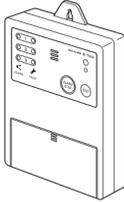


# B-780 Gas Alarm

## User's Manual

- Thank you for purchasing this B-780 Gas Alarm.
- Be sure to read this user's manual and that you fully understand this information before use.
- Keep this user's manual and the warranty form in a safe place.
- New Cosmos Electric will not be liable for any secondary damages or compensation of any kind due to any devices that were activated by the external output signal of this device.
- As a general guideline, this alarm should be replaced 10 years after installation.

Pressure-resistant, explosion-proof detector  
Weather-resistant detector  
Simplified detector  
Alarm



### 1. To Detector Alarm Users

This user's manual uses safety symbols to ensure that the detector alarm is used safely and correctly, protect you and others from potential hazards, and prevent property damage. The appearance of these safety symbols and their meanings are shown below. Be sure that you fully understand their meanings before reading the information in this manual.

- DANGER** This indicates a hazardous situation which, if not avoided, will result in death or serious injury.
- WARNING** This indicates a hazardous situation which, if not avoided, could result in death or serious injury.
- CAUTION** This indicates a hazardous situation which, if not avoided, could result in a minor or moderate injury or result in property damage only.

### Meanings of Safety Symbols

- Indicates general prohibitions.
- Indicates that disassembly is prohibited.
- Indicates that an open flame is strictly prohibited.

### 2. Overview

The B-780 is a gas alarm intended for LP gas storage equipment that is less than 3 tons, gas consumption equipment, and governor chambers. This system consists of the B-780 alarm and detectors and enables connection of up to three gas detection units. A pressure-resistant, explosion-proof detector, weather-resistant detector, or simplified detector can be selected and connected based on the specific installation location and installation target equipment.

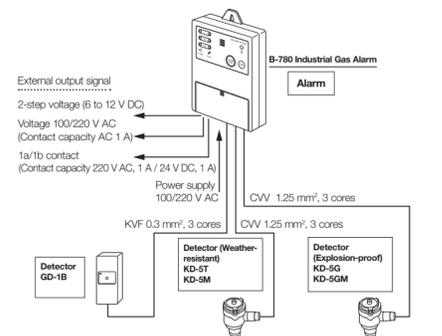
- Pressure-resistant, explosion-proof detector (for LP gas) KD-5G (for LP gas) Explosion-proof rating d2G4
- Pressure-resistant, explosion-proof detector (for methane gas) KD-5GM (for methane gas) Explosion-proof rating d2G4
- Weather-resistant detector (for LP gas) KD-5T (for LP gas) Weather-resistant
- Weather-resistant detector (for methane gas) KD-5M (for methane gas) Weather-resistant
- Simplified detector GD-1B (for LP gas) Drip-proof

The detector and alarm do not require any sensitivity or other adjustments at installation, and they can be used as soon as the mounting and wiring connection processes are completed.

In the B-780 alarm, when a gas leak is detected, the red (Alarm) lamp of the corresponding detector starts blinking and emits a beeping sound and a synthesized voice message that says, "Possible gas leak" to notify the user of an alarm. When the Alarm Stop button is pressed, the synthesized voice message is stopped, and the red (Alarm) lamp changes from blinking to fully lit. When there is no longer any gas in the area around the detector, the red (Alarm) lamp of the alarm turns off. Also, if a detector fails or a wiring error occurs, the yellow (Trouble) lamp of the alarm starts blinking, and a beeping trouble alarm sound is emitted. When the Alarm Stop button is pressed, the alarm sound is stopped, and the yellow (Trouble) lamp changes from blinking to fully lit. After corrective action is taken for the problem cause and operation is recovered, the yellow (Trouble) lamp turns off.

