

# 型 S3D2

传感器控制器

## 使用说明书

感谢您选择欧姆龙产品。  
以下主要记载在安装和使用本产品过程中需注意事项。  
使用本产品前，请仔细阅读本说明书，充分了解产品。  
为了您的方便，请妥善保管好本说明书。

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110615-0B1

### 规格/性能

型 号	S3D2-AK/AKB/AKD	S3D2-CK/CBK/CKD	S3D2-CC/CGB/CCD	S3D2-BK	S3D2-DK	S3D2-EK
电 源 电 压	AC100~240V±10% 50/60Hz (型S3D2-AKD/CKD/CCD是DC24V±10%)					
消 耗 电 力	15VA以下 (型S3D2-AKD/CKD/CCD是2.5VA以下 但传感器用电源除外)					
※ 1 传 感 器 用 电 源	DC12V±10% (含全部变动)、200mA以下 (带短路保护) (型S3D2-AKD/CKD/CCD是DC24V、由电源电压供给)					
输 入 信 号	S3D2-AK/AKD/CK/CKD/CC/CCD/BK/DK/EK: NPN、三极管输出或有接点输出 S3D2-AKB/CBK/CGB: PNP、三极管输出或有接点输出					
输 入 响 应 时 间	0.1ms		2ms		0.1ms	
控 制 输 出	继电器输出1C AC250V 3A (COS φ=1) (内置继电器-G6C-2114P-US)		NPN开路集电极输出 DC30V 100mA (NO、NC)		继电器输出1x2 (共通端子) AC250V 2A (COS φ=1) (内置继电器-G6B-1114P-FD-US)	
输 出 响 应 时 间	10ms以下		0.5ms以下		10ms以下	
※ 2 计 时 功 能	—		单触发、ON延迟、OFF延迟功能		—	
	—		0.1~1s 1~10s 转换		0.01~0.1s 0.1~1s 转换	
其 他 功 能	· 信号输入转换功能 · AND/OR动作模式线 转换功能		· 信号输入转换功能 · 同步方式转换功能 · AND/OR动作模式转换功能		· 信号输入转换功能 · 单触发功能 · 信号输入转换功能	
瞬 时 停 电 保 证 时 间	20ms以下 (但是、型S3D2-AKD/CKD/CCD除外)					
使 用 周 围 温 度	-10~55°C (但是、不结冰)					

※1 型号S3D2-AKD/CKD/CCD、传感器电源输出请连接200mA以上的负载，避免成为故障的原因。

※2 对于从接通电源到经过50ms前的输入，计时器不工作。(但是、S3D2-EK除外)

### 安全上的注意

#### 警告表示的意思

**危险** 表示紧急危险情况，如果不避免，有可能会造成严重人员伤亡甚至死亡、同时有可能造成严重的财产损失。

#### 警告表示

#### 危险

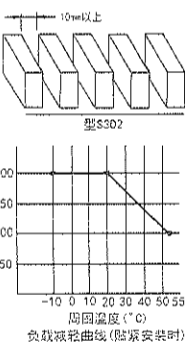
请确认电源关闭后再配线，否则有触电、火灾的危险。

### 安全上的要点

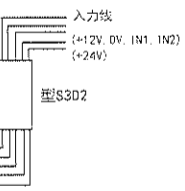
- 以下项目在安全确保方面非常重要，请务必遵守。
- 请不要在具有可燃性、爆炸性气体的环境下使用。
  - 请勿拆卸、修理、改造本产品。
  - 关于电源电压，请在额定电压范围以内使用。  
施加超过额定电压以上的电压，可能导致产品烧毁、破裂。
  - 关于负载短路，请不要将负载短路，否则可能导致产品破裂或烧毁。
  - 请注意端子的极性，请不要误接线。

