

MODEL H7CX-R
Digital Tachometer

English INSTRUCTION MANUAL

Thank you for purchasing this H7CX-R. This INSTRUCTION MANUAL describes the information such as function, performance, and how to use the product required for using the H7CX-R. For using this product, please follow the precautions as shown in the following:

- Please operate this product by the qualified specialist having the electrical know how.
- Read this instruction manual with enough, and use the product correctly with enough understanding.
- Keep this instruction manual close at hand and use it for reference during operation.

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SAFETY PRECAUTIONS

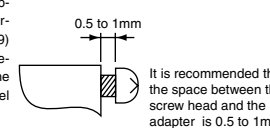
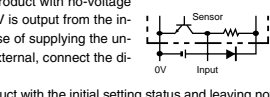
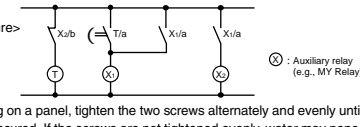
CAUTION Definition of Precautionary Information
Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or in property damage.

- Precautionary Information**
- CAUTION** Loose screws may occasionally result in fire or malfunction. Tighten the terminal screws securely. The recommended tightening torque is 0.5 N·m.
 - There may occasionally be a risk of explosion. Do not use the product where flammable or combustion gases are present.
 - If the output relay is used beyond its life expectancy, its contacts may occasionally become fused or there may occasionally be a risk of fire. 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.
 - This may occasionally cause electric shock, fire or malfunction. Never disassemble, repair or modify the product.
 - This may occasionally cause electric shock, fire or malfunction. Do not allow metal fragments or lead wire scraps to fall inside this product.

Precautions for Safe Use

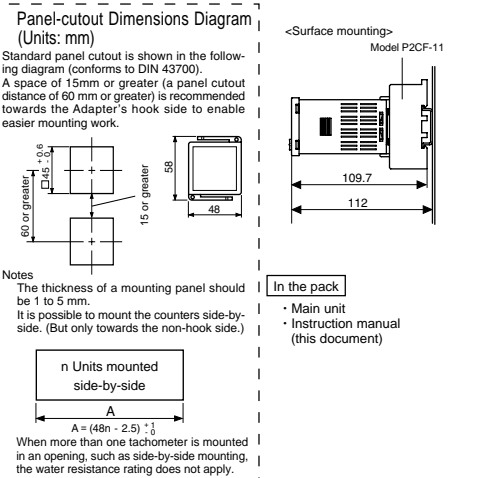
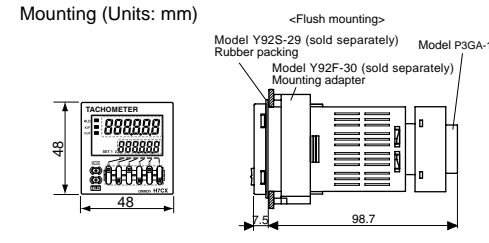
- Please comply strictly with the following instructions which are intended to ensure safe operation of the controller.
- Environmental Precautions**
 - Do not use in locations affected by excessive vibration or shock, or in locations subject to exposure to water or oil.
 - Do not use this equipment 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 H7CX close to sources of excessive static electricity (e.g., forming compounds, powders, or fluid materials being transported by pipe).
 - To prevent damage to the exterior of the tachometer, it must not be exposed to organic solvents (e.g., paint thinner or benzene), strong alkalis, or strong acids.
 - Do not install the H7CX in the following places:
 - Locations subject to condensation as a result of high humidity.
 - Locations subject to severe changes in temperature.
 - Usage Precautions**
 - Store at the specified temperature. If the H7CX has been stored at a temperature of less than -10°C, allow the H7CX to stand at room temperature for at least 3 hours before use.
 - Use in locations subject to temperatures or humidity within the range specified in the specifications.
 - Application of voltages other than the rated voltage may seriously damage the internal elements.
 - Do not exceed the rated load current.
 - Operate the DIP switch with the power supply turned OFF. Touching the terminal applied the high voltage may be caused electric shock.
 - Ensure that the terminals are connected with the correct polarity.
 - Always maintain the power supply voltage within specifications.
 - Apply power voltage by way of switch and relay quickly so as to reach the rated voltage within 2 seconds. Gradual application of the voltage may be caused the invalid of the power reset or unstable performance of the product.
 - Set the each value adjusting to the measurement item. Not matching the setting content and the content of the measurement item may cause the unexpected breakage or accident.

