

# Proximity Sensors



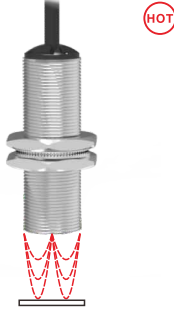
- ◉ Non-contact position detection, wear-free and highly reliable.
- ◉ Highly sensitive and intense accuracy, durability up to 8 years.
- ◉ A full range of housing materials: stainless steel, nickel-copper alloy, plastic and Teflon coating.
- ◉ Covering a wide range of specifications and sizes
- ◉ IP67 protection design, excellent water and oil resistance.



### Standard Distance Type (TR series)

- Classical cylindrical appearance, high stability
- Adaptive to different occasions, top-notch quality, low price
- Customizable cables & connectors as requested

P.E-17



### Extended Distance Type (TL series)

- sensing distance is double that of standard products
- Save installing space effectively
- Customizable cables & connectors at your request

P.E-20



### Long Distance Type (TY series)

- Ultra-long sensing distance, up to 40mm
- Avoid any attenuation caused by the material of detected objects
- Ip67 high protection degree

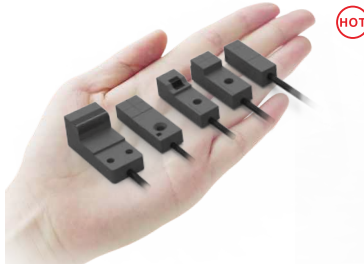
P.E-23



### Square Type (TQ series)

- Kidney-shaped hole, easy installation
- Up to 8 mm sensing distance
- Plastic housing, protection degree IP67

P.E-26



### Mini-square Type (TE series)

- 6mm (extral small), built-in amplifier
- 8mm sensing distance, the longest sensing distance in the industry
- Sensing surface on the top and at the front to suit your needs

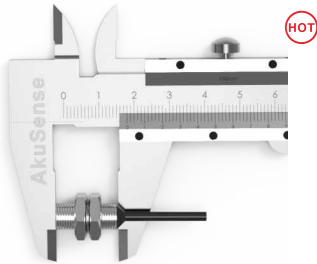
P.E-27



### Mini-cylindrical Type (TX series)

- Highly stabilized detection in narrow space
- Shield type, can be embedded in detecting objects
- $\Phi 3, \Phi 4, M4, M5$ , various models for you to choose from

P.E-29



### Short-body Type (TSS/TS series)

- Compared with similar sensors, the length can be shortened 1/3
- 18mm body length can perfectly fit into narrow space
- Epoxy resin fillings exhibit excellent shock resistance

P.E-31



### Ring-type (TH series)

- 2mm thickness, the thinnest one in the industry
- Stainless steel casing; strong impact resistance
- Flexible sensitivity adjustment with knobs

P.E-34



### Metal Face Type (TM series)

- Stainless steel face, with great impact resistance
- 1000PSI/High pressure resistance
- Wonderful thermal shock and chemical resistance

P.E-35



### Temperature Resistance Type (TG/TZ series)

- Extended temperature varies from  $-40^{\circ}\text{C}$  to  $+220^{\circ}\text{C}$
- Degree of protection up to IP67
- Reverse polarity protection and surge protection

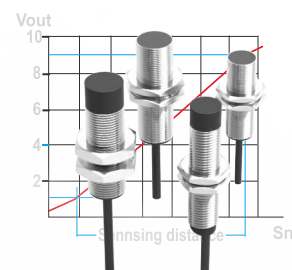
P.E-37



### IP69K High Protection (TP series)

- AISI 316L stainless steel housing
- IP67-IP68-IP69K protection level
- Can be used in the food and beverage field

P.E-39



### Analog Output Type (TA series)

- First choice of short distance and non-contact detection
- Analog output 0~20mA and 0~10v
- Output PNP-Analog

P.E-41

|               |
|---------------|
| Fiber Optic   |
| Slot Sensors  |
| Photoelectric |
| Laser         |
| Proximity     |
| Displacement  |
| Magnetic      |
| Contact       |
| Area          |
| Ultrasonic    |
| Vision        |
| Code Readers  |
| Vibration     |
| Temperature   |
| Accessories   |

#### Guidance

#### Inductive sensors

|                       |
|-----------------------|
| Standard distance     |
| Extended distance     |
| Long distance         |
| Square                |
| Mini square           |
| Mini-cylindrical      |
| Short-body            |
| Ring-type             |
| Metal face            |
| Temperature           |
| IP69K high protection |
| Analog output         |
| DC 2 wires            |

#### Capacitive sensors

|                          |
|--------------------------|
| Cylindrical              |
| Correction resistot type |
| Flat type                |
| Level detection          |



DC 2-wire Type (TD series)

- Nonpolarized specifications, easy wiring method
- With smallest sensing surface M8
- 10~30V DC and 10~60V DC ,two voltages

P.E-42

|               |
|---------------|
| Fiber Optic   |
| Slot Sensors  |
| Photoelectric |
| Laser         |
| Proximity     |
| Displacement  |
| Magnetic      |
| Contact       |
| Area          |
| Ultrasonic    |
| Vision        |
| Code Readers  |
| Vibration     |
| Temperature   |
| Accessories   |

Guidance

|                       |
|-----------------------|
| Inductive sensors     |
| Standard distance     |
| Extended distance     |
| Long distance         |
| Square                |
| Mini square           |
| Mini-cylindrical      |
| Short-body            |
| Ring-type             |
| Metal face            |
| Temperature           |
| IP69K high protection |
| Analog output         |
| DC 2 wires            |

|                              |
|------------------------------|
| Capacitive sensors           |
| Cylindrical                  |
| Correction<br>resistant type |
| Flat type                    |
| Level detection              |

| Type 1            | Type 2               | Series                 |               |
|-------------------|----------------------|------------------------|---------------|
| Inductive Sensors | Cylindrical          | Standard Distance      | TR Series     |
|                   |                      | Extended Distance      | TL Series     |
|                   |                      | Long Distance          | TY Series     |
|                   |                      | Mini–cylindrical       | TX Series     |
|                   |                      | Short–body             | TSS/TS Series |
|                   |                      | Analog Output          | TA Series     |
|                   |                      | DC 2–wire              | TD Series     |
|                   | Square               | Standard Square        | TQ Series     |
|                   |                      | Mini–square            | TE Series     |
|                   | Special Applications | Ring–type              | TH Series     |
|                   |                      | Metal Face             | TM Series     |
|                   |                      | Temperature Resistance | TG/TZ Series  |
|                   |                      | IP69K High Protection  | TP Series     |

Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

Guidance

Inductive sensors

Standard distance

Extended distance

Long distance

Square

Mini square

Mini-cylindrical

Short-body

Ring-type

Metal face

Temperature

IP69K high protection

Analog output

DC 2 wires

Capacitive sensors

Cylindrical

Correction

resistant type

Flat type

Level detection

## Standard Distance DC 3-wire

| Type           | Appearance | Sensing distance                                                                             | Model numbers                                                                           | Pages                                                                                    |                                                                                                |                |
|----------------|------------|----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|----------------|
|                |            | Unit: mm                                                                                     | NPN Normally open                                                                       | NPN Normally closed                                                                      |                                                                                                |                |
| Pre-wired Type | Shielded   |  ϕ 6.5*45.5 |  1.5mm | TRF6.5–1.5NO                                                                             | TRF6.5–1.5NC                                                                                   |                |
|                |            |             | M8*45                                                                                   |  1.5mm  | TRF08–1.5NO                                                                                    | TRF08–1.5NC    |
|                |            |                                                                                              | M12*44.5                                                                                |  2mm    | TRF12–02NO                                                                                     | TRF12–02NC     |
|                |            |                                                                                              | M18*55                                                                                  |  5mm    | TRF18–05NO                                                                                     | TRF18–05NC     |
|                |            |                                                                                              | M30*54                                                                                  |  10mm   | TRF30–10NO                                                                                     | TRF30–10NC     |
|                | Unshielded |  ϕ 6.5*45   |  2mm   | TRN6.5–02NO                                                                              | TRN6.5–02NC                                                                                    |                |
|                |            |             | M8*45.5                                                                                 |  2mm    | TRN08–02NO  | TRN08–02NC     |
|                |            |                                                                                              | M12*46.5                                                                                |  4mm    | TRN12–04NO  | TRN12–04NC     |
|                |            |                                                                                              | M18*54                                                                                  |  8mm    | TRN18–08NO                                                                                     | TRN18–08NC     |
|                |            |                                                                                              | M30*58                                                                                  |  15mm   | TRN30–15NO                                                                                     | TRN30–15NC     |
| Connector Type | Shielded   |             | M8*60                                                                                   |  1.5mm  | TRF08–1.5NO–E1                                                                                 | TRF08–1.5NC–E1 |
|                |            |                                                                                              | M12*68                                                                                  |  2mm    | TRF12–02NO–E2                                                                                  | TRF12–02NC–E2  |
|                |            |                                                                                              | M18*82                                                                                  |  5mm    | TRF18–05NO–E2                                                                                  | TRF18–05NC–E2  |
|                |            |                                                                                              | M30*78                                                                                  |  10mm   | TRF30–10NO–E2                                                                                  | TRF30–10NC–E2  |
|                | Unshielded |             | M8*60                                                                                   |  2mm    | TRN08–02NO–E1                                                                                  | TRN08–02NC–E1  |
|                |            |                                                                                              | M12*67                                                                                  |  4mm    | TRN12–04NO–E2                                                                                  | TRN12–04NC–E2  |
|                |            |                                                                                              | M18*78                                                                                  |  8mm   | TRN18–08NO–E2                                                                                  | TRN18–08NC–E2  |
|                |            |                                                                                              | M30*78                                                                                  |  15mm | TRN30–15NO–E2                                                                                  | TRN30–15NC–E2  |

Noted: Model numbers ended with "PO"/"PO-E1"/"PO-E2" are PNP normally open ;model numbers ended with "PC"/"PC-E1"/"PC-E2" are PNP normally closed.

## Extended Distance DC 3-wire

| Type           | Appearance | Sensing distance                                                                                  | Model numbers                                                                           | Pages                                                                                    |                                                                                                  |               |
|----------------|------------|---------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|---------------|
|                |            | Unit: mm                                                                                          | NPN Normally open                                                                       | NPN Normally closed                                                                      |                                                                                                  |               |
| Pre-wired Type | Shielded   |  $\phi$ 6.5*45 |  2mm | TLF6.5-02NO                                                                              | TLF6.5-02NC                                                                                      |               |
|                |            |                | M8*45                                                                                   |  2mm  | TLF08-02NO                                                                                       | TLF08-02NC    |
|                |            |                                                                                                   | M12*45                                                                                  |  4mm  | TLF12-04NO                                                                                       | TLF12-04NC    |
|                |            |                                                                                                   | M18*54                                                                                  |  8mm  | TLF18-08NO                                                                                       | TLF18-08NC    |
|                |            |                                                                                                   | M30*54                                                                                  |  16mm | TLF30-16NO                                                                                       | TLF30-16NC    |
|                | Unshielded |  $\phi$ 6.5*44 |  4mm | TLN6.5-04NO                                                                              | TLN6.5-04NC                                                                                      |               |
|                |            |                | M8*44                                                                                   |  4mm  | TLN08-04NO  | TLN08-04NC    |
|                |            |                                                                                                   | M12*53                                                                                  |  8mm  | TLN12-08NO  | TLN12-08NC    |
|                |            |                                                                                                   | M18*58                                                                                  |  16mm | TLN18-16NO                                                                                       | TLN18-16NC    |
|                |            |                                                                                                   | M30*61                                                                                  |  25mm | TLN30-25NO                                                                                       | TLN30-25NC    |
| Connector Type | Shielded   |                | M8*60                                                                                   |  2mm  | TLF08-02NO-E1                                                                                    | TLF08-02NC-E1 |
|                |            |                                                                                                   | M12*68                                                                                  |  4mm  | TLF12-04NO-E2                                                                                    | TLF12-04NC-E2 |
|                |            |                                                                                                   | M18*82                                                                                  |  8mm  | TLF18-08NO-E2                                                                                    | TLF18-08NC-E2 |
|                |            |                                                                                                   | M30*78                                                                                  |  16mm | TLF30-16NO-E2                                                                                    | TLF30-16NC-E2 |
|                | Unshielded |                | M8*60                                                                                   |  4mm  | TLN08-04NO-E1                                                                                    | TLN08-04NC-E1 |
|                |            |                                                                                                   | M12*71                                                                                  |  8mm  | TLN12-08NO-E2                                                                                    | TLN12-08NC-E2 |
|                |            |                                                                                                   | M18*82                                                                                  |  16mm | TLN18-16NO-E2                                                                                    | TLN18-16NC-E2 |
|                |            |                                                                                                   | M30*81                                                                                  |  25mm | TLN30-25NO-E2                                                                                    | TLN30-25NC-E2 |

Noted: Model numbers ended with "PO"/"PO-E1"/"PO-E2" are PNP normally open ; model numbers ended with "PC"/"PC-E1"/"PC-E2" are PNP normally closed.

DC 3-wire **Long Distance**

| Type           | Appearance | Sensing distance                                                                                       | Model numbers                                                                            | Pages               |               |
|----------------|------------|--------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|---------------------|---------------|
| Unit: mm       |            | NPN Normally open                                                                                      |                                                                                          | NPN Normally closed |               |
| Pre-wired Type | Shielded   |  $\phi 6.5 \times 45$ |  3mm    | TYF6.5-03NO         | TYF6.5-03NC   |
|                |            | M8*45                                                                                                  |  3mm    | TYF08-03NO          | TYF08-03NC    |
|                |            | M12*45                                                                                                 |  6mm    | TYF12-06NO          | TYF12-06NC    |
|                |            | M18*54                                                                                                 |  12mm   | TYF18-12NO          | TYF18-12NC    |
|                |            | M30*54                                                                                                 |  22mm   | TYF30-22NO          | TYF30-22NC    |
|                | Unshielded |  $\phi 6.5 \times 44$ |  6mm    | TYN6.5-06NO         | TYN6.5-06NC   |
|                |            | M8*44                                                                                                  |  6mm    | TYN08-06NO          | TYN08-06NC    |
|                |            | M12*53                                                                                                 |  10mm   | TYN12-10NO          | TYN12-10NC    |
|                |            | M18*58                                                                                                 |  20mm   | TYN18-20NO          | TYN18-20NC    |
|                |            | M30*61                                                                                                 |  40mm   | TYN30-40NO          | TYN30-40NC    |
| Connector Type | Shielded   | M8*60                                                                                                  |  3mm    | TYF08-03NO-E1       | TYF08-03NC-E1 |
|                |            | M12*68                                                                                                 |  6mm    | TYF12-06NO-E2       | TYF12-06NC-E2 |
|                |            | M18*82                                                                                                 |  12mm   | TYF18-12NO-E2       | TYF18-12NC-E2 |
|                |            | M30*78                                                                                                 |  22mm   | TYF30-22NO-E2       | TYF30-22NC-E2 |
|                | Unshielded | M8*60                                                                                                  |  6mm    | TYN08-06NO-E1       | TYN08-06NC-E1 |
|                |            | M12*71                                                                                                 |  10mm   | TYN12-10NO-E2       | TYN12-10NC-E2 |
|                |            | M18*82                                                                                                 |  20mm   | TYN18-20NO-E2       | TYN18-20NC-E2 |
|                |            | M30*81                                                                                                 |  40mm | TYN30-40NO-E2       | TYN30-40NC-E2 |

Noted: Model numbers ended with "PO"/"PO-E1"/"PO-E2" are PNP normally open ;model numbers ended with "PC"/"PC-E1"/"PC-E2" are PNP normally closed.

Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

## Guidance

## Inductive sensors

Standard distance

Extended distance

Long distance

Square

Mini square

Mini-cylindrical

Short-body

Ring-type

Metal face

Temperature

IP69K high protection

Analog output

DC 2 wires

## Capacitive sensors

Cylindrical

Correction

resistance type

Flat type

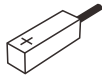
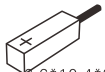
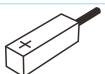
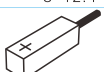
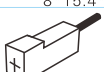
Level detection

DC 3-wire **Square**

| Type           | Appearance                                                                                      |            | Sensing distance                                                                        |                                                                                                | Model numbers       |            | Pages |
|----------------|-------------------------------------------------------------------------------------------------|------------|-----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|---------------------|------------|-------|
| Unit: mm       |                                                                                                 |            | NPN Normally open                                                                       |                                                                                                | NPN Normally closed |            |       |
| Pre-wired Type | <br>17*17*27 | Q17        | Shielded                                                                                |  5mm        | TQF17-05NO          | TQF17-05NC | E-26  |
|                |                                                                                                 |            | Unshielded                                                                              |  8mm        | TQN17-08NO          | TQN17-08NC |       |
|                | Q18                                                                                             | Shielded   |  5mm | TQF18-05NO  | TQF18-05NC          |            |       |
|                |                                                                                                 | Unshielded |  8mm | TQN18-08NO                                                                                     | TQN18-08NC          |            |       |
|                | Q18C                                                                                            | Shielded   |  5mm | TQF18C-05NO                                                                                    | TQF18C-05NC         |            |       |
|                |                                                                                                 | Unshielded |  8mm | TQN18C-08NO                                                                                    | TQN18C-08NC         |            |       |

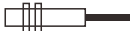
Noted: Model numbers ended with "PO" are PNP normally open ;model numbers ended with "PC" are PNP normally closed.

