AnyWireASLINK System Products Guide

ASLINKSENSOR [ASLINK Sensor]

BM-C27-DM9-□□□□-5050

[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.

WARNING

- O 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.
- O Always turn off the power in installing or replacing the system.
- O 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.

CAUTION

- O System power supply
  Use a stable, 24V DC power supply. Use of an unstable power supply may cause problems with the system.
- O 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.
- O 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.
- O Do not impose any external loads on the units. Doing so may cause a failure.
- O Do not disconnect or reconnect between the transmission line and slave units when the transmission line is active. A malfunction may occur.
- O 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 Products 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.

[Type]

AnyWireASLINK ASLINKSENSOR:
Cylinder type (amplifier relay type)

BM-C27-DM9-50-5050	Loose wire	ϕ4 round groove compatible
BM-C27-DM9-3012-5050	M12 connector	

[Function]

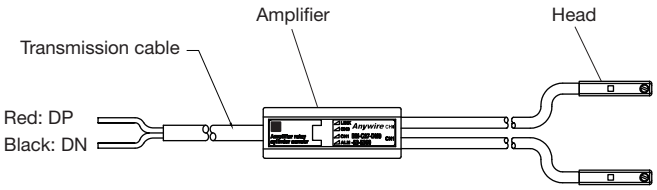
Model	ASLINKSENSOR 2-wire type (non-isolated)
Detection method	Cylinder type (amplifier relay type)
Features	Threshold
	Alarm determination level
	Alarm determination time
	Normally open/Normally closed
	Operation mode
	Debug mode
	Amplifier-head disconnection
	Amplifier-head short circuit
	Sensing level drop
	Slave unit voltage drop

[Included in the Package]

BM-C27-DM9-□□□□-5050	This product ... 1

[Name of Each Part]

The drawing is an example of BM-C27-DM9-50-5050.



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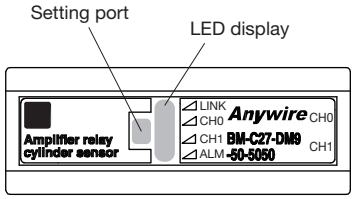

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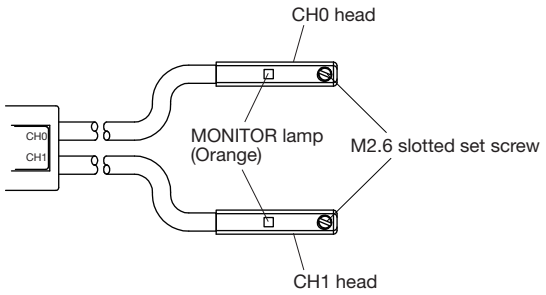
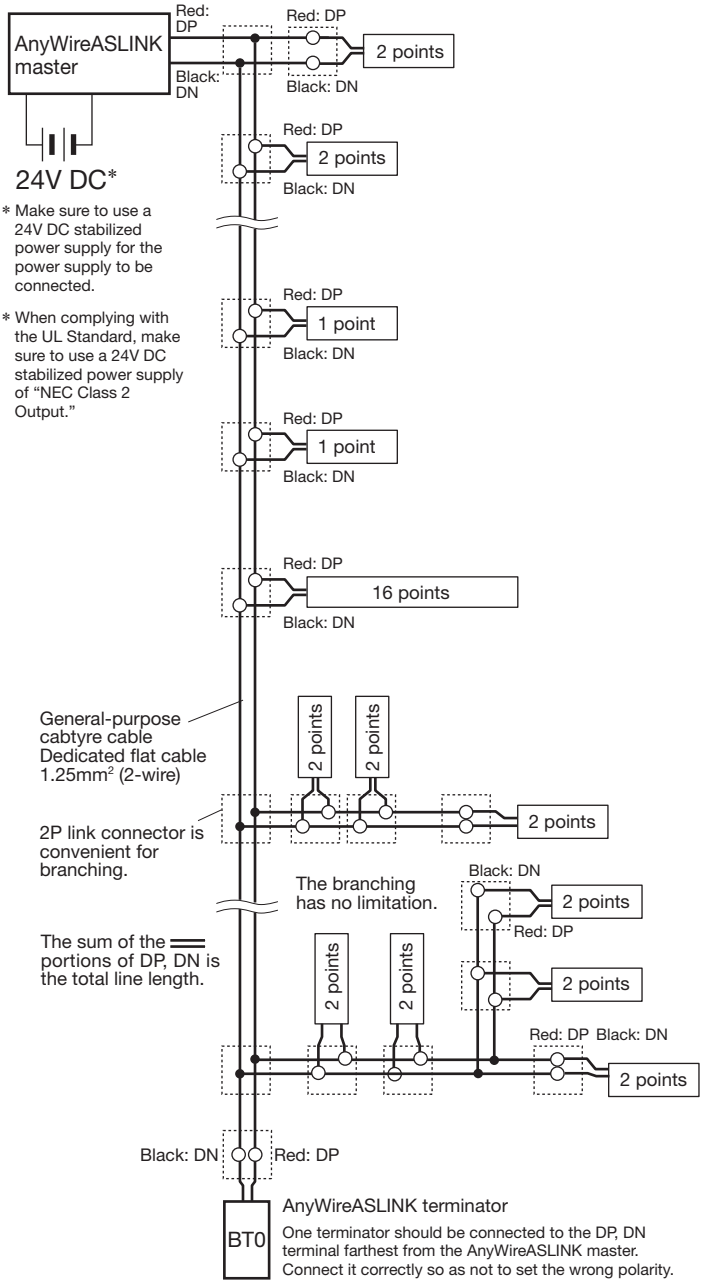


