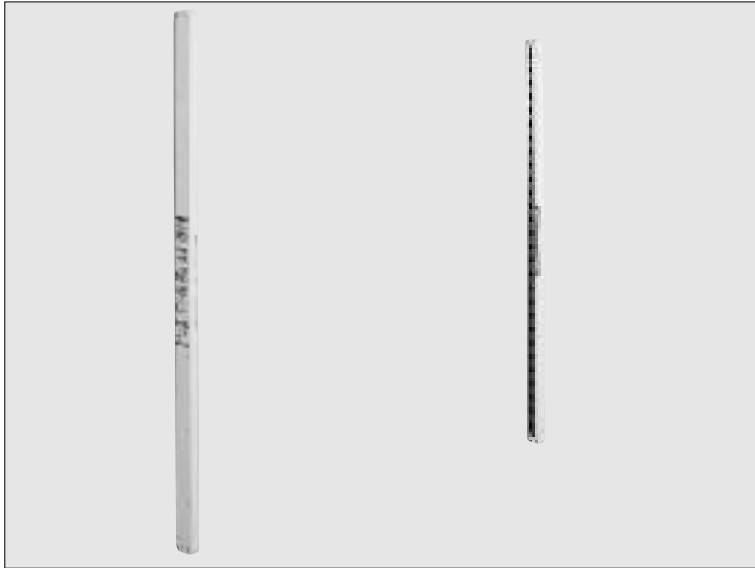


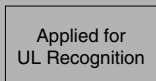
NA2-N

SERIES

General Purpose Area Sensor



Slim Body Type



Flexible solutions for your on-site needs. High performance made easy.

The NA2-N series offers incredibly high performance in a general purpose area sensor. The slim body, just 13mm thick and 30mm wide, can be installed almost anywhere, greatly increasing planning efficiency.

With a wide range of thin resin case type area sensors, from sensing height at 540mm (28 beam channels) down to 140mm (8 beam channels), you can choose the size that best suits your purpose.

In order to meet global market standards, these sensors conform to the CE marking EMC Directive and are currently undergoing UL Recognition certification. In addition to this, a PNP output type, which is in high demand in Europe, is also available.

This general purpose & slim body area sensor is the answer to all of your on-site needs.

※ The NA2-N series cannot be used as a safety sensor.

ORDER GUIDE

Appearance	Sensing range	Model No.	Number of beam channels	Sensing height (mm)	Output
	5m	NA2-N8	8	140	NPN open-collector transistor
		NA2-N8-PN			PNP open-collector transistor
		NA2-N12	12	220	NPN open-collector transistor
		NA2-N12-PN			PNP open-collector transistor
		NA2-N16	16	300	NPN open-collector transistor
		NA2-N16-PN			PNP open-collector transistor
		NA2-N20	20	380	NPN open-collector transistor
		NA2-N20-PN			PNP open-collector transistor
		NA2-N24	24	460	NPN open-collector transistor
		NA2-N24-PN			PNP open-collector transistor
		NA2-N28	28	540	NPN open-collector transistor
		NA2-N28-PN			PNP open-collector transistor

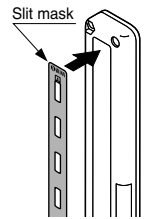
OPTIONS

Designation	Model No.	Description
Slit mask	OS-NA2-N8	For 8 beam channels
	OS-NA2-N12	For 12 beam channels
	OS-NA2-N16	For 16 beam channels
	OS-NA2-N20	For 20 beam channels
	OS-NA2-N24	For 24 beam channels
	OS-NA2-N28	For 28 beam channels
Sensor mounting bracket (Note)	MS-NA1-1	Four bracket set Eight M4 (length 18mm) screws with washers (Four screws with washers are used), eight nuts, four hooks, four spacers and four M4 (length 15mm) screws with washers are attached. (Spacers are not attached with MS-NA1-1 . M4 (length 15mm) screws with washers are not used for NA2-N series.)
	MS-NA2-1	
Sensor supporting bracket	MS-NA3-N8	For 8 beam channels
	MS-NA3-N12	For 12 beam channels
	MS-NA3-N16	For 16 beam channels
	MS-NA3-N20	For 20 beam channels
	MS-NA3-N24	For 24 beam channels
	MS-NA3-N28	For 28 beam channels

Note: Do not fix the sensor mounting bracket on the front surface of the sensor.

