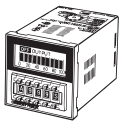
OMRON

型号 H3CA-A-101 固态定时器

指导手册

感谢您购买本OMRON产品。为保证产品的安全应用，仅懂得电和电气设备的专业人员才可操作。使用本产品之前，请仔细阅读本手册，并在产品使用中妥善保管。



欧姆龙公司

2259779-0A

安全警告

● 警告符号的要点

⚠ 警告　表示潜在的危险情况，如不加以防止，很可能导致轻度或中度的人身伤害，或财产损坏。在使用该产品前应仔细阅读本手册。

● 警告符号

⚠ 警告	
当电源带电时，不要接触端子。这样做很可能会因为电击导致轻度伤害。	⚠
电源切断后1分钟之内，不要接触端子。这样做很可能会因为点击导致轻度伤害。	🚫
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。	🚫
如果输出继电器超过了预期的使用寿命，有时会发生触电融化或者燃烧。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。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。	⚠
使用规定的力矩拧紧端子螺丝。松动的螺丝可能导致火灾。	❗
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。这样做很可能导致电击、火灾或者机器的故障。	❗

安全使用注意事项

了解以下警告以避免操作失误、误动作或产品特性、功能的相反效果。如果不这样做，可能导致不可预期的事情发生。

1）该产品只被设计为室内使用。不要将该产品用在室外或者下列地点。
- 直接受加热设备热辐射的地方。
- 有液体或油气飞溅的地方。
- 阳光直射的地方。
- 灰尘较多或有腐蚀性气体（特别是硫化物气体和氨气）的地方。
- 温度剧烈变化的地方。
- 结冰和结露的地方。
- 有震动或大的冲击的地方。
- 有挥发性、易燃性气体的地方。

2）在额定的温度和湿度范围内使用/存储该设备。必要时应采取强制冷却。
3）按端子的极性进行正确的接线，接线前请仔细检查噪声影响。
4）不用的端子不要接线。
5）在控制器与可以产生高频或浪涌或产生大量静电的设备之间应保持足够远的距离。将高压或大电流导线与其它导线隔离，在端子接线时避免与电源线共端或并联。
6）在该产品的附近应该有开关或者断路器。
开关或者断路器应该在操作者便于够到的地方，并且有明显的断开标志。
7）不要使用油漆稀释剂或同类化学品清洁该产品。使用标准等级的酒精。
8）请在确认是否是您所希望的产品之后，再行使用。
9）请在额定范围内保存。如在-10℃以下保存后使用时，请于常温下放置三小时后再通电。

使用注意事项

1）在额定负载和供电电源下使用该产品。
2）使用开关或继电器接触以确保瞬间将电源升为额定电压。如果电压是逐渐上升的，电源可能无法复位或者发生输出误动作。
3）输出继电器是有使用寿命的，请在使用寿命次数内使用。
- 电气寿命 10万次以上（AC250V，3A电阻负载）
- 机械寿命 1，000万次以上

4）工作环境
在可能发生爆炸或者有易燃气体的地方不要使用本品。
5）负载供电
请确认负载供电在额定范围内。
6）处置
不要拆卸、改造或修理本产品。

产品特性

工作电源：
110VDC -30，+10%（2W最大）
220VDC -30，+10%（2W最大）
（启动电压为额定工作电压55%～70%）

工作周围温度：-10～55℃（无结冰、结露。）
工作周围湿度：35～85%
仓储温度：-25～+65℃（无结冰、结露。）
安装种类：III
污染度：2
高度：最高2000米
建议保险丝：T1A，250VAC，时延，低熔断容量

使用的适用性

欧姆龙不负责遵守任何使用该产品进行集成的用户产品的标准、章程或规则。采取一切必要的步骤来决定该产品对该产品的系统、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。在整套装备或者系统中适当使用和安装欧姆龙产品。参加产品目录中有关保证和免责事项。