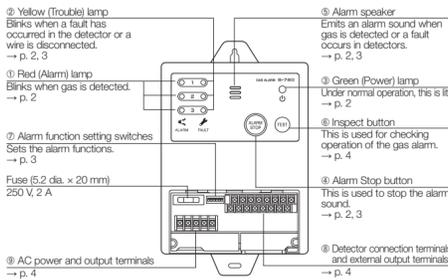
The B-780 alarm is provided with output jacks for 2-step voltage output (6 to 12 V DC), voltage output (100/220 V AC), and 1a/1b contact output for enabling connection to various external devices such as external buzzers, rotating lights, and transmission devices.

### 3. System Configuration



- The B-780 includes a power plug cable, and so no special qualifications are required for the electrical work.
- The combination of detectors above is simply an example.

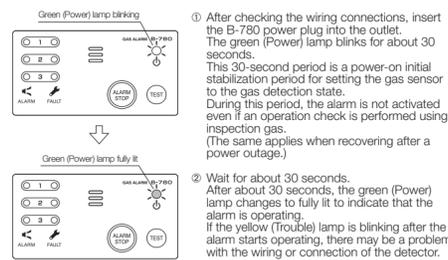
### 4. Names of Parts



### 5. Safety Information

- DANGER** Do not cut the power cord while power is being supplied. Doing so could result in an electric shock or start a fire.
- WARNING** Do not disassemble or modify this device. Doing so could result in a device breakdown.
- CAUTION** Check that the green (Power) lamp is lit on a daily basis. If no backup power supply is being used, this device will not operate in the event of a power outage. Also, no alarm is activated for about 30 seconds after power is first supplied. Install the alarm (B-780) indoors. If installed outdoors, the alarm should be housed in a box with protection from rain and high temperatures.

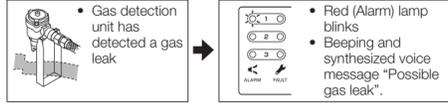
### 6. Usage Procedure



### 7. Basic Operation of Detector Alarm

#### Gas Leak Alarm

When the gas concentration in the area around the detector reaches the alarm level, the red (Alarm) lamp of the detector number corresponding to the alarm starts blinking, and an alarm is activated with a beeping sound and a synthesized voice message that says, "Possible gas leak". At the same time, an external output signal is emitted.



#### To set to auto reset:

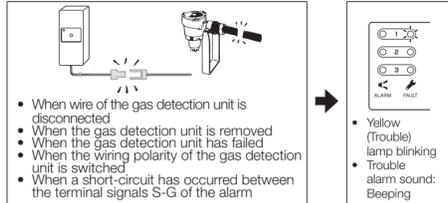
- To stop the alarm sound, press the Alarm Stop button. The alarm sound is stopped, and the red (Alarm) lamp changes from blinking to fully lit. When there is no longer any gas in the area around the detector, the red (Alarm) lamp which is fully lit will turn off.
- Even if the Alarm Stop button is not pressed, if there is no longer any gas in the area around the detector, the alarm sound will stop, and the red (Alarm) lamp will change from blinking to off.
- Successive alarm sounding system While a gas leak alarm is being received, after the alarm sound was stopped by pressing the Alarm Stop button, if a gas leak alarm is input from another detector, the alarm sound will be activated again.

#### To set to manual reset:

- To stop the alarm sound, press the Alarm Stop button. The alarm sound is stopped, and the red (Alarm) lamp changes from blinking to fully lit. When there is no longer any gas in the area around the detector, the red (Alarm) lamp which is fully lit will turn off.
- If there is no longer any gas in the area around the detector before you press the Alarm Stop button, the red (Alarm) lamp will change from blinking to fully lit, and the alarm sound will continue to be emitted. To stop the alarm sound, press the Alarm Stop button. The alarm sound is stopped, and the red (Alarm) lamp changes from fully lit to off.
- Successive alarm sounding system While a gas leak alarm is being received, after the alarm sound was stopped by pressing the Alarm Stop button, if a gas leak alarm is input from another detector, the alarm sound will be activated again.

#### Trouble Alarm

If a fault occurs in the gas detection unit or the wiring to the gas detection unit, the trouble alarm lamp (yellow) for the detector number corresponding to the alarm starts blinking, and a beeping trouble alarm sound is emitted.



