

Ultra-compact CMOS Smart Laser Sensor


E3NC-S

CSM_E3NC-S_DS_E_2_1

A Ultra-compact CMOS Laser Sensor for Stable Detection without the Influence of Workpiece Color, Material, or Surface Conditions

- Dynamic range of 500,000 times for stable detection without influence from changes in workpieces.
- The industry's smallest CMOS laser head* for installation into small spaces.
- Distance discrimination enables stable detection of level differences as small as 1.5 mm.
- Robot cable for reliable application in adverse environments and IP67 protection.
- Laser Class 1 for safe application.
- White on black display characters for high visibility.
- Smart Tuning to achieve stable detection with easy setup.

* Based on November 2012 OMRON investigation.





 Refer to the **Safety Precautions** on page 8.






For the most recent information on models that have been certified for safety standards, refer to your OMRON website.

Ordering Information

Sensor Heads (Dimensions → page 10)

| Appearance | Sensing distance | Model |
|---|--|---------------|
|  |  35 to 250 mm | E3NC-SH250 2M |
|  |  35 to 100 mm | E3NC-SH100 2M |

Amplifier Units (Dimensions → page 10)



| Connecting method | Appearance | Inputs/outputs | Model | |
|--|---|---------------------|--------------|-----------------|
| | | | NPN output | PNP output |
| Pre-wired (2 m) |  | 2 outputs + 1 input | E3NC-SA21 2M | E3NC-SA51 2M |
| Wire-saving Connector |  | 1 output + 1 input | E3NC-SA7 | E3NC-SA9 |
| Connector for Sensor Communications Unit |  | 2 outputs | E3NC-SA0 | Available soon. |

Accessories (Sold Separately)

Sensor Head Accessories

Sensor Head Mounting Brackets



A Mounting Bracket is not provided with the Sensor Head. It must be ordered separately as required. (Dimensions → page 12)

| Applicable Sensor Head | Appearance | Model | Quantity | Contents |
|--------------------------|---|----------|----------|---|
| E3NC-SH250 E3NC-SH100 |  | E39-L187 | 1 | Mounting Bracket: 1 Nut plate: 1 Phillips screws (M3×18): 2 |
| |  | E39-L188 | 1 | |

Amplifier Unit Accessories


Wire-saving Connectors (Required for models for Wire-saving Connectors.) (Dimensions → page 14)

A Connector is not provided with the Amplifier Unit. It must be ordered separately. *Protective stickers are provided.

| Type | Appearance | Cable length | No. of conductors | Model |
|------------------|---|--------------|-------------------|----------|
| Master Connector |  | 2 m | 4 | E3X-CN21 |
| Slave Connector |  | | 2 | E3X-CN22 |


Amplifier Unit Mounting Bracket (Dimensions → page 15)

A Mounting Bracket is not provided with the Amplifier Unit. It must be ordered separately as required.

| Appearance | Model | Quantity |
|---|----------|----------|
|  | E39-L143 | 1 |

DIN Track (Dimensions → page 15)


A DIN Track is not provided with the Amplifier Unit. It must be ordered separately as required.

| Appearance | Type | Model | Quantity |
|---|----------------------------------|-----------|----------|
|  | Shallow type, total length: 1 m | PFP-100N | 1 |
| | Shallow type, total length: 0.5m | PFP-50N | 1 |
| | Deep type, total length: 1 m | PFP-100N2 | 1 |

End Plate (Dimensions → page 15)

Two End Plates are provided with the Sensor Communications Unit.

End Plates are not provided with the Amplifier Unit. They must be ordered separately as required.

| Appearance | Model | Quantity |
|---|-------|----------|
|  | PFP-M | 1 |

Related Products

Sensor Communications Units (Dimensions → page 16)

| Type | Appearance | Model |
|--|---|---------------------------------------|
| Sensor Communications Unit for EtherCAT* |  | E3NW-ECT Available soon. |
| Sensor Dispersion Unit |  | E3NW-DS Available soon. |

* EtherCAT® is a registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.

Ratings and Specifications

Sensor Heads

| Sensing method | | Distance-settable | |
|--|-------|--|--|
| Item | Model | E3NC-SH250 | E3NC-SH100 |
| Light source (wavelength)* ¹ | | Visible semiconductor laser diode (660 nm), 100 μW max. (JIS Class 1, IEC/EN Class 1, and FDA Class 1) | |
| Measurement range | | 35 to 250 mm (display value: 350 to 2,500) | 35 to 100 mm (display value: 350 to 1,000) |
| Standard detected level difference* ² | | 35 to 180mm: 9 mm 180 to 250 mm: 25 mm | 35 to 50 mm: 1.5 mm 50 to 100 mm: 3 mm |
| Spot diameter* ³ | | Approx. 1 mm (at 250 mm) | Approx. 0.5 mm (at 100 mm) |
| Indicators | | OUT indicator (orange), STABILITY indicator (green), and ST indicator (blue) | |
| Ambient illumination | | Illumination on received light surface: 2,000 lx max. of incandescent light, 4,000 lx max. of sunlight | Illumination on received light surface: 4,000 lx max. of incandescent light, 8,000 lx max. of sunlight |
| Ambient temperature range | | Operating: -10 to 50°C; Storage: -25 to 70°C (with no icing or condensation) | |
| Ambient humidity range | | Operating and storage: 35% to 85% (with no condensation) | |
| Insulation resistance | | 20 MΩ min. (at 500 VDC) | |
| Dielectric strength | | 1,000 VAC at 50/60 Hz for 1 min. | |
| Vibration resistance (destruction) | | 10 to 55 Hz with a 1.5-mm double amplitude for 2 hours each in X, Y, and Z directions | |
| Shock resistance (destruction) | | 500 m/s ² 3 times each in X, Y, and Z directions | |
| Degree of protection | | IEC IP67 | |
| Connecting method | | Pre-wired connector (Standard cable length: 2 m) | |
| Materials | Case | Polybutylene terephthalate (PBT) | |
| | Lens | Methacrylic resin | |
| | Cable | PVC | |
| Weight (packed state/Sensor Head only) | | Approx. 125 g/approx. 75 g | |
| Accessories | | Instruction Manual | |

Note: Incorrect detection may occur outside the measurement range if the object has a high reflection factor.

*1. These Sensors are classified as Class 1 laser devices under IEC 60825-1 and the regulations of Laser Notice No. 50 for FDA certification. CDRH (Center for Devices and Radiological Health) registration has been completed. (Accession Number:1220691)

*2. The values were measured at the center of the sensing distance using OMRON's standard sensing object (white ceramic).

*3. Spot diameter: Defined as $1/e^2$ (13.5 %) of the minimum diameter (actual value) in the measurement range.

False detections can occur if there is light leakage outside the defined region and the surroundings of the target object have a high reflectance in comparison to the target object.

Also, correct measurement values may not be obtained if the workpiece is smaller than the spot diameter.

