Ultra-slim Body Picking Sensor

Even a slim hand is detected by the 25 mm (0.984 in) pitch beam curtain

Clearly visible job indicator
Bright, easy-to-see job indicators, 55 mm 2.165 in length, have been incorporated into both the emitter and the receiver. This sensor is optimal for picking. With the NA1-PK5, we’ve enhanced visibility even further by using 8 orange LED lights.

Long sensing range: 3 m 9.843 ft
Its long sensing range of 3 m 9.843 ft is sufficient for confirming access to a parts shelf. Further, if the sensor has been set to the Light-ON mode, the output is turned OFF should the cable break.

Two unit installations are possible
Sensor units can now be set to different light emission frequencies, in order to prevent mutual interference. Two units can now be operated in a side-by-side configuration without interference, for problem-free detection over wider areas.

Selectable detection operation
Either of two different detection operations may be selected, in order to best suit the particular application. Sensor units can be set to detect the interruption of 1 or more beam channels, or can be set to detect only the interruption of 2 or more beam channels.

Lighting pattern selectable
The job indicator operation can be selected as either continuous lighting or blinking.

10 mm 0.394 in thick: half the thickness of conventional models
Space savings now possible; ultra-thin design does not obstruct picking operations.

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Even a slim hand is detected by the 25 mm (0.984 in) pitch beam curtain

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Space savings now possible; ultra-thin design does not obstruct picking operations.

Even a slim hand is detected by the 25 mm (0.984 in) pitch beam curtain
APPLICATIONS

Preventing wrong parts picking
Access control on assembly line
Detecting parts having wide positioning area

WARNING Never use this product in any personnel safety application.

ORDER GUIDE

<table>
<thead>
<tr>
<th>Type</th>
<th>Appearance</th>
<th>Sensing range (Note)</th>
<th>Model No.</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-luminous job indicator type</td>
<td>NA1-PK5</td>
<td>0.1 to 1.2 m (0.328 to 3.937 ft) when set to SHORT.</td>
<td>NA1-PK5-PN</td>
<td>PNP open-collector transistor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.05 to 0.5 m (0.164 to 1.640 ft) when set to SHORT.</td>
<td>NA1-PK5-PN-J</td>
<td>PNP open-collector transistor</td>
</tr>
<tr>
<td>Long-sensing range type</td>
<td>NA1-5</td>
<td>0.2 to 3 m (0.656 to 9.843 ft) when set to SHORT.</td>
<td>NA1-5-PN</td>
<td>PNP open-collector transistor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.05 to 1 m (0.164 to 3.281 ft) when set to SHORT.</td>
<td>NA1-5-PN-J</td>
<td>PNP open-collector transistor</td>
</tr>
</tbody>
</table>

Note: The sensing range is the possible setting distance between the emitter and the receiver. NA1-PK5-PN can detect an object less than 0.1 m (0.328 ft) (0.05 m (0.164 ft) when set to SHORT) away. NA1-5-PN can detect an object less than 0.2 m (0.656 ft) (0.05 m (0.164 ft) when set to SHORT) away.

Emitter
Receiver cannot be placed in this range
Actual sensing range of the sensor
NA1-PK5-PN: 1.2 m (3.937 ft) (0.5 m (1.640 ft) when set to SHORT)
NA1-5-PN: 3 m (9.843 ft) (1 m (3.281 ft) when set to SHORT)
Setting range of the receiver

Receiver

5 m 16.404 ft cable length type, pigtailed type
5 m 16.404 ft cable length type (standard: 2 m 6.562 ft) and pigtailed type (standard: cable type) are also available.

Table of Model Nos.

<table>
<thead>
<tr>
<th>Type</th>
<th>Standard type</th>
<th>5 m 16.404 ft cable length type</th>
<th>Pigtailed type (Note)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NA1-PK5</td>
<td></td>
<td></td>
<td>NA1-PK5-J</td>
</tr>
<tr>
<td>NA1-PK5-PN</td>
<td></td>
<td></td>
<td>NA1-PK5-PN-J</td>
</tr>
<tr>
<td>NA1-5</td>
<td>NA1-5-C5</td>
<td></td>
<td>NA1-5-J</td>
</tr>
<tr>
<td>NA1-5-PN</td>
<td></td>
<td></td>
<td>NA1-5-PN-J</td>
</tr>
</tbody>
</table>

Note: Please order the suitable mating cable separately for pigtailed type.

