

AnyWireASLINK System Product Guide

ASLINKSENSOR [Retroreflective Photoelectric Type (IP67)] BS-H0217G-1K

■ Note on use

For setting addresses and other parameters, ARW-04 (Ver. 04-1.01 or later version) is required. Prepare the Address Writer separately.

[Notes on Safety]

Precautions that must be observed in order to use this system safely are indicated as shown below. You must observe these precautions.

WARNING A WARNING indicates a potentially hazardous situation which, if not handled correctly, could result in death or serious injury.

CAUTION A CAUTION indicates a potentially hazardous situation which, if not handled correctly, may result in personal injury or property damage.



- System Safety
This system is intended for general industrial applications. It does not have functions for supporting applications requiring higher levels of safety such as safety-related devices or accident prevention systems. The product must not be used for these purposes.
- Always turn off the power in installing or replacing the system.
- Prolonged continuous flow of a rated load current or higher or a transit current due to load short-circuit, etc., in the hybrid unit including the output unit and the output circuit may result in smoking or firing. An external safety device such as a fuse must be installed.



- System power supply
Use a stable, 24V DC power supply. Use of an unstable power supply may cause problems with the system.
- Separately route high-voltage and power cables
Although the AnyWireASLINK has a high noise margin, install the transmission line and I/O cables away from high-voltage and power cables.
- Connectors and terminals
 - Consider the length and securing method of cables so that the cables and connectors would not be subjected to any stress and, even if they are under stress, they would not become loose.
 - Make sure to prevent any metal objects from getting inside the connectors or the terminal blocks.
 - Short-circuits caused by metal objects or mis-wiring are likely to damage the device.
- Do not impose any external loads on the units. Doing so may cause a failure.
- Do not disconnect or reconnect between the transmission line and slave units when the transmission line is active. A malfunction may occur.
- Use the AnyWireASLINK within the range of the specifications and conditions shown below.

[Warranty]

■ Warranty period

The warranty on the delivered Product shall continue to be effective for one (1) year after the delivery thereof to a location as designated by the original owner.

■ Scope of warranty

Should a defect occur in any part of the Product during the foregoing warranty period when it is used normally in accordance with the specifications described in this Product Guide, the Company shall replace or repair the defect free of charge, except when it arises as a result of:

- [1] Misuse or abuse of the Product by the owner;
- [2] Fault caused by other than the delivered Product;
- [3] The unauthorized modification or repair of the Product by any person other than the Company's personnel;
- [4] Any unusual force of nature, disaster or other cause beyond the Company's control.

The term "warranty," as used herein, refers to the warranty applicable to the delivered product alone. The Company shall not be liable for consequential or incidental damages resulting from any malfunction.

■ Repair at cost

After the expiration of the warranty period, the owner shall be responsible for all costs and expenses incurred for the troubleshooting and repair of the Product. Even during the warranty term, the Company shall repair any defects arising from causes other than within the scope of the warranty as specified above, at the owner's cost.

■ Changes in the product specifications and the descriptions in the manual

The descriptions in this manual may be subject to change without notice.

[Type]

AnyWireASLINK photoelectric sensor:
Retroreflective photoelectric type, bit operation

BS-H0217G-1K

Input 1 point

[Functions]

| | |
|---|--|
| Model | ASLINKSENSOR 2-wire type (non-isolated) |
| Detection method | Retroreflective type |
| Features | Sensitivity adjustment (threshold) |
| | Hysteresis |
| | Alarm determination level |
| | Alarm determination time |
| | Light ON/Dark ON |
| | Operation mode |
| | Light receiving level indication switching |
| | Delay timer |
| | One shot |
| | Sensing level drop |
| | Slave unit voltage drop |
| IP67 (Oil resistance under in-house standard) | |

[Included in the Package]

BS-H0217G-1K

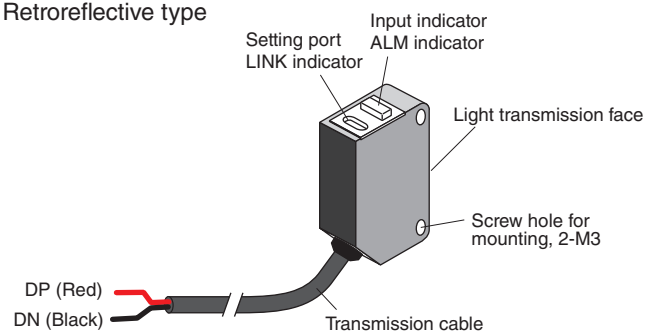
This product ... 1

*The reflector should be purchased separately.

Mounting fitting should be purchased separately as required.

[Name of Each Part]

■ Retroreflective type



[How to Connect AnyWireASLINK]

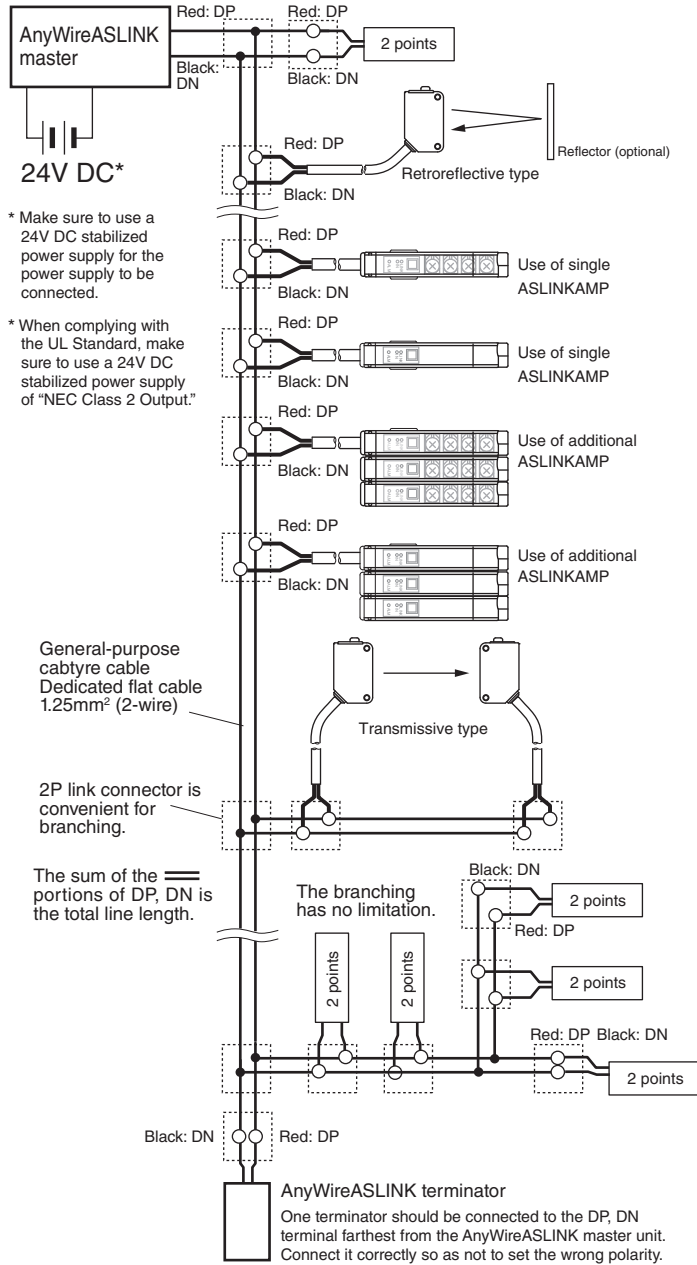
The AnyWireASLINK can employ a two-wire or four-wire terminal selectively depending on the load current. If the load current is small, using a two-wire (non-isolated) terminal allows for achieving simplified wiring without local power supply.