- When wire of the gas detection unit is disconnected
- When the gas detection unit is removed
- When the gas detection unit has failed
- When the wiring polarity of the gas detection unit is switched
- When a short-circuit has occurred between the terminal signals S-G of the alarm

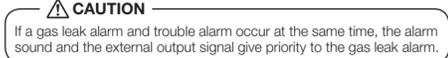
- Yellow (Trouble) lamp blinking
- Trouble alarm sound: Beeping

#### To set to auto reset:

- To stop the alarm sound, press the Alarm Stop button. The alarm sound is stopped, and the yellow (Trouble) lamp changes from blinking to fully lit. After corrective action is taken for the detector or the cause of the wiring problem and operation is recovered, the yellow (Trouble) lamp (fully lit) also turns off to indicate that the device is in the normal monitoring state.

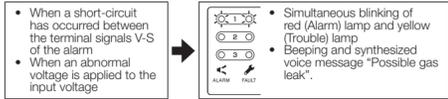
#### To set to manual reset:

- To stop the alarm sound, press the Alarm Stop button. The alarm sound is stopped, and the yellow (Trouble) lamp changes from blinking to fully lit. After corrective action is taken for the detector or the cause of the wiring problem and operation is recovered, the yellow (Trouble) lamp (fully lit) also turns off to indicate that the device is in the normal monitoring state.
- If corrective action is taken for the detector or the cause of the wiring problem and operation is recovered before pressing the Alarm Stop button, the yellow (Trouble) lamp will change from blinking to fully lit, and the alarm sound will continue to be emitted. To stop the alarm sound, press the Alarm Stop button. The alarm sound is stopped, and the yellow (Trouble) lamp changes from fully lit to off.



#### Input Voltage Error Alarm

If an abnormal voltage is applied to the input voltage from the gas detection unit, the red (Alarm) lamp and the yellow (Trouble) lamp of the detector number corresponding to the alarm start blinking simultaneously, and an alarm is activated with a beeping sound and a synthesized voice message that says, "Possible gas leak". An external output signal is emitted.



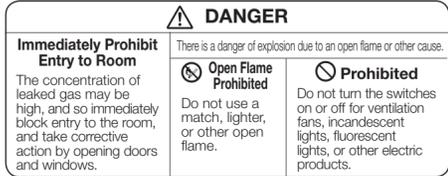
#### To set to auto reset:

- To stop the alarm sound, press the Alarm Stop button. The alarm sound is stopped, and the red (Alarm) lamp and yellow (Trouble) lamp change from blinking to fully lit. After corrective action is taken for the problem and operation is recovered, both the red (Alarm) lamp and yellow (Trouble) lamp turn off to indicate that the device is in the normal monitoring state.

#### To set to manual reset:

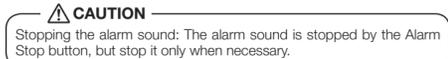
- To stop the alarm sound, press the Alarm Stop button. The alarm sound is stopped, and the red (Alarm) lamp and yellow (Trouble) lamp change from blinking to fully lit. After corrective action is taken for the problem and operation is recovered before pressing the Alarm Stop button, the red (Alarm) lamp and yellow (Trouble) lamp will continue to be emitted. To stop the alarm sound, press the Alarm Stop button. The alarm sound is stopped, and the red (Alarm) lamp and yellow (Trouble) lamp change from fully lit to off.

### 8. Corrective Action When Gas Leak Alarm Occurs



#### Take the following corrective action.

- Provide ventilation to the area, such as by gently opening doors and windows.
- Check for any gas leak locations and their possible causes, and immediately take the proper corrective action, such as by remedying the leak or reporting it.



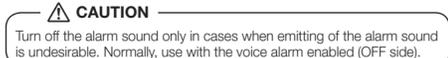
### 9. Alarm Function Settings

The DIP switches on the terminal connection part of the B-780 alarm can be used to set the alarm functions.

