

### 1/16 DIN, Single Preset Counter with Four-Digit LED Display

- Choose from UP, DOWN and reversible counting
- Count speed up to 5 K counts per second
- Wide-range AC or DC supply voltages
- Contact and solid-state output models available
- Memory protection circuit available on AC models
- Easy-to-read 8 mm-high LED display
- Panel-mounting adapter, sockets, and accessories available separately



## Ordering Information

### ■ COUNTERS

Add the supply voltage type to the part number when you order. For example, **H7CN-XHNM-AC**.

#### Contact Output Types

Memory protection is not available on contact output models with DC supply voltages.

| Input signal type                  |         | Contact and solid-state inputs for count and reset |                 |                  |                  |                     |                  |
|------------------------------------|---------|----------------------------------------------------|-----------------|------------------|------------------|---------------------|------------------|
| Operating mode                     |         | UP counting                                        | DOWN counting   | UP counting      | DOWN counting    | Reversible counting |                  |
|                                    |         |                                                    |                 |                  |                  | Command input       | Individual input |
| Backup power for memory protection |         | Not provided                                       |                 | Provided         |                  | Not provided        |                  |
| Output type                        |         | SPST-NO                                            |                 | SPDT             |                  | SPST-NO             |                  |
| Max. counting speed                | 30 cps  | <b>H7CN-XLN</b>                                    | <b>H7CN-YLN</b> | <b>H7CN-XLNM</b> | <b>H7CN-YLNM</b> | <b>H7CN-ALN</b>     | <b>H7CN-BLN</b>  |
|                                    | 5 kcps* | <b>H7CN-XHN</b>                                    | <b>H7CN-YHN</b> | <b>H7CN-XHNM</b> | <b>H7CN-YHNM</b> | <b>H7CN-AHN</b>     | <b>H7CN-BHN</b>  |
| Supply voltages                    | AC      | 100 to 240 VAC, 50/60 Hz                           |                 |                  |                  |                     |                  |
|                                    | DC      | 12 to 48 VDC, 20% max. ripple                      |                 |                  |                  |                     |                  |

\*Only the solid-state input signal is available when the maximum counting speed is 5 kcps.

#### Solid-State Output Types

| Input signal type                  |    | Contact and solid-state inputs for count and reset |                  |
|------------------------------------|----|----------------------------------------------------|------------------|
| Operating mode                     |    | UP counting                                        | DOWN counting    |
| Backup power for memory protection |    | Not provided                                       |                  |
| Output type                        |    | Open collector transistor                          |                  |
| Max. counting speed                |    | 5 kcps                                             |                  |
| Part number                        |    | <b>H7CN-XHNS</b>                                   | <b>H7CN-YHNS</b> |
| Supply voltages                    | AC | 100 to 240 VAC, 50/60 Hz                           |                  |
|                                    | DC | 12 to 48 VDC, 20% max. ripple                      |                  |

## ■ ACCESSORIES

| Description               |        |                                                                                                      | Part number |
|---------------------------|--------|------------------------------------------------------------------------------------------------------|-------------|
| Sockets                   | 11-pin | Bottom surface or track mounting, top screw terminals                                                | P2CF-11     |
|                           |        | Bottom surface or track mounting, top screw terminals, finger safe terminal conforms to VDE0106/P100 | P2CF-11-E   |
|                           |        | Back mounting, for use with Y92F-30 mounting adapter, bottom screw terminals                         | P3GA-11     |
|                           | 8-pin  | Bottom surface or track mounting, top screw terminals                                                | P2CF-08     |
|                           |        | Bottom surface or track mounting, top screw terminals, finger safe terminal conforms to VDE0106/P100 | P2CF-08-E   |
|                           |        | Back mounting, for use with Y92F-30 mounting adapter, bottom screw terminals                         | P3G-08      |
|                           |        | Terminal cover for P3G sockets, conforms to VDE0106/P100                                             | Y92A-48G    |
| Panel mounting adapter    |        | Fits behind panel, ideal for side-by-side installation. Use P3G□-□□ sockets                          | Y92F-30     |
| Battery for memory backup |        | Use with H7CN-□□□M counters                                                                          | Y92S-20     |
| Protective cover          |        | Hard plastic cover protects against dust, dirt, and water; not for use with panel covers             | Y92A-48B    |
|                           |        | Soft plastic cover protects against dust, dirt, and oil; not for use with panel covers               | Y92A-48D    |
| NEMA 4 cover              |        | Waterproof front cover                                                                               | Y92A-48N    |
| Mounting track            |        | DIN rail, 50 cm (1.64 ft) length; 7.3 mm thick                                                       | PFP-50N     |
|                           |        | DIN rail, 1 m (3.28 ft) length; 7.3 mm thick                                                         | PFP-100N    |
|                           |        | DIN rail, 1 m (3.28 ft) length; 16 mm thick                                                          | PFP-100N2   |
| End plate                 |        |                                                                                                      | PFP-M       |
| Spacer                    |        |                                                                                                      | PFP-S       |