[AnyWireASLINK Terminal]

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 a 2-wire (non-isolated) terminal only



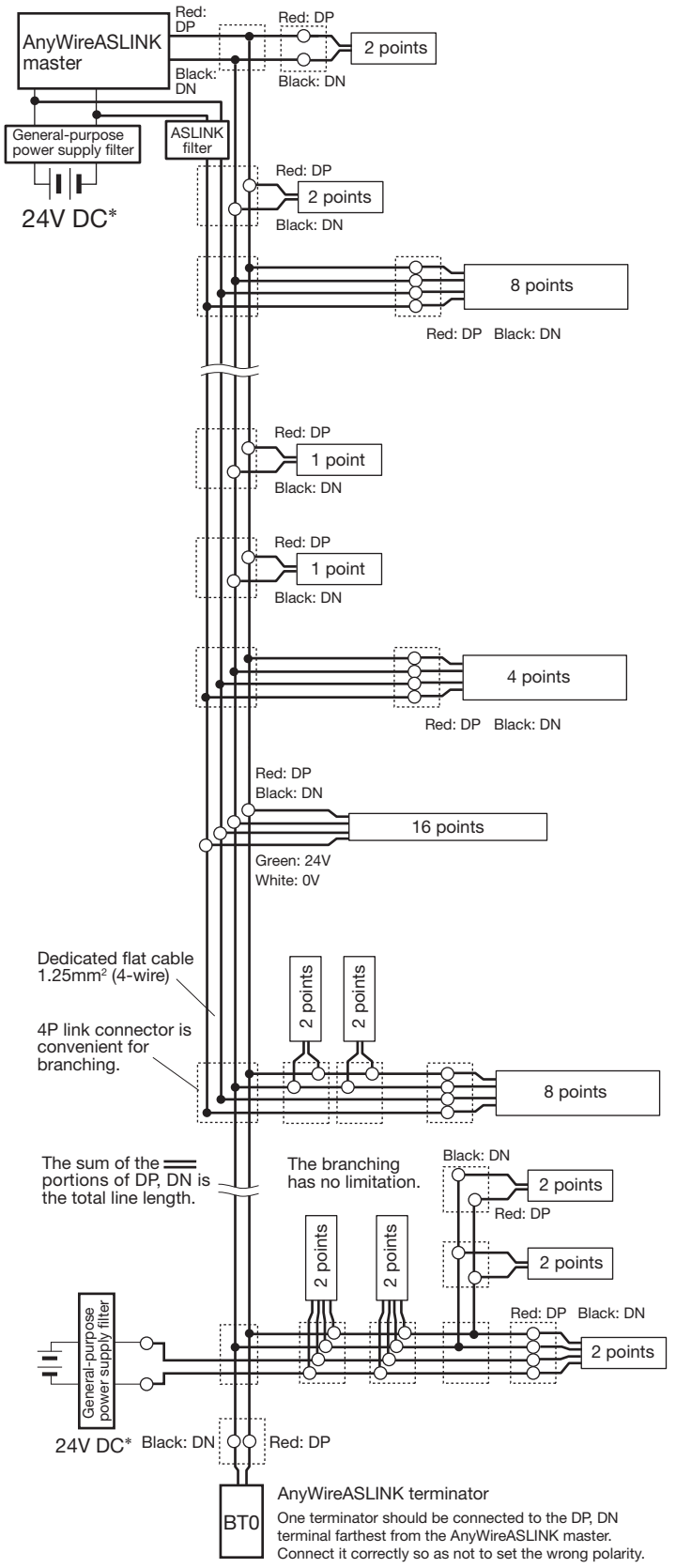
■Relationship between the size and length of the transmission line and the supply current (Table 1)

