

H7CZ

数字计数器

CN

指导手册

感谢您购买OMRON产品。在使用前敬请详细阅读本指导手册，熟悉功能和特征。请妥善保管本手册以备将来参考所需。

欧姆龙公司

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使用的适用性

欧姆龙不保证使用该产品进行集成的用户产品能符合任何标准、章程或规则。采取一切必要的步骤来决定对采用该产品的系统、机器和设备的适用性。了解并遵守一切使用该产品的禁止行为。如果应用该产品的系统在设计上不能保证有效处理对生命、财产的危害，不要在这样的系统上使用该产品。在整套装备或系统中适当使用和安装欧姆龙产品。参见产品目录中有关保证和免责声明。

安全上的注意

警告标志的含义

警告 如果操作不当，潜在的危險可能导致轻度或中度的人身伤害，或财产损失。

警告

偶尔会发生轻度的触电、起火、机器故障。请勿让金属、导线、安装加工过程中的粉尘跑进产品内部。

偶尔会发生爆炸引起轻度的伤害。使用时请远离有易燃易爆气体的场所。

偶尔会发生起火。请按照以下规定的扭矩拧紧端子螺丝。
P2CF插座端子：4.4 Lb-in (0.5 N·m)

触电偶尔会引起轻度的伤害。通电中不要触摸端子。排线时一定要盖上端子盖。

开闭容量、开闭条件对输出继电器的寿命影响很大，因此请考虑实际使用条件、额定负载、在电器寿命次数内使用。如超过寿命继续使用，会有接点熔敷、烧毁的危险。此外，负载电流必须小于额定值。使用加热器等装置时，务必在负载电路中接入热敏开关。

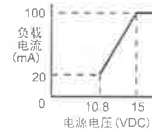
偶尔会发生轻度的触电、起火、机器故障。请勿擅自拆开、改造、修理，请勿触摸产品内部。

安全上的要点

- 1) 进行面板安装时，加固螺丝时请两边交替着拧，注意两边松紧程度要均衡。如果两个螺丝松紧不均，面板内部可能会进水。
- 2) 请在额定温度范围内保存本产品。此外，如果在-10℃以下的的环境下保存，使用时请先在常温下放置3小时以上再通电。
- 3) 密封安装可能会缩短内部零件使用寿命。
- 4) 使用周围温度、湿度，请控制在额定范围以内。
- 5) 请避免在下列环境中使用本产品。
 - 湿度高、易结露的地方
 - 受震动、冲击影响大的地方
 - 会淋到水的地方
 - 会沾到油的地方
- 6) 请避免在粉尘多的地方、有腐蚀性气体的地方、阳光直射的地方使用。
- 7) 在易产生大静电电气的环境(比如管道运送成型材料、粉、流体材料的情况)下使用时，请将本产品远离静电气产生源。
- 8) 若施加额定外的电压，内部元件会有遭到破坏的危险。
- 9) 排线时请勿弄错端子的极性。
- 10) 请远离噪音产生源、来自附着噪音的强电线的输入信号源的机器、输入信号线的排线、以及产品本体。
- 11) 使用压接端子时，1个端子最多接两个。
- 12) 排线时，如果1个端子上接2条线，这2条线必须是同线种。
- 13) 请选用合适的适用电线用于排线。
 - 适用电线 AWG18 ~ 22 单线或绞线 铜
- 14) 请设置开关或断路器，并作适当标示，以便作业人员可以迅速切断电源。
- 15) 输入端子的输出约为14V。请使用带有二极管的传感器。
- 16) 请透过开关、继电器等接点迅速施加电压，以使电源电压能在0.1秒以内达到额定电压。如果缓慢施加电压，电源可能没有复位，或者发生输出误动作。
- 17) 电源切断时请迅速断开开关、继电器等接点。如果电压下降缓慢，输出可能会无动作，或者发生记忆异常。
- 18) 因采用常时读取方式，运行中改变设定值时，若“设定值=计数值”，则输出变为ON，需要注意。
- 19) 当“设定值=计数值=0”，则输出变为ON(出厂状态)。不过在复位操作时输出为OFF。
- 20) 本体外包装会受到有机溶剂(稀释剂、挥发油等)、强碱性、强酸性物质侵蚀，请勿使用。
- 21) 请确认显示(LCD)正常动作。不同使用环境下可能会加速LCD、树脂零件的劣化，导致显示不良，因此请定期检查，定期更换。
- 22) 防水包装在不同的使用环境下，会发生劣化、收缩、硬化，因此请定期检查，定期更换。