## Specifications

### ■ GENERAL CAPABILITIES

| Model                | H7CN-□□N                                                                                                                                                                                                          | H7CN-□□NS                                                      |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|
| Classification       | Single preset counter                                                                                                                                                                                             |                                                                |
| Mounting             | Panel, track or surface                                                                                                                                                                                           |                                                                |
| External connections | 8-pin round sockets or 11-pin round sockets (-M types)                                                                                                                                                            |                                                                |
| Output modes         | Sustained output until reset                                                                                                                                                                                      |                                                                |
| Input modes          | UP (H7CN-X), DOWN (H7CN-Y), reversible with command input (H7CN-A), reversible with individual input (H7CN-B)                                                                                                     | UP (H7CN-X), DOWN (H7CN-Y)                                     |
| Reset system         | Power-OFF: 0.5 sec reset time (except H7CN-M types)<br>Reset time following power application: 0.05 sec<br>External reset and manual: 0.02 second reset time<br>Reset time following signal application: 0.05 sec |                                                                |
| Sensor power supply  | Not provided                                                                                                                                                                                                      |                                                                |
| Input signal         | Count and reset                                                                                                                                                                                                   |                                                                |
| Input method         | Contact<br>Impedance by short-circuiting contacts: 1 kΩ max.<br>Impedance by opening contacts: 100 kΩ min.                                                                                                        | Solid-state input<br>Residual voltage: 0.5 V max. (1 V actual) |
| Control outputs      | SPST-NO, 3 A, 250 VAC<br>SPDT, 3 A, 250 VAC for H7CN-M counters                                                                                                                                                   | Open collector transistor,<br>100 mA, 30 VDC max.              |
| Displays             | 7-segment LED count value display, 8 mm (0.3 in) high characters, and LED indicators for count up and reset                                                                                                       |                                                                |
| Digits               | 4 digits                                                                                                                                                                                                          |                                                                |
| Memory backup        | H7CN-M models have a memory protection circuit that protects against momentary power failures lasting up to 10 minutes. An optional Y92S-20 lithium 3 V battery can provide up to 5 years of memory retention.    |                                                                |

## RATINGS

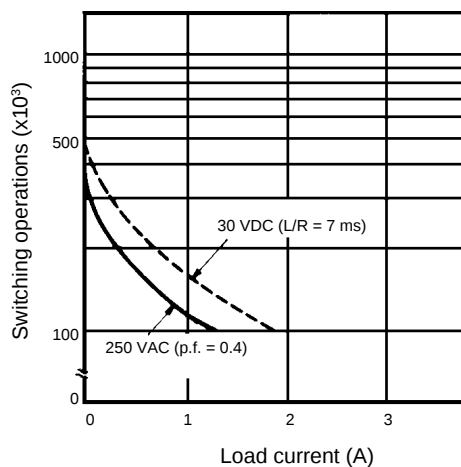
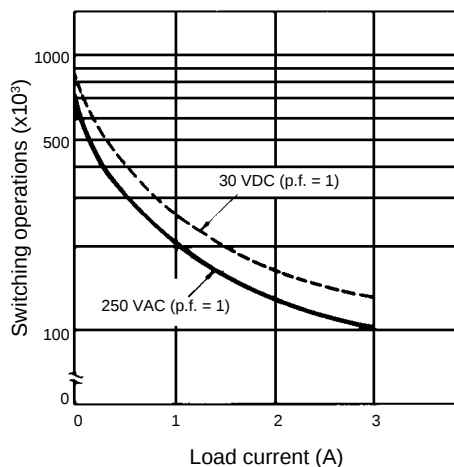
|                                 |                                                                                    |                                |
|---------------------------------|------------------------------------------------------------------------------------|--------------------------------|
| Supply voltage                  | AC                                                                                 | 100 to 240 VAC, 50/60 Hz       |
|                                 | DC                                                                                 | 12 to 48 VDC (20% max. ripple) |
| Operating voltage range         | 85 to 110% of rated voltage                                                        |                                |
| Power consumption               | Approx. 12 VA/2.5 W at 240 VAC, 50 Hz<br>Approx. 2.5 W at 48 VDC                   |                                |
| Max. counting speeds (CP1, CP2) | 30 cps with contact and solid-state inputs; 5,000 cps with solid-state inputs only |                                |
| Minimum pulse widths            | 16.7 ms at 30 cps (ON/OFF ratio of 1:1)<br>0.1 ms at 5 kcps (ON/OFF ratio of 1:1)  |                                |
| Approvals                       | UL / CSA                                                                           |                                |