■错误信息

如果内部的IC出现错误，显示条会闪亮。断电后重新通电来清除错误。

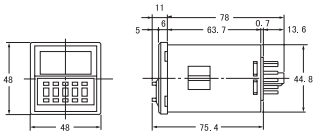
■如何改变预置值

使用一直读取的方式，这样就可以在定时器工作时修改定时器的设置值。如果定时器的设置值在定时器工作时被修改，显示的已过时间也随之改变。

⚠ 符合 EN/IEC 标准

这是一种A类产品。在住宅区中会导致无线电干扰，所以要求用户采取适当的措施减少干扰。

■尺寸



■可用的类型

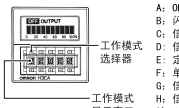
工作/复位方式		时限工作/自复位/外部复位 *
工作模式		8种工作模式（可选择）**
端子形式		11脚圆插座
时限接点		SPDT
配备控制输出ON/OFF和剩余时间指示	表面安装	带P2CF-11插座
	导轨安装	
	埋入安装	带Y92F-30适配器

注：
1. *工作/复位方式与选择的工作模式有关。详情见“时序图(工作模式)。”
2. **8种工作模式是：
A：ON延迟工作
B：闪动工作
C：信号ON/OFF延迟工作（I）
D：信号OFF延迟工作（I）
E：定时间间隔工作
F：单脉冲和闪动工作
G：信号ON/OFF延迟工作（II）
H：信号OFF延迟工作（II）

■正确使用提示

• 如何改变工作模式

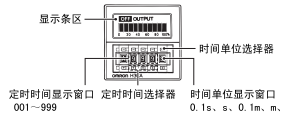
在前面板的最左边位置，按拨盘开关按钮，设置工作模式。可选择8种工作模式(A、B、C、D、E、F、G和H)，在工作模式显示窗口中会显示选中的工作模式。



A：ON延迟工作
B：闪动工作
C：信号ON/OFF延迟工作（I）
D：信号OFF延迟工作（I）
E：定时间间隔工作
F：单脉冲闪动工作
G：信号ON/OFF延迟工作(II)
H：信号OFF延迟工作(II)
注：1. 工作模式选择器中的两个A模式、两个B模式的功能相同。
2. 固定模式为A模式

• 如何改变时间单位和定时时间

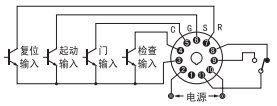
按最右边的拨盘开关按钮，可选择需要的时间单位。可选择7种时间单位(0.1s、s、0.1m、m、0.1h、h和10h)，在时间单位显示窗口中显示选中的时间单位。
按前面板中间的3个拨盘开关按钮，选择需要的定时时间。对每种时间单位，定时时间的范围是001到999。



■连接

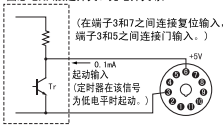
• 固态信号输入的连接

分别在端子③和⑥之间连接起动输入晶体管，端子③和⑦之间连接复位输入晶体管，端子③和⑤之间连接门输入晶体管，端子③和④之间连接检查输入晶体管。



对信号输入，使用开路集电极的晶体管，特性参数：
V_{CEO}=20V min.，$V_{CE(S)}$=1V max.，
I_{C}=50mA min.和 I_{CBO}=0.5μA max.
另外，这些输入信号必须满足下列要求：
晶体管导通时，电阻最大1kΩ，残余电压最大1V。晶体管截止时，电阻最小200kΩ。输入信号也可以是额定电压范围6～30VDC的固态电路(接近开关、光电开关或类似的)，不一定是开路集电极类型，如下图所示。当输出晶体管Tr导通时，固态电路有输入信号。用信号电压的情况下，在高电平变为低电平时有信号输入。再次强调，晶体管导通时，残余电压为最大1V。因为定时器到Tr的电流输出约为0.1mA，这样的连接可能产生的残余电压可保证最大1V。

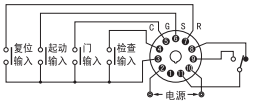
固态电路（接近开关、光电开关等）



注：除了电源接线回路，避免输入信号线与高压线或电源线并排放置或在相同线槽内。建议使用屏蔽线或使用单独的金属线槽，并尽量走最短距离。

• 接点信号输入连接

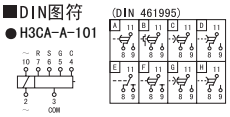
分别在端子③和⑥之间连接起动输入接点，端子③和⑦之间连接复位输入接点，端子③和⑤之间连接门输入接点，端子③和④之间连接检查输入接点。