Mating cable (2 cables are required.)

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CN-24-C2</td>
<td>4-core, cable length 2 m 6.562 ft</td>
</tr>
<tr>
<td>CN-24-C5</td>
<td>4-core, cable length 5 m 16.404 ft</td>
</tr>
</tbody>
</table>
### Options

<table>
<thead>
<tr>
<th>Designation</th>
<th>Model No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensor mounting bracket</td>
<td>MS-NA1-1</td>
<td>Four bracket set Four M4 (length 15 mm 0.591 in) screws with washers, eight nuts, four hooks, four spacers and eight M4 (length 18 mm 0.709 in) screws with washers are attached. (Spacers are not attached with MS-NA1-1.)</td>
</tr>
<tr>
<td></td>
<td>MS-NA2-1</td>
<td>It protects the sensor body. Two silver bracket set Four M4 (length 15 mm 0.591 in) screws with washers, and four nuts are attached.</td>
</tr>
<tr>
<td>Sensor protection bracket</td>
<td>MS-NA3</td>
<td>It protects the sensor body. Two black bracket set Four M4 (length 15 mm 0.591 in) screws with washers, and four nuts are attached.</td>
</tr>
<tr>
<td></td>
<td>MS-NA3-BK</td>
<td>It protects the sensor body. Two black bracket set Four M4 (length 15 mm 0.591 in) screws with washers, and four nuts are attached.</td>
</tr>
<tr>
<td>Slit mask</td>
<td>OS-NA1-5</td>
<td>The slit mask restrains the amount of beam emitted or received. (Seal type, 10 pcs. in 1 set)</td>
</tr>
<tr>
<td>Y-shaped connector</td>
<td>SL-WY</td>
<td>This connector is able to combine the cables of receiver and emitter into one.</td>
</tr>
</tbody>
</table>

Sensor protection brackets
- MS-NA3
- MS-NA3-BK

Slit mask
- OS-NA1-5

Since the slit mask is seal type, it can be used by sticking it to the detection surface. Take care that the sensing range will be reduced when the slit mask is used. Please contact our office for details.

Sensor mounting brackets
- MS-NA1-1
- MS-NA2-1

Y-shaped connector
- SL-WY

M4 screws with washers, and nuts are attached.

M4 screws with washers, nuts and hooks are attached.

M4 screws with washers, nuts, and hooks and spacers are attached.
**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Model No.</th>
<th>NA1-PK5</th>
<th>NA1-5</th>
<th>NA1-PK5-PN</th>
<th>NA1-5-PN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensing height</td>
<td>100 mm</td>
<td>3.937 in</td>
<td>25 mm 0.984 in</td>
<td>25 mm 0.984 in</td>
</tr>
<tr>
<td>Sensing range (Note 1)</td>
<td>0.1 to 1.2 m 0.328 to 3.937 ft</td>
<td>0.2 to 3 m 0.656 to 9.843 ft</td>
<td>0.1 to 1.2 m 0.328 to 3.937 ft</td>
<td>0.2 to 3 m 0.656 to 9.843 ft</td>
</tr>
<tr>
<td>Beam pitch</td>
<td>0.35 to 0.5 m 0.114 to 0.164 ft when set to SHORT</td>
<td>0.35 to 1.144 ft when set to SHORT</td>
<td>0.35 to 0.5 m 0.114 to 0.164 ft when set to SHORT</td>
<td>0.35 to 1.144 ft when set to SHORT</td>
</tr>
<tr>
<td>Number of beam channels</td>
<td>5 beam channels</td>
<td>5 beam channels</td>
<td>5 beam channels</td>
<td>5 beam channels</td>
</tr>
<tr>
<td>Sensing object</td>
<td>35 mm 1.378 in or more opaque object</td>
<td>35 mm 1.378 in or more opaque object</td>
<td>35 mm 1.378 in or more opaque object</td>
<td>35 mm 1.378 in or more opaque object</td>
</tr>
<tr>
<td>Supply voltage</td>
<td>12 to 24 V DC ± 10 % Ripple P-P 10 % or less</td>
<td>12 to 24 V DC ± 10 % Ripple P-P 10 % or less</td>
<td>12 to 24 V DC ± 10 % Ripple P-P 10 % or less</td>
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</tr>
</tbody>
</table>