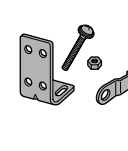
Slit mask

The slit mask restricts the amount of beam emitted or received and is used to reduce interference between neighboring sensors. It is also used if the light is so strong that it passes through the object. Remove the cover (metal plate) from the front of the sensor and replace it with the slit mask. The sensing range is reduced when the slit mask is used.



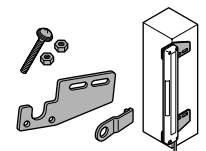
Sensor mounting bracket

• **MS-NA1-1**



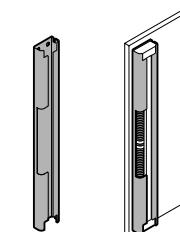
M4 screws with washers, nuts, and hooks are attached.

• **MS-NA2-1**



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

Sensor supporting bracket



Sensor protection bracket

Sensor protection brackets are available to protect the front and sides of **NA2-N12(-PN)**, **NA2-N16(-PN)** and **NA2-N20(-PN)**. Please contact our office for further details.

NA2-N

SPECIFICATIONS

Item	Model No.	Number of beam channels	8	12	16	20	24	28
		NPN output	NA2-N8	NA2-N12	NA2-N16	NA2-N20	NA2-N24	NA2-N28
		PNP output	NA2-N8-PN	NA2-N12-PN	NA2-N16-PN	NA2-N20-PN	NA2-N24-PN	NA2-N28-PN
Sensing height			140mm	220mm	300mm	380mm	460mm	540mm
Sensing range			5m					
Beam pitch			20mm					
Sensing object			φ30mm or more opaque object					
Supply voltage			12 to 24V DC±10% Ripple P-P 10% or less					
Power consumption (Note)	Emitter	Job indicator ON	0.7W or less	0.8W or less	0.9W or less	1.0W or less	1.1W or less	1.2W or less
		Job indicator OFF	0.6W or less	0.7W or less	0.8W or less	0.9W or less	1.0W or less	1.1W or less
	Receiver	Job indicator ON	0.7W or less	0.8W or less	0.9W or less	1.0W or less	1.1W or less	1.2W or less
		Job indicator OFF	0.6W or less	0.7W or less	0.8W or less	0.9W or less	1.0W or less	1.1W or less
Output			<NPN output type> NPN open-collector transistor • Maximum sink current: 100mA • Applied voltage: 30V DC or less (between output and 0V) • Residual voltage: 1V or less (at 100mA sink current) 0.4V or less (at 16mA sink current)			<PNP output type> PNP open-collector transistor • Maximum source current: 100mA • Applied voltage: 30V DC or less (between output and +V) • Residual voltage: 1V or less (at 100mA source current) 0.4V or less (at 16mA source current)		
		Utilization category	DC-12 or DC-13					
		Output operation	ON when all beams are received (OFF when one or more beams are interrupted)					
		Short-circuit protection	Incorporated					
Response time			10ms or less (12ms or less when the interference prevention function is used)					
Indicators	Emitter	Emitting indicator: Green LED × 2 (light up during emission; one LED lights up for Frequency A setting, both LEDs light up for Frequency B setting) Job indicator: Red LED (lights up, blinks or lights off when the job indicator input is applied, selected by operation mode switch)						
	Receiver	Operation indicator: Red LED (lights up when one or more beams are interrupted) Stable incident beam indicator: Green LED (lights up when all beams are stably received) Job indicator: Red LED (lights up, blinks or lights off when the job indicator input is applied, selected by operation mode switch) ※When an excess current flows through the output, the stable incident beam indicator and the operation indicator on the receiver blink simultaneously due to operation of the short-circuit protection circuit.						
Interference prevention function			Incorporated					
Test-run function			Incorporated					
Environmental resistance	Pollution degree		3 (Industrial environment)					
	Ambient temperature		-10 to +55°C (No dew condensation or icing allowed), Storage: -10 to +60°C					
	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		Emission: EN50081-2, Immunity: EN50082-2					
	Voltage withstandability		1,000V AC for one min. between all supply terminals connected together and enclosure					
	Insulation resistance		20MΩ, or more, with 250V DC megger between all supply terminals connected together and enclosure					
	Vibration resistance		10 to 150Hz frequency, 0.75mm amplitude in X, Y and Z directions for two hours each					
Shock resistance		500m/s ² acceleration (50G approx.) in X, Y and Z directions for three times each						
Emitting element			Infrared LED (modulated)					
Material			Enclosure: Heat-resistant ABS, Lens cover: Polyester, Indicator cover: Acrylic					
Cable			0.2mm ² 4-core cable, 3m long					
Cable extension			Extension up to total 25m is possible for both emitter and receiver, with 0.2mm ² , or more, cable.					
Weight			350g approx.	400g approx.	450g approx.	500g approx.	570g approx.	650g approx.

