New Product

# Contact-Type Smart Sensor
## E9NC-T

## Advanced, Durable, Space-saving Contact Sensors.

- **OMRON's unique ball spline mechanism for resistance to vibration and shock.**
- **Employs a robot cable that withstands bending. *1**
- **Slim, short Sensor Heads and slim Amplifier Units to save you space.**
- **A flanged type that does not require mounting brackets and is easy to replace.**
- **Transmits high-precision data with a resolution of 0.1 μm across a network (E9NC-TA0 only).**

*1. Robot cable specifications apply to the Sensor Head cable and the Connection Cable between the Preamplifier and the Amplifier Unit.

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

## Features

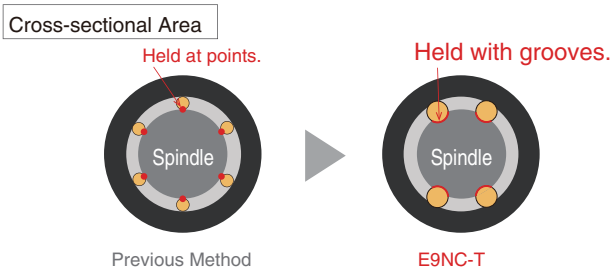
### Handles Diverse Measurement Applications

■ Handles Measurement Applications in Harsh Environments

#### Durable

**Tough under Vibration and Shock**

Ball Spline Mechanism




■ Handles Advanced Measurement Applications*2

#### Advanced

**Data Communications via Field Networks**

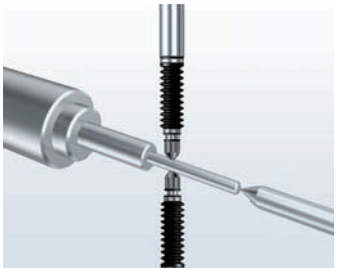
High-precision Data Transmission (0.1-μm Resolution)

**Connect Many Sensors**

Connect Up to 30 Sensors with Reduced Wiring *3

**Eight Calculation Functions** *4

Maximum Value, Minimum Value, Flatness, Average, Step, Twist, Warp, and Thickness



Measurement of Machined Part Precision

*2. E9NC-TA0 only.
*3. You can connect up to 30 Sensors to an E3NW Sensor Communications Unit with EtherCAT (when an OMRON NJ-series Controller is used) or up to 16 Sensors with CC-Link.
*4. Calculations are performed on the host controller. Special function blocks are available separately. For details, please contact your OMRON sales representative.

■ Handles Measurement Applications with Limited Space

#### Space-saving

**Slim, Short Sensor Heads**

8-mm outside diameter

**Slim Amplifier Units**

Slim Body Only 10 mm Wide

E9NC-TH5S (on the left) and E9NC-TH5L (on the right)

# E9NC-T

## Ordering Information

### Sensor Heads (Dimensions ➜ page 10 and 11) (Connection Cable between Preamplifier and Amplifier Unit is not provided with the Snesor Head. Be sure to have the Connection Cable ready when using the Sensor.)

| Type | Appearance | Measuring range (Moving range) | Resolution | Model |
|---|---|---|---|---|
| Straight type |  | 5 mm | 0.1 µm | **E9NC-TH5S 2M** |
| Right-angle air type | | | | **E9NC-TH5L 2M** |
| Flanged type/ Straight type | | | | **E9NC-TH5SF 2M** |
| Flanged type/ Right-angle air type | | | | **E9NC-TH5LF 2M** |
| Straight type | | 12 mm | | **E9NC-TH12S 2M** |
| Right-angle air type | | | | **E9NC-TH12L 2M** |
| Flanged type/ Straight type | | | | **E9NC-TH12SF 2M** |
| Flanged type/ Right-angle air type | | | | **E9NC-TH12LF 2M** |

### Amplifier Units (Dimensions ➜ page 12)

| Type | Appearance | Model | |
|---|---|---|---|
| Communications* | | **E9NC-TA0** | |
| ON/OFF output | | **NPN output** | **PNP output** |
| | | **E9NC-TA21 2M** | **E9NC-TA51 2M** |

* A Sensor Communications Unit is required if you want to use the Amplifier Unit on a network.

### Connection Cable between Preamplifier and Amplifier Unit (Dimensions ➜ page 13)

| Cable length | Model | Quantity |
|---|---|---|
| 0.5 m | **E9NC-TXC05** | 1 |
| 5 m | **E9NC-TXC5** | 1 |
| 10 m | **E9NC-TXC10** | 1 |
| 20 m | **E9NC-TXC20** | 1 |

### Accessories (Sold Separately)

#### Sensor Head Accessories

**Probe (Dimensions ➜ page 13)**

**The E9NC-TB1 is provided with the Sensor Head. Order replacements as required.**

| Type | Appearance | Model | Quantity |
|---|---|---|---|
| 3-dia. probe | | **E9NC-TB1** | 1 |
| Nylon probe | | **E9NC-TB2** | 1 |
| Probe for flat surfaces | | **E9NC-TB3** | 1 |

### Rubber boots (Dimensions ➜ page 13)

**A rubber boot is provided with the Sensor Head. Order replacements as required.**

| Applicable Sensor Head | Model | Quantity |
|---|---|---|
| E9NC-TH5□ | **E9NC-G5** | 1 |
| E9NC-TH12□ | **E9NC-G12** | 1 |

## Amplifier Unit Accessories

### Amplifier Unit Mounting Bracket (Dimensions ➜ page 14)

**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 14)

**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: 0.5 m | **PFP-50N** | 1 |
| | Deep type, total length: 1 m | **PFP-100N2** | 1 |

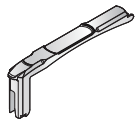
### End Plate (Dimensions ➜ page 14)

**An End Plate is not provided with the Amplifier Unit. It must be ordered separately as required.**

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

### Cover

**Attach these Covers to Amplifier Units. Order a Cover when required, e.g., if you lose the covers.**

| Appearance | Model | Quantity |
|---|---|---|
|  | **E39-G22**<br>**FOR E9NC-TA** | 1 |

## Related Products

### Sensor Communications Units

| Type | Appearance | Model |
|---|---|---|
| Sensor Communications Unit for EtherCAT | | **E3NW-ECT** |
| Sensor Communications Unit for CC-Link | | **E3NW-CCL** |
| Distributed Sensor Unit* | | **E3NW-DS** |

The E9NC-TA0 is supported for firmware version 1.03 or higher (Sensor Communications Units manufactured in July 2014 or later).
*The Distributed Sensor Unit can be connected to any of the Sensor Communications Units.