### 使用上的注意

- 请不在以下场所使用。
  - 阳光直射的场所。
  - 湿度高、有结露的场所。
  - 有腐蚀性气体的场所。
  - 本体直接受振动和冲击的场所。
- 有关清扫工作  
有机溶剂类清洁剂会造成产品表面溶化，故请避免使用。
- 有关安装工作  
S3D2数个并列安装时，由于本体会发热，所以请确保安装间隔10mm以上。  
(但是、S2D3-□□□D除外)  
· 不得进行贴紧安装时，请参考右图的负载电流减轻曲线。  
(但是、S2D3-□□□D除外)
- 如果控制器被安装在外壳内，请在外壳处安装风扇或者预留出风口以便于散热。
- S3D2的输入线和输出线以及动力线必须要分开配置，因为干扰会引起误动作。

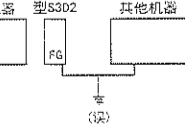


负载减轻曲线 (贴紧安装时)

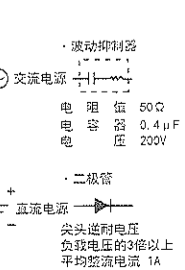


· 动力线 (电动驱动等大型电流通过的线) 的连接一定要离开S3D2 20cm以上

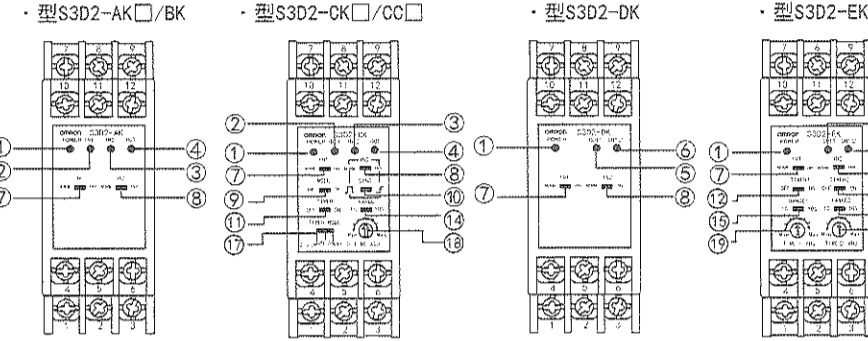
- 有关操作·配线
  - 电源要正确连接到电源端子上。  
请在AC100~240V±10%范围内使用。
  - FG为大地接地端子。在干扰很大的环境下使用，或S3D2发生误动作时，请进行D种接地(从前的第3种接地，接地电阻100Ω以下)。
  - 与其他机器共用接地线，或将接地线连接在建筑物的梁上，则会出现相反效果，会受到不良影响，所以请务必避免。



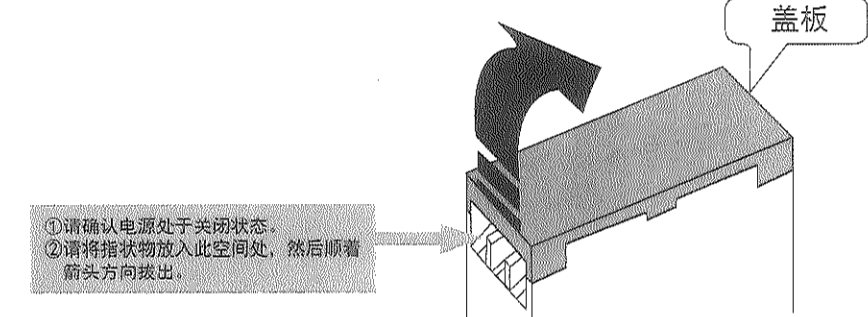
- 有关输出
  - 连接在输出上容易发生感应负载等干扰的电气部件时，要在负载上并列连接浪涌抑制器或二极管。
  - 连接二极管时要使负极侧与电源的⊖侧连接。



