

Solid-state Timer H3CA

CSM_H3CA_DS_E_2_1

DIN-sized (48 x 48, 45 x 75 mm) Timer with Digital Setting and LCD Display

- Dual power supplies for free AC/DC.
- Eight operation modes selectable with one unit.
- Any desired time can be set digitally within a range from 0.1 seconds to 9,990 hrs.
- Four external signal inputs.
- ON/OFF indicator for control output and bar indicator for remaining time.
- Conforms to UL, CSA, and CE marking.



Ordering Information

Operation/resetting system	Operation mode	Terminal	Time-limit contact	Instantaneous contact	Mounting	
					Surface mounting/ track mounting	Flush mounting
Time-limit operation/self-resetting/external resetting (see note 2)	8 operation modes (selectable) (see note 3)	11-pin round socket	SPDT	---	H3CA-A	H3CA-A
		Front screw			H3CA-FA	---
Time-limit operation/self-resetting	ON-delay operation	8-pin round socket	DPDT	---	H3CA-8	H3CA-8
			SPDT	SPDT	H3CA-8H	H3CA-8H

- Note:**
1. Specify both the model number and supply voltage when ordering for the H3CA-8H and H3CA-8.
 2. The operation/resetting system depends on the selected operation mode. For details, see "Timing Chart".
 3. The 8 operation modes are as follows:

A: ON-delay operation	E: Interval operation
B: Repeat cycle operation	F: One-shot and flicker operation
C: Signal ON/OFF-delay operation (1)	G: Signal ON/OFF-delay operation (2)
D: Signal OFF-delay operation (1)	H: Signal OFF-delay operation (2)

Accessories (Order Separately)

Timer	Track mounted socket (See note.)	Back connecting socket	
		Solder terminal	Screw terminal
H3CA-A	P2CF-11	PL11	P3GA-11
H3CA-8H/H3CA-8	P2CF-08	PL08	P3G-08

Note: Track mounted socket can be used as a front connecting socket.

Specifications

Time Ranges

A desired time can be set within a range of 0.1 s to 9,990 hrs by combining the three thumbwheel switch modules for time setting and one module for time unit selection.

Time unit	0.1 s	1 s	0.1 min	1 min	0.1 hrs	1 hr	10 hrs
Time range	1 to 999 (3 digits)						
	<div style="display: flex; justify-content: center; gap: 5px;"> 0 0 1 0.1 S to 9 9 9 10 h </div>						

■ Ratings

Item	H3CA-A/H3CA-FA	H3CA-8	H3CA-8H
Rated supply voltage (See note 2.)	24 to 240 VAC (50/60 Hz), 12 to 240 VDC (permissible ripple: 20% max.)	100/110/120, 200/220/240 VAC, (50/60 Hz), 24 VDC, 110 VDC (permissible ripple: 20% max.) (See note 1.)	
Operating voltage range	90% to 110% of rated supply voltage	85% to 110% of rated supply voltage	
Power consumption	AC: approx. 4 VA DC: approx. 2 W	AC: approx. 10 VA/1 W DC: approx. 1 W	AC: approx. 10 VA/1.5 W DC: approx. 2 W
Control outputs	3 A at 250 VAC, resistive load ($\cos\phi = 1$)		

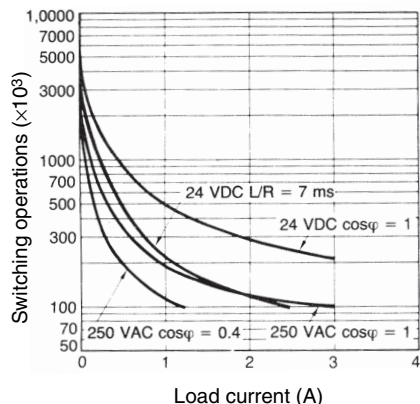
- Note:** 1. Single-phase, full-wave rectified power sources may be used for 24 to 240 VDC.
2. Refer to *Safety Precautions for All Times* when combining the Timer with an AC 2-wire proximity sensor.

■ Characteristics

Accuracy of operating time	±0.3% ±0.05 s		
Influence of voltage			
Influence of temperature			
Setting error	±0.5% ±0.05 s max.		
Reset time	H3CA-A/-FA: 0.5 s max. H3CA-8H/-8: 0.1 s max.		
Insulation resistance	100 M Ω min. (at 500 VDC)		
Dielectric strength	2,000 VAC, 50/60 Hz for 1 min (between current-carrying and non-current-carrying parts and between contact and control circuit) 1,000 VAC, 50/60 Hz for 1 min (between non-continuous contacts)		
Impulse withstand voltage	3 kV		
Vibration resistance	Destruction: 10 to 55 Hz with 0.75-mm double amplitude for 1 h each in three directions Malfunction: 10 to 55 Hz with 0.5-mm double amplitude for 10 min each in three directions		
Shock resistance	Destruction: 980 m/s ² Malfunction: 98 m/s ²		
Ambient temperature	Operating: -10°C to 55°C		
Ambient humidity	Operating: 35% to 85%		
Life expectancy	Mechanical: 10,000,000 operations min. (under no load at 1,800 operations/h) Electrical: 100,000 operations min. (3 A at 250 VAC, $\cos\phi = 1$ at 1,800 operations/h) See <i>Lift-test Curve</i> for more details.		
Approved standards	UL508, CSA C22.2 No. 14, LR, NK Conforms to EN61010-1.		
EMC	(EMI) Emission Enclosure: Emission AC mains: (EMS) Immunity ESD: Immunity RF-interference: Immunity Conducted Disturbance: Immunity Burst: Immunity Surge: Immunity Voltage Dip/Interruption	EN61326 EN55011 Group 1 class A EN55011 Group 1 class A EN61326 EN61000-4-2: EN61000-4-3: EN61000-4-6: EN61000-4-4: EN61000-4-5: EN61000-4-11:	4 kV contact discharge (level 2) 8 kV air discharge (level 3) 10 V/m (Amplitude-modulated, 80 MHz to 1 GHz) (level 3); 10 V/m (Pulse-modulated, 900 MHz ±5 MHz) (level 3) 10 V (0.15 to 80 MHz) (according to EN61000-6-2) 2 kV power-line (level 3); 1 kV I/O signal-line (level 4) 1 kV line to lines (power and output lines) (level 3); 2 kV line to ground (power and output lines) (level 3) 0.5 cycle, 100% (rated voltage)
Weight	H3CA-A: approx. 110 g H3CA-FA: approx. 190 g		