In the case of prioritizing the sites of concentrated loads and/or the number of connections, hybridization with a four-wire (isolated) terminal, which supports local power supply, is also possible.

Make sure to use a four-wire (isolated) terminal in the case of input and load driving using an external power supply.

[System Configuration Example]

■ Connection with 2-wire (non-isolated) terminals only



■ Relationship between the size and length of the transmission line and the supply current (Table 1)

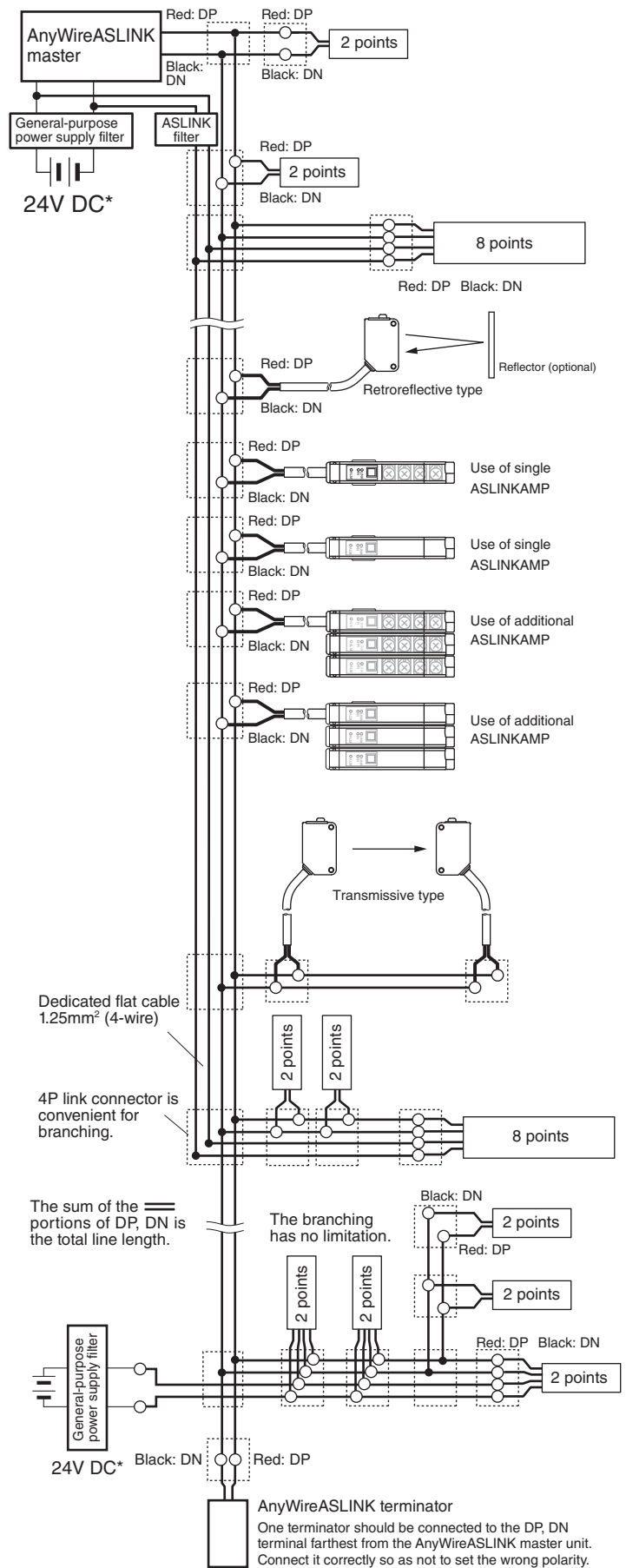
| Size of the transmission line (DP, DN) | Supply current on the transmission line (DP, DN) | | |
|--|--|---|--|
| | Total length: 50m or less | Total length: Over 50m, no longer than 100m | Total length: Over 100m, no longer than 200m |
| 1.25mm ² | MAX 2A | MAX 1A | MAX 0.5A |
| 0.75mm ² | MAX 1.2A | MAX 0.6A | MAX 0.3A |
| 0.5mm ² | MAX 0.8A | MAX 0.4A | MAX 0.2A |



- Refer to Table 1 so that the size and length of the transmission line and the allowable supply current lie within an appropriate range.

- Connect the same symbols (DP, DN) correctly between the AnyWireASLINK master unit and each device.
- The branching length or branch number has no limitation.
- Include the length of the cable provided with the terminal in the "total line length."
- Connect the terminator (with polarity) on the transmission line terminal farthest from the AnyWireASLINK master unit.

■ Example of mixed installation with 2-wire (non-isolated) and 4-wire (isolated) terminals



To connect loads (e.g. I/O ports) that are controlled with a power supply other than the one used for the AnyWireASLINK system, always use a 4-wire (isolated) terminal. Otherwise, malfunction may be caused.

[Notes on Combined Use of 4-Wire (Isolated) Terminal]

If the total length of the sections where all the DP, DN, 24V, and 0V lines run in parallel in the power supply system is more than 50m, connect an ASLINK filter (Type ANF-01) or a filter manufactured by COSEL Co., Ltd. (Type EAC-06-472) in series to the 24V and 0V lines at a position where these four lines start running in parallel.