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CC-Link is a registered trademark of Mitsubishi Electric Corporation. The trademark is managed by the CC-Link Partner Association.

# E9NC-T

## Ratings and Specifications

### Sensor Heads

| Type / Item | | | | |
|---|---|---|---|---|
| Type | Straight type | | E9NC-TH5S | E9NC-TH12S |
| | Right-angle air type | | E9NC-TH5L | E9NC-TH12L |
| | Flanged type/Straight type | | E9NC-TH5SF | E9NC-TH12SF |
| Item | Flanged type/Right-angle air type | | E9NC-TH5LF | E9NC-TH12LF |
| Measuring range (Moving range) | | | 5 mm | 12 mm |
| Resolution | | | 0.1 μm | |
| Precision *1 | | | 1 μm | |
| Measuring force *1 | Upward | | 0.35±0.25 N | 0.4±0.3 N |
| | Horizontal | | 0.4±0.25 N | 0.5±0.3 N |
| | Downward | | 0.45±0.25 N | 0.6±0.3 N |
| Indicator (Preamplifier) | | | Operation indicator (blue/red) | |
| Ambient temperature range | | | Operating: −10 to 55°C; Storage: −20 to 60°C (with no icing or condensation) | |
| Ambient humidity range | | | Operating and storage: 35% to 85% (with no condensation) | |
| Maximum response speed | | | 80 m/min | |
| Origin detection speed | | | 80 m/min | |
| Origin position | | | 1 ±0.5 mm from the spindle push-out position (the lowest point) | |
| Vibration resistance (destruction) | | | 100 m/s$^2$ (20 to 2,000 Hz) 20 minutes each in X, Y, and Z directions | |
| Shock resistance (destruction) | | | 1,000 m/s$^2$ 3 times each in X, Y, and Z directions | |
| Degree of protection | Head | Right-angle air type | IEC IP67 (only when a hose elbow and air hose are connected) | |
| | | Straight type | --- | |
| | Preamplifier | | --- | |
| Number of sliding operations | | | 92 million times (based on OMRON's dedicated evaluation) | |
| Probe | | | Carbide with a round surface, screw thread size: M2.5 | |
| Connecting method | | | Pre-wired connector (2 m from the Sensor Head to the Preamplifier) | |
| Materials | Sensor Head | | Stainless steel (SUS303) | |
| | Rubber boot | | Nitrile rubber (NBR) | |
| | Preamplifier | | ABS | |
| | Probe contact point *2 | | Carbide | |
| | Cable | | PVC | |
| | Hose elbow for air (included) (Right-angle air type only) | | Nickel-plated brass | |
| | Tightening nut, Wave washer (Flanged type only) | | Tightening nut: Stainless steel (SUS410), Wave washer: SK5 | |
| Weight (packed state/Sensor Head only) | | | Approx. 340 g/approx. 110 g | |
| Accessories | | | Common: Wrench, Instruction Manual<br>Right-angle air type: Hose elbow<br>Flanged type: Tightening nut, wave washer, clamp wrench, pin | |

*1. These values were measured at an ambient temperature of 20°C.
*2. For the case of the provided E9NC-TB1 (3-dia. probe)

## Amplifier Units

| Item | | Type | Communications | ON/OFF output |
|---|---|---|---|---|
| | | NPN output | E9NC-TA0 | E9NC-TA21 |
| | | PNP output | | E9NC-TA51 |
| | | Connecting method | Connector for Sensor Communications Unit | Pre-wired type |
| Inputs/outputs | Outputs | | ---*1 | 2 outputs |
| | External inputs | | | 1 input |
| Power supply voltage | | | Supplied from the connector through the Sensor Communications Unit | 10 to 30 VDC, including 10% ripple (p-p) |
| Display resolution | | | 0.1 μm min. | |
| Power consumption *2 | | | At Power Supply Voltage of 24 VDC<br>Normal mode: 2,040 mW max. (Current consumption: 85 mA max.)<br>Eco ON: 1,800 mW max. (Current consumption: 75 mA max.)<br>Eco LO: 1,920 mW max. (Current consumption: 80 mA max.) | |
| Control outputs *3 | | | --- | Load power supply voltage: 30 VDC max., open-collector output<br>Load current: 100 mA max. in total for the 2 outputs<br>(Residual voltage At load current of less than 10 mA: 1 V max., at load current of 10 to 100 mA: 2 V max.)<br>OFF current: 0.1 mA max. |
| External inputs | | | --- | Refer to *4. |
| Indicators | | | 7-segment displays (white)<br>GO indicator (orange), HIGH/LOW indicator (orange), NO/NC indicator (orange), PRST indicator (green), ST indicator (blue) | |
| Protection circuits | | | Power supply reverse polarity protection and output short-circuit protection | Power supply reverse polarity protection, output short-circuit protection, and output reverse polarity protection |
| Response time | Super-high-speed mode (SHS) | | Operate or reset: 3 ms | |
| | High-speed mode (HS) | | Operate or reset: 10 ms | |
| | Standard mode (Stnd) | | Operate or reset: 100 ms | |
| | Giga mode (GIGA) | | Operate or reset: 1,000 ms | |
| Threshold setting | | | Smart Tuning (2-point area tuning, tolerance tuning, 2-point tuning, 1-point tuning), or manual adjustment | |
| No. of banks | | | 4 | |
| Functions | Output mode selection | | Normal output, hybrid output (Output is performed according to the combination of the two bits used to specify HIGH, GO, LOW, and error.) | |
| | Preset | | Negative values can be displayed. | |
| | Resetting settings *5 | | Select from initial reset (factory defaults) or user reset (saved settings). | |
| | Eco mode *6 | | Select from OFF (digital display lit), ECO ON (digital display not lit), and ECO LO (digital display dimmed). | |
| | Bank switching | | Select from banks 1 to 4. | |
| | Origin point use setting | | Select whether using the Sensor Head origin point or setting the point at power ON as origin. | |
| | Direction | | Switchable | |
| | Output | | Select from Normal sensing mode or Area sensing mode. | |
| | External input | | --- | Select from preset, bank switching, input OFF, and tuning. |
| | Display digits | | Settable in units ranging from 0.0001 mm to 1 mm. | |
| | Hysteresis width | | --- | Select from standard setting or user setting.<br>The hysteresis width can be set to a value from 0 to 9999.9999 in the user settings. |
| Maximum connectable Units | | | With E3NW-ECT: 30 units *7<br>With E3NW-CCL: 16 units | 30 units |
| Ambient temperature range | | | Operating: Groups of 1 or 2 Amplifier Units: 0 to 55°C, Groups of 3 to 10 Amplifier Units: 0 to 50°C, Groups of 11 to 16 Amplifier Units: 0 to 45°C, Groups of 17 to 30 Amplifier Units: 0 to 40°C<br>Storage: −30 to 70°C (with no icing or condensation) | Operating: Groups of 1 or 2 Amplifier Units: −25 to 55°C, Groups of 3 to 10 Amplifier Units: −25 to 50°C, Groups of 11 to 16 Amplifier Units: −25 to 45°C, Groups of 17 to 30 Amplifier Units: −25 to 40°C<br>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 minute | |
| 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) | | | 150 m/s$^2$ for 3 times each in X, Y, and Z directions | 500 m/s$^2$ for 3 times each in X, Y, and Z directions |
| Weight (packed state/Amplifier Unit only) | | | Approx. 65 g/approx. 25 g | Approx. 115 g/approx. 75 g |
| Materials | Case | | Polycarbonate (PC) | |
| | Cover | | Polycarbonate (PC) | |
| | Cable | | --- | PVC |
| Accessories | | | Instruction Manual | |

