

Machinery Built-in Type Fire Detection System

CPC-3 / 0KB3

NITTAN COMPANY, LIMITED

1. System Summary

This system **detects a fire which occurs in a machinery such as large-scale computers, various control panels etc** and it is composed of a dedicated control panel (eg CPC-3) and its smoke detectors (0KB3: photoelectric type).

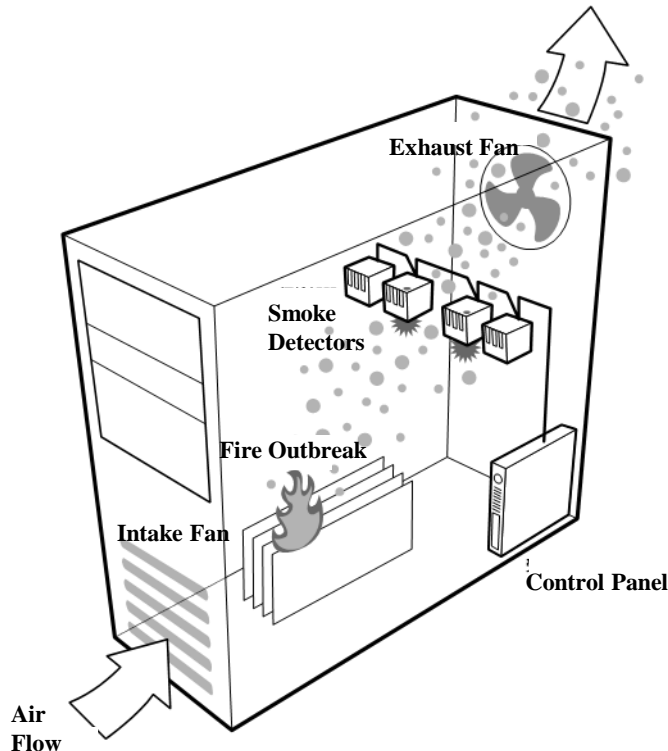
Smoke detector is produced with **high sensitivity** so that it can work even in an environment where smoke is diluted with high wind speed. In addition, smoke detector has **a sensitivity compensation function** which can **maintain a normal sensitivity** against dust accumulation.

2. Features of System

1. Compact Size used for machinery built-in type
2. Fire alarm generated by "AND" signal (two detectors' simultaneous operation) It is capable of producing the signal by one detector's operation too.
3. Wind speed Resistance (Effective up to 8 m/s), Heat Resistance (Available up to 60°C)
4. Maintains a normal sensitivity by sensitivity compensation function against dust accumulation
5. Capable of connecting existing smoke detectors (Model: 0KB, 0IB) without sensitivity compensation function

3-1. Detector Installation Example 1

Detectors and control panel shall be installed inside the machinery which should protect. Detectors can be installed in the place where it is easy to fix and maintain since it can detect smoke from any directions. If there is a fan on the machinery, detectors should be installed near the exhaust fan.