Note: Obtain the current consumption from the following equation.

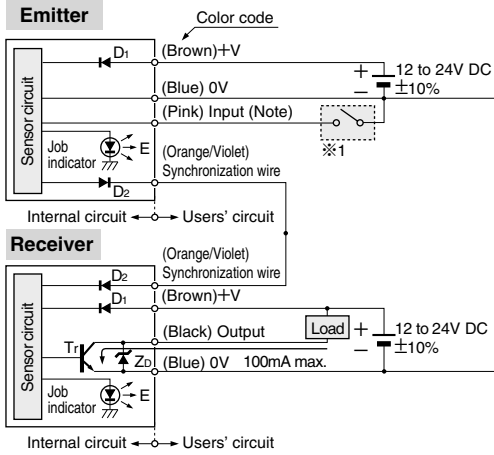
Current consumption = Power consumption ÷ Supply voltage
 (e.g.) In case of NA2-N8 (when job indicator lights on)

When the supply voltage is 12V, the current consumption of the emitter is: 0.7W ÷ 12V = 0.058A = 58mA.

I/O CIRCUIT AND WIRING DIAGRAMS

NPN output type

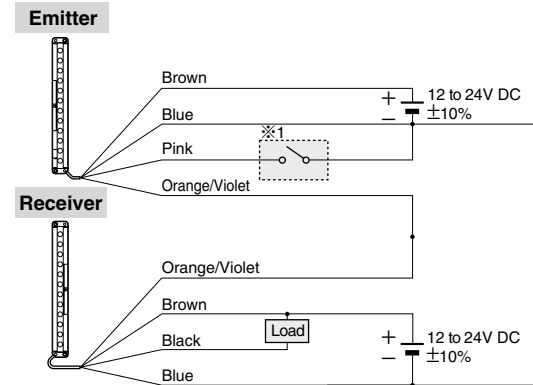
I/O circuit diagram



- Notes: 1) Input (pink) is the job indicator input when No.4 of the operation mode switch on the emitter is set to the OFF side, and it is the test input when the switch is set to the ON side.
 2) In order to use the job indicator as a large operation indicator, connect the input (pink) of the emitter to the output (black) of the receiver.
 3) When the test input is set, the job indicator does not light up or blink.