This will improve noise resistance, suppress the adverse effects of crosstalk caused by transmitted signals, and stabilize signals. The above filters must be inserted regardless of whether power is supplied to all terminals collectively from the power supply for the master or power is supplied to each terminal individually from their local power supply.

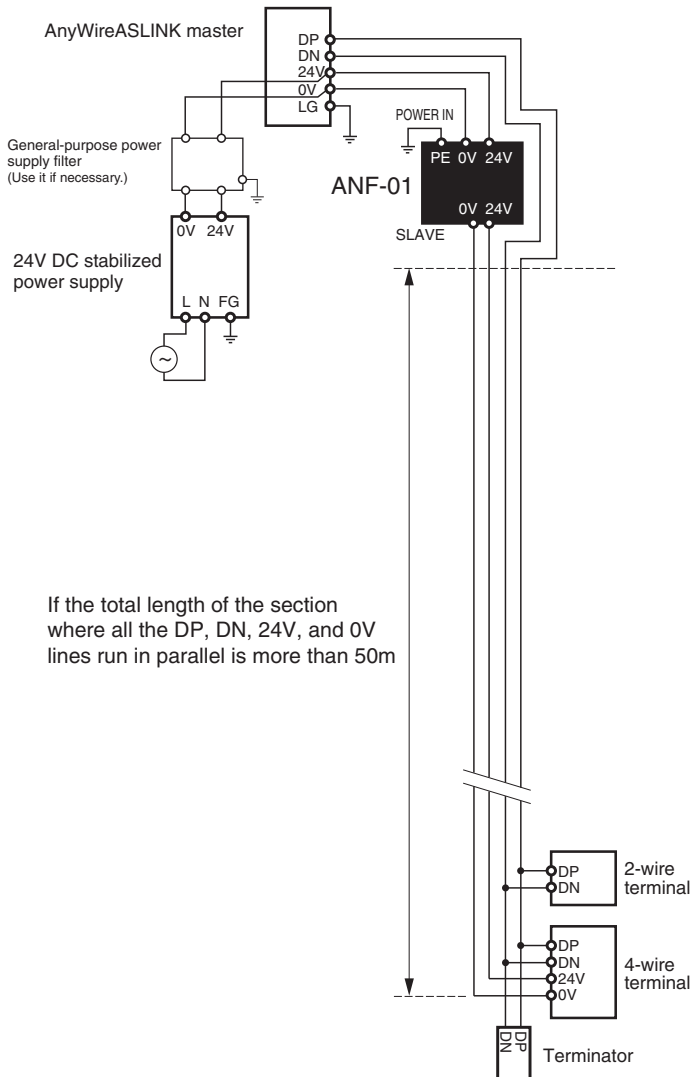
Insert the "ASLINK filter [Type ANF-01]" regardless of installation method and distance when complying with CE Standard.

Filter allowable current

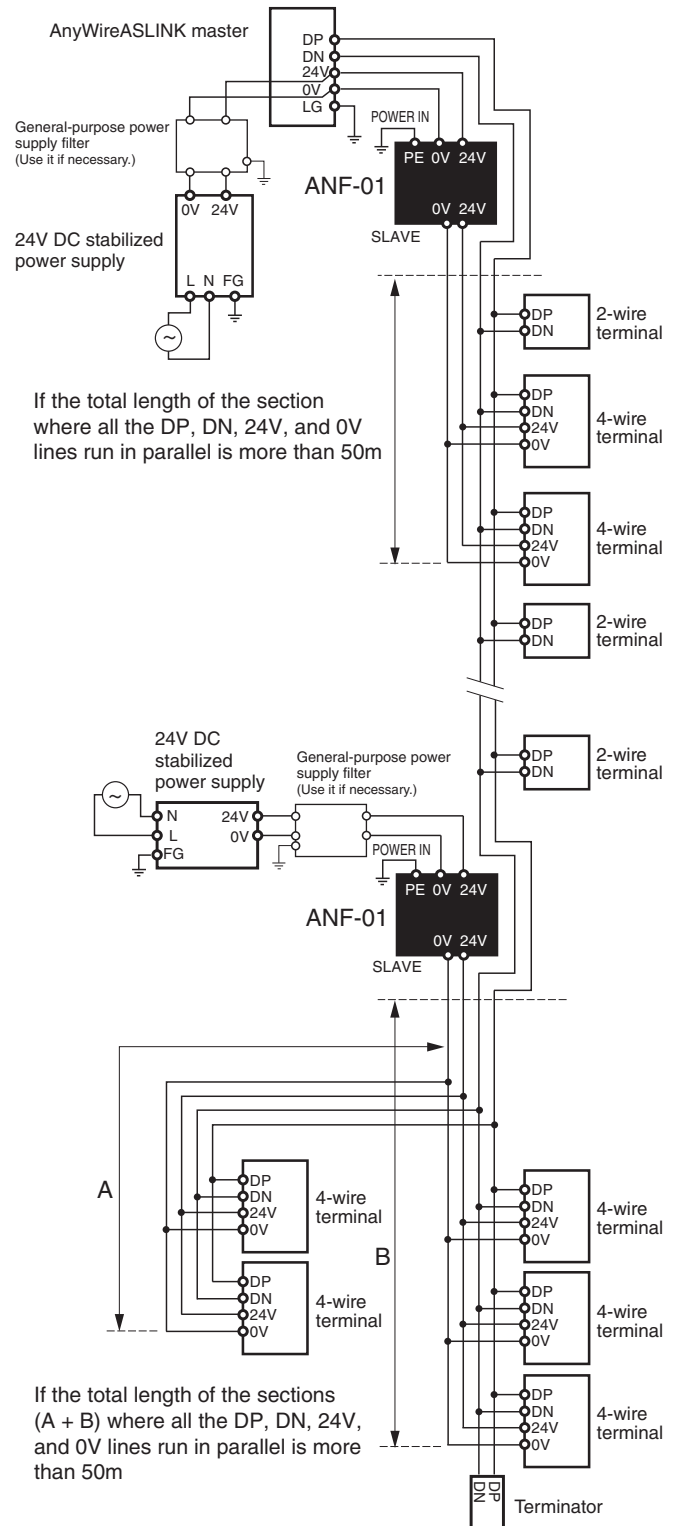
| Product | Type | Allowable power current |
|---------------------------|------------|-------------------------|
| ASLINK filter | ANF-01 | MAX 5A/24V DC |
| Filter of COSEL Co., Ltd. | EAC-06-472 | MAX 6A/24V DC |