Installation Example Inside the Machinery

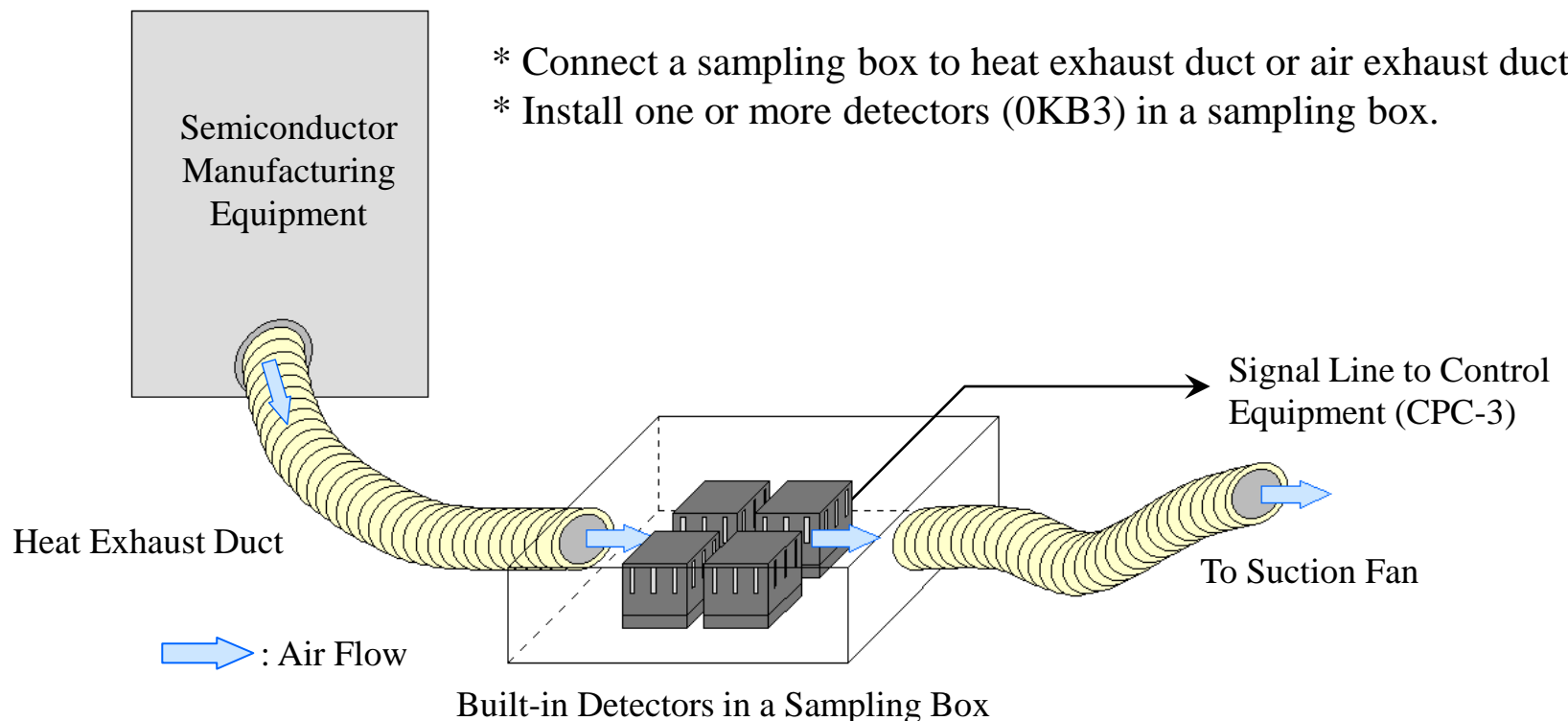


Detector Installation Example

3-2. Detector Installation Example 2

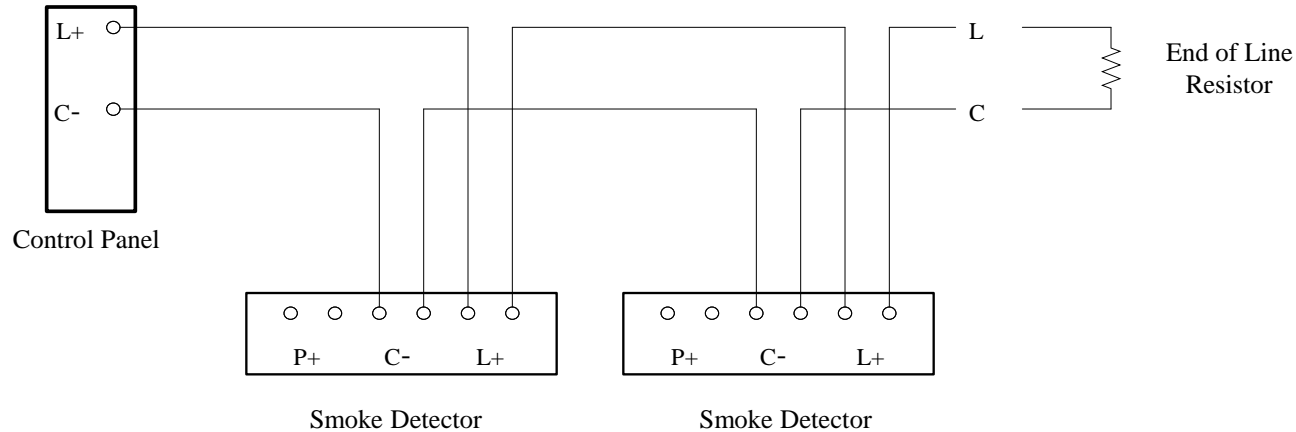
In consideration of flow of air inside the machinery, detectors shall be so installed that it can monitor the smoke more effectively.