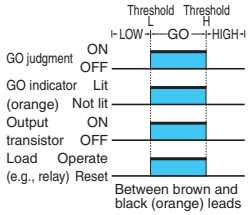
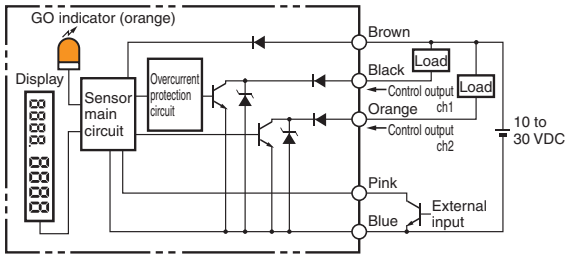
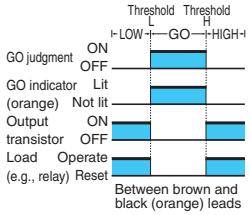
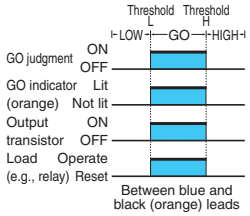
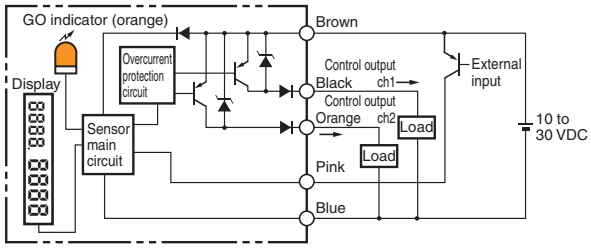
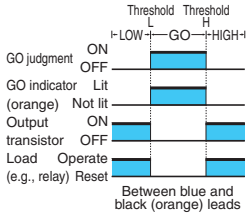
*1. Two sensor outputs are allocated in the programmable logic controller (PLC) I/O table.
PLC operation via Communications Unit enables reading detected values and changing settings.
*2. At Power Supply Voltage of 10 to 30 VDC.
Normal mode: 2,250 mW max. (Current consumption: 75 mA max. at 30 VDC, 155 mA max. at 10 VDC)
Eco ON: 2,010 mW max. (Current consumption: 67 mA max. at 30 VDC, 135 mA max. at 10 VDC)
Eco LO: 2,130 mW max. (Current consumption: 71 mA max. at 30 VDC, 145 mA max. at 10 VDC)
*3. Load current: 20 mA max. in total for the 2 outputs when 4 or more units are linked.

*4. The following details apply to the input.

| | Contact input (relay or switch) | Non-contact input (transistor) | Input time*4-1 |
|---|---|---|---|
| **NPN** | ON: Shorted to 0 V (Sourcing current: 1 mA max.).<br>OFF: Open or shorted to Vcc. | ON: 1.5 V max. (Sourcing current: 1 mA max.)<br>OFF: Vcc – 1.5 V to Vcc (Leakage current: 0.1 mA max.) | ON: 9 ms min.<br>OFF: 20 ms min. |
| **PNP** | ON: Shorted to Vcc (Sinking current: 3 mA max.).<br>OFF: Open or shorted to 0 V. | ON: Vcc – 1.5 V to Vcc (Sinking current: 3 mA max.)<br>OFF: 1.5 V max. (Leakage current: 0.1 mA max.) | |

*4-1.Input time is 25 ms (ON)/(OFF) only when (in tUnE) input is selected.
*5. The bank is not reset by the user reset function or saved by the user save function.
*6. ECO LO is supported for Amplifier Units manufactured in August 2014 or later.
*7. When the Sensors are connected to an OMRON NJ-series Controller.

## I/O Circuit Diagrams

| Output method | Model | Operation mode | Timing chart | NO/NC indicator | Output circuit |
|---|---|---|---|---|---|
| NPN | E9NC-TA21 | NO |  | |  |
| | | NC |  | | |
| PNP | E9NC-TA51 | NO |  | |  |
| | | NC |  | | |



### Signal Assignments to the Output Wire

When normal output mode and NO operation are set

| | GO judgment | NoGO judgment | Error judgment or Undetermined |
|---|---|---|---|
| **Control output 1** | ON | OFF | OFF |
| **Control output 2** | OFF | | ON |

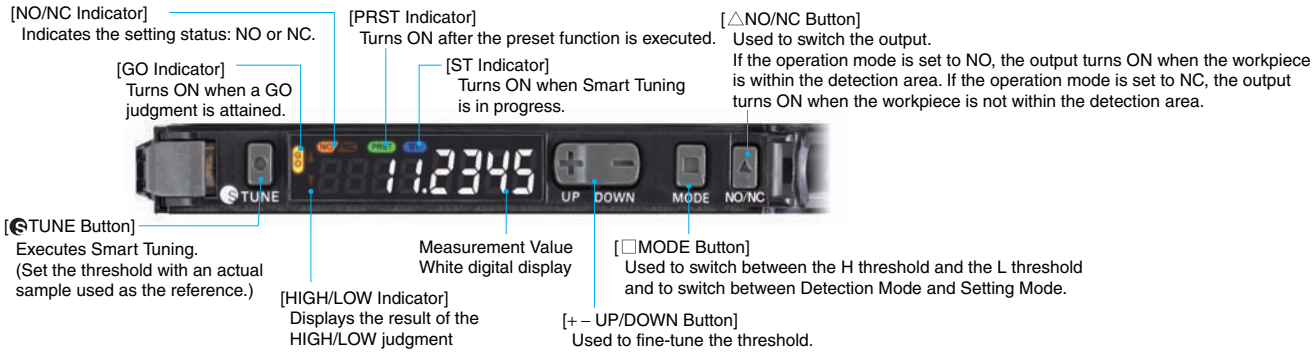
When hybrid output mode and NO operation are set

| | LOW judgment | GO judgment | HIGH judgment | Error judgment or Undetermined |
|---|---|---|---|---|
| **Control output 1** | OFF | ON | ON | OFF |
| **Control output 2** | ON | ON | OFF | OFF |

**Note: 1.** The output is reversed when the operation mode is set to NC. The indicator is not reversed.
**2.** If the judgment output mode is the normal sensing mode, the output is provided in the normal output pattern regardless of the setting.
**3.** The change timing of the control output 1 and the control output 2 shifts for 10 μm at the maximum.