使用上的注意

- 1) H7CZ系列的DC12~24V电源型属无变压器电源，电源端子和信号输入端子之间非绝缘。使用非绝缘型号的DC电源时，可能会因为排线的原因而产生干扰，偶尔会有内部零件烧毁(损坏)的危险。使用前请务必充分确认排线。
- 2) 电源接通时的一瞬间有突入电流流过(约10A)，个别电源容量下可能会出现无法启动的情况。请使用容量充足的电源。
- 3) 电源电压的变动范围请控制在容许范围内。
- 4) 考虑到计数器的外部设备(传感器等)的启动时间，计数器在电源接通后，要经过200 ~ 290ms才开始运作。前200 ~ 290ms是接收不到输入信号的，需要注意。
- 5) 电源切断后的5 ~ 100ms内不接受输入，需要注意。
- 6) 电源ON/OFF时的突入电流可能会使接点劣化，因此我们推荐使用额定在10A以上的机器进行开闭。
- 7) 外接电源的容量为12V 100mA。不过在给AC 24V/DC12 ~ 24V规格的机种使用外接电源时，请按下图所示，根据供给电源电压减轻负载。(仅当DC电源供电时)

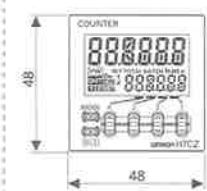


- 8) 预换算值设定错误会导致计数误差。请确认设定无误后再使用。
- 9) 各种设定值请配合被测对象正确设定。若设定内容与被测对象内容不一致，会有意想不到的动作发生，可能会损坏装置，甚至引发事故。
- 10) 在高温下，若长时间放任输出电流处于流动状态，可能会加速内部零件(如电解电容等)的劣化，请尽量避免。
- 11) 用EEP-ROM可进行停电记忆。EEP-ROM的可擦写次数是10万次。EEP-ROM在电源断电、功能设定模式切换到RUN模式时进行擦写。
- 12) 报废本产品时，请遵守各地自治体的产业废弃物处理办法。

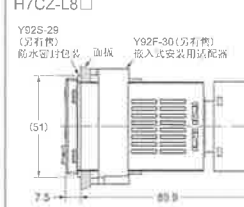
安装及面板加工尺寸图

安装尺寸图 (单位: mm)

前面板部位的外型尺寸，所有型号均相同。

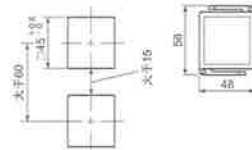


暗埋安装

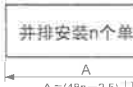


面板开孔尺寸图 (单位: mm)

标准面板开孔如下图(符合DIN43700) 为使安装工作更容易，建议在适配器挂钩侧留出15mm或更大的空间(面板开孔距离为60mm或更大)。



注1. 安装面板的厚度应是1~5mm。
注2. 计数器可以并排安装。(仅限于没有挂钩的一侧。)

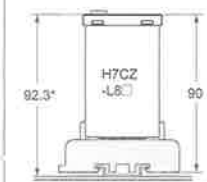


注3. 超过一个计数器安装在同一开孔中时(如并排安装)，就不能防水。

包装内

- 主单元
- 指导手册(本文件)

