

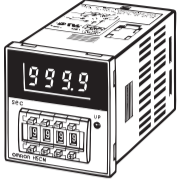
H5CN

石英定时器

Chinese 使用说明书

感谢您购买本欧姆龙产品。在本使用说明书中，记载了使用本产品所必需的功能、性能、使用方法等信息。使用本产品之际，请遵守如下事项。

- 使用该产品的必须具有足够的电气系统知识。
- 请在仔细阅读并充分理解本产品使用说明书内容基础上正确使用。
- 请妥善保管该手册以确保在需要时可以随时查阅。



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2288978-2A (Side-A)

安全警告

警告符号的要点

注意 表示潜在的危險情况，如不加以防止，很可能导致轻度或中度的人身伤害，或财产损失。

警告符号

注意

当电源带电时，不要接触端子。这样做可能会因为电击导致轻度伤害。

不要将该产品用于有易燃易爆气体的场合。否则有可能因为爆炸而造成轻度伤害。

绝对不要拆卸，改装以及修理该产品或接触任何内部元件。有时会发生轻微的电击、火花或误动作。

输出继电器的预期寿命随着输出负载以及开关条件的变化而变化。始终要注意输出继电器的应用环境，并在额定负载及预期寿命以内使用。如果超过了预期的使用寿命，有时会发生触点融化和烧损。此外，请务必将负载电流控制在额定值以内使用；在使用加热器等设备时，请务必在负载回路中使用温控开关。

使用0.74~0.90N·m的力矩拧紧端子螺丝。松动的螺丝有时可能导致火灾。

不允许金属碎片、导线线头或者安装时产生的细小的金属屑进入设备。这样做可能导致电击、火灾或机器的故障。

安全使用注意事项

为了确保安全，请务必遵守如下事项。

- 1) 请在确认是否是您所希望的产品之后，再行使用。
- 2) 请避免在下列环境中使用。
 - 温度变化剧烈的场所
 - 湿度较高，可能结露的场所
 - 剧烈振动和冲击的场所
 - 多灰尘或腐蚀性气体、阳光直射的场所
- 3) 本产品并非防水、防油构造。不要在液体飞溅或有油气的地方使用。
- 4) 请务必在环境温度及湿度的规格范围内使用和储存。必要时需强制冷却。此外，在-10℃以下环境中存放后再使用时，请在常温条件下放置3小时以上再通电。
- 5) 请勿遮盖本体的通风孔及其周围，以免阻碍其散热。
- 6) 接线时，请勿接错端子的极性。
- 7) 不用的端子不要接线。
- 8) 请使用所指定尺寸的配线用压入端子（M3.5、宽7.2mm以下）。裸线连接的配线材料请使用铜制AWG24（截面积0.205mm²）—AWG18（截面积0.823mm²）的绞线或单线。（电线绝缘体切除长度：5~6mm）在同一端子上只能连接同尺寸、同种类的2根线；若使用压入端子，最多只能使用2片。
- 9) 电源电压及控制输出请在规格、额定值范围内使用。
- 10) 使用开关、继电器或者其它的触点元件来进行电源的瞬时接通。如果电压是逐渐提高的，则可能产生误动作。
- 11) 请勿在晶体管输出端子上直接施加外部电压。
- 12) 为了使作业人员能够立即让电源OFF，请设置开关或断路器，并进行适当的显示。
- 13) 请确保输入信号源设备、输入信号线的接线以及产品本体远离干扰信号发生源及带干扰信号的强电线。
- 14) 在有大量静电发生的场所（成形材料，管道输送粉末状、液体状物质等情况）使用时，请使用产品本体远离静电发生源。
- 15) 长时间在高温或以输出ON状态下放置，会加速内部零件（电解电容器等）的老化。因此，请与继电器互锁使用，不要在输出为ON状态下长时间（如一个月以上）放置。
- 16) 无电压输入端子上有内部回路电压（约5V）。所连接的输入设备，有可能会发生误动作或故障，因此请确认输入设备的规格（额定输出电压、电源回路中有无内置二极管）。电源回路中未内置二极管的输入设备用于5V以下的电源电压时，为了防止对电源装置进行充电的事故，请如图所示连接二极管。
- 17) 本体外表请勿使用带腐蚀性的有机溶剂（稀释剂、汽油等）、强碱性、强酸性物质进行清洁。进行清洁时使用市售酒精。
- 18) 请确认显示（LED）正常工作。受使用环境影响，可能会导致LED/树脂零件提前老化及显示不良，因此请定期进行检查和更换。
- 19) 报废分解时请使用工具。
- 20) 废弃本产品时，请按照当地的工业废弃物处理方法予以适当处理。

