

H7CZ
Digital Counter

INSTRUCTION MANUAL

Thank you for purchasing the OMRON Product. To ensure the safe application of the Product, read this manual carefully before using the Product and always keep it close at hand when the Product is in use.

OMRON Corporation
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For details, refer to the latest datasheet (Cat. No. M079).

Suitability for Use

OMRON shall not be responsible for conformity with any standards, codes, or regulations that apply to the combination of the products in the customer's application or use of the product.

Take all necessary steps to determine the suitability of the product for the systems, machines, and equipment with which it will be used. Know and observe all prohibitions of use applicable to this product.

NEVER USE THE PRODUCTS FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

See also Product catalog for Warranty and Limitation of Liability.

SAFETY PRECAUTIONS

Keys to Warning Symbols

CAUTION Indicates a potentially hazardous situation which, if not avoided, is likely to result in minor or moderate injury or in property damage.

CAUTION

Do not allow pieces of metal, wire clippings, or fine metallic shavings or filings from installation to enter the product. Doing so may occasionally result in electric shock, fire, or malfunction.

Minor injury due to explosion may occasionally occur. Do not use the Counter where subject to flammable or explosive gas.

Fire may occasionally occur. Tighten the terminal screws to the rated torque.
P2CF Socket terminals: 4.4 lb-in (0.5 N-m)

Minor injury due to electric shock may occasionally occur. Do not touch any of the terminals while power is being supplied. Be sure to mount the terminal cover after wiring.

The life expectancy of the output relay varies considerably according to its usage. Use the output relay within its rated load and electrical life expectancy. If the output relay is used beyond its life expectancy, its contacts may become fused or there may be a risk of fire. Also, be sure that the load current does not exceed the rated load current and when using a heater, be sure to use a thermal switch in the load circuit.

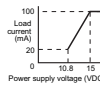
Minor electric shock, fire, or malfunction may occasionally occur. Do not disassemble, modify, or repair the Counter or touch internal components.

Precautions for Safe Use

- When mounting the Counter to a panel, tighten the two mounting screws alternately, a little at a time, so as to keep them at an equal tightness. If the panel screws are tightened unequally, water may enter the panel.
- Store the Counter at the specified temperature. If the Counter has been stored at a temperature of less than -10°C, allow the Counter to stand at room temperature for at least 3 hours before use.
- Mounting the Counter side-by-side may reduce the life expectancies of internal components.
- Use the Counter within the specified ranges for the ambient operating temperature and humidity.
- Do not use in the following locations:
 - Locations subject to sudden or extreme changes in temperature.
 - Locations where high humidity may result in condensation.
 - Locations with excessive vibration or shock.
 - Locations subject to water.
 - Locations subject to oil.
- Do not use the Counter outside of the rated ranges for vibration, shock, water exposure, and oil exposure.
- Install the Counter in dusty environments, in locations where corrosive gasses are present, or in locations subject to direct sunlight.
- Install the Counter well away from any sources of static electricity, such as pipes transporting molding materials, powders, or liquids.
- Separate the Counter from sources of noise, such as devices with input signals from power lines carrying noise, and wiring for I/O signals.
- Do not connect more than two crimp terminals to the same terminal.
- Up to two wires of the same size and type can be inserted into a single terminal.
- Use the specified wires for wiring. Applicable Wires: AWG 18 to AWG 22, solid or twisted, copper
- Install a switch or circuit breaker that allows the operator to immediately turn OFF the power, and label it to clearly indicate its function.
- Approximately 14 V is output from the input terminals. Use a sensor that contains a diode.
- Use a switch, relay, or other contact so that the rated power supply voltage will be reached within 0.1 seconds. If the power supply voltage is not reached quickly enough, the Counter may malfunction or outputs may be unstable.
- Use a switch, relay, or other contact to turn the power supply OFF instantaneously. Outputs may malfunction and memory errors may occur if the power supply voltage is decreased gradually.
- When changing the set value during operation, because the H7CZ uses a constant read-in system, output will turn ON if the set value is equal to the present value.
- If the set value and present value are both 0, the output will turn ON for the default setting. The output will turn OFF during a reset operation.
- Do not use organic solvents (such as paint thinners or benzene), strong alkali, or strong acids. They will damage the external finish.
- Confirm that indicators are working normally, including the LCD. The indicator LCD and resin parts may deteriorate more quickly depending on the application environment, preventing normal indications. Periodic inspection and replacement are required.
- The waterproof packing may deteriorate, shrink, or harden depending on the application environment. Periodic inspection and replacement are required.