For example, in a semiconductor manufacturing equipment, air inside of it is discharged from a heat exhaust duct. And built-in detectors in a sampling box attached to the said duct can monitor the smoke contained in the exhaust air.

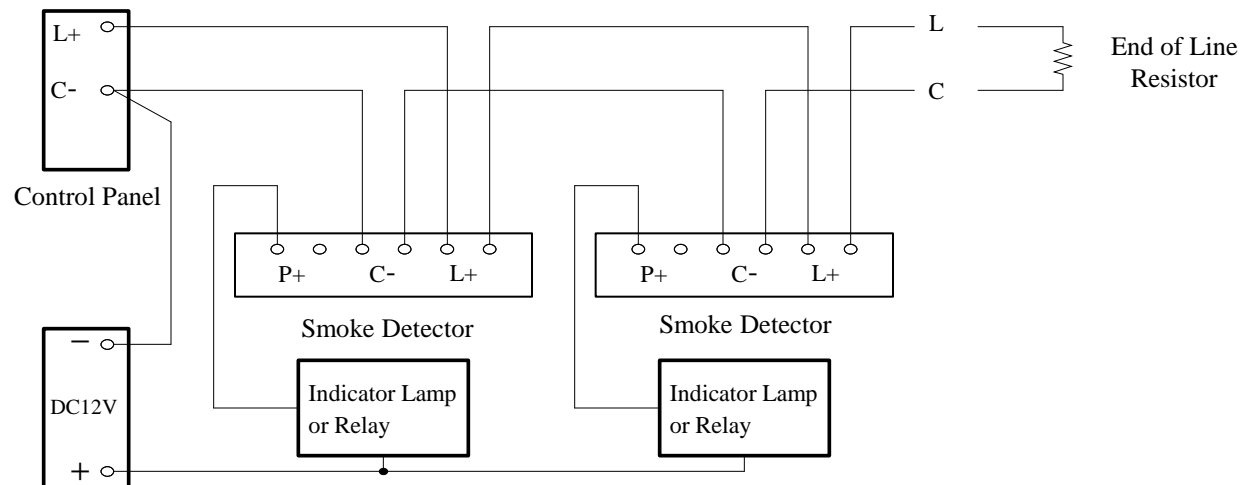


4-1. Wiring Connection Diagram 1

* Basic Wiring



* Wiring for Terminal “P” (Applicable in case of connecting indicator lamps or relays additionally.)