### 各部的名称

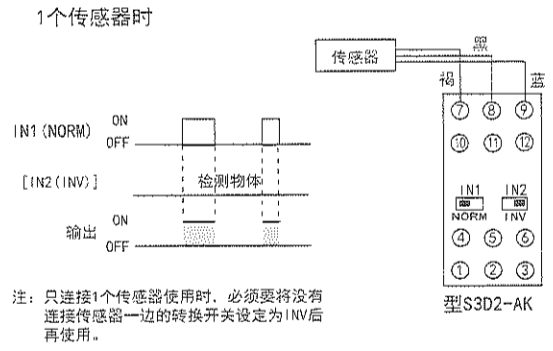


### 端子台盖板的拆卸方法

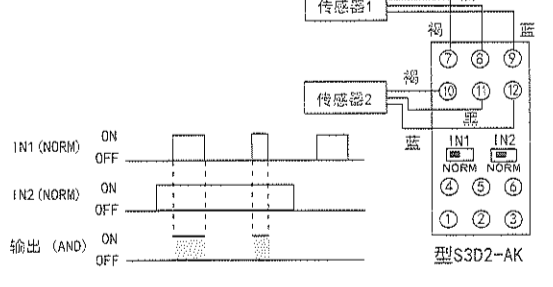


### 动作

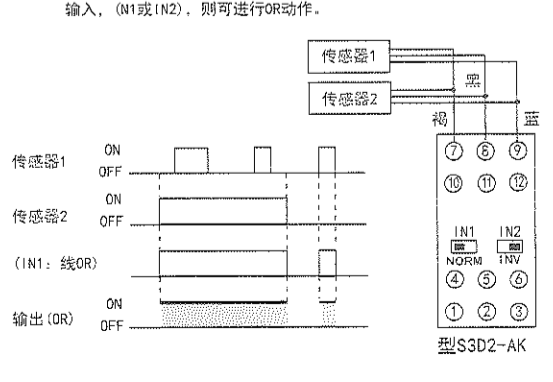
#### · 型S3D2-AK□/基本动作



#### 2个传感器时 (AND动作)

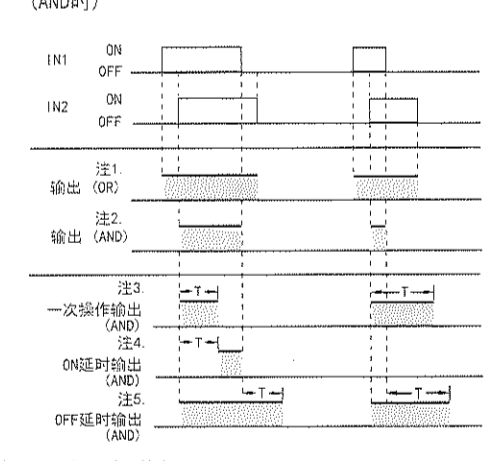


#### 2个传感器时 (OR动作)

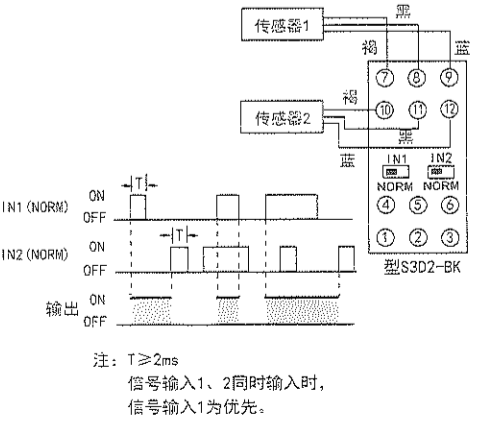


型S3D2-AK□出厂时以IN1→NORM、IN2→INV设定。  
在AND动作中使用，请将IN2置于NORM侧。

#### · 型S3D2-CK□/CC□/计时器动作 (AND时)



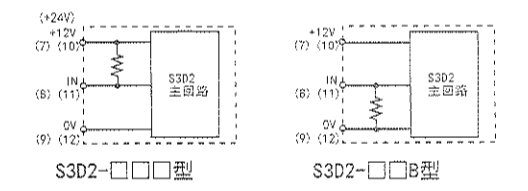
#### · 型S3D2-BK/触发器动作



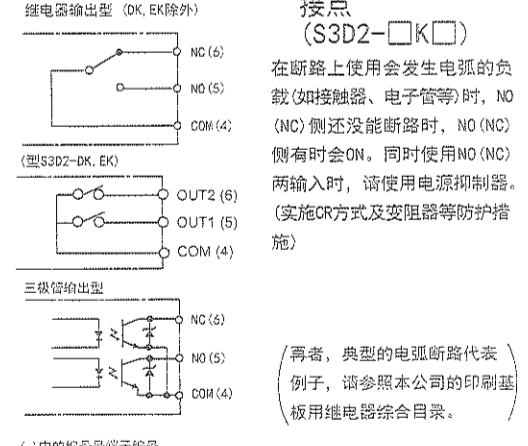
· 型S3D2-DK/EK使2个输入信号按原状独立输出。

NO	名 称	动 作
1	电源指示灯	操作电源ON、传感器用电源输出时灯亮。 操作电源OFF或者传感器用电源输出故障时 (传感器的12V或24V、0V短路) 灯灭。
2	IN1输入指示灯	—
3	IN2输入指示灯	—
4	输出指示灯	—
5	OUT1输出指示灯	—
6	OUT2输出指示灯	—
7	IN1信号输入转换开关	NORM: 传感器的输入晶体管 (或有接点输入) 为ON时，作为信号输入。 INV: 传感器的输入晶体管 (或有接点输入) 为OFF时，作为信号输入。
8	IN2信号输入转换开关	—
9	AND/OR动作转换开关	AND: IN1和IN2均为输入信号ON时输出。 OR: IN1或IN2的任一输入信号ON时输出ON。
10	SYNC (同步状态转换开关) (AND/OR动作转换开关只在AND时工作)	IN1和IN2均为输入信号ON时，输出ON。 在IN2的输入信号ON时 (启动时)，如果IN1的输入信号ON，则输出ON。
11	计时器开关	选择计时器动作/断。 ON: 计时器动作。 OFF: 计时器不动作。
12	OUT1计时器开关	—
13	OUT2计时器开关	—
14	计时器时间转换开关 (S3D2-CK□/EK□)	切换计时器设定时间的量程。 1s: 设定时间为0.1~1s的范围。 10s: 设定时间为1~10s的范围。
15	OUT1计时器时间转换开关 (S3D2-CC□□)	—
16	OUT2计时器时间转换开关	—