表面安装



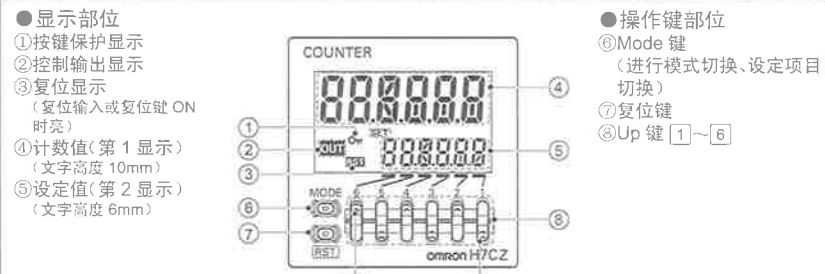
型号P2CF-08(E)(另有售) 表面连接插座

*根据不同的DIN导轨而有所不同。(参考值)

额定(规格)

电源电压	AC100 ~ 240V 50/60Hz AC24V 50/60Hz / DC12 ~ 24V	输入方式	无电压输入	短路时阻抗: 1kΩ以下(0Ω时流出电流12mA)、 短路时残留电压: 3V以下、 开放时阻抗: 100kΩ以上
容许电压变动范围	额定电源电压的85 ~ 110% (DC12 ~ 24V, DC100V 为90 ~ 110%)	控制输出	继电器输出	AC250V 3A(电阻负载) DC30V 3A(电阻负载)
消耗功率	约9.4VA(AC100~240V时) 约7.2VA/4.7W(AC24V/DC12~24V时)	继电器的电气寿命		10万次(周围温度环境: 23℃)
使用温度范围	-10 ~ +55℃(密封安装时: -10 ~ +50℃) (前提是无结冰、结露)	继电器的机械寿命		1000万次(周围温度环境: 23℃)
保存温度范围	-25 ~ +70℃(前提是无结冰、结露)	外接电源		DC12V 100mA
使用周围湿度	25 ~ 85%	保护构造		IEC规格 IP66、UL508 Type 4X*
使用高度	2,000m 以下	*单品安装: 前端的保护构造满足以下全部条件时,适用UL508 Type 4X。 • 防水密封包装 Y 92S-29、安装适配器 Y 92F-30 和计数器一同使用。更换时,仍使用这些部件。 • 计数器应当安装在有“Type 4X for Indoor Use Only”认定标志的控制箱的平面上。		
推荐保险丝	T2A、AC250V、延时熔丝、低分断容量			
质量	约100g(仅本体)			
设置环境	过电压类别 II、污染度2(根据 IEC61010-1)			

前面板部位的名称



操作

用正面按键进行各种功能设定。

- 从RUN模式切换到功能设定模式。



- 各参数通过 [] 键来设定。反色文字为出厂设定。

画面	参数名称	设定值	特别记载事项
Enter	输入模式	00 down	-
Output	输出模式	0 F, F, r, μ-1, P, Q, R ※1	-
Out	输出时间	001 ~ 9999	仅在输出模式为 C, r, μ-1, P, Q, R 时显示。单位: 秒
Count	计数速度	0.001 ~ 5MHz ※1	-
FL	最小复位时间	0.005 ~ 1s ※1	-
dP	小数点位置	0 ~ 9 ※1	-
PSC	预换算值	0.001 ~ 9999 ~ 99999	-
SL-H	设定 limit 上限	1 ~ 999999	-
PL	按钮保护等级	0P-1, 0P-2, 0P-3, 0P-4, 0P-5, 0P-6, 0P-7 ※1	-
On-R	输出 ON 次数报警设定值	0 ~ 9999	× 1,000
On-C	输出 ON 次数监视值	-	仅显示监视值, 而非设定。× 1,000