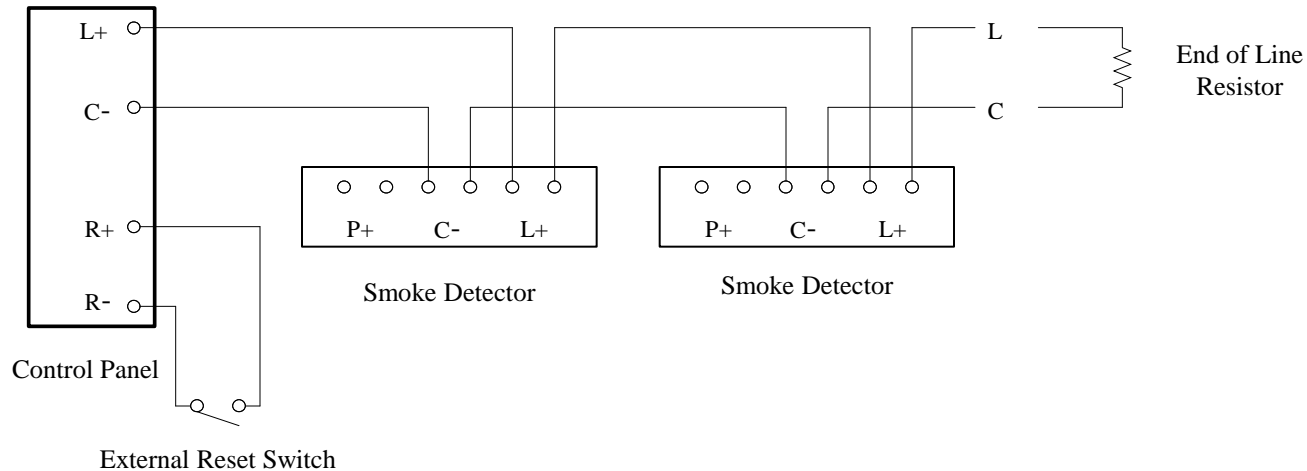


Additional Power Source (out of scope of supply)

4-2. Wiring Connection Diagram 2

* Wiring to Reset Externally

Reset operation can be done remotely by applying a pulse signal of more than 500 msec to the terminal "R+" and "R-" provided on the control panel.



5. Machinery Built-in Type Smoke Detector, 0KB3

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0KB3
(Size
Comparison)



0KB3
(Body and its Base)

| | | | |
|-----------------------|---|------------------------------|--|
| Product Model Name | 0KB3 | Sensitivity | 4% / m Obscuration (Equivalent to class 1 or more in Japan Fire Service Law) |
| Detection Method | Light Scattering Type | Applicable Temperature Range | -10°C ~ +60°C |
| Material | Polycarbonate | Applicable Control Equipment | CPC-3 series, CPC-2 series, |
| Finish Color | Black | Max Q'ty to be Connected | 20 units |
| Combustibility | Product Safety Certification UL-94V-2 | External Dimensions | 40W × 40D × 45.3H (mm) including Detector Base |
| Rated Voltage/Current | DC19V, 5mA between L-C | Mass | 55g (Body: 38.5g, Base: 16.5g) |
| | DC12V max, 100mA (in Loaded Resistor) between P-C | RoHS Directive | Compliant |
| Current Consumption | Quiescent Current: 50 μA | Main Function | Sensitivity Compensation: Automatic Compensation every 6 Hours |
| | Alarm Current: 5mA | | |

6. Dedicated Control Panel, CPC-3

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CPC-3



CPC-3 (Back Side Portion)