对每个信号输入接点，需使用高接触可靠性的镀金接点。
这些输入信号必须满足下列要求：接点连通时，电阻最大1kΩ，残余电压最大1V。

■DIN图符

● H3CA-A-101

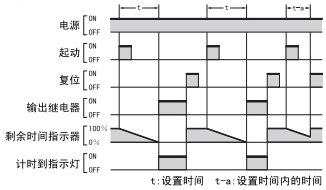


■时序图(工作模式)

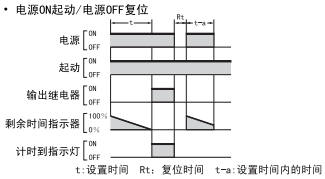
注：1. 最小信号输入时间是0.05秒。
2. 最小复位时间是0.5秒。
3. 注意，当定时时间设置为000时，A、B或F模式下不会产生输出，而C、D、E、G或H模式下会产生输出。

A模式 ON延迟工作

• 信号起动

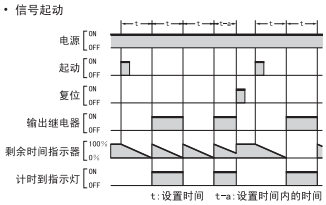


• 电源ON起动/电源OFF复位

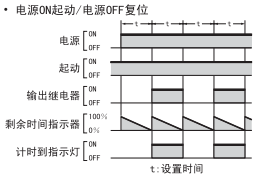


B模式 闪动工作

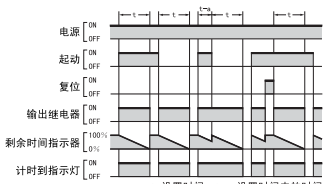
• 信号起动



• 电源ON起动/电源OFF复位

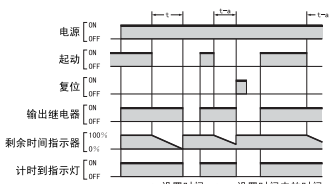


C模式 信号ON/OFF延迟工作(类型 I)



注：类型 I 指在起动信号为ON时输出继电器动作的版本。

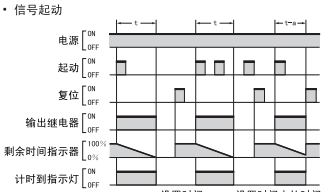
D模式 信号OFF延迟工作(类型 I)



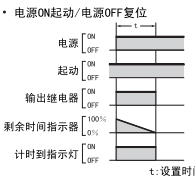
注：类型 I 指在起动信号为ON时输出继电器动作的版本。

E模式 定时间隔工作

• 信号起动

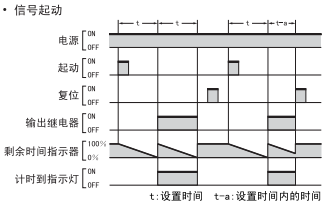


• 电源ON起动/电源OFF复位

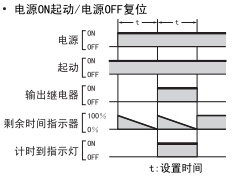


F模式 单脉冲和闪动工作

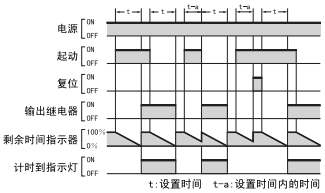
• 信号起动



• 电源ON起动/电源OFF复位

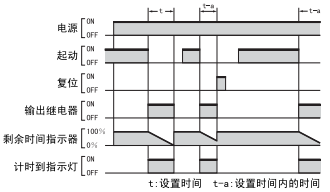


G模式 信号ON/OFF延迟工作(类型 II)



注：类型 II 指在起动信号为ON时输出继电器不动作的版本。

H模式 信号OFF延迟工作



注：类型 II 指在起动信号为ON时输出继电器不动作的版本。

■联系方式

■制造商
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

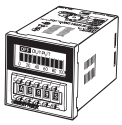
■技术咨询
欧姆龙自动化(中国)有限公司
地址：中国上海市浦东新区银城中路200号中银大厦2211室
电话：(86)21-5037-2222
技术咨询热线：400-820-4535
网址：http://www.fa.omron.com.cn

OMRON

Model **H3CA-A-101** SOLID-STATE TIMER

EN INSTRUCTION MANUAL

Thank you for purchasing an OMRON Product. To ensure the safe application of Product, only a professional with an understanding of electricity and electric devices must handle it. Read this manual carefully before using the Product and always keep it close at hand when the Product is in use.