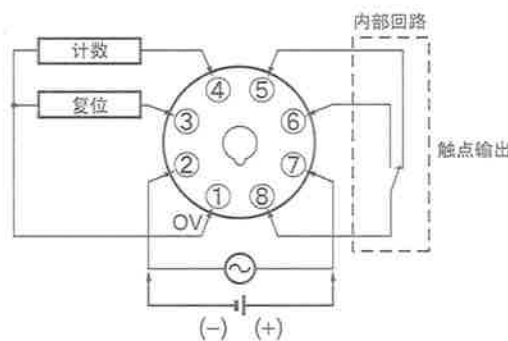
※1: 设定值到最末尾时,通过 [] 键重新返回前项。

在RUN模式中显示/设定



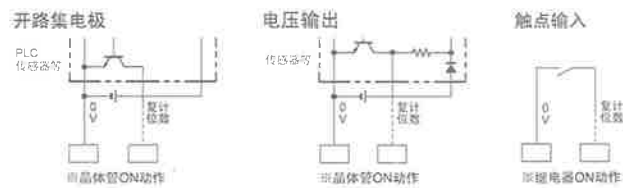
端子配置

- 排线前请先确认电源规格。



输入连接

- 无电压输入(NPN输入)



自诊断功能

发生异常时显示如下。

第1显示	第2显示	内容	输出状态	复位方法	复位后的设定值	
---	3	无变化	计数值下溢 *2	无变化	复位键或复位输入	无变化
E1	灯灭	CPU异常	OFF	复位键或电源切断再接通	无变化	
E2	灯灭	存储器异常(RAM)	OFF	复位键或电源切断再接通	无变化	
E2	5u	存储器异常(EEP-ROM) *1	OFF	复位键	出厂状态	
E3 *5	无变化	超出输出次数	无变化	复位键 *4	无变化	

- *1 也包括到达EEP-ROM 擦写寿命的情况。
- *2 计数值低于-99999 时发生。
- *3 闪烁显示(1秒为周期)
- *4 不能使用复位键消除总和 ON 次数。
- *5 E3 与正常显示交替出现。按下复位键后,即使超过报警设定值也不显示 E3,但由于在不取消输出 ON 次数的情况下要继续计数,可监控。

联系方式

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欧姆龙(中国)有限公司苏州办事处 电话: 0512-8669277	欧姆龙(广州)自动化有限公司 电话: 020-87320508	欧姆龙(中国)有限公司西安办事处 电话: 029-6765245	欧姆龙(中国)有限公司西安办事处 电话: 029-5381152	欧姆龙(中国)有限公司(香港) 电话: (852) 23753827
台湾欧姆龙股份有限公司(台北) 电话: 02-27153331	台湾欧姆龙股份有限公司桃园营业所 电话: 03-3554463	台湾欧姆龙股份有限公司台中营业所 电话: 04-23250834	台湾欧姆龙股份有限公司台南营业所 电话: 06-2903797	

技术咨询

800免费技术咨询电话: 800-820-4535(仅限于中国大陆)

制造单位

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邮编: 201206

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 fillings 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.

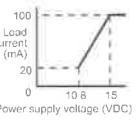
Minor electric shock, fire, or malfunction may occasionally occur. Do not disassemble, modify, or repair the Counter or touch internal components.

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.
- Do not use this 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.
- Internal elements may be destroyed if a voltage outside the rated voltage range is applied.
- 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 indications 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

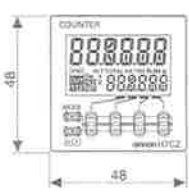
- H7CZ models with a 12 to 24-VDC power supply use a transformer-free power supply method in which the power supply terminals are not isolated from the signal input terminals. If a non-isolating DC power supply is used, unwanted current paths may occasionally burn or destroy internal components depending 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.
- Inrush current generated by turning ON or OFF 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 writes. 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.



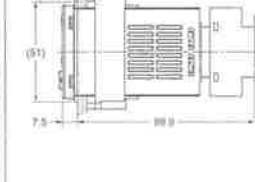
Surface Mounting



*These dimensions vary with the type of DIN track (reference value).