17	计时器动作转换开关	0.S: 一次操作计时器 ON.D: ON延时计时器 OFF.D: OFF延时计时器
18	计时器时间设定微调电位器	—
19	OUT1计时器时间设定微调电位器	—
20	OUT2计时器时间设定微调电位器	—

### 输入回路



### 输出回路



### 关于输出的继电器接点 (S3D2-□□□□)

在断路上使用会发生电弧的负载 (如接触器、电子管等) 时，NO (NC) 侧还不能断路时，NO (NC) 侧有时会ON。同时使用NO (NC) 两输入时，请使用电源抑制器。(实施OR方式及变阻器等防护措施)

(再者，典型的电弧断路代表 (例子，请参照本公司的印刷基板用继电器综合目录。)

### 承诺事项

本公司产品是作为工业通用产品而设计制造的。因此，不适用于以下用途。当本公司产品被使用于以下用途时，本公司不做任何保证。但若是本公司特意为以下用途而设计、或有过特别协商的情况下，可以用于以下用途。

- 需要高度安全性的用途 (例: 用于原子能控制设备、医疗设备、航空、宇宙设备、铁道设备、升降设备、娱乐设备、医用机器、安全装置、或其他可能危及到生命、人身安全的用途)
- 需要高可靠性的用途 (例: 煤气、水力、电力等的供给系统、24小时连续运转系统、决策系统、或其他牵涉到权利、财产的用途)
- 苛刻条件或环境下的用途 (例: 室外设备、易受化学污染的设备、易受电磁干扰的设备、易受震动、冲击的设备等)
- 产品手册里未记载的条件或环境下的用途

\*除上述a)~d)的记载事项，本产品手册等记载的商品不适用于机动车辆 (包括两轮车，以下相同)。请勿搭载于机动车辆上使用。机动车辆搭载用商品请咨询本公司销售人员。

\*以上是适用条件的一部分。详情请参阅记载于本公司最新版的综合产品目录、使用手册上的保证·免责事项后再使用。

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# Model S3D2

SENSOR CONTROLLER

## INSTRUCTION SHEET

Thank you for selecting OMRON product. This sheet primarily describes precautions required in installing and operating the product. Before operating the product, read the sheet thoroughly to acquire sufficient knowledge of the product. For your convenience, keep the sheet at your disposal.