## Mini Square DC 3-wire

| Type           | Appearance | Sensing distance                                                                                   |                                                                                       | Model numbers                                                                                  | Pages                                                                                           |             |      |
|----------------|------------|----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|-------------|------|
|                |            | Unit: mm                                                                                           | NPN Normally open                                                                     |                                                                                                | NPN Normally closed                                                                             |             |      |
| Pre-wired Type | Unshielded | <br>6.2*6.4*20.4  | E06                                                                                   |  1mm          | TEN06-01NO                                                                                      | TEN06-01NC  | E-27 |
|                |            | <br>6.1*6.3*20.4  | E07                                                                                   |  1mm          | TEN07-01NO                                                                                      | TEN07-01NC  |      |
|                |            | <br>8*8.4*23.5    | E08                                                                                   |  2.5mm        | TEN08-2.5NO  | TEN08-2.5NC |      |
|                |            |                                                                                                    |  3mm | TEN08-03NO                                                                                     | TEN08-03NC                                                                                      |             |      |
|                |            | <br>8*8.4*25.5    | E09                                                                                   |  2.5mm        | TEN09-2.5NO                                                                                     | TEN09-2.5NC |      |
|                |            |                                                                                                    |  3mm | TEN09-03NO  | TEN09-03NC                                                                                      |             |      |
|                |            | <br>6.6*10.4*30.5 | E10                                                                                   |  2.5mm        | TEN10-2.5NO                                                                                     | TEN10-2.5NC |      |
|                |            |                                                                                                    |  4mm | TEN10-04NO                                                                                     | TEN10-04NC                                                                                      |             |      |
|                |            | <br>8*12.4*30.5   | E12                                                                                   |  4mm          | TEN12-04NO                                                                                      | TEN12-04NC  |      |
|                |            | <br>8*15.4*34.5   | E15                                                                                   |  5mm          | TEN15-05NO                                                                                      | TEN15-05NC  |      |
|                |            |                                                                                                    |  8mm | TEN15-08NO                                                                                     | TEN15-08NC                                                                                      |             |      |
|                |            | <br>15*16.4*24.5  | E16                                                                                   |  5mm          | TEN16-05NO                                                                                      | TEN16-05NC  |      |
|                |            |                                                                                                    |  8mm | TEN16-08NO                                                                                     | TEN16-08NC                                                                                      |             |      |

Noted: Model numbers ended with "PO" are PNP normally open ;model numbers ended with"PC" are PNP normally closed.

## Mini-cylindrical DC 3-wire

| Type           | Appearance | Sensing distance                                                                    |          | Model numbers     |             | Pages               |      |
|----------------|------------|-------------------------------------------------------------------------------------|----------|-------------------|-------------|---------------------|------|
|                |            | Unit: mm                                                                            |          | NPN Normally open |             | NPN Normally closed |      |
| Pre-wired Type | Shielded   |  | φ 3 * 25 | 0.6mm             | TXF03-0.6NO | TXF03-0.6NC         | E-29 |
|                |            |                                                                                     |          | 0.8mm             | TXF03-0.8NO | TXF03-0.8NC         |      |
|                |            |                                                                                     |          | 1.0mm             | TXF03-01NO  | TXF03-01NC          |      |
|                |            |  | φ 4 * 25 | 0.8mm             | TXF04-0.8NO | TXF04-0.8NC         |      |
|                |            |                                                                                     |          | 1.0mm             | TXF04-01NO  | TXF04-01NC          |      |
|                |            |                                                                                     |          | 1.2mm             | TXF04-1.2NO | TXF04-1.2NC         |      |
|                |            |                                                                                     |          | 1.5mm             | TXF04-1.5NO | TXF04-1.5NC         |      |
|                |            |  | M4 * 25  | 0.6mm             | TXFM4-0.6NO | TXFM4-0.6NC         |      |
|                |            |                                                                                     |          | 0.8mm             | TXFM4-0.8NO | TXFM4-0.8NC         |      |
|                |            |                                                                                     |          | 1.0mm             | TXFM4-01NO  | TXFM4-01NC          |      |
|                |            |                                                                                     | M5 * 25  | 0.8mm             | TXF05-0.8NO | TXF05-0.8NC         |      |
|                |            |                                                                                     |          | 1.0mm             | TXF05-01NO  | TXF05-01NC          |      |
|                |            |                                                                                     |          | 1.2mm             | TXF05-1.2NO | TXF05-1.2NC         |      |
|                |            |                                                                                     |          | 1.5mm             | TXF05-1.5NO | TXF05-1.5NC         |      |
|                |            |                                                                                     |          |                   |             |                     |      |
|                |            |                                                                                     |          |                   |             |                     |      |

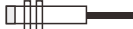
Noted: Model numbers ended with "PO" are PNP normally open ;model numbers ended with"PC" are PNP normally closed.

DC 3-wire **Ultra-short Body**

| Type           | Appearance | Sensing distance                                                                              | Model numbers                                                                         | Pages                                                                                          |               |      |
|----------------|------------|-----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|---------------|------|
| Unit: mm       |            | NPN Normally open                                                                             | NPN Normally closed                                                                   |                                                                                                |               |      |
| Pre-wired Type | Shielded   | <br>φ 6.5*18 |  1mm | TSSF6.5-01NO                                                                                   | TSSF6.5-01NC  | E-31 |
|                |            |  2mm         | TSSF6.5-02NO                                                                          | TSSF6.5-02NC                                                                                   |               |      |
|                |            |  3mm         | TSSF6.5-03NO                                                                          | TSSF6.5-03NC                                                                                   |               |      |
|                |            | <br>φ 6.5*18 |  1mm | TSSF6.5Y-01NO                                                                                  | TSSF6.5Y-01NC |      |
|                |            |  2mm         | TSSF6.5Y-02NO                                                                         | TSSF6.5Y-02NC                                                                                  |               |      |
|                |            |  3mm         | TSSF6.5Y-03NO                                                                         | TSSF6.5Y-03NC                                                                                  |               |      |
|                |            | <br>M8*18    |  1mm | TSSF08-01NO                                                                                    | TSSF08-01NC   |      |
|                |            |                                                                                               |  2mm | TSSF08-02NO  | TSSF08-02NC   |      |
|                |            | <br>M12*22   |  2mm | TSSF12-02NO                                                                                    | TSSF12-02NC   |      |
|                |            |                                                                                               |  4mm | TSSF12-04NO                                                                                    | TSSF12-04NC   |      |

Noted: Model numbers ended with "PO" are PNP normally open ;model numbers ended with "PC" are PNP normally closed.

DC 3-wire **Short-body**

| Type           | Appearance | Sensing distance                                                                    | Model numbers     | Pages                                                                                    |            |            |      |
|----------------|------------|-------------------------------------------------------------------------------------|-------------------|------------------------------------------------------------------------------------------|------------|------------|------|
|                |            | Unit: mm                                                                            | NPN Normally open | NPN Normally closed                                                                      |            |            |      |
| Pre-wired Type | Shielded   |  | M8*35             |  1mm  | TSF08-01NO | TSF08-01NC | E-32 |
|                |            |                                                                                     |                   |  2mm  | TSF08-02NO | TSF08-02NC |      |
|                |            |                                                                                     | M12*35            |  2mm  | TSF12-02NO | TSF12-02NC |      |
|                |            |                                                                                     |                   |  4mm  | TSF12-04NO | TSF12-04NC |      |
|                |            |                                                                                     | M18*35            |  5mm  | TSF18-05NO | TSF18-05NC |      |
|                |            |                                                                                     |                   |  8mm  | TSF18-08NO | TSF18-08NC |      |
|                |            |                                                                                     | M30*35            |  10mm | TSF30-10NO | TSF30-10NC |      |
|                |            |                                                                                     |                   |  16mm | TSF30-16NO | TSF30-16NC |      |
|                | Unshielded |  | M8*35             |  2mm  | TSN08-02NO | TSN08-02NC |      |
|                |            |                                                                                     |                   |  4mm  | TSN08-04NO | TSN08-04NC |      |
|                |            |                                                                                     | M12*35            |  4mm  | TSN12-04NO | TSN12-04NC |      |
|                |            |                                                                                     |                   |  8mm  | TSN12-08NO | TSN12-08NC |      |
|                |            |                                                                                     | M18*43            |  8mm  | TSN18-08NO | TSN18-08NC |      |
|                |            |                                                                                     |                   |  16mm | TSN18-16NO | TSN18-16NC |      |
|                |            |                                                                                     | M30*47            |  15mm | TSN30-15NO | TSN30-15NC |      |
|                |            |                                                                                     |                   |  25mm | TSN30-25NO | TSN30-25NC |      |

Noted: Model numbers ended with "PO" are PNP normally open ;model numbers ended with "PC" are PNP normally closed.

Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

## Guidance

## Inductive sensors

Standard distance

Extended distance

Long distance

Square

Mini square

Mini-cylindrical

Short-body

Ring-type

Metal face

Temperature

IP69K high protection

Analog output

DC 2 wires

## Capacitive sensors

Cylindrical

Correction

resistance type

Flat type

Level detection

## Ring-type DC 3-wire

| Type           | Appearance                                                                        | Sensing distance                                                                                            | Model numbers | Pages               |
|----------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|---------------|---------------------|
| Unit: mm       |                                                                                   | NPN Normally open                                                                                           |               | NPN Normally closed |
| Pre-wired Type |  | H10 Hole height:20  10.5mm | TH10-20NO     | TH10-20NC           |
|                |                                                                                   | H15 Hole height:20  15.5mm | TH15-20NO     | TH15-20NC           |
|                |                                                                                   | H21 Hole height:20  22.5mm | TH21-20NO     | TH21-20NC           |
|                |                                                                                   | H43 Hole height:20  43.5mm | TH43-20NO     | TH43-20NC           |

E-34

Noted: Model numbers ended with "PO" are PNP normally open ;model numbers ended with"PC" are PNP normally closed.

## Metal Face DC 3-wire

| Type           | Appearance                                                                                     | Sensing distance                                                                                | Model numbers | Pages               |
|----------------|------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|---------------|---------------------|
| Unit: mm       |                                                                                                | NPN Normally open                                                                               |               | NPN Normally closed |
| Pre-wired Type | Shielded     | M8*45  1mm     | TMF08-01NO    | TMF08-01NC          |
|                |                                                                                                |  2mm           | TMF08-02NO    | TMF08-02NC          |
|                |                                                                                                | M12*45  2mm    | TMF12-02NO    | TMF12-02NC          |
|                |                                                                                                |  4mm           | TMF12-04NO    | TMF12-04NC          |
|                |                                                                                                | M18*54  5mm  | TMF18-05NO    | TMF18-05NC          |
|                |                                                                                                |  8mm         | TMF18-08NO    | TMF18-08NC          |
|                |                                                                                                | M30*54  10mm | TMF30-10NO    | TMF30-10NC          |
|                |                                                                                                |  16mm        | TMF30-16NO    | TMF30-16NC          |
|                | Unshielded  | M8*49  2mm   | TMN08-02NO    | TMN08-02NC          |
|                |                                                                                                |  3mm         | TMN08-03NO    | TMN08-03NC          |
|                |                                                                                                | M12*54  4mm  | TMN12-04NO    | TMN12-04NC          |
|                |                                                                                                |  8mm         | TMN12-08NO    | TMN12-08NC          |
|                |                                                                                                | M18*62  8mm  | TMN18-08NO    | TMN18-08NC          |
|                |                                                                                                |  16mm        | TMN18-16NO    | TMN18-16NC          |
|                |                                                                                                | M30*66  15mm | TMN30-15NO    | TMN30-15NC          |
|                |                                                                                                |  25mm        | TMN30-25NO    | TMN30-25NC          |

E-35

Noted: Model numbers ended with "PO" are PNP normally open ;model numbers ended with"PC" are PNP normally closed.

Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

Guidance

## Inductive sensors

Standard distance

Extended distance

Long distance

Square

Mini square

Mini-cylindrical

Short-body

Ring-type

Metal face

Temperature

IP69K high protection

Analog output

DC 2 wires

## Capacitive sensors

Cylindrical

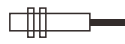
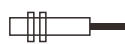
Correction

resistance type

Flat type

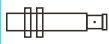
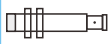
Level detection

DC 3-wire **Temperature Resistance**

| Type                       |            | Appearance                                                                        |                                                                                   | Sensing distance                                                                       |                                                                                                | Model numbers       |             | Pages |
|----------------------------|------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|---------------------|-------------|-------|
| Unit: mm                   |            |                                                                                   |                                                                                   | NPN Normally open                                                                      |                                                                                                | NPN Normally closed |             |       |
| High temperature resistant | 120℃       | Shielded                                                                          |  | M12*54                                                                                 |  2mm          | TGF12-02NO          | TGF12-02NC  | E-37  |
|                            |            |                                                                                   |                                                                                   | M18*55                                                                                 |  5mm          | TGF18-05NO          | TGF18-05NC  |       |
|                            |            |                                                                                   |                                                                                   | M30*51.5                                                                               |  10mm         | TGF30-10NO          | TGF30-10NC  |       |
|                            | Unshielded |  | M12*51                                                                            |  4mm  | TGN12-04NO                                                                                     | TGN12-04NC          |             |       |
|                            |            |                                                                                   | M18*51.5                                                                          |  8mm  | TGN18-08NO  | TGN18-08NC          |             |       |
|                            |            |                                                                                   | M30*51.5                                                                          |  15mm | TGN30-15NO                                                                                     | TGN30-15NC          |             |       |
|                            | 220℃       | Shielded                                                                          |  | M12*55                                                                                 |  2mm          | TGF12-02NO2         | TGF12-02PO2 |       |
|                            |            |                                                                                   |                                                                                   | M18*55                                                                                 |  5mm          | TGF18-05NO2         | TGF18-05PO2 |       |
|                            |            |                                                                                   |                                                                                   | M30*54                                                                                 |  10mm         | TGF30-10NO2         | TGF30-10PO2 |       |

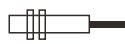
Noted: Model numbers ended with "PO" are PNP normally open ; model numbers ended with "PC" are PNP normally closed.

**IP69K High Protection**

| Type           | Appearance | Sensing distance                                                                    | Model numbers | Pages                                                                                    |               |               |      |
|----------------|------------|-------------------------------------------------------------------------------------|---------------|------------------------------------------------------------------------------------------|---------------|---------------|------|
| Unit: mm       |            |                                                                                     | NPN           | PNP                                                                                      |               |               |      |
| Pre-wired Type | Shielded   |   | M12*64.6      |  2mm    | TPF12-02NR-E2 | TPF12-02PR-E2 | E-39 |
|                |            |                                                                                     |               |  4mm    | TPF12-04NR-E2 | TPF12-04PR-E2 |      |
|                |            |                                                                                     | M18*63.1      |  5mm  | TPF18-05NR-E2 | TPF18-05PR-E2 | E-40 |
|                |            |                                                                                     |               |  8mm  | TPF18-08NR-E2 | TPF18-08PR-E2 |      |
|                | Unshielded |  | M12*64.6      |  4mm  | TPN12-04NR-E2 | TPN12-04PR-E2 | E-39 |
|                |            |                                                                                     |               |  8mm  | TPN12-08NR-E2 | TPN12-08PR-E2 |      |
|                |            |                                                                                     | M18*63.1      |  8mm  | TPN18-08NR-E2 | TPN18-08PR-E2 | E-40 |
|                |            |                                                                                     |               |  12mm | TPN18-12NR-E2 | TPN18-12PR-E2 |      |

Note: The model ending with \*\*NR-E2 is NPN normally open + normally closed; the model ending with \*\*PR-E2 is PNP normally open + normally closed.

DC 3-wire **Analog Output**

| Type           |            | Appearance                                                                          | Sensing distance |                                                                                          | Model numbers      |                    | Pages |
|----------------|------------|-------------------------------------------------------------------------------------|------------------|------------------------------------------------------------------------------------------|--------------------|--------------------|-------|
|                |            |                                                                                     | Unit: mm         |                                                                                          | PNP Current output | PNP Voltage output |       |
| Pre-wired Type | Shielded   |  | M12*45           |  3mm  | TAF12-03PA         | TAF12-03PV         | E-41  |
|                |            |                                                                                     | M18*54           |  4mm  | TAF18-04PA         | TAF18-04PV         |       |
|                |            |                                                                                     | M30*54           |  10mm | TAF30-10PA         | TAF30-10PV         |       |
|                | Unshielded |  | M12*44           |  4mm  | TAN12-04PA         | TAN12-04PV         |       |
|                |            |                                                                                     | M18*54           |  7mm  | TAN18-07PA         | TAN18-07PV         |       |
|                |            |                                                                                     | M30*58           |  14mm | TAN30-14PA         | TAN30-14PV         |       |

Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

Guidance

Inductive sensors

Standard distance

Extended distance

Long distance

Square

Mini square

Mini-cylindrical

Short-body

Ring-type

Metal face

Temperature

IP69K high protection

Analog output

DC 2 wires

Capacitive sensors

Cylindrical

Correction

resistance type

Flat type

Level detection

DC 2-Wire

| Type           | Appearance | Sensing distance                                                                    |          | Model numbers                                                                            |                 | Pages       |      |
|----------------|------------|-------------------------------------------------------------------------------------|----------|------------------------------------------------------------------------------------------|-----------------|-------------|------|
|                |            | Unit: mm                                                                            |          | Normally open                                                                            | Normally closed |             |      |
| Pre-wired Type | Shielded   |    | φ 6.5*45 |  1mm    | TDF6.5-01HO     | TDF6.5-01HC | F-42 |
|                |            |                                                                                     |          |  2mm    | TDF6.5-02HO     | TDF6.5-02HC |      |
|                |            |    | M8*45    |  1mm    | TDF08-01HO      | TDF08-01HC  |      |
|                |            |                                                                                     |          |  2mm    | TDF08-02HO      | TDF08-02HC  |      |
|                |            |    | M12*45   |  2mm    | TDF12-02HO      | TDF12-02HC  |      |
|                |            |                                                                                     |          |  4mm    | TDF12-04HO      | TDF12-04HC  |      |
|                |            |    | M18*54   |  5mm    | TDF18-05HO      | TDF18-05HC  |      |
|                |            |                                                                                     |          |  8mm    | TDF18-08HO      | TDF18-08HC  |      |
|                |            |    | M30*54   |  10mm   | TDF30-10HO      | TDF30-10HC  |      |
|                |            |                                                                                     |          |  16mm   | TDF30-16HO      | TDF30-16HC  |      |
|                | Unshielded |    | φ 6.5*44 |  2mm    | TDN6.5-02HO     | TDN6.5-02HC |      |
|                |            |                                                                                     |          |  4mm    | TDN6.5-04HO     | TDN6.5-04HC |      |
|                |            |    | M8*44    |  2mm    | TDN08-02HO      | TDN08-02HC  |      |
|                |            |                                                                                     |          |  4mm    | TDN08-04HO      | TDN08-04HC  |      |
|                |            |    | M12*44   |  4mm    | TDN12-04HO      | TDN12-04HC  |      |
|                |            |                                                                                     |          |  8mm    | TDN12-08HO      | TDN12-08HC  |      |
|                |            |   | M18*54   |  8mm    | TDN18-08HO      | TDN18-08HC  |      |
|                |            |                                                                                     |          |  16mm | TDN18-16HO      | TDN18-16HC  |      |
|                |            |  | M30*58   |  15mm | TDN30-15HO      | TDN30-15HC  |      |
|                |            |                                                                                     |          |  25mm | TDN30-25HO      | TDN30-25HC  |      |

F-42

Guidance

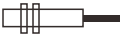
Inductive sensors

- Standard distance
- Extended distance
- Long distance
- Square
- Mini square
- Mini-cylindrical
- Short-body
- Ring-type
- Metal face
- Temperature
- IP69K high protection
- Analog output
- DC 2 wires

Capacitive sensors

- Cylindrical
- Correction resistanc type
- Flat type
- Level detection

DC 3-wire **Cylindrical**

| Type           | Appearance | Sensing distance                                                                                                                                                               | Model numbers     | Pages               |
|----------------|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|---------------------|
|                |            | Unit: mm                                                                                                                                                                       | NPN Normally open | NPN Normally closed |
| Plastic Shells | Shielded   |  M12*55  3mm | CKF12-03NO        | CKF12-03NC          |
|                |            | M18*70  8mm                                                                                   | CKF18-08NO        | CKF18-08NC          |
|                |            | M30*80  20mm                                                                                  | CKF30-20NO        | CKF30-20NC          |
|                | Unshielded |  M12*59  6mm | CKN12-06NO        | CKN12-06NC          |
|                |            | M18*73  15mm                                                                                  | CKN18-15NO        | CKN18-15NC          |
|                |            | M30*82  30mm                                                                                  | CKN30-30NO        | CKN30-30NC          |

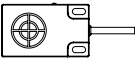
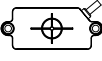
E-44

Noted: Model numbers ended with "PO" are PNP normally open ; model numbers ended with "PC" are PNP normally closed.

