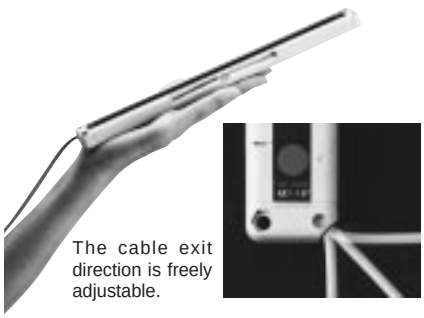
NA2 SERIES
Slim Body 20mm Beam Pitch Area Sensor

Wide Sensing Area with Just 13mm Thick Sensor

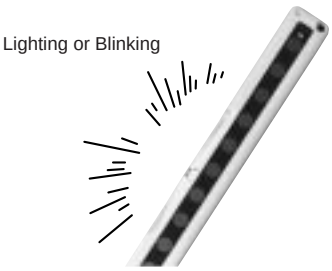
Slim Body, Just 13mm Thick

The slim body **NA2** aesthetically fits in your equipment, since it is just 13mm thick.
It never disturbs your access to the machine.



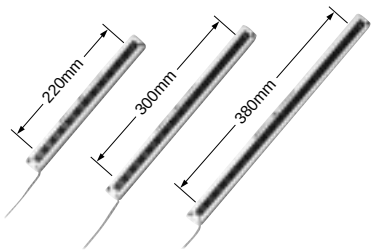
Clearly Visible Wide Job Indicator

Both the receiver and the emitter feature job indicators, 102mm wide, which use red bright LEDs.
When the sensing output and the job indicator input are connected, the job indicator can be used as a large size operation indicator.



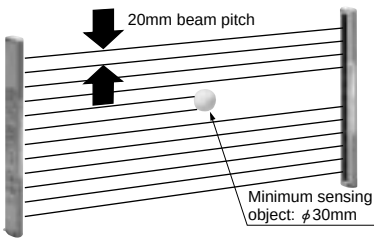
Selectable Sensing Height

The **NA2** series has three models featuring sensing heights of 220, 300 and 380mm, each having a sensing range of 5m.



20mm Beam Pitch

The beam pitch of 20mm enables detection of an object having 30mm min. diameter.
Because of its perfect Light-ON operation (the output is turned ON only when all beams are received), it ensures operation to the safe side (same as beam interrupted condition) if the cable breaks accidentally.

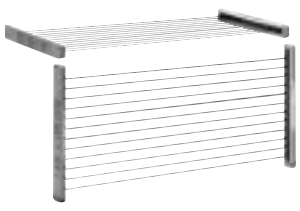


Convenient Test-run Function

With the test-run function, the sensor checks if it is in the perfect Light-ON state before operation.
If all beams are not received due to some trouble, such as, sensor failure, cable breakage, or beam interruption during the test-run period, the output is held in the OFF state, and the indicators give an alarm by blinking.
This function is activated by an external input after power is supplied, with the test-run switch set to ON.

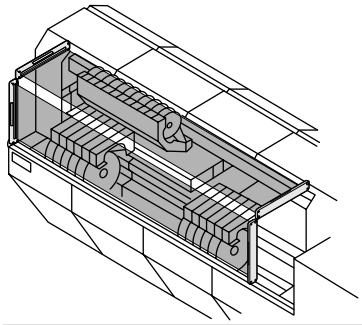
Parallel Installation

Setting different emission frequencies for two sensors prevents mutual interference.
Use of two sensors together covers a wider detection area.
The set frequencies can be identified by the number of power indicators which light up on the emitters.