## CHARACTERISTICS

|                               |                        |                                                                                                                                                     |
|-------------------------------|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| Ambient operating temperature |                        | -10° to 55°C (14° to 131°F)                                                                                                                         |
| Storage temperature           |                        | -25° to 65°C (-13° to 149°F)                                                                                                                        |
| Ambient operating humidity    |                        | 35 to 85% RH                                                                                                                                        |
| Insulation resistance         |                        | 100 mΩ minimum at 500 VDC                                                                                                                           |
| Dielectric strength           |                        | 2,000 VAC, 50/60 Hz for 1 minute between current-carrying terminal and exposed metal parts, between power supply circuit and control output circuit |
| Vibration                     | Mechanical durability  | 10 to 55 Hz, 0.75 mm (0.03 in) double amplitude                                                                                                     |
|                               | Malfunction durability | 10 to 55 Hz, 0.5 mm (0.02 in) double amplitude                                                                                                      |
| Shock                         | Mechanical durability  | Approx. 30 G                                                                                                                                        |
|                               | Malfunction durability | Approx. 10 G                                                                                                                                        |
| Service life                  | Mechanical             | 10 million operations minimum under no load at 1,800 operations/hour switching frequency                                                            |
|                               | Electrical             | 100,000 operations minimum under resistive load at 3 A, 250 VAC (p.f. = 1)                                                                          |
| Weight                        |                        | 150 g (5.3 oz.)                                                                                                                                     |

## Engineering Data

### ELECTRICAL SERVICE LIFE



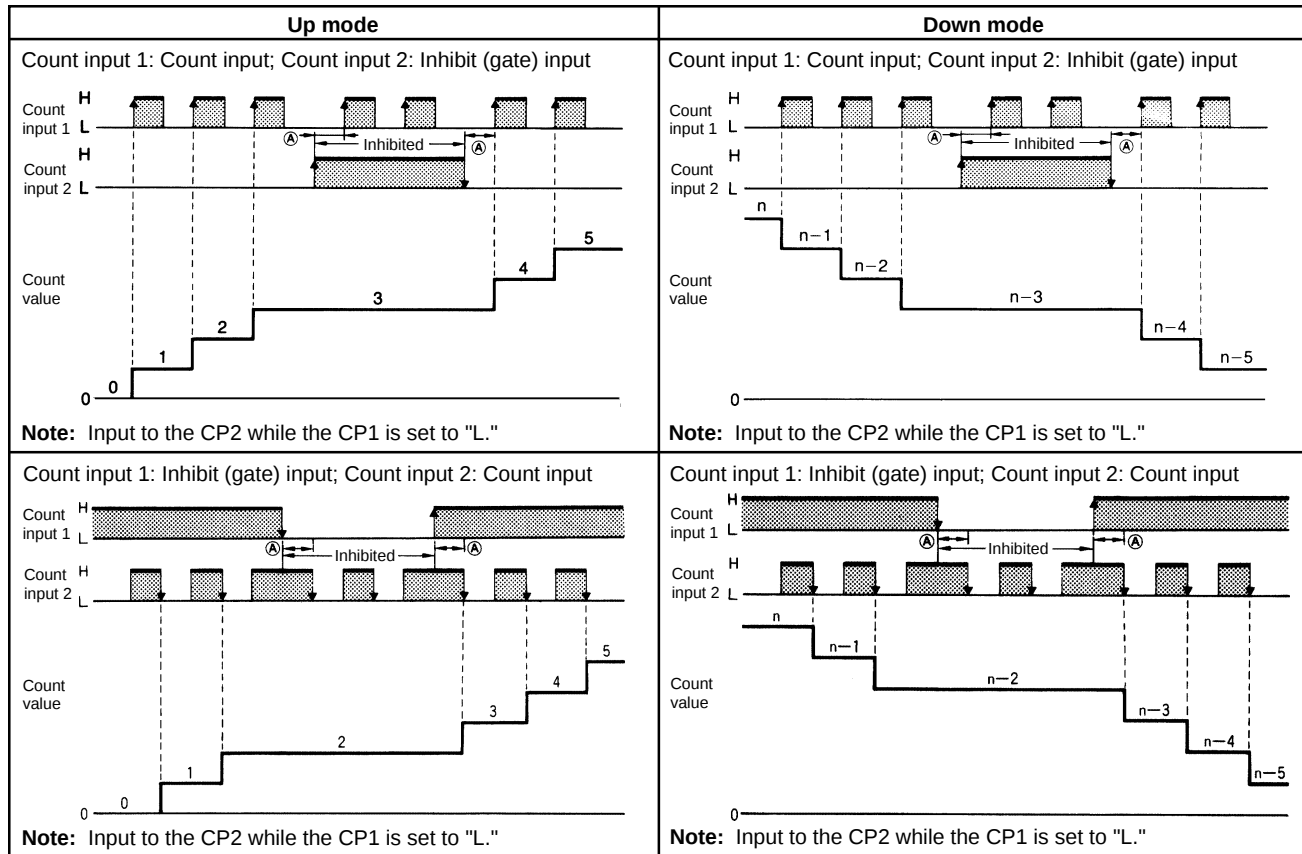
Note:  
The service life graphs apply to all relay output models. They do not apply to solid-state output models H7CN-XHNS or H7CN-YHNS.