DC 4-wire **Corrosion Resistant Type**

| Type                      | Appearance                                                                        | Sensing distance                                                                                | Model numbers                         | Pages |
|---------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|---------------------------------------|-------|
|                           |                                                                                   | Unit: mm                                                                                        | NPN PNP Normally open/Normally closed |       |
| Teflon casing<br>Shielded |  | M18*70.5  10mm | CWF18-10NP                            | E-45  |

DC 3-wire **Flat Type**

| Appearance                                                                          | Sensing distance                                                                         | Model numbers      | Pages |
|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|--------------------|-------|
|  |  5mm  | CQ07-05NO/NC/PO/PC | E-46  |
|                                                                                     |  10mm | CQ07-10NO/NC/PO/PC |       |
|  |  8mm  | CQ07-08NO/NC/PO/PC | E-47  |

DC 3-wire **Liquid Level Detection**

| Type       | Appearance                                                                          | Exterior diameter of pipes | Model numbers                                                                                  | Pages               |
|------------|-------------------------------------------------------------------------------------|----------------------------|------------------------------------------------------------------------------------------------|---------------------|
|            |                                                                                     |                            | NPN Normally open                                                                              | NPN Normally closed |
| Unshielded |  | $\phi 8 \sim \phi 11$      | CE15-13NO                                                                                      | CE15-13NC           |
|            |  | $\phi 12 \sim \phi 26$     | CE30-26NO  | CE30-26NC           |

E-48

Noted: Model numbers ended with "PO" are PNP normally open ; model numbers ended with "PC" are PNP normally closed.

Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

## Guidance

Inductive sensors

Standard distance

Extended distance

Long distance

Square

Mini square

Mini-cylindrical

Short-body

Ring-type

Metal face

Temperature

IP69K high protection

Analog output

DC 2 wires

Capacitive sensors

Cylindrical

Correction  
resistant type

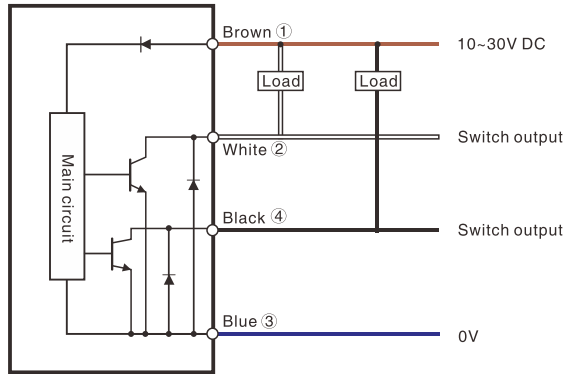
Flat type

Level detection

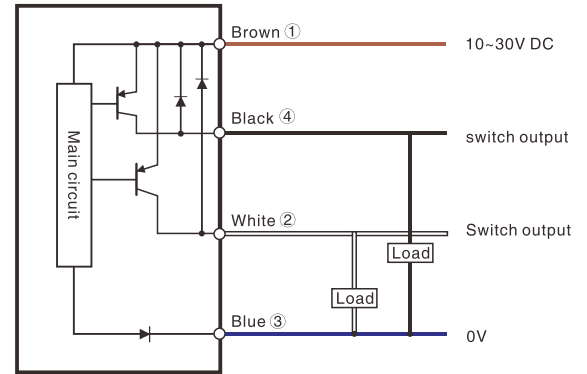
## Input/Output Circuit

## DC 4-Wire

## NPN Output

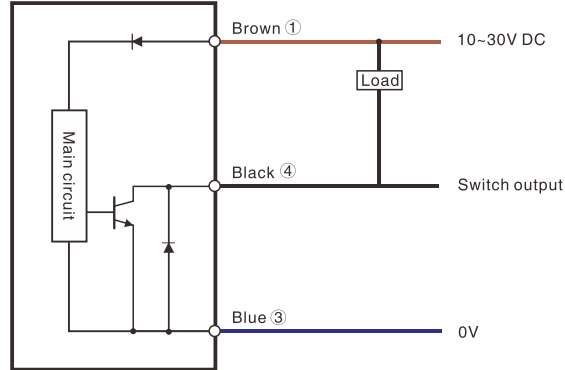


## PNP Output

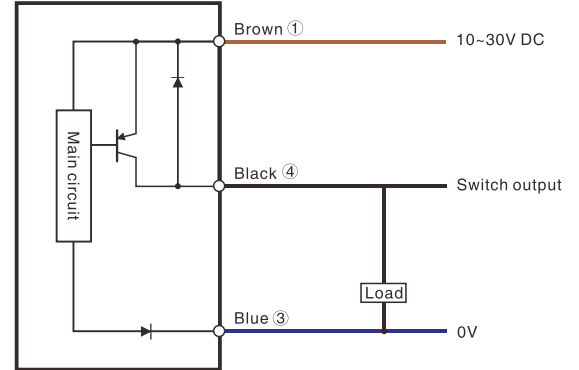


## DC 3-Wire

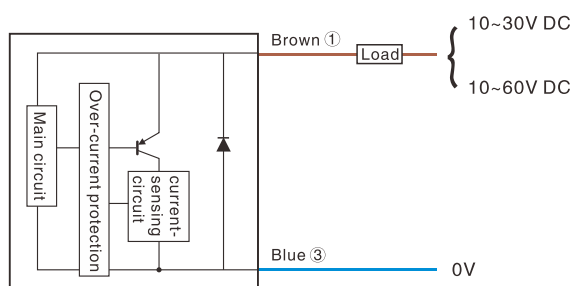
## NPN Output



## PNP Output

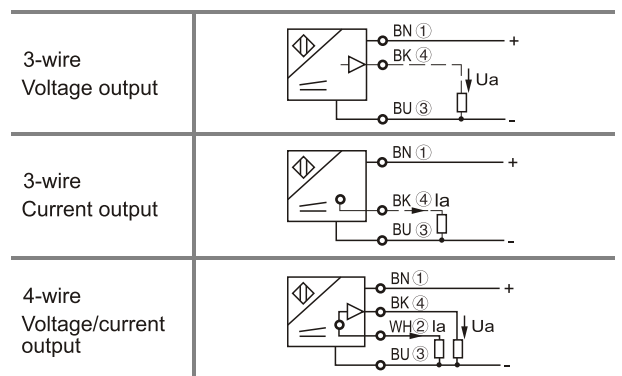


## DC 2-Wire



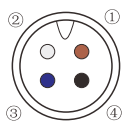
\*Load (can be connected between blue wire and negative power supply.)  
M8 sensor does not include short-circuit protection or current detection circuit. 1 and 4 in the circuit diagram show the connection of the connector type.

## Analog

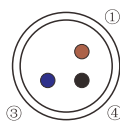


## Configuration of Connector Type Sensor

Note: Terminal 1 and 4 are used in connector models



M12 4 pin



M8 3 pin



| No. | Classification   | Explantion of model numbers                                                                                                                                                                                                                                                                                                                 |
|-----|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ①   | Series           | A: Analog Output      D: DC 2–wire      E: Mini Square<br>G: High–temperature Resistant      H: Ring–type<br>L: Extended Distance      M: Metal Face      Q: Square<br>R: Standard Distance      S: Short–body      P: IP69K<br>SS: Extra Short Outer Casing      X: Mini–cylindrical<br>Y: Long Distance      Z: Low Temperature Resistant |
| ②   | Mounting         | F: Shielded      N: Unshielded                                                                                                                                                                                                                                                                                                              |
| ③   | Specifications   | 08: M8      12: M12      18: M18      30: M30                                                                                                                                                                                                                                                                                               |
| ④   | Sensing Distance | 1.5: 1.5mm      02: 2mm      05: 5mm      08: 8mm                                                                                                                                                                                                                                                                                           |
| ⑤   | Output Type      | N: NPN      P: PNP      H: DC 2–Wire                                                                                                                                                                                                                                                                                                        |
| ⑥   | Output Status    | O: Normally open      C: Normally closed<br>A: Current output      V: Voltage output                                                                                                                                                                                                                                                        |
| ⑦   | Connection       | Null: Pre–wired type<br>E1: M8 3 pin connector      E2: M12 4 pin connector                                                                                                                                                                                                                                                                 |

Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

Guidance

Inductive sensors

Standard distance

Extended distance

Long distance

Square

Mini square

Mini-cylindrical

Short-body

Ring-type

Metal face

Temperature

IP69K high protection

Analog output

DC 2 wires

Capacitive sensors

Cylindrical

Correction

resistant type

Flat type

Level detection

Standard Distance

Pre-wired

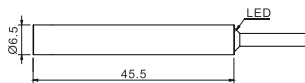
|                          |                                                                                   |                    |                                                                                   |                      |            |                                                                                    |           |                                                                                     |             |            |          |
|--------------------------|-----------------------------------------------------------------------------------|--------------------|-----------------------------------------------------------------------------------|----------------------|------------|------------------------------------------------------------------------------------|-----------|-------------------------------------------------------------------------------------|-------------|------------|----------|
| Appearance               |  |                    |  |                      |            |  |           |  |             |            |          |
| Mounting                 | Shielded                                                                          |                    | Shielded                                                                          |                      |            | Unshielded                                                                         |           | Unshielded                                                                          |             |            |          |
| Size                     | φ 6.5                                                                             | M8                 | M12                                                                               | M18                  | M30        | φ 6.5                                                                              | M8        | M12                                                                                 | M18         | M30        |          |
| Sensing distance         | 1.5mm ± 10%                                                                       | 1.5mm ± 10%        | 2mm ± 10%                                                                         | 5mm ± 10%            | 10mm ± 10% | 2mm ± 10%                                                                          | 2mm ± 10% | 4mm ± 10%                                                                           | 8mm ± 10%   | 15mm ± 10% |          |
| Housing material         | Stainless steel                                                                   |                    | Nickel copper alloy                                                               |                      |            | Stainless steel                                                                    |           | Nickel copper alloy                                                                 |             |            |          |
| Operating voltage        | 10~30V DC(Ripple < 10%)                                                           |                    |                                                                                   |                      |            |                                                                                    |           |                                                                                     |             |            |          |
| Voltage drop             | < 1.5V                                                                            | < 2.0V             |                                                                                   |                      |            | < 1.5V                                                                             | < 2.0V    |                                                                                     |             |            |          |
| Load Current, Max        | 150mA                                                                             |                    |                                                                                   |                      |            |                                                                                    |           |                                                                                     |             |            |          |
| Current consumption      | < 10mA                                                                            |                    |                                                                                   |                      |            |                                                                                    |           |                                                                                     | < 20mA      |            |          |
| Leakage current          | < 0.01mA                                                                          |                    |                                                                                   |                      |            |                                                                                    |           |                                                                                     |             |            |          |
| Switch frequency         | 2KHz                                                                              | 1.5KHz             | 1KHz                                                                              |                      | 300Hz      | 2KHz                                                                               | 1KHz      | 800Hz                                                                               | 500Hz       | 150Hz      |          |
| Repeat accuracy          | < 1.0% (Sr)                                                                       |                    |                                                                                   |                      |            |                                                                                    |           | < 5.0% (Sr)                                                                         | < 1.0% (Sr) |            |          |
| Hysteresis               | < 15% (Sr)                                                                        |                    |                                                                                   |                      |            |                                                                                    |           |                                                                                     |             |            |          |
| Sensing surface material | PBT                                                                               |                    |                                                                                   |                      |            |                                                                                    |           |                                                                                     |             |            |          |
| Operating temperature    | -25℃~+75℃                                                                         |                    |                                                                                   |                      |            |                                                                                    |           |                                                                                     |             |            |          |
| Circuit Protection       | Short circuit                                                                     |                    |                                                                                   |                      |            |                                                                                    |           |                                                                                     |             |            |          |
| Degree of protection     | IP67                                                                              |                    |                                                                                   |                      |            |                                                                                    |           |                                                                                     |             |            |          |
| Model No.                | NPN Normally open                                                                 | TRF6.5-1.5         | TRF08-1.5                                                                         | TRF12-02             | TRF18-05   | TRF30-10                                                                           | TRN6.5-02 | TRN08-02                                                                            | TRN12-04    | TRN18-08   | TRN30-15 |
|                          | Others                                                                            | :NPN Normally open |                                                                                   | :NPN Normally closed |            | :PNP Normally open                                                                 |           | :PNP Normally closed                                                                |             |            |          |

Connector Type

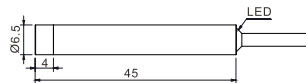
|                          |                   |                                                                                     |                     |                      |            |                                                                                       |                     |                      |            |
|--------------------------|-------------------|-------------------------------------------------------------------------------------|---------------------|----------------------|------------|---------------------------------------------------------------------------------------|---------------------|----------------------|------------|
| Appearance               |                   |  |                     |                      |            |  |                     |                      |            |
| Mounting                 |                   | Shielded                                                                            |                     |                      |            | Unshielded                                                                            |                     |                      |            |
| Size                     |                   | M8                                                                                  | M12                 | M18                  | M30        | M8                                                                                    | M12                 | M18                  | M30        |
| Sensing distance         |                   | 1.5mm ± 10%                                                                         | 2mm ± 10%           | 5mm ± 10%            | 10mm ± 10% | 2mm ± 10%                                                                             | 4mm ± 10%           | 8mm ± 10%            | 15mm ± 10% |
| Housing material         |                   | Stainless steel                                                                     | Nickel copper alloy |                      |            | Stainless steel                                                                       | Nickel copper alloy |                      |            |
| Operating voltage        |                   | 10~30V DC(Ripple < 10%)                                                             |                     |                      |            |                                                                                       |                     |                      |            |
| Voltage drop             |                   | < 1.5V                                                                              |                     |                      |            |                                                                                       |                     |                      |            |
| Load Current Max         |                   | 150mA                                                                               |                     |                      |            |                                                                                       |                     |                      |            |
| Current consumption      |                   | < 10mA                                                                              |                     |                      |            |                                                                                       |                     |                      |            |
| Leakage current          |                   | < 0.01mA                                                                            |                     |                      |            |                                                                                       |                     |                      |            |
| Switch frequency         |                   | 1.5KHz                                                                              | 2KHz                | 1KHz                 | 300Hz      | 1KHz                                                                                  | 500Hz               | 150Hz                |            |
| Repeat accuracy          |                   | < 1.0% (Sr)                                                                         |                     |                      |            |                                                                                       |                     |                      |            |
| Hysteresis               |                   | < 15% (Sr)                                                                          |                     |                      |            |                                                                                       |                     |                      |            |
| Sensing surface material |                   | PBT                                                                                 |                     |                      |            |                                                                                       |                     |                      |            |
| Operating temperature    |                   | -25℃~+75℃                                                                           |                     |                      |            |                                                                                       |                     |                      |            |
| Circuit Protection       |                   | Short circuit                                                                       |                     |                      |            |                                                                                       |                     |                      |            |
| Degree of protection     |                   | IP67                                                                                |                     |                      |            |                                                                                       |                     |                      |            |
| Model No.                | NPN Normally open | TRF08-1.5                                                                           | TRF12-02            | TRF18-05             | TRF30-10   | TRN08-02                                                                              | TRN12-04            | TRN18-08             | TRN30-15   |
|                          | Others            | :NPN Normally open                                                                  |                     | :NPN Normally closed |            | :PNP Normally open                                                                    |                     | :PNP Normally closed |            |

φ6.5

TRF6.5-1.5□□

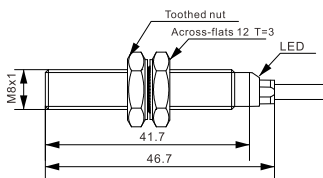


TRN6.5-02□□

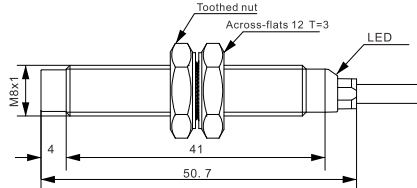


M8

TRF08-1.5□□

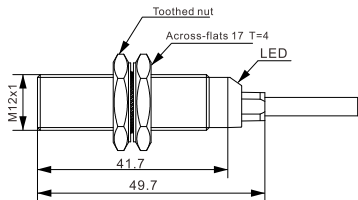


TRN08-02□□

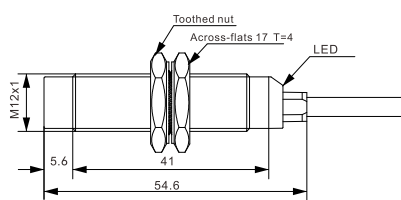


M12

TRF12-02□□

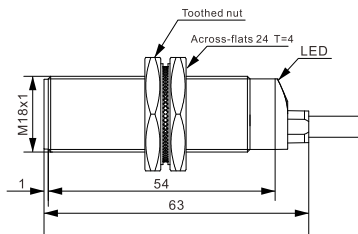


TRN12-04□□

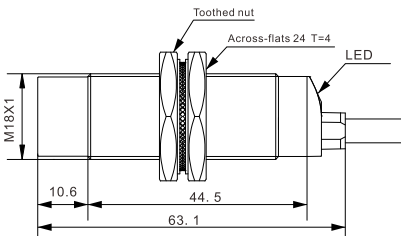


M18

TRF18-05□□

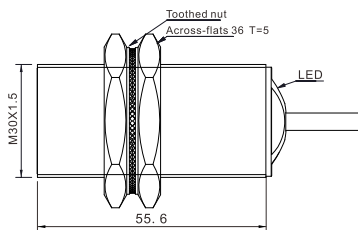


TRN18-08□□

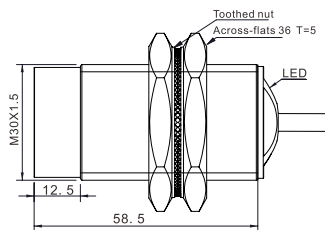


M30

TRF30-10□□



TRN30-15□□



Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

Guidance

Inductive sensors

Standard distance

Extended distance

Long distance

Square

Mini square

Mini-cylindrical

Short-body

Ring-type

Metal face

Temperature

IP69K high protection

Analog output

DC 2 wires

Capacitive sensors

Cylindrical

Correction

resistanc type

Flat type

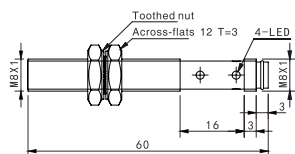
Level detection

# Standard Distance

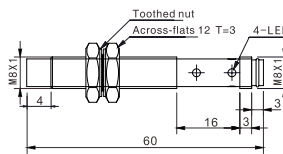
## Dimensions- Connector Type (Unit:mm)