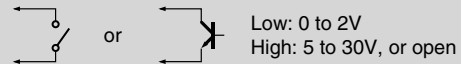
Symbols ... D1: Reverse supply polarity protection diode
 D2: Reverse current protection diode
 Zb: Surge absorption zener diode
 Tr: NPN output transistor
 E : Job indicator

Wiring diagram



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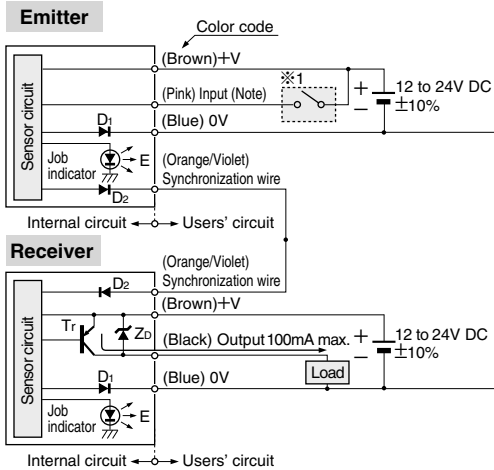
Non-voltage contact or NPN open-collector transistor



Note: Refer to **PRECAUTIONS FOR PROPER USE** (P.7~) for job indicator operation or test input operation.

PNP output type

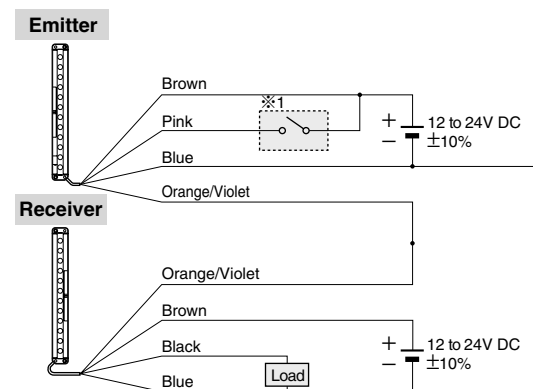
I/O circuit diagram



- Notes: 1) Input (pink) is the job indicator input when No.4 of the operation mode switch on the emitter is set to the OFF side, and it is the test input when the switch is set to the ON side.
 2) In order to use the job indicator as a large operation indicator, connect the input (pink) of the emitter to the output (black) of the receiver.
 3) When the test input is set, the job indicator does not light up or blink.

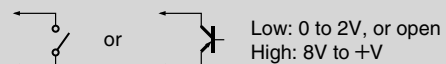
Symbols ... D1: Reverse supply polarity protection diode
 D2: Reverse current protection diode
 Zb: Surge absorption zener diode
 Tr: PNP output transistor
 E : Job indicator

Wiring diagram



※1

Non-voltage contact or PNP open-collector transistor

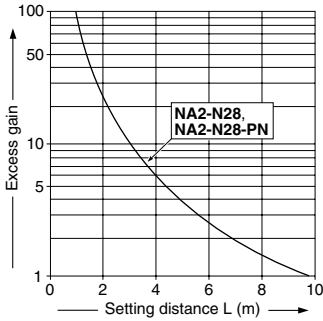


Note: Refer to **PRECAUTIONS FOR PROPER USE** (P.7~) for job indicator operation or test input operation.

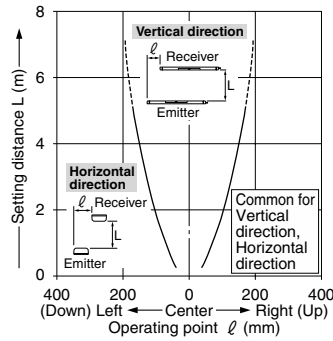
NA2-N

SENSING CHARACTERISTICS (TYPICAL)

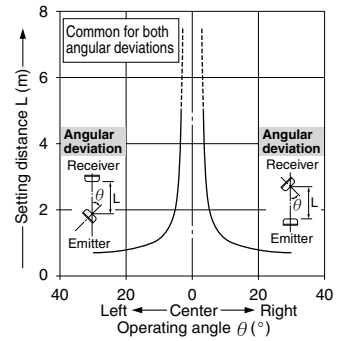
Correlation between setting distance and excess gain