Amplifier Units

| Item | | Type | Standard models | | Model for Sensor Communications Unit |
|---|--------------------------------|-------------------|--|-----------------------|--|
| | | NPN output | E3NC-SA21 | E3NC-SA7 | E3NC-SA0 Available soon. |
| | | PNP output | E3NC-SA51 | E3NC-SA9 | |
| | | Connecting method | Pre-wired | Wire-saving Connector | Connector for Sensor Communications Unit |
| Inputs/ outputs | Outputs | | 2 outputs | 1 output | 2 outputs |
| | External inputs | | 1 input | 1 input | --- |
| Power supply voltage | | | 10 to 30 VDC, including 10% ripple (p-p) | | |
| Power consumption *1 | | | At Power Supply Voltage of 24 VDC Normal mode: 1,920 mW max. (Current consumption: 80 mA max.) Power saving eco mode: 1,680 mW max. (Current consumption: 70 mA max.) | | |
| Control outputs *2 | | | Load power supply voltage: 30 VDC max., open-collector output Load current: Groups of 1 to 3 Amplifiers: 100 mA max., Groups of 4 to 30 Amplifiers: 20 mA max. Residual voltage: At load current of less than 10 mA: 1 V max. At load current of 10 to 100 mA: 2 V max. OFF current: 0.1 mA max. | | --- |
| External inputs | | | Refer to *3. | | |
| Indicators | | | 7-segment displays (Sub digital display: green, Main digital display: white) Display direction: Switchable between normal and reversed. OUT indicator (orange), L/D indicator (orange), ST indicator (blue), ZERO indicator (green), and OUT selection indicator (orange, only on models with 2 outputs) | | |
| Protection circuits | | | Power supply reverse polarity protection, output short-circuit protection, and output reverse polarity protection | | Power supply reverse polarity protection and output short-circuit protection |
| Response time | Super-high-speed mode (SHS) *4 | | Operate or reset: 1.5 ms | | |
| | High-speed mode (HS) | | Operate or reset: 5 ms | | |
| | Standard mode (Std) | | Operate or reset: 10 ms | | |
| | Giga-power mode (GIGA) | | Operate or reset: 50 ms | | |
| Sensitivity adjustment | | | Smart Tuning (2-point tuning, full auto tuning, 1-point tuning, tuning without workpiece, 2-point area tuning, 1-point area tuning, or area tuning without workpiece), or manual adjustment | | |
| No. of Units for mutual interference prevention | Super-high-speed mode (SHS) *4 | | 0 | | |
| | High-speed mode (HS) | | 2 | | |
| | Standard mode (Std) | | 2 | | |
| | Giga-power mode (GIGA) | | 2 | | |
| Functions | Timer | | Select from timer disabled, OFF-delay, ON-delay, one-shot, or ON-delay + OFF-delay timer: 1 to 9,999 ms | | |
| | Zero reset | | Negative values can be displayed. (Threshold value is shifted.) | | |
| | Resetting settings *5 | | Select from initial reset (factory defaults) or user reset (saved settings). | | |
| | Eco mode | | Select from OFF (digital displays lit) or ECO (digital displays not lit). | | |
| | Bank switching | | Select from banks 1 to 4. | | |
| | Output 1 | | Select from Normal detection mode, Area detection mode, or hold mode. | | |
| | Output 2 | | Select from Normal detection mode or Error output mode. | --- | Select from Normal detection mode or Error output mode. |
| | External input | | Select from input OFF, tuning, laser OFF, zero reset, or bank switching. | | --- |
| | Keep function *6 | | Select from ON or OFF. | | |
| | Background suppression *7 | | Select from ON or OFF. | | |
| | Hysteresis width | | Select from standard setting or user setting. | | |

*1. At Power Supply Voltage of 10 to 30 VDC.

Normal mode: 2,250 mW max. (Current consumption: 75 mA max. at 30 VDC, 145 mA max. at 10 VDC)

Power saving eco mode: 1,950 mW max. (Current consumption: 65 mA max. at 30 VDC, 125 mA max. at 10 VDC)

*2. The total for both outputs of a model with 2 outputs is 100 mA max. (Residual voltage: Load current of less than 10 mA: 1 V max., Load current of 10 to 100 mA: 2 V max.)

*3. The following details apply to the input.

| | Contact input (relay or switch) | Non-contact input (transistor) | Input time |
|-----|---|--|----------------------------------|
| NPN | ON: Shorted to 0 V (Sourcing current: 1 mA max.). OFF: Open or shorted to Vcc. | ON: 1.5 V max. (Sourcing current: 1 mA max.) OFF: Vcc – 1.5 V to Vcc (Leakage current: 0.1 mA max.) | ON: 2 ms min. OFF: 20 ms min. |
| PNP | ON: Shorted to Vcc (Sinking current: 3 mA max.). OFF: Open or shorted to 0 V. | ON: Vcc – 1.5 V to Vcc (Sinking current: 3 mA max.) OFF: 1.5 V max. (Leakage current: 0.1 mA max.) | |

*4. The mutual interference prevention function is disabled if the detection mode is set to super-high-speed mode.

*5. The bank is not reset by the user reset function or saved by the user save function.

*6. The output for a measurement error is set. ON: The value of the output from before the measurement error is retained. OFF: The output is turned OFF when a measurement error occurs.

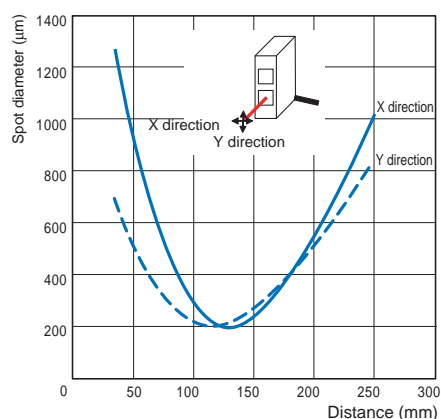
*7. Only the sensing object is detected when tuning.

| Item | Type | Standard models | | Model for Sensor Communications Unit |
|---|-------------------|--|---------------------------|--|
| | NPN output | E3NC-SA21 | E3NC-SA7 | E3NC-SA0 Available soon. |
| | PNP output | E3NC-SA51 | E3NC-SA9 | |
| | Connecting method | Pre-wired | Wire-saving Connector | Connector for Sensor Communications Unit |
| Maximum connectable Units | | 30 | | |
| Ambient temperature range | | Operating: Groups of 1 or 2 Amplifiers: -25 to 55°C, Groups of 3 to 10 Amplifiers: -25 to 50°C, Groups of 11 to 16 Amplifiers: -25 to 45°C, Groups of 17 to 30 Amplifiers: -25 to 40°C Storage: -30 to 70°C (with no icing or condensation) | | Operating: Groups of 1 or 2 Amplifiers: 0 to 55°C, Groups of 3 to 10 Amplifiers: 0 to 50°C, Groups of 11 to 16 Amplifiers: 0 to 45°C, Groups of 17 to 30 Amplifiers: 0 to 40°C Storage: -30 to 70°C (with no icing or condensation) |
| Ambient humidity range | | Operating and storage: 35% to 85% (with no condensation) | | |
| Insulation resistance | | 20 MΩ (at 500 VDC) | | |
| Dielectric strength | | 1,000 VAC at 50/60 Hz for 1 min. | | |
| Vibration resistance (destruction) | | 10 to 55 Hz with a 1.5-mm double amplitude for 2 hours each in X, Y, and Z directions | | |
| Shock resistance (destruction) | | 500 m/s ² for 3 times each in X, Y, and Z directions | | 150 m/s ² for 3 times each in X, Y, and Z directions |
| Weight (packed state/Amplifier Unit only) | | Approx. 115 g/approx. 75 g | Approx. 60 g/approx. 20 g | Approx. 65 g/approx. 25 g |
| Materials | Case | Polycarbonate (PC) | | |
| | Cover | Polycarbonate (PC) | | |
| | Cable | PVC | | |
| Accessories | | Instruction Manual | | |