OMRON Corporation

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. Read this manual carefully before using the product.

● 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 touch the terminals at least within 60 seconds, after turning the power OFF. Doing so many 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.	⃠
If the output relays are used past their life expectancy, contact fusing or burning may occasionally occur. Always consider the application conditions and use the output relays within their rated load and electrical life expectancy. The life expectancy of output relays varies considerably with the output load and switching conditions.	⚠
Tighten the terminal screws at the specified torque. 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 many occasionally result in electric shock, fire, or malfunction.	

PRECAUTIONS FOR SAFETY USE

Be sure to observe the following precautions to prevent operation failure, malfunction, or adverse affects on the performance and functions of the product. Not doing so may occasionally result in unexpected events.

1) The product is designed for indoor use only. Do not use the product outdoors or in any of the following locations.
- Places directly subject to heat radiated from heating equipment.
- Places subject to splashing water, oil or chemicals.
- Places subject to direct sunlight.
- Places subject to dust or corrosive gas (in particular, sulfide gas and ammonia gas.)
- Places subject to intense temperature change.
- Places subject to icing and condensation.
- Places subject to vibration and large shocks.
- Places subject to explosive or flammable gases.

2) Use/store within the rated temperature and humidity ranges. Provide forced-cooling if required.

3) Be sure to wire properly with correct polarity of terminals.

4) Do not wire the terminals which are not used. Check noise influense carefully before wiring.

5) Allow as much space as possible between the controller and devices that generate a powerful high frequency, surge or much static electricity. Separate the high-voltage or large-current power lines from other lines, and avoid parallel or common wiring with the power lines when you are wiring to the terminals.

6) A switch or circuit breaker should be provided close to this unit. The switch or circuit breaker should be within easy reach of the operator, and must be marked as a disconnecting means for this unit.

7) Do not use paint thinner or similar chemical to clean with. Use standard grade alcohol.

8) Make sure the proper product is specified for the application.

9) Store at the specified temperature, If the products has been stored at a temperature of less than -10℃, allow the products to stand at room temperature for at least 3 hours before use.

PRECAUTIONS FOR CORRECT USE

1) Use this product within the rated load and power supply.
2) Make sure that the rated voltage is attained at the moment of turning ON the power using a switch or relay contact. If the voltage is applied gradually, the power may not be reset or output malfunctions may occur.
3) Use the output relays within their life expectancy.
   - Electrical life of relay 100,000 operations (250VAC 3A,resistive load)
   - Machinery life of relay 10,000,000 operations
4) Operating environment
   Do not use the product in places where explosive or flammable gases may be present.
5) Load power supply
   Make sure that the load power supply is within the rating.
6) Handling
   Never disassemble, modify or repair the product.

PRODUCT CHARACTERISTIC

Operating power:
110VDC -30, +10% (2W max.)
220VDC -30, +10% (2W max.)
(Operating voltage is 50% ~70% of the rated voltage)

Operating ambient temperature: -10 to 55℃
(No icing or condensation)
Operating ambient humidity: 35 to 85%
Storage temperature: -25 to 65℃ (No icing or condensation)
Installation category: Ⅲ
Pollution degree: 2
Altitude: 2000 m max
Recommended fuse: T1A, 250VAC, Time-lag, low-breaking capacity

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 ADN INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

ERROR MESSAGE

The bar display will flash if an error occurs in the built-in IC. Reset the power supply to clear the error.

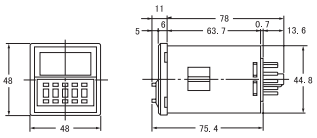
HOW TO CHANGE THE PRESET VALUE

A constant read-in system is used. This enables changing the set value of the timer even when the timer is operating. The elapsed time display will also change accordingly if the timer's set value is changed during timer operation.

⚠ CONFORMANCE TO EN/IEC STANDARDS

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.