# Timing Charts

## ■ INPUT MODE

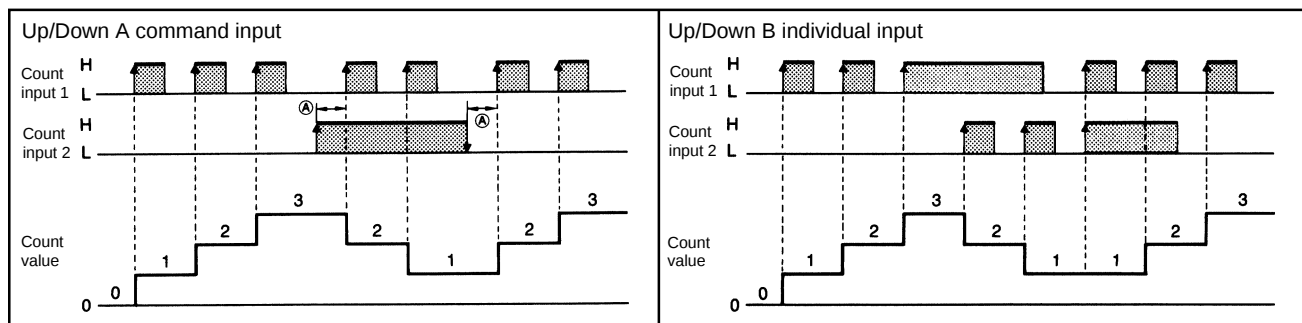
### Up/Down Selectable Type

**Note:** (A) must be more than the minimum signal width. If (A) is set shorter than the minimum signal width, the error of count  $\pm 1$  may occur.



### Up/Down Type

**Note:** (A) must be more than the minimum signal width. If (A) is set shorter than the minimum signal width, the error of count  $\pm 1$  may occur.

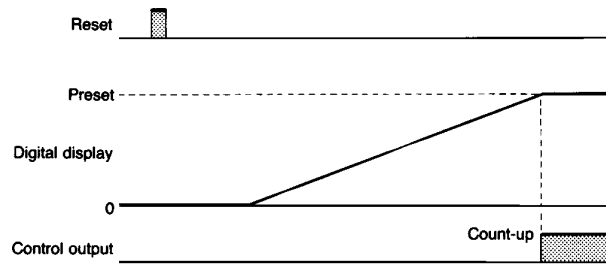


H: Short-circuit ON-time impedance; 1 k $\Omega$  max. Residual voltage; 0.5 V max.

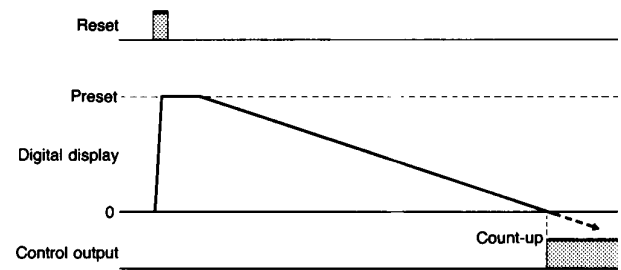
L: Open-circuit OFF-time impedance; 100 k $\Omega$  min.

## OUTPUT OPERATION

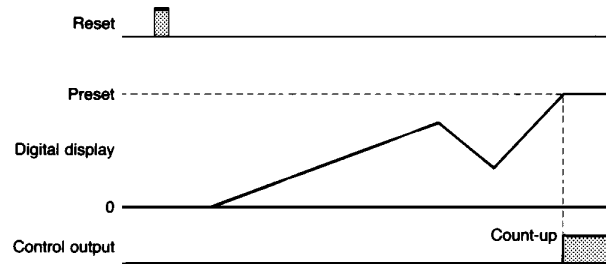
### UP Counters



### DOWN Counters



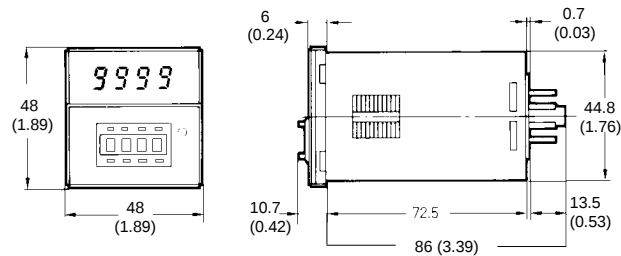
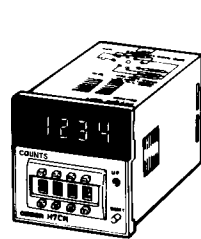
### Reversible Counters