Precautions for Correct Use

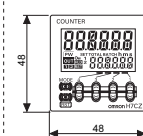
- H7CZ models with a 12 to 24-VDC power supply use a transformer-free power supply method in which the power supply terminals are not isolated from the signal input terminals. If a non-isolating DC power supply is used, unwanted current paths may occasionally burn or destroy internal components depending on the wiring. Always check the wiring sufficiently before use.
- An inrush current of approx. 10 A will flow for a short time when the power supply is turned ON. If the capacity of the power supply is not sufficient, the Counter may not start. Be sure to use a power supply with sufficient capacity.
- Maintain voltage fluctuations in the power supply within the specified operating voltage range.
- To allow for the startup time of peripheral devices (e.g., sensors), start Counter timing operation 200 ms to 290 ms after turning ON the power. The input signal will not be accepted before 200 to 290 ms has elapsed.
- The input signal will not be accepted after 5 to 1005 ms has elapsed from when the power supply is turned OFF.
- If the current generated by turning ON the power supply may deteriorate contacts on the power supply circuit. Turn ON or OFF to a device with the rated current of more than 10 A.
- The capacity of the external power supply is 100 mA at 12 V. When using a 24 VAC/12 to 24 VDC power supply, reduce the load with the power supply voltage, as shown in the diagram (DC power supplies only) on the right.
- If the prescale value setting is incorrect, a counting error will occur. Check that the settings are correct before using this function.
- Make sure that all settings are appropriate for the application. Unexpected operation resulting in property damage or accidents may occur if the settings are not appropriate.
- Do not leave the Counter for long periods at a high temperature with output current in the ON state. Doing so may result in the premature deterioration of internal components (e.g., electrolytic capacitors).
- EEPROM is used as memory when the power is interrupted. The write life of the EEPROM is 100,000 times. The EEPROM is written when the power is turned OFF or when switching from function setting mode to run mode.
- Dispose of the product according to local ordinances as they apply.



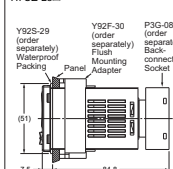
Mounting and Panel-cutout Dimensions Diagram

Mounting Dimensions (Unit: mm)

Front panel dimensions are the same for all models.

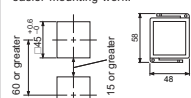


Flush Mounting H7CZ-L8□

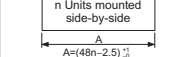


Panel-cutout Dimensions Diagram (Unit: mm)

Standard panel cutout is shown in the following diagram (conforms to DIN 43700). A space of 15 mm or greater (a panel cut-out distance of 60 mm or greater) is recommended towards the Adapter's hookside to enable easier mounting work.



- The thickness of a mounting panel should be 1 to 5 mm.
- It is possible to mount Timers side-by-side. (But only towards the non-hook side.)
- If the products are mounted side by side, water resistance will be lost.



Package Contents

- Digital Counter
- Instruction manual (this document)

Ratings (Specifications)

Power supply voltage	- 100 to 240 VAC, 50/60 Hz (H7CZ-L8) - 12 to 24 VDC/24 VAC, 50/60 Hz (H7CZ-LBD1)	Input method	No-voltage input ON impedance: 1 kΩ max. (Leakage current: 12 mA when 0 V) ON residual voltage: 3 V max. OFF impedance: 100 kΩ min.
Allowable voltage fluctuation range	85% to 110% of rated supply voltage (12 to 24 VDC; 90% to 110%)	Control output	Contact Output 250 VAC, 3 A (resistive load) 30 VDC, 3 A (resistive load)
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	Electrical life of relay	100,000 operations (at an ambient temperature of 23°C)
Operating temperature range	-10 to 55°C (-10 to 50°C if Counters are mounted side by side) (with no icing or condensation)	Mechanical life of relay	10,000,000 operations (at an ambient temperature of 23°C)
Storage temperature range	-25 to 70°C (with no icing or condensation)	External power supply	12 VDC, 100 mA
Operating humidity range	25% to 85%	Degree of protection	IEC IP66, UL508 Type 4*
Altitude	2,000 m max.	* Individual mounting: Degree of protection on the front panel of the Counter conforms to UL 508 Type 4X when all of the following conditions are satisfied: • The Y92S-29 waterproof packing and Y92F-30 mounting adapter are used with the Counter. Use only these parts for replacement. • The Counter is mounted on the flat surface of an enclosure that is rated and marked "Type 4X for Indoor Use Only."	
Recommended fuse	T2A, 250VAC, time-lag, low-breaking capacity		
Weight	Approx. 100 g (main unit only)		
Installation environment	Over-voltage category II, pollution degree 2. (IEC 61010-1)		

Nomenclature

● Display Section

- Key Protect Indicator
- Control Output Indicator
- Reset Indicator (Lit when the reset input or Reset Key is ON.)
- Present Value (Main Display) (Character height: 10 mm)
- Set Value Display (Sub-display) (Character height: 6 mm)

● Operation Key

- Mode Key (Changes modes and setting items)
- Reset Key
- Up Keys [↑] [↵]

Conformance to EN/IEC Standards

- When conforming to EMC standards, refer to the information provided in this Instruction Manual for cable selection and other conditions.
- This is a class A product. In residential areas it may cause radio interference, in which case the user may be required to take adequate measures to reduce interference.
- Basic insulation is provided between power supply and input terminals, between power supply and output terminals, and between input and output terminals. (No insulation is provided between the power supply and input terminals for the H7CZ-LBD1.)
- Basic insulation is provided between power supply and output terminals, and between input and output terminals. When double insulation or reinforced insulation is required, apply double insulation or reinforced insulation as defined in IEC 60664 that is suitable for the maximum operating voltage with clearances or solid insulation.
- Connect the input and output terminals to devices that do not have any exposed charged parts.