**Power consumption (Note 2)**
- Emitter: 0.5 W or less, Receiver: 0.8 W or less
- Emitter: 0.6 W or less, Receiver: 0.9 W or less

**Utilization category**
- NA1-PK5/5 NA1-PK5/5

**Operation**
- Output operation: DC-12 or DC-13
- Short-circuit protection: Incorporated
- Interference prevention function: Incorporated

**Pollution degree**
- 3 (Industrial environment)

**Protection**
- IP62

**Ambient temperature**
- -10 to +55 °C +14 to +131 °F (No dew condensation or icing allowed), Storage: -20 to +70 °C -4 to +158 °F

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

**Ambient illuminance**
- Sunlight: 10,000 lx at the light-receiving face, Incandescent light: 3,000 lx at the light-receiving face

**EMC**
- EN 50081-2, EN 50082-2, EN 61000-4-5

**Voltage withstandability**
- 1,000 V AC for one min. between all supply terminals connected together and enclosure

**Insulation resistance**
- 20 MΩ, or more, with 250 V DC megger between all supply terminals connected together and enclosure

**Vibration resistance**
- 10 to 150 Hz frequency, 0.75 mm 0.030 in amplitude in X, Y and Z directions for two hours each

**Emitting body**
- Infrared LED (synchronized scanning system)

**Material**

**Cable**
- 0.3 mm² 4-core (emitter: 3-core) oil resistant cable, 2 m 6.56 ft long

**Cable extension**
- Extension up to total length 320 m 984 ft is possible for both emitter and receiver with 0.3 mm², or more, cable.

**Weight**
- Emitter: 80 g approx., Receiver: 85 g approx.
- Emitter: 70 g approx., Receiver: 80 g approx.
- Emitter: 80 g approx., Receiver: 85 g approx.
- Emitter: 70 g approx., Receiver: 80 g approx.

**Notes:**
1. The sensing range is the possible setting distance between the emitter and the receiver. NA1-PK5/5 (PN) can detect an object less than 0.1 m 0.328 ft (0.05 m 0.164 ft when set to SHORT) away, NA1-5 (PN) can detect an object less than 0.2 m 0.656 ft (0.05 m 0.164 ft when set to SHORT) away.
2. Obtain the current consumption by the following equation.

\[ \text{Current consumption} = \frac{\text{Power consumption}}{\text{Supply voltage}} \]

*(e.g.)* When the supply voltage is 12 V, the current consumption of the emitter is:

\[ 0.5 \text{ W} / 12 \text{ V} = 0.042 \text{ A} = 42 \text{ mA} \]
### NA1-PK5/5

#### I/O CIRCUIT AND WIRING DIAGRAMS

**I/O circuit diagram**

- **NA1-PK5**
  - NPN output type
  - **Color code / Connector pin No. of the pigtailed type**
    - (Brown / 1) + V
    - (Black / 4) Output (Note 1)
    - (Blue / 3) 0 V
  - Internal circuit
  - Users' circuit

**Wiring diagram**

- **Color code / Connector pin No. of the pigtailed type**
  - Brown / 1
  - Black / 4
  - Blue / 3
  - Pink / 2

**Notes:**
1. The emitter does not incorporate the output.
2. Unused wire must be insulated to ensure that they do not come into contact with wires already in use.

Symbols...
- D: Reverse supply polarity protection diode
- Zn: Surge absorption zener diode
- Tr: NPN output transistor
- E: Job indicator (IND.)

**Connector pin position (Pigtailed type)**

- **Color code / Connector pin No. of the pigtailed type**
  - Brown / 1
  - Black / 4
  - Blue / 3
  - Pink / 2

**Notes:**
1. No connection is required for the emitter.
2. The pin arrangement of the SL-WY Y-shaped connector (optional) is identical to the receiver.