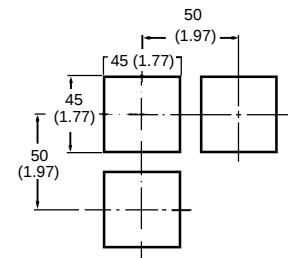
## Dimensions

Unit: mm (inch)

### COUNTERS



### Panel cutout

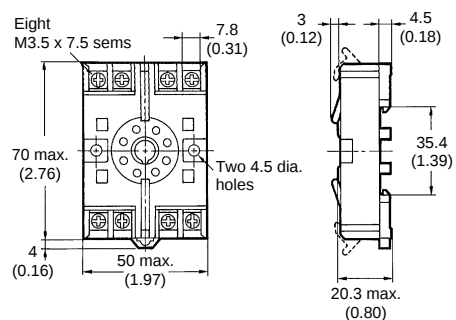
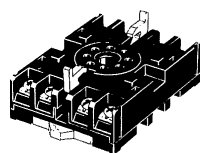


Note: Recommended panel thickness is 1 to 3.2 mm.

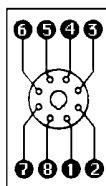
Panel cutout conforms to DIN 43700.

## ■ ACCESSORIES

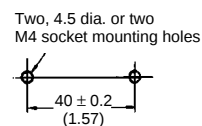
### P2CF-08 Track Mounting/Front Connecting Socket



Terminal Arrangement/  
Internal Connections  
(Top View)

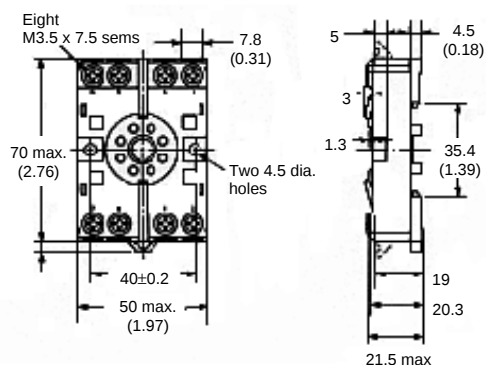


Surface Mounting  
Holes

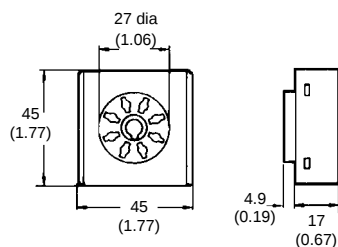
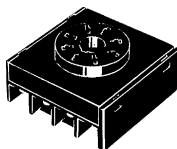


### P2CF-08E Finger Safe Terminal Type

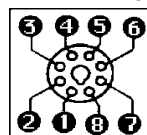
Conforming to VDE0106/P100



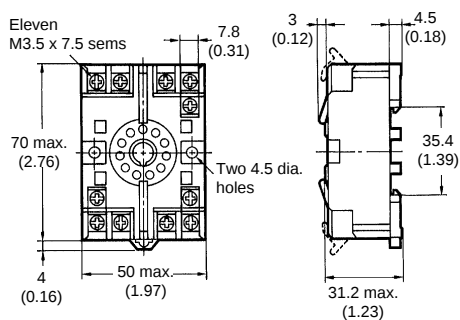
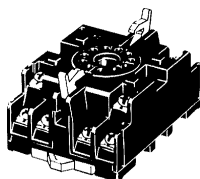
### P3G-08 Back Connecting Socket



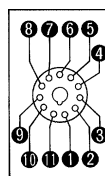
Terminal Arrangement



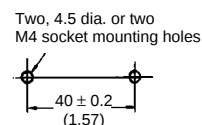
### P2CF-11 Track Mounting/Front Connecting Socket