### M8

#### TRF08-1.5□□-E1



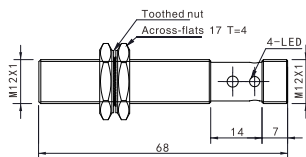
#### TRN08-02□□-E1



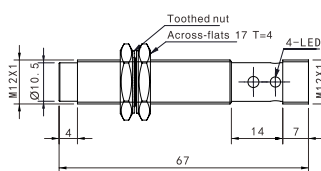
M8 3芯

### M12

#### TRF12-02□□-E2



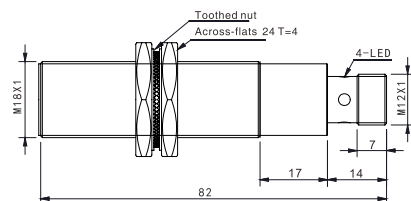
#### TRN12-04□□-E2



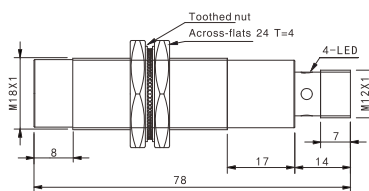
M12 4芯

### M18

#### TRF18-05□□-E2



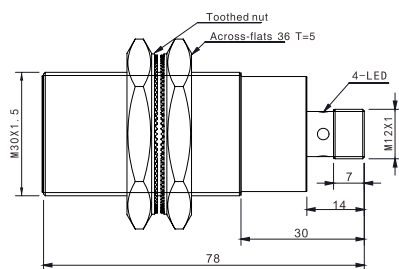
#### TRN18-08□□-E2



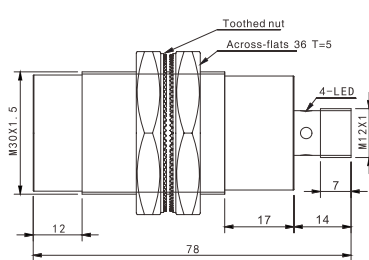
M18 4芯

### M30

#### TRF30-10□□-E2



#### TRN30-15□□-E2



M12 4芯

- Fiber Optic
- Slot Sensors
- Photoelectric
- Laser
- Proximity**
- Displacement
- Magnetic
- Contact
- Area
- Ultrasonic
- Vision
- Code Readers
- Vibration
- Temperature
- Accessories
- Guidance

- Inductive sensors**
- Standard distance**
- Extended distance
- Long distance
- Square
- Mini square
- Mini-cylindrical
- Short-body
- Ring-type
- Metal face
- Temperature
- IP69K high protection
- Analog output
- DC 2 wires

- Capacitive sensors**
- Cylindrical
- Correction resistant type
- Flat type
- Level detection

|                          |                                                                                   |                        |                     |                          |            |                                                                                    |            |                          |            |            |          |
|--------------------------|-----------------------------------------------------------------------------------|------------------------|---------------------|--------------------------|------------|------------------------------------------------------------------------------------|------------|--------------------------|------------|------------|----------|
| Appearance               |  |                        |                     |                          |            |  |            |                          |            |            |          |
| Mounting                 | Shielded                                                                          |                        | Shielded            |                          |            | Unshielded                                                                         |            | Unshielded               |            |            |          |
| Size                     | φ 6.5                                                                             | M8                     | M12                 | M18                      | M30        | φ 6.5                                                                              | M8         | M12                      | M18        | M30        |          |
| Sensing distance         | 2mm ± 10%                                                                         | 2mm ± 10%              | 4mm ± 10%           | 8mm ± 10%                | 16mm ± 10% | 4mm ± 10%                                                                          | 4mm ± 10%  | 8mm ± 10%                | 16mm ± 10% | 25mm ± 10% |          |
| Housing material         | Stainless steel                                                                   |                        | Nickel copper alloy |                          |            | Stainless steel                                                                    |            | Nickel copper alloy      |            |            |          |
| Operating voltage        | 10~30V DC(Ripple < 10%)                                                           |                        |                     |                          |            |                                                                                    |            |                          |            |            |          |
| Voltage drop             | < 1.5V                                                                            |                        | < 2.0V              |                          |            | < 1.5V                                                                             |            | < 2.0V                   |            |            |          |
| Load Current, Max        | 150mA                                                                             |                        |                     |                          |            |                                                                                    |            |                          |            |            |          |
| Current consumption      | < 10mA                                                                            |                        |                     |                          |            |                                                                                    |            |                          |            |            |          |
| Leakage current          | < 0.01mA                                                                          |                        |                     |                          |            |                                                                                    |            |                          |            |            |          |
| Switch frequency         | 2KHz                                                                              | 1KHz                   | 300Hz               | 500Hz                    | 150Hz      | 1KHz                                                                               | 800Hz      | 500Hz                    | 150Hz      | 100Hz      |          |
| Repeat accuracy          | < 1.0%(Sr)                                                                        |                        | < 5.0%(Sr)          |                          | < 1.0%(Sr) |                                                                                    | < 5.0%(Sr) |                          | < 1.0%(Sr) |            |          |
| Hysteresis               | < 15%(Sr)                                                                         |                        |                     |                          |            |                                                                                    |            |                          |            |            |          |
| Sensing surface material | PBT                                                                               |                        |                     |                          |            |                                                                                    |            |                          |            |            |          |
| Operating temperature    | -25℃~+75℃                                                                         |                        |                     |                          |            |                                                                                    |            |                          |            |            |          |
| Circuit Protection       | Short circuit                                                                     |                        |                     |                          |            |                                                                                    |            |                          |            |            |          |
| Degree of protection     | IP67                                                                              |                        |                     |                          |            |                                                                                    |            |                          |            |            |          |
| Model No.                | NPN Normally open                                                                 | TLF6.5-02              | TLF08-02            | TLF12-04                 | TLF18-08   | TLF30-16                                                                           | TLN6.5-04  | TLN08-04                 | TLN12-08   | TLN18-16   | TLN30-25 |
|                          | Others                                                                            | [NO]:NPN Normally open |                     | [NC]:NPN Normally closed |            | [PO]:PNP Normally open                                                             |            | [PC]:PNP Normally closed |            |            |          |

## Connector Type




|                          |                         |                       |               |                         |                 |                       |               |                         |               |
|--------------------------|-------------------------|-----------------------|---------------|-------------------------|-----------------|-----------------------|---------------|-------------------------|---------------|
| Appearance               |                         |                       |               |                         |                 |                       |               |                         |               |
| Mounting                 | Shielded                |                       |               |                         |                 | Unshielded            |               |                         |               |
| Size                     | M8                      | M12                   | M18           | M30                     | M8              | M12                   | M18           | M30                     |               |
| Sensing distance         | 2mm ± 10%               | 4mm ± 10%             | 8mm ± 10%     | 16mm ± 10%              | 4mm ± 10%       | 8mm ± 10%             | 16mm ± 10%    | 25mm ± 10%              |               |
| Housing material         | Stainless steel         | Nickel copper alloy   |               |                         | Stainless steel | Nickel copper alloy   |               |                         |               |
| Operating voltage        | 10~30V DC(Ripple < 10%) |                       |               |                         |                 |                       |               |                         |               |
| Voltage drop             | < 1.5V                  |                       |               |                         |                 |                       |               |                         |               |
| Load Current, Max        | 150mA                   |                       |               |                         |                 |                       |               |                         |               |
| Current consumption      | < 10mA                  |                       |               |                         |                 |                       |               |                         |               |
| Leakage current          | < 0.01mA                |                       |               |                         |                 |                       |               |                         |               |
| Switch frequency         | 1KHz                    |                       | 500Hz         | 150Hz                   | 800Hz           | 500Hz                 | 150Hz         | 100Hz                   |               |
| Repeat accuracy          | < 1.0% (Sr)             |                       |               |                         |                 |                       |               |                         |               |
| Hysteresis               | < 15% (Sr)              |                       |               |                         |                 |                       |               |                         |               |
| Sensing surface material | PBT                     |                       |               |                         |                 |                       |               |                         |               |
| Operating temperature    | -25°C~+75°C             |                       |               |                         |                 |                       |               |                         |               |
| Circuit Protection       | Short circuit           |                       |               |                         |                 |                       |               |                         |               |
| Degree of protection     | IP67                    |                       |               |                         |                 |                       |               |                         |               |
| Model No.                | NPN Normally open       | TLF08-02NO-E1         | TLF12-04NO-E2 | TLF18-08NO-E2           | TLF30-16NO-E2   | TLN08-04NO-E1         | TLN12-08NO-E2 | TLN18-16NO-E2           | TLN30-25NO-E2 |
|                          | Others                  | NO: NPN Normally open |               | NC: NPN Normally closed |                 | PO: PNP Normally open |               | PC: PNP Normally closed |               |

Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

## Guidance

Inductive sensors

Standard distance

Extended distance

Long distance

Square

Mini square

Mini-cylindrical

Short-body

Ring-type

Metal face

Temperature

IP69K high protection

Analog output

DC 2 wires

Capacitive sensors

Cylindrical

Correction resistanc type

Flat type

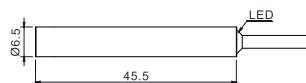
Level detection

## Extended Distance

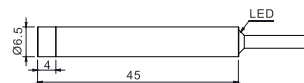
## Dimensions-Pre-wired Type (Unit:mm)

φ6.5

TLF6.5-02□□

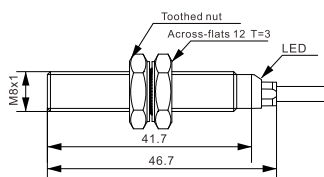


TLN6.5-04□□

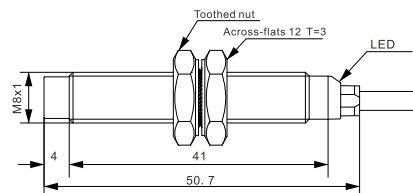


M8

TLF08-02□□

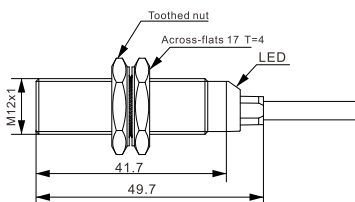


TLN08-04□□

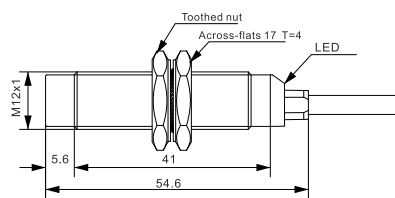


M12

TLF12-04□□

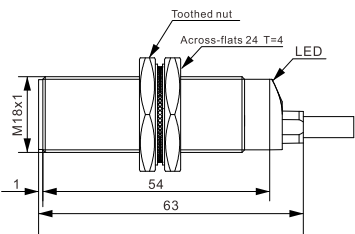


TLN12-08□□

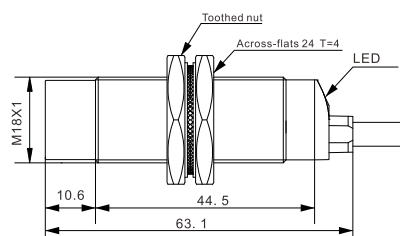


M18

TLF18-08□□

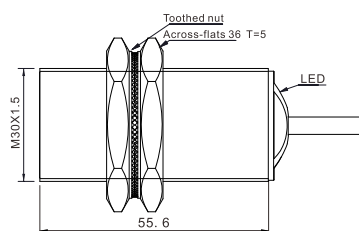


TLN18-16□□

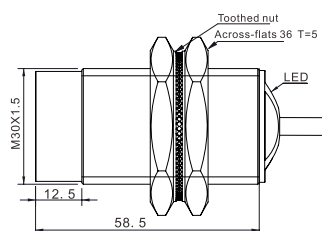


M30

TLF30-16□□



TLN30-25□□



Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

Guidance

Inductive sensors

Standard distance

Extended distance

Long distance

Square

Mini square

Mini-cylindrical

Short-body

Ring-type

Metal face

Temperature

IP69K high protection

Analog output

DC 2 wires

Capacitive sensors

Cylindrical

Correction

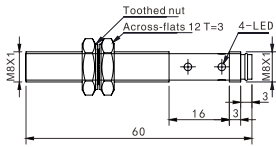
resistance type

Flat type

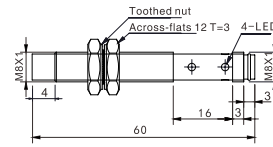
Level detection

M8

TLF08-02□□-E1



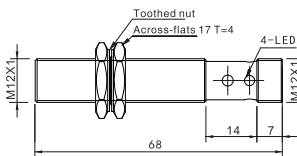
TLN08-04□□-E1



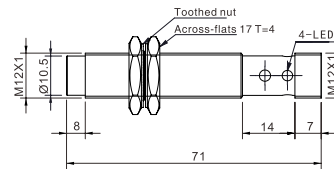
M8 3PIN

M12

TLF12-04□□-E2



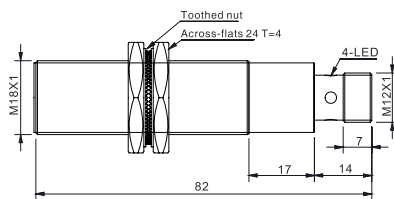
TLN12-08□□-E2



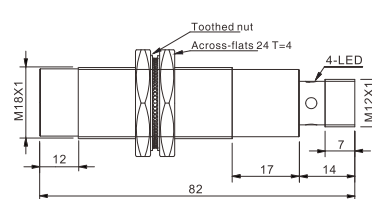
M12 4PIN

M18

TLF18-08□□-E2



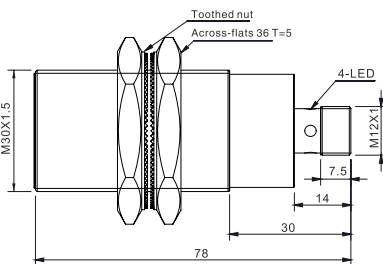
TLN18-16□□-E2



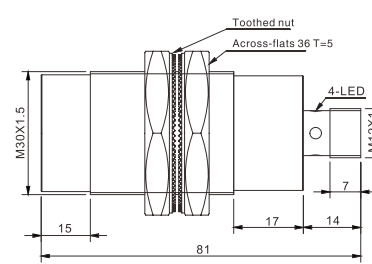
M12 4PIN

M30

TLF30-16□□-E2



TLN30-25□□-E2



M12 4PIN

- Fiber Optic
- Slot Sensors
- Photoelectric
- Laser
- Proximity**
- Displacement
- Magnetic
- Contact
- Area
- Ultrasonic
- Vision
- Code Readers
- Vibration
- Temperature
- Accessories

### Guidance

- Inductive sensors**
  - Standard distance
  - Extended distance**
  - Long distance
  - Square
  - Mini square
  - Mini-cylindrical
  - Short-body
  - Ring-type
  - Metal face
  - Temperature
  - IP69K high protection
  - Analog output
  - DC 2 wires

- Capacitive sensors**
  - Cylindrical
  - Correction
  - resistance type
  - Flat type
  - Level detection

Long Distance

Pre-wired



|                          |                         |                       |                     |                         |            |                       |             |                         |            |            |            |
|--------------------------|-------------------------|-----------------------|---------------------|-------------------------|------------|-----------------------|-------------|-------------------------|------------|------------|------------|
| Appearance               |                         |                       |                     |                         |            |                       |             |                         |            |            |            |
| Mounting                 | Shielded                |                       | Shielded            |                         |            | Unshielded            |             | Unshielded              |            |            |            |
| Size                     | φ 6.5                   | M8                    | M12                 | M18                     | M30        | φ 6.5                 | M8          | M12                     | M18        | M30        |            |
| Sensing distance         | 3mm ± 10%               | 3mm ± 10%             | 6mm ± 10%           | 12mm ± 10%              | 22mm ± 10% | 6mm ± 10%             | 6mm ± 10%   | 10mm ± 10%              | 20mm ± 10% | 40mm ± 10% |            |
| Housing material         | Stainless steel         |                       | Nickel copper alloy |                         |            | Stainless steel       |             | Nickel copper alloy     |            |            |            |
| Operating voltage        | 10~30V DC(Ripple < 10%) |                       |                     |                         |            |                       |             |                         |            |            |            |
| Voltage drop             | < 1.5V                  |                       |                     |                         |            |                       |             |                         |            |            |            |
| Load Current, Max        | 150mA                   |                       |                     |                         |            |                       |             |                         |            |            |            |
| Current consumption      | < 10mA                  |                       |                     |                         |            |                       |             |                         |            |            |            |
| Leakage current          | < 0.01mA                |                       |                     |                         |            |                       |             |                         |            |            |            |
| Switch frequency         | 1 KHz                   |                       | 800Hz               | 300Hz                   | 150Hz      | 500Hz                 |             | 400Hz                   | 100Hz      |            |            |
| Repeat accuracy          | < 5.0% (Sr)             |                       |                     |                         |            |                       |             |                         |            |            |            |
| Hysteresis               | < 15% (Sr)              |                       |                     |                         |            |                       |             |                         |            |            |            |
| Sensing surface material | PBT                     |                       |                     |                         |            |                       |             |                         |            |            |            |
| Operating Temperature    | -25℃~+75℃               |                       |                     |                         |            |                       |             |                         |            |            |            |
| Circuit Protection       | Short circuit           |                       |                     |                         |            |                       |             |                         |            |            |            |
| Degree of protection     | IP67                    |                       |                     |                         |            |                       |             |                         |            |            |            |
| Model No.                | NPN Normally open       | TYF6.5-03NO           | TYF08-03NO          | TYF12-06NO              | TYF18-12NO | TYF30-22NO            | TYN6.5-06NO | TYN08-06NO              | TYN12-10NO | TYN18-20NO | TYN30-40NO |
|                          | Others                  | NO: NPN Normally open |                     | NC: NPN Normally closed |            | PO: PNP Normally open |             | PC: PNP Normally closed |            |            |            |