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### PRECAUTIONS ON SAFETY

#### ● Meaning of warning symbol

**WARNING** Indicates a potentially hazardous situation which, if not avoided, will result in minor or moderate injury, or may result in serious injury or death. Additionally there may be significant property damage.

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

#### ● Warning symbol



Do not use this product as a safety device or not as part of a safety system.

### PRECAUTIONS FOR SAFE USE

Be sure to follow the safety precautions below for added safety.

- Do not use the sensor under the environment with explosive or ignition gas.
- Never disassemble, repair nor tamper with the product.
- Keep the supply voltage within the specified range. If any voltage exceeding the rated voltage range on the unit, the unit may explode or burn.
- Do not short-circuit the load, otherwise the load may explode or burn.
- Be careful not to confuse the terminal polarities.

### PRECAUTIONS FOR CORRECT USE

- Do not use the product under the following conditions.
  - In the place exposed to the direct sunlight.
  - In the place where humidity is high and condensation may occur.
  - In the place where corrosive gas exists.
  - In the place where vibration or shock is directly transmitted to the product.
- Cleaning.
 

Paint thinner will damage the casing of sensor. Do not apply paint thinner when cleaning the sensor.
- Set-up.
 

When two or more units of the S3D2 are to be installed side by side, place them more than 10mm apart from each other to avoid an adverse effect of heat generated. (Exclusive of Type S3D2-□□□D)

Reduce the load current, as charted at right, to set up the controller closely. (Exclusive of Type S3D2-□□□D)

If the controller is built in a casing, for example, provide the casing with a fan or vent hole to relieve the heat.

Lay the input line output line and power line separately from each other to prevent malfunction due to noises.

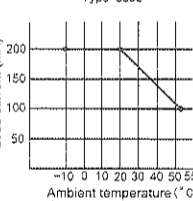
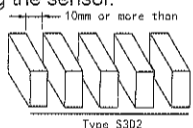
Keep a power line (where a large current flows for motor drive, for instance) at least 20cm away from the S3D2.
- Wiring
 

Connect the power properly to the power terminal. The supply voltage should be 100 to 240V AC ± 10%.

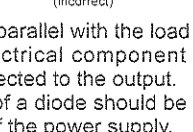
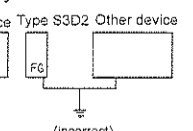
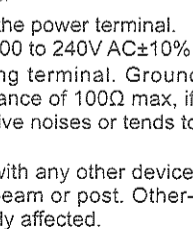
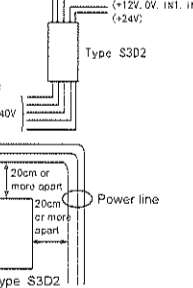
The FG denotes the grounding terminal. Ground this terminal at a ground resistance of 100Ω max, if the S3D2 is exposed to excessive noises or tends to malfunction.

Do not share the ground wire with any other device, nor connect it to a structural beam or post. Otherwise the S3D2 may be adversely affected.
- Output
 

Add a surge killer or a diode in parallel with the load when a noise-generating electrical component (such as inductive load) is connected to the output. Keep in mind that the cathode of a diode should be connected to the positive side of the power supply.