**Non-contact voltage or NPN open-collector transistor**

- Low (0 to 2 V): Lights up or Blanks
- High (5 to 30 V, or open): Lights off

#### NA1-PK5-PN

**I/O circuit diagram**

- **NA1-5-PN**
  - PNP output type
  - **Color code / Connector pin No. of the pigtailed type**
    - (Brown / 1) + V
    - (Black / 4) Output (Note 1)
    - (Blue / 3) 0 V
  - Internal circuit
  - Users' circuit

**Wiring diagram**

- **Color code / Connector pin No. of the pigtailed type**
  - Brown / 1
  - Black / 4
  - Blue / 3
  - Pink / 2

**Notes:**
1. The emitter does not incorporate the output.
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Symbols...
- D: Reverse supply polarity protection diode
- Zn: Surge absorption zener diode
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**Connector pin position (Pigtailed type)**

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  - Brown / 1
  - Black / 4
  - Blue / 3
  - Pink / 2

**Notes:**
1. No connection is required for the emitter.
2. The pin arrangement of the SL-WY Y-shaped connector (optional) is identical to the receiver.

**Non-contact voltage or PNP open-collector transistor**

- Low (0 to 2 V): Lights up or Blinks
- High (4 V or more): Lights up or Blinks
- Low (0 to 0.6 V, or open): Lights off
SENSING CHARACTERISTICS (TYPICAL)

**NA1-PK5/5**

**NA1-PK5-PN**

**Parallel deviation**

**Vertical direction**

**Horizontal direction**

**Angular deviation**

**NA1-5**

**NA1-5-PN**

**Parallel deviation**

**Angular deviation**
PRECAUTIONS FOR PROPER USE

Never use this product as a sensing device for personnel protection.

For sensing devices to be used as safety devices for press machines or for personnel protection, use products which meet standards, such as OSHA, ANSI or IEC etc., for personnel protection applicable in each region or country.

If this product is used as a sensing device for personnel protection, death or serious body injury could result.

For a product which meets safety standards, use the following products:
Type 4: SF4-AH series (p.420~) SF2-EH series (p.486~)
Type 2: SF2-A series (p.446~) SF2-N series (p.464~)

Mounting

- Use M4 screws with washers and M4 nuts. The tightening torque should be 0.5 N-m or less.
  (Please arrange the screws and nuts separately.)

Orientation

- The emitter and the receiver must face each other correctly. If they are set upside down, the sensor does not work.

Interference prevention function

- By setting different emission frequencies, two units of the sensor can be mounted close together, as shown in the figure below.
  The switches must be set with the power supply off. The operation mode does not change if the switch setting is changed with the power supplied.

Selection of output operation

- The output operation mode is selected by the operation mode switch on the receiver.
  The switches must be set with the power supply off. The operation mode does not change if the switch setting is changed with the power supplied.

Job indicator operation selection

- Lighting / Blinking is selected by the operation mode switch on the emitter and the receiver.
  The switches must be set with the power supply off. The operation mode does not change if the switch setting is changed with the power supplied.

Others

- Do not use during the initial transient time (0.5 sec.) after the power supply is switched on.
NA1-PK5/5

DIMENSIONS (Unit: mm in)

The CAD data in the dimensions can be downloaded from the SUNX website: http://www.sunx.co.jp/

MS-NA1-1 Sensor mounting bracket (Optional)

Assembly dimensions
Mounting drawing with the receiver

Material: Cold rolled carbon steel (SPCC) (Uni-chrome plated)

Four bracket set
Four M4 (length 15 mm 0.591 in) screws with washers, eight nuts, four hooks and eight M4 (length 18 mm 0.709 in) screws with washers are attached.

M4 (length 18 mm 0.709 in) screws with washers are not used for NA1-PK5/5 series.

Very close!!
**DIMENSIONS (Unit: mm [in])**  The CAD data in the dimensions can be downloaded from the SUNX website: http://www.sunx.co.jp/

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**MS-NA2-1**  Sensor mounting bracket (Optional)

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**Assembly dimensions**  Mounting drawing with the receiver

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**Material:** Cold rolled carbon steel (SPCC)  (Uni-chrome plated)

**Four bracket set**

- Four M4 (length 15 mm 0.591 in) screws with washers, eight nuts, four hooks, four spacers and eight M4 (length 18 mm 0.709 in) screws with washers are attached.

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**MS-NA3**  Sensor protection bracket (Optional)

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**Material:** Cold rolled carbon steel (SPCC)  
- **MS-NA3:** Chrome plated,  
- **MS-NA3-BK:** Black chromate

**Two bracket set**

- Four M4 (length 15 mm 0.591 in) screws with washers, and four nuts are attached.