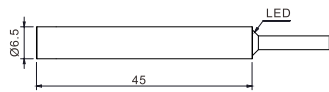
Connector Type



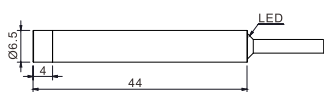

|                          |                         |                       |               |                         |                 |                       |               |                         |               |
|--------------------------|-------------------------|-----------------------|---------------|-------------------------|-----------------|-----------------------|---------------|-------------------------|---------------|
| Appearance               |                         |                       |               |                         |                 |                       |               |                         |               |
| Mounting                 |                         | Shielded              |               |                         |                 | Unshielded            |               |                         |               |
| Size                     | M8                      | M12                   | M18           | M30                     | M8              | M12                   | M18           | M30                     |               |
| Sensing distance         | 3mm ± 10%               | 6mm ± 10%             | 12mm ± 10%    | 22mm ± 10%              | 6mm ± 10%       | 10mm ± 10%            | 20mm ± 10%    | 40mm ± 10%              |               |
| Housing material         | Stainless steel         | Nickel copper alloy   |               |                         | Stainless steel | Nickel copper alloy   |               |                         |               |
| Operating voltage        | 10~30V DC(Ripple < 10%) |                       |               |                         |                 |                       |               |                         |               |
| Voltage drop             | < 1.5V                  |                       |               |                         |                 |                       |               |                         |               |
| Load Current , Max       | 150mA                   |                       |               |                         |                 |                       |               |                         |               |
| Current consumption      | < 10mA                  |                       |               |                         |                 |                       |               |                         |               |
| Leakage current          | < 0.01mA                |                       |               |                         |                 |                       |               |                         |               |
| Switch frequency         | 1 KHz                   | 800Hz                 | 300Hz         | 150Hz                   | 500Hz           | 400Hz                 | 100Hz         |                         |               |
| Repeat accuracy          | < 5.0% (Sr)             |                       |               |                         |                 |                       |               |                         |               |
| Hysteresis               | < 15% (Sr)              |                       |               |                         |                 |                       |               |                         |               |
| Sensing surface material | PBT                     |                       |               |                         |                 |                       |               |                         |               |
| Operating Temperature    | -25℃~+75℃               |                       |               |                         |                 |                       |               |                         |               |
| Circuit Protection       | Short circuit           |                       |               |                         |                 |                       |               |                         |               |
| Degree of protection     | IP67                    |                       |               |                         |                 |                       |               |                         |               |
| Model No.                | NPN Normally open       | TYF08-03NO-E1         | TYF12-06NO-E2 | TYF18-12NO-E2           | TYF30-22NO-E2   | TYN08-06NO-E1         | TYN12-10NO-E2 | TYN18-20NO-E2           | TYN30-40NO-E2 |
|                          | Others                  | NO: NPN Normally open |               | NC: NPN Normally closed |                 | PO: PNP Normally open |               | PC: PNP Normally closed |               |

φ6.5

TYF6.5-03□□

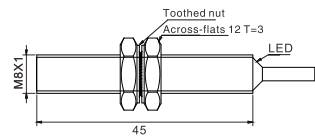


TYN6.5-06□□

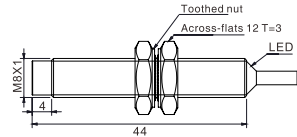


M8

TYF08-03□□

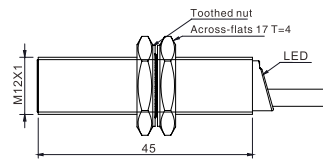


TYN08-06□□

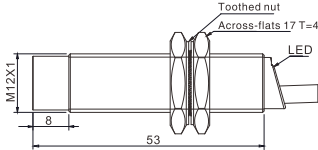


M12

TYF12-06□□

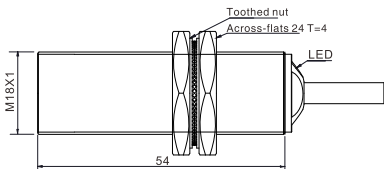


TYN12-10□□

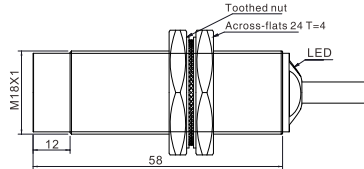


M18

TYF18-12□□

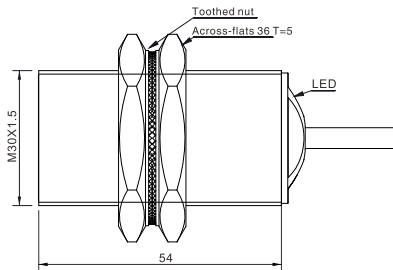


TYN18-20□□

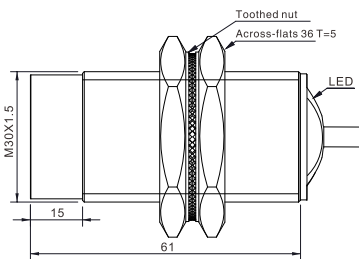


M30

TYF30-22□□



TYN30-40□□



Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

Guidance

Inductive sensors

Standard distance

Extended distance

Long distance

Square

Mini square

Mini-cylindrical

Short-body

Ring-type

Metal face

Temperature

IP69K high protection

Analog output

DC 2 wires

Capacitive sensors

Cylindrical

Correction

resistance type

Flat type

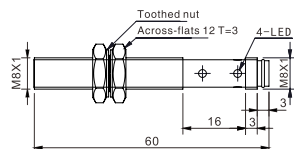
Level detection

## Long Distance

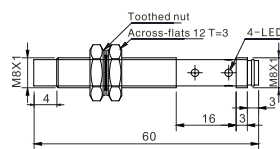
## Dimensions-Connector Type (Unit:mm)

## M8

## TYF08-03□□-E1



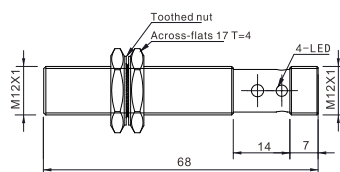
## TYN08-06□□-E1



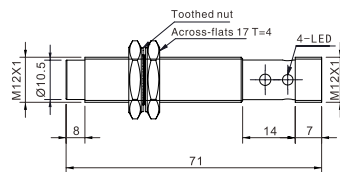
M8 3芯

## M12

## TYF12-06□□-E2



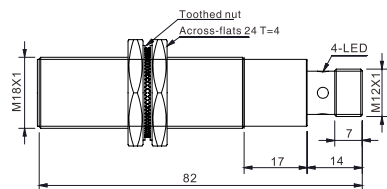
## TYN12-10□□-E2



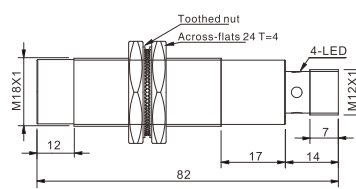
M12 4芯

## M18

## TYF18-12□□-E2



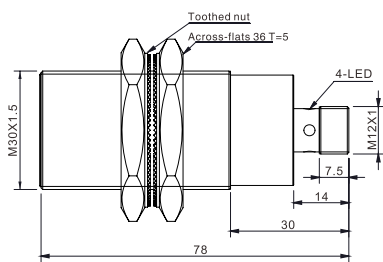
## TYN18-20□□-E2



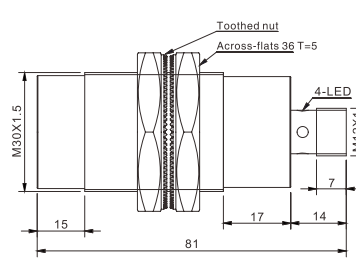
M12 4芯

## M30

## TYF30-22□□-E2



## TYN30-40□□-E2



M12 4芯

Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

Guidance

## Inductive sensors

Standard distance

Extended distance

Long distance

Square

Mini square

Mini-cylindrical

Short-body

Ring-type

Metal face

Temperature

IP69K high protection

Analog output

DC 2 wires

## Capacitive sensors

Cylindrical

Correction

resistance type

Flat type

Level detection

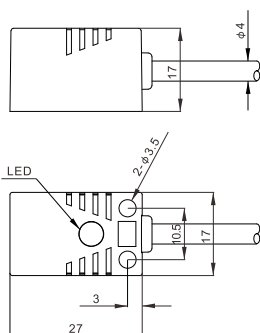


| Mounting                 | Shielded                                                                                                                      | Unshielded    | Shielded      | Unshielded    | Shielded       | Unshielded     |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------|---------------|---------------|---------------|----------------|----------------|
| Size                     | Q17                                                                                                                           |               | Q18           |               | Q18C           |                |
| Sensing distance         | 5mm ± 10%                                                                                                                     | 8mm ± 10%     | 5mm ± 10%     | 8mm ± 10%     | 5mm ± 10%      | 8mm ± 10%      |
| Housing material         | Plastic                                                                                                                       |               |               |               |                |                |
| Operating voltage        | 10~30V DC                                                                                                                     |               |               |               |                |                |
| Voltage drop             | < 1.5V                                                                                                                        |               |               |               |                |                |
| Load Current, Max        | 150mA                                                                                                                         |               |               |               |                |                |
| Current consumption      | < 10mA                                                                                                                        |               |               |               |                |                |
| Leakage current          | < 0.01mA                                                                                                                      |               |               |               |                |                |
| Switch frequency         | 1KHz                                                                                                                          | 300Hz         | 1KHz          | 300Hz         | 1KHz           | 300Hz          |
| Repeat accuracy          | < 1.0% (Sr)                                                                                                                   |               |               |               |                |                |
| Hysteresis               | < 15% (Sr)                                                                                                                    |               |               |               |                |                |
| Sensing surface material | ABS                                                                                                                           |               |               |               |                |                |
| Operating Temperature    | -25°C~+75°C                                                                                                                   |               |               |               |                |                |
| Circuit Protection       | Short circuit                                                                                                                 |               |               |               |                |                |
| Degree of protection     | IP67                                                                                                                          |               |               |               |                |                |
| Model No.                | TQF17-05[NIO]                                                                                                                 | TQN17-08[NIO] | TQF18-05[NIO] | TQN18-08[NIO] | TQF18C-05[NIO] | TQN18C-08[NIO] |
|                          | NPN Normally open    NIO: NPN Normally open    NIO: NPN Normally closed    PNO: PNP Normally open    PNO: PNP Normally closed |               |               |               |                |                |

## Dimensions (Unit:mm)

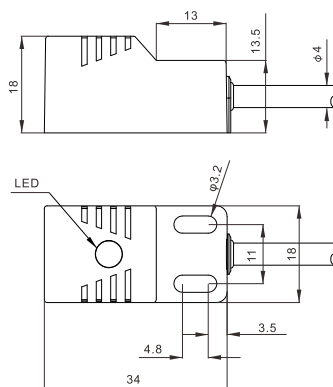
## Q17

TQF17-05□□  
TQN17-08□□



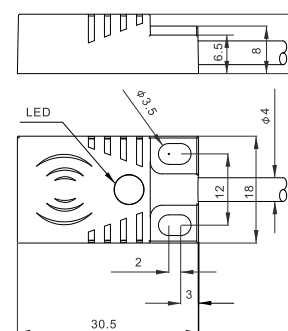
## Q18

TQF18-05□□  
TQN18-08□□



## Q18C

TQF18C-05□□  
TQN18C-08□□



Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

Guidance

Inductive sensors

Standard distance

Extended distance

Long distance

Square

Mini square

Mini-cylindrical

Short-body

Ring-type

Metal face

Temperature

IP69K high protection

Analog output

DC 2 wires

Capacitive sensors

Cylindrical

Correction

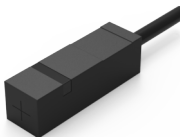
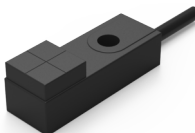
resistance type

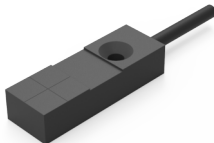
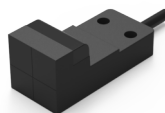
Flat type

Level detection

## Mini-square

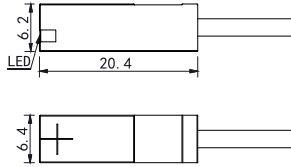
## Pre-wired

|                          |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                          |
|--------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------|
| Appearance               |  |  |  |  |                          |
| Mounting                 | Unshielded                                                                        | Unshielded                                                                        | Unshielded                                                                         | Unshielded                                                                          |                          |
| Size                     | E06                                                                               | E07                                                                               | E08                                                                                | E09                                                                                 |                          |
| Sensing distance         | 1mm ± 15%                                                                         | 1mm ± 15%                                                                         | 2.5mm ± 10%                                                                        | 2.5mm ± 10%                                                                         |                          |
| Housing material         | Plastic                                                                           |                                                                                   |                                                                                    |                                                                                     |                          |
| Operating voltage        | 10~30V DC(Ripple< 10%)                                                            |                                                                                   |                                                                                    |                                                                                     |                          |
| Voltage drop             | < 1.5V                                                                            |                                                                                   |                                                                                    |                                                                                     |                          |
| Load Current , Max       | 100mA                                                                             |                                                                                   | 150mA                                                                              |                                                                                     |                          |
| Current consumption      | < 10mA                                                                            |                                                                                   |                                                                                    |                                                                                     |                          |
| Leakage current          | < 0.01mA                                                                          |                                                                                   |                                                                                    |                                                                                     |                          |
| Switch frequency         | 500Hz                                                                             |                                                                                   | 800Hz                                                                              |                                                                                     |                          |
| Repeat accuracy          | < 5% (Sr)                                                                         |                                                                                   | < 1% (Sr)                                                                          |                                                                                     |                          |
| Hysteresis               | < 15% (Sr)                                                                        |                                                                                   |                                                                                    |                                                                                     |                          |
| Sensing surface material | PC                                                                                |                                                                                   |                                                                                    |                                                                                     |                          |
| Operating Temperature    | -25℃~+75℃                                                                         |                                                                                   |                                                                                    |                                                                                     |                          |
| Circuit Protection       | —                                                                                 |                                                                                   | Short circuit                                                                      |                                                                                     |                          |
| Degree of protection     | IP67                                                                              |                                                                                   |                                                                                    |                                                                                     |                          |
| Model No.                | NPN<br>Normally open                                                              | TEN06-01NNO                                                                       | TEN07-01NNO                                                                        | TEN08-2.5NNO (HOT)                                                                  | TEN09-2.5NNO (HOT)       |
|                          | Others                                                                            | NNO:NPN Normally open                                                             | NNC:NPN Normally closed                                                            | PNNO: PNP Normally open                                                             | PNC: PNP Normally closed |

|                          |                                                                                     |                                                                                     |                                                                                      |                                                                                       |                         |
|--------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-------------------------|
| Appearance               |  |  |  |  |                         |
| Mounting                 | Unshielded                                                                          | Unshielded                                                                          | Unshielded                                                                           | Unshielded                                                                            |                         |
| Size                     | E10                                                                                 | E12                                                                                 | E15                                                                                  | E16                                                                                   |                         |
| Sensing distance         | 2.5mm/4mm ± 10%                                                                     | 4mm ± 10%                                                                           | 5mm/8mm ± 10%                                                                        | 5mm/8mm ± 10%                                                                         |                         |
| Housing material         | Plastic                                                                             |                                                                                     |                                                                                      |                                                                                       |                         |
| Operating voltage        | 10~30V DC(Ripple < 10%)                                                             |                                                                                     |                                                                                      |                                                                                       |                         |
| Voltage drop             | < 1.5V                                                                              |                                                                                     |                                                                                      |                                                                                       |                         |
| Load Current, Max        | 150mA                                                                               |                                                                                     |                                                                                      |                                                                                       |                         |
| Current consumption      | < 10mA                                                                              |                                                                                     |                                                                                      |                                                                                       |                         |
| Leakage current          | < 0.01mA                                                                            |                                                                                     |                                                                                      |                                                                                       |                         |
| Switch frequency         | 800Hz/200Hz                                                                         |                                                                                     | 1KHz/500Hz                                                                           |                                                                                       |                         |
| Repeat accuracy          | < 5% (Sr)                                                                           |                                                                                     | < 1% (Sr)                                                                            |                                                                                       |                         |
| Hysteresis               | < 15% ( Sr )                                                                        |                                                                                     |                                                                                      |                                                                                       |                         |
| Sensing surface material | PC                                                                                  |                                                                                     |                                                                                      |                                                                                       |                         |
| Operating Temperature    | -25℃~+75℃                                                                           |                                                                                     |                                                                                      |                                                                                       |                         |
| Circuit Protection       | Short circuit                                                                       |                                                                                     |                                                                                      |                                                                                       |                         |
| Degree of protection     | IP67                                                                                |                                                                                     |                                                                                      |                                                                                       |                         |
| Model No.                | NPN<br>Normally open                                                                | TEN10-2.5NO/TEN10-04NO                                                              | TEN12-04NO                                                                           | TEN15-05NO/TEN15-08NO                                                                 | TEN16-05NO/TEN16-08NO   |
|                          | Others                                                                              | NO: NPN Normally open                                                               | NC: NPN Normally closed                                                              | PO: PNP Normally open                                                                 | PC: PNP Normally closed |