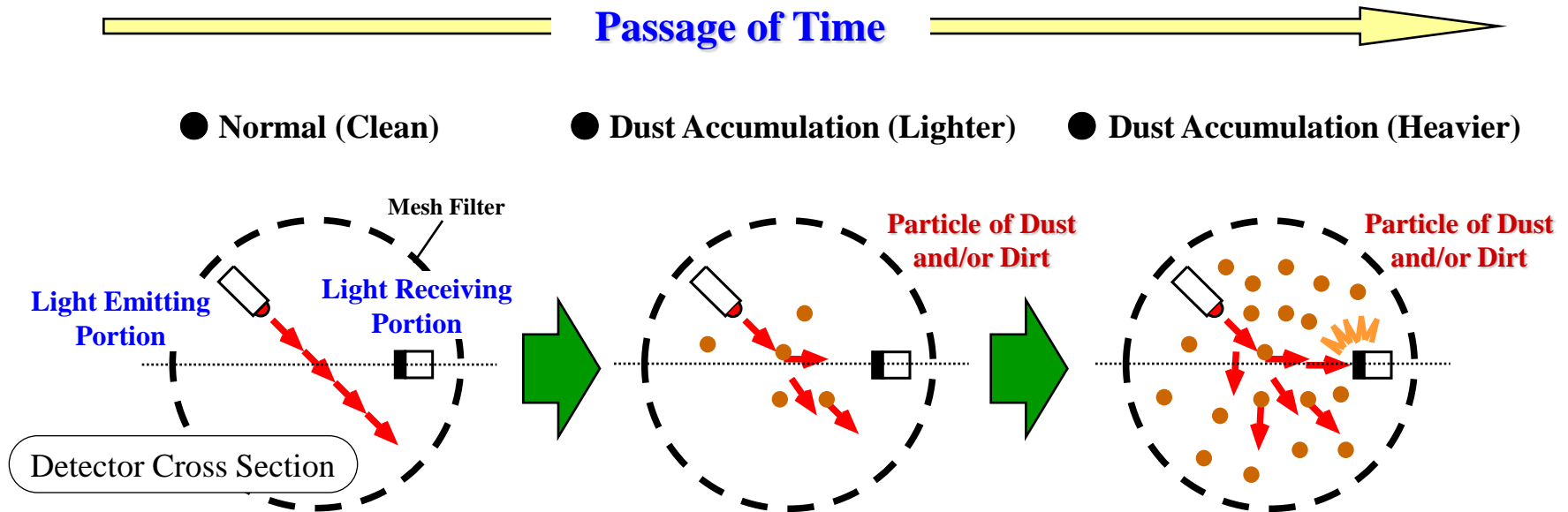
| Product Model Name | CPC-3 | CPC-3-24 |
|----------------------------------|--|---------------------------------|
| Material | Aluminum: Processed to Almite, Steel: Processed to Trivalent Chrome | |
| Rated Voltage | AC100V ~ 240V, 50/60Hz | AC/DC24V |
| Rated Power | Quiescent Mode | 1.2VA (AC100V) / 1.9VA (AC240V) |
| | Alarm Mode | 1.9VA (AC100V) / 3.3VA (AC240V) |
| | | 0.9VA (DC24V) / 1.1VA (AC24V) |
| | | 2.2VA (DC24V) / 2.7VA (AC24V) |
| Detector Power Source Voltage | Rated Voltage: DC19V | |
| Q'ty of Detector to be Connected | 20 units max | |
| External Wiring Resistance | 20Ω or less | |
| Applicable Detector | 0KB3, 0KB, 0IB | |
| End of Line Resistor | 7.5kΩ, 1/4W | |
| Switch | Power SW (Power Switch) ----- Alternate Type | |
| | Reset SW (Reset Switch) ----- Momentary Type | |
| Indicator Lamp | Power Indication (Power Indicator Lamp) ----- Green | |
| | Fault (Fault Indicator Lamp) ----- Yellow | |
| | Fire Alarm (Fire Indicator Lamp) ----- Red | |
| | Detector Operated (One Detector Operation Lamp) ----- Red | |
| Relay Contacts | Fault (Fault Indicator Lamp) ----- C-Contact × 1 | |
| | Fire Alarm (Fire Indicator Lamp) ----- C-Contact × 1 | |
| | Detector Operated (One Detector Operation Lamp) ----- C-Contact × 1 | |
| | Contact Capacity (Resistance Load) DC30V, 1A / AC125V, 0.3A | |
| Alarm Buzzer | Fault (Short Circuit / Cable Break) ----- Intermittent Sound: 0.5Hz | |
| | Operation of One Detector ----- Intermittent Sound: 5.0Hz | |
| | Operation of Two or More Detectors (Fire Alarm) ----- Continuous Sound | |
| External Dimensions | 110W × 195L × 40H | |
| Mass | Approx. 550g | |
| Applicable Temperature Range | 0°C ~ +60°C | |

7-1. Sensitivity Compensation Function-1

■ Past Problems

Dust, etc accumulates inside the detector as the time elapses.