Engineering Data

Life-test Curve

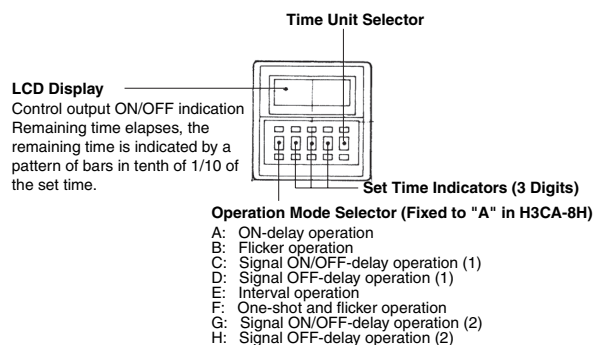


Reference: A maximum current of 0.15 A can be switched at 125 VDC (cosφ = 1).
 Maximum current of 0.1 A can be switched if L/R is 7 ms. In both cases, a life of 100,000 operations can be expected.

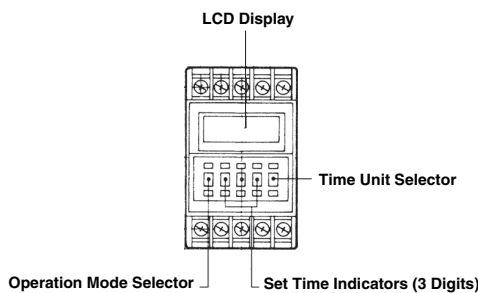
- Note:**
- The H3CA Series has been tested for the following: impulse voltages, noise (via noise simulator, for L loads, and for relay oscillation), and resistance to static electricity.
 - Minimum applicable load (P reference values):
 H3CA-A(FA), H3CA-8H: 100 mA at 5 VDC
 H3CA-8: 10 mA at 5 VDC

Nomenclature

H3CA-A/H3CA-8H



H3CA-FA



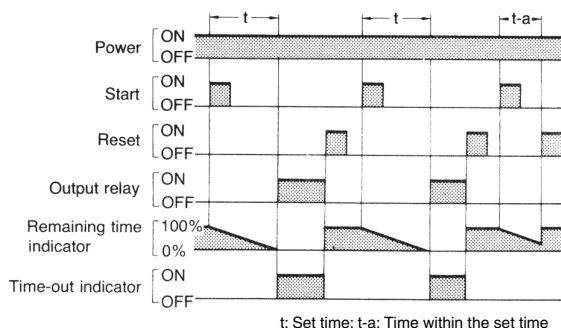
Operation

■ Timing Chart

H3CA-A (FA)

ON-delay Operation (A Mode)

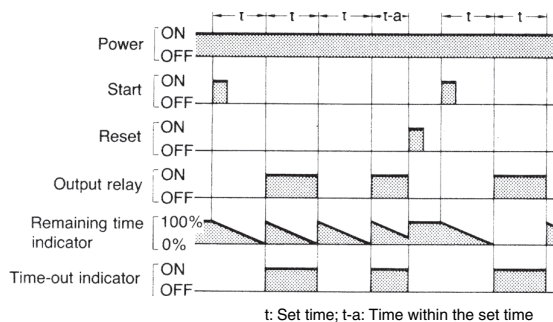
Signal Start



Note: The minimum signal input time is 0.05 s.

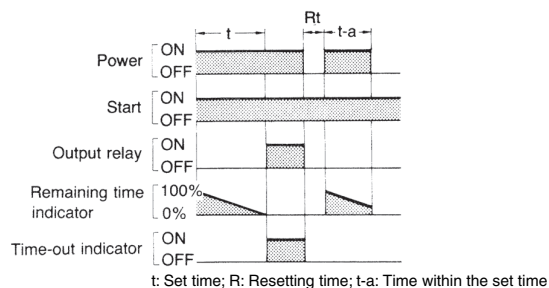
Flicker Operation (B Mode)

Signal Start

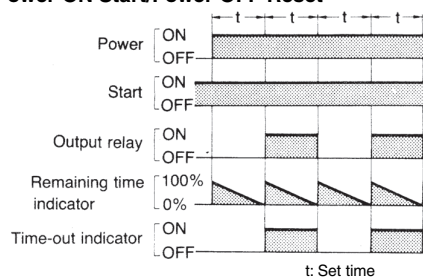


Note: The minimum signal input time is 0.05 s.

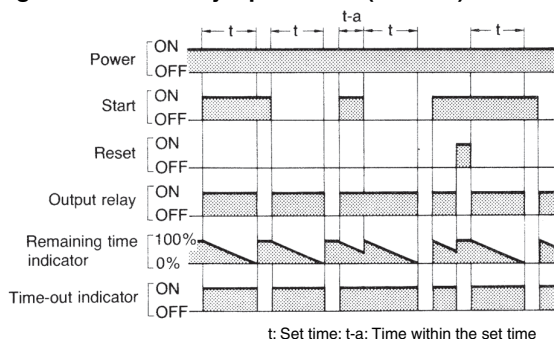
Power-ON Start/Power-OFF Reset



Power-ON Start/Power-OFF Reset

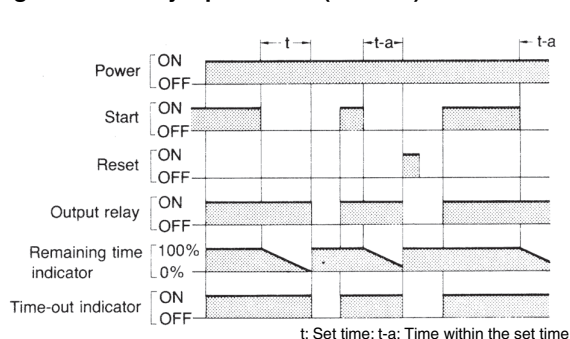


Signal ON/OFF-delay Operation 1 (C Mode)



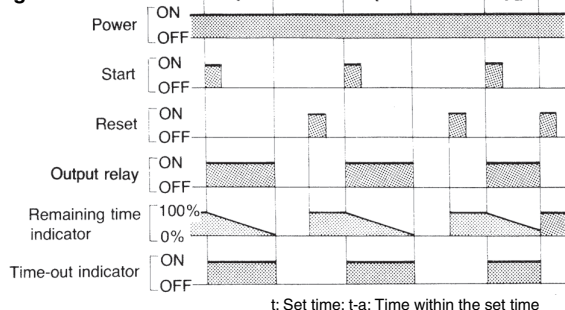
- Note:** 1. The minimum signal input time is 0.05 s.
2. Operation 1 refers to the version in which the output relay operates when the Start signal is ON.