Parallel deviation (All models)



Angular deviation (All models)



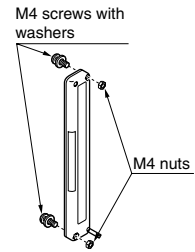
PRECAUTIONS FOR PROPER USE



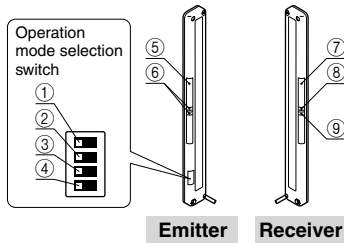
- This sensor is not for press machine safeguard. Do not use this sensor for any press machine.
- This product is not a safety sensor. Its use is not intended or designed to protect life and prevent body injury or property damage from dangerous parts of machinery. It is a normal object detection sensor.
- Area sensors conforming to safety standards are available. For details, please contact our office.

Mounting

- Use M4 screws with washers and M4 nuts. The tightening torque should be 0.5N·m or less. During mounting, do not apply any bending or twisting force to the sensor. (Please arrange the screws and nuts separately.)



Functional description



	Description	Function	
Emitter	① Emission frequency selection switch	1 ■ :Frequency A	1 ■ :Frequency B
	② Job indicator mode switch	2 ■ : Lights up when the job indicator input is Low	2 ■ : Lights off when the job indicator input is Low
		3 ■ : Lighting	3 ■ : Blinking
	④ Job indicator/Test-run selection switch	4 ■ : Job indicator input	4 ■ : Test input
	⑤ Job indicator (Red LED)	Lights up, blinks or lights off when the job indicator input is applied, selected by operation mode switch.	
	⑥ Emitting indicator (Green LED×2)	Light up during emission; one LED lights up for Frequency A setting, both LEDs light up for Frequency B setting.	
Receiver	⑦ Job indicator (Red LED)	Lights up, blinks or lights off when the job indicator input is applied, selected by operation mode switch.	
	⑧ Stable incident beam indicator (Green LED)	Lights up when all beams are stably received.	When an excess current flows through the output, the stable incident beam indicator and the operation indicator on the receiver blink simultaneously due to the operation of the short-circuit protection circuit.
	⑨ Operation indicator (Red LED)	Lights up when one or more beams are interrupted.	

Job indicator operation selection

- The operation of the job indicator can be selected with job indicator mode switch.

Job indicator mode switch	Job indicator operation	
	Job indicator input: Low	Job indicator input: High
1 ■ 2 ■ 3 ■ 4 ■	Lights up	Lights off
1 ■ 2 ■ 3 ■ 4 ■	Lights off	Lights up
1 ■ 2 ■ 3 ■ 4 ■	Lights up	Blinks
1 ■ 2 ■ 3 ■ 4 ■	Lights off	Blinks

Job indicator input signal condition

Output	Signal	Signal condition
NPN output	Low	0 to 2V
	High	5 to 30V, or open (Note)
PNP output	Low	0 to 2V, or open (Note)
	High	8V to +V

Note: Insulate the wire if it is kept open.

PRECAUTIONS FOR PROPER USE

To use job indicator as large operation indicator

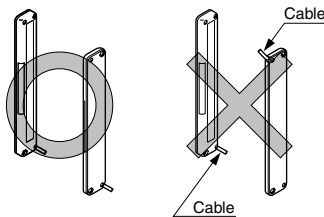
- The job indicators can be used as large operation indicators by setting No.4 of the operation mode switch to the OFF side and connecting the input (pink) of the emitter to the output (black) of the receiver.

