## NA1-PK5 serris NA1-5 serils




## Even a slim hand is detectable by the 25 mm 0.984 in pitch beam area sensor

## 10 mm 0.394 in thick: half the thickness of conventional models

Space saving is now possible. The ultra-thin design does not obstruct picking operation.


Cable can be freely arranged in any position

## Clearly visible job indicators

Bright, easy-to-see job indicators, 55 mm 2.165 in 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.


## FUNCTIONS

## Two unit installation is 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.



## FUNCTIONS

## Lighting pattern selectable

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


## Selectable detection operation

Either of the two different detection operations may be selected in order to 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.


All opaque bodies with $\varnothing 35 \mathrm{~mm} \varnothing 1.378$ in or greater will be detected.

Double beam interruption


The accidental passage of small objects through the beam axis will not trigger detection, yet the operator's hands will always be accurately detected. This function is also useful when small objects regularly interrupt the beam axis.

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ORDER GUIDE

| Type | Appearance | Sensing range (Note) | Model No. | Output |
| :--- | :--- | :--- | :--- | :--- | :--- |

Notes: 1) The sensing range is the possible setting distance between the emitter and the receiver.
2) The model No. with " $P$ " shown on the label affixed to the product is the emitter, " $D$ " shown on the label is receiver.


## ORDER GUIDE

## FIBER SENSORS

## MICRO

ELECTRIC

## S-LINK direct hook-up picking sensor

SL-N15 can be hooked up to the sensor \& wire-saving link system S-LINK.
Refer to p.1033~ for the sensor \& wire-saving link system S-LINK.

| Model No. | Description |  |
| :---: | :---: | :---: |
| SL-N15 | Sensing range: 0.2 to 3 m 0.656 to 9.843 ft ( 0.05 to 1 m 0.164 to 3.281 ft when the switch is set to SHORT) <br> Beam pitch: 25 mm 0.984 in <br> Sensing height: 100 mm 3.937 in Sensing object: $\varnothing 35 \mathrm{~mm} \varnothing 1.378$ in or more opaque object | It is a parts-taking verification sensor with five sensing beams and can be hooked up to the S-LINK cable without any interface. <br> Both the emitter and the receiver are incorporated with bright orange LED job indicators that are easily visible to the operator. |

5 m 16.404 ft cable length type
5 m 16.404 ft cable length type (standard: 2 m 6.562 ft ) is also available. Model No.: NA1-5-C5

## Pigtailed type

Pigtailed type is also available. When ordering this type, suffix "-J" to the model No. Please order the mating cable separately
(e.g.) Pigtailed type of NA1-PK5-PN is "NA1-PK5-PN-J".

- Mating cable (2 cables are required.)

| Model No. | Description |
| :---: | :---: |
| CN-24-C2 | 4-core, cable length 2 m 6.562 ft |
| CN-24-C5 | 4-core, cable length 5 m 16.404 ft |

Selection
Guid
$\underset{\substack{\text { Slim } \\ \text { Body }}}{ }$

都

## OPTIONS

Sensor protection bracket

## - MS-NA3

- MS-NA3-BK

- MS-NA2-1

Sensor mounting bracket

## - MS-NA1-1



M4 screws with washers, nuts and hooks are attached.


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

## Slit mask

## -OS-NA1-5



Since the slit mask is of seal type, it can be used by sticking 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.