Signal OFF-delay Operation 1 (D Mode)

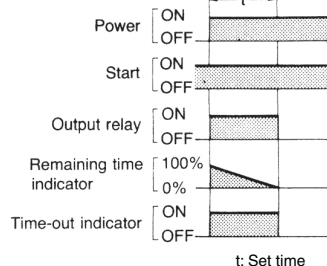


Interval Operation (E Mode)

Signal Start

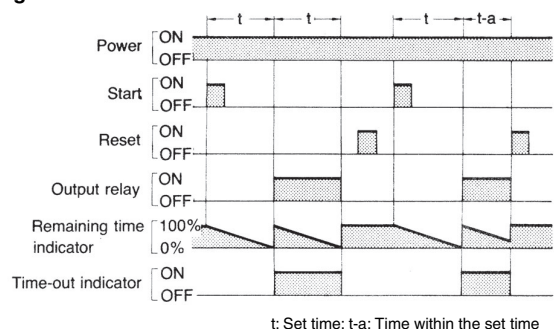


- Note:** The minimum signal input time is 0.05 s.



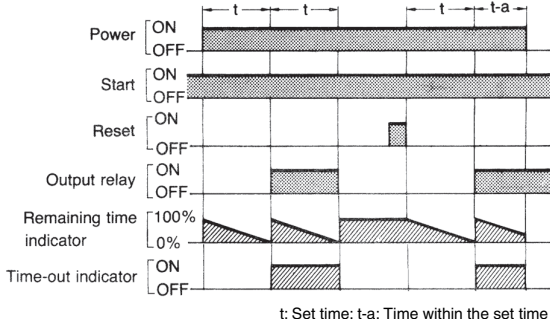
One-shot and Flicker Operation (F Mode)

Signal Start



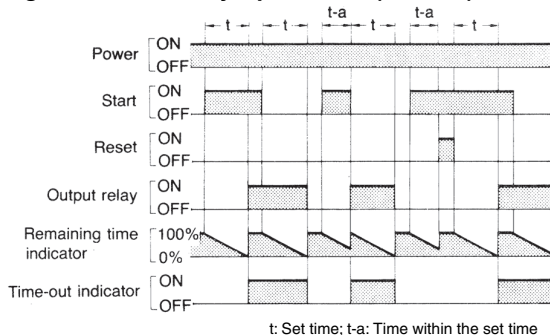
- Note:** The minimum signal input time is 0.05 s.

Power-ON Start/Power-OFF Reset



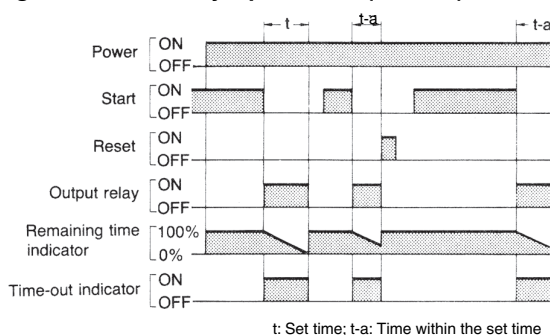
- Note:** The minimum signal input time is 0.05 s.

Signal ON/OFF-delay Operation 2 (G Mode)

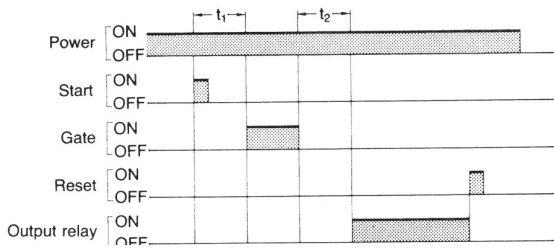


- Note:** 1. The minimum signal input time is 0.05 s.
2. Operation 2 refers to the version in which the output relay does not operate when the Start signal is ON.

Signal ON/OFF-delay Operation 2 (H Mode)



How to Use Gate Signal Input

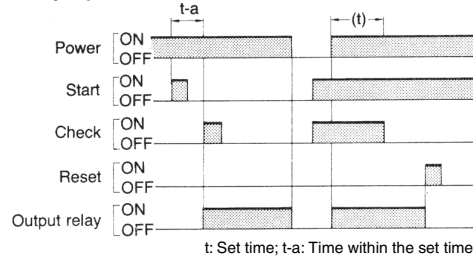


- Note:**
1. This timing chart indicates the gate input in operation mode A (ON-delay operation).
 2. The set time is the sum of t_1 and t_2 .

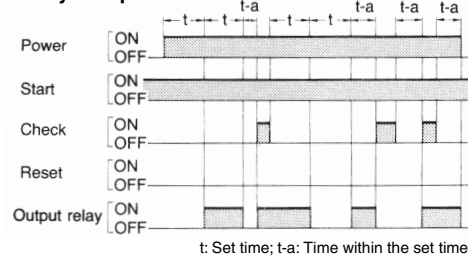
How to Use Check Signal Input

If a check signal is input to the timer during the lapse of a set time, the remaining set time will become 0 and the timer will enter the next control state. Also, while a check signal is being input, the elapsed time measurement of the set time is not performed.

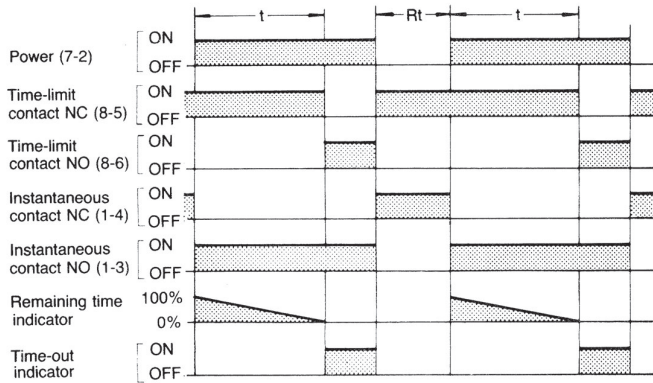
ON-delay Operation



Repeat Cycle Operation



H3CA-8H

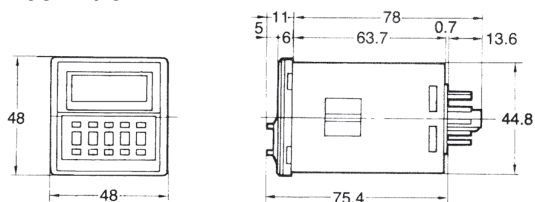


Dimensions

Note: All units are in millimeters unless otherwise indicated.