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
1.25mm²	MAX 2A	MAX 1A	MAX 0.5A
0.75mm²	MAX 1.2A	MAX 0.6A	MAX 0.3A
0.5mm²	MAX 0.8A	MAX 0.4A	MAX 0.2A

CAUTION

- 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 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 BT0 (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



CAUTION

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.

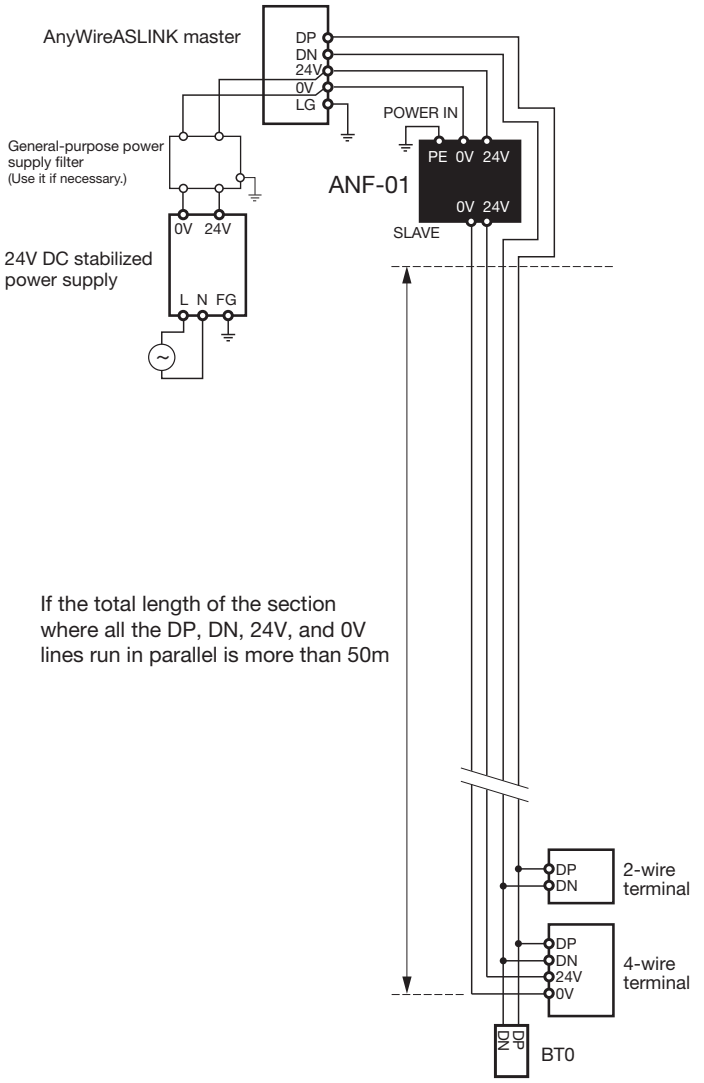
Insert the “ASLINK filter [Type ANF-01]” regardless of installation method and distance when complying with CE Standard.

