

# OMRON

## MODEL H5CX-BWSD

### Digital Timer

**English INSTRUCTION MANUAL**

Thank you for purchasing this OMRON product. Please read this instruction MANUAL, and thoroughly familiarize yourself with the functions and characteristics of the product before use. Please retain this MANUAL for future reference.

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### SAFETY PRECAUTIONS

**Definition of Precautionary Information**

**CAUTION** Indicates information that, if not heeded, could result in relatively serious or minor injury, damage to the product, or faulty operation.

**Precautionary Information**

**CAUTION**

- Tighten the terminal screws securely. The recommended tightening torque is 0.5 N·m. Loose screws may result in fire or malfunction.
- Do not use the product where flammable or combustion gasses are present.
- Never disassemble, repair or modify the product. This may cause electric shock, fire or malfunction.
- Do not allow metal fragments or lead wire scraps to fall inside the product. This may cause electric shock, fire or malfunction.
- Use the installed power for the timer. When the power for input device and that for the timer are both not installed, the internal elements may be damaged due to a sneak current from the AC power.

**PRECAUTIONS IN USING THE PRODUCT**

When the product is used under the circumstances or environments below, ensure adherence to limitations of the ratings and functions. Also, take countermeasures for safety precautions.

- Use under circumstances or environment which are not described in the instruction manual.
- Use for tractor power control, railway, aircraft, vehicle, incinerator, medical equipment, entertainment equipment, safety device, etc.
- Use for applications where death or serious property damage is possible and extensive safety precautions are required.

### NOTICE

Please comply strictly with the following instructions which are intended to ensure safe operation of the controller.

- Environmental Considerations**
  - Do not use in locations affected by excessive vibration or shock, or in locations subjected to exposure to water or oil.
  - Do not use this equipment in dusty environments or expose it to corrosive gases or direct sunlight.
  - Wire signal lines and power lines separately to reduce the influence of noise.
  - Do not install the H5CX close to sources of excessive static electricity (e.g., forming compounds, powders, or fluid materials being transported by gravity).
  - To prevent damage to the exterior of the timer, it must not be exposed to organic solvents (e.g. Paint thinner or benzene), strong alkalies, or strong acids.
- Usage Considerations**
  - Shove of the speed of temperature. If the H5CX has been stored at a temperature of about -10°C, allow the H5CX to stand at room temperature for at least 3 hours before use.
  - Locations subject to temperatures or humidity outside the range specified in the specifications.
  - Application of voltages other than the rated voltage may seriously damage the internal elements.
  - The H5CX's panel surface is water resistant (conforming to NEMA4 and IP66). In order to prevent the internal circuit from water penetration through the space between the timer and operating panel, attach a waterproof packing in the space and be sure to secure it by tightening screws of the Y52F-30 flush-mounting adapter.

### NOTICE

- Be sure to wire the timer with the correct polarity.
- Apply the power through a relay or switch so that the voltage reaches the rated supply voltage immediately. If the voltage increase gradually, the recycle power function does not work properly or output may fluctuate.
- When power is supplied, an inrush current (approx. 6A) will flow for a short time. If the power supply capacity is too small, the H5CX may not operate. Make sure that a power supply of a sufficiently large capacity is used.
- Always maintain the power supply voltage within specifications.
- When mounting on a panel, tighten the two screws alternately and evenly. If the screws are not tightened evenly, water may penetrate inside of the panel.
- Do not install the H5CX in the following places:
  - Locations subject to condensation as a result of high humidity.
  - Locations subject to severe changes in temperature.
- Output will turn ON if the set value is changed as follows during operation:
  - Setting the Forecast Value:
    - Present value > Set value: Output 2 is ON
    - Present value > Forecast value (Forecast value = Set value - Forecast set value): Output 1 is ON
  - Setting the Absolute Value:
    - Present value > Set value: Output is ON.
- When set value = 0:
  - The output turns ON when the start signal input is input. Output turned OFF by reset.
- To allow for the starting time of peripheral devices (sensors, etc.), the H5CX starts timing operation between 200 to 250 ms after power is formed ON. For this reason, in operations where timing starts from power ON, the time display will actually start from 249 ms. If the set value is 249 ms or less, the time until output turns ON will be a fixed value between 200 and 250. (Normal operation is possible for set values of 250 ms or more.) In applications where a set value of 249 ms or less is required, use start timing with signal input.
- When turning the Power ON and OFF, input signal reception becomes possible, impossible or unstable as shown in the diagram below.
- Memory backup is transcoded by writing data in E.E.P.-ROM at the instance of power failure. The ability of re-writing is 100,000 times/m. The most frequent ON/OFF, the faster reaches to the re-writing times of E.E.P.-ROM.