## Nomenclature

### E9NC-TA0/TA21/TA51



# Safety Precautions

## Sensor Heads

### ⚠ WARNING

**Do not forcibly bend or pull the cables.**
**Do not put a heavy object on them or heat them.**
**Doing so may damage the cables, resulting in a fire.**

**Do not disassemble or alter the unit. There is a risk of injury or electric shock. And it may cause damage on the internal circuit.**

### Precautions for Safe Use

Please observe the following precautions for safe use of the products.

1. Installation Environment
   - Do not use the product in environments where it can be exposed to inflammable/explosive gas.
   - To secure the safety of operation and maintenance, do not install the product close to high-voltage devices or power devices.
2. Power Supply and Wiring
   - Be sure to use an E9NC-TA□□ Amplifier Unit. Connecting to other amplifier unit may cause damage or fire.
   - When shortening cables, be sure to connect wires according to the specifications. Misconnection may cause damage or fire.
   - High-voltage lines and power lines must be wired separately from this product. Wiring them together or placing them in the same duct may cause induction, resulting in malfunction or damage.
   - Always turn OFF the power of the unit before connecting or disconnecting the connectors.
   - To prevent cables to cut, fix it in a place where too much tension should not be applied to it. Avoid pulling cables too strongly or bending them too much.
     Repeated flexing: R50 or more
     Permanent bend: R20 or more
   - Head and output cables must be placed separately from the power line.
3. Installation
   - Use the dedicated wrench that comes with the product for attaching and detaching the probe. Do not apply torque of 0.1 N·m or more to the spindle. Otherwise damage may result. To prevent the probe from coming loose, use the accessory wave washer of nominal 2.5 or use screw lock.
   - After you secure the stem, do not apply rotational force. Doing so may result in malfunction.
   - Use screws or tightening nut for mounting and be sure to tighten screws with a specified torque.
     Specified torque M3 screw: 0.6 N·m
     Tightening nut: 1.0 N·m
4. Others
   - Do not attempt to disassemble, deform by pressure, incinerate, repair, or modify this product.
   - When disposing of the product, treat as industrial waste.
   - If you notice an abnormal condition such as a strange odor, extreme heating of the unit, or smoke, immediately stop using the product, turn off the power, and consult your dealer.

### Precautions for Correct Use

Please observe the following precautions to prevent failure to operate, malfunctions, or undesirable effects on product performance.

1. Installation Environment

Do not install the product in locations subjected to the following conditions:

- Surrounding air temperature outside the rating
- Rapid temperature fluctuations (causing condensation)
- Relative humidity outside the range of 35 to 85%
- Presence of corrosive or flammable gases
- Presence of dust, salt, or iron particles
- Direct vibration or shock
- Water, oil, or chemical fumes or spray, or mist atmospheres
- Presence of intense magnetic, electric field or high frequency electric field (use the product in a place distant from a noise source such as high power relay and high-voltage high-current switch by 0.5 m or more)

2. Warming Up
   - The circuitry is not stable immediately after turning the power ON, and the values gradually change until the Sensor Head is completely warmed up.
   - Before using the product, check that its functionality and capability are normal.
3. Maintenance and Inspection
   - Always turn off the power of the unit before connecting or disconnecting cables.
   - Do not use thinner, alcohol, benzene, acetone, or kerosene to clean the sensor.
   - If oil that becomes extremely viscous when it's dry, such as cutting oil, attaches to the rubber boot, the operation may not work properly.
     Wipe off with a waste cloth dampened with absolute alcohol.
   - The rubber boot may be significantly degraded by organic solvent or ozone in the air or ultraviolet rays in the environment. In such cases, replace the rubber boot regularly (6 months to a year).
   - Rubber boots are coated with grease. Please do not remove the grease when the rubber boot is used, since sliding movement may be degraded if it is removed.
   - When it used after wiping off the oil, perform regular maintenance not to rust. Be sure to check that there is no influence on the measurement due to the oil when it is used with the oil.
4. Do not use this product under water, rain or outdoors.

### ■ Using with air supply

(E9NC-TH5L/E9NC-TH5LF/E9NC-TH12L/E9NC-TH12LF)

- The suction air must be dry air with a negative pressure of 0.04 to 0.067 MPa.
- The outside diameter of the tube for air suction inlet must be 4 mm.
- Air suction draws the spindle in.
- If the spindle extrusion rate is high, the amplifier indication may display an error when a workpiece is contacted.
- Too much impact may shift the ball retainer inside the bearing, resulting in less operating range. If so, adjust the spindle rate.
- Attach the hose elbow to the sensor head before you secure it. When you attach the hose elbow, hold the right-angle bracket on the sensor head. Do not apply force to any other part.

## Amplifier Units

### ⚠ WARNING

**This product is not designed or rated for ensuring safety of persons either directly or indirectly. Do not use it for such purposes.**

**Do not use the product with voltage in excess of the rated voltage. Excess voltage may result in malfunction or fire.**

**Never use the product with an AC power supply. Otherwise, explosion may result.**

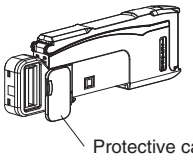
### Precautions for Safe Use

The following precautions must be observed to ensure safe operation of the product. Doing so may cause damage or fire.