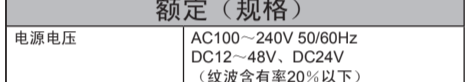
使用注意事项

- 1) 电源接通时在短时间内会有突入电流流过，由于电源容量的关系，有时可能无法启动，因此请使用容量足够的电源、断路器及接点。
 - AC100~240V 式样 AC264V时 约0.8A
 - DC12~48V 式样 DC52.8V时 约0.4A
- 2) 接通电源后有50ms的内部回路电压上升时间，对此段时间内的输入信号可能不会动作。
- 3) 断开电源后（刚停电时）有100ms的内部回路电压下降时间，可能会对这段时间内的输入信号进行动作。
- 4) 采用非挥发性存储器进行停电存储，写入寿命达100万次以上。在电源断开时，对非挥发性存储器进行写入。（仅限-M型）
- 5) H5CN系列DC12~48V电源型的电源端子与信号输入端子之间为非绝缘的无变压器方式的电源。当使用非绝缘型DC电源时，根据不同接线方式，有时可能会因返回电流而导致内部零件烧损（破坏）。请在使用前充分确认接线状况。
- 6) 动作时间的设定
时间设定范围

设定范围	型号
0.001s~9.999s	H5CN-□Z□
0.01s~99.99s	H5CN-□A□
0.1s~999.9s	H5CN-□B□
1s~99min59s	H5CN-□C□
1min~99h59min	H5CN-□D□

- 采用“常时读取方式”，即便在通电中也能变更设定，因此可以一时长期设定不动作状态、短期设定提前动作。（运行中如果因误碰而改变了设定值，将按照改变后的设定值动作。因此，如有此种可能性，请使用另售的前盖Y92A-48B。）
- 如果将设定值全设定为“0”（例如000.0s和00h00min），就会瞬时控制输出，因此可用于时间“零”的测试。运行中要变更设定值时，请不要让所有状态为“0”。
- 通电中要变更设定时间时，若按码开关的数字显示窗口可看见2个数字的半推进状态继续，则动作时间失常，因此请确认推紧了按码开关。特别是设定变更中的位数以外的3位数被设定为“0”时，剩余的1位如上述不彻底地设定，便会出现输出，必须注意。

（不正确的设定变更）



（有可能性的动作时间）

5min30s (瞬时性出现输出)

00h00min (瞬时性出现输出)

• 使用可设定1/1000秒的H5CN-□Z□型时，有时可能会发生固定误差（0.03~0.05s）。（但重复误差为1~2ms左右）

额定（规格）

电源电压	AC100~240V 50/60Hz DC12~48V、DC24V (纹波含有率20%以下)
容许电压变动范围	额定电源电压的85~110%
消费电力	约12VA (AC240V时) 约2.5VA (DC48V时)
复位、栅 电源复位	最小电源开路时间0.5s 电源投入后的复位时间0.05s
外部复位、栅	最小复位输入信号宽度 0.02s 残留电压2V以下 ※接点、无接点输入共用
控制输出	
接点输出	AC250V 3A 阻性负载 (cos φ=1) 最小适用负载 DC5V 10mA (P水准、参考值) 集电极开路 DC30V max, 100mA max -10~+55℃ (不结冰、不结露)
晶体管输出	
使用环境温度	35~+85% (不结冰、不结露)
使用环境温度	-25~+65℃ (不结冰、不结露)
储存环境温度	2,000m以下
高度	约110g
质量	10万次以上 (AC250V 3A阻性负载) 1,000万次以上
继电器的电气寿命	
继电器的机械寿命	

连接插座

插座	表面安装用插座	嵌入式安装用插座
H5CN-□□□	P2CF-08(-E)	P3G-08
-□□□N	P2CF-11(-E)	P3GA-11
-□□□NM		

自我诊断功能

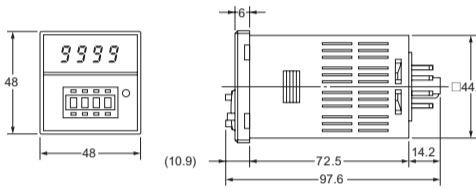
当发生故障时，将出现以下故障代码。

7段数字显示	时间已到显示	内容	输出
E1	OFF	CPU异常	OFF
E2	OFF	存储器异常 (RAM)	OFF
E3	OFF	存储器异常 (非挥发性存储器) ※	OFF