## Mounting

### Mounting and Panel-cutout Dimensions Diagram

**Mounting (Units: mm)**

**Panel-cutout Dimensions Diagram (Units: mm)**

Standard panel cutout is shown in the following diagram (conforms to DIN 43700). A space of 15 mm or greater (a panel cutout distance of 80 mm or greater) is recommended towards the Adapter's hook side to enable easier mounting work.

**Unit Label Attachment position**

Put the unit label with its right side end aligned to the right side end of the display window.

**In the pack:**

- Main unit
- Instruction manual (this document)
- Mounting Adapter, Rubber packing, Terminal Cover
- Unit Label

**1.** The thickness of a mounting panel should be 1 to 6 mm.

**2.** It is possible to mount Timers side-by-side (only towards the non-hook side). When mounted side-by-side, waterproof is not possible.

**3.** The product is not waterproof if it is mounted side by side.

### Specifications

**Power supply voltage/Power consumption**  
DC12-24V / 2.5 W

**Operating voltage range**  
50% to 110% of rated voltage (DC 12-24V / 50% to 110%)

**Ambient temperature**  
-10 to +55 °C (When side-by-side mounting: -10 to +50 °C) (Avoid freezing or condensation)

**Relative humidity**  
25% to 85% (Avoid condensation)

**Storage temperature**  
-25 to +65 °C (Avoid freezing or condensation)

**MAX. 6,000 m**

**Altitude**  
Approx. 140 g (main unit only)

**Weight**  
Installation environment: Over-voltage category III, pollution degree 2

**Transistor output**  
Open collector, 30 VDC max., 100 mA max.  
Residual voltage: 1.5 VDC max. (Effective value, approx. 1 VDC)  
Leak current: 0.1 mA or less

**Enclosure rating**  
Individual mounting: The front surface of the enclosure of the Type H5CX series must meet UL 509 Type 4X, when all of the following conditions are met:  
- The Y52F-30 rubber packing and Y52F-30 mounting adapter are used with the timer.  
- Use only these parts for replacement.  
- The timer is mounted on the flat surface of an enclosure that is rated and makes "Type 4X for Indoor Use Only."

### Conformance to EN/IEC standards.

Input terminals have no insulation from power supply terminals. These are basic insulation between the power supply and output terminals and between input and output terminals.

### Self-diagnostic functions

Present Value	Set Value	Meaning	Output status	Recovery	Set value after reset
E2	No display	Memory error (RAM)	OFF	Turn the power OFF and ON again. If normal operation is still not restored, it may be necessary to repair or replace the H5CX. The display is restored to normal, then a problem exists on the internal power supplying the controller. Check for external noise.	No change
E2	50A	Memory error (EEP)	OFF	All settings are initialized to the factory setting when pressing Reset key.	0
E1	No display	CPU error	OFF	Reset key to power cycle.	No change

## Nomenclature and Application as a Timer

**Display**

- ① Reset indicator (Orange)
- ② Key protection indicator (Orange)
- ③ Output indicator (Orange)

**Forecast setting**

- ① (1) is 0 when the forecast output is ON
- ② (2) is 1 when the forecast output is ON
- ③ (3) is 0 when the forecast output is ON

**Present value**

- ④ Present value (8-mm character height, Red)
- ⑤ Set value (8-mm character height, Green)
- ⑥ Set values 1 and 2 display (Green)

**Operation**

- ⑦ MODE key: Switching of setting bars.
- ⑧ RESET key: Reset
- ⑨ Key-protect switch: Key-protect switch ON/OFF
- ⑩ DIP switch

**Switch**

- ⑪ ON (Enabled)
- ⑫ OFF (Disabled/Factory-set)