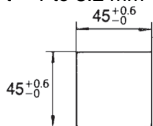
Timers

H3CA-A/-8H

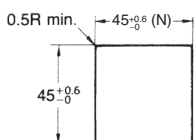


Panel Cutouts

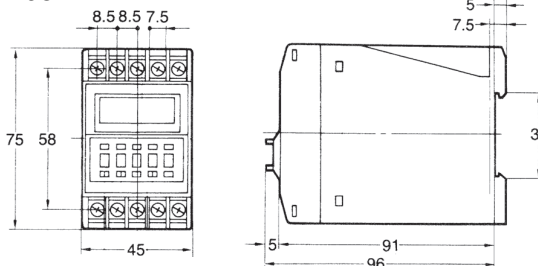
When mounting a single unit
t = 1 to 3.2 mm



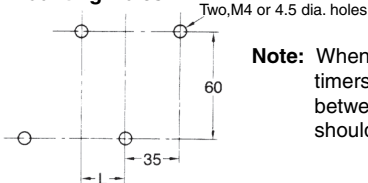
Horizontally connecting n units
No front cover:
 $N = (48n - 2.5) + 1/0$
With front cover:
 $N = \{48n - 2.5 + (n - 1) \times 3\} + 1/0$



H3CA-FA



Mounting Holes

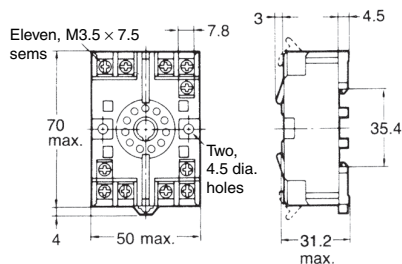


Note: When mounting two or more timers in line, dimension L between two adjacent timers should be 10 mm min.

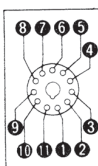
Accessories (Order Separately)

Track Mounted Front Connecting Socket

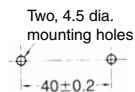
P2CF-11



Terminal Arrangement (Top View)

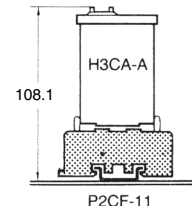


Mounting Holes

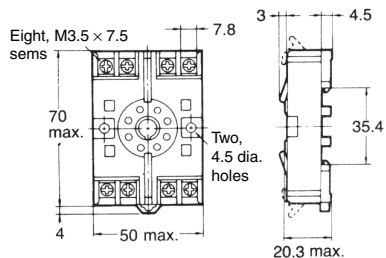


Note: P2CF-11 can be used as a front connecting socket.

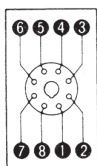
Mounting Height of Timer with Socket



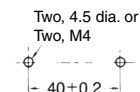
P2CF-08



Terminal Arrangement (Top View)

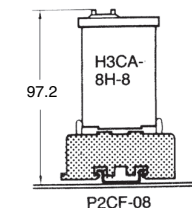


Mounting Holes



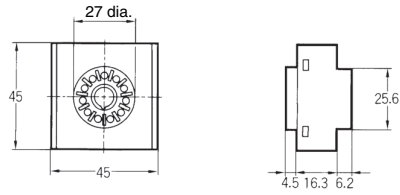
Note: P2CF-08 can be used as a front connecting socket.

Mounting Height of Timer with Socket

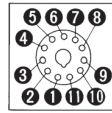


Back Connecting Socket

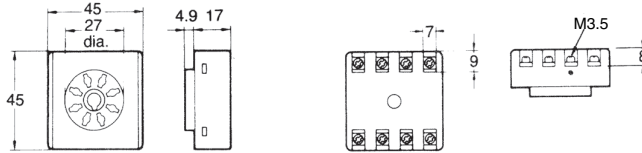
P3GA-11



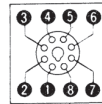
Terminal Arrangement (Bottom View)



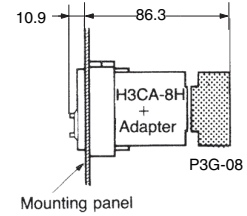
P3G-08



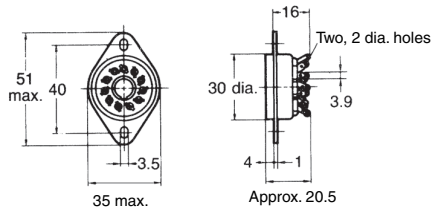
Terminal Arrangement (Bottom View)



Mounting Height of Timer with Socket



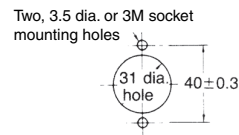
PL11



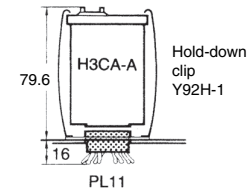
Terminal Arrangement (Bottom View)



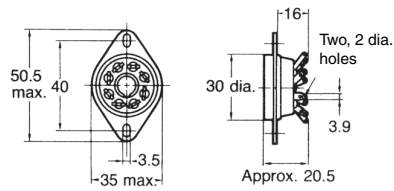
Mounting Holes



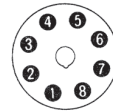
Mounting Height of Timer with Socket



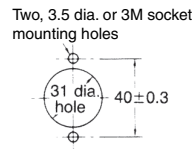
PL08



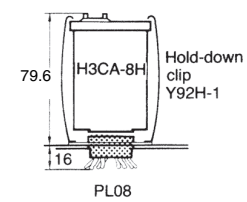
Terminal Arrangement (Bottom View)



Mounting Holes

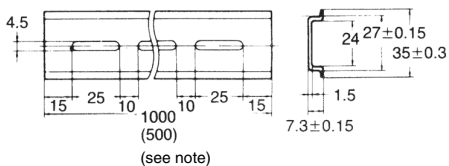


Mounting Height of Timer with Socket



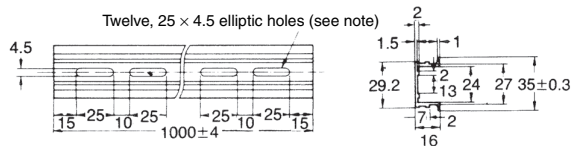
Mounting Track (Meets DIN EN50022)

PFP-100N/PFP-50N



Note: This dimension applied to PFP-50N.