Job indicator mode switch	Light state	Dark state
	Lights up	Lights off
	Lights off	Lights up
	Lights up	Blinks
	Light off	Blinks

Note: In order to use the job indicators as large operation indicators, make sure to set No.4 of the operation mode switch to the OFF side. If it is set to the ON side, the job indicator does not light up or blink.

Orientation

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



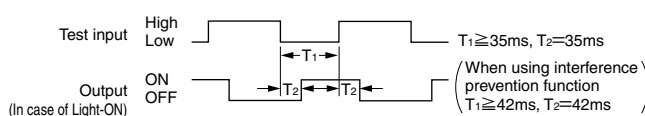
Test-run function

- The emission is stopped when No.4 of the operation mode switch is set to the ON side and the input (pink) of the emitter is made High (PNP output type: Low). Since the output can be turned ON/OFF without the sensing object, this function is useful for start-up inspection. If the output follows the application/withdrawal of the test input, the sensor operation is normal, else it is abnormal.

Operation mode switch setting

OFF	ON

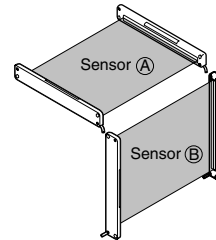
Time chart



- Notes: 1) When the test-run function is set, the job indicator (red) does not light up or blink.
2) When emission is stopped during the test-run function, the emitter's emitting indicator (green) does not light up.

Interference prevention function

- By setting different emission frequencies, two units of NA2-N series can be mounted close together, as shown in the figure below. The emission frequency can be checked by the number of LEDs lighting up in the emitting indicator on the emitter.



	Operation mode switch	Emitting indicator (Emitter)
Sensor A	Frequency A	One LED lights up
Sensor B	Frequency B	Two LEDs light up

Wiring

- Make sure to carry out the wiring in the power supply off condition.
- Verify that the supply voltage variation is within the rating.
- If power is supplied from a commercial switching regulator, ensure that the frame ground (F.G.) terminal of the power supply is connected to an actual ground.
- In case noise generating equipment (switching regulator, inverter motor, etc.) is used in the vicinity of this sensor, connect the frame ground. (F.G.) terminal of the equipment to an actual ground.
- Do not run the wires together with high-voltage lines or power lines or put them in the same raceway. This can cause malfunction due to induction.

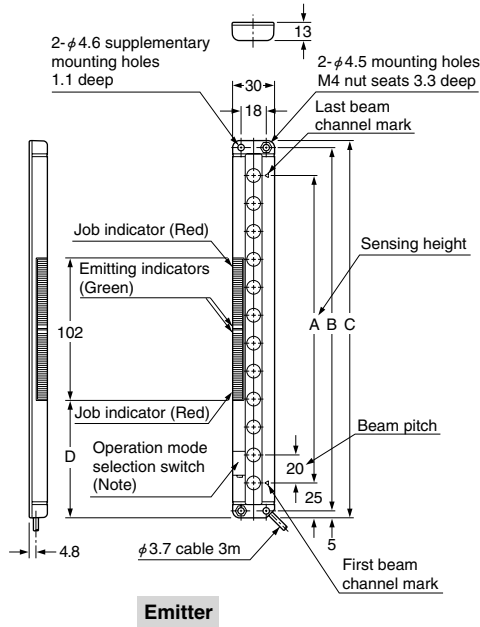
Others

- Do not use during the initial transient time (500ms) after the power supply is switched on.
- Avoid dust, dirt and steam.
- Take care that the sensor does not come in direct contact with water, oil, grease, or organic solvents, such as, thinner, etc.
- Take care that the sensor is not directly exposed to fluorescent light from a rapid-starter lamp or a high frequency lighting device, as it may affect the sensing performance.