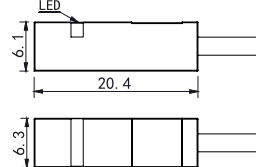
E06

TEN06-01□□



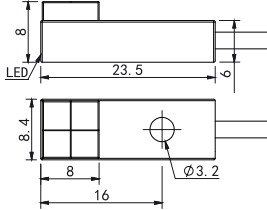
E07

TEN07-01□□



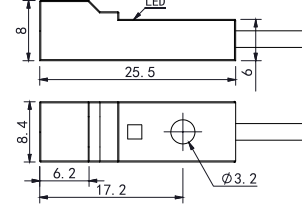
E08

TEN08-2.5/03□□



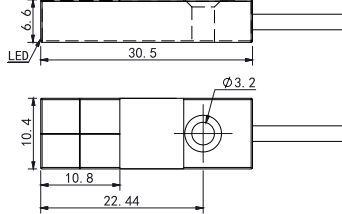
E09

TEN09-2.5/03□□



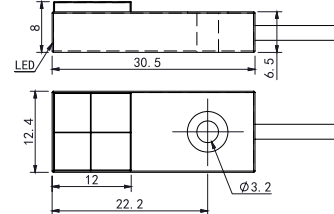
E10

TEN10-2.5/04□□



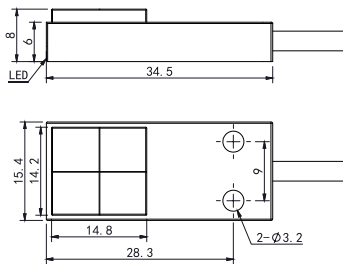
E12

TEN12-04□□



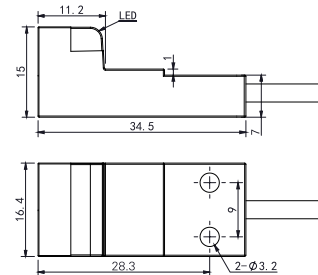
E15

TEN15-05/08□□



E16

TEN16-05/08□□



|               |
|---------------|
| Fiber Optic   |
| Slot Sensors  |
| Photoelectric |
| Laser         |
| Proximity     |
| Displacement  |
| Magnetic      |
| Contact       |
| Area          |
| Ultrasonic    |
| Vision        |
| Code Readers  |
| Vibration     |
| Temperature   |
| Accessories   |

#### Guidance

#### Inductive sensors

|                   |
|-------------------|
| Standard distance |
| Extended distance |
| Long distance     |
| Square            |

#### Mini square

|                       |
|-----------------------|
| Mini-cylindrical      |
| Short-body            |
| Ring-type             |
| Metal face            |
| Temperature           |
| IP69K high protection |
| Analog output         |
| DC 2 wires            |

#### Capacitive sensors

|                      |
|----------------------|
| Cylindrical          |
| Correction resistanc |
| Flat type            |
| Level detection      |

## Mini-cylindrical

## Pre-wired



Appearance

|                          |                          |                                                                                                      |
|--------------------------|--------------------------|------------------------------------------------------------------------------------------------------|
| Mounting                 | Shielded                 |                                                                                                      |
| Size                     | φ 3                      | φ 4                                                                                                  |
| Sensing distance         | 0.6mm/0.8mm/1.0mm ± 10 % | 0.8mm/1.0mm/1.2mm/1.5mm ± 10 %                                                                       |
| Housing material         | Stainless steel          |                                                                                                      |
| Operating voltage        | 10~30V DC(Ripple < 10%)  |                                                                                                      |
| Voltage drop             | < 1.5V                   |                                                                                                      |
| Load Current, Max        | 100mA                    | 150mA                                                                                                |
| Current consumption      | < 10mA                   |                                                                                                      |
| Leakage current          | < 0.01mA                 |                                                                                                      |
| Switch frequency         | 2KHz                     |                                                                                                      |
| Repeat accuracy          | < 1.0% (Sr)              |                                                                                                      |
| Hysteresis               | < 15% (Sr)               |                                                                                                      |
| Sensing surface material | PA66                     |                                                                                                      |
| Operating Temperature    | -25℃~+75℃                |                                                                                                      |
| Degree of protection     | IP67                     |                                                                                                      |
| Model No.                | NPN Normally open        | TXF03-0.6N□ / TXF03-0.8N□ / TXF03-01N□                                                               |
|                          | Others                   | N□:NPN Normally open    NC□:NPN Normally closed    P□: PNP Normally open    PC□: PNP Normally closed |
|                          | NPN Normally open        | TXF04-0.8N□ / TXF04-01N□ / TXF04-1.2N□ / TXF04-1.5N□                                                 |
|                          | Others                   | N□:NPN Normally open    NC□:NPN Normally closed    P□: PNP Normally open    PC□: PNP Normally closed |

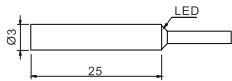


Appearance

|                          |                          |                                                                                                      |
|--------------------------|--------------------------|------------------------------------------------------------------------------------------------------|
| Mounting                 | Shielded                 |                                                                                                      |
| Size                     | M4                       | M5                                                                                                   |
| Sensing distance         | 0.6mm/0.8mm/1.0mm ± 10 % | 0.8mm/1.0mm/1.2mm/1.5mm ± 10 %                                                                       |
| Housing material         | Stainless steel          |                                                                                                      |
| Operating voltage        | 10~30V DC(Ripple < 10%)  |                                                                                                      |
| Voltage drop             | < 1.5V                   |                                                                                                      |
| Load Current,Max         | 100mA                    |                                                                                                      |
| Current consumption      | < 10mA                   |                                                                                                      |
| Leakage current          | < 0.01mA                 |                                                                                                      |
| Switch frequency         | 2KHz                     |                                                                                                      |
| Repeat accuracy          | < 5.0% (Sr)              |                                                                                                      |
| Hysteresis               | < 15% (Sr)               |                                                                                                      |
| Sensing surface material | PA66                     |                                                                                                      |
| Operating Temperature    | -25℃~+75℃                |                                                                                                      |
| Degree of protection     | IP67                     |                                                                                                      |
| Model No.                | NPN Normally open        | TXFM4-0.6N□ / TXFM4-0.8N□ / TXFM4-01N□                                                               |
|                          | Others                   | N□:NPN Normally open    NC□:NPN Normally closed    P□: PNP Normally open    PC□: PNP Normally closed |
|                          | NPN Normally open        | TXF05-0.8N□ / TXF05-01N□ / TXF05-1.2N□ / TXF05-1.5N□                                                 |
|                          | Others                   | N□:NPN Normally open    NC□:NPN Normally closed    P□: PNP Normally open    PC□: PNP Normally closed |

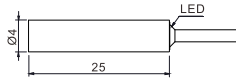
φ3

TXF03-0.6/0.8/01□□



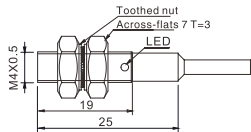
φ4

TXF04-0.8/01/1.2/1.5□□



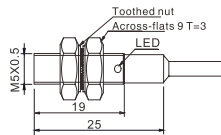
M4

TXFM4-0.6/0.8/01□□



M5

TXF05-0.8/01/1.2/1.5□□



Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

Guidance

Inductive sensors

Standard distance

Extended distance

Long distance

Square

Mini square

Mini-cylindrical

Short-body

Ring-type

Metal face

Temperature

IP69K high protection

Analog output

DC 2 wires

Capacitive sensors

Cylindrical

Correction

resistance type

Flat type

Level detection

# Short-body

## Ultra Short Housing

### Proximity



|                          |                            |                       |
|--------------------------|----------------------------|-----------------------|
| Appearance               |                            |                       |
| Mounting                 | Shielded                   |                       |
| Size                     | φ 6.5                      | φ 6.5Y                |
| Sensing distance         | 1mm/2mm ± 10%              |                       |
| Housing material         | Stainless steel            |                       |
| Operating voltage        | 10~30V DC(Ripple < 10%)    |                       |
| Voltage drop             | < 1.5V                     |                       |
| Load Current , Max       | 150mA                      |                       |
| Current consumption      | < 10mA                     |                       |
| Leakage current          | < 0.01mA                   |                       |
| Switch frequency         | 2KHz                       |                       |
| Repeat accuracy          | < 1.0% (Sr)                |                       |
| Hysteresis               | < 15% (Sr)                 |                       |
| Sensing surface material | PBT                        |                       |
| Operating Temperature    | -25°C~+75°C                |                       |
| Circuit Protection       | Short circuit              |                       |
| Degree of protection     | IP67                       |                       |
| Model No.                | TSSF6.5-01  / TSSF6.5-02   |                       |
|                          | TSSF6.5Y-01  / TSSF6.5Y-02 |                       |
|                          | : NPN Normally open        | : NPN Normally closed |
|                          | : PNP Normally open        | : PNP Normally closed |



|                          |                                     |                       |
|--------------------------|-------------------------------------|-----------------------|
| Appearance               |                                     |                       |
| Mounting                 | Shielded                            |                       |
| Size                     | M8                                  | M12                   |
| Sensing distance         | 1mm/2mm ± 10%                       | 2mm/4mm ± 10%         |
| Housing material         | Stainless steel                     | Nickle plated brass   |
| Operating voltage        | 10~30V DC(Ripple < 10%)             |                       |
| Voltage drop             | < 1.5V                              |                       |
| Load Current , Max       | 150mA                               |                       |
| Current consumption      | < 10mA                              |                       |
| Leakage current          | < 0.01mA                            |                       |
| Switch frequency         | 2KHz                                |                       |
| Repeat accuracy          | < 1.0% (Sr)                         |                       |
| Hysteresis               | < 15% (Sr)                          |                       |
| Sensing surface material | PBT                                 |                       |
| Operating Temperature    | -25°C~+75°C                         |                       |
| Circuit Protection       | Short circuit, except TSSF08-02 N O |                       |
| Degree of protection     | IP67                                |                       |
| Model No.                | TSSF08-01  / TSSF08-02              |                       |
|                          | TSSF12-02  / TSSF12-04              |                       |
|                          | : NPN Normally open                 | : NPN Normally closed |
|                          | : PNP Normally open                 | : PNP Normally closed |

HOT



Appearance

| Mounting                 | Shielded                |                         |                         |                         |                         |
|--------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| Size                     | M8                      | M12                     | M18                     | M30                     |                         |
| Sensing distance         | 1mm/2mm ± 10%           | 2mm/4mm ± 10%           | 5mm/8mm ± 10%           | 10mm/16mm ± 10%         |                         |
| Housing material         | Stainless steel         | Nickle plated brass     |                         |                         |                         |
| Operating voltage        | 10~30V DC(Ripple < 10%) |                         |                         |                         |                         |
| Voltage drop             | < 1.5V                  |                         |                         |                         |                         |
| Load Current, Max        | 150mA                   |                         |                         |                         |                         |
| Current consumption      | < 10mA                  |                         |                         |                         |                         |
| Leakage current          | < 0.01mA                |                         |                         |                         |                         |
| Switch frequency         | 2KHz                    | 2KHz/1KHz               | 1KHz/500Hz              | 300Hz/150Hz             |                         |
| Repeat accuracy          | < 1.0% (Sr)             |                         |                         |                         |                         |
| Hysteresis               | < 15% (Sr)              |                         |                         |                         |                         |
| Sensing surface material | PBT                     |                         |                         |                         |                         |
| Operating Temperature    | -25℃~+75℃               |                         |                         |                         |                         |
| Circuit Protection       | Short circuit           |                         |                         |                         |                         |
| Degree of protection     | IP67                    |                         |                         |                         |                         |
| Model No.                | NPN Normally open       | TSF08-01NO / TSF08-02NO | TSF12-02NO / TSF12-04NO | TSF18-05NO / TSF18-08NO | TSF30-10NO / TSF30-16NO |
|                          | Others                  | NO:NPN Normally open    | NC:NPN Normally closed  | PO: PNP Normally open   | PC: PNP Normally closed |



Appearance

| Mounting                 |                         | Unshielded              |                         |                         |                         |
|--------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| Size                     | M8                      | M12                     | M18                     | M30                     |                         |
| Sensing distance         | 2mm/4mm ± 10%           | 4mm/8mm ± 10%           | 8mm/16mm ± 10%          | 15mm/25mm ± 10%         |                         |
| Housing material         | Stainless steel         | Nickle plated brass     |                         |                         |                         |
| Operating voltage        | 10~30V DC(Ripple < 10%) |                         |                         |                         |                         |
| Voltage drop             | < 1.5V                  |                         |                         |                         |                         |
| Load Current, Max        | 150mA                   |                         |                         |                         |                         |
| Current consumption      | < 10mA                  | < 20mA                  |                         |                         |                         |
| Leakage current          | < 0.01mA                |                         |                         |                         |                         |
| Switch frequency         | 2KHz/1KHz               | 1KHz/500Hz              | 500Hz/150Hz             | 150Hz/100Hz             |                         |
| Repeat accuracy          | < 1.0% (Sr)             |                         |                         |                         |                         |
| Hysteresis               | < 15% (Sr)              |                         |                         |                         |                         |
| Sensing surface material | PBT                     |                         |                         |                         |                         |
| Operating Temperature    | -25℃~+75℃               |                         |                         |                         |                         |
| Circuit Protection       | Short circuit           |                         |                         |                         |                         |
| Degree of protection     | IP67                    |                         |                         |                         |                         |
| Model No.                | NPN Normally open       | TSN08-02NO / TSN08-04NO | TSN12-04NO / TSN12-08NO | TSN18-08NO / TSN18-16NO | TSN30-15NO / TSN30-25NO |
|                          | Others                  | NO:NPN Normally open    | NC:NPN Normally closed  | PO: PNP Normally open   | PC: PNP Normally closed |

Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

## Guidance

## Inductive sensors

Standard distance

Extended distance

Long distance

Square

Mini square

Mini-cylindrical

Short-body

Ring-type

Metal face

Temperature

IP69K high protection

Analog output

DC 2 wires

## Capacitive sensors

Cylindrical

Correction resistanc type

Flat type

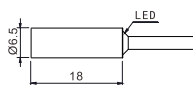
Level detection

## Short-body

## Extra Shot Outer Casing-Dimensions (Unit:mm)

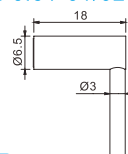
φ6.5

TSSF6.5-01/02 □ □



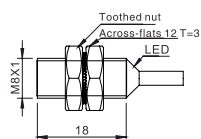
φ6.5Y

TSSF6.5Y-01/02 □ □



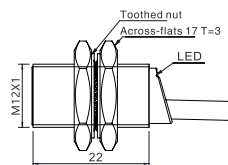
M8

TSSF08-01/02 □ □



M12

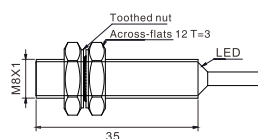
TSSF12-02/04 □ □



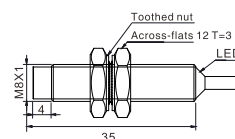
## General-Dimensions (Unit:mm)

M8

TSF08-01/02 □ □

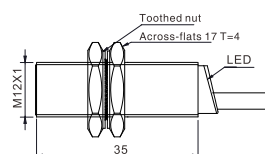


TSN08-02/04 □ □

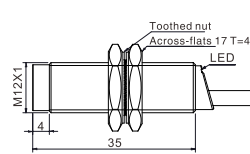


M12

TSF12-02/04 □ □

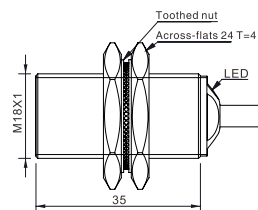


TSN12-04/08 □ □

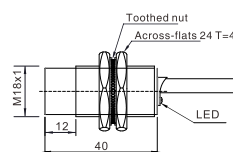


M18

TSF18-05/08 □ □

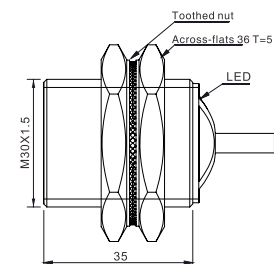


TSN18-08/16 □ □

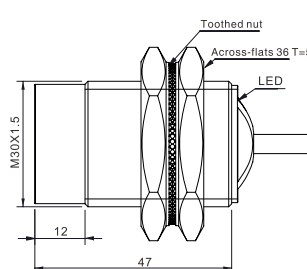


M30

TSF30-10/16 □ □



TSN30-15/25 □ □

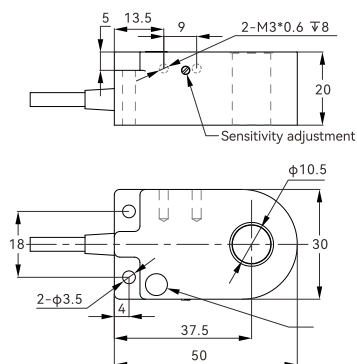


|                          |                                                                                   |                                                                                   |                                                                                    |                                                                                     |
|--------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Appearance               |  |  |  |  |
| Size                     | H10                                                                               | H15                                                                               | H21                                                                                | H43                                                                                 |
| Hole diameter            | 10.5mm                                                                            | 15.5mm                                                                            | 22.5mm                                                                             | 43.5mm                                                                              |
| Hole height              | 20mm                                                                              |                                                                                   |                                                                                    |                                                                                     |
| Housing material         | ABS                                                                               |                                                                                   |                                                                                    |                                                                                     |
| Operating voltage        | 10~30V DC(Ripple < 10%)                                                           |                                                                                   |                                                                                    |                                                                                     |
| Voltage drop             | < 1.5V                                                                            |                                                                                   |                                                                                    |                                                                                     |
| Load Current, Max        | 150mA                                                                             |                                                                                   |                                                                                    |                                                                                     |
| Current consumption      | < 15mA                                                                            |                                                                                   |                                                                                    |                                                                                     |
| Leakage current          | < 10mA                                                                            |                                                                                   |                                                                                    |                                                                                     |
| Switch frequency         | 2KHz                                                                              | 1.5KHz                                                                            | 1KHz                                                                               | 500Hz                                                                               |
| Min.detectable object    | D=2.5mm;L=4mm                                                                     | D=3mm;L=6mm                                                                       | D=6mm;L=12mm                                                                       | D=9mm;L=18mm                                                                        |
| Repeat accuracy          | < 2.0% (Sr)                                                                       |                                                                                   |                                                                                    |                                                                                     |
| Hysteresis               | < 15% (Sr)                                                                        |                                                                                   |                                                                                    |                                                                                     |
| Sensing surface material | PBT                                                                               |                                                                                   |                                                                                    |                                                                                     |
| Operating Temperature    | -25°C~+75°C                                                                       |                                                                                   |                                                                                    |                                                                                     |
| Circuit Protection       | Short circuit; Reverse polarity                                                   |                                                                                   |                                                                                    |                                                                                     |
| Degree of protection     | IP67                                                                              |                                                                                   |                                                                                    |                                                                                     |
| Model No.                | TH10-20□□                                                                         | TH15-20□□                                                                         | TH21-20□□                                                                          | TH43-20□□                                                                           |
|                          | □□: NPN Normally open                                                             | □□: NPN Normally closed                                                           | □□: PNP Normally open                                                              | □□: PNP Normally closed                                                             |