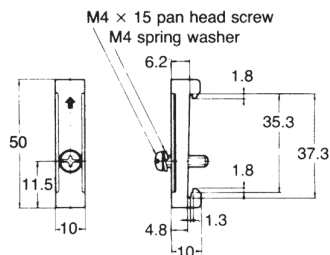
PFP-100N2



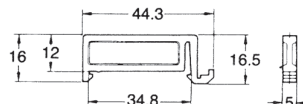
Note: A total of 12-25 × 4.5 elliptic holes are provided with 6 holes cut from each rail end at a pitch of 10 mm between holes.

End Plate

PFP-M

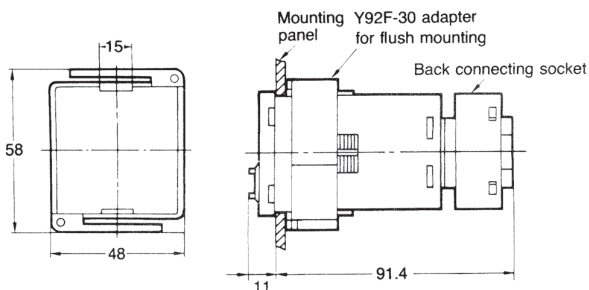


PFP-S



Adapter for Flush Mounting

Y92F-30



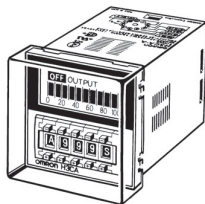
Note: Pay attention to the orientation of the adapter when mounting two or more timers in a vertical or horizontal line.

Protective Cover

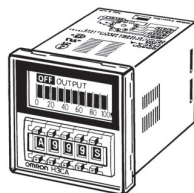
Y92A-48B/Y92A-48D

The protective cover protects the front panel, particularly the time setting section, against dust, dirt and water drip, as well as prevents the set value from being altered due to accidental contact with the time setting knob.

Y92A-48B Hard Plastic Cover



Y92A-48D Soft PVC Cover

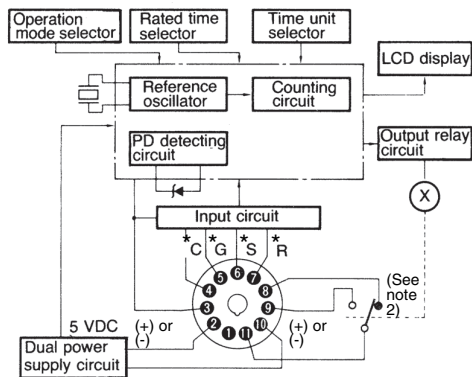


Note: The Y92A-48B Protective Cover is made of a hard plastic and therefore, must be removed to change the timer set value. However, since the Y92A-48D Protective Cover is made of PVC, the set value can be altered by pressing on the surface of the cover. It may be, however, difficult to make setting changes of the Timer with the Y92A-48B Protective Cover attached, which must be taken into consideration before using the Y92A-48B Protective Cover. When attaching the Y92A-48A to the Timer to be panel-mounted, use the Y92F-30 Mounting Adapter along with the Timer. The Protective Cover cannot be, however, used for the H3CA-FA Series.

Installation

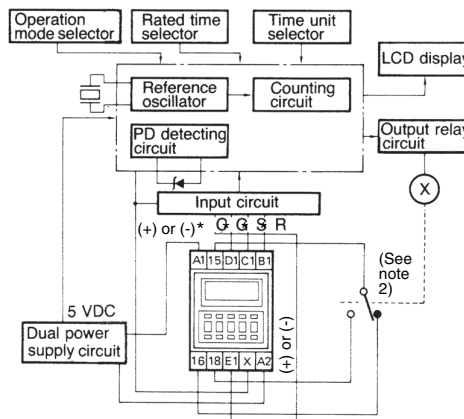
Terminal Arrangement

H3CA-A



- Note:** 1. *C: Check: 3-4
 *G: Gate: 3-5
 *S: Start: 3-6
 *R: Reset: 3-7
2. Conventional time-limit contacts are symbolized as . However, the contacts of H3CA-A are symbolized as because timer has 8 operation modes.

H3CA-FA

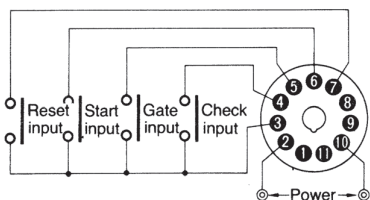


- Note:** 1. *C: Check: X-E1
 *G: Gate: X-D1
 *S: Start: X-C1
 *R: Reset: X-B1
2. Conventional time-limit contacts are symbolized as . However, the contacts of H3CA-FA are symbolized as because timer has 8 operation modes.

Input Connections

Signal Inputs

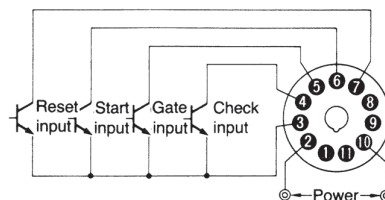
Connect the start input contact between terminals ③ and ⑥, the reset input contact between terminals ③ and ⑦, the gate input contact between terminals ③ and ⑤, and the check input contact between terminals ③ and ④.



For each signal input contact, use a gold-plated contacts with high reliability. Be sure that these input signals satisfy the following requirements: a resistance of 1 kΩ (max.) and a residual voltage of 1 V (max.) when the contact is made.

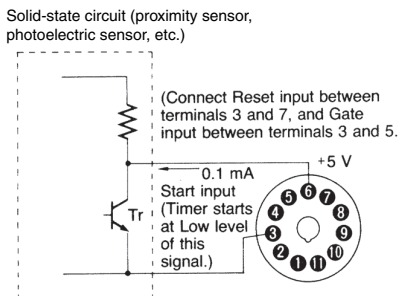
Solid-state Signal Inputs

Connect the start input transistor between terminals ③ and ⑥, the reset input transistor between terminals ③ and ⑦, the gate input transistor between terminals ③ and ⑤, and the check input transistor between terminals ③ and ④.