Terminal Arrangement

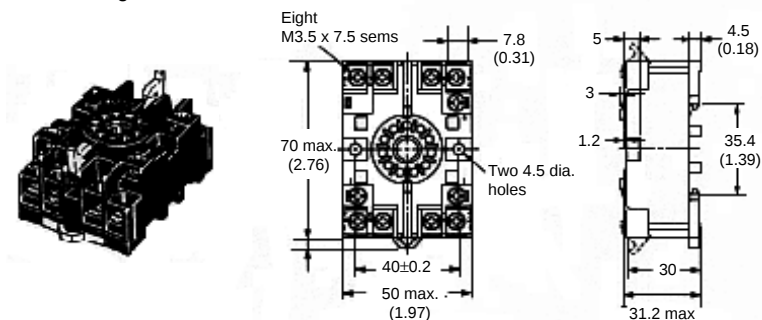
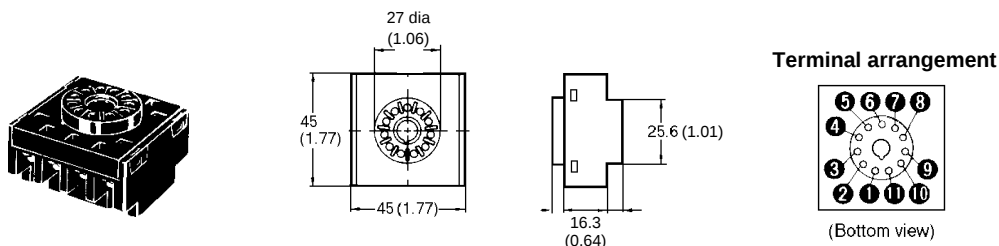


Surface Mounting Holes

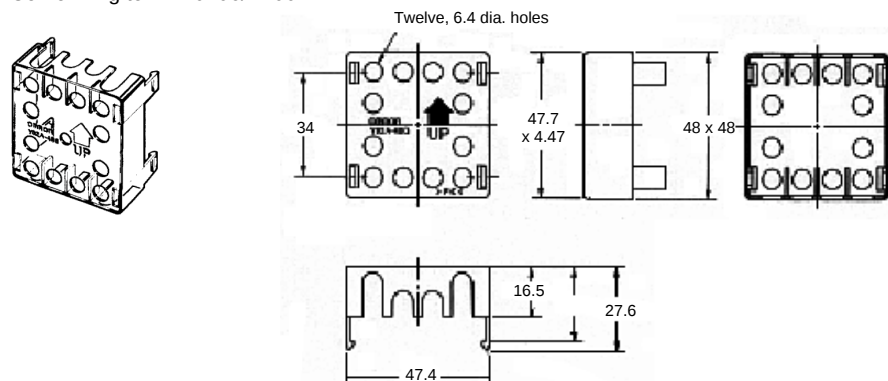


**P2CF-11-E Finger Safe Terminal Type**

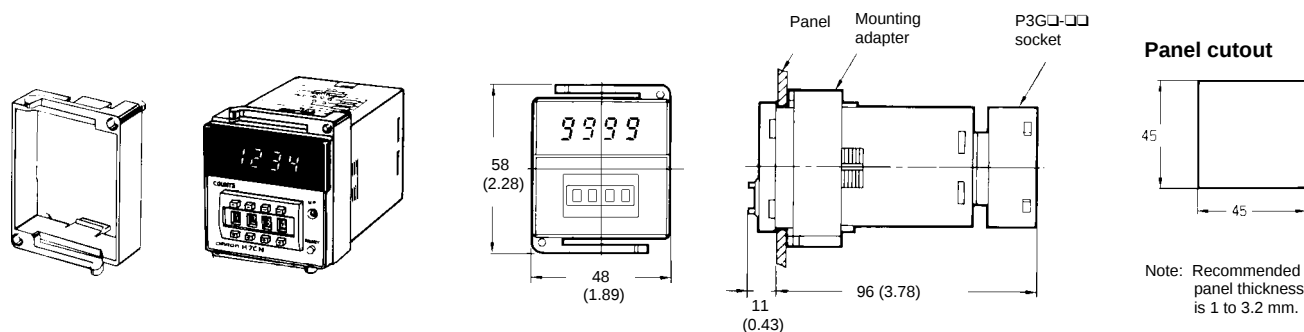
Conforming to VDE0106/P100

**P3GA-11 Back Mounting Socket****Y92A-48G Finger Safe Terminal for P3G(A)**

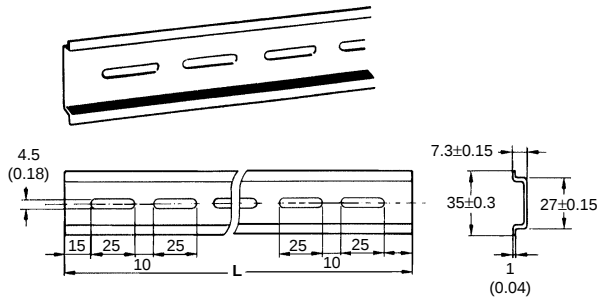
Conforming to VDE0106/P100

**Y92F-30 Panel Mounting Adapter**

Adapter installs behind the panel. It is ideal for side by side installation. Use P3GA-11 or P3G-08 sockets.