Load reduction curve (For close set-up)



Surge killer  
AC power supply  
Resistance : 50 Ω  
Capacitor : 0.4μF  
Voltage : 200V

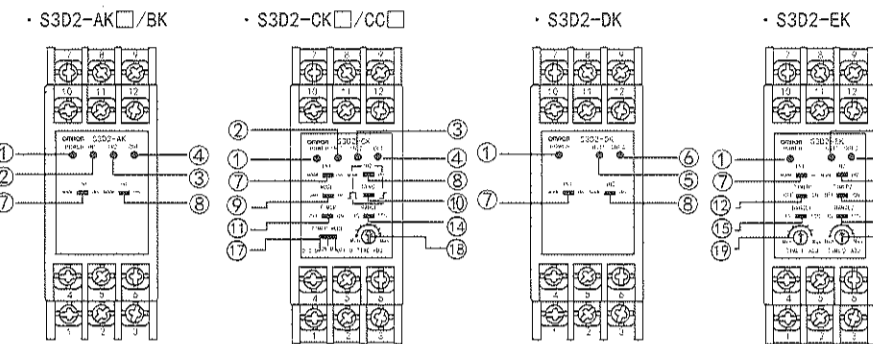
Diode  
Peak inverse voltage: More than 3 times the load voltage  
Average rectified current: 1A

### RATINGS/PERFORMANCE

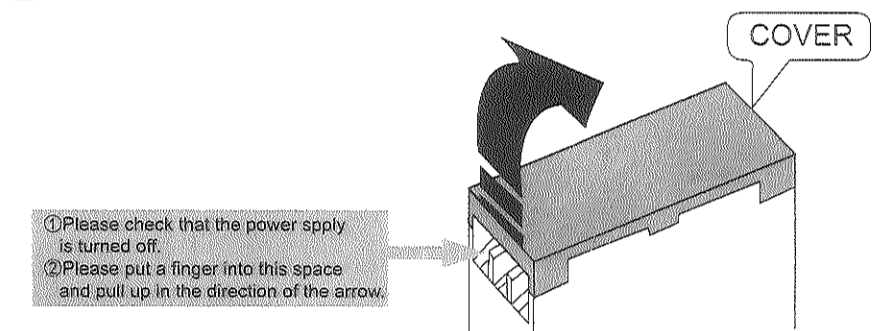
Type	S3D2-AK/AKB/AKD	S3D2-CK/CKB/CKD	S3D2-CC/CCB/CCD	S3D2-BK	S3D2-DK	S3D2-EK
Supply voltage	100 to 240V AC ±10% 50/60Hz (S3D2-AKD/CKD/CCD: 24V DC ±10%)					
Power consumption	Less than 15VA (S3D2-AKD/CKD/CCD: Less than 2.5VA, excepting Sensor power)					
※ 1 Sensor power	12V DC ±10% (incl. total fluctuations), 200mA Max. (S3D2-AKD/CKD/CCD: 24V DC supplied with Sply voltage)					
Signal input	S3D2-AK/AKB/CK/CKB/CC/CCD/BK/DK/EK: NPN, transistor output or contact output S3D2-AKB/CKB/CCB: PNP, transistor output or contact output					
Input response time	0.1ms		2ms		0.1ms	
Control output	Relay output 1c 250V AC 3A (cosφ=1) (Built-in relay G6C-2114P-US)		NPN Open Collector output 30V DC 100mA (NO, NC)		Relay output 1c 250V AC 3A (cosφ=1) (Built-in relay G6C-2114P-US) Relay output 1aX2 250V AC 2A (cosφ=1) 4A/2-point com on relay (Built-in relay G6B-1114P-FD-US)	
Output response time	Less than 10ms		Less than 0.5ms		Less than 10ms	
※ 2 Timer function	One-short, On-delay, and off-delay switchable				off-delay	
	0.1 to 1s and 1 to 10s Switchable		0.01 to 0.1s and 0.1 to 1s Switchable		0.1 to 1s and 1 to 10s Switchable	
Other functions	<ul style="list-style-type: none"> <li>Signal input reverse</li> <li>AND/OR operation mode selection by wiring</li> </ul>		<ul style="list-style-type: none"> <li>Signal input selection</li> <li>Sync mode selection</li> <li>AND/OR operation mode selection</li> </ul>		<ul style="list-style-type: none"> <li>Signal input selection</li> <li>Flip-flop function</li> <li>Signal input selection</li> </ul>	
Instantaneous stop time	Less than 20ms (Exclusive of S3D2-AKD/CKD/CCD)					
Ambient operating temperature	-10 to 55°C (on dew condensation)					