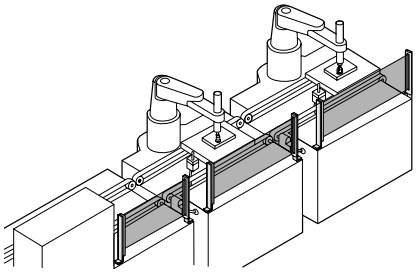


APPLICATIONS

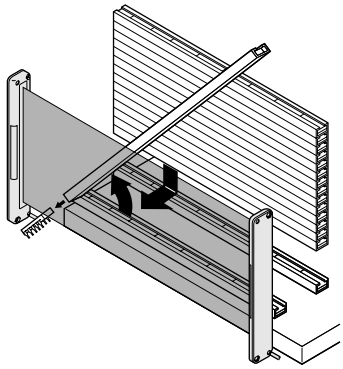
Access control on chip mounter



Access control on assembly line

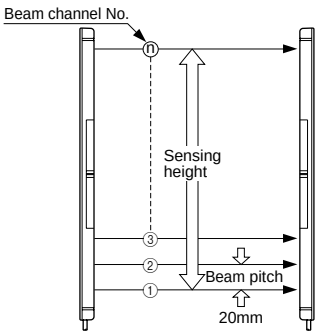


Access control on IC sorter



WARNING Never use this product in any personnel safety application.

ORDER GUIDE

Appearance	Sensing range	Model No.	Number of beam channels	Sensing height
	5m	**NA2-12**	12	220mm
		NA2-16	16	300mm
		NA2-20	20	380mm

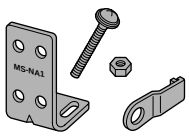
OPTIONS

Designation	Model No.	Description
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**.
	MS-NA2-1	
Sensor protection bracket	**MS-NA3-12**	For **NA2-12** Two bracket set Four M4 (length 20mm) screws with washers, and four nuts are attached.
	MS-NA3-16	For **NA2-16** Two bracket set Four M4 (length 20mm) screws with washers, and four nuts are attached.
	MS-NA3-20	For **NA2-20** Two bracket set Four M4 (length 20mm) screws with washers, and four nuts are attached.

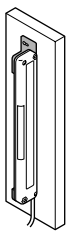
Note: Do not fix the sensor mounting bracket on the front surface of the sensor.

Sensor mounting bracket

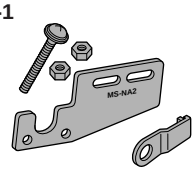
• **MS-NA1-1**



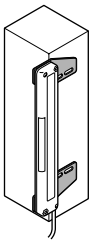
M4 screws with washers, nuts and hooks are attached.



• **MS-NA2-1**

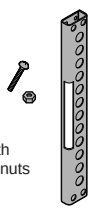


M4 screws with washers, nuts, hooks and spacers are attached.

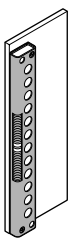


Sensor protection bracket

• **MS-NA3-12**
• **MS-NA3-16**
• **MS-NA3-20**



M4 screws with washers, and nuts are attached.