ON	OFF	Detector 1	Detector 2	Alarm method	Output delay	Alarm sound	Alarm svnt type
ON	OFF	Not connected	Not connected	Auto reset	35 seconds	Disable	Buzzer alarm
OFF	ON	Connected	Connected	Manual reset	Immediate	Enable	Voice alarm

- Connection of detectors (switches 1 and 2)** When three detectors are connected: Switches 1 and 2 are set to OFF. When two detectors are connected and terminal 3 (V3, S3, G3) is an open terminal: Switch 1 is set to OFF, and switch 2 is set to ON. When one detector only is connected and terminal 2 (V2, S2, G2) and terminal 3 (V3, S3, G3) are open terminals: Switches 1 and 2 are set to ON.
- Switching between auto reset and manual reset (Switch 3)** To set the alarm method to auto reset, set switch 3 to ON. To set to manual reset, set the switch to OFF.
- Switching the output delay time (Switch 4)** The 1a/1b contact output and the 100/220 V AC voltage output can be set to an output delay time of 35 seconds or immediate output. To set to a delay time of 35 seconds, set switch 4 to ON. To set to immediate output, set to OFF.

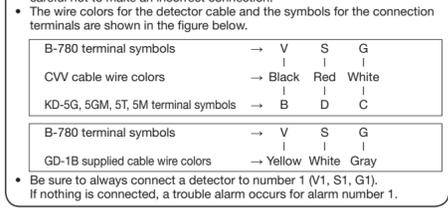
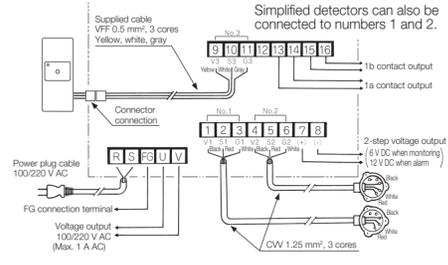
- 2-step voltage output (6 to 12 V DC)** can be set to immediate output only, and it cannot be switched to delay time.
- Voice alarm enable/disable (Switch 5)** When switch 5 is set to ON, the voice alarm is disabled, and the lamp indicator only is used.



- When the switch is set to OFF, the gas leak alarm emits beeping and the synthesized voice message "Possible gas leak".
- When the switch is set to ON, the gas leak alarm emits beeping only.

### 10. Overall Wiring Diagram

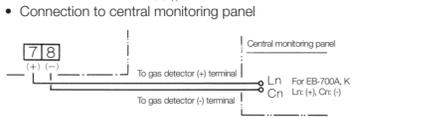
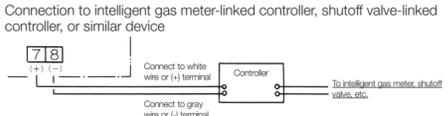
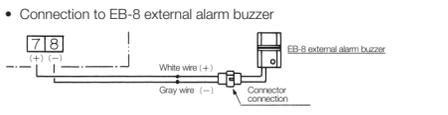
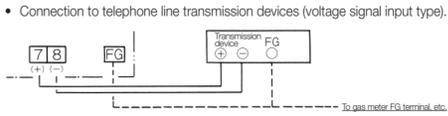
The connections for the detectors below are examples only.



### 11. Connecting External Outputs and External Devices

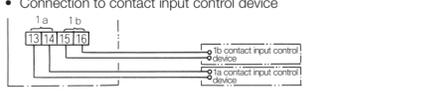
#### 2-step voltage output (6 to 12 V DC) Terminal number 7 = (+), 8 = (-)

The alarm supplies 6 V DC during normal monitoring, 12 V DC when a gas alarm occurs, has an impedance 1.2 kΩ to 50 kΩ, and is linked to a gas leak alarm sound. Pressing the Alarm Stop button recovers operation to 6 V DC. (This can be set to immediate output only, and it cannot be switched to output delay.)



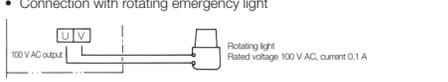
Note that connection is not possible to devices having an impedance less than 1.2 kΩ.