AnyWire Type: ANF-01 Connection example

① Power supply to the entire system



② Local power supply/branching

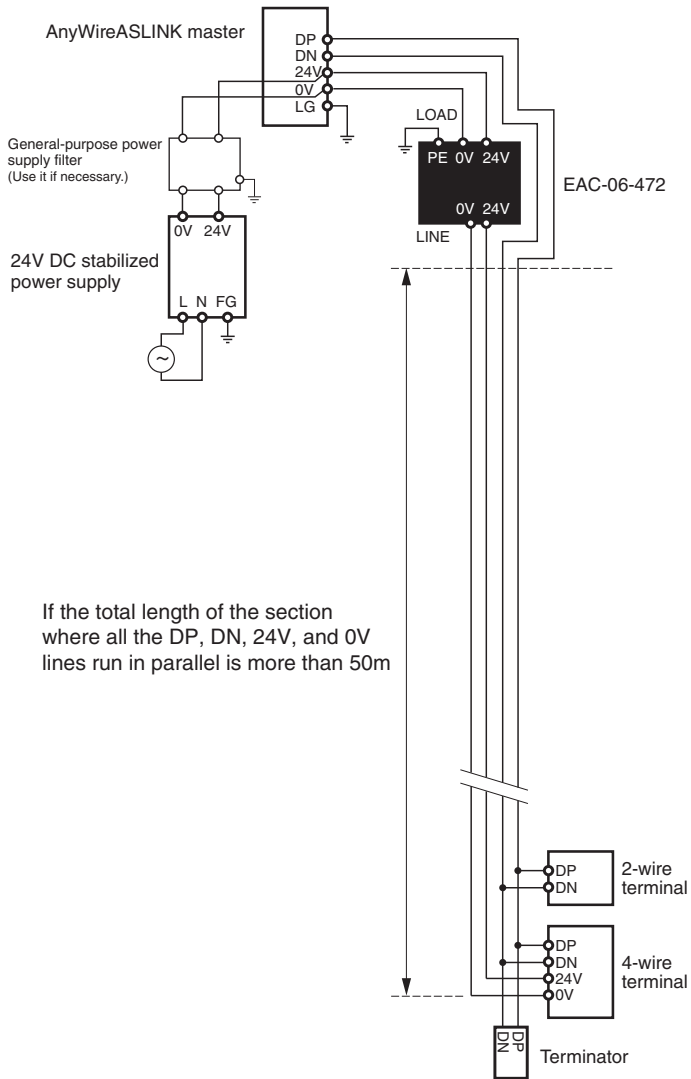


Filter representation in the drawing

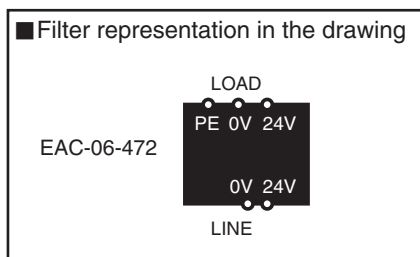
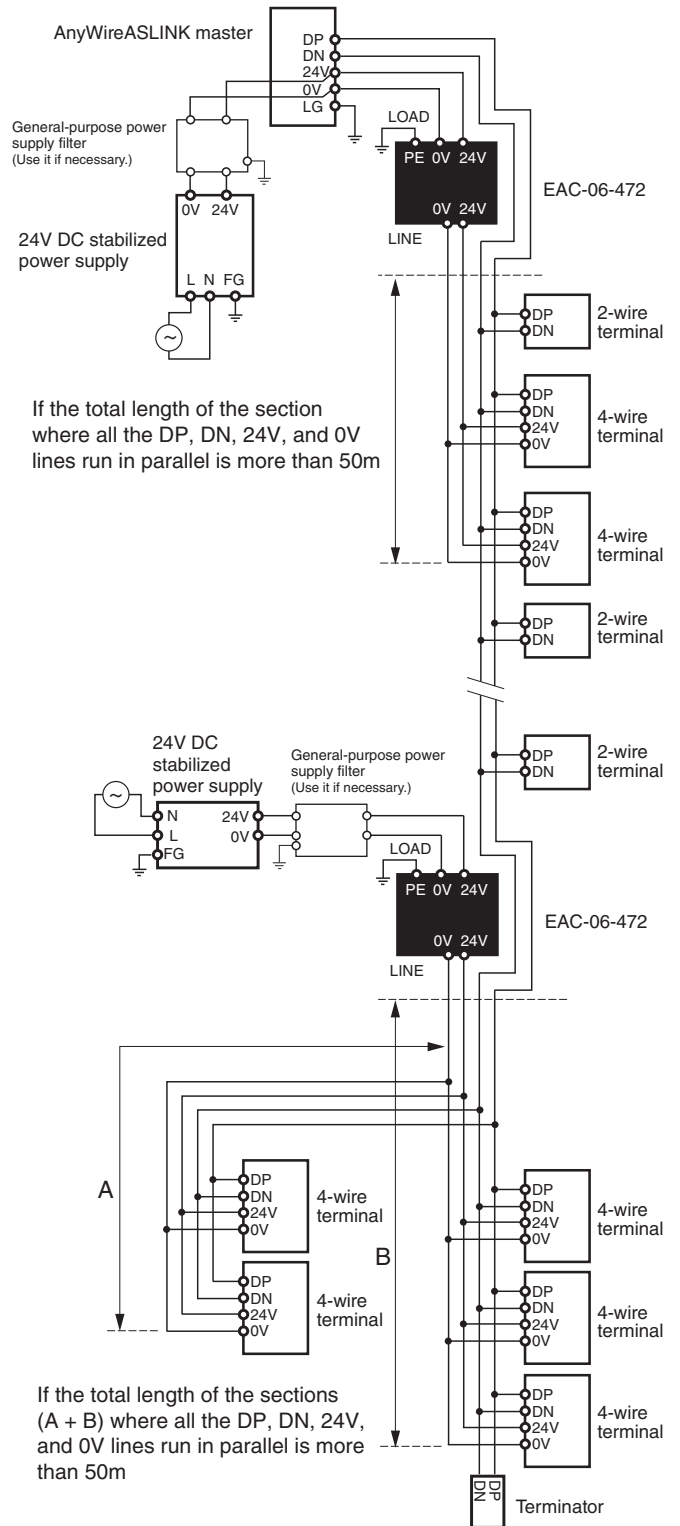
For further information on ANF-01, refer to the product guide on ANF-01.