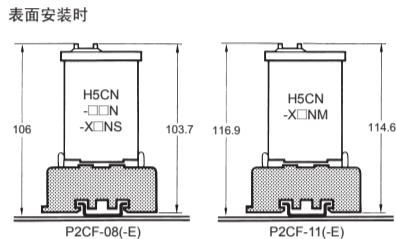
※包括非挥发性存储器达到写入寿命的场合。
复位方法
请重新接通电源。当显示正常时，可能是干扰信号引起的，请确认是否有干扰产生。如果错误代码为E3，则必须消除发生错误时的状态，请输入栅极（显示“0000”），然后重新接通电源。如果经过上述处理显示内容仍未变化，则需要修理。

外形尺寸及安装尺寸

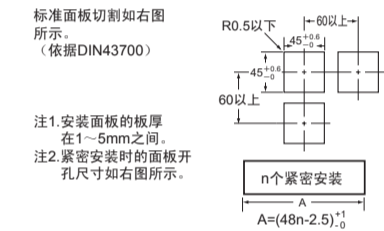
外形尺寸 [mm]



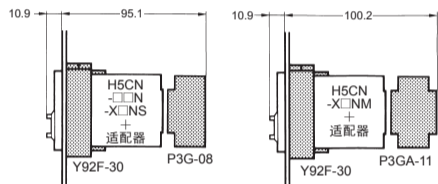
安装尺寸 [mm]



面板开孔尺寸 [mm]

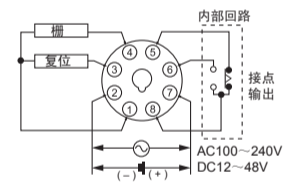


嵌入式安装时

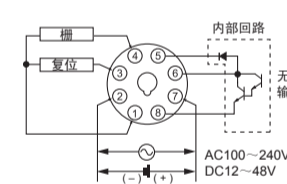


连接

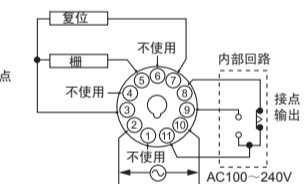
●H5CN-□□□ (无停电存储) 接点输出



●H5CN-□□□N (无停电存储) 无接点输出

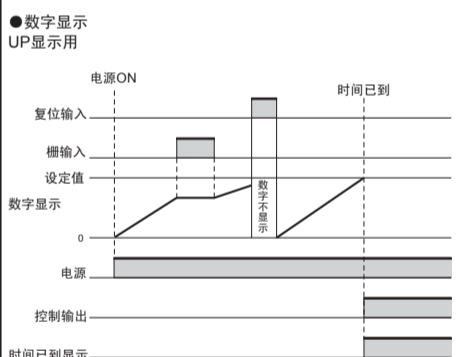


●H5CN-□□□NM (有停电存储) 接点输出



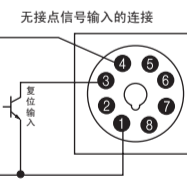
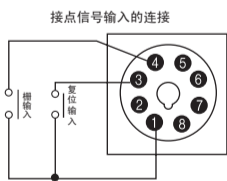
- 使用DC电源规格的产品时，无停电记忆型的②-①端子和有停电记忆型的③-②端子已在内部连接。
- H5CN-□□□N的端子⑤-⑥之间的二极管是用来吸收连接感应负载时发生的反向电压的。
- 不要的端子不要接线。

时序图（电源接通延迟）

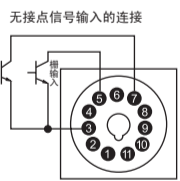
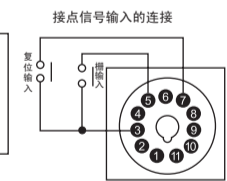


输入的连接

●H5CN-□□□ / □□□N (无停电存储)



●H5CN-□□□NM (有停电存储)



电源复位（电源Reset）时，请务必将电源开路时间定为0.5s以上。

使用的适用性

在客户的应用中，欧姆龙不负责产品与任何客户端产品所涉及的规格、规范和标准保持一致性。请务必考虑本产品对于所应用的系统、机器和设备间的适用性。使用时请注意并遵守本产品的禁止事项。在没有确认整个系统设计时所考虑到的风险，以及没有确认在设备和系统中该欧姆龙产品的额定使用条件和正确安装条件的情况下，禁止将本产品应用于对人身及财产存在严重危险的情况。详见产品规格书中保证及免责事项内容。