**Settings for functions are possible with just the DIP switch.**

Item	OFF	ON	Switch1	Switch2	Time range
1. Time range	Refer to the table on the right.		OFF	OFF	0.1s to 9999.9s
2. Output mode	F1 mode	A mode	ON	OFF	0.01s to 9999.99s
3. Input signal width	On time	Off time	OFF	ON	0.0001min to 99.99min/99s
4. Input signal width	Off time	On time	ON	ON	0.1min to 9999.9min
5. UP key protect	Disabled	Enabled			
6. DOWN key protect	Disabled	Enabled			

Note: Default settings are all OFF.

**\* DIP switch settings are updated when the power is turned ON. (Set the DIP switches before installation and turning on power.)**

**Key protect**

When the key protect switch is ON, individual key operations can be disabled to prevent setting errors according to the settings of DIP switches 6 to 8. Switching of the key protect switch is valid with the power turned ON. The key protect indicator is lit while the key protect switch is ON.

## Operating Method

### Forecast value setting

**Display in RUN mode.**

Each press of the [MODE] key switches the set value and forecast set value in the (5) Set value display.

### The explanation of basic operation

- When the present value reaches the set value, control output (OUT 2) is turned ON.
- When the present value reaches the forecast value, control output (OUT 1) is turned ON. The forecast value is obtained by subtracting the forecast set value from the set value.
- In case of "Forecast set value > Set value", forecast output (OUT 1) is lured ON when timing starts.
- In case of "Set value = 0", both forecast output (OUT 1) and control output (OUT 2) are turned ON when timing starts.

### Absolute value setting

**Display in RUN mode.**

Each press of the [MODE] key switches the set value 1 and set value 2 in the (5) Set value display.

### The explanation of basic operation

- When the present value reaches the set value 1, control output 1 (OUT 1) is turned ON.
- When the present value reaches the set value 2, control output 2 (OUT 2) is turned ON.
- In case of "Set value = 0", control output is turned ON when the timer starts up.

### Selection for setting method

There are two possible settings: Forecast value setting (off-set setting) and Absolute value setting. (Factory-set: Forecast value)

Selection mode: SET (F5) or ABS (R5) using the [F] key.

Power ON again: SET (F5) or ABS (R5) using the [F] key.

RUN mode: SET (F5) or ABS (R5) using the [F] key.

### Output mode

**A mode (Signal ON delay: power reset operation)**

- Timing starts when the start signal goes ON
- While the start signal is ON, the timer starts when the power comes ON or when the reset input goes OFF
- The control output is sustained.

**F-1 mode (Cumulative: power hold operation)**

- Start signal enables timing (timing is stopped when the start signal is OFF or when the power is OFF)
- The control output is sustained.

**Output operation chart**

**\* The signal input is invalid during the operation**

### Terminal Arrangement

Use after checking the specifications of the power supply voltage.

- Do not connect unused terminals.
- Recommended lead wire: AWG 18 to 24, solid or stranded, copper

**\* The power supply and input circuit are not insulated.**

**\* Terminals ① and ② are connected internally.**

**\* Terminals ③ and ④ are both for reset function. Connection to either of these makes reset function possible. The terminal ③ and ④ are not connected internally. Do not use them for connection use.**

### I/O function

The inputs are no-voltage (short-circuit or open) input or voltage inputs.

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

(Open Collector) (Contact Input) (Two-wire Sensor)

**Input Connections**

The inputs are no-voltage (short-circuit or open) input or voltage inputs.

**No-voltage Input Signal Level**

- Short-circuit level (Transistor ON): Residual voltage: 2 V max.
- Open level (Transistor OFF): Impedance when ON: 1 kΩ max.
- Impedance when OFF: 20 kΩ min.
- Impedance when OFF: 100 kΩ max.

**Applicable Two-wire Sensor**

- Leakage current: 1 mA max.
- Maximum supply voltage: 5 VDC max.
- Reverse voltage: 1.0 VDC max.
- Operating voltage: Operated 10 VDC.