■ COSEL Co., Ltd. Type: EAC-06-472 Connection example

① Power supply to the entire system -----

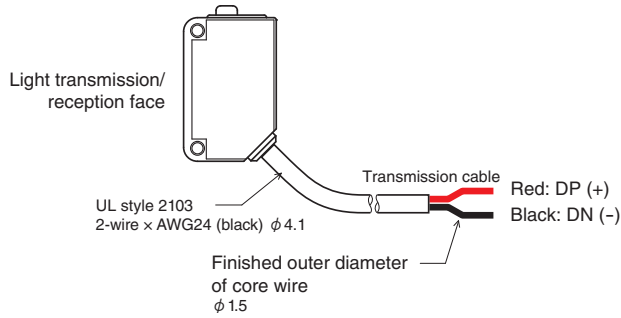


② Local power supply/branching -----



[Connection Method]

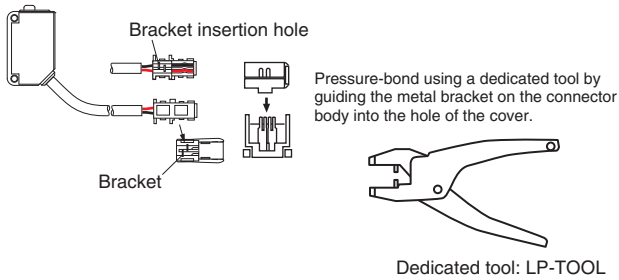
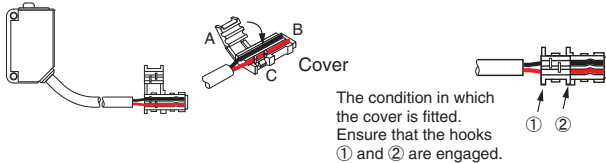
Connect the transmission line included in the master unit to the transmission line of the AnyWireASLINK master unit. Make sure that connections of the positive and negative polarities are correct.



■ Example of fitting the LP connector at the end of transmission line

Applicable LP connector: LP2-PWH-10P

Place the wires in the grooves so that the black wire (DN) is on the hinge side of the cover, fold A over B and engage the hook C to fasten it.

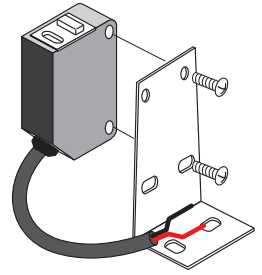


[Installation Example]

The bracket should be purchased separately.
M3 screw tightening torque: 0.25N·m or less

CAUTION

To secure the sensor, allow some extra length on the cable so that the cable and the connectors would not be subjected to any stress. Do not tighten the screws too tight. Doing so may cause a failure or a shift of optical axis.



[Installation Location]

- Locations where this product is not directly subject to vibration or shock
- Locations where this product is not exposed to dust and/or water continuously, even if it is waterproof
- Locations where this product is not directly exposed to conductors, such as metal chips or spatters
- Locations without condensation
- Locations where the atmosphere is free of corrosive gases, flammable gases, and sulfur
- Locations far from high-voltage or high-current cables
- Locations far from servos, inverters, and other cables and controllers that generate high-frequency noise
- Locations where this product is not directly exposed to the sunlight

[Notes on the Use]

- This unit should be used by connecting it with the AnyWireASLINK transmission line. It will not work if it is connected directly to an I/O card for a PLC.
- Use it in an appropriate voltage range.
- The transmission line attached to ASLINKSENSOR should be counted in the determination of the total length.

[Various Settings]

Address setting

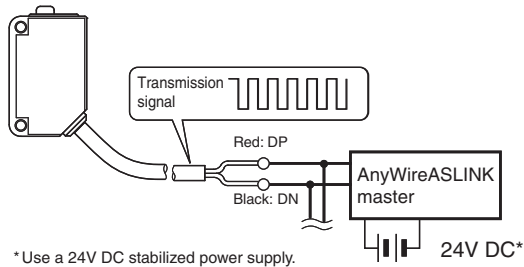
Teaching

Parameter setting

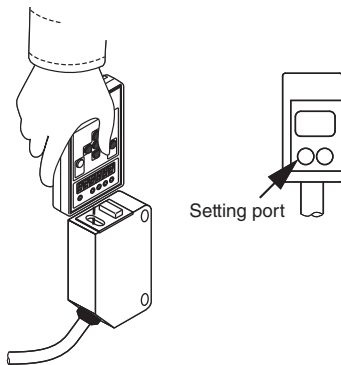
Common procedure for address writer operation

Use the address writer with the sensor connected to the AnyWireASLINK master unit.
An address writer is required for the operation.
For further information on the operation, refer to the product guide for the address writer.

1. Connect the terminal to the AnyWireASLINK master unit.
Perform the setting using the address writer with the transmission signal (DP, DN) supplied.



2. All terminals require settings.
Perform the settings with the address writer pointed toward the setting port on the transmitter/receiver.
(Hold the light emitting/receiving part as close as possible to the setting port.)



Address setting

For address numbers, specify the leading number of the transmission frames to be allocated to the terminal.
The address numbers of this unit are set between 0 and 254.



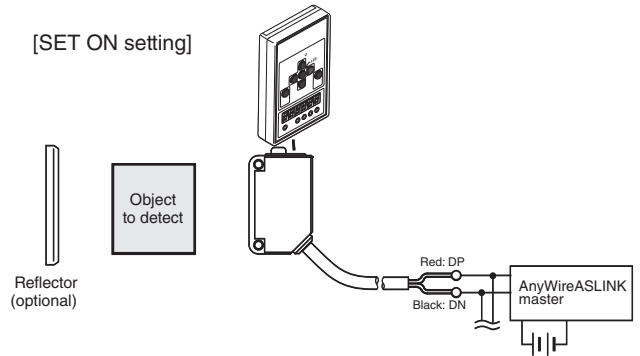
The factory setting of the terminal is "255," which means no setting.
If the address number is set to 255, the terminal does not perform I/O operations.
Before using the terminal, be sure to set an address number between 0 and 254.