■Filter allowable current

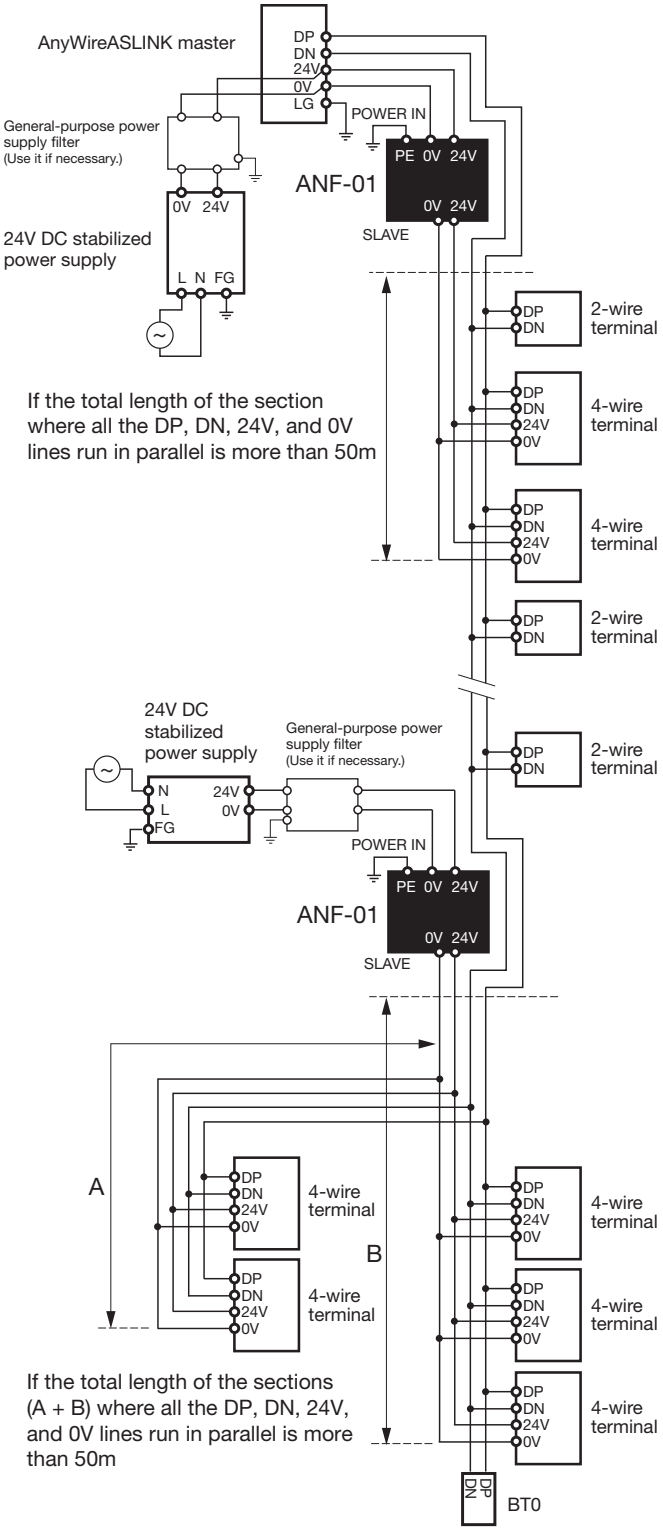
Product	Type	Allowable power current
ASLINK filter	ANF-01	MAX 5A/24V DC
Filter of COSEL Co., Ltd.	EAC-06-472	MAX 6A/24V DC