## Dimensions (Unit:mm)

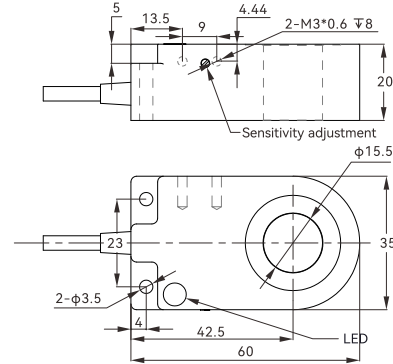
### H10

#### TH10-20□□



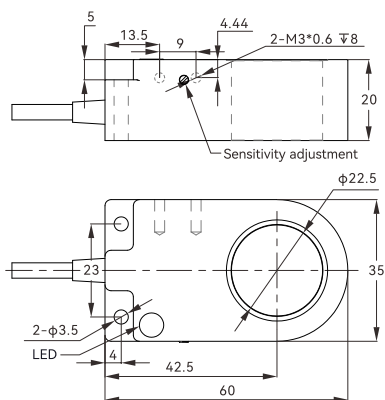
### H15

#### TH15-20□□



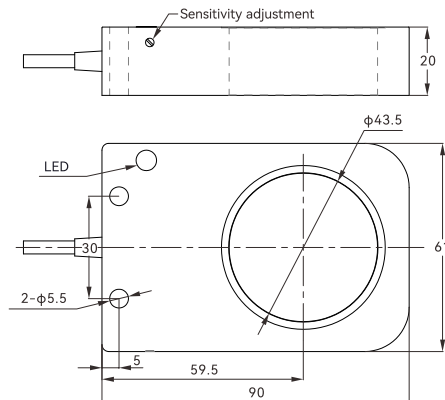
### H21

#### TH21-20□□



### H43

#### TH43-20□□



Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

#### Guidance

#### Inductive sensors

Standard distance

Extended distance

Long distance

Square

Mini square

Mini-cylindrical

Short-body

Ring-type

Metal face

Temperature

IP69K high protection

Analog output

DC 2 wires

#### Capacitive sensors

Cylindrical

Correction

resistanc type

Flat type

Level detection

Metal Face

Pre-wired



Appearance

|                          |                         |                        |                        |                        |                        |
|--------------------------|-------------------------|------------------------|------------------------|------------------------|------------------------|
| Mounting                 | Shielded                |                        |                        |                        |                        |
| Size                     | M8                      | M12                    | M18                    | M30                    |                        |
| Sensing distance         | 1mm/2mm ± 10%           | 2mm/4mm ± 10%          | 5mm/8mm ± 10%          | 10mm/16mm ± 10%        |                        |
| Housing material         | Stainless steel         |                        |                        |                        |                        |
| Operating voltage        | 10~30V DC(Ripple < 10%) |                        |                        |                        |                        |
| Voltage drop             | < 1.5V                  |                        |                        |                        |                        |
| Load Current, Max        | 150mA                   |                        |                        |                        |                        |
| Current consumption      | < 10mA                  |                        |                        |                        |                        |
| Leakage current          | < 0.01mA                |                        |                        |                        |                        |
| Switch frequency         | 2KHz/1KHz               |                        | 1KHz/500Hz             | 300Hz/150Hz            |                        |
| Repeat accuracy          | < 1.0%(Sr)              |                        |                        |                        |                        |
| Hysteresis               | < 15%(Sr)               |                        |                        |                        |                        |
| Sensing surface material | Stainless steel         |                        |                        |                        |                        |
| Operating Temperature    | -25℃~-+75℃              |                        |                        |                        |                        |
| Circuit protection       | Short circuit           |                        |                        |                        |                        |
| Degree of protection     | IP67                    |                        |                        |                        |                        |
| Model No.                | NPN Normally open       | TMF08-01NO /TMF08-02NO | TMF12-02NO /TMF12-04NO | TMF18-05NO /TMF18-08NO | TMF30-10NO /TMF30-16NO |
|                          | Others                  | NO:NPN Normally open   | NC:NPN Normally closed | PO:PNP Normally open   | PC:PNP Normally closed |

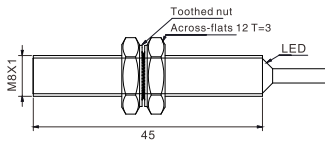


Appearance

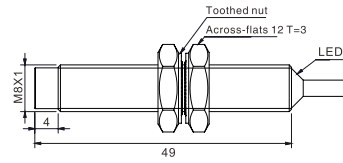
|                          |                         |                        |                        |                        |                        |
|--------------------------|-------------------------|------------------------|------------------------|------------------------|------------------------|
| Mounting                 |                         | Unshielded             |                        |                        |                        |
| Size                     | M8                      | M12                    |                        | M18                    | M30                    |
| Sensing distance         | 2mm/3mm ± 10%           |                        | 4mm/8mm ± 10%          | 8mm/16mm ± 10%         | 15mm/25mm ± 10%        |
| Housing material         | Stainless steel         |                        |                        |                        |                        |
| Operating voltage        | 10~30V DC(Ripple < 10%) |                        |                        |                        |                        |
| Voltage drop             | < 1.5V                  |                        |                        |                        |                        |
| Load Current, Max        | 150mA                   |                        |                        |                        |                        |
| Current consumption      | < 10mA                  |                        |                        |                        |                        |
| Leakage current          | < 0.01mA                |                        |                        |                        |                        |
| Switch frequency         | 2KHz/1KHz               | 1KHz/500Hz             |                        | 500Hz/150Hz            | 150Hz/100Hz            |
| Repeat accuracy          | < 1.0%(Sr)              |                        |                        |                        |                        |
| Hysteresis               | < 15%(Sr)               |                        |                        |                        |                        |
| Sensing surface material | Stainless steel         |                        |                        |                        |                        |
| Operating Temperature    | -25℃~+75℃               |                        |                        |                        |                        |
| Circuit protection       | Short circuit           |                        |                        |                        |                        |
| Degree of protection     | IP67                    |                        |                        |                        |                        |
| Model No.                | NPN Normally open       | TMN08-02NO /TMN08-03NO | TMN12-04NO /TMN12-08NO | TMN18-08NO /TMN18-16NO | TMN30-15NO /TMN30-25NO |
|                          | Others                  | NO:NPN Normally open   | NC:NPN Normally closed | PO:PNP Normally open   | PC:PNP Normally closed |

#### M8

##### TMF08-01/02 □□

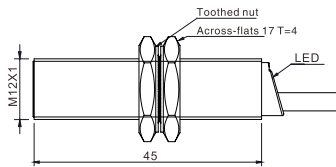


##### TMN08-02/03 □□

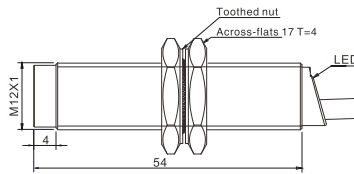


#### M12

##### TMF12-02/04 □□

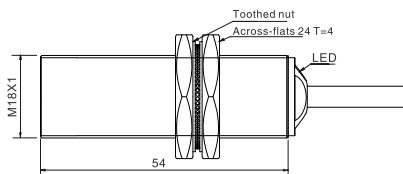


##### TMN12-04/08 □□

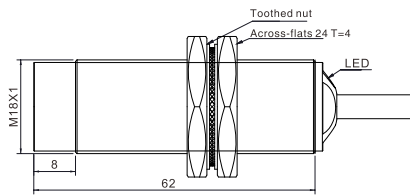


#### M18

##### TMF18-05/08 □□

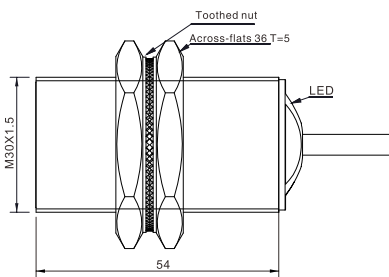


##### TMN18-08/16 □□

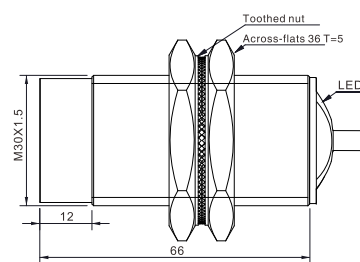


#### M30

##### TMF30-10/16 □□



##### TMN30-15/25 □□



- Fiber Optic
- Slot Sensors
- Photoelectric
- Laser
- Proximity**
- Displacement
- Magnetic
- Contact
- Area
- Ultrasonic
- Vision
- Code Readers
- Vibration
- Temperature
- Accessories

#### Guidance

#### Inductive sensors

- Standard distance
- Extended distance
- Long distance
- Square
- Mini square
- Mini-cylindrical
- Short-body
- Ring-type

#### Metal face

- Temperature
- IP69K high protection
- Analog output
- DC 2 wires

#### Capacitive sensors

- Cylindrical
- Correction
- resistance type
- Flat type
- Level detection

# Temperature Resistance

## High Temperature (120°C) Resistance Pre-wired Type



|                      |                                                                                   |                      |                        |                                                                                     |                        |                                                                                                   |            |
|----------------------|-----------------------------------------------------------------------------------|----------------------|------------------------|-------------------------------------------------------------------------------------|------------------------|---------------------------------------------------------------------------------------------------|------------|
| Appearance           |  |                      |                        |  |                        |                                                                                                   |            |
| Mounting             | Shielded                                                                          |                      |                        | Unshielded                                                                          |                        |                                                                                                   |            |
| Size                 | M12                                                                               | M18                  | M30                    | M12                                                                                 | M18                    | M30                                                                                               |            |
| Sensing distance     | 2mm ± 10%                                                                         | 5mm ± 10%            | 10mm ± 10%             | 4mm ± 10%                                                                           | 8mm ± 10%              | 15mm ± 10%                                                                                        |            |
| Housing material     | Nickel copper alloy                                                               |                      |                        |                                                                                     |                        |                                                                                                   |            |
| Operating voltage    | 10~30V DC(Ripple< 10%)                                                            |                      |                        |                                                                                     |                        |                                                                                                   |            |
| Voltage drop         | < 2.5V                                                                            |                      |                        |                                                                                     |                        |                                                                                                   |            |
| Load Current, Max    | 100mA                                                                             |                      |                        |                                                                                     |                        |                                                                                                   |            |
| Current consumption  | < 15mA                                                                            |                      |                        |                                                                                     |                        |                                                                                                   |            |
| Hysteresis           | 1~20%                                                                             |                      |                        |                                                                                     |                        |                                                                                                   |            |
| Repeat accuracy      | < 5%                                                                              |                      |                        |                                                                                     |                        |                                                                                                   |            |
| Response frequency   | 1500Hz                                                                            | 1000Hz               | 500Hz                  | 1000Hz                                                                              | 800Hz                  | 300Hz                                                                                             |            |
| Indicator            | Yellow LED                                                                        |                      |                        |                                                                                     |                        |                                                                                                   |            |
| Ambient temperature  | -25℃~+120℃                                                                        |                      |                        |                                                                                     |                        |                                                                                                   |            |
| Ambient humidity     | 35~95% RH                                                                         |                      |                        |                                                                                     |                        |                                                                                                   |            |
| Circuit protection   | Reverse polarity; Surge protection                                                |                      |                        |                                                                                     |                        |                                                                                                   |            |
| Degree of protection | IP67                                                                              |                      |                        |                                                                                     |                        |                                                                                                   |            |
| Model No.            | NPN<br>Normally open                                                              | TGF12-02N□           | TGF18-05N□             | TGF30-10N□                                                                          | TGN12-04N□             | TGN18-08N□<br> | TGN30-15N□ |
|                      | Others                                                                            | N□:NPN Normally open | N□:NPN Normally closed | P□:PNP Normally open                                                                | P□:PNP Normally closed |                                                                                                   |            |

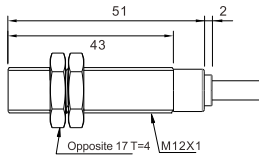
## High Temperature (220°C) Resistance Pre-wired Type



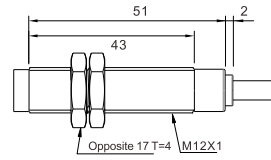
|                          |                      |                                                                                      |             |             |
|--------------------------|----------------------|--------------------------------------------------------------------------------------|-------------|-------------|
| Appearance               |                      |  |             |             |
| Mounting                 |                      | Shielded                                                                             |             |             |
| Housing size             |                      | M12                                                                                  | M18         | M30         |
| Sensing distance         |                      | 2mm ± 10 %                                                                           | 5mm ± 10 %  | 10mm ± 10 % |
| Housing material         |                      | Nickel copper alloy                                                                  |             |             |
| Operating voltage        |                      | 10~30V DC                                                                            |             |             |
| Voltage drop             |                      | < 1.8V                                                                               |             |             |
| Load current             |                      | External                                                                             |             |             |
| Current consumption      |                      | < 25mA(24V)                                                                          |             |             |
| Switch frequency         |                      | 500Hz/220℃                                                                           | 500Hz/230℃  | 200Hz/230℃  |
| Repeat accuracy          |                      | < 3.0 % (Sr)                                                                         |             |             |
| Hysteresis               |                      | 3~ 15 % (Sr)                                                                         |             |             |
| Sensing surface material |                      | PEEK                                                                                 |             |             |
| Ambient temperature      |                      | -25~+230℃                                                                            |             |             |
| Degree of protection     |                      | IP66                                                                                 |             |             |
| Interface                |                      | PTFE Cable/2m; 3*0.34mm <sup>2</sup>                                                 |             |             |
| Model No.                | NPN<br>Normally open | TGF12-02NO2                                                                          | TGF18-05NO2 | TGF30-10NO2 |
|                          | PNP<br>Normally open | TGF12-02PO2                                                                          | TGF18-05PO2 | TGF30-10PO2 |

#### M12

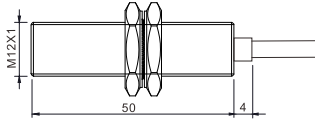
##### TGF12-02□□



##### TGN12-04□□

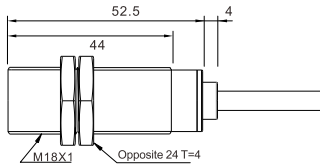


##### TGF12-02□□2

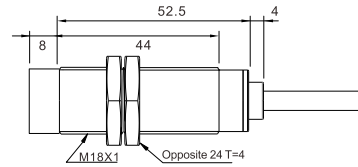


#### M18

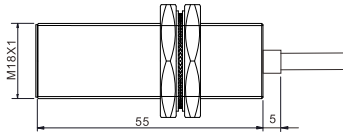
##### TGF18-05□□



##### TGN18-08□□

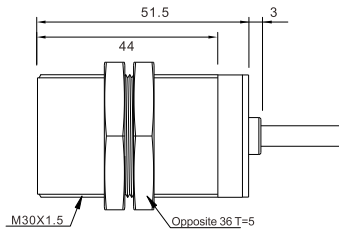


##### TGF18-05□□2

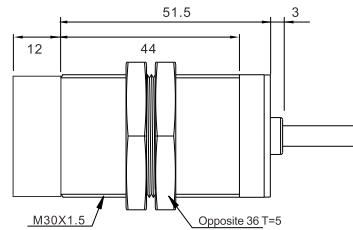


#### M30

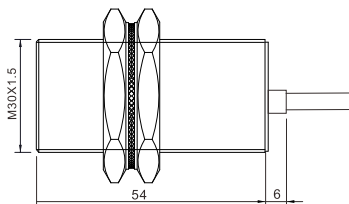
##### TGF30-10□□



##### TGN30-15□□



##### TGF30-10□□2



- Fiber Optic
- Slot Sensors
- Photoelectric
- Laser
- Proximity**
- Displacement
- Magnetic
- Contact
- Area
- Ultrasonic
- Vision
- Code Readers
- Vibration
- Temperature
- Accessories

#### Guidance

#### Inductive sensors

- Standard distance
- Extended distance
- Long distance
- Square

#### Mini square

#### Mini-cylindrical

#### Short-body

#### Ring-type

#### Metal face

#### Temperature

#### IP69K high protection

#### Analog output

#### DC 2 wires

#### Capacitive sensors

#### Cylindrical

#### Correction

#### resistanc type

#### Flat type

#### Level detection

## IP69K High Protection

## TP Series

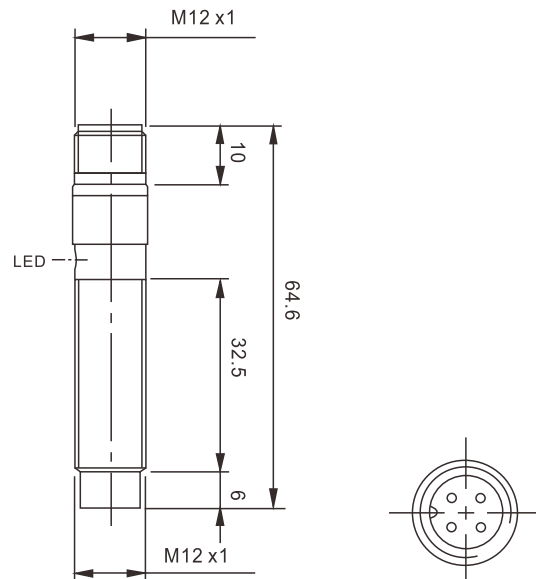
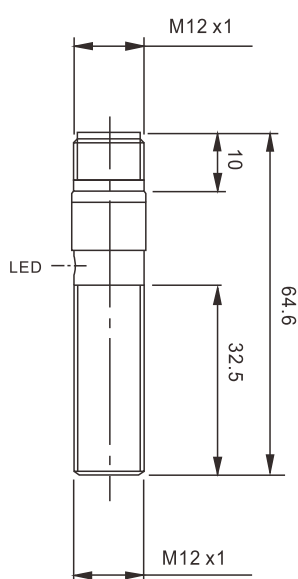


|                                   |                                                                                    |               |               |                 |
|-----------------------------------|------------------------------------------------------------------------------------|---------------|---------------|-----------------|
| Appearance                        |                                                                                    |               |               |                 |
| Mounting                          | Shielded                                                                           |               | Unshielded    |                 |
| Sensing distance                  | 2mm                                                                                | 4mm           | 4mm           | 8mm             |
| Working distance                  | 0~1.62mm                                                                           |               | 0~3.24mm      | 0~6.5mm         |
| Hysteresis                        | 1~20%                                                                              |               |               |                 |
| Standard target                   | 12 x 12mm FE360                                                                    |               |               | 24 x 24mm FE360 |
| Repeatability                     | 5%                                                                                 |               |               |                 |
| Operating                         | 10~30V DC                                                                          |               |               |                 |
| Output type                       | NPN or PNP-NO+NC or NO                                                             |               |               |                 |
| Maximum ripple content            | ≤10%                                                                               |               |               |                 |
| Output current                    | ≤200mA                                                                             |               |               |                 |
| Output voltage drop               | ≤2V                                                                                |               |               |                 |
| No-load current                   | ≤15mA                                                                              |               |               |                 |
| Leakage current                   | ≤15uA                                                                              |               |               |                 |
| operating frequency               | 2kHz                                                                               |               |               |                 |
| Start delay                       | 50ms                                                                               |               |               |                 |
| Ambient temperature range         | -40℃~+80℃ in a short time (within 15 seconds) up to 100℃ 10%                       |               |               |                 |
| Thermal drift                     | 10%                                                                                |               |               |                 |
| Shock and vibration               | IEC 60947-5-5/7.4                                                                  |               |               |                 |
| Weight                            | 30g                                                                                |               |               |                 |
| LEDs                              | NO output status/without led -25℃~+110℃                                            |               |               |                 |
| Degree of protection              | IP67,IP68(1m,7days);IP69K (in line with DIN 40050-9 standard)                      |               |               |                 |
| Electromagnetic compatibility/EMC | Comply with EMC directive requirements and comply with IEC 60947-5-2 specification |               |               |                 |
| Housing material                  | Stainless steel                                                                    |               |               |                 |
| Sensing surface material          | PPS (FDA certification)                                                            |               |               |                 |
| Connection method                 | M12 connector with gold-plated pins                                                |               |               |                 |
| Tightening torque                 | 25Nm                                                                               |               |               |                 |
| Model No                          | NPN                                                                                | TPF12-02NR-E2 | TPF12-04NR-E2 | TPN12-04NR-E2   |
|                                   | PNP                                                                                | TPF12-02PR-E2 | TPF12-04PR-E2 | TPN12-04PR-E2   |