1. Do not install the product in the following locations.
   - Locations subject to direct sunlight
   - Locations subject to condensation due to high humidity
   - Locations subject to corrosive gas
   - Locations subject to vibration or mechanical shocks exceeding the rated values
   - Locations subject to exposure to water, oil, chemicals
   - Locations subject to stream
   - Locations subject to strong magnetic field or electric field
2. Do not use the product in environments subject to flammable or explosive gases.
3. Do not use the product in any atmosphere or environment that exceeds the ratings.
4. To secure the safety of operation and maintenance, do not install the product close to high-voltage devices and power devices.
5. High-voltage lines and power lines must be wired separately from the product. Wiring them together or placing them in the same duct may cause induction, resulting in malfunction or damage.
6. Do not apply any load exceeding the ratings. Otherwise, damage or fire may result.
7. Do not short the load. Otherwise, damage or fire may result.
8. Connect the load correctly.
9. Do not miswire such as the polarity of the power supply.
10. To use this device as connecting with each other, be sure to connect with the same power supply and turn ON the power simultaneously. Using a separate power supply will influence the functions when connecting the devices to use them.
11. Do not use the product if the case is damaged.
12. Burn injury may occur. The product surface temperature rises depending on application conditions, such as the ambient temperature and the power supply voltage. Attention must be paid during operation or cleaning.
13. When setting the sensor, be sure to check safety such as by stopping the equipment.
14. Be sure to turn off the power supply before connecting or disconnecting wires.
15. Do not attempt to disassemble, repair, or modify the product in any way.
16. When disposing of the product, treat it as industrial waste.
17. Do not use the Sensor in water, rainfall, or outdoors.

### Precautions for Correct Use

1. Be sure to mount the unit to the DIN track until it clicks.
2. When using the Amplifier Units with Connectors for Communications Units, attach the protective caps (provided with E3NW-series Sensor Communications Unit) on the unused power pins to prevent electrical shock and short circuiting.




3. Do not apply excessive force such as tension, compression or torsion to the connector of the Sensor Head that is fixed to the Amplifier Unit.
4. Always keep the protective cover in place when using the Amplifier Unit. Not doing so may cause malfunction.
5. It may take time until the measured value become stable immediately after the power is turned on depending on use environment.
6. The Mobile Console E3X-MC11, E3X-MC11-SV2 and E3X-MC11-S cannot be connected.
7. The E3X-DRT21-S, E3X-CRT, E3X-ECT, and E3NW Sensor Communications Units cannot be used with the models with ON/OFF outputs. The E3NW-ECT or E3NW-CCL Sensor Communications Unit can be used with the model with communications (E9NC-TA0), but the E3X-DRT21-S, E3X-CRT, E3X-ECT, and E3NW-CRT Sensor Communications Units cannot be used.
8. If you notice an abnormal condition such as a strange odor, extreme heating of the unit, or smoke, immediately stop using the product, turn off the power, and consult your dealer.
9. Do not use thinner, benzene, acetone, and lamp oil for cleaning.

# E9NC-T

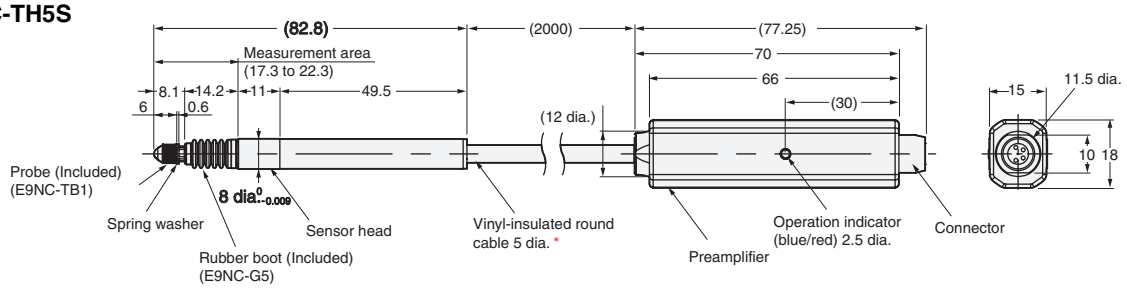
## Dimensions

(Unit: mm)

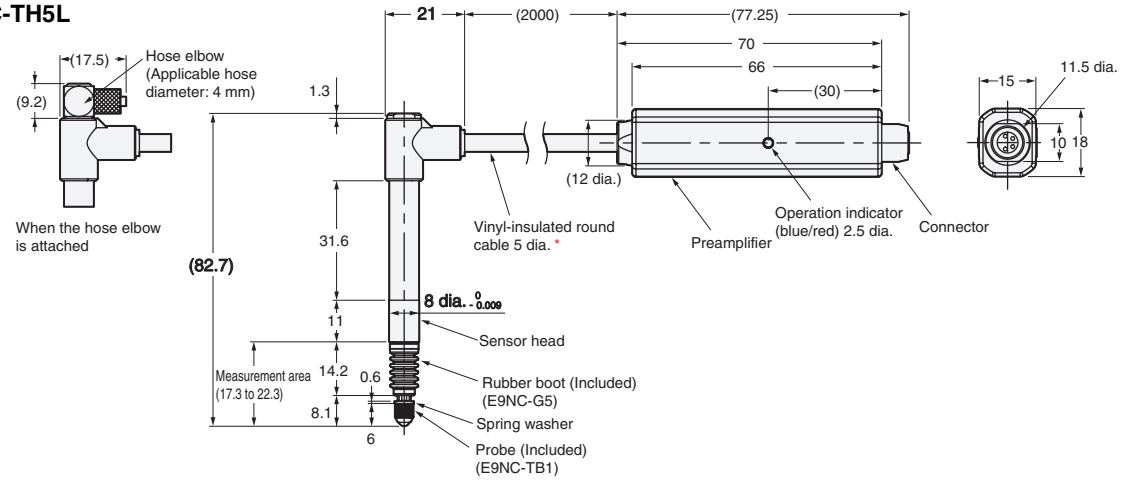
Tolerance class IT16 applies to dimensions in this data sheet unless otherwise specified.