Detector becomes easy to operate with its sensitivity change by getting dirty inside.



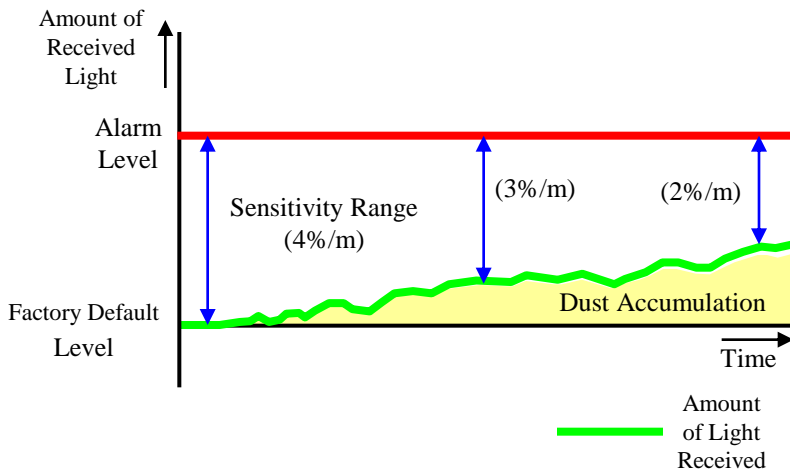
* By means of the scattered light coming from the light emitting portion caused by dust and/or dirt, that was reached to the light receiving portion, detector judges it as a fire.

7-2. Sensitivity Compensation Function-2

■ Sensitivity Compensation Function

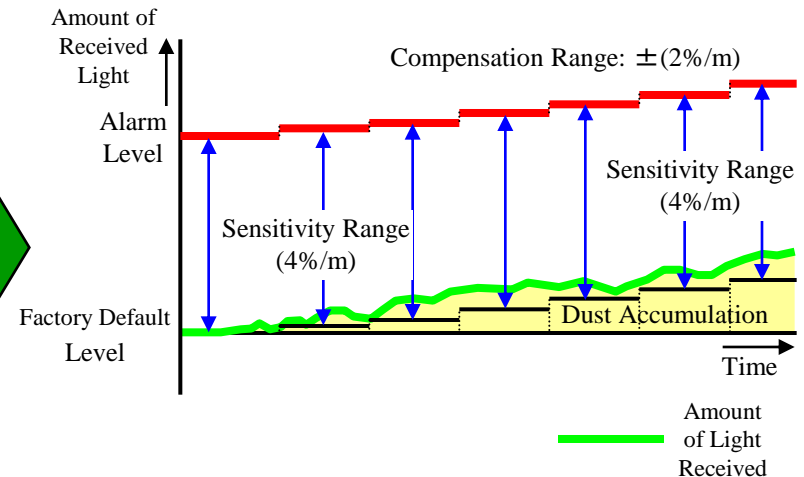
It reduces false alarms with compensating its sensitivity appropriately by means of automatic sensitivity compensation function against dust accumulated inside detector for years.

Detector of Conventional Product, 0KB



Amount of received light increases by accumulating dust inside the detector, and sensitivity range gets small. Detector becomes easier to operate than the time when it was installed, because it becomes unable to maintain the appropriate sensitivity.