■AnyWire Type: ANF-01 Connection example

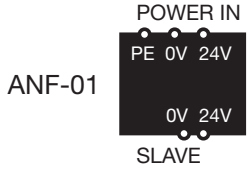
①Power supply to the entire system



②Local power supply/branching



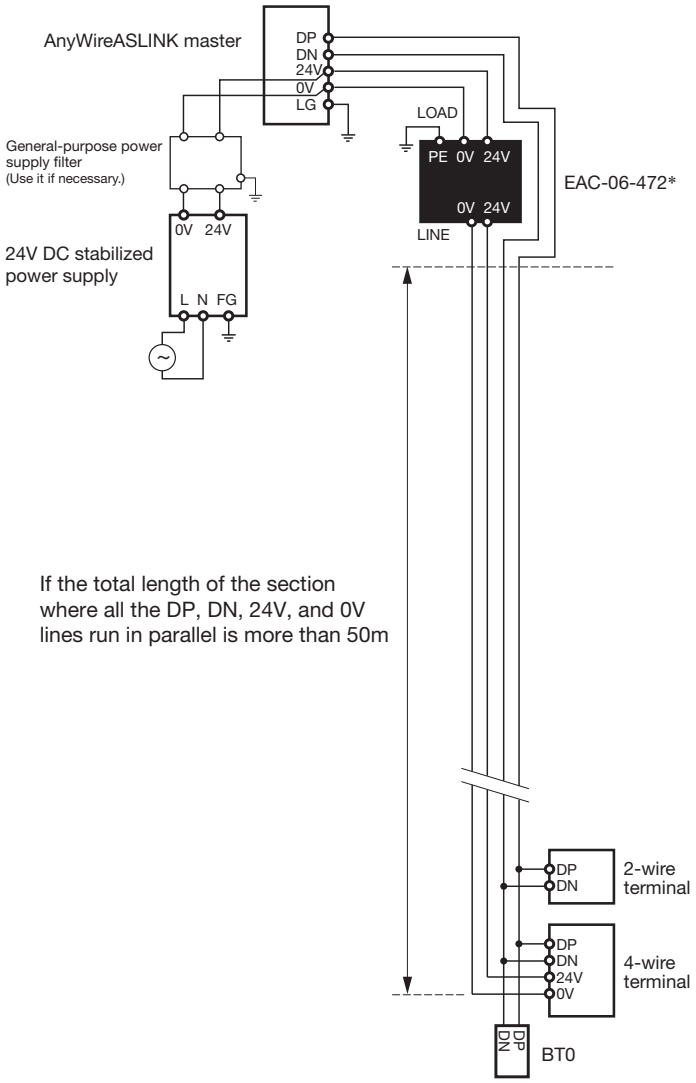
■Filter representation in the drawing



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

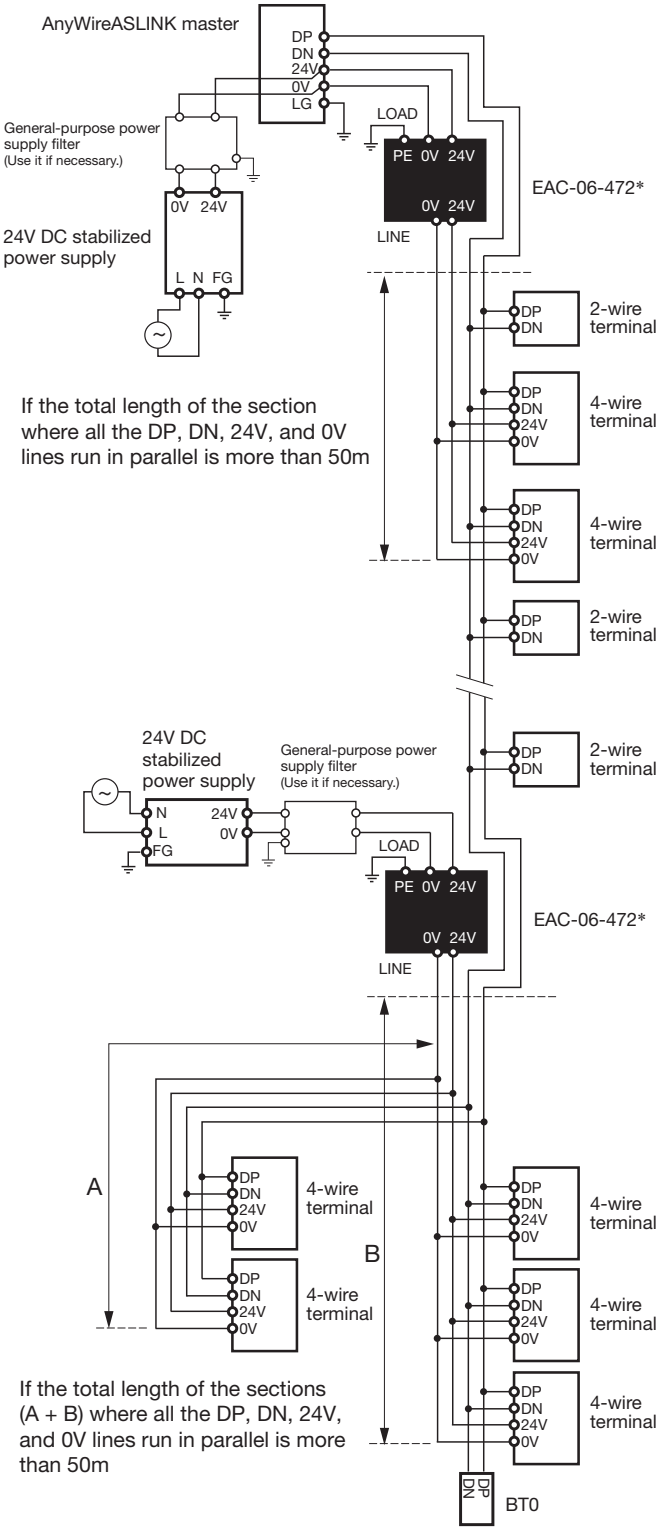
■COSEL Co., Ltd. Type: EAC-06-472 Connection example