### Sensor Heads

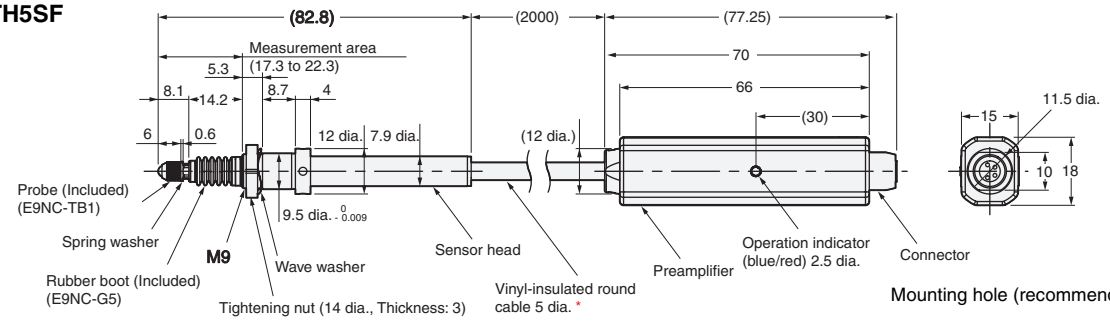
#### E9NC-TH5S




#### E9NC-TH5L

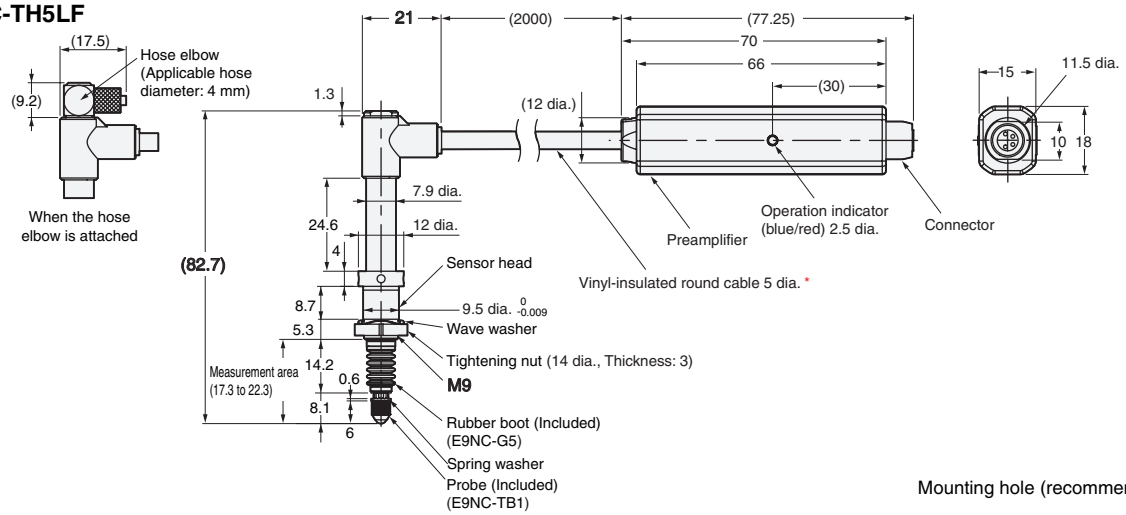



#### E9NC-TH5SF




Mounting hole (recommended): 9.7 dia. ±0.15

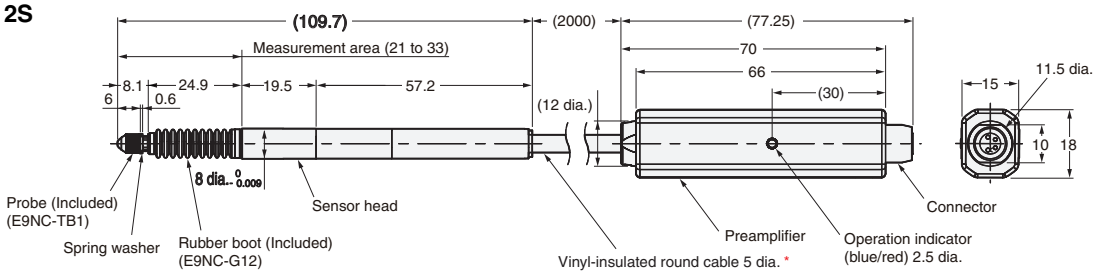
#### E9NC-TH5LF



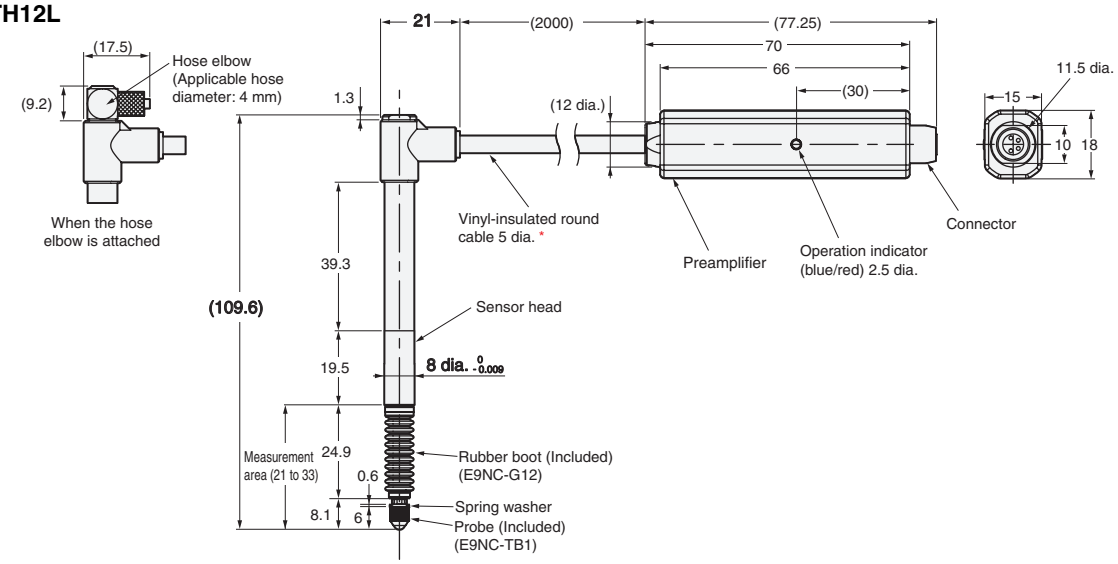

Mounting hole (recommended): 9.7 dia. ±0.15

* The minimum bending radiuses of the Sensor Head cable are shown below.
Repeated flexing: 50 mm
Permanent bend: 20 mm