技术咨询

■技术咨询

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■制造单位

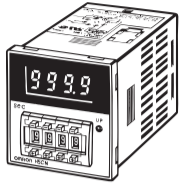
欧姆龙（上海）有限公司
地址：中国上海市浦东新区金桥出口加工区
金吉路789号
电话：(86)21-50509988

Model H5CN DIGITAL TIMER

English INSTRUCTION MANUAL

Thank you for purchasing this OMRON product. This manual primarily describes the functions, performance and application methods needed for optimum use of the product. Please observe the following items when using the product.

- This product is designed for use by qualified personnel with a knowledge of electrical systems.
- Before using the product, thoroughly read and understand this manual to ensure correct use.
- Keep this manual in a safe location so that it is available for reference whenever required.



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2288978-2A (Side-B)

Safety Precautions

● **Key to WARNING Symbols**

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

● **Warning Symbols**

⚠ **CAUTION**

Do not touch the terminals while power is being supplied. Doing so may occasionally result in minor injury due to electric shock.

Do not use the product where subject to flammable or explosive gas. Otherwise, minor injury from explosion may occasionally occur.

Never disassemble, modify or repair the product or touch any of the internal parts. Minor electric shock, fire, or malfunction may occasionally occur.

The life expectancy of output relays varies considerably with the output load and switching conditions. Always consider the application conditions and use the output relays within their rated load and electrical life expectancy. If the output relays are used past their life expectancy, contact fusing or burning may occasionally occur. Also, never exceed the rated load current. When using a heater, surely use a thermo switch in the load circuit.

Tighten the terminal screws to between 0.74 and 0.90 N·m. Loose screws may occasionally result in fire.

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.

Precautions for Safety Use

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

- Make sure the proper product is specified for the application.
- For correct use, do not subject the product to the following conditions.
 - Dramatic temperature fluctuations
 - High humidity or where condensation may occur
 - Severe vibration and shock
 - Where excessive dust, corrosive gas, or direct sunlight may be present
- This product is not waterproof or oil resistance. Do not use the product in any of the places subject to splashing liquid or oil atmosphere.
- Use and store the product within the rated ranges given for the product model you are using. If necessary, use forced cooling. If the product is stored below -10°C, allow it to warm up for three hours at room temperature before turning ON the power supply.
- Do not cover the vent holes on the products and the area around the product in order to ensure thermal dissipation.
- Wiring all terminals correctly.
- Do not wire the terminals which are not used.
- Use specified size crimped terminals (M3.5, thickness 7.2 mm max.) for wiring with a gage of AWG 24 to AWG 18 (equal to a cross section area of 0.205 to 0.823 mm²). (The wiring stripping length is 5 to 6 mm.)
- Up to two wires of same size and type, or two crimped terminals can be inserted into a single terminal.
- Use this product within the rated power supply voltage and control output.
- Use a switch, relay, or other contact to turn the power supply ON instantaneously. If the voltage is applied gradually, the power may not be reset or output malfunctions may occur.
- Do not apply the supply voltage directly from external to transistor output.
- Install and clearly label a switch or circuit breaker so that the operator can quickly turn OFF the power supply.
- Install the input signal resource and the product itself apart from noise generating sources and wiring which is carrying the high power current to cause noise.
- Separate the product from any sources of excessive static electricity, such as forming materials and pipes carrying powder and liquid materials.
- Interlock the power to the product with a relay so that the product will not be left in an output on condition for long periods. Leaving the product in an output-on condition for a month or longer, especially in places with high temperatures, may result in deterioration to internal parts, such as an electrolytic capacitor.
- Internal circuit voltage (5 V) is output to the no-voltage input terminals, which may cause some connected devices to malfunction or fail. Check the specifications of the input device (e.g., rated output voltage or whether a power supply circuit diode is built in).
To prevent power supply devices from being subjected to charging accidents, connect a diode as in the figure when using a power supply voltage of 5 V or less to operate input devices that do not have a diode built into the power supply circuit.
- The exterior of the product may be damaged by organic solvents (such as thinners or benzene), strong alkali, or strong acids.
- Check that the LED indicators are operating normally. Depending on the operating environment, the indicators and plastic parts may deteriorate faster than expected, causing the indicators to fail. Periodically perform inspections and replacements.
- Use tools when separating parts for disposal.
- When disposing of the product, observe all local ordinances as they apply.