①Power supply to the entire system

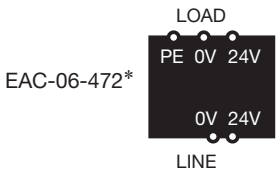


*When using this filter, please be careful of the positions of LOAD and LINE.

②Local power supply/branching



■Filter representation in the drawing

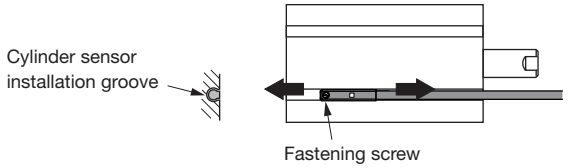


*When using this filter, please be careful of the positions of LOAD and LINE.

[Installation]

■Securing the sensor

Insert the cylinder sensor into the groove on the cylinder and adjust its position by sliding it. To secure it, tighten the fastening screw on the cylinder sensor.

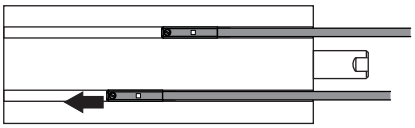


> **⚠CAUTION** To secure ASLINKSENSOR, allow some extra length on the cable so that the cable and the connectors would not be subjected to any stress.
> Install the cable in a way that it would not be tangled with cylinder rod and other parts.
> Do not tighten the cylinder sensor fastening screw too tight. Doing so may cause a failure.

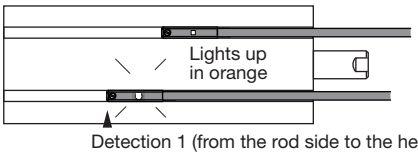
■Adjusting the sensor detection position

An example of mounting the sensor on the head is used for the explanation below. The same applies to the rod end as well.
∗Make this adjustment after setting the address number properly.

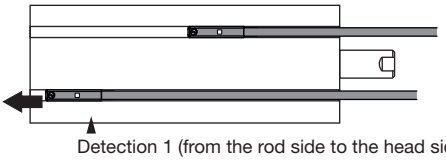
① Insert the piston rod into the head all the way and move the cylinder sensor in the direction indicated by the arrow.



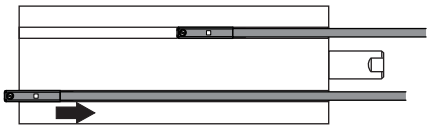
② Mark the position at which the orange LED lights up for the first time (detection 1).



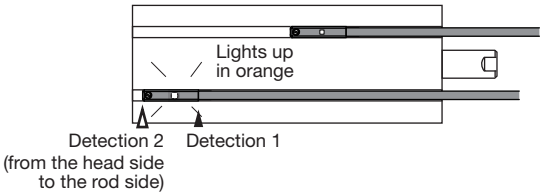
③ Move the sensor further until the orange LED turns off.



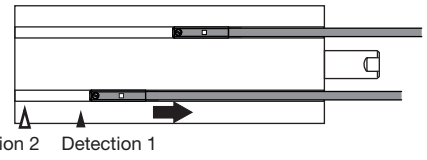
④ Next, move the sensor in the direction indicated by the arrow from the head side.



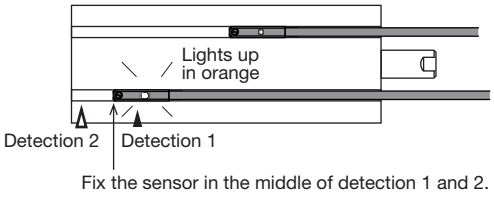
⑤ In the same way as above, mark the position at which the orange LED lights up (detection 2).



⑥ Move the sensor further until the orange LED turns off.



⑦ Fix the ASLINKSENSOR at the middle point between the two positions at which the orange LED lighted up (detection 1 and 2).