- If left at high temperatures for long periods with the output turned ON, there is risk of accelerated deterioration of the internal components (such as the electrolytic capacitor). Therefore, make sure that it is used in combination with a relay and avoid leaving it with output ON for long periods (e.g., greater than 1 month).
- When mounting on a panel, tighten the two screws alternately and evenly until they become secured. If the screws are not tightened evenly, water may penetrate inside of the panel.
- Since this product adopts the reading method all the time, the output status may be affected by changing the relative value for changing the current measurement value during operation.
- In the case of operating the product with no-voltage input (NPN input), approx. 14V is output from the input terminal. Therefore, in case of supplying the under 14V power source from external, connect the diode.
- Applying the power to the product with the initial setting status and leaving not activating the pulse onto the count input, the product turns ON after passing 999.9 seconds.
- Install a switch or circuit breaker that allows the operator to immediately turn off the power, and label suitably.
- The H7CX'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 tachometer and operating panel, attach a water-proof packing (Model Y92S-29) in the space and be sure to secure it by tightening screws of the flush-mounting adapter (Model Y92F-30).

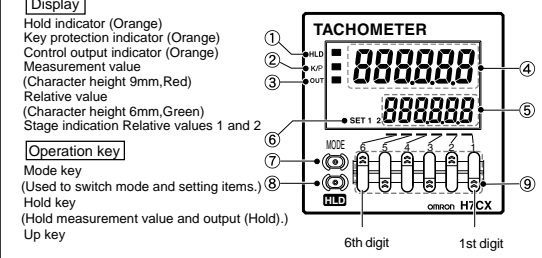


Mounting

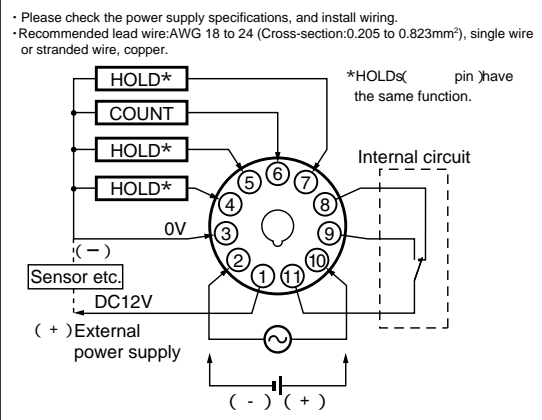
Mounting and Panel-cutout Dimensions Diagram



Nomenclature



Terminal Arrangement



Specifications

Power supply voltage/Power consumption	AC100-240 V 50/60Hz	9.4VA
Operating voltage range	AC24 V 50/60Hz/DC12-24 V	7.1VA/4.7W
Ambient temperature	85 to 110 % of the rated voltage (90 to 110 % in the case of DC12-24 V)	
Ambient humidity	-10 to +55 (When side-by-side mounting: -10 to +50)	
Storage temperature	25 to 85 % (Avoid freezing or condensation)	
Altitude	-10 to +65 (Avoid freezing or condensation)	
Recommended external fuse	T2A, 250 VAC, time-lag, low-breaking capacity	
Weight	Approximately 140 g (main unit only)	
Installation environment	Over-voltage category , pollution degree 2 (as per IEC61010-1)	
Control output	Relay output 250 VAC, 3 A (resistive load)	30 VDC, 3 A (resistive load)
Electrical life of relay	100,000 operations	
Mechanical life of relay	10,000,000 operations	
External power supply	12 VDC, 100 mA	
Enclosure rating	Individual mounting: The front surface of the enclosure of the Type H7CX series tachometer meets UL 508 Type 4X for Indoor Use Only, when all of the following conditions are met:	

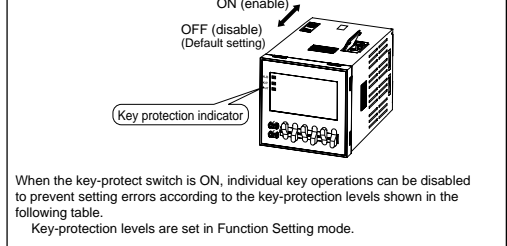
Conformance to EN/IEC Standards

- There exists basic insulation between the power supply and input, power supply and output, and between input and output terminals.
- Connect input and output terminals to devices in such a way that there are no accessible live parts.
- Connect input and output terminals to devices containing basic insulation suitable for the maximum usage voltage.