## Y-shaped connector

-SL-WY


## SPECIFICATIONS

|  |  | NPN output |  | PNP output |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | High-luminous job indicator type | Long sensing range type | High-luminous job indicator type | Long sensing range type |
|  |  | NA1-PK5 | NA1-5 | NA1-PK5-PN | NA1-5-PN |
| Sensing height |  | 100 mm 3.937 in |  |  |  |
| Sensing range (Note 2) |  | 0.1 to 1.2 m 0.328 to 3.937 ft ( 0.05 to 0.5 m 0.164 to 1.640 f when set to SHORT) | 0.2 to 3 m 0.656 to 9.843 ft ( 0.05 to 1 m 0.164 to 0.281 t when set to SHORT) | 0.1 to 1.2 m 0.328 to 3.937 ft ( 0.05 to 0.5 m 0.164 to 1.640 t when set to SHORT) | 0.2 to 3 m 0.656 to 9.843 ft (0.05 to 1 m 0.164 to 3.281 twhen set to SHORT) |
| Beam pitch |  | 25 mm 0.984 in |  |  |  |
| Number of beam channels |  | 5 beam channels |  |  |  |
| Sensing object |  | $\varnothing 35 \mathrm{~mm} \varnothing 1.378$ in or more opaque object (completely beam interrupted object) |  |  |  |
| Supply voltage |  | 12 to 24 V DC $\pm 10 \%$ Ripple P-P $10 \%$ or less |  |  |  |
| Power consumption (Note 3) |  | Emitter: 0.5 W or less, Receiver: 0.8 W or less |  | Emitter: 0.6 W or less, Receiver: 0.9 W or less |  |
| Output |  | NPN open-collector transistor <br> - Maximum sink current: 100 mA <br> - Applied voltage: 30 V DC or less (between output and 0 V ) <br> - Residual voltage: 1 V or less (at 100 mA sink current) 0.4 V or less (at 16 mA sink current) |  | PNP open-collector transistor <br> - Maximum source current: 100 mA <br> - Applied voltage: 30 V DC or less (between output and +V ) <br> - Residual voltage: 1 V or less (at 100 mA source current) 0.4 V or less (at 16 mA source current) |  |
|  | Utilization category | DC-12 or DC-13 |  |  |  |
|  | Output operation | ON or OFF when one or more beam channels are interrupted / ON or OFF when two or more beam channels are interrupted, selectable by operation mode switch |  |  |  |
|  | Short-circuit protection | Incorporated |  |  |  |
| Response time |  | 10 ms or less (when the interference prevention is used, in Light state: 30 ms or less, in Dark state: 13 ms or less) |  |  |  |
|  | Emitter | Power indicator: Green LED (lights up when the power is ON) Job indicator: Orange LED (lights up or blinks when the job indicator input is Low, lighting pattern is selected by operation mode switch) |  | Power indicator: Green LED (lights up when the power is ON) Job indicator: Orange LED (lights up or blinks when the job indicator input is High, lighting pattern is selected by operation mode switch) |  |
|  | Receiver | Operation indicator: Red LED (lights up when one or more beam channels are interrupted, but lights up when two beam channels or more are interrupted in the double-beaminterruption mode) <br> Stable incident beam indicator: Green LED (lights up when all beam channels are stably received) <br> Job indicator: Orange LED (lights up or blinks when the job indicator input is Low, lighting pattern is selected by operation mode switch) |  | Operation indicator: Red LED (lights up when one or more beam channels are interrupted, but lights up when two beam channels or more are interrupted in the double-beaminterruption mode) <br> Stable incident beam indicator: Green LED (lights up when all beam channels are stably received) Job indicator: Orange LED (lights up or blinks when the job indicator input is High, lighting pattern is selected by operation mode switch) |  |
| Interference prevention function |  | Incorporated |  |  |  |
|  | Pollution degree | 3 (Industrial environment) |  |  |  |
|  | Protection | IP62 (IEC) |  |  |  |
|  | Ambient temperature | -10 to $+55^{\circ} \mathrm{C}+14$ to $+131{ }^{\circ} \mathrm{F}$ (No dew condensation or icing allowed), Storage: -20 to $+70{ }^{\circ} \mathrm{C}-4$ to $+158{ }^{\circ} \mathrm{F}$ |  |  |  |
|  | Ambient humidity | 35 to 85 \% RH, Storage: 35 to 85 \% RH |  |  |  |
|  | Ambient illuminance | Incandescent light: 3,000 lx at the light-receiving face |  |  |  |
|  | EMC | EN 60947-5-2 |  |  |  |
|  | Voltage withstandability | $1,000 \mathrm{~V} \mathrm{AC}$ for one min. between all supply terminals connected together and enclosure |  |  |  |
|  | Insulation resistance | $20 \mathrm{M} \Omega$, 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 $\mathrm{X}, \mathrm{Y}$ and Z directions for two hours each |  |  |  |
|  | Shock resistance | $490 \mathrm{~m} / \mathrm{s}^{2}$ acceleration ( 50 G approx.) in $\mathrm{X}, \mathrm{Y}$ and Z directions for three times each |  |  |  |
| Emitting element |  | Infrared LED (Peak emission wavelength: 950 nm 0.037 mil, synchronized scanning system) |  |  |  |
| Material |  | Enclosure: Heat-resistant ABS, Lens cover: Acrylic, Indicator cover: Acrylic |  |  |  |
| Cable |  | $0.3 \mathrm{~mm}^{2}$ 4-core (emitter: 3-core) oil resistant cabtyre cable, 2 m 6.562 ft long |  |  |  |
| Cable extension |  | Extension up to total 100 m 328.084 ft is possible for both emitter and receiver with $0.3 \mathrm{~mm}^{2}$, or more, cable. |  |  |  |
| Weight |  | Net weight: <br> Emitter 80 g approx. <br> Receiver 85 g approx. <br> Gross weight: 270 g approx. | Net weight: <br> Emitter 70 g approx. <br> Receiver 80 g approx. <br> Gross weight: 270 g approx. | Net weight: <br> Emitter 80 g approx. <br> Receiver 85 g approx. <br> Gross weight: 270 g approx. | Net weight: <br> Emitter 70 g approx. <br> Receiver 80 g approx. <br> Gross weight: 270 g approx. |

Notes: 1) Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of $+23^{\circ} \mathrm{C}+73.4^{\circ} \mathrm{F}$.
2) The sensing range is the possible setting distance between the emitter and the receiver.
3) Obtain the current consumption by the following equation.