## Dimensions (Unit:mm)

TPF12-02NR-E2(PR)  
TPF12-04NR-E2(PR)

TPN12-04NR-E2(PR)  
TPN12-08NR-E2(PR)

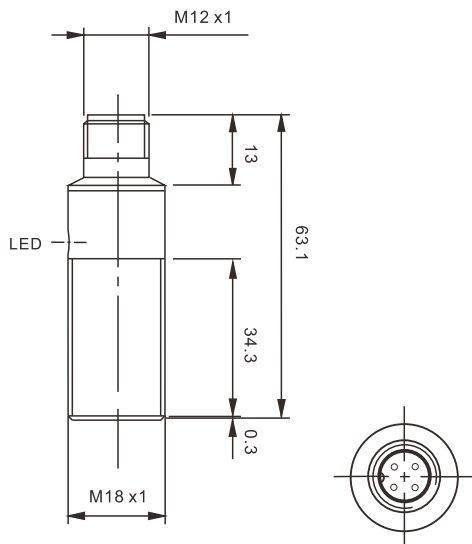




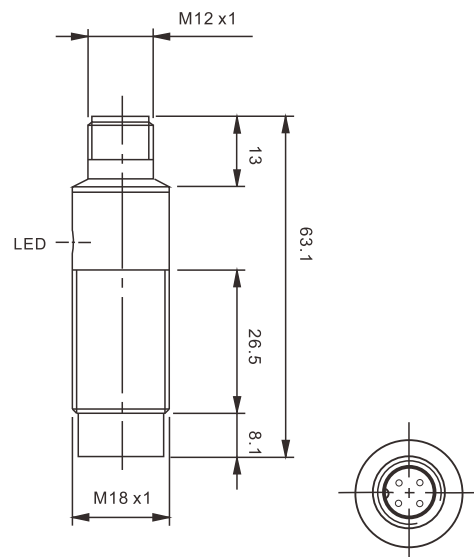
|                                   |                                                                                    |               |               |                 |
|-----------------------------------|------------------------------------------------------------------------------------|---------------|---------------|-----------------|
| Appearance                        |                                                                                    |               |               |                 |
| Mounting                          | Shielded                                                                           |               | Unshielded    |                 |
| Sensing distance                  | 5mm                                                                                | 8mm           |               | 12mm            |
| Working distance                  | 0~4mm                                                                              | 0~6.5mm       |               | 0~9.72mm        |
| Hysteresis                        | 1~20%                                                                              |               |               |                 |
| Standard target                   | 18 × 18mm FE360                                                                    |               |               | 36 × 36mm FE360 |
| Repeatability                     | 5%                                                                                 |               |               |                 |
| Operating Voltage                 | 10~30V DC                                                                          |               |               |                 |
| Output type                       | NPN or PNP–NO+NC or NO                                                             |               |               |                 |
| Maximum ripple content            | ≤10%                                                                               |               |               |                 |
| Output current                    | ≤200mA                                                                             |               |               |                 |
| Output voltage drop               | ≤2V                                                                                |               |               |                 |
| No-load current                   | ≤15mA                                                                              |               |               |                 |
| Leakage current                   | ≤10uA                                                                              |               |               |                 |
| Operating frequency               | 15kHz                                                                              |               |               |                 |
| Start delay                       | 50ms                                                                               |               |               |                 |
| Ambient temperature range         | –40℃~+80℃ in a short time (within 15 seconds) up to 100℃ 10%                       |               |               |                 |
| Thermal drift                     | 10%                                                                                |               |               |                 |
| Shock and vibration               | IEC 60947–5–5/7.4                                                                  |               |               |                 |
| Weight                            | 30g                                                                                |               |               |                 |
| LEDs                              | NO output status/without led –25℃~+110℃                                            |               |               |                 |
| Degree of protection              | IP67, IP68(1m, 7days); IP69K (in line with DIN 40050–9 standard)                   |               |               |                 |
| Electromagnetic compatibility/EMC | Comply with EMC directive requirements and comply with IEC 60947–5–2 specification |               |               |                 |
| Housing material                  | Stainless steel                                                                    |               |               |                 |
| Sensing surface material          | PPS (FDA certification)                                                            |               |               |                 |
| Connection method                 | M12 connector with gold–plated pins                                                |               |               |                 |
| Tightening torque                 | 25Nm                                                                               |               |               |                 |
| Model No                          | NPN                                                                                | TPF18-05NR-E2 | TPF18-08NR-E2 | TPN18-08NR-E2   |
|                                   | PNP                                                                                | TPF18-05PR-E2 | TPF18-08PR-E2 | TPN18-12PR-E2   |

## Dimensions (Unit:mm)

TPF18-05NR-E2(PR)  
TPF18-08NR-E2(PR)



TPN18-08NR-E2(PR)  
TPN18-12NR-E2(PR)



Fiber Optic  
Slot Sensors  
Photoelectric  
Laser  
Proximity  
Displacement  
Magnetic  
Contact  
Area  
Ultrasonic  
Vision  
Code Readers  
Vibration  
Temperature  
Accessories

## Guidance

## Inductive sensors

Standard distance  
Extended distance  
Long distance  
Square  
Mini square  
Mini-cylindrical  
Short-body  
Ring-type  
Metal face  
Temperature  
IP69K high protection  
Analog output  
DC 2 wires

## Capacitive sensors

Cylindrical  
Correction  
resistance type  
Flat type  
Level detection

# Analog Output

## Pre-wired



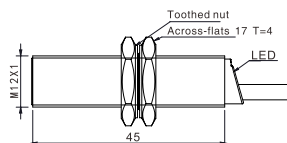
Appearance

| Mounting                 | Shielded                |               |              | Unshielded    |               |              |            |
|--------------------------|-------------------------|---------------|--------------|---------------|---------------|--------------|------------|
| Size                     | M12                     | M18           | M30          | M12           | M18           | M30          |            |
| Sensing distance         | 0.1~3mm ± 10%           | 1~4mm ± 10%   | 5~10mm ± 10% | 0.1~4mm ± 10% | 1~7mm ± 10%   | 7~14mm ± 10% |            |
| Housing material         | Nickel copper alloy     |               |              |               |               |              |            |
| Operating voltage        | 18~30V DC(Ripple < 10%) |               |              |               |               |              |            |
| Current consumption      | < 15mA                  |               |              |               |               |              |            |
| Linear                   | < 5%                    |               |              |               |               |              |            |
| Switch frequency         | 100Hz                   |               |              |               |               |              |            |
| Repeat accuracy          | 0.02mm                  |               |              |               |               |              |            |
| Current output           | 4~20mA/≤200 Ω           | 0~20mA/≤200 Ω |              | 4~20mA/≤400 Ω | 0~20mA/≤200 Ω |              |            |
| Voltage output           | 0~10VDC/≥4.7K Ω         |               |              |               |               |              |            |
| Output type              | PNP–Analog              |               |              |               |               |              |            |
| Sensing surface material | PBT                     |               |              |               |               |              |            |
| Ambient temperature      | -25℃~+75℃               |               |              |               |               |              |            |
| Circuit protection       | Reverse polarity        |               |              |               |               |              |            |
| Degree of protection     | IP67                    |               |              |               |               |              |            |
| Model No.                | Current output          | TAF12-03PA    | TAF18-04PA   | TAF30-10PA    | TAN12-04PA    | TAN18-07PA   | TAN30-14PA |
|                          | Voltage output          | TAF12-03PV    | TAF18-04PV   | TAF30-10PV    | TAN12-04PV    | TAN18-07PV   | TAN30-14PV |

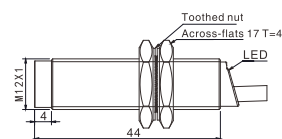
## Dimensions (Unit:mm)

### M12

TAF12-03□□

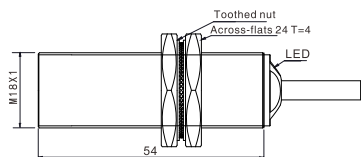


TAN12-04□□

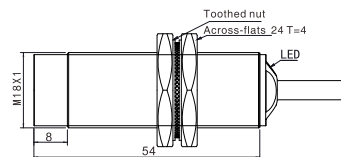


### M18

TAF18-04□□

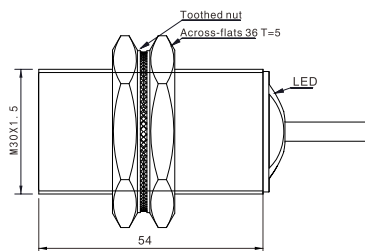


TAN18-07□□

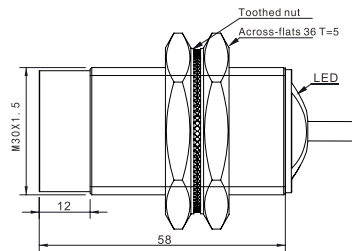


### M30

TAF30-10□□



TAN30-14□□





|                          |                         |                         |                         |                       |                       |                       |
|--------------------------|-------------------------|-------------------------|-------------------------|-----------------------|-----------------------|-----------------------|
| Appearance               |                         |                         |                         |                       |                       |                       |
| Mounting                 | Shielded                |                         |                         |                       |                       |                       |
| Size                     | φ 6.5                   | M8                      | M12                     | M18                   | M30                   |                       |
| Sensing distance         | 1 mm/2mm ± 10%          | 1 mm/2mm ± 10%          | 2mm/4mm ± 10%           | 5mm/8mm ± 10%         | 10mm/16mm ± 10%       |                       |
| Housing material         | Stainless steel         |                         | Nickel copper alloy     |                       |                       |                       |
| Operating voltage        | 10~30V DC(Ripple < 10%) |                         | 10~60V DC(Ripple < 10%) |                       |                       |                       |
| Operating current        | 3~100mA                 |                         |                         |                       |                       |                       |
| Leakage current          | < 0.8mA                 |                         |                         |                       |                       |                       |
| Voltage drop             | < 6V/ < 4V              |                         |                         |                       |                       |                       |
| Circuit protection       | Short circuit           |                         |                         |                       |                       |                       |
| Over-load current        | > 120mA                 |                         |                         |                       |                       |                       |
| Switch frequency         | 2KHz                    |                         | 1 KHz                   |                       | 500Hz                 |                       |
| Hysteresis               | 15%                     |                         |                         |                       |                       |                       |
| Temperature drift        | 10%                     |                         |                         |                       |                       |                       |
| Repeat accuracy          | < 2%                    |                         |                         |                       |                       |                       |
| Operating Temperature    | -25℃~+75℃               |                         |                         |                       |                       |                       |
| Sensing surface material | PBT                     |                         |                         |                       |                       |                       |
| Model No.                | Normally open           | TDF6.5-01HO/TDF6.5-02HO | TDF08-01HO/TDF08-02HO   | TDF12-02HO/TDF12-04HO | TDF18-05HO/TDF18-08HO | TDF30-10HO/TDF30-16HO |
|                          | Normally close          | TDF6.5-01HC/TDF6.5-02HC | TDF08-01HC/TDF08-02HC   | TDF12-02HC/TDF12-04HC | TDF18-05HC/TDF18-08HC | TDF30-10HC/TDF30-16HC |



|                          |                         |                         |                         |                       |                       |                       |
|--------------------------|-------------------------|-------------------------|-------------------------|-----------------------|-----------------------|-----------------------|
| Appearance               |                         |                         |                         |                       |                       |                       |
| Mounting                 | Unshielded              |                         |                         |                       |                       |                       |
| Size                     | φ 6.5                   | M8                      | M12                     | M18                   | M30                   |                       |
| Sensing distance         | 2mm/4mm ± 10%           | 2mm/4mm ± 10%           | 4mm/8mm ± 10%           | 8mm/16mm ± 10%        | 15mm/25mm ± 10%       |                       |
| Housing material         | Stainless steel         |                         | Nickle plated brass     |                       |                       |                       |
| Operating voltage        | 10~30V DC(Ripple < 10%) |                         | 10~60V DC(Ripple < 10%) |                       |                       |                       |
| Operating current        | 3~100mA                 |                         |                         |                       |                       |                       |
| Leakage current          | < 0.8mA                 |                         |                         |                       |                       |                       |
| Voltage drop             | < 6V/ < 4V              |                         |                         |                       |                       |                       |
| Circuit protection       | Short circuit           |                         |                         |                       |                       |                       |
| Over-load current        | > 120mA                 |                         |                         |                       |                       |                       |
| Switch frequency         | 2KHz                    |                         | 1KHz                    | 500Hz                 | 200Hz                 |                       |
| Hysteresis               | 15%                     |                         |                         |                       |                       |                       |
| Temperature drift        | 10%                     |                         |                         |                       |                       |                       |
| Repeat accuracy          | < 2%                    |                         |                         |                       |                       |                       |
| Operating Temperature    | -25℃~+75℃               |                         |                         |                       |                       |                       |
| Sensing surface material | PBT                     |                         |                         |                       |                       |                       |
| Model No.                | Normally open           | TDN6.5-02HO/TDN6.5-04HO | TDN08-02HO/TDN08-04HO   | TDN12-04HO/TDN12-08HO | TDN18-08HO/TDN18-16HO | TDN30-15HO/TDN30-25HO |
|                          | Normally close          | TDN6.5-02HC/TDN6.5-04HC | TDN08-02HC/TDN08-04HC   | TDN12-04HC/TDN12-08HC | TDN18-08HC/TDN18-16HC | TDN30-15HC/TDN30-25HC |

Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

## Guidance

## Inductive sensors

Standard distance

Extended distance

Long distance

Square

Mini square

Mini-cylindrical

Short-body

Ring-type

Metal face

Temperature

IP69K high protection

Analog output

DC 2 wires

## Capacitive sensors

Cylindrical

Correction

resistance type

Flat type

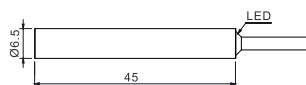
Level detection

## DC 2-wire

Dimensions (Unit:mm)

φ6.5

TDF6.5-01/02 □□

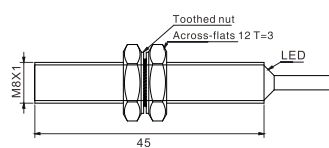


TDN6.5-02/04 □□

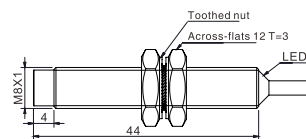


M8

TDF08-01/02 □□

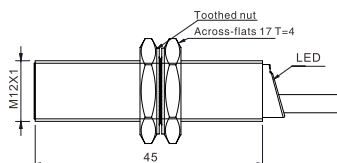


TDN08-02/04 □□

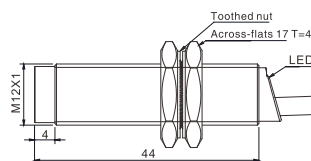


M12

TDF12-02/04 □□

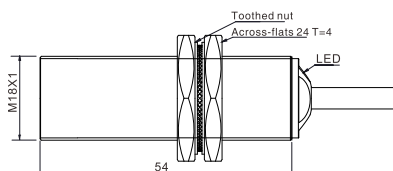


TDN12-04/08 □□

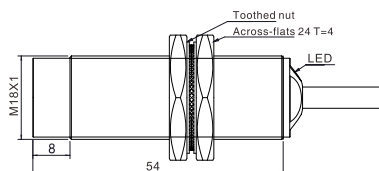


M18

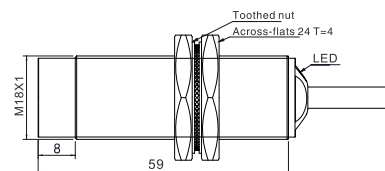
TDF18-05/08 □□



TDN18-08 □□

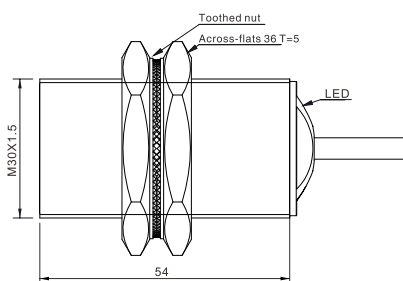


TDN18-16 □□

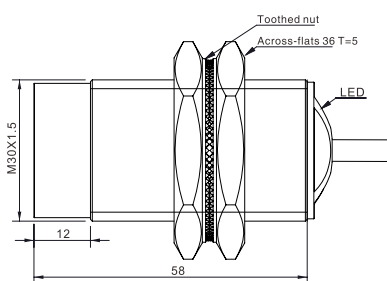


M30

TDF30-10/16 □□



TDN30-15 □□



TDN30-25 □□