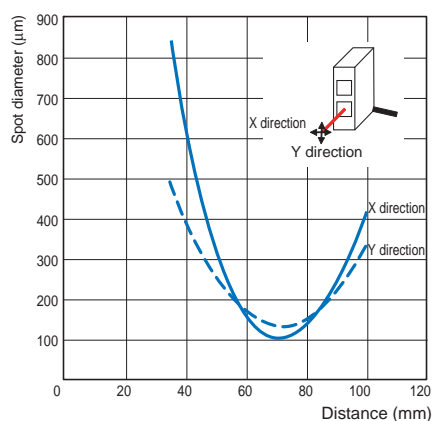
Engineering Data (Reference Value)

Spot Diameter Vs. Distance

E3NC-SH250


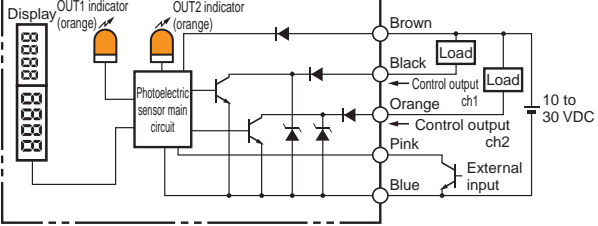


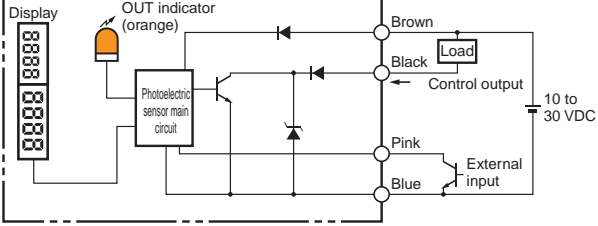



E3NC-SH100


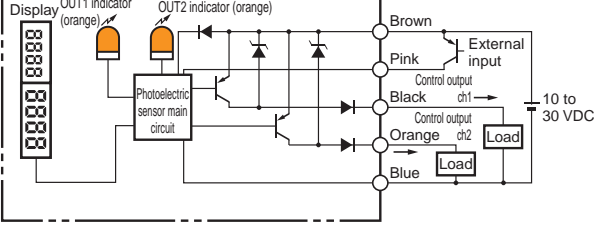


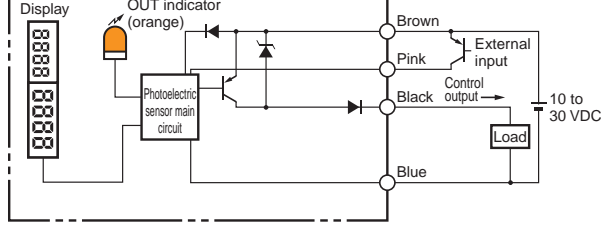



I/O Circuit Diagrams

NPN Output

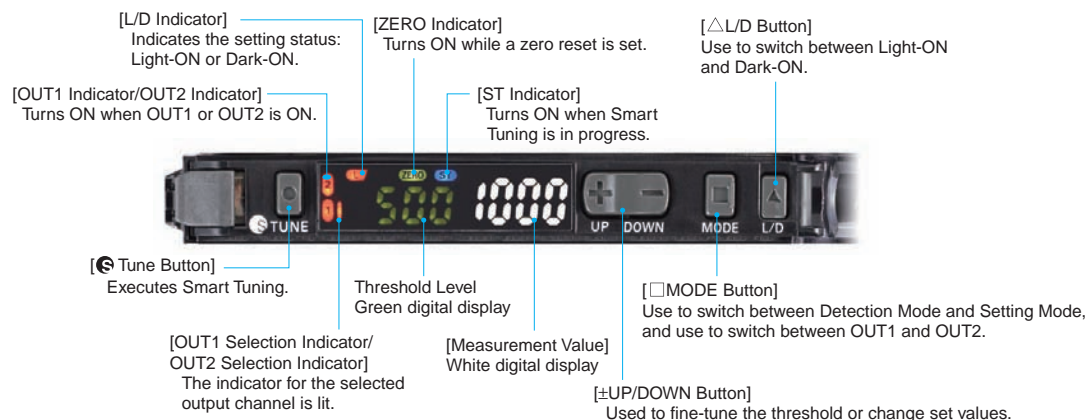
| Model | Operation mode | Timing chart | L/D indicator | Output circuit |
|-----------|----------------|--|---|---|
| E3NC-SA21 | Light-ON | ch1/ Incident light ch2 No incident light OUT indicator Lit (orange) Not lit Output ON transistor OFF Load Operate (e.g., relay) Reset (Between brown and black (orange) leads) |  lit. |  |
| | Dark-ON | ch1/ Incident light ch2 No incident light OUT indicator Lit (orange) Not lit Output ON transistor OFF Load Operate (e.g., relay) Reset (Between brown and black (orange) leads) |  lit. | |
| E3NC-SA7 | Light-ON | Incident light No incident light OUT indicator Lit (orange) Not lit Output ON transistor OFF Load Operate (e.g., relay) Reset (Between brown and black leads) |  lit. |  |
| | Dark-ON | Incident light No incident light OUT indicator Lit (orange) Not lit Output ON transistor OFF Load Operate (e.g., relay) Reset (Between brown and black leads) |  lit. | |

PNP Output

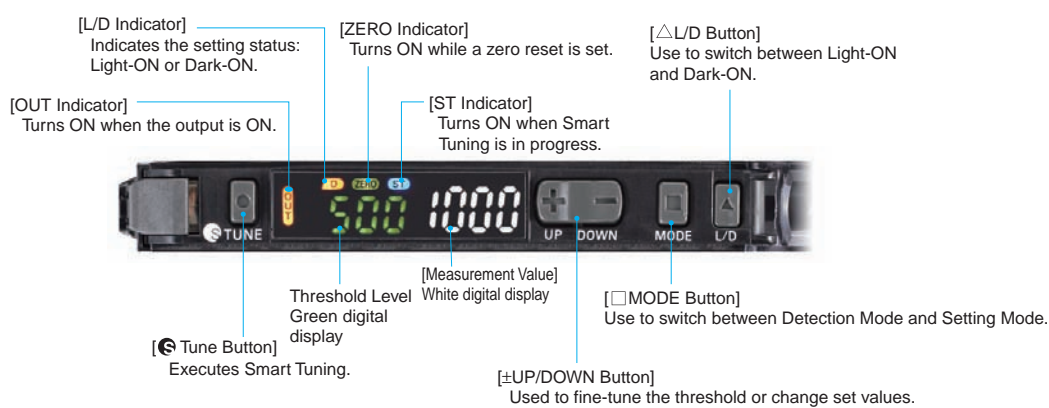
| Model | Operation mode | Timing chart | L/D indicator | Output circuit |
|-----------|----------------|---|--|--|
| E3NC-SA51 | Light-ON | ch1/ Incident light ch2 No incident light OUT indicator Lit (orange) Not lit Output ON transistor OFF Load Operate (e.g., relay) Reset (Between blue and black (orange) leads) |  lit. |  |
| | Dark-ON | ch1/ Incident light ch2 No incident light OUT indicator Lit (orange) Not lit Output ON transistor OFF Load Operate (e.g., relay) Reset (Between blue and black (orange) leads) |  lit. | |
| E3NC-SA9 | Light-ON | Incident light No incident light OUT indicator Lit (orange) Not lit Output ON transistor OFF Load Operate (e.g., relay) Reset (Between blue and black leads) |  lit. |  |
| | Dark-ON | Incident light No incident light OUT indicator Lit (orange) Not lit Output ON transistor OFF Load Operate (e.g., relay) Reset (Between blue and black leads) |  lit. | |