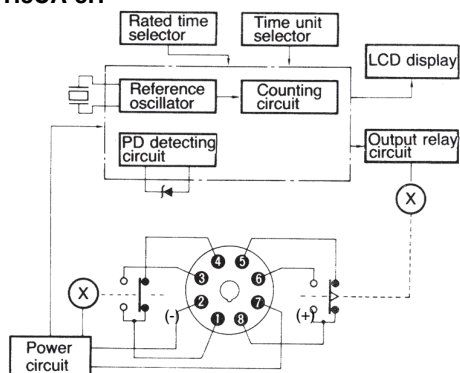
For signal input, use an open collector type transistor with characteristics: $V_{CE0} = 20 \text{ V min.}$, $V_{CE(S)} = 1 \text{ V max.}$, $I_C = 50 \text{ mA min.}$ and $I_{CBO} = 0.5 \mu\text{A max.}$ In addition, be sure that the input signals satisfy the following requirements: a resistance of 1 kΩ (max.) and a residual voltage of 1 V (max.) when the transistor is ON, and a resistance of 200 kΩ (min.) when the transistor is OFF.

From a solid-state circuit (proximity sensor, photoelectric sensor, or the like) with rated power supply voltage ranging from 6 to 30 VDC, input signals can also be applied by other than an open collector type transistor as shown in the following diagram. The input signal from a solid-state circuit is applied when output transistor Tr turns ON. In terms of signal voltage, the signal is input when it goes from a high to low level. Again, the residual voltage should be 1 V (max.) when the transistor is ON. As the current output from the timer to Tr is approximately 0.1 mA, this connection is possible provided the residual voltage is kept to a maximum of 1 V.

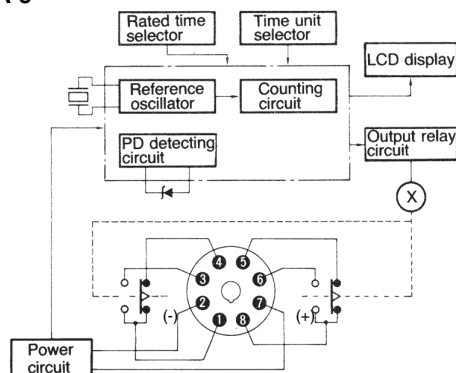


Note: Except for the power supply circuitry, avoid the laying of input signal wires in parallel or in the same conduit with high-tension or power lines. It is recommended to use shielded wires or wiring with independent metal conduits for the shortest possible distance.

H3CA-8H



H3CA-8

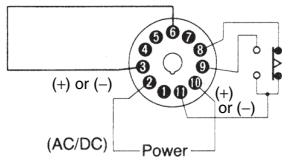
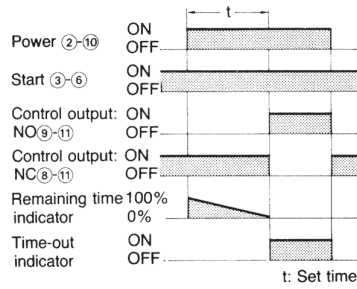


Application Examples

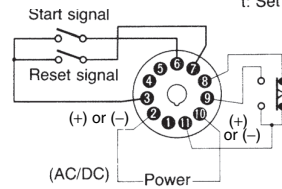
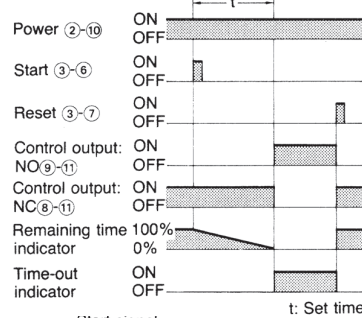
Standard type H3CA is used for the following application examples. In the schematic diagrams, each thick line indicates the wiring necessary for selecting the desired operation mode.

ON-delay Operation (A Mode)

Power-ON Start/Power-OFF Reset

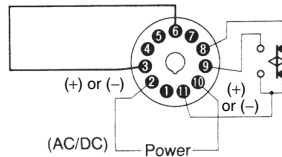
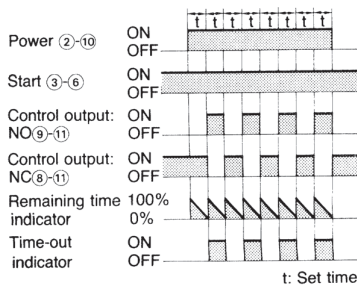


Signal Start/Signal Reset

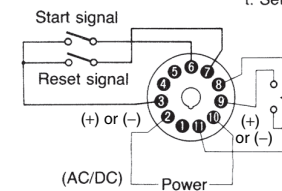
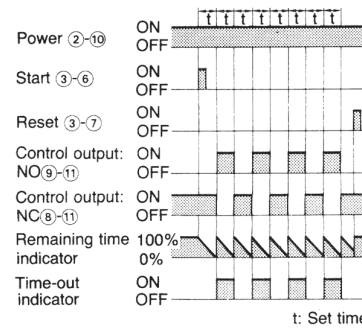


Flicker Operation (B Mode)

Power-ON Start/Power-OFF Reset

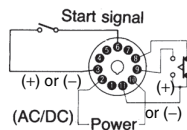
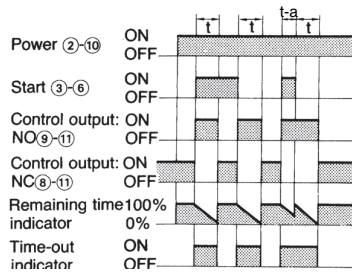


Signal Start/Signal Reset



Signal ON/OFF-delay Operation 1 (C Mode)

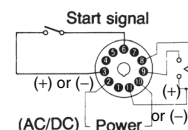
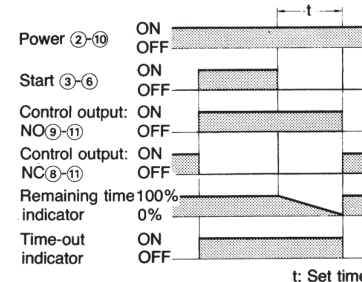
Signal ON/OFF-start/Instantaneous Operation/Time-limit Reset



t: Set time, t-a: Time within the set time

Signal OFF-delay Operation 1 (D Mode)

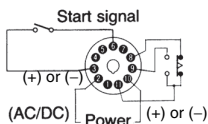
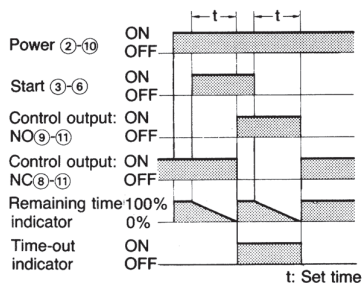
Signal Start/Instantaneous Operation/Time-limit Reset