**1a/1b contact output Terminal numbers 13, 14, 15, 16** Linked with gas leak alarm sound. Pressing the Alarm Stop button recovers operation. (Immediate output or delay time of 35 seconds can be selected using the DIP switch.)



#### Voltage output 100/220 V AC Terminal numbers U, V

Output of 100 V AC when gas leak alarm occurs. Current capacity 1 A. Linked with gas leak alarm sound. Pressing the Alarm Stop button recovers operation. (Immediate output or delay time of 35 seconds can be selected using the DIP switch.)



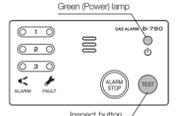
Immediate output or delay output cannot be selected separately for the 1a/1b contact output and voltage output 100/220 V AC.

### 12. Maintenance and Inspection

Because the detector alarm is a safety device, daily maintenance and inspection are extremely important.

#### Daily Inspection

- Visual inspection The green (Power) lamp of the B-780 alarm is fully lit. Check for any clogging in the sintered metal of the KD-5 detector or any corrosion on the case. Check that the power-on lamp of the GD-1B detector is fully lit and that the case is not damaged.



- Operation verification of alarm using inspect button Gas leak alarm operation can be verified using the Inspect button of the B-780 alarm.

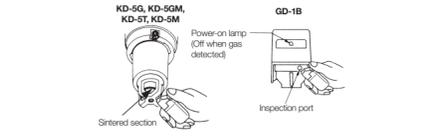
- While the inspect button is pressed down, all lamps of the gas leak alarm blink, and the alarm emits beeping and the synthesized voice message "Possible gas leak". An external output signal is also output, and so caution is necessary when connected to external equipment.

#### Detector check using simple inspection gas (EG-3: sold separately) (at least once a month)

**KD-5G, KD-5GM, KD-5T, KD-5M:** Remove the rainproof cap from the detector, bring the tip of the inspection gas (EG-3: Lighter type) into contact with the sintered section from directly under the sensor unit, and hold down the lever to spray out gas. (Note that, if the tip of the inspection gas does not fit into the sintered section, the gas will be diluted, and it will be difficult for the alarm to activate.)

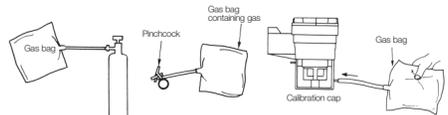
**GD-1B:** Bring the tip of the inspection gas (EG-3: Lighter type) near the inspection port of the detector, and hold down the lever to spray out gas. When gas is detected, the power-on lamp of the detector turns off.

- Check that the red (Alarm) lamp of the detector corresponding to the B-780 alarm starts blinking and the alarm sound is emitted.



#### Inspection of KD-5G, KD-5GM, KD-5T, and KD-5M detectors using the calibration tool set (sold separately)

- Remove the rainproof cover and rainproof cap of the detector.
- Capture gas from a standard gas canister to a gas bag connected to a PVC tube, and close it with a pinchcock.
- Put the calibration cap onto the sensor unit of the detector, and allow gas to flow to the calibration cap.
- Check that the red (Alarm) lamp of the detector corresponding to the B-780 alarm starts blinking and the alarm sound is emitted.



### 13. Identifying Faults and Errors and Troubleshooting Procedures

If the device is operating abnormally or if a problem occurs, do not continue to use in this state, immediately stop usage, and conduct a complete inspection.