Nomenclature

E3NC-SA21/SA51/SA0



E3NC-SA7/SA9



Safety Precautions

To ensure safe operation, be sure to read and follow the Instruction Manual provided with the Sensor.

Sensor Heads

Laser Safety

Various safety standards regarding laser devices are stipulated in Japan and abroad. When this Sensor Head is used in Japan and when it is assembled in Japan but exported to a foreign country, the safety standards are classified into three cases.

1. When Using the Sensor Head in Japan

JIS C6802 stipulates the safety measures that must be observed by the user for each type of laser equipment.

E3NC-SH□□ Sensor Heads: Class 1

WARNING

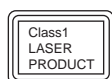
Do not expose your eyes to the laser beam either directly or indirectly (i.e., after reflection from a mirror or shiny surface). The laser beam has a high power density and exposure may result in loss of sight.



Do not disassemble the Sensor Head. Doing so may cause the laser beam to leak, resulting in a risk of visual impairment.



- Displaying the Laser Label
Attach the certification label that is shown at the right to the side of the Sensor Head.



2. Exporting the Sensor Head to the USA

When exporting devices in which the Sensor Head is installed to the USA, the devices are subject to FDA (Food and Drug Administration) laser regulations of the USA. These Sensors are classified as Class 1 laser devices under IEC/EN 60825-1 and the regulations of Laser Notice No. 50 for this certification. CDRH (Center for Devices and Radiological Health) registration has been completed. (Accession Number:1220691)

3. Exporting the Sensor Head to Europe

This Sensor Head is classified in Class 1 under EN 60825-1.

Precautions for Safe Use

The following precautions must be observed to ensure safe operation of the Sensor Head.

- 1. Installation Environment**
 - Do not use the Sensor Head in an environment where explosive or flammable gas is present.
 - To secure the safety of operation and maintenance, do not install the Sensor Head close to high-voltage devices or power devices.
- 2. Power Supply and Wiring**
 - Always use an E3NC-SA□□, or E3NC-SA0 Amplifier Unit. If a different Amplifier Unit is used, damage or fire may occur.
 - If you short the cable, reconnect it as specified. If the connections are not correct, damage or fire may occur.
 - High-voltage lines and power lines must be wired separately from the Sensor Head. Wiring them together or placing them in the same duct may cause induction, resulting in malfunction or damage.
 - Always turn OFF the power supply before connecting or disconnecting the connectors.
- 3. Installation**
 - During installation, tighten the screws securely, but do not exceed the specified tightening torque.
Specified torque (M3): 0.5 N·m
- 4. Others**
 - Never disassemble, repair, modify, deform by pressure, or incinerate the Sensor Head.
 - Dispose of the Sensor Head as industrial waste.

- If you notice any abnormalities, immediately stop using the Sensor Head, turn OFF the power supply, and contact your OMRON representative.

Precautions for Correct Use

Observe the following precautions to prevent failure to operate, malfunctions, or undesirable effects on Sensor Head performance.

1. Installation Environment

Do not install the Sensor Head in locations subject to the following conditions:

- Ambient temperatures outside of the rated range
- Condensation caused by rapid changes in temperature
- Relative humidity that is not between 35% and 85%
- Corrosive or flammable gas
- Dust, salt, or iron particles
- Direct vibration or shock
- Strong external light interference (such as other laser beams or electric arc-welding machines)
- Direct sunlight or near heaters
- Water, oil, or chemical fumes or spray
- Strong magnetic or electric fields

2. Warming Up

- For accurate measurements, allow the product to stand for at least 10 minutes after turning ON the power supply before use.
- The circuits will be unstable just after the power supply is turned ON, so measurement values may fluctuate gradually.

3. Maintenance and Inspection

- Always turn OFF the power supply before adjusting or connecting/disconnecting the Sensor Head.
- Do not use thinner, benzene, acetone, or kerosene to clean the Sensor Head.
- If large dust particles or dirt adheres to the filter on the front of the Sensor Head, use a blower brush (such as one used to clean camera lenses) to blow it off. Do not blow the dust particles or dirt with your mouth. To remove dust particles or dirt, wipe it off gently with a soft cloth (such as one for cleaning lenses) moistened with a small amount of alcohol. Do not wipe it off with excessive force. Scratches on the filter may cause errors.

4. Sensing Object

- The Sensor Head cannot accurately measure the following types of objects: Transparent objects, objects with an extremely low reflection ratio, objects smaller than the spot diameter, objects with a large curvature, excessively inclined objects, etc.

5. The degree of protection is IP67, but do not use the Sensor Head in water, rain, or outdoors.

Amplifier Units

WARNING

This Amplifier Unit is not designed or rated for ensuring safety of persons either directly or indirectly.

Do not use it for such purposes.



CAUTION

Excess voltage may result in malfunction or fire.
Do not use the Amplifier Unit with a voltage that exceeds the rated voltage.



Explosion may result.

Never use the Amplifier Unit with an AC power supply.



Precautions for Safe Use

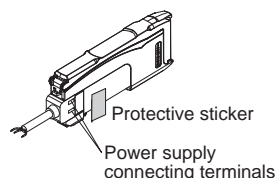
The following precautions must be observed to ensure safe operation of the Amplifier Unit. Damage or fire may occur.

1. Do not use the Amplifier Unit in an environment where explosive or flammable gas is present.
2. Do not use the Amplifier Unit in a location subject to splattering with water, steam, oil, or chemicals.
3. Do not attempt to disassemble, repair, or modify the Amplifier Unit.
4. Do not apply a voltage or current that exceeds the rated range to the Amplifier Unit.
5. Do not use the Amplifier Unit in an ambient atmosphere or environment that exceeds the ratings.
6. Wire the power supply correctly, including the polarity.
7. Connect the load correctly.
8. Do not short-circuit the load at both ends.
9. Do not use the Amplifier Unit if the case is damaged.
10. Dispose of the Amplifier Unit as industrial waste.
11. Burn injury may result. The surface of the Amplifier Unit may be hot depending on operating conditions (e.g., the ambient temperature or power supply voltage). Be careful during operation and cleaning.
12. Take appropriate safety measures, such as stopping the equipment, before you change any Amplifier Unit settings.
13. To secure the safety of operation and maintenance, do not install the Amplifier Unit close to high-voltage devices or power devices.
14. High-voltage lines and power lines must be wired separately from the Amplifier Unit. Wiring them together or placing them in the same duct may cause induction, resulting in malfunction or damage.
15. Do not install the Amplifier Unit in locations subject to strong electrical or magnetic fields.
16. Do not use the Amplifier Unit with a voltage that exceeds the rated voltage (10 to 30 VDC, including 10% ripple (p-p)).
17. Do not short the load of an open-collector output.
18. Do not use a load that exceeds the rated range.