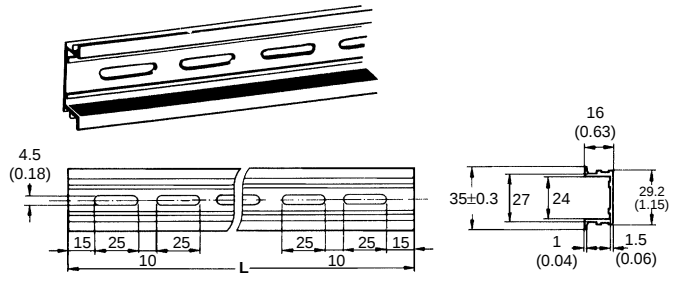
### PFP-100N, PFP-50N Mounting Track



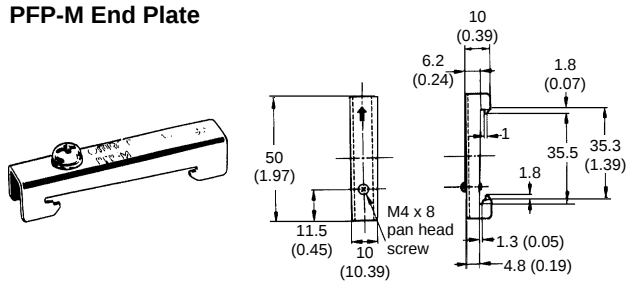
L: Length

|       |           |
|-------|-----------|
| 1 m   | PFP-100N  |
| 50 cm | PFP-50N   |
| 1 m   | PFP-100N2 |

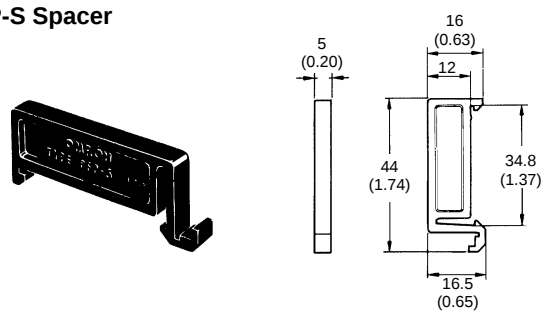
### PFP-100N2 Mounting Track



### PFP-M End Plate



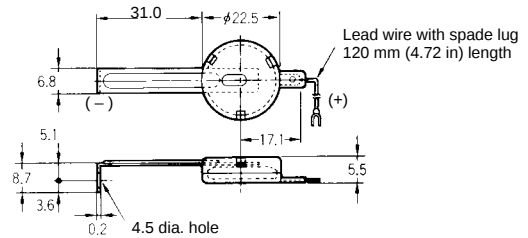
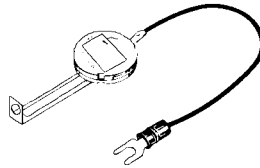
### PFP-S Spacer



## BATTERY FOR MEMORY BACK-UP

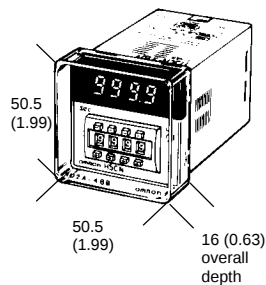
### Y92S-20 Battery

Use this battery with H7CN-□M counters with memory protection circuit. While the counter's built-in memory protection circuit can retain values for power failures lasting up to 10 minutes, the optional battery protects memory in case of a longer power outage. We recommend using the battery as a safeguard. Memory values can be retained for up to 5 years.

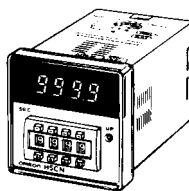


## PROTECTIVE COVERS

### Y92A-48B Hard Plastic Cover



### Y92A-48D Soft Plastic Cover

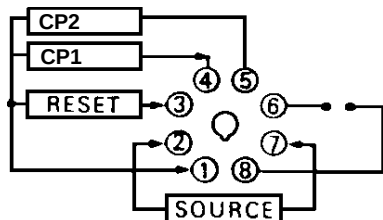


Hard plastic cover Y92A-48B and soft plastic cover Y92A-48D snap onto the front of the counter to protect against dirt and water. The Y92A-48B hard plastic cover prevents accidental resetting. Y92A-48D soft plastic cover fits snugly over the front and allows settings to be changed. These covers are intended for use in areas where unusual service conditions do not exist.

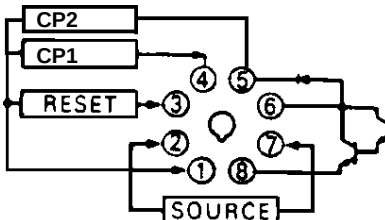
## Connections

|           | Input terminal number |       |     |     | Power supply terminal numbers |               | Output terminals |    |    | Memory |     |
|-----------|-----------------------|-------|-----|-----|-------------------------------|---------------|------------------|----|----|--------|-----|
|           | COM                   | Reset | CP1 | CP2 | AC (common), DC-              | AC (hot), DC+ | COM              | NC | NO | DC-    | DC+ |
| H7CN-□□N  | 1                     | 3     | 4   | 5   | 2                             | 7             | 8                | —  | 6  | —      | —   |
| H7CN-□□□S | 1                     | 3     | 4   | 5   | 2                             | 7             | 8                | —  | 6  | —      | —   |
| H7CN-□□□M | 3                     | 7     | 6   | 5   | 2                             | 10            | 11               | 8  | 9  | 1      | 4   |