NA2

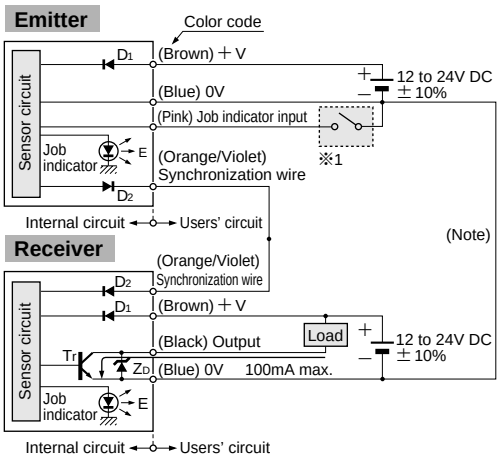
SPECIFICATIONS

Item \ Number of beam channels		12	16	20
Model No.		**NA2-12**	**NA2-16**	**NA2-20**
Sensing height		220mm	300mm	380mm
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: 0.5W or less (0.4W or less when job indicator is off) Receiver: 0.8W or less (0.7W or less when job indicator is off)	Emitter: 0.5W or less (0.4W or less when job indicator is off) Receiver: 0.9W or less (0.8W or less when job indicator is off)	Emitter: 0.5W or less (0.4W or less when job indicator is off) Receiver: 1.0W or less (0.9W or less when job indicator is off)
Output		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)		
	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	Power indicator: Green LED × 2 (light up when the power is ON; emission frequency Ⓐ or Ⓑ is indicated by the number of LEDs lighting up) Job indicator: Red LED (lights up, blinks, or lights off when the job indicator input is at Low; lighting pattern is selected by operation mode switch)		
	Receiver	Operation indicator: Red LED (lights up when one or more beams are interrupted, and blinks alternately with the stable incident beam indicator when an abnormal condition is found out by the test-run) Stable incident beam indicator: Green LED (lights up when all beams are stably received, and blinks alternately with the operation indicator when an abnormal condition is found out by the test-run) Job indicator: Red LED (lights up, blinks, or lights off when the job indicator input is at Low; lighting pattern is 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 the operation of the short-circuit protection circuit.		
Interference prevention function		Incorporated		
Test-run function		Incorporated		
Environmental resistance	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: 10,000ℓx at the light-receiving face, Incandescent light: 3,000ℓx at the light-receiving face		
	Noise immunity	Power line: 240Vp, 10ms cycle, and 0.5μs pulse width Radiation: 300Vp, 10ms cycle, and 0.5μs pulse width (with noise simulator)		
	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	490m/s² 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		0.2mm² 4-core cabtyre cable, 3m long		
Cable extension		Extension up to total 25m is possible for both emitter and receiver, with 0.2m², or more, cable.		
Weight		400g approx.	450g approx.	500g approx.

Note: Obtain the current consumption from the following equation.
Current consumption = Power consumption ÷ Supply voltage
(e.g.) When the supply voltage is 12V, the current consumption of the emitter is: 0.5W ÷ 12V ≒ 0.042A = 42mA.

I/O CIRCUIT AND WIRING DIAGRAMS

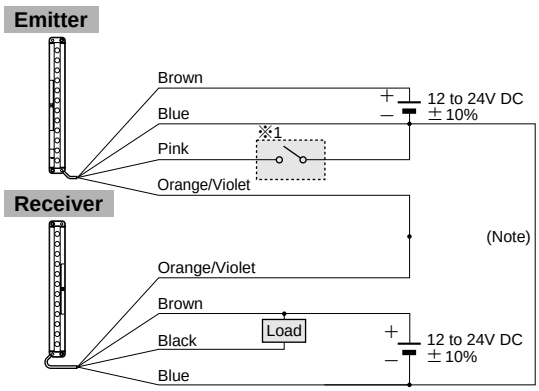
I/O circuit diagram



Note: To supply power to the emitter and the receiver from separate power supplies, be sure to connect both 0V (blue) wires in common.

Symbols ... D_1: Reverse supply polarity protection diode
D_2: Reverse current protection diode
Z_D: Surge absorption zener diode
Tr : NPN output transistor
E: Job indicator

Wiring diagram



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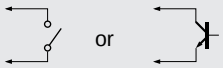
Non-voltage contact or
NPN open-collector transistor

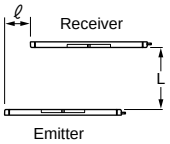


Low: 0 to 2V
High: 5 to 30V, or open

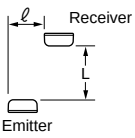
SENSING CHARACTERISTICS (TYPICAL)

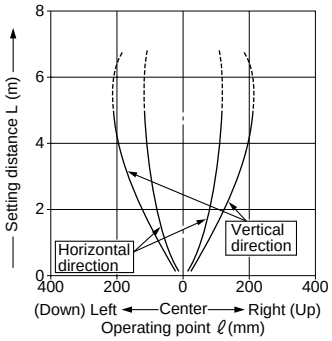
Parallel deviation (All models)

Vertical direction



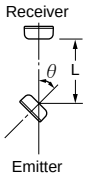
Horizontal direction



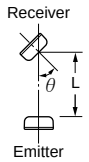


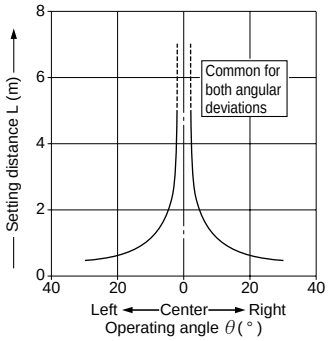
Angular deviation (All models)

Emitter angular deviation



Receiver angular deviation





NA2

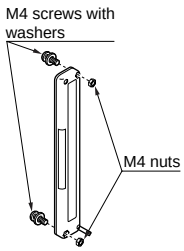
PRECAUTIONS FOR PROPER USE

Refer to P.820～ for general precautions.

