Thank you very much for using SUNX products. Please read this Instruction Manual carefully and thoroughly for the correct and optimum use of this product. Kindly keep this manual in a convenient place for quick reference.

### 1 SPECIFICATIONS

<table>
<thead>
<tr>
<th>Item</th>
<th>Type</th>
<th>Long-range sensing range (0.2 to 3m)</th>
<th>High-luminous job indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>NA1-5</td>
<td>NPN output type</td>
<td>Emitter: 0.5W or less</td>
<td>Receiver: 0.8W or less</td>
</tr>
<tr>
<td>NA1-PK5</td>
<td>PNP output type</td>
<td>Emitter: 0.7W or less</td>
<td>Receiver: 0.5W or less</td>
</tr>
<tr>
<td>NA1-PK5-PN</td>
<td>PNP open-collector output</td>
<td>Emitter: 0.9W or less</td>
<td>Receiver: 1.2W or less</td>
</tr>
</tbody>
</table>

#### 2 CAUTIONS

- This product has been developed / produced for industrial use only.
- Make sure to carry out the wiring and the operation of the operation mode switches in the power supply off condition.
- Make sure that the wiring may damage the sensor.
- Verify that the supply voltage variation is within the rating.
- Take care that the sensor does not come in contact with water, oil, grease, organic solvents, such as thinner, etc., or strong acid, and alkali.
- Use this product installed to a machinery or a device as a sensing device to detect a hand or a part of the operator’s body entering a dangerous area and stop the machinery or the device.

### 3 MOUNTING

- Use M4 screws with washers, and M4 nuts. The tightening torque should be 0.5N·m or less. (Please arrange the screws and nuts separately.)
- Optional sensor mounting brackets (MS-NA1-1, MS-NA2-1) are also available.

### 4 I/C CIRCUIT DIAGRAMS

#### NPN output type

- Color code / Connector pin No. of the pigtailed type

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**SPECIFICATIONS**

- **Type**
  - Long-range sensing range (0.2 to 3m)
  - High-luminous job indicator

- **Item**
  - NA1-5
  - NA1-PK5
  - NA1-PK5-PN

- **Sensing height**
  - 100mm

- **Sensing range**
  - (Note 2)
  - 0.2 to 3m (0.05 to 1m when set to SHORT)

- **Beam pitch**
  - 5 beam channels

- **Number of beam channels**
  - 5 beam channels

- **Sensing object**
  - δ 0mm or more opaque object

- **Supply voltage**
  - 12 to 24V DC ±10%

- **Power consumption**
  - (Note 3)
  - Emitter: 0.5W or less
  - Receiver: 0.8W or less

- **Type**
  - NPN output type
  - PNP output type
  - PNP open-collector output

- **Output**
  - High (5 to 30V, or open): turns off
  - Low (0 to 2V): lights up or blinks

- **Responsiveness**
  - 10ms or less (when the interference prevention function is used, in Light state: 30ms or less, in Dark state: 13ms or less)

- **Inference prevention function**
  - Incorporated

- **Ambient temperature**
  - -10 to +55°C (No condensation or icing allowed), Storage: -20 to +70°C

- **Ambient humidity**
  - 35 to 85% RH, Storage: 35 to 85% RH

- **Material**

- **Enclosure**
  - Infrared LED (synchronized scanning system)

- **Cable**
  - 0.3mm² to 4-core (emitter: 3-core) oil-resistant cable, 2m long

- **Connector-pin position (Pigtailed type)**
  - NA1-5: CS-5, NA1-PK5-PN: CS-5, NA1-PK5: CS-5

- **Job indicator**
  - High (5V or more): lights up or blinks
  - Low (0 to 2V): lights up or blinks

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**CAUTIONS**

- This product has been developed / produced for industrial use only.
- Make sure to carry out the wiring and the operation of the operation mode switches in the power supply off condition.
- Take care that the wiring may damage the sensor.
- Verify that the supply voltage variation is within the rating.
- Check that the sensor does not come in contact with water, oil, grease, organic solvents, such as thinner, etc., or strong acid, and alkali.
- Use this product installed to a machinery or a device as a sensing device to detect a hand or a part of the operator’s body entering a dangerous area and stop the machinery or the device.
- Do not run the wires together with high voltage lines, high frequency lighting device, as it may affect the sensor performance.

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**NOTES**

1. The model No. with suffix ‘-CS’ is 5m cable length type. (only the long sensing range: NPN output type)

   - Model No.: NA1-5-CS
   - Model No.: NA1-5-PK5-CS

2. For the cable connected with the pigtailed type, use the connection cable (cable length: 5m) (optional).

3. The sensitivity range gives the measuring distance between the emitter and the receiver, in case of NA1-PK5-PN, an object can be detected for a 0.2m or less (0.05m or less when set to SHORT) away, and in case of NA1-PK5-PN, it can be detected even if it is 0.1m or less (0.05m or less when set to SHORT) away.