DIMENSIONS



AVAILABLE TYPES

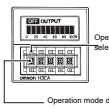
Operation/resetting system		Time-limit operation/self-resetting/ external resetting ＊
Operation mode		8 operation modes(selectable) ＊＊
Terminal form		11-pin round socket
Time-limit contact		SPDT
Equipped with control output ON/OFF and remaining time indicators	Surface mounting	With P2CF-11 socket
	Track mounting	
	Flush mounting	With Y92F-30 adapter

NOTES:
1. * The operation/resetting system depends on the selected operation mode. For details, see "TIMING CHARTS (OPERATION MODES)."
2. **The 8 operation modes are as following.
   A: ON-dela operation
   B: Flicker operation
   C: Signal ON-/OFF-delay operation (I)
   D: Signal OFF-delay operation (I)
   E: Interval operation
   F: One-shot and flicker operation
   G: Signal ON-/OFF-delay opertion (II)
   H: Signal OFF-delay operation (II)

HINTS ON CORRECT USE

• HOW TO CHANGE OPERATION MODE

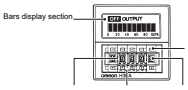
Operate the push buttons of the thumbwheel switch, located at the leftmost position on the front panel, to set the operation mode, Eight operation modes (A,B,C,D,E,F,G, and H) are selectable and the selected operation mode is displayed in the operation mode display window.



A: ON-dela operation
B: Flicker operation
C: Signal ON-/OFF-delay operation (I)
D: Signal OFF-delay operation (I)
E: Interval operation
F: One-shot and flicker operation
G: Signal ON-/OFF-delay opertion (II)
H: Signal OFF-delay operation (II)
NOTES:
1. Two A and two B modes are the same function in "Work mode selection".
2. The default value is A

• HOW TO CHANGE TIME UNIT AND RATED TIME

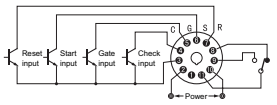
Operation the pushbuttons of the rightmost thumbwheel switch to select the desired time unit. Seven time units (0.1s, s, 0.1m, m, 0.1h, h, or 10h) are selectable and the selected time unit is displayed in the time unit display window.
The desired rated time is specified by operating the 3 thumbwheel switches in the middle of the front panel. The range of a rated time is 001 to 999 for each time unit.



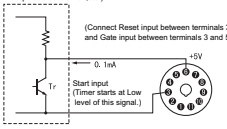
CONNECTIONS

• Connection of solid-state signal inputs

Connect the start input transistor between terminals ③ and ⑥, the reset input transistor between terminals ③ and ⑦, the gate input transistor between terminals ③ and ⑤, and the check input transistor between terminals ③ and ④, respectively.



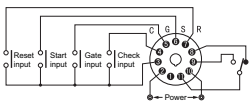
For signal input, use a transistor of open collector type with characteristics:
V_{CEO}=20V min., $V_{CE(S)}$=1V max.,
I_C=50mA min., and I_{CBO}=0.5μA max.
In addition, be sure that these input signals satisfy the following requirements:
a resistance of 1KΩ max. when the transistor is ON,
residual voltage of 1V max. when the transistor is ON,
and a resistance of 200KΩ min. when the transistor is OFF.
From a solid-state circuit (proximity switch, photoelectric switch, or the like) with the rated power supply voltage ranging from 6 to 30 VDC, input signals can also be applied by other than the open collector type transistor as shown in the following diagram.
The input signal from the solid-state circuit is applied when output transistor Tr turns ON. In terms of signal voltage, the signal is input when it goes from high level to low level. Again, the residual voltage should be 1V max. when the transistor is ON. As the current output from the timer to Tr is approximately 0.1 mA, this connection is possible provided the residual voltage is kept to the 1V maximum.



NOTES:
Excepting the wirings for power supply circuit, avoid the laying of input signal wires in parallel or in the same conduit with high-tension or power lines. It is recommended to use shielded wires or wiring with independent metal conduits for the shortest possible distance.

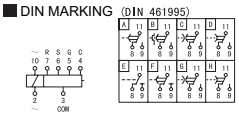
• Connection of contact signal inputs

Connect the start input contact between terminals ③ and ⑥, the reset input contact between terminals ③ and ⑦, the gate input contact between terminals ③ and ⑤, and the check input contact between terminals ③ and ④, respectively.