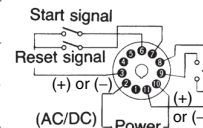
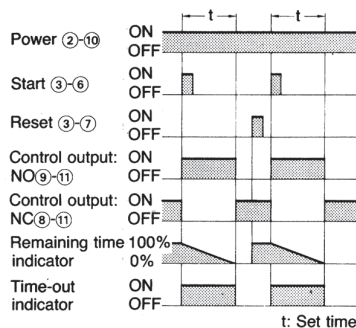
t: Set time

Signal ON/OFF-delay Operation 2 (G Mode)

Signal ON/OFF-start/Instantaneous Operation/
Time-limit Reset

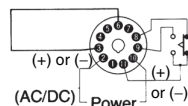
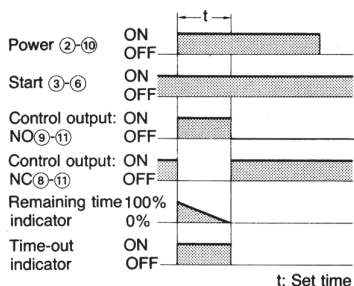


Signal Start/Signal Reset

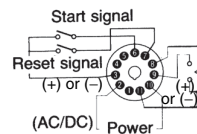
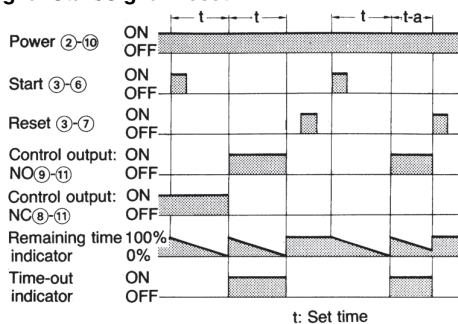


Interval Operation (E Mode)

Power-ON Start/Power-OFF Reset

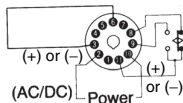
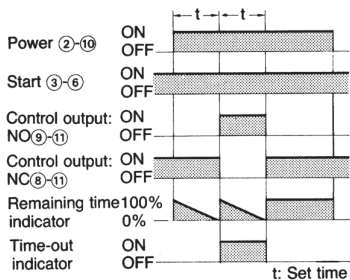


Signal Start/Signal Reset



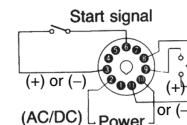
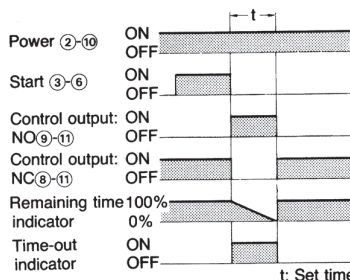
One-shot and Flicker Operation (F Mode)

Power-ON Start/Power-OFF Reset



Signal OFF-delay Operation 2 (H Mode)

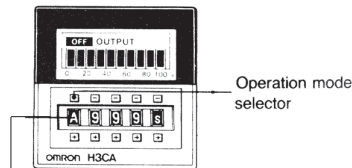
Signal/Instantaneous Operation/Time-limit Reset



Safety Precautions

How to Change Operation Mode

Operate the pushbuttons of the thumbwheel switch, located at the leftmost position on the front panel to set the operation mode. Eight operation modes (A, B, C, D, E, F, G, and H) are selectable and the selected operation mode is displayed in the operation mode display window.

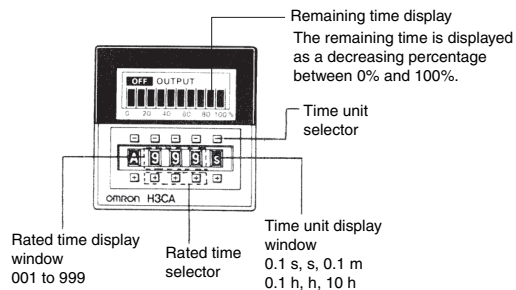


- Operation mode display window
 A: ON-delay mode display window
 B: Flicker operation
 C: Signal ON-/OFF-delay operation (1)
 D: Signal OFF-delay operation (1)
 E: Interval operation
 F: One-shot flicker operation
 G: Signal ON-/OFF-delay operation (2)
 H: Signal OFF-delay operation (2)

Note: The operation mode is fixed to "A" for H3CA-8H. The characters are yellow.

How to Change Time Unit and Rated Time

Operate the pushbuttons of the rightmost thumbwheel switch to select the desired time unit. Seven time units (0.1 s, s, 0.1 m, m, 0.1 h, h, or 10 h) are selectable and the selected time unit is displayed in the time unit display window. The desired rated time is specified by operating the three thumbwheel switches in the middle of the front panel. The range of rated time is 001 to 999 for each unit.



Note: The characters are yellow.

Time Unit and Rated Time

Time unit	Rated time
0.1 s	0.1 to 99.9 s
s	1 to 999 s
0.1 m	0.1 to 99.9 m
m	1 to 999 m
0.1 h	0.1 to 99.9 h
h	1 to 999 h
10 h	10 to 9,990 h

CAUTION

- Do not change the time unit, rated time, or operation mode while the timer is in operation. Otherwise, the timer may malfunction or be damaged. Be sure to turn off the power supply to the timer before changing the timer unit, rated time or operation mode.
- Note that output will be generated in C, D, E, G, or H mode even if the rated time is set to 000. No output will be generated in A, B, or F mode.

Connecting the Operating Power Supply

The H3CA-8□ contains a capacitor-drop power circuit. Use a sinusoidal power supply with a commercial frequency. Do not use power supplies with a high frequency component (such as inverter power supplies) for Timers with 100 to 240-VAC specifications. Using these power supplies can damage internal circuits.

The power supply connections to the H3CA-A and H3CA-FA can be made without regard to polarity for both AC and DC power supplies; just connect to the specified terminals (2 and 10, or A1 and A2). When connecting a DC power supply to the H3CA-8 or H3CA-8H, however, the polarity must be connected as indicated.

Although there is a wide range of power connectable to the H3CA-A and H3CA-FA, be sure that there is no inductive voltage or residual voltage applied to the timer power supply terminals (2 and 10, or A1 and A2) when the power switch is turned OFF. (Inductive voltage can be generated in the power supply line if it is placed in parallel with high-voltage or power lines.)