Symptom	Cause	Troubleshooting Procedure
Yellow (Trouble) lamp is blinking (fully lit)	Problem in detector connection cable (broken wire, short-circuit, loose terminal connection part, wrong polarity connection)	Resolve the cable problem, tighten the terminal connection part, check the polarity, etc.
Yellow (Trouble) lamp is blinking (fully lit) No. 1	The detector is not connected to the terminal of detector number 1	If the number of connected detectors is two or less, be sure to always connect starting from terminal number 1, and set the function setting switch of the unconnected terminal to the ON position. Check the ON and OFF settings for the function setting switch, such as after the connection numbers of the detectors were changed. (Connected to No. 2 - Switch 1 = OFF, Not connected = ON) (Connected to No. 3 - Switch 2 = OFF, Not connected = ON)
Yellow (Trouble) lamp is blinking (fully lit) No. 2 or No. 3	Forgetting to set the function setting switch	(Connected to No. 2 - Switch 1 = OFF, Not connected = ON) (Connected to No. 3 - Switch 2 = OFF, Not connected = ON)
If the yellow (Trouble) lamp does not turn off even after checking the above points	Failure of detector itself (due to impact, ingress of water, lightning, etc.)	If you checked the other items and the trouble lamp still does not turn off, contact your dealer or New Cosmos Electric sales office.
The alarm sound does not stop after an alarm even though operation was recovered	The function setting switch is set to manual reset (Switch 3 is set to OFF)	After there is no longer any gas, and the detector has recovered operation, press the Alarm Stop button to recover alarm operation.
The alarm sound is not emitted during a gas leak alarm or when trouble is indicated	The function setting switch is set to alarm sound disable (Switch 5 is set to ON)	Set function setting switch 5 to OFF.
The detector lamp of the GD-1B simplified detector does not turn on	The yellow (Trouble) lamp of the problem location turns on: Connector problem in detector cable (broken wire, short-circuit, loose terminal connection part, wrong polarity connection, missing connector) Gas leak alarm has occurred	Remove the problem cable, check the polarity, tighten the terminal connection part, and check the connector. The power-on lamp is off during a gas leak alarm.
The external alarm device is not activated	The alarm delay time is about (35 seconds) The 100/220 V AC output does not work (rotating light or similar device does not turn on)	After the alarm delay time has elapsed, the alarm signal is output. (If the delay time is not needed, set function setting switch 4 to OFF to set to immediate output.) The fuse may have blown, and so contact your dealer or New Cosmos Electric sales office.

If the problem persists or you remain unsure about the problem even after checking the above points, contact your dealer or New Cosmos Electric sales office.

### 14. Requesting After-sales Service

#### Requesting Service

- Check the points in "Identifying Faults and Errors and Troubleshooting Procedures" again.
- If the problem persists even after checking the above points, or you are uncertain about the problem, do not attempt to repair the alarm yourself. Instead, contact your dealer or New Cosmos Electric sales office. When you contact to request service, please provide the following information.

(1) Product name	Gas alarm
(2) Model	B-780 alarm Connected detectors KD-5G, KD-5GM, KD-5T, KD-5M GD-1B, etc.
(3) Problem symptoms	Describe in as much detail as possible (lamps turned on, blinking state, etc.)

- Failures and damages incurred by incorrect use, deliberate acts or negligence of the user.
- Failures and damages caused by disaster, earthquake, storm and flood, lightning, extreme climate, abnormal power supply voltage, excessive electromagnetic interferences, or other acts of God.
- Failures and damages resulting from repair and/or modification by non-New Cosmos certified technicians.
- Consumables and failures and damages resulting from improper consumable replacement.
- Other failures and damages not attributable to the manufacturer.

### 15. Specifications

#### B-780 Alarm Specifications

Target gas	LP gas	Methane gas
Number of connected detectors	1 to 3	
Connectable detector models	KD-5G, KD-5T, GD-1B	KD-5GM, KD-5M
Alarm method	Red (Alarm) lamp blinks (Fully lit after alarm stopped), Synthesized voice message, Auto reset (Can be set to manual reset by switch)	
Alarm volume	80 dB/m or more	
Alarm stop	By pushbutton (Alarm Stop button)	
Circuit inspection function	By pushbutton (Inspect button) (3-point simultaneous inspection)	
Trouble indicator	Yellow (Trouble) lamp blinking (Fully lit after alarm stopped)	
Power supply	100 V AC or 220 V AC ±10% 50/60 Hz (terminal block type)	
Power consumption	Approx. 5 W when monitoring (maximum) Approx. 10 W when alarm occurs (maximum)	
External output signal	(1) 2-step voltage (6 V DC when monitoring, 12 V DC when alarm, 0 V when problem) (2) Voltage 100 V AC or 220 V AC when alarm, 1 A max. output (output delay time of approx. 35 seconds, can be changed to immediate output by switch setting, replaceable fuse) (3) 1a/1b contact 24 V DC, 1 A max. (Output delay time of approx. 35 seconds, can be changed to immediate output by switch setting)	
Operating temperature range	-10°C to +40°C (no condensation)	
Dimensions and weight	138 (W) × 180 (H) × 33 (D) mm (excluding protrusions), approx. 420 g	
Accessories	Wood screws ×2, Crimp terminals ×10	