Precautions for Correct Use

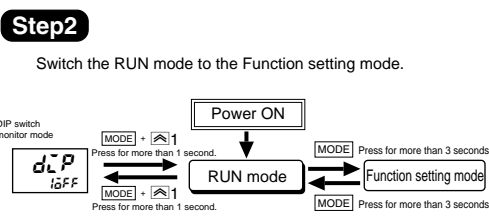
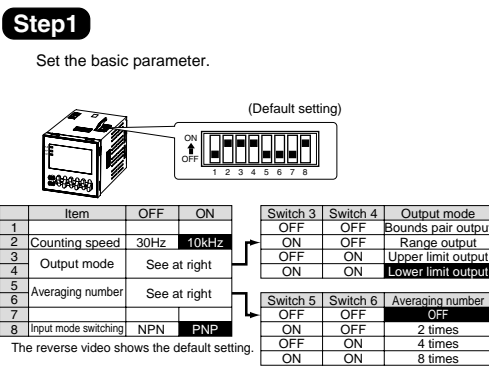
- When power is supplied, an inrush current (approx. 10 A) will flow for a short time. If the power supply capacity is too small, the H7CX may not operate. Make sure that a power supply of a sufficiently large capacity is used.
 - In the case of setting the relative value under Bounds pair output mode, the output becomes always ON so as that the setting of the relative value be relative value 1 relative value 2.
 - Missetting of the prescaling value may cause the difference of the count. Check all setting conditions are correct and operate the product.
 - The product memorizes the status just before occurring the electric failure memory with EEPROM. The rewriting life of the EEPROM is 100,000 or more. The EEPROM rewrites the setting condition into the initial setting one when the power source is OFF.
 - In the case of using the external power supply for the models with AC24 V/DC12-24 V specification, the load should be reduced according to the power supply voltage as shown in the diagram on the right. (Only when DC power is supplied)
-

Key-protect Switch Settings

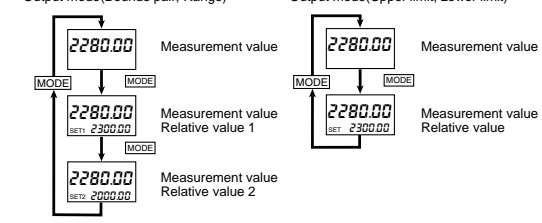
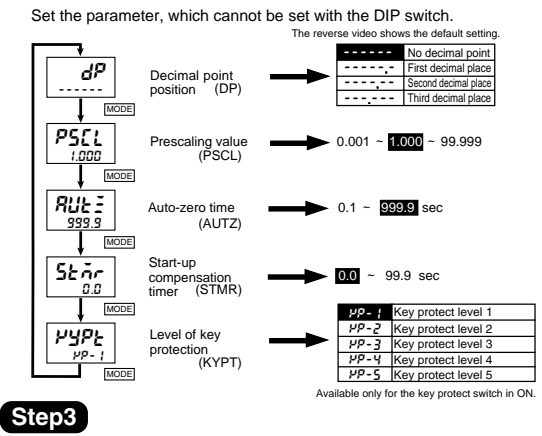