Precautions for Correct Use

- Inrush current will be carried when turning on the power. If the capacity of the power for the product is insufficient, the product cannot start. Use a power supply, breakers, contacts which sufficient capacity.
100 to 240 VAC specifications Approx. 0.8 A for 264 VAC
12 to 48 VDC specifications Approx. 0.4 A for 52.8 VDC
- Since 50 ms after the power is turned ON is required as the raise time of the internal circuit voltage, note that the product may not operate in response to any input signal during this period.
- Since 100 ms after the power is turned OFF (or momentary power failures) is required as the fall time of the internal circuit voltage, note that the product may respond to input signals during this period.
- The product memorizes the status just before occurring the electric failure memory with non-volatile memory. The rewriting lifespan of the non-volatile memory is 1,000,000 or more. The non-volatile memory rewrites the setting condition into the initial setting one when the power OFF and reset input. (-M type only)
- Model H5CN 12-48 VDC specification use transformer-less power supply which the power terminals and input terminals are not insulated. When use this specification, the internal parts of the product may be occasionally burnt (damaged) if the wiring is not correct. Pay attention to check the wiring before use.
- Operation time setting
Time setting range

Setting range	Model
0.001 sec-9.999 sec	H5CN-□□□
0.01 sec-99.99 sec	H5CN-□□□□
0.1 sec-999.9 sec	H5CN-□□□□□
1 sec-99min59 sec	H5CN-□□□□□□
1 min-99h59 min	H5CN-□□□□□□□

- The H5CN Timer is capable of reading the input data at any time during normal operation. This means that the set time can be changed during power application. This feature sets back the output from the timer by temporarily setting the longer time or quickens the output by setting the shorter time. During normal operation, the set time may be accidentally changed by touching a thumbwheel switch, causing the timer to operate with a different set time. To prevent this possibility, use the optional Y92A-48B Protective Cover.
- When the set time is all zeroes (e.g., 000.0 s or 00 h 00 min), there will be a momentary control output upon power application, which can be used to check normal output. When changing the set time during normal operation, pay attention not to alter the set value to this all zeroes.
- When changing the set time while power is being supplied, an inadequate push of the thumbwheel switches will display two numbers in one display window, causing the operating count to drift widely. Therefore, press the thumbwheel switches surely. Take particular care when the other three digits are all zeroes, because the improper setting of the fourth switch to create four zeroes will cause an instantaneous output.

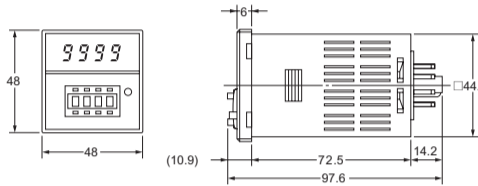
(Undesirable changes in the settings)

(Conceivable operating time) 5 min 30 s 00 h 00 min (instant output)

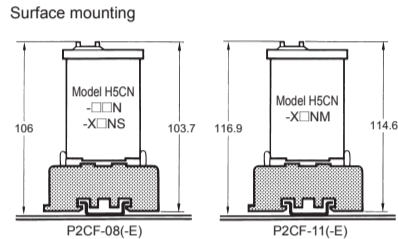
- Take particular care with the H5CN-□□□□□, which is capable of setting in 1/1000th of a second because there is an error of between 0.03 to 0.05 s. (Repeat accuracy is 1 to 2 ms)

Dimensions and Installation

DIMENSIONS [mm]

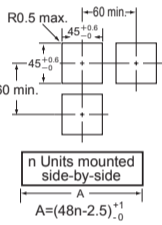


INSTALLATION [mm]

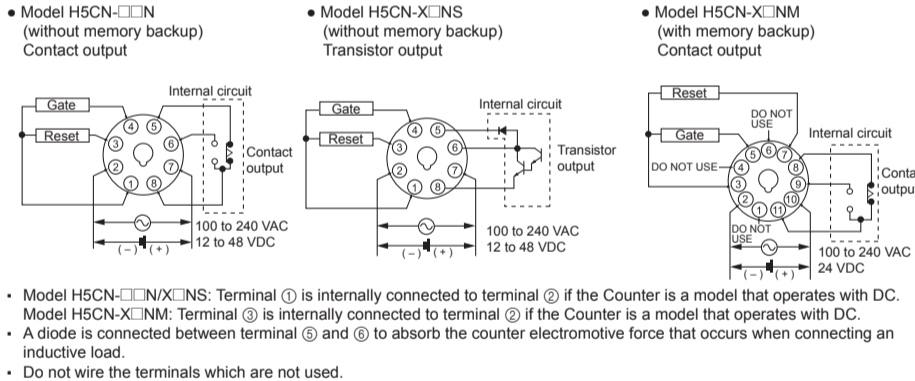


PANEL CUTOUT [mm]