**Voltage Input (PNP Inputs)**

(No-contact input (PNP Transistor)) (Contact Input)

**Voltage Input Signal Level**

- High level (Transistor ON): 5 VDC min. to 24 VDC max.
- Low level (Transistor OFF): 0 VDC min. to 1 VDC max.
- Impedance when ON: 1 kΩ max.
- Impedance when OFF: 20 kΩ min. to 100 kΩ max.
- Maximum applicable voltage: 30 VDC max.
- Input resistance: Approx. 4 kΩ

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形 H5CX-BWSD デジタルタイマ

取扱説明書

オムロン製品をお買い上げいただきありがとうございます。この製品を安全に正しく使用していただくために、お使いになる前にこの取扱説明書をお読みになり、十分にご理解ください。

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安全上のご注意

- 警告表示の意味
注意
警告表示
端子ネジは指定トルク (0.5 N・m程度) で締めてください。

ご使用に際してのお願い

- 次に示す条件や環境で使用する場合は、仕様、性能に對して余裕を持った使い方をすることがお求めになります。
● 取扱説明書に記載のない条件や環境での使用

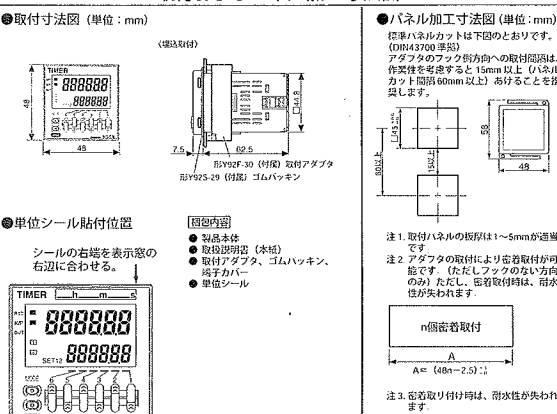
お願い

- 以下に示す項目は、安全を確保するために必ず守ってください。
1. 環境上のお問い合わせ
2. 使用上のお願い

正しい使い方

- (1) 端子の極性は、誤配線のないように注意してください。
(2) 電源電圧はスイッチ、リレー等の接続を介して一気に印加してください。

取付およびパネル加工寸法図



仕様

Table with specifications: 電源電圧/消費電力, 許容電圧変動範囲, 動作電圧範囲, 動作電流, 動作時間, 保存温度, 動作温度, 湿度, 振動, 衝撃, 電圧降下, 電圧変動, 電圧変動, 電圧変動.

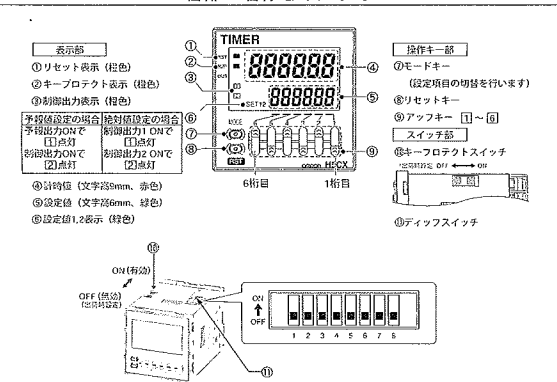
EN/IEC 規格対応について

電源-入力端子線は非絶縁です。電源-出力端子線は基礎絶縁です。

自己診断機能

自己診断機能表. Columns: 項目, 設定値, 異常表示, 出力状態, 復帰方法とその条件, 復帰時の設定値.

各部の名称とはたらき



操作方法

予報値設定の場合
● 運転モードでの表示
● 基本動作の説明
● 絶対値設定の場合
● 運転モードでの表示
● 基本動作の説明

入出力機能

入出力機能
シグナル
リセット
ゲート
予報出力
絶対値出力
定値出力
無電圧入力 (NPN入力)
絶圧入力 (PNP入力)

設定方法の選択

予報値設定 (オフセット設定) と絶対値設定の2通りの設定方法が可能です。
● RSTキーとONキー (4桁目のONキー) を同時に押し下しながら電源を投入することで、機能設定モードに移行します。

出力モード

● Aモード (シングルオンディレー: 電源リセット動作)
● F-1モード (積算: 電源保持動作)
出力動作時間
出力動作時間

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