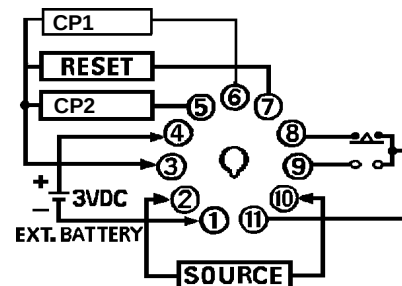
H7CN-□□N Counter



H7CN-□□□S Counter



H7CN-□□□M Counter



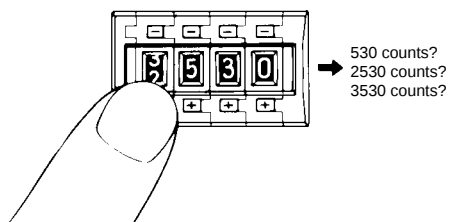
## Operation

### ■ SETTING THE COUNT PRESET

Use the four pushwheel switches on the front panel to set the desired count. Firmly push the switches to avoid having two numbers appear in the display window. This causes the operating time to drift widely.

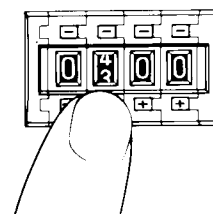
Do not change the setting while the counter is powered up. It may cause a momentary output to occur.

#### Undesirable settings



#### WARNING

Do not set all four digits to zero. This causes a momentary output to occur that may lead to accidental injury or damage.

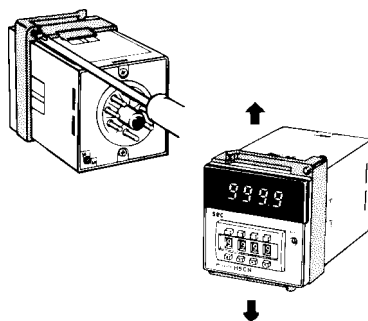


# Mounting

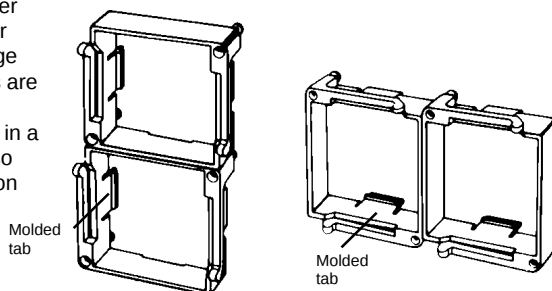
## ■ PANEL MOUNTING

### Using Y92F-30 Adapter

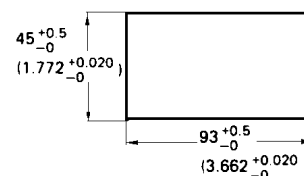
Insert the counter through the panel cutout. Push the Y92F-30 adapter from the rear of the counter as far forward toward the panel as possible. Push the P3G□-□□ socket onto the rear of the counter. Then wire the socket. Tighten the two retaining screws. To release the adapter, lift the tab at the rear of the adapter.



Several counters may be panel mounted close together using a Y92F-30 adapter as shown here. When mounting two or more counters in a vertical line, arrange the adapters so that their molded tabs are positioned on the right and left sides. When mounting two or more counters in a horizontal line, arrange the adapters so that their molded tabs are positioned on the top and bottom sides.



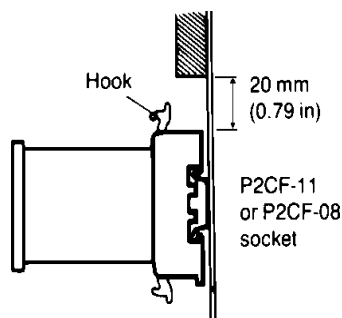
Panel cutout for side-by-side mounting of two counters



## P2CF-□□ Socket

### Mounting

The P2CF-□□ socket has two hooks that secure the counter to the socket. Be sure to allow at least 20 mm (0.79 in) clearance above and below the socket to gain access and to release the hooks for servicing and maintenance. Insert counter into the socket. Latch hooks. Then clip rear of the socket to the track. Push the bottom onto the track until the latch hooks securely.



### Removal

Pull the latch on the socket with a flat-blade screwdriver and remove the counter and socket as one unit.

**NOTE: DIMENSIONS ARE SHOWN IN MILLIMETERS. To convert millimeters to inches divide by 25.4.**

# OMRON

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