4. Take care that the sensor does not come in contact with water, oil, grease, organic solvents, such as thinner, etc., or strong acid, and alkali.

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**NOTES**

1. The model No. with suffix ‘-CS’ is pigtailed type. (cable length: 0.3m)

2. In order to use the job indicators as large size operation indicators, connect the job indicator input (pink) and output (black) wires together.

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**NOTES**

1. The model No. with suffix ‘-CS’ is pigtailed type. (cable length: 0.3m)

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**NOTES**

1. The model No. with suffix ‘-CS’ is pigtailed type. (cable length: 0.3m)

2. In order to use the job indicators as large size operation indicators, connect the job indicator input (pink) and output (black) wires together.
PART DESCRIPTION

SELECTION OF OPERATION

- **Selection of output operation**
  - The output operation mode is selected by the operation mode switch on the receiver.
  - Make sure that the power is off while setting.
  - The operation mode does not change even if the setting is changed in the power supply on condition.

<table>
<thead>
<tr>
<th>Operation mode switch</th>
<th>Output operation</th>
<th>Operation indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>SINGLE D-ON</td>
<td>ON</td>
<td>Lights up when the output is ON.</td>
</tr>
<tr>
<td>SINGLE L-ON</td>
<td>OFF</td>
<td>Lights up when the output is OFF.</td>
</tr>
<tr>
<td>DOUBLE D-ON</td>
<td>ON</td>
<td>Lights up when the output is ON.</td>
</tr>
<tr>
<td>DOUBLE L-ON</td>
<td>OFF</td>
<td>Lights up when the output is OFF.</td>
</tr>
</tbody>
</table>

- **Job indicator operation selection**
  - Lighting / blinking is selected by the operation mode switch on the emitter and the receiver.
  - Make sure that the power is off while setting.
  - The operation mode does not change even if the setting is changed in the power supply on condition.

<table>
<thead>
<tr>
<th>Operation mode switch</th>
<th>Job indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>SINGLE D-ON</td>
<td>LIGHT</td>
</tr>
<tr>
<td>SINGLE L-ON</td>
<td>LIGHT</td>
</tr>
<tr>
<td>DOUBLE D-ON</td>
<td>FLASH</td>
</tr>
<tr>
<td>DOUBLE L-ON</td>
<td>FLASH</td>
</tr>
</tbody>
</table>

BEAM AXIS ALIGNMENT

1. Place the emitter and the receiver face to face along a straight line.
2. After the cable has been correctly connected, switch the power ON.
3. Move the emitter in the up, down, left and right directions, in order to determine the range of the beam received condition with the help of the operation indicator (red) on the receiver. Then, set the emitter at the center of this range.
4. Similarly, adjust for up, down, left and right angular movement of the emitter.
5. Further, perform the angular adjustment for the receiver also.
6. Check that the stable incident beam indicator (green) lights up.
7. Interrupt each beam channel with the actual sensing object, and confirm that the sensor operates correctly.

INTERFERENCE PREVENTION FUNCTION

- By setting different emission frequencies, two sets of sensors can be mounted close together, as shown in the figure below.

- **Frequency setting**
  - Set the frequency of Sensor A to FREQ. A (on the emitter and the receiver) and that of Sensor B to FREQ. B (on the emitter and the receiver).
  - Make sure that the power is off while setting.
  - The operation mode does not change even if the setting is changed in the power supply on condition.

LONG / SHORT SELECTION SWITCH

- **(incorporated in the emitter)**
  - Select the switch setting according to the setting distance L between the emitter and the receiver as given below.

<table>
<thead>
<tr>
<th>Setting distance L</th>
<th>Operation mode switch (Emitter)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.05 to 1m (0.05m ≤ L ≤ 1m)</td>
<td>SHORT</td>
</tr>
<tr>
<td>1m to 3m (1m ≤ L ≤ 3m)</td>
<td>LONG</td>
</tr>
<tr>
<td>3m to 5m (3m ≤ L ≤ 5m)</td>
<td>SHORT</td>
</tr>
</tbody>
</table>

FIXING OF SENSOR MOUNTING BRACKET (OPTIONAL)

- **Assembly diagram for MS-NA1-1**
  - M4 screws with washers, nuts and hooks are attached with MS-NA1-1.

- **Assembly diagram for MS-NA2-1**
  - M4 screws with washers, nuts, hooks and spacers are attached with MS-NA2-1.

INTENDED PRODUCTS FOR CE MARKING

- The models listed under SPECIFICATIONS come with CE Marking.
  - As for all other models, please contact our office.

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