Operation

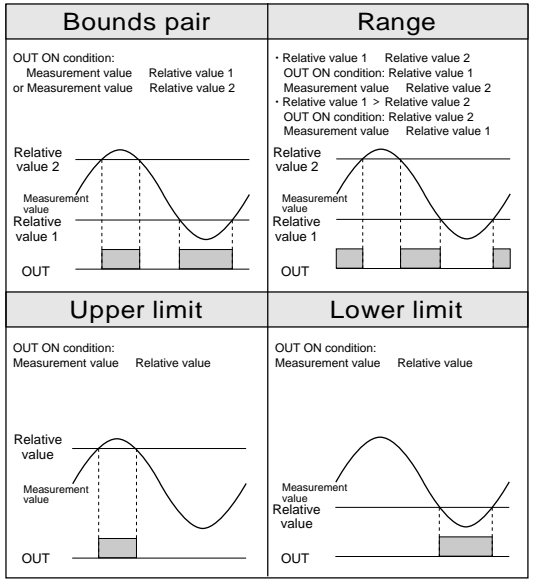
For setting parameter, both the setting using DIP switch and the setting using front key are required. Refer to the following procedures for details.



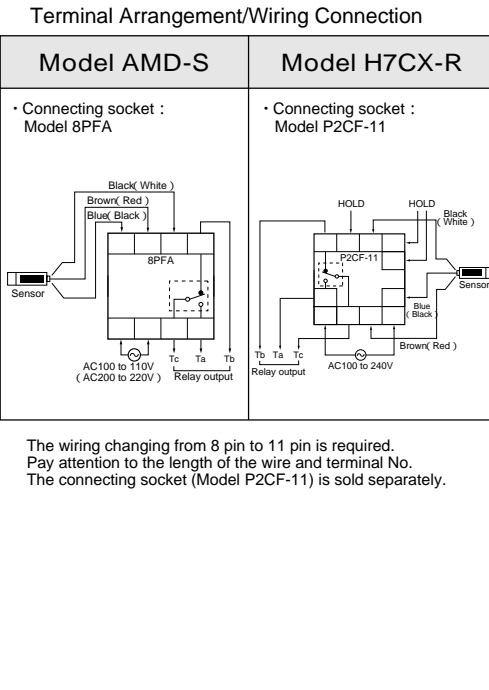
Setting



Output Mode Settings



Replacement from Model AMD-S to Model H7CX-R



Specifications

	Model AMD-S	Model H7CX-R
Power supply voltage	• AC100 to 110V • AC200 to 220V	• AC100 to 240V • AC24V/DC12 to 24V
Input mode	Voltage input (H:4 to 14V, L:0 to 1V)	No-voltage input/ Voltage input (H:4.5 to 30V, L:0 to 2V)
External power supply	DC12V ± 1V 12mA	DC12V(± 10%) 100mA
Relay output	AC200V 5A (resistive load)	AC250V/DC30V 3A (resistive load)
Output mode	Detected speed-up of rotation (Model AMD-SU) Detected lowering of rotation (Model AMD-SL)	Bounds pair, Range, Upper limit, Lower limit (Switchable with DIP switch)
Setting *	Interval of Input Pulse (s)	Frequency (Hz)
Range of detection rpm	6 to 6000rpm (at 1 pulse/round)	0.06 to 600000rpm (at 1 pulse/round)
Start-up compensation timer	Fix timer value between 0.1 to 10s (Unless otherwise specified, fix timer value at 10s)	Variable between 0.0 to 99.9s
Life of relay	Electrical life of relay 500,000 operations	Electrical life of relay 100,000 operations
Memorizing method for service interruption	Invalid	EEP-ROM (Times of rewriting: 100,000)

* The interval of time and related formula of the frequency are shown as follows.
Frequency (Hz)=1/Interval of Input Pulse (s)
[ex.] Interval of Input Pulse=0.01s Frequency = 1/0.01s=100Hz
Interval of Input Pulse=10s Frequency = 1/10s=0.1Hz

Setting

Set each item according to the conditions shown in the following table precisely for realizing the function of the Model AMD-S on the Model H7CX-R.

[DIP switch setting] The reverse video shows the default setting.