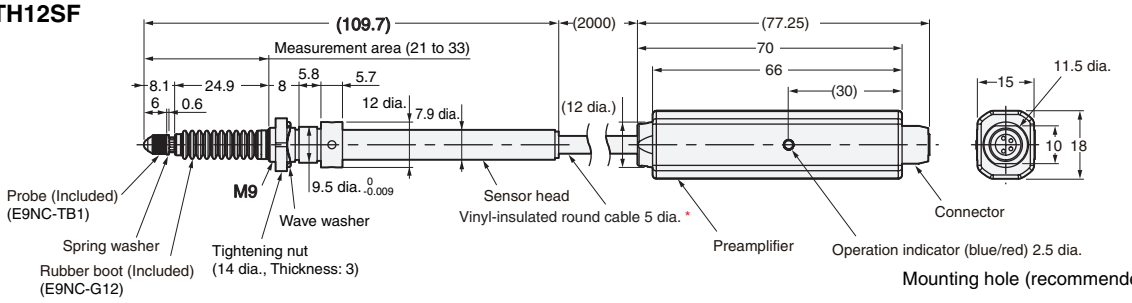
## E9NC-TH12S




## E9NC-TH12L

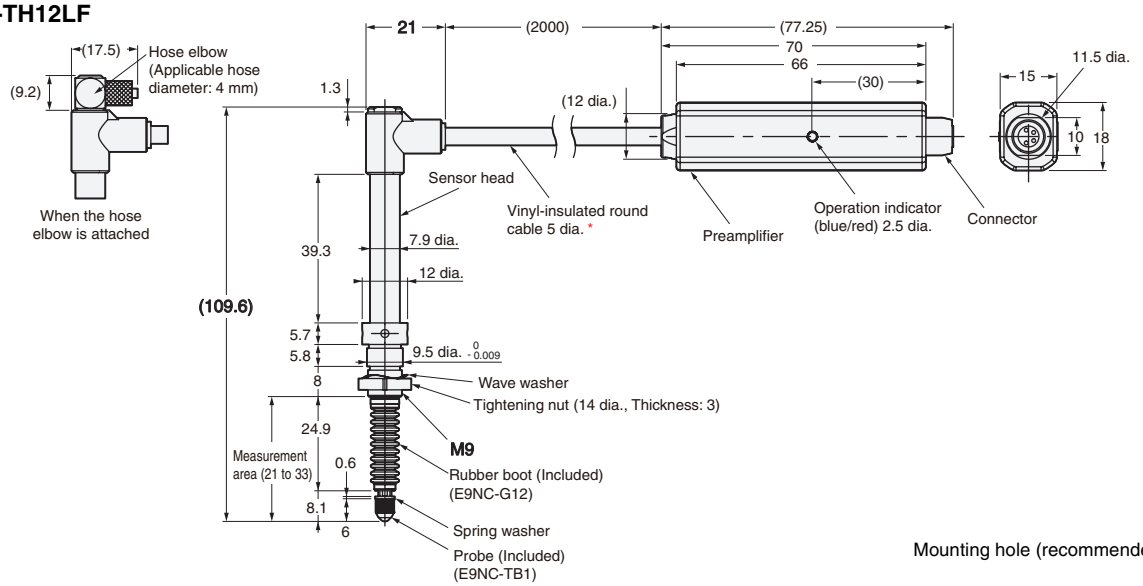



## E9NC-TH12SF




Mounting hole (recommended): 9.7 dia. ±0.15

## E9NC-TH12LF



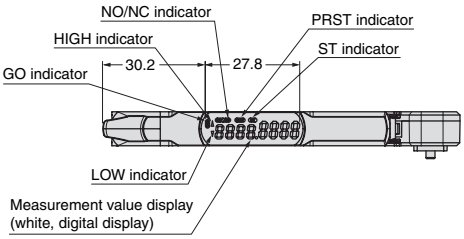

Mounting hole (recommended): 9.7 dia. ±0.15

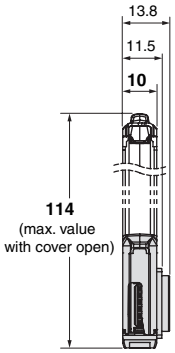
* The minimum bending radiuses of the Sensor Head cable are shown below.
Repeated flexing: 50 mm
Permanent bend: 20 mm

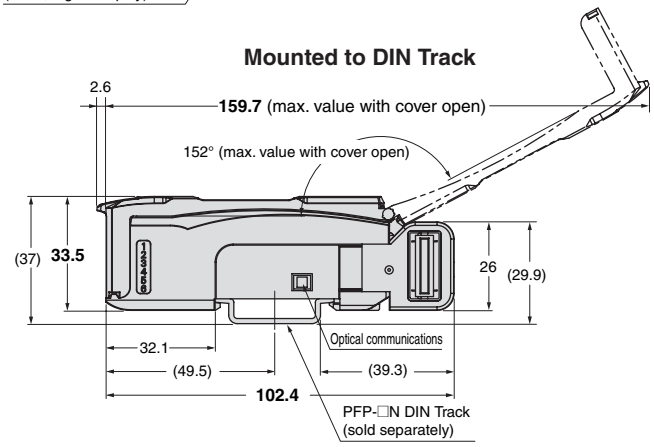
## Amplifier Units

### Model with Communications

**E9NC-TA0**



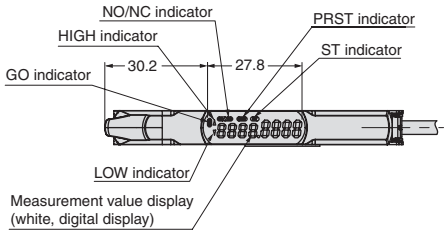



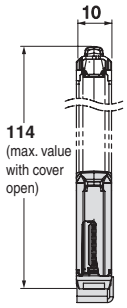

### Models with ON/OFF Outputs

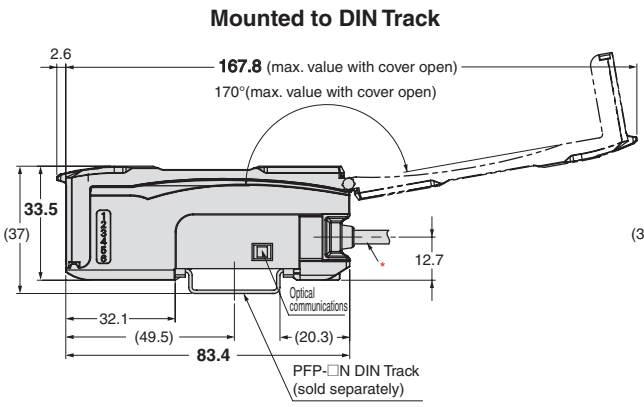
**E9NC-TA21**
**E9NC-TA51**

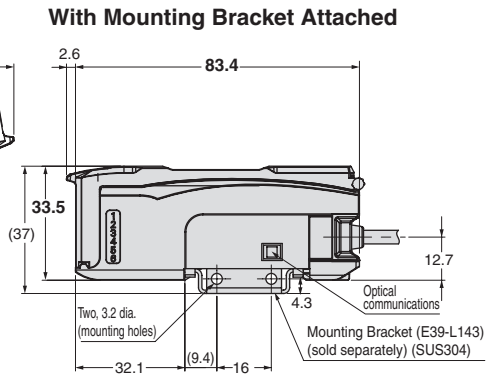
*Cable Specifications

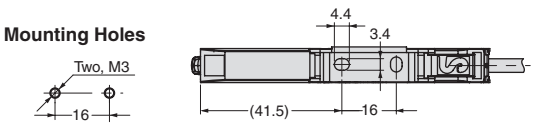
Vinyl-insulated round cable, 4 dia., 5 conductors (Conductor cross-section: 0.2 mm², Insulation diameter: 0.9 mm), Standard cable length: 2 m, Minimum bending radius: 12 mm