Current consumption $=$ Power consumption $\div$ Supply voltage
(e.g.) When the supply voltage is 12 V , the current consumption of the emitter is: $0.5 \mathrm{~W} \div 12 \mathrm{~V} \approx 0.042 \mathrm{~A}=42 \mathrm{~mA}$



Notes: 1) The emitter does not incorporate the output (black).
2) If a connection cable is connected to the relay connector type, then the lead wire color is "white".
3) Unused wire must be insulated to ensure that they do not come into contact with wires already in use.

| Symbols $\ldots$ D $:$ Reverse supply polarity protection diode |
| :---: |
| ZD: Surge absorption zener diode |
| Tr $:$ NPN output transistor |
|  |
| $\mathrm{E}:$ Job indicator (IND.) |

*1

| Non-contact voltage or NPN open-collector transistor |
| :--- |
| - Job indicator input |
| Low ( 0 to 2 V ): Lights up or Blinks |
| High ( 5 to 30 V , or open): Lights off |

## Wiring diagram



Notes: 1) The emitter does not incorporate the black lead wire.
2) If a connection cable is connected to the relay connector type, then the lead wire color is "white".
3) Unused wires must be insulated to ensure that they do not come into contact with wires already in use.

Connector pin position (Pigtailed type)


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.

## NA1-PK5-PN NA1-5-PN

I/O circuit diagram


Internal circuit $\longleftrightarrow 0 \longrightarrow$ Users' circuit
Notes: 1) The emitter does not incorporate the output (black).
2) If a connection cable is connected to the relay connector type, then the lead wire color is "white".
3) Unused wire must be insulated to ensure that they do not come into contact with wires already in use.

| Symbols $\ldots \mathrm{D}:$ Reverse supply polarity protection diode |
| :---: |
| $\mathrm{ZD}:$ Surge absorption zener diode |
| $\mathrm{Tr}: \mathrm{PNP}$ output transistor |
| $\mathrm{E}:$ Job indicator (IND.) |

* 1

Non-contact voltage or PNP open-collector transistor


- Job indicator input

High (4 V or more): Lights up or Blinks Low ( 0 to 0.6 V , or open): Lights off

## SENSING CHARACTERISTICS (TYPICAL)



## NA1-5 NA1-5-PN



- 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.
Type4: SF4C series (p.531~)
Type2: SF2C series (p.551~)


## Mounting

- Use M4 screws with washers and M4 nuts. The tightening torque should be $0.5 \mathrm{~N} \cdot \mathrm{~m}$ or less.
(Purchase 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.



LONG / SHORT selection switch (incorporated on the emitter)

- Select the switch setting according to the setting distance between the emitter and the receiver as given 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.

| Setting distance | Operation mode switch |
| :---: | :---: |
| 0.05 to 0.5 m 0.164 to 1.640 ft [NA1-PK5(-PN)] 0.05 to 1 m 0.164 to 3.281 ft [NA1-5(-PN)] | LONG $\square_{\text {SHORT }}$ |
| 0.5 to 1.2 m 1.640 to 3.937 ft [NA1-PK5(-PN)] <br> 1 to 3 m 3.281 to 9.843 ft [NA1-5(-PN)] | LONG $\square_{\text {SHORT }}$ |

## 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.

| Output operation | Operation mode switch |
| :---: | :---: |
| ON when one or more beam channels are interrupted (OFF when all beam channels are received). |  |
| OFF when one or more beam channels are interrupted (ON when all beam channels are received). |  |
| ON when any two or more beam channels are interrupted. |  |
| OFF when any two or more beam channels are interrupted. |  |

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.

|  | Operation mode switch |  |
| :---: | :---: | :---: |
|  | Emitter | Receiver |
| Lighting | LIGHT | FLASH |
| Blinking | LIGHT | FIGHT |

## Others

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



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

## Assembly dimensions <br> Mounting drawing with the receiver



[^0]

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120257-0024 $\frac{120257-0022}{120257-0025} \underline{120257-0023} \underline{120257-0020} \underline{120257-0021} \underline{120257-0019} \underline{120257-0018}$ 120257-0017 120257-0016
120255-0038 $\underline{120255-0039} \underline{120255-0037} \underline{120255-0040}$ F39-JD7A-D 42370 NA1-PK3 MS-SFC-1


[^0]:    Four M4 (length 15 mm 0.591 in ) screws with washers, eight nuts, four hooks and eight
    Four M4 (length 15 mm 0.591 in ) screws with washers, eight nut,
    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.] ]