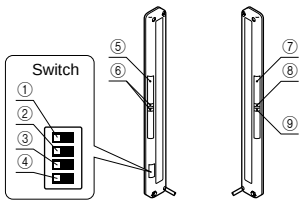
- This sensor is not for press machine safeguard. Do not use this sensor for any press machine.
- This product is not a safety sensor. Its use is not intended or designed to protect life and prevent body injury or property damage from dangerous parts of machinery. It is a normal object detection sensor.
- 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 at Low	2 □■: Lights off when the job indicator input is at Low
	③		3 ■□: Lighting	3 □■: Blinking
	④	Test-run switch	4 ■□: OFF	4 □■: ON
	⑤	Job indicator (Red LED)	Lights up, blinks, or lights off when the job indicator input is at Low. Lighting pattern is selected by operation mode switch.	
	⑥	Power indicators (Green LED × 2)	Light up when power is ON. Emission frequency Ⓐ or Ⓑ is indicated by the number of LEDs lighting up.	
Receiver	⑦	Job indicator (Red LED)	Lights up, blinks, or lights off when the job indicator input is at Low. Lighting pattern is selected by operation mode switch.	
	⑧	Stable incident beam indicator (Green LED)	Lights up when all beams are stably received, and blinks alternately with the operation indicator when an abnormal condition is found out by the test-run.	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, and blinks alternately with the stable incident beam indicator when an abnormal condition is found out by the test-run.	

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 or Open
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

	Signal condition
Low	0 to 2V
High	5 to 30V, or open

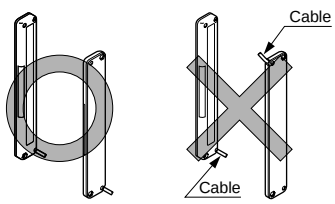
To use job indicator as large operation indicator

- When the job indicator input of the emitter is connected to the output of the receiver, the job indicators can be used as large operation indicators.

Job indicator mode switch	Light state	Dark state
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

Orientation

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



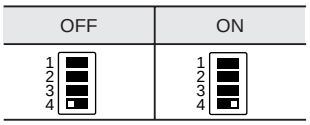
PRECAUTIONS FOR PROPER USE

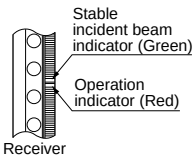
Refer to P.820～ for general precautions.

Test-run function

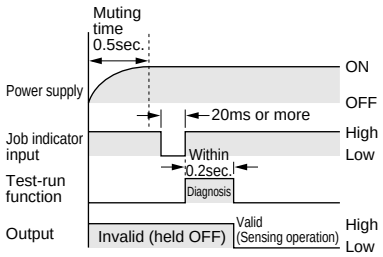
- Set the test-run switch to ON before switching on the power supply.
  Turn the external input ON (job indicator input Low) after supplying power. Then, the sensor starts emission and checks itself whether each beam channel is in the Light or Dark state.
  If all beams are properly received, the sensor starts normal sensing operation.
  If the sensor may fail or the sensing area is blocked by some object, the sensor is held in the Dark state (safe side) and the stable incident beam indicator and the operation indicator blink alternately.

Setting test-run switch





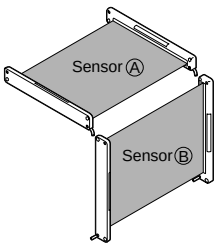
Time chart



Note: The test-run function can be used only once after switching on the power supply.

Interference prevention function

- By setting different emission frequencies, two units of **NA2** can be mounted close together, as shown in the figure on the right.
  The emission frequency can be checked by the number of power indicators lighting up on the emitter.