	Model AMD-S	Model H7CX-R	
		State of DIP switch	Set value
Measurement range	0.01 to 0.1s (Model AMD-S 1)	ON	10kHz
	0.1 to 1s (Model AMD-S 2)	OFF	
	1 to 10s (Model AMD-S 3)	ON	
Output mode	Rotational speed decrease detection (Model AMD-SL)	ON	Lower limit
	Rotational speed increase detection (Model AMD-SU)	OFF	Upper limit
Averaging number	Invalid	ON	OFF
Input mode	Voltage input	ON	PNP

[Setting with the keys on the front panel]

	Model AMD-S	Model H7CX-R	
	Parameter	Set range	Set value
Start-up compensation timer	Stmr (STMR)	0.0 - 99.9 (0.0s) (99.9s)	0.0

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.

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形 H7CX-R 電子タコメータ

Japanese 取扱説明書

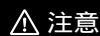
このたびは、オムロン製品をお買い上げいただきまして、まことにありがとうございます。この取扱説明書では、この製品を使用する上で、必要な機能、性能、使用方法などの情報を記載しています。

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詳細は、「新商品ニュース H7CX-R」(SGTB-006)を参照ください。

安全上のご注意

警告表示の意味



正しい取扱いをしなれば、この危険のために、時に軽傷・中程度の傷害を負ったり、あるいは物的損害を受ける恐れがあります。

警告表示



ネジがゆるむと、稀に発火および誤動作の恐れがあります。端子ネジは規定トルク(0.5N・m程度)で締めてください。

稀に爆発の恐れがあります。引火性、爆発性ガスのあるところでは使用しないでください。

寿命を超えた状態で使用すると、稀に接点溶着や焼損の恐れがあります。出力リレーの寿命は、閉閉容量、閉閉条件により大きく異なるので必ず実使用条件を考慮し、定格負荷、電氣的寿命回数内でご使用ください。

稀に感電、火災、故障の原因になります。ディップスイッチの操作は電源OFF時に行ってください。高電圧が印加された端子に触れて感電する危険があります。

稀に感電、火災、故障の原因になります。製品の中に金属や導線を入れないでください。



安全上の要点

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. 環境上の要点

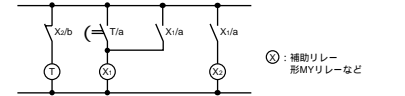
- 振動、衝撃の影響が大きいところ、水がかかるところ、被油のあるところでの使用は避けてください。
・ 粉塵の多いところ、腐食ガスの発生するところ、直射日光のあたる場所での使用は避けてください。
・ ノイズの発生源、ノイズのつった強電線から、入力信号線の機器、入力信号線の配線、および製品本体を離してください。

2. 使用上の要点

- 保存は、記載された定格範囲内としてください。また、-10℃以下で保存後使用する場合は、常温に3時間以上放置してから通電してください。
・ 使用周囲温度や使用周囲湿度については、記載された定格範囲内でご使用ください。
・ 定格以外の電圧を印加すると、内部素子を破壊する恐れがあります。

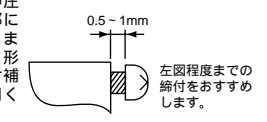
- 高温中に長時間、出力ONの状態を放置すると、内部部品(電解コンデンサなど)の劣化を早める恐れがあります。そのためにレールと組み合わせて使用するようし、長時間(例えば1ヶ月以上)の出力ON放置は避けてください。

<参考図>



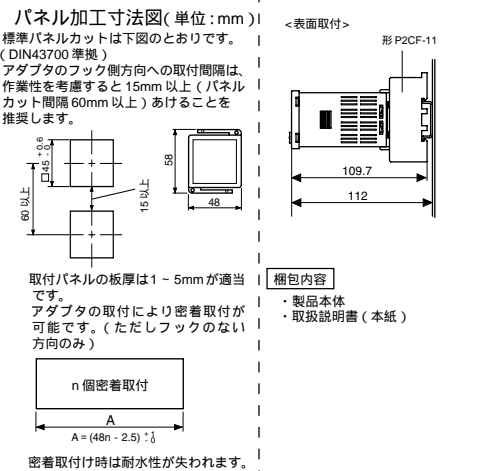
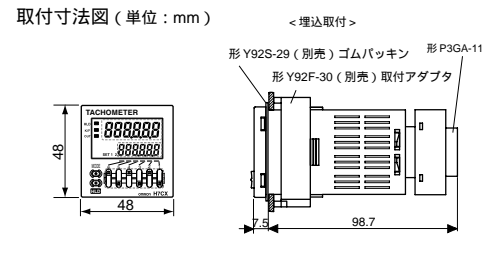
- パネルへの取り付けの際は2ヶ所のネジを交互にバランスをとりながらしっかりと締めてください。
・ パネルの内部に水が浸入する恐れがあります。
・ 常時読込方式を採用しているため、動作中に比較値を変更する場合には、現在計測値をまたぐような変更をしないと出力状態に影響します。