Ensure to perform the Teaching Operation on page 7 in this condition.

[Installation Location]

- Locations where this product is not directly subject to vibration or shock
- Locations where this product is not directly exposed to dust
- 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

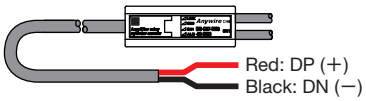
[Notes on the Use]

- This terminal 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.

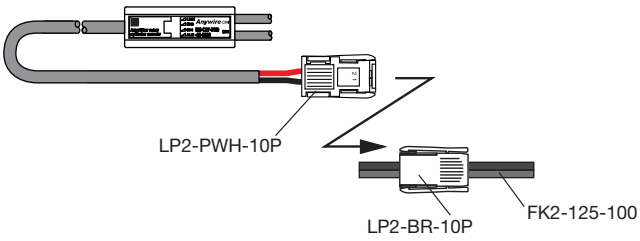
[Connection Method]

Connect the transmission line (DP, DN) coming from ASLINKSENSOR to the transmission line (DP, DN) of AnyWireASLINK system. Pay attention to the polarity.

■Loose wire type

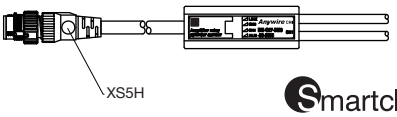


[Connection example when using a Link Connector]



■M12 connector type

1	N/C
2	DP
3	N/C
4	DN



Smartclick

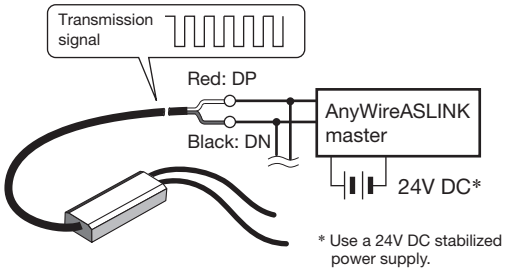
[Various Settings]

Address number setting | Teaching | Parameter setting

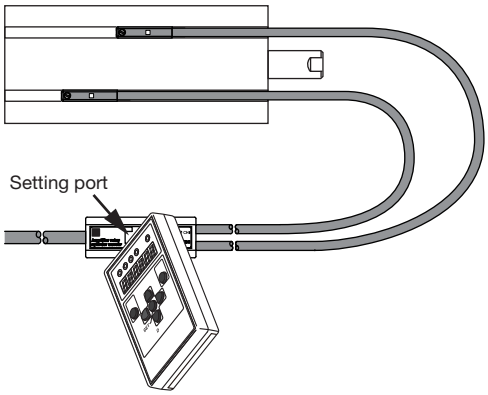
■Common procedure for address writer operation

Be sure to connect to the AnyWireASLINK master unit to use.
Address Writer ARW-04 (Ver. 04-1.01 or later) or
ARW-03 (Ver. 2.10 or later) is required for operation.
For details about the operation method, refer to the address writer's Products Guide.

1. Connect the ASLINKSENSOR to the master unit of AnyWireASLINK system.
   The transmission signal is required for setting the address number and reading/writing the parameters.
   Use an Address Writer to perform settings while the transmission signal is supplied through the terminal's transmission line (DP, DN).



2. All ASLINKSENSORs require settings.
   Perform the settings with the Address Writer come into contact with the setting port on ASLINKSENSOR.



Address number setting

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

CAUTION

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.

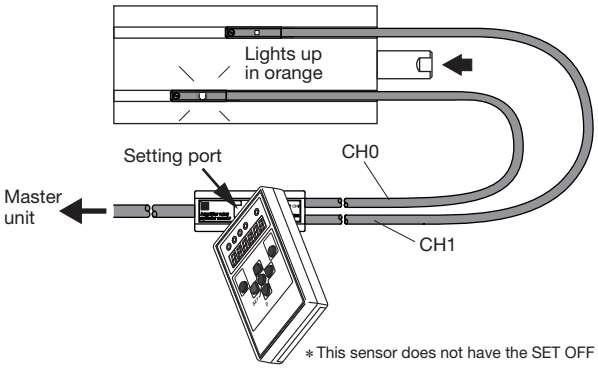
Teaching

Save the condition with a piston in the ASLINKSENSOR.

[SET ON setting]