New Detector, 0KB3



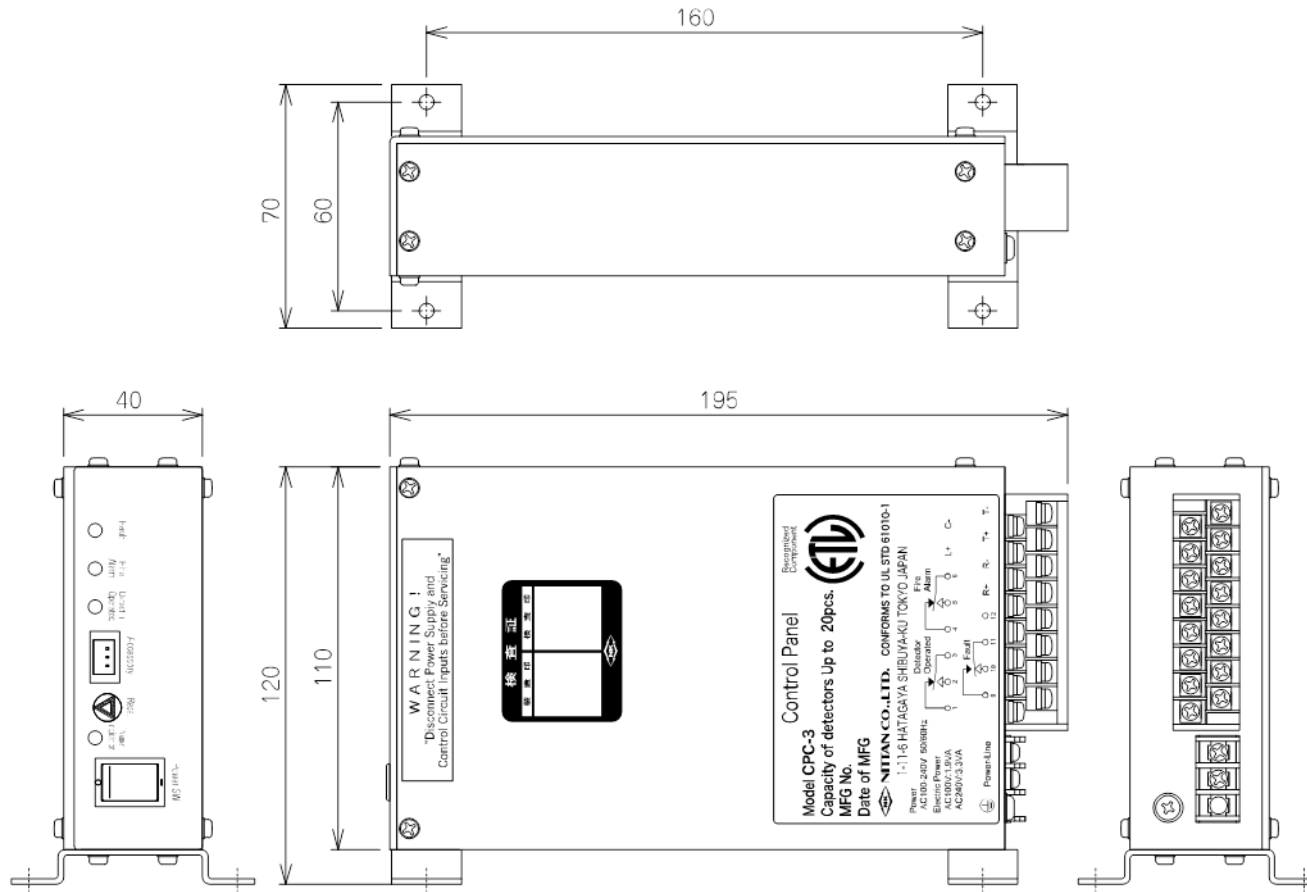
By measuring the changes of amount of received light caused by the effect of dust accumulation, factory default level is automatically compensated every 6 hours.

It reduces false alarms against dust accumulated for years by maintaining appropriate sensitivity.

8-2. Equipment Drawing-2, CPC-3

■ Equipment drawing for installing control panel (CPC-3) longitudinally

Mounting Bracket B



8-3. Equipment Drawing-3, 0KB3

- Equipment drawing for machinery built-in type smoke detector (0KB3)