Precautions for Correct Use

1. Do not use the Amplifier Unit in locations subject to the following conditions:
 - Direct sunlight
 - High humidity with the chance of condensation
 - Corrosive gas
 - Vibration or shock outside of the rated range
2. Do not extend the length of the cable to more than 100 m. Use wires of 0.3 mm² or larger to extend the cable.
3. Do not subject the cable to more than the following forces.
Pull: 40 N, Torque: 0.1 N·m, Pressure: 20 N, Bending: 3 kg
4. Detection will be possible 200 ms after the power supply turns ON. If separate power supplies are used for the load and the Amplifier Unit, turn ON the power supply to the Amplifier Unit first.
5. Depending on the operating environment, time may be required for the incident level to stabilize after the power supply is turned ON.
6. When using the Amplifier Units with Wire-saving Connectors, attach the protective stickers (provided with E3X-CN-series Connectors) on the unused power pins to prevent electrical shock and short circuiting.
Attach the protective cap when using a model with a connector for a Sensor Communications Unit.

Amplifier Unit with Wire-saving Connector



Amplifier Unit with Connector for Sensor Communications Unit



7. Output pulses may occur when the power supply is turned OFF. Turn OFF the power supply to the load or load line first.
8. Always turn OFF the power supply before connecting, disconnecting, or adding an Amplifier Unit.
9. Do not pull on the fiber, twist it, or otherwise subject it to excessive force when it is attached to the connector on the Amplifier Unit. (Do not exceed 9.8 N·m.)
10. The E3X-MC11, E3X-MC11-SV2, and E3X-MC11-S Mobile Consoles cannot be used.
11. Connection is not possible to the E3C, E2C, E3X-NA, or E3X-SD.
12. Connection is not possible to the E3X-HD, E3X-DA-S, E3X-DA-N, or E3X-MDA.
13. The E3NW-ECT Sensor Communications Unit can be used, but the E3X-DRT21-S, E3X-CRT, and E3X-ECT Communications Units cannot be used.
14. Always keep the protective cover in place when using the Amplifier Unit. Otherwise, the Amplifier Unit may malfunction.
15. Do not use thinner, benzene, acetone, or kerosene to clean the Amplifier Unit.

Dimensions

Tolerance class IT16 applies to dimensions in this data sheet unless otherwise specified.

Sensor Heads

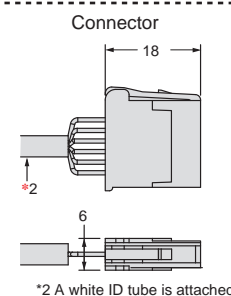
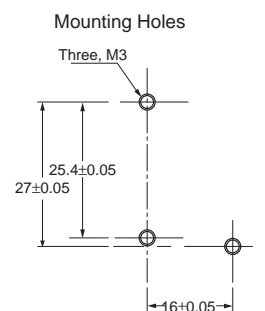
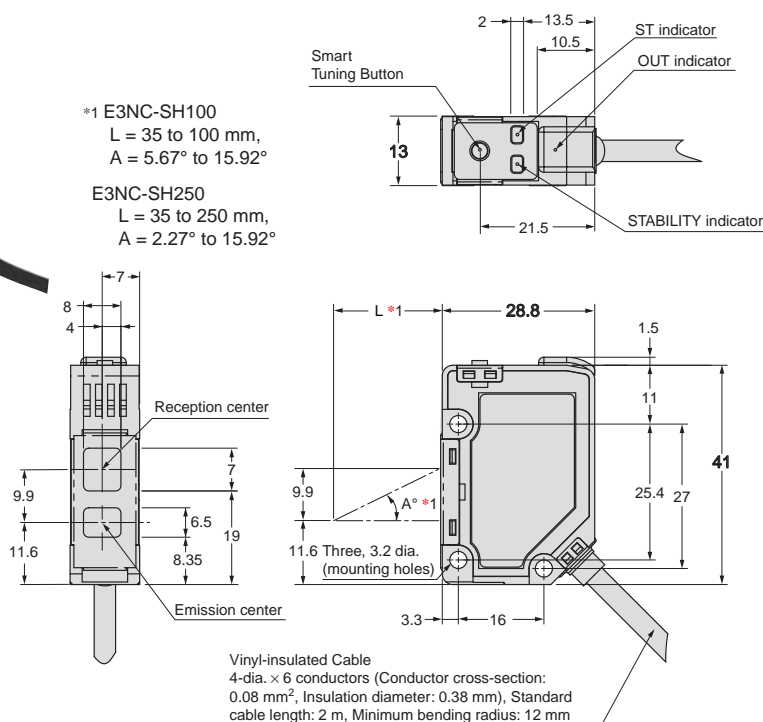
E3NC-SH250

E3NC-SH100



*1 E3NC-SH100
L = 35 to 100 mm,
A = 5.67° to 15.92°

E3NC-SH250
L = 35 to 250 mm,
A = 2.27° to 15.92°



Amplifier Units

Pre-wired Amplifier Units

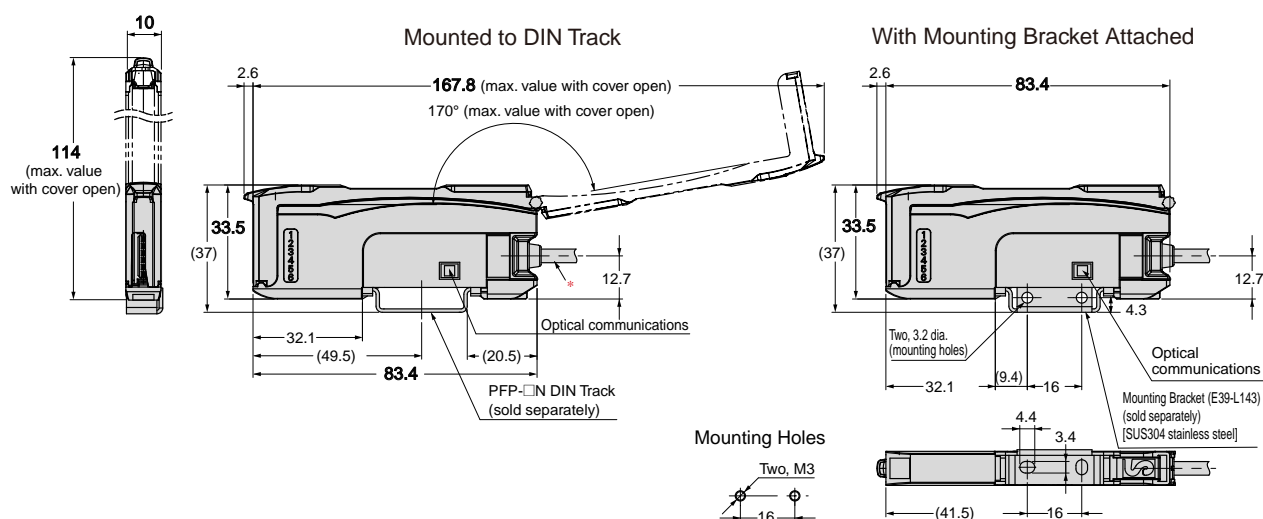
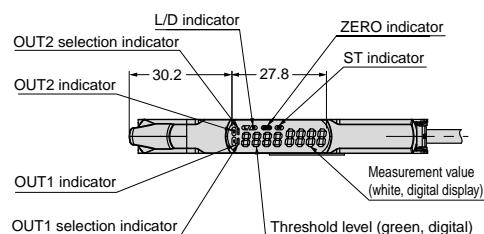
E3NC-SA21