Teaching

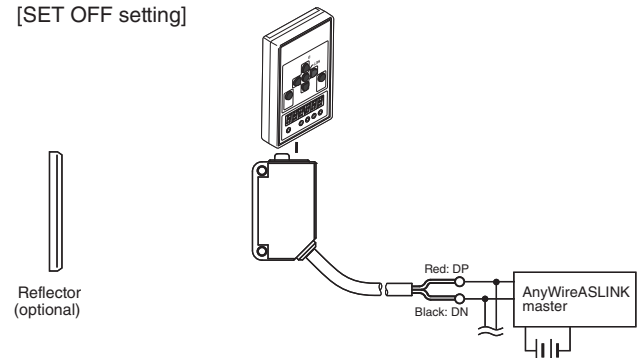
Save the condition with and without a workpiece in the ASLINKSENSOR.

The setting procedure should be conducted with a workpiece to be actually used.
To select the "0-100%" mode for the light receiving level indication setting (equipment parameter 8), be sure to conduct teaching.

[SET ON setting]



[SET OFF setting]



[Automatic setting for teaching]

If you conduct teaching when "AD value indication" is selected for the light receiving level indication setting (equipment parameter 8), "threshold," "hysteresis," "alarm Hi" and "alarm Lo" values will be automatically calculated and set at the following ratio, based on the difference in AD value between SET ON status (workpiece is present) and SET OFF status (no workpiece).

* When the "0-100%" mode is selected for light receiving level indication setting (equipment parameter 8), the automatic setting function for teaching is disabled.

| | |
|------------|-----|
| Threshold | 50% |
| Hysteresis | 5% |
| Alarm Hi | 80% |
| Alarm Lo | 20% |

Example)

- ① SET ON AD value for workpiece present status is "0."
- ② SET OFF AD value for workpiece absent status is "980."

With the difference "980" in AD value between SET ON status and SET OFF status defined as the reference (100%), the following parameters will be automatically set.

Threshold (Equipment parameter 1): 490 (50%)
Hysteresis (Equipment parameter 2): 49 (5%)
Alarm Hi (Equipment parameter 3): 784 (80%)
Alarm Lo (Equipment parameter 4): 196 (20%)

Parameter setting

■ Threshold setting [Equipment parameter 1]

This parameter determines the level of light to be received for detecting a workpiece.

*The gap in the detection conditions stored in memory in teaching is assumed to be 100%.

| AD value | 0-100% |
|----------|--------|
| 0-1023 | 0-100% |

Factory setting: 50 (AD value)

*The setting range depends on the parameter 8 setting.

■ Hysteresis setting [Equipment parameter 2]

This parameter determines the light level required for the detection condition to change from ON to OFF.

| AD value | 0-100% |
|----------|--------|
| 0-1023 | 0-100% |

Factory setting: 10 (AD value)

*The setting range depends on the parameter 8 setting.

■ Alarm Hi setting [Equipment parameter 3]

This parameter determines the upper limit for issuing an alarm.

*Set the alarm level so that the relationship $Hi > Lo$ will be satisfied.

| AD value | 0-100% |
|----------|--------|
| 0-1023 | 0-100% |

Factory setting: 0 (AD value)

*The setting range depends on the parameter 8 setting.

■ Alarm Lo setting [Equipment parameter 4]

This parameter determines the lower limit for issuing an alarm.

*Set the alarm level so that the relationship $Hi > Lo$ will be satisfied.

| AD value | 0-100% |
|----------|--------|
| 0-1023 | 0-100% |

Factory setting: 0 (AD value)

*The setting range depends on the parameter 8 setting.

■ Alarm monitoring time setting [Equipment parameter 5]

This parameter determines the monitoring time of alarm determination.

| Variable | Unit |
|----------|-------|
| 3-255 | 100ms |

Factory setting: 50

■ Light ON/Dark ON setting [Equipment parameter 6]

This parameter determines Light ON or Dark ON.

| Variable | Description |
|----------|-------------|
| 0 | Dark ON |
| 1 | Light ON |

Factory setting: 0

■ Operation mode setting [Equipment parameter 7]

This parameter disables/enables the preventive maintenance feature.

| Variable | Description | |
|----------|-----------------|---|
| 0 | Simplified mode | Preventive maintenance feature disabled |
| 1 | Normal mode | Preventive maintenance feature enabled |

Factory setting: 0

<Sensing level drop detection>

The sensing level is determined to have dropped if the current sensing level remained within the range set with the alarm Hi (equipment parameter 3) and alarm Lo (equipment parameter 4) for a period set in the alarm monitoring time (equipment parameter 5).

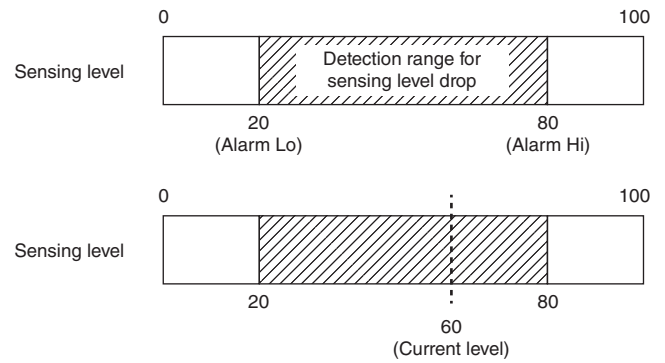
(Example)

With the settings of:

Alarm Hi (equipment parameter 3) : 80

Alarm Lo (equipment parameter 4) : 20

Alarm monitoring time (equipment parameter 5) : 50



If this condition continues for 5000ms (equipment parameter 5: 50×100 ms), it is detected as a drop in the sensing level and the user is notified with the ALM indicator on the unit and the alarm information is sent to the status detail area* on the master unit.

*This can be used on the master unit having the status detail area. For details, refer to the manual for the master unit.

■ Light receiving level indication setting [Equipment parameter 8]

This parameter determines the light receiving level indication. Based on this setting, parameters 1, 2, 3, 4 and the sensing level will be automatically set to the AD value or values in the range of 0 to 100%.

| Variable | Description |
|----------|------------------------------------|
| 0 | AD value indication (0-1023 Digit) |
| 1 | 0-100% indication |

Factory setting: 0

*Once the setting was modified by writing parameters from the host, the values of equipment parameters 1, 2, 3 and 4 will not be converted automatically.

■ ON delay setting [Equipment parameter 10]

This parameter determines the ON delay time.

| Variable | Unit |
|----------|-------|
| 0-999 | 100ms |

Factory setting: 0

■ OFF delay setting [Equipment parameter 11]

This parameter determines the OFF delay time.

| Variable | Unit |
|----------|-------|
| 0-999 | 100ms |

Factory setting: 0

■ One Shot setting [Equipment parameter 12]











This parameter determines the One Shot time.