For each signal input contact, use a gold-plated contact of high contact reliability. Be sure that these input signals satisfy the following requirements: a resistance of 1kΩ max, and a residual voltage of 1V max. when the contact makes.

DIN MARKING (DIN 461995)

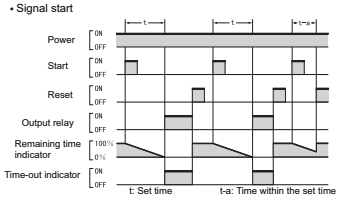


TIMING CHARTS(OPERATION MODES)

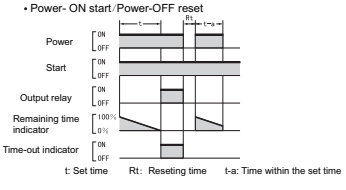
NOTES: 1.The minimum signal input time is 0.05 sec.
2.The minimum resetting time is 0.5 sec .
3.Note that output will be generated in C, D, E, G, or H mode even if rated time is set to 000. No output will be generated in A, B, or F mode.

A mode ON-delay operation

• Signal start

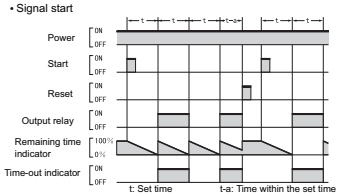


• Power- ON start/Power-OFF reset

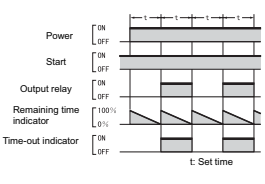


B mode Flicker operation

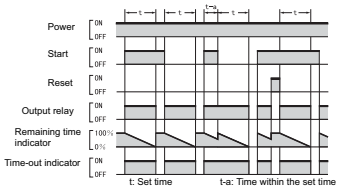
• Signal start



• Power- ON start/Power-OFF reset

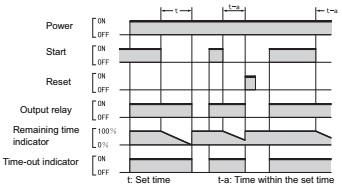


C mode Signal ON-/OFF-delay operation (Type I)



NOTE: Type I refers to the version in which the output relay operates when Start signal is ON.

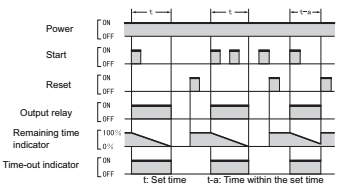
D mode Signal OFF-delay operation (Type I)



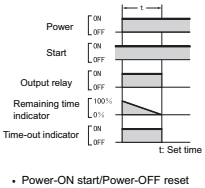
NOTE: Type I refers to the version in which the output relay operates when Start signal is ON.

E mode Interval operation

• Signal start

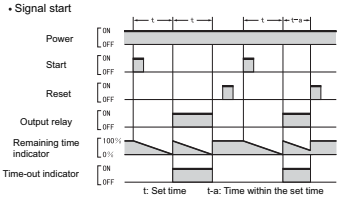


• Power-ON start/Power-OFF reset

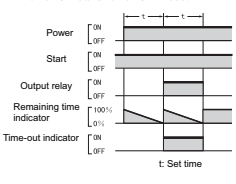


F mode One-shot and flicker operation

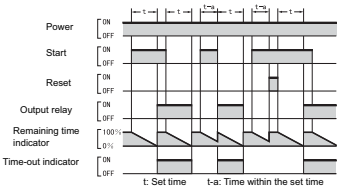
• Signal start



• Power-ON start/Power-OFF reset

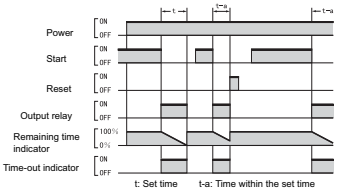


G mode Signal ON-/OFF-delay operation (Type II)



NOTE: Type II refers to the version in which the output relay does not operate when Start signal is ON.

H mode Signal OFF-delay operation



NOTE: Type II refers to the version in which the output relay does not operate when Start signal is ON.

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