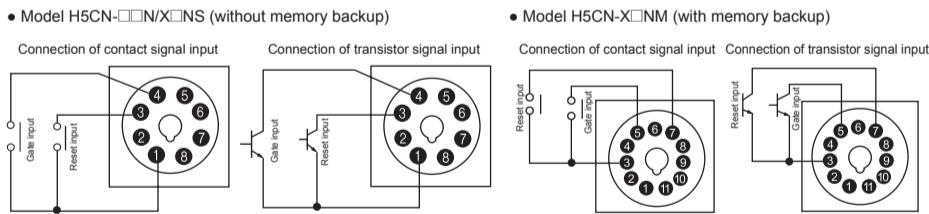
Standard panel cutout is as shown in the right figure. (conforms to DIN43700)



Connection



Input Connection



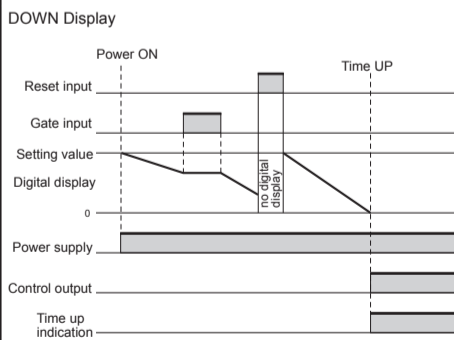
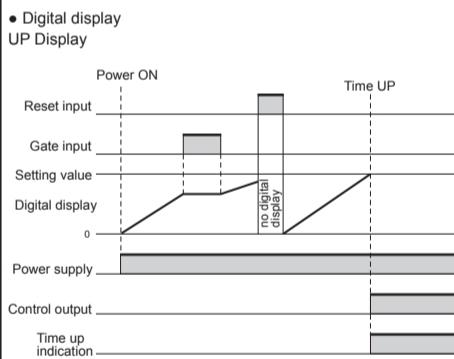
Set the reset time at least 0.5 sec during power recovery (power reset).

Suitability for 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.

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 PRODUCT(S) IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

Timing Chart (Power ON Delay)



Specifications

Power supply voltage	100 to 240 VAC 50/60 Hz 12 to 48 VDC, 24 VDC (20% max. ripple)
Operating voltage range	85 to 110% of rated power voltage
Power consumption	Approx. 12 VA (for 240 VAC) Approx. 2.5 W (for 48 VDC)
Reset, gate	
Power reset	0.5 sec reset time (min.) Reset time following power application: 0.05 sec
External reset, gate	0.02 sec reset signal width (min.) ON residual voltage: 2 V max. * Contact and transistor signal input use common terminal.
Control output	
Contact output	250 VAC 3 A resistive load (cosφ=1) Minimum load 10 mA, 5 VDC (P level, reference value) open collector 100 mA, 30 VDC max.
Transistor output	
Operating ambient temperature	-10 to +55 °C (with no icing and condensation)
Operating ambient humidity	35 to 85% RH
Storage temperature	-25 to +65 °C (with no icing and condensation)
Altitude	2,000 m max.
Weight	Approx. 110 g
Electrical lifespan of relay	100,000 operations min. (3 A, 250 VAC resistive load)
Mechanical lifespan of relay	10,000,000 operations min.

Connecting Sockets

H5CN SOCKET	Surface mounting	Flush mounting
□□□□	P2CF-08(-E)	P3G-08
X□□□□	P2CF-11(-E)	P3GA-11

Self-diagnosis Function

When an error has occurred, the below error codes are shown.

7 segment display	Time UP display	Description	Output
E1	OFF	CPU error	OFF
E2	OFF	Memory error (RAM)	OFF
E3	OFF	Memory error (non-volatile memory)*	OFF

* Including the case when the rewriting lifespan of the non-volatile memory is reached.

Recovery method
As an action, turn the power OFF then back ON again. If the display restored to normal, then a probable cause can be external noise affecting the system. Check for external noise. In the case of E3, input gate ("0000" will be displayed) and turn power ON again. After that, if it still remains the same, the product must be repaired.

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