Precautions for Compliance with UL Standards and CSA Standards

Notice to Users of the H7CZ in the USA and Canada
Please use the following installation information instead of the general information in the instruction manuals in order to use the product under certified conditions of UL and CSA when the product is installed in the USA or Canada. These conditions are required by NFPA 70, National Electrical Code in the USA and the Canadian Electrical Code, Part I in Canada and may vary from information given in the product manuals or safety precautions.

- Installation in a Panel: H7CZ is normally installed on a flat surface in an operation panel. Use a Type 1 Enclosure for the operation panel.
- Use the isolated source for inputs.
- Environment: Surrounding Air Temperature: -10 to 40°C

● Accessories (Order Separately)

Track Mounting/ Front Connecting Socket	8-pin, finger-safe type	P2CF-08
Flush Mounting Adapter	---	P2CF-08-E
Waterproof Packing	---	Y92F-30 Y92S-29

Operating Procedures

Parameters are set with the operation keys on the front panel.

Note: Refer to the datasheet (Cat. No. M079) for detailed parameter settings.

- Change from RUN Mode to Function Setting Mode.



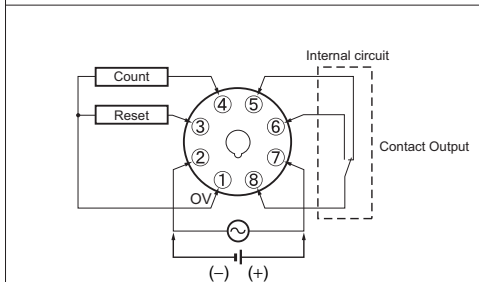
- Set the parameters using the Key. The characters displayed in reverse video are the default settings.

Display	Parameter name	Set value	Comments
Input mode	Input mode	00 d00n	---
Output mode	Output mode	0. F, L, r, P, -1, P, 9, R *1	---
Output time	Output time	00 1 to 9999 to 99.99	Displayed only when the output mode is L, r, P, -1, P, 9, or R. Unit: second
Counting speed	Counting speed	30H, 5MHz *1	---
Reset input signal width	Reset input signal width	20-5, 1-5 *1	---
Decimal point position	Decimal point position	---	---
Prescale value	Prescale value	000 1 to 9999 to 99.999	---
Set value upper limit	Set value upper limit	1 to 999999	---
Key protect level	Key protect level	0-4, P-2, P-3, P-4, P-5, P-6, P-7 *1	---
Output ON count alarm set value	Output ON count alarm set value	0 to 9999	× 1,000
Output ON count monitor value	Output ON count monitor value	---	The monitor value is only displayed. It cannot be set. × 1,000

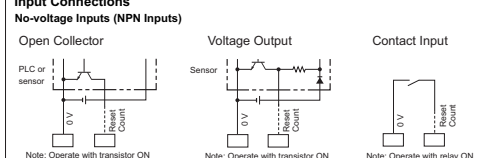
*1: After reaching the last set value, the Key will return to the first set value.

Terminal Arrangement

Wire properly after checking the specifications of the power supply voltage.



Input Connections



Key-protect Switch Settings

When the key-protect switch is ON, individual key operations can be disabled to prevent setting errors according to the key protect levels (KP-1 to KP-7) shown in the following table.

Level	*Mode change	Display switch in the run mode	Reset Key	Up Key
KP-1 (default setting)	Invalid	Valid	Valid	Valid
KP-2	Invalid	Valid	Invalid	Valid
KP-3	Invalid	Valid	Valid	Invalid
KP-4	Invalid	Valid	Invalid	Invalid
KP-5	Invalid	Invalid	Invalid	Invalid
KP-6	Invalid	Invalid	Valid	Valid
KP-7	Invalid	Invalid	Invalid	Valid

* Changing mode to function setting mode.

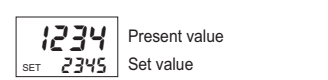
Self-diagnostic Functions

The following displays will appear if an error occurs.

Main display	Sub-display	Description	Output status	Correction method	Set value after reset
----	---	No change	Present value underflow *2	Either press the Reset Key or turn ON the reset input.	No change
E 1	Not lit	CPU error	OFF	Turn ON the power again, Reset Key	No change
E 2	Not lit	Memory error (RAM)	OFF	Turn ON the power again.	No change
E 2	5uH	Memory error (EEPROM) *1	OFF	Reset Key	Factory setting.
E 3 *5	No change	Output Counter Overflow	No change	Reset Key *4	No change

*1. This includes times when the life of the EEPROM has expired.
*2. This occurs if the present value falls below -9999.
*3. Display flashes (1-second cycles).
*4. The total ON count will not be cleared by using the Reset Key.
*5. The normal display and E 3 will appear alternately. When the Reset Key is pressed, E 3 will not be displayed even if the alarm set value is exceeded. (Monitoring is possible, however, because the Counter will continue without the output ON count being cleared.)

Displays and Settings in Run Mode



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