E3NC-SA51



*Cable Specifications

Round vinyl-insulated cable, 4 dia. x 5
conductors (Conductor cross-section:
0.2 mm², Insulation diameter: 0.9 mm),
Standard cable length: 2 m, Minimum
bending radius: 12 mm



Amplifier Units with Wire-saving Connectors

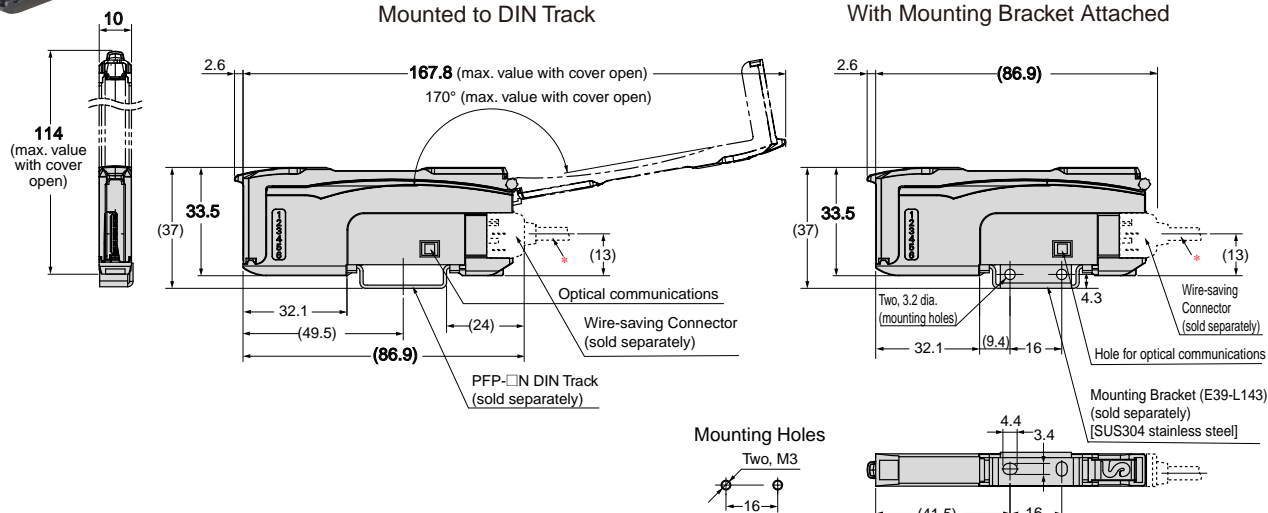
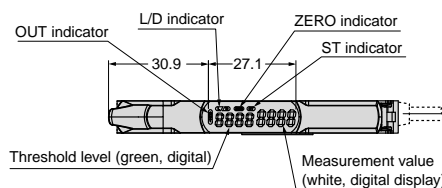
E3NC-SA7

E3NC-SA9



*Cable Specifications

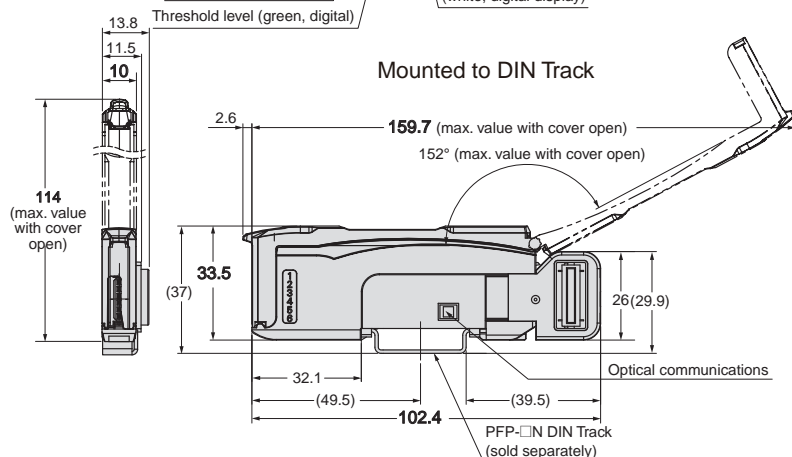
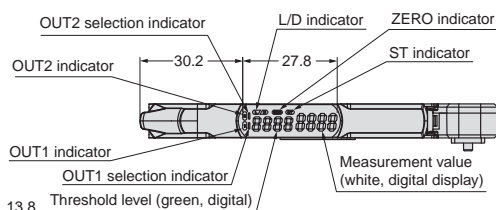
| Model | Outer diameter | No. of conductors |
|----------|----------------|-------------------|
| E3X-CN22 | 4.0 dia. | 2 |
| E3X-CN21 | | 4 |



Amplifier Unit with Connector for Sensor Communications Unit

E3NC-SA0

Available soon.



Accessories (Sold Separately)

Sensor Head Mounting Brackets

E39-L187



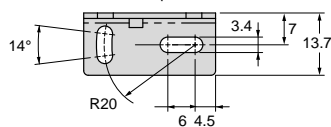
Mounting Bracket

Material: Stainless steel (SUS304)

Thickness: 1.2 mm

Accessories: Phillips screws (M3×18, P = 0.5, stainless steel): 2

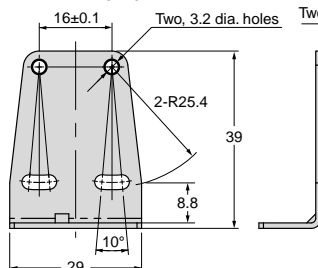
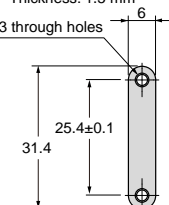
Nut plate: 1