- 無電圧入力(NPN入力)で使用される場合、入力端子より約14Vが出力されるので、外部から14V以下の電源を供給する場合はダイオードを接続してください。
・ 工場出荷時の設定で電源を投入し、カウント入力にパルスが入らない状態で放置すると999.9秒後に出力がONします。
・ 作業者がすぐ電源をOFFできるよう、スイッチまたはサーキットブレーカを設置し、適切に表示してください。

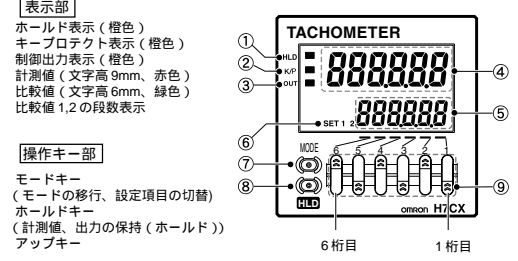


取付方法

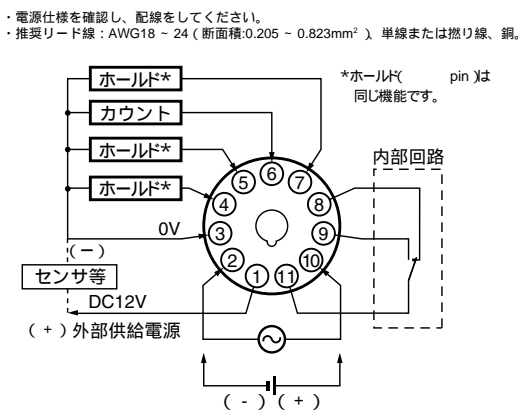
取付およびパネル加工寸法図



フロント部の名称



端子配置



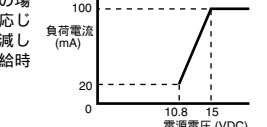
仕様

Table with specifications for power supply, operating temperature, humidity, and electrical life.

電源電圧/消費電力 AC100 ~ 240V 50/60Hz 9.4VA
許容電圧変動範囲 AC24V 50/60Hz/DC12-24V 7.1VA/4.7W
使用周囲温度 -10 ~ +55 (密着取付時は-10 ~ +50)

使用上の注意

- (1) 電源投入時に短時間ですが突入電流(約10A)が流れ、電源の容量によっては起動しないことがあります。
(2) 上下出力モードで比較値を設定する場合には、比較値1 比較値2となるように設定すると出力が常時ONします。



操作方法

パラメータを設定するにはディップスイッチによる設定と前面キーによる設定の両方が必要になります。

Step 1: Basic parameter setting. Includes a table for switching ON/OFF settings for various functions like counting speed and average count.

Step 2: Switching to function setting mode. Shows the sequence of button presses to enter the mode.

設定方法

Step 3: Setting parameters using dip switches. Lists settings for decimal point, scale, auto zero, and key lock.

出力モードの設定

Output mode settings diagram showing waveforms for upper and lower limits and range modes.

形 AMD-S から形 H7CX-R への置換

Terminal configuration and wiring diagrams for the replacement of AMD-S with H7CX-R.

Comparison table of performance between AMD-S and H7CX-R models.

Setting method for the replacement, including dip switch settings and front key settings.

キープロテクトスイッチの設定

Diagram and text explaining the key protection switch settings and their effects.

自己診断機能

Table of self-diagnostic functions, including error codes and their corresponding actions.

ご使用に際してのご承諾事項

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Omron company information, contact details, and service hours.