※1 In the case of S3D2-AKD/CKD/CCD, avoid connection of over 200mA loading to Sensor power output, which can be cause of failure.  
※2 For 50ms after Power Supply turn on, an input signal doesn't operate at Timer function. (excepting type S3D2-EK)

### NOMENCLATURE

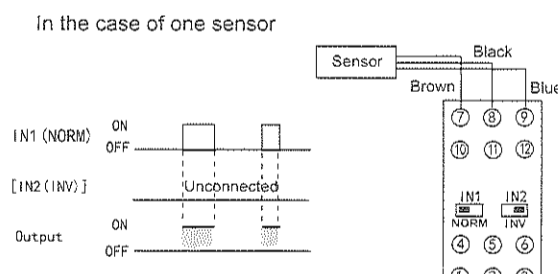


### HOW TO REMOVE A COVER

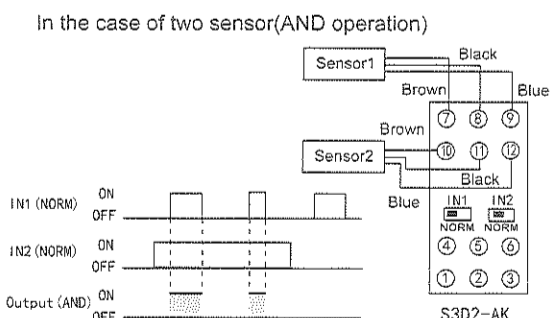


### OPERATION

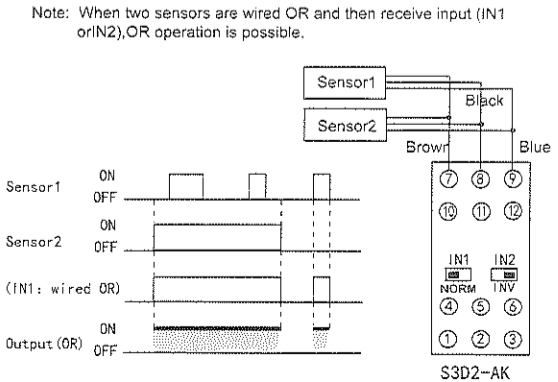
#### • S3D2-AK/□/Standard operation



Input signal selector switch which doesn't receive input signal, set on "INV"

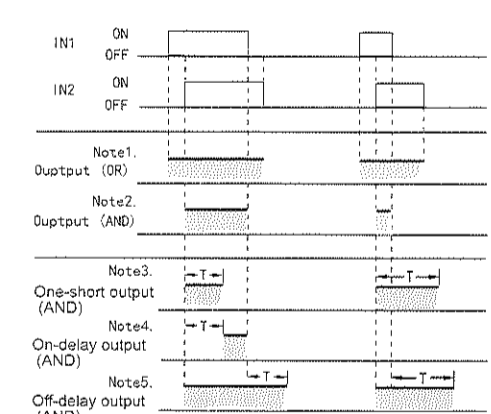


#### • S3D2-BK/Flip flop operation

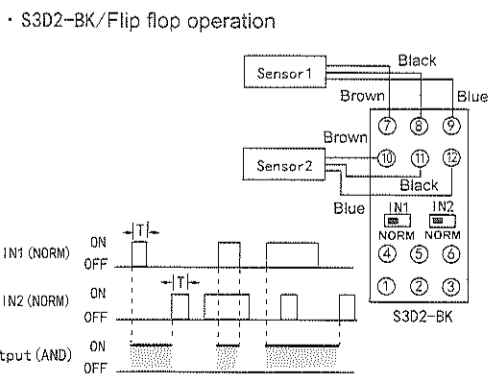


When both set(IN1) and reset(IN2) signals are input simultaneously, The set input takes precedence over the reset input.