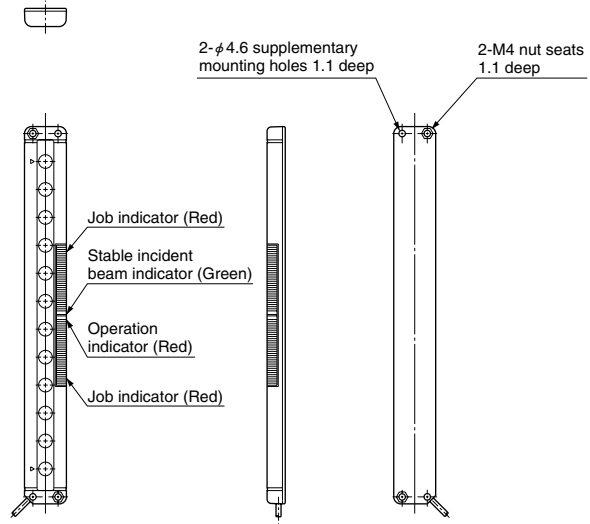
NA2-N

DIMENSIONS (Unit: mm)

NA2-N□
NA2-N□-PN Sensor



Emitter



Receiver

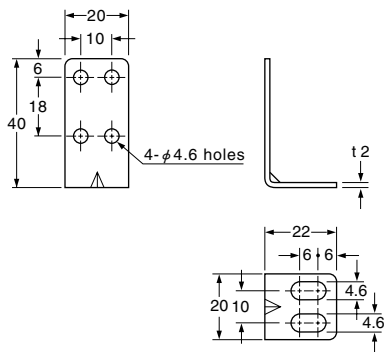
Model No.	A	B	C	D
NA2-N8 (-PN)	140	180	190	52
NA2-N12 (-PN)	220	260	270	84
NA2-N16 (-PN)	300	340	350	124
NA2-N20 (-PN)	380	420	430	164
NA2-N24 (-PN)	460	500	510	204
NA2-N28 (-PN)	540	580	590	244

Note: Located on the right side in case of **NA2-N8 (-PN)**.

MS-NA1-1 Sensor mounting bracket (Optional)

Assembly dimensions

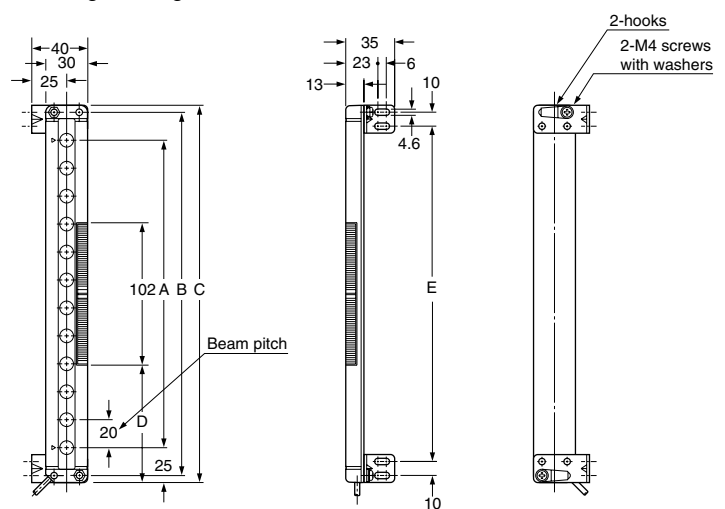
Mounting drawing with the receiver



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

Four bracket set

Eight M4 (length 18mm) screws with washers
(Four screws with washers are used,
eight nuts, four hooks and four M4 (length 15mm) screws
with washers are attached.
[M4 (length 15mm) screws with washers are not used]
for **NA2-N** series.



Model No.	A	B	C	D	E
NA2-N8 (-PN)	140	180	190	52	160
NA2-N12 (-PN)	220	260	270	84	240
NA2-N16 (-PN)	300	340	350	124	320
NA2-N20 (-PN)	380	420	430	164	400
NA2-N24 (-PN)	460	500	510	204	480
NA2-N28 (-PN)	540	580	590	244	560