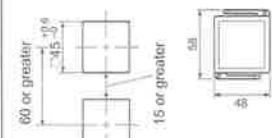
Flush Mounting H7CZ-L8□

Y92S-29 (order separately) Waterproof Packing
Y92F-30 (order separately) Flush Mounting Adapter

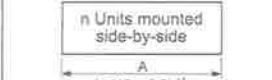


Panel-cutout Dimensions Diagram (Unit: mm)

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-L8D1)	Input method	No-voltage input	ON impedance: 1 kΩ max. (Leakage current: 12 mA when 0 Ω) 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 4X*
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 [1] to [6]

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 [F] Key.

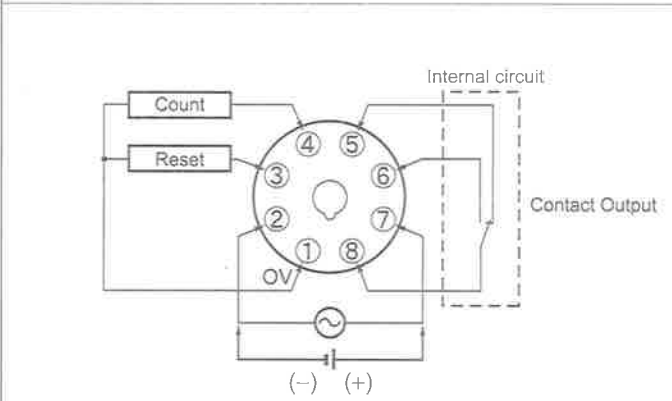
The characters displayed in reverse video are the default settings.

Display	Parameter name	Set value	Comments
Count	Input mode	00 down	---
Output	Output mode	0, F, C, r, P-1, P, Q, R *1	---
Output	Output time	00 to 9999	Displayed only when the output mode is C, r, P-1, P, Q, or R. Unit: second
Count	Counting speed	0.01 to 9999 *1	---
Count	Reset input signal width	0.05 to 9.9 *1	---
Count	Decimal point position	---	---
Count	Prescale value	000 to 9999 to 99999	---
Count	Set value upper limit	0 to 999999	---
Count	Key protect level	KP-1, KP-2, KP-3, KP-4, KP-5, KP-6, KP-7 *1	---
Count	Output ON count alarm set value	0 to 9999	× 1,000
Count	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 [F] Key will return to the first set value.

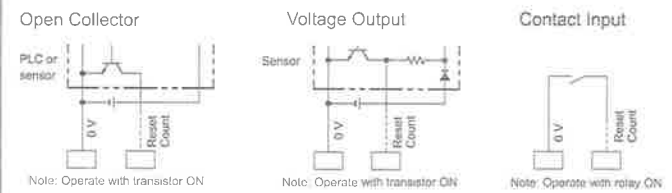
Terminal Arrangement

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



Input Connections

No-voltage Inputs (NPN Inputs)



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. * Key protect levels are set in function setting mode.

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	Invalid	Invalid
KP-4	Invalid	Valid	Invalid	Invalid
KP-5	Invalid	Invalid	Invalid	Invalid
KP-6	Invalid	Invalid	Invalid	Valid
KP-7	Invalid	Invalid	Invalid	Valid

* Changing mode to function setting mode.

Self-diagnostic Functions

Main display	Sub-display	Description	Output status	Correction method	Set value after reset
----	No change	Present value underflow *2	No change	Either press the Reset Key or turn ON reset input	No change
E1	Not lit	CPU error	OFF	Turn ON the power again. Reset Key	No change
E2	Not lit	Memory error (RAM)	OFF	Turn ON the power again.	No change
E3	5U _n	Memory error (EEPROM) *1	OFF	Reset Key	Factory setting
E3 *5	No change	Output Counter Overflow	No change	Reset Key *4	No change

- This includes times when the life of the EEPROM has expired.
- This occurs if the present value falls below -99999.
- Display flashes (1-second cycles)
- The total ON count will not be cleared by using the Reset Key.
- The normal display and E3 will appear alternately. When the Reset Key is pressed, E3 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

