 mm)

### H7CX-A11-N/-A11S-N/-A11D1-N/-A11SD1-N/-A114-N/-A114S-N/-A114D1-N (Flush Mounting/Surface Mounting Models)

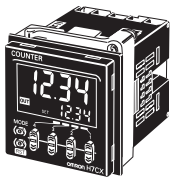


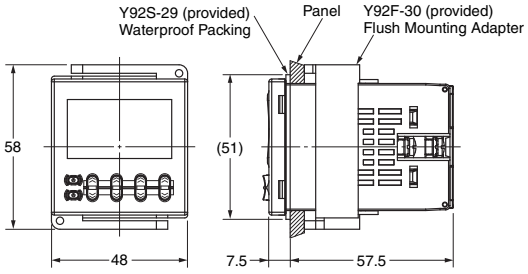

## Dimensions with Flush Mounting Adapter

### H7CX-A-N/-AS-N/-AW-N/-AWS-N/-AWD1-N/-AWSD1-N/-A4-N/-A4S-N/-A4W-N (Provided with Adapter and Waterproof Packing)

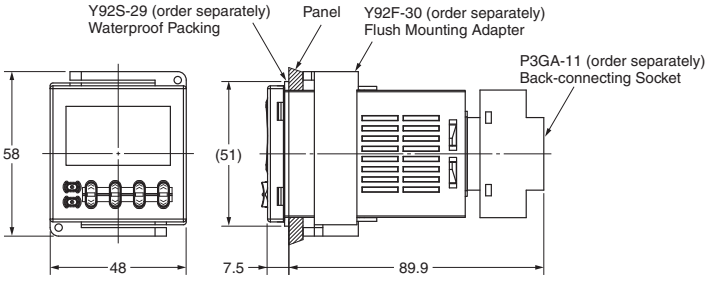



### H7CX-AD-N/-ASD-N/-AWSD-N/-A4D-N/-A4SD-N/-A4WSD-N (Provided with Adapter and Waterproof Packing)



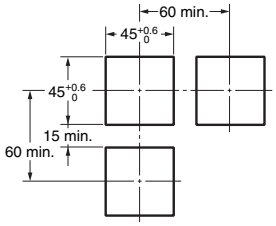



### H7CX-A11-N/-A11S-N/-A11D1-N/-A11SD1-N/-A114-N/-A114S-N/-A114D1-N (Adapter and Waterproof Packing Ordered Separately)




**Panel Cutouts**

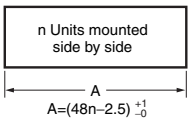
Panel cutouts are as shown below. (according to DIN43700).




**Note:** **1.** The mounting panel thickness should be 1 to 5 mm.

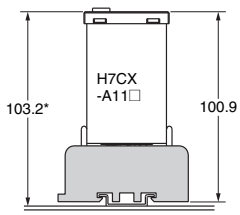
**2.** To allow easier operation, it is recommended that Adapters be mounted so that the gap between sides with hooks is at least 15 mm (i.e., with the panel cutouts separated by at least 60 mm).

**3.** It is possible to horizontally mount Timers side by side. Attach the Flush Mounting Adapters so that the surfaces without hooks are on the sides of the Timers. If they are mounted side-by-side, water-resistance will be lost.




With Y92A-48F1 attached.
A={48n–2.5+(n–1)×4} +1 –0
With Y92A-48 attached.
A=(51n–5.5) +1 –0

## Dimensions with Front Connecting Socket




P2CF-11(-E) Front Connecting Socket
(order separately)

* These dimensions depend on the kind of DIN Track. (Reference value)