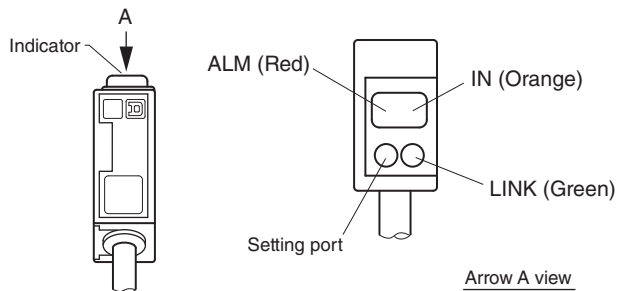
| Variable | Unit |
|----------|-------|
| 0-999 | 100ms |

Factory setting: 0

Parameter [9] and parameters from [13] onward are those in the system region. Do not modify these parameters with the address writer.

[Monitor Display]

| LED name | Display status | Description |
|-----------------|---|--|
| LINK (Green) | Lit  | Transmission signal error |
| | Flashing  | Transmission signal supplied properly |
| | Unlit  | No transmission signal |
| ALM (Red) | Lit  | Sensing level drop |
| | Flashing  | Slave unit voltage drop |
| | Unlit  | Normal |
| LINK ALM | Alternate flashing LINK  ALM  | The master unit has detected that the unit ID (address) is either duplicated or unregistered |
| IN (Orange) | Lit  | ON |
| | Unlit  | OFF |



[Troubleshooting]

If the following errors are indicated on the display window of ASLINKSENSOR, take the following actions.

| LINK | IN | ALM | Cause | Remedy |
|--|------------|---|---|---|
| ○ Unlit | ○ Unlit | ○ Unlit | - The ASLINKSENSOR is not connected to the AnyWireASLINK system. - The AnyWireASLINK system is not turned on. | - Check if there is a disconnection between the ASLINKSENSOR and AnyWireASLINK system and, if there was a disconnection, restore the connection. - Check the power supply of AnyWireASLINK system and turn ON the power. |
| ● Lit | ○ Unlit | ○ Unlit | - Connected directly to the 24-0V power supply. | - Reconnect the power to the AnyWireASLINK system. |
| ⊙ Flashing (alternates with a 0.5 sec. interval) | ○ Unlit | ⊙ Flashing (alternates with a 0.5 sec. interval) | - The address of ASLINKSENSOR remains as "255" (factory setting). - The address of ASLINKSENSOR is duplicated. | - Assign an address other than 255. - Look for a unit that has the same error and assign an address different from the address of that unit. |
| — | — | ⊙ Flashing (Lit for 0.2 sec., unlit for 1.0 sec.) | - The voltage of internal power supply for the ASLINKSENSOR is low. | - Reduce the number of units connected to the same AnyWireASLINK system. - Reduce the length of transmission line between ASLINKSENSOR and the master unit. |
| ⊙ Flashing | — | ● Lit | - The sensing level is low. | - Check the condition of ASLINKSENSOR, adjust the optical axis and clean the transmission/reception face. |

If the following error is indicated on the address writer, take the following action.

| Display | Cause | Remedy |
|----------|-------------------------------------|--|
| [E-0303] | The parameter setting is incorrect. | Refer to the parameter correspondence table and correct the setting. |

Should any of the following apply, take the following actions.

| Symptom | Remedy |
|--|--|
| Detection cannot be made | - Is the reflector installed correctly? → Install the reflector so that it faces against the transmission/reception face of ASLINKSENSOR. - Is the wiring correct? → Re-check the connection of ASLINKSENSOR transmission line. - Is there a power supply with a capacity appropriate for the AnyWireASLINK master and slave units and turned ON? → Check the power supply. - Has teaching been performed? → Perform teaching using a workpiece to be detected in the operation. - Is the sensor used in the specified detection range? → Use it within its rating. |
| Setting cannot be made with the address writer | - Is the wiring correct? → Check the connection of ASLINKSENSOR transmission line once more. - Is the power supplied to the AnyWireASLINK system? → Check the power supply. - Are the parameters set correctly? → Refer to the parameter correspondence table and correct the setting. |

[Equipment Parameters and Their Settings]

| Equipment parameter | Variable | Description | Factory setting |
|--------------------------------------|-----------------|--|-----------------|
| [1] Threshold | 0-1023 (0-100%) | The light receiving level for the detection | 50 |
| [2] Hysteresis | 0-1023 (0-100%) | The change in the light receiving level required for the detection status to change from ON to OFF | 10 |
| [3] Alarm Hi | 0-1023 (0-100%) | The upper limit of light receiving level for issuing an alarm | 0 |
| [4] Alarm Lo | 0-1023 (0-100%) | The lower limit of light receiving level for issuing an alarm | 0 |
| [5] Alarm monitoring time | 3-255 | The time of monitoring the light receiving level for issuing an alarm (1 = 100ms) | 50 |
| [6] Light ON/ Dark ON | 0 | Dark ON | 0 |
| | 1 | Light ON | |
| [7] Operation mode | 0 | Simplified mode (preventive maintenance feature disabled) | 0 |
| | 1 | Normal mode (preventive maintenance feature enabled) | |
| [8] Light receiving level indication | 0 | AD value indication (0-1023 Digit) | 0 |
| | 1 | 0-100% indication | |
| [10] ON Delay | 0-999 | The ON delay time (1 = 100ms) | 0 |
| [11] OFF Delay | 0-999 | The OFF delay time (1 = 100ms) | 0 |
| [12] One Shot | 0-999 | The One Shot time (1 = 100ms) | 0 |

[Specifications]

■ General specifications

| | |
|--|---|
| Operating ambient temperature/humidity | 0 to +55°C, 5 to 95%RH No condensation |
| Storing ambient temperature/humidity | -25 to +70°C, 5 to 95%RH No condensation |
| Operating ambient illuminance | Brightness on the reception face equivalent to max. 3000 lx of incandescent light |
| Vibration resistance | Based on JIS B 3502 and IEC 61131-2 |
| Shock resistance | Based on JIS B 3502 and IEC 61131-2 |
| Operating atmosphere | No corrosive gas |
| Operating altitude*1 | 0 to 2000m |
| Pollution level*2 | 2 or less |

*1 Do not use or store AnyWireASLINK devices in an environment where the pressure exceeds the atmospheric pressure at an altitude of 0 meters. Doing so may result in malfunction.