	Frequency selection switch	Power indicator (Emitter)
Sensor Ⓐ (FREQ. A)	Frequency A 1 2 3 4	One LED lights up
Sensor Ⓑ (FREQ. B)	1 2 3 4 Frequency B	Two LEDs light up

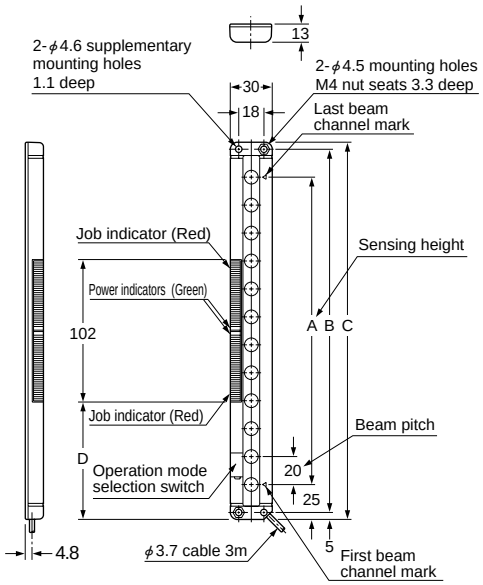
Others

- Make sure to carry out the wiring and the test-run switch operation in the power supply off condition.
- Do not use during the initial transient time (0.5 sec.) after the power supply is switched on.

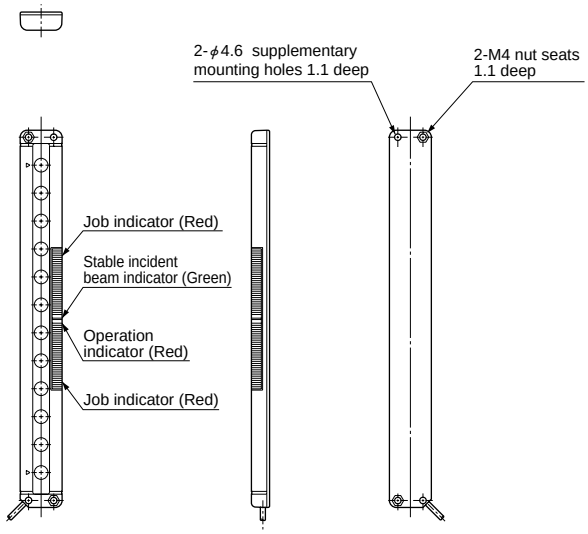
NA2

DIMENSIONS (Unit: mm)

NA2-12 NA2-16 NA2-20 Sensor



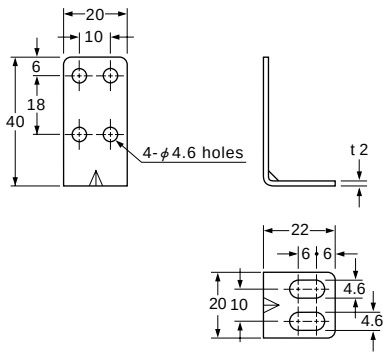
Emitter



Receiver

Model No.	A	B	C	D
NA2-12	220	260	270	84
NA2-16	300	340	350	124
NA2-20	380	420	430	164

MS-NA1-1 Sensor mounting bracket (Optional)

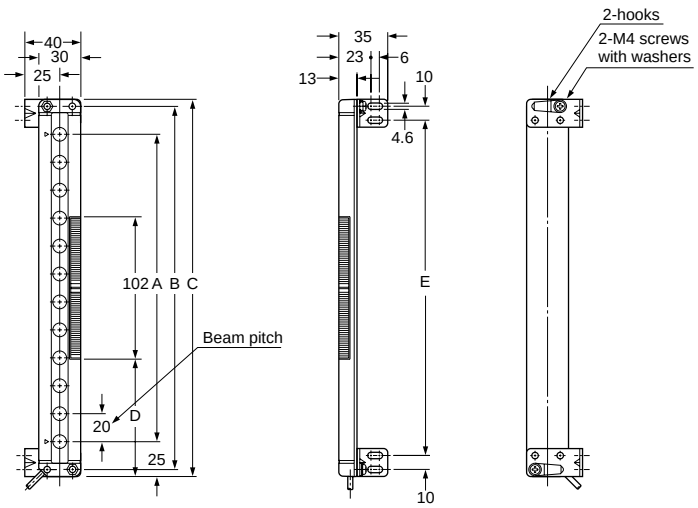


Material: Cold rolled carbon steel (SPCC)
(Uni-chrome plated)

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**.]