#### • S3D2-CK/□/CC□/Timer operation (in the case of AND)



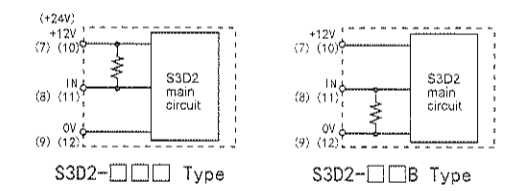
Note: 1. IN1 and IN2 issue OR output.  
2. IN1 and IN2 issue AND output.  
3. IN1 and IN2 issue AND output for T seconds from the rising point.  
4. IN1 and IN2 issue AND output with a time delay of T seconds from rising point.  
5. IN1 and IN2 issue AND output for T seconds from the falling point.  
6. In the case of one sensor, AND/OR operation selector switch sets on "OR".



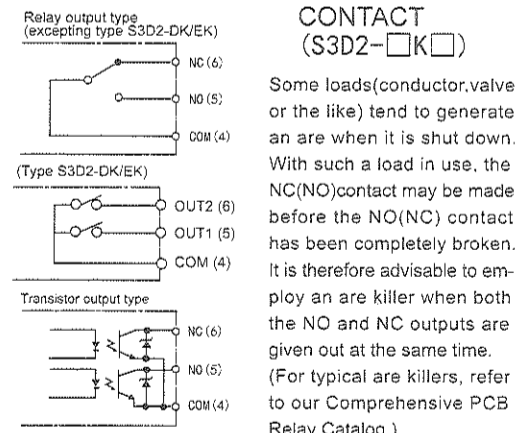
• Type S3D2-DK/EK  
Input signals of IN1 and IN2 are each outputs to OUT1 and OUT2.

NO.	Name	Functions
1	Power supply indicator	This illuminates when the operating power is turned on and the same time, the output is issued from the power supply for sensors. It does not illuminate when the operating power is turned off or the power supply output for sensors is short-circuited (between +12V terminal and 0V terminal).
2	IN1 indicator	This illuminates when it receives the output of the sensor which is connected with IN1 as an input.
3	IN2 indicator	This illuminates when it receives the output of the sensor which is connected with IN2 as an input.
4	Out indicator	
5	Out1 indicator	This illuminates when the output is turned on.
6	Out2 indicator	
7	IN1 input signal selector switch	NORM: When the transistor (or output contact) is turned on, the switch receives it as a signal. INV: When the transistor (or output contact) is turned off, the switch receives it as a signal.
8	IN2 input signal selector switch	
9	AND/OR operation selector switch	AND: The output is turned on when input signals of both IN1 and IN2 are turned on. OR: The output is turned on when input signal of either IN1 or IN2 is turned on.
10	Synchronous mode selector switch	This switch can operate only when AND is selected on the AND/OR operation selector switch. ON: The output is turned on during input signals when both IN1 and IN2 are turned on. OFF: If the input signal of IN2 is turned on (at the rising time) when that of IN1 is in the ON state, the output is turned on.
11	Timer switch	With this switch, ON or OFF of timer operation is selected. When ON, the timer function operates. When OFF, the timer function does not operate.
12	OUT1 Timer switch	
13	OUT2 Timer switch	
14	Timer timing selector switch	With this switch, ranges of timer setting are changed. (Model S3D2-CK, S3D2-EK) 1s: Setting time lies in the range of 0.1 to 1s. 10s: Setting time lies in the range of 1 to 10s. (Model S3D2-CC) 0.1s: Setting time lies in the range of 0.01 to 0.1s. 1s: Setting time lies in the range of 0.1 to 1s.
15	OUT1 Timer timing selector switch	
16	OUT2 Timer timing selector switch	
17	Timer operating selector switch	ON: One-short delay timer ON.D: On-delay timer OFF.D: Off-delay timer
18	Timer setting trimmer	
19	OUT1 Timer setting trimmer	Setting time can be adjusted with the accessory screwdriver. It rotates 190°
20	OUT2 Timer setting trimmer	

### INPUT CIRCUIT



### OUTPUT CIRCUIT



### 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 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. See also Product catalog for Warranty and Limitation of Liability.

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