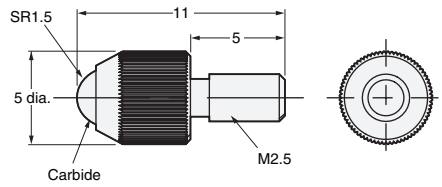



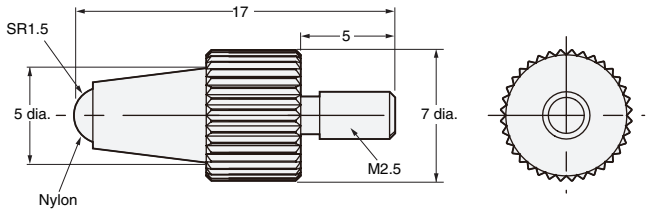
## Accessories (Sold Separately)

### Probes

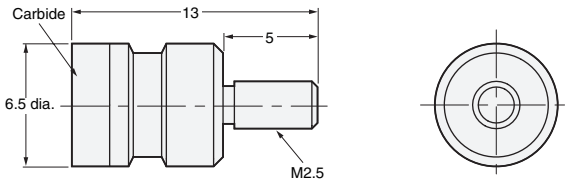
#### E9NC-TB1




#### E9NC-TB2

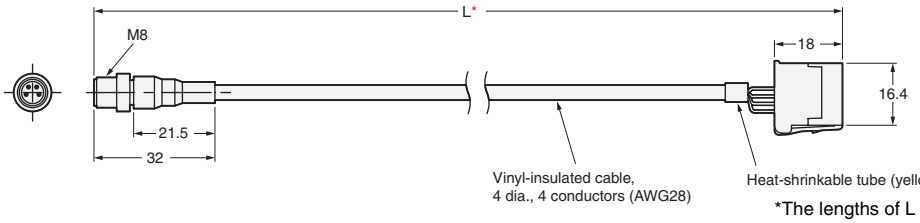



#### E9NC-TB3




### Connection Cables

**E9NC-TXC05**
**E9NC-TXC5**
**E9NC-TXC10**
**E9NC-TXC20**

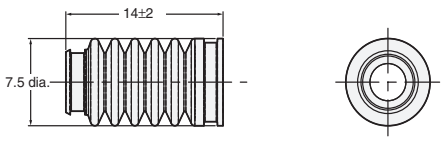



*The lengths of L are shown below.

| Model | L (m) |
|---|---|
| E9NC-TXC05 | 0.5 |
| E9NC-TXC5 | 5 |
| E9NC-TXC10 | 10 |
| E9NC-TXC20 | 20 |

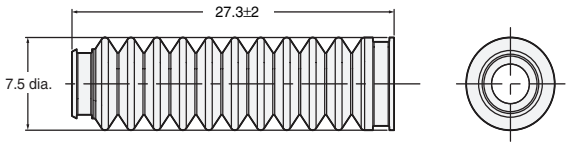
### Rubber Boots

#### E9NC-G5




Material: Nitrile rubber (NBR)

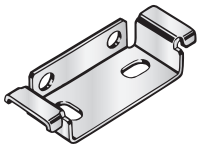
#### E9NC-G12

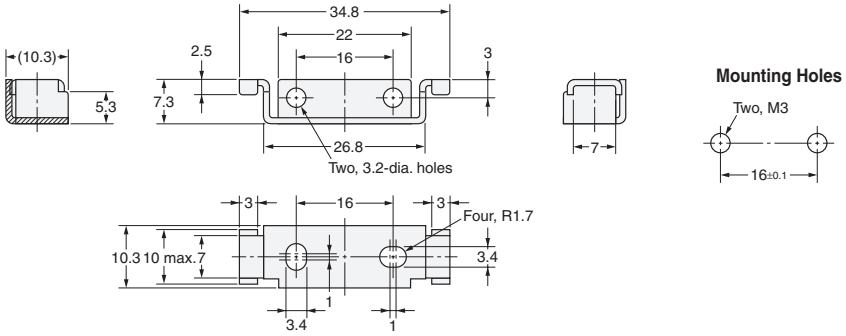



Material: Nitrile rubber (NBR)

## Amplifier Unit Mounting Bracket

**E39-L143**



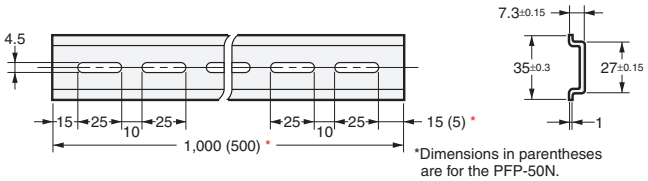



Material: Stainless steel (SUS304)

## DIN Tracks

**PFP-100N**

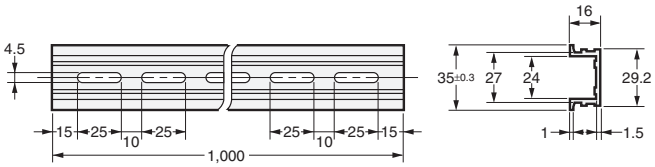
**PFP-50N**




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

Material: Aluminum

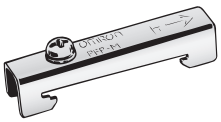
**PFP-100N2**

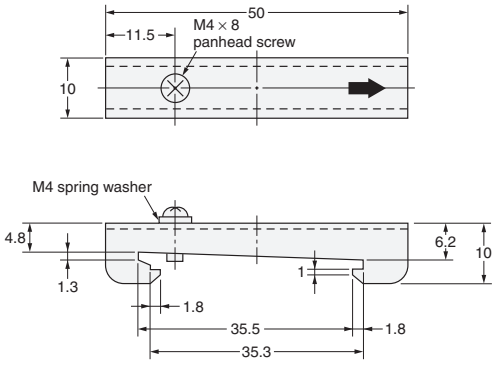



Material: Aluminum

## End Plate

**PFP-M**






Materials: Iron, zinc plating

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