*2 "Pollution level" is an index that indicates the degree of occurrence of conductive substances in the environment where the device is used.

Pollution level 2 means the occurrence of only pollution by non-conductive substances.

In such an environment, however, electrical conduction could occur due to accidental condensation.

■ Transmission specifications

| | |
|------------------------------|--|
| Service power supply voltage | 24V DC +15% to -10% (21.6 to 27.6V DC) with a ripple of 0.5Vp-p or less |
| Transmission method | DC power supply superimposed total frame/cyclic method |
| Synchronization method | Frame/bit synchronization method |
| Transmission procedure | AnyWireASLINK protocol |
| Connection mode | Bus type (Multi-drop method, T-branch method, Tree branch method) |
| Number of connection points | 512 max. (IN: 256, OUT: 256) |
| Number of connection units | Up to 128 units |
| RAS function | Detection of transmission line disconnection, transmission line short-circuit, and transmission power supply drop Detection of duplicated/unregistered ID |

■ Individual specifications

| | |
|--|--|
| Number of occupied points | Input 1 point |
| Response time*3 | 1 to 2 cycles |
| Weight | 33g |
| Detection method | Retroreflective |
| Detection distance | 3000mm |
| Smallest object detectable | When AKR-1 is used: An opaque object of $\phi 73$ mm When AKR-2 is used: An opaque object of $\phi 50$ mm |
| Angle of beam spread | 2 to 10° |
| Light source (illumination wavelength) | Red LED |
| Protective circuit | Short circuit protection of power supply, protection against reverse connection of power supply, prevention of mutual interference |
| Protection class*4 | IP67 (Oil resistance under in-house standard) |
| Current consumption | 10mA |

*3 Time required to send a transmission signal after detection of ON or OFF status.
*This time + 2-cycle transmission time" is defined as transmission delay time.

*4 Oil resistance is verified with the oil or cutting fluid specified by in-house standard.
This unit hardly suffers damage from oil, but it is not guaranteed to be free from damage.
Do not use this unit in a place where it is always exposed to oil splash or stream.

*Cutting oil specified by in-house standard

Water-insoluble (YUSHIRONCUT KM557, KZ313S), water-soluble (YUSHIROKEN EC50, AP-EX-E7, FGS700)

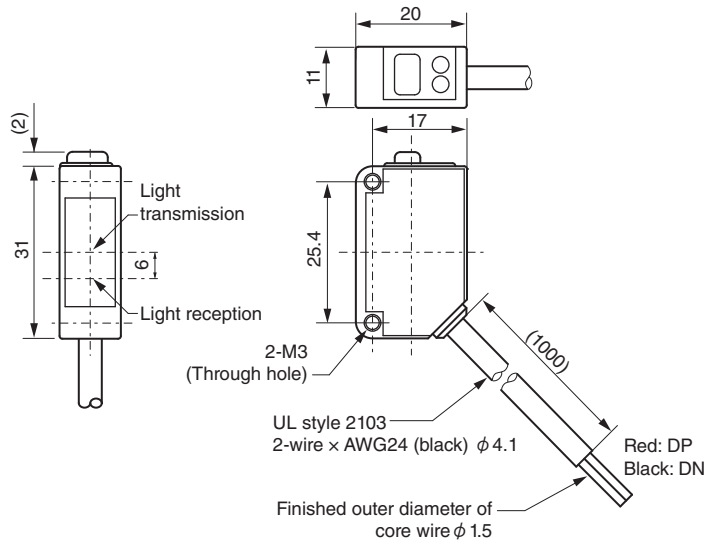
Immersion at 55°C ambient temperature

*Lubricating oil specified by in-house standard (VELOCITY OIL No. 3)

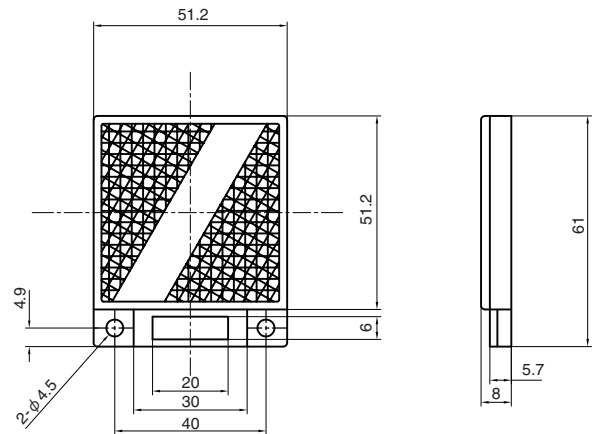
Immersion at 55°C ambient temperature

[Outside Dimensions]

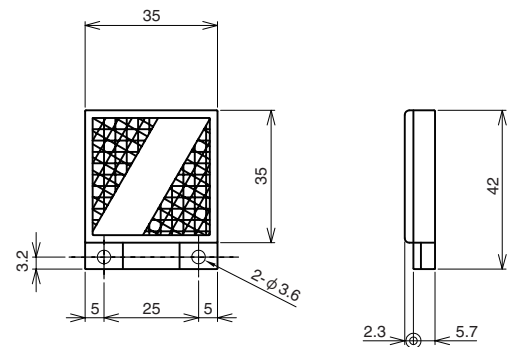
Unit: mm



<AKR-1>



<AKR-2>



【中国版RoHS指令】

电子信息产品上所示标记是依据SJ/T11364-2006规定,按照电子信息产品污染控制标识要求制定。
本产品的环保使用期限为10年,如果遵守产品说明书中的操作条件使用电子信息产品,不会发生因产品中的有害物质泄漏或突发异常而引发严重的环境污染、人身事故,或损坏财产等情况。

的产品中有害物质的名称及含量

| 部件名称 | 有害物质 | | | | | |
|------|-----------|-----------|-----------|-----------------|---------------|-----------------|
| | 铅 (Pb) | 汞 (Hg) | 镉 (Cd) | 六价铬 [Cr(VI)] | 多溴联苯 (PBB) | 多溴二苯醚 (PBDE) |
| 安装基板 | × | ○ | ○ | ○ | ○ | ○ |
| 框架 | ○ | ○ | ○ | ○ | ○ | ○ |

本表格依据SJ/T11364的规定编制。
○：表示该有害物质在该部件所有均质材料中的含量均在GB/T26572规定的限量要求以下。
×：表示该有害物质至少在该部件的某一均质材料中的含量超出GB/T26572规定的限量要求。



基于中国标准法的参考规格：GB/T115969.2

[Address]

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