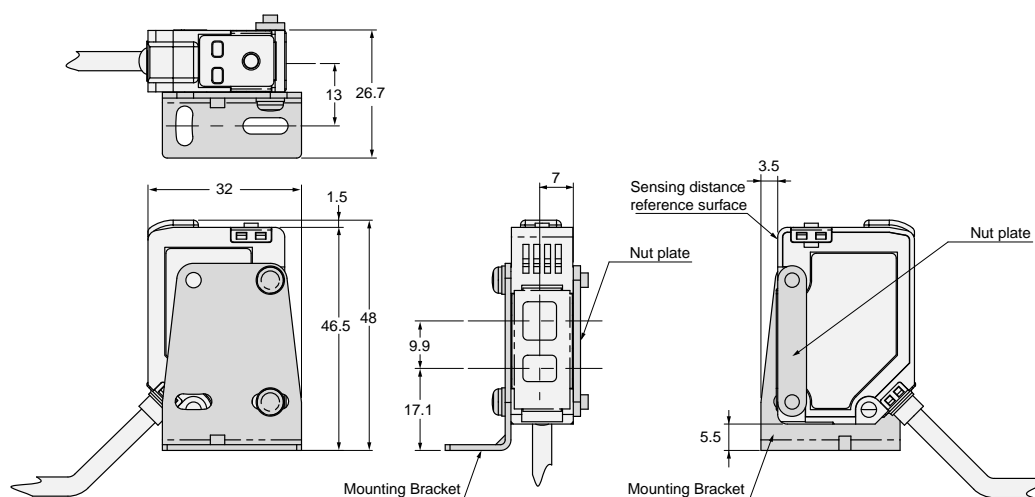
Nut Plate

Material: Stainless steel (SUS304)

Thickness: 1.5 mm



With E39-L187 Mounting Bracket Attached



E39-L188



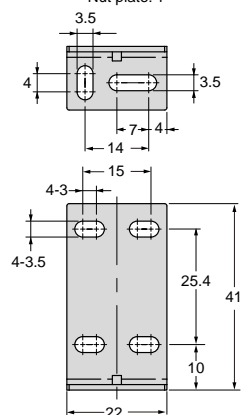
Mounting Bracket

Material: Stainless steel (SUS304)

Thickness: 1.2 mm

Accessories: Phillips screws (M3x18, P = 0.5, stainless steel): 2

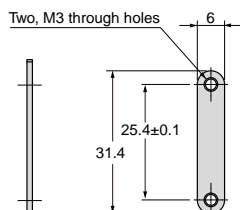
Nut plate: 1



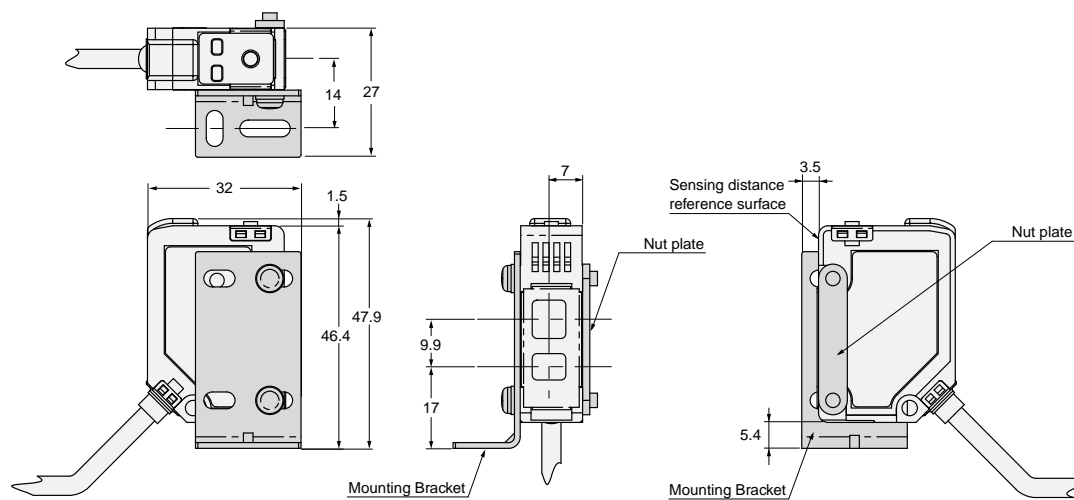
Nut Plate

Material: Stainless steel (SUS304)

Thickness: 1.5 mm

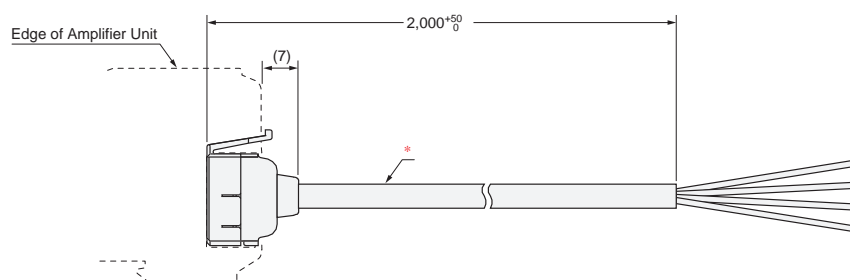


With E39-L188 Mounting Bracket Attached



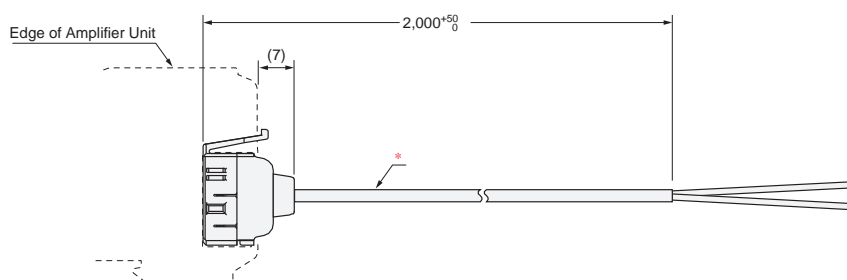
Wire-saving Connector

Master Connector E3X-CN21



*4-dia. cable with 4 conductors, Standard cable length: 2 m (Conductor cross-section: 0.2 mm^2 (AWG24), Insulation diameter: 1.1 mm)

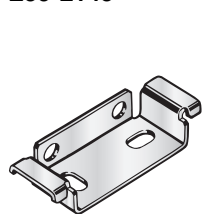
Slave Connector E3X-CN22



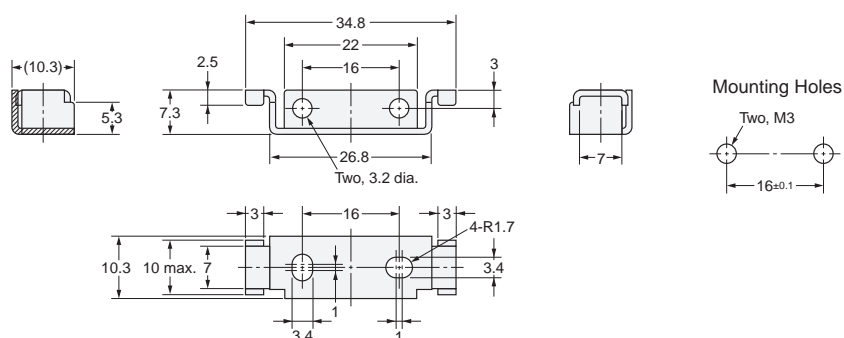
*4-dia. cable with 2 conductors, Standard cable length: 2 m (Conductor cross-section: 0.2 mm^2 (AWG24), Insulation diameter: 1.1 mm)