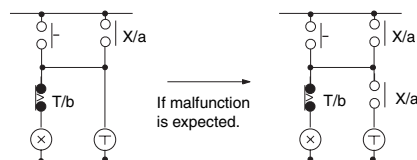
A DC power supply can be connected if its ripple factor is 20% or less and the mean voltage is within the rated operating voltage range of the Timer.

Connect the power supply voltage through a relay or switch in such a way that the voltage reaches a fixed value at once or the Timer may not be reset or a timer error could result.

H3CA-8 and H3CA-8H Timers with AC specifications are equivalent to capacitor loads. When switching the Timer power supply with an SSR, use an SSR with a withstand voltage of twice the power supply voltage.

Since the H3CA-8 and H3CA-8H Timers of AC specifications externally discharges a part of internal energy when the power is turned OFF, it may malfunction if an extremely sensitive relay is used with the following sequence circuit.

If such a malfunction occurs, change the circuit configuration as shown below on the right side.

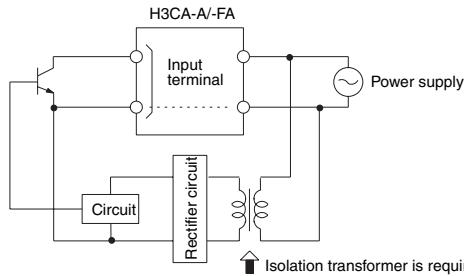


Input/Output

The operation of the output contacts varies with the operation specifications. Before making connections, check the operation specifications and operating conditions using the application examples provided.

The H3CA-A and H3CA-FA do not use transformers. Simultaneous inputting power from two or more power supplies to separate timers or counters from a single input contact or transistor is not possible.

For the power supply of an input device, use an isolating transformer, of which the primary and secondary windings are mutually isolated and the secondary winding is not grounded.



A transformer is not used in the power supplies for the H3CA-A and H3CA-FA. You can therefore receive an electrical shock by touching the input terminals when the power supply voltage is being applied. Take adequate precautions to protect against electrical shock.

Inputs to input signal terminals are made by shorting the individual input terminals to the common terminal (terminal 3 for the H3CA-A or terminal (X) for the H3CA-FA). Internal circuits may be damaged if connections are made to any other terminals or if voltages are applied.

If contacts are used to short the terminals, they will be switching a low voltage (approximately 5 VDC) and current (approximately 100 μ A). You must therefore use high-reliability contacts with a contact resistance of 1 k Ω or less when shorted and residual voltage of 1 V maximum when shorted.

The reset input will take priority if both the set and reset inputs are turned ON simultaneously.

Others

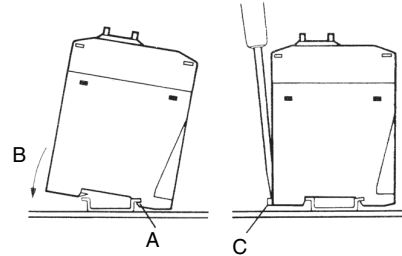
Holding relays are used for outputs on the H3CA-A Series. Dropping the Unit or otherwise subjecting it to shock can cause the relay to reverse or to move to the center position.

How to Mount the Timer on Mounting Track

When mounting a H3CA-FA Timer on a socket mounting track, observe the following procedures:

Mounting

First hook portion A of the timer to an edge of the track and then depress the timer in direction B.



Dismounting

Pull out portion C with a round-blade screwdriver and remove the timer from the mounting track.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

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

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

Terms and Conditions of Sale

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

Certain Precautions on Specifications and Use

- Suitability of Use.** Omron Companies shall not be responsible for conformity with any standards, codes or regulations which apply to the combination of the Product in the Buyer's application or use of the Product. At Buyer's request, Omron will provide applicable third party certification documents identifying ratings and limitations of use which apply to the Product. This information by itself is not sufficient for a complete determination of the suitability of the Product in combination with the end product, machine, system, or other application or use. Buyer shall be solely responsible for determining appropriateness of the particular Product with respect to Buyer's application, product or system. Buyer shall take application responsibility in all cases but the following is a non-exhaustive list of applications for which particular attention must be given:
 - Outdoor use, uses involving potential chemical contamination or electrical interference, or conditions or uses not described in this document.
 - Use in consumer products or any use in significant quantities.
 - Energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, and installations subject to separate industry or government regulations.
 - Systems, machines and equipment that could present a risk to life or property. Please know and observe all prohibitions of use applicable to this Product.

NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY OR IN LARGE QUANTITIES WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON'S PRODUCT IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.
- Programmable Products.** Omron Companies shall not be responsible for the user's programming of a programmable Product, or any consequence thereof.
- Performance Data.** Data presented in Omron Company websites, catalogs and other materials is provided as a guide for the user in determining suitability and does not constitute a warranty. It may represent the result of Omron's test conditions, and the user must correlate it to actual application requirements. Actual performance is subject to the Omron's Warranty and Limitations of Liability.
- Change in Specifications.** Product specifications and accessories may be changed at any time based on improvements and other reasons. It is our practice to change part numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the Product may be changed without any notice. When in doubt, special part numbers may be assigned to fix or establish key specifications for your application. Please consult with your Omron's representative at any time to confirm actual specifications of purchased Product.
- Errors and Omissions.** Information presented by Omron Companies has been checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical or proofreading errors or omissions.

OMRON

OMRON ELECTRONICS LLC • THE AMERICAS HEADQUARTERS

Schaumburg, IL USA • 847.843.7900 • 800.556.6766 • www.omron247.com

OMRON CANADA, INC. • HEAD OFFICE

Toronto, ON, Canada • 416.286.6465 • 866.986.6766 • www.omron247.com

OMRON ELETRÔNICA DO BRASIL LTDA • HEAD OFFICE

São Paulo, SP, Brasil • 55.11.2101.6300 • www.omron.com.br

OMRON ELECTRONICS MEXICO SA DE CV • HEAD OFFICE

Apodaca, N.L. • 52.811.156.99.10 • 001.800.556.6766 • mela@omron.com

OMRON ARGENTINA • SALES OFFICE

Cono Sur • 54.11.4783.5300

OMRON CHILE • SALES OFFICE

Santiago • 56.9.9917.3920

OTHER OMRON LATIN AMERICA SALES

54.11.4783.5300

© 2009 Omron Electronics LLC

Cat. No. CSM_H3CA_DS_E_2_1

Specifications are subject to change without notice.