Assembly dimensions

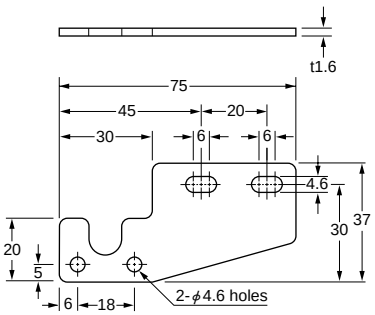
Mounting drawing with the receiver



Model No.	A	B	C	D	E
NA2-12	220	260	270	84	240
NA2-16	300	340	350	124	320
NA2-20	380	420	430	164	400

DIMENSIONS (Unit: mm)

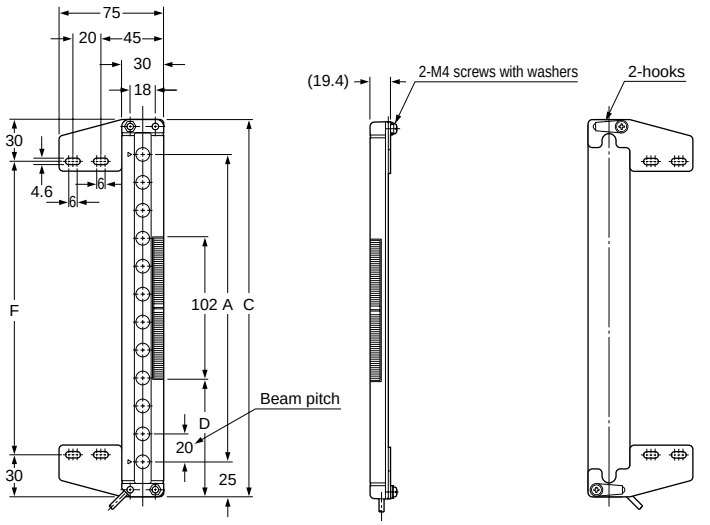
MS-NA2-1 Sensor mounting bracket (Optional)



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

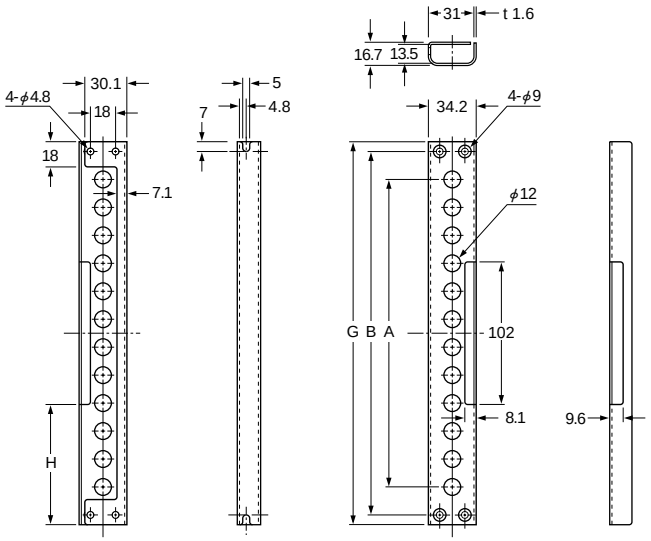
Four bracket set
(Eight M4 (length 18mm) screws with washers (Four screws with washers are used), eight nuts, four hooks, four spacers and four M4 (length 15mm) screws with washers are attached.
[M4 (length 15mm) screws with washers are not used for **NA2**.])

Assembly dimensions
Mounting drawing with the receiver



Model No.	A	C	D	F
NA2-12	220	270	84	210
NA2-16	300	350	124	290
NA2-20	380	430	164	370

MS-NA3-12 MS-NA3-16 MS-NA3-20 Sensor protection bracket (Optional)



Note: The sensor protection bracket can be used for both the emitter and the receiver.

Material: Cold rolled carbon steel (SPCC)
(Chrome plated)

Two bracket set
(Four M4 (length 20mm) screws with washers, and four nuts are attached.)

Model No.	A	B	G	H
MS-NA3-12	220	260	274	86
MS-NA3-16	300	340	354	126
MS-NA3-20	380	420	434	166