Amplifier Unit Mounting Bracket

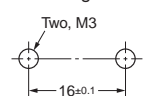
E39-L143



Material: Stainless steel (SUS304)



Mounting Holes



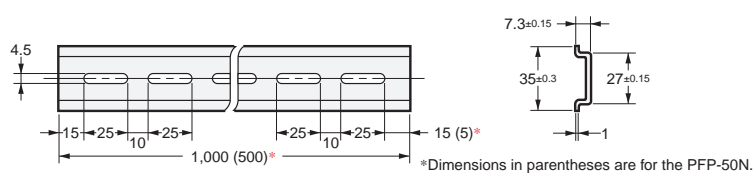
DIN Track

PFP-100N

PFP-50N



Material: Aluminum

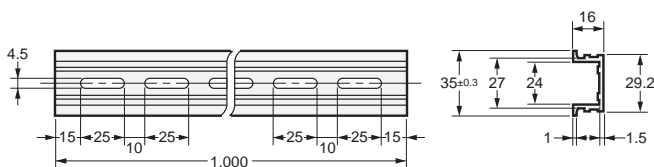


*Dimensions in parentheses are for the PFP-50N.

PFP-100N2

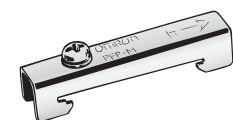


Material: Aluminum

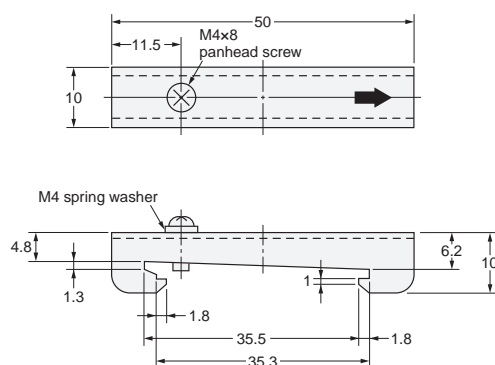


End Plate

PFP-M



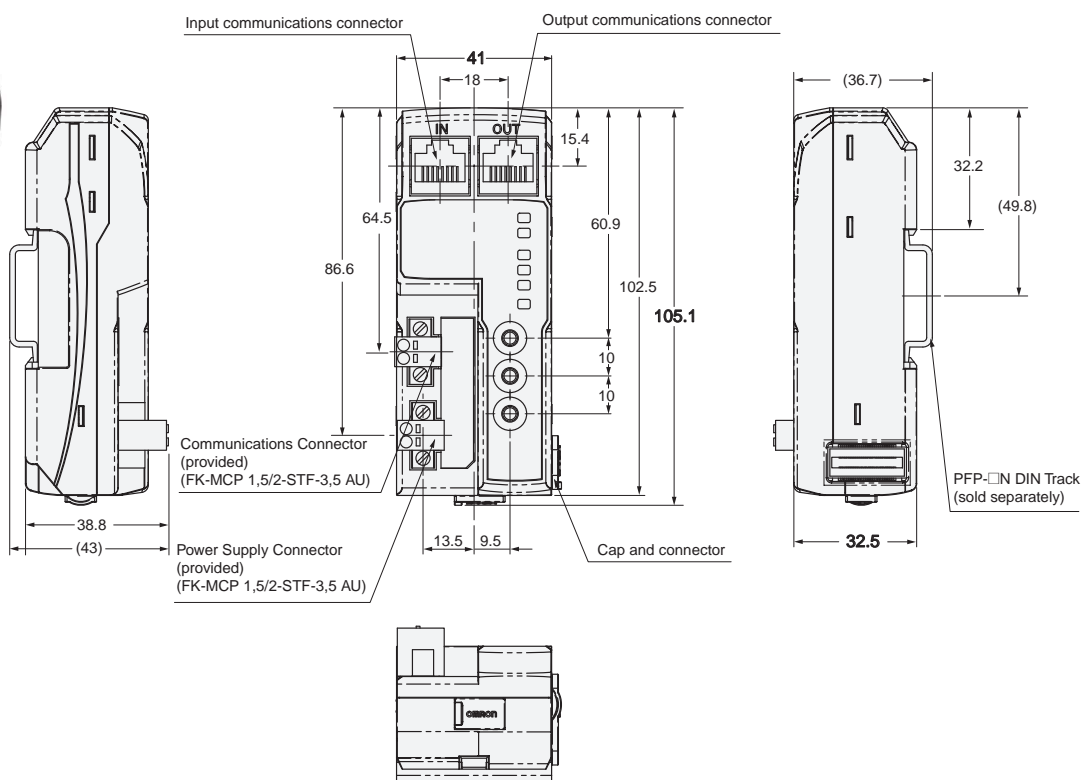
Materials: Iron, zinc plating



Related Products

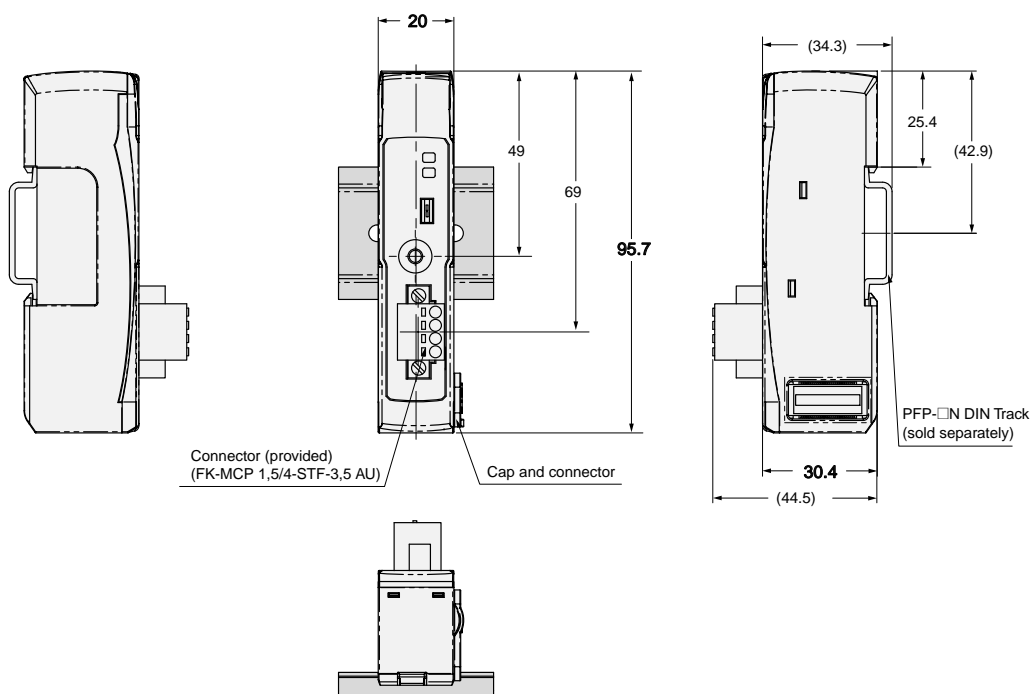
Sensor Communications Unit

E3NW-ECT Available soon.



Sensor Dispersion Unit

E3NW-DS Available soon.



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