#### KD-5 Detector Specifications

Model	KD-5G	KD-5GM	KD-5T	KD-5M
Detection type	Contact combustion (low power type)			Hot-wire semiconductor
Target gas	LP gas	Methane gas	LP gas	Methane gas
Alarm gas concentration	1/100 to 1/4 of LEL			
Response time	30 seconds or less / 1 minute or less	30 seconds or less / 1 minute or less		
Power supply	24 V DC ±20%			
Consumption current	30 mA or less at 24 V			
Structure	Explosion-proof structure (d2G4)			Weather-resistant
Output signal	2-step voltage type (6 V DC when monitoring, 12 V DC when alarm, 0 V when problem)			
Extendable distance	Max. 500 m (CVV 1.25 mm <sup>2</sup> , 3-core cable)			
Operating temperature range	-10°C to +60°C			-10°C to +50°C
Dimensions and weight	94 (W) × 141 (H) × 123 (D) mm (excluding protrusions), approx. 1,500 g			
Installation method	Screw-mounted installation			
Accessories	Standard, rainproof cap, rainproof cover, screws, screw expansion plugs, crimp terminals			

#### GD-1B Detector Specifications

Model	GD-1B
Detection type	Contact combustion (low power type)
Target gas	LP gas
Alarm gas concentration	1/100 to 1/4 of LEL
Response time	30 seconds or less
Power supply	24 V DC ±20%
Consumption current	30 mA or less at 24 V
Structure	Simplified
Output signal	2-step voltage type (6 V DC when monitoring, 12 V DC when alarm, 0 V when problem)
Extendable distance	Max. 200 m (0.5 mm <sup>2</sup> , using 3-core wire)
Operating temperature range	-10°C to +40°C
Dimensions and weight	52 (W) × 116 (H) × 37 (D) mm (excluding protrusions), approx. 220 g
Installation method	Installation by installation plate and band
Accessories	Installation plate, wood screws, band, connectors, screw expansion plugs, crimp terminals

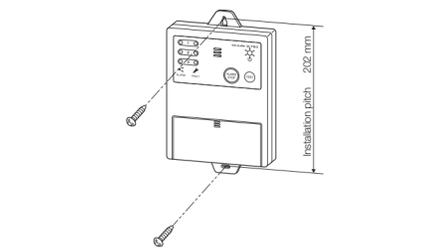
### 16. Installing the B-780 Alarm

#### Installation Location of the Alarm

- Install in a location where the alarm can easily be verified if a gas leak alarm occurs.
- Select a location where the green (Power) lamp is clearly visible and the alarm is easily accessible for maintenance.
- Install in a location that is at least 8 meters away from hazard zones or in a non-hazard zone.
- The alarm requires a 100/220 V AC power supply.

#### Installation Procedure for B-780 Alarm

Insert wood screws into the hooks at the top and bottom of the alarm to secure it in place.



### 17. Warranty

The warranty period is one (1) year from the date of purchase. You are entitled to the limited warranty, if the product malfunctions due to a manufacturing defect during normal use in accordance with the instruction manual, specifications and labels.

- 1. Warranty Scope** If the product fails or is found to be damaged due to a manufacturing defect during the warranty period, and used in accordance with the instruction manual and specifications, we will provide a free replacement. This warranty covers the New Cosmos product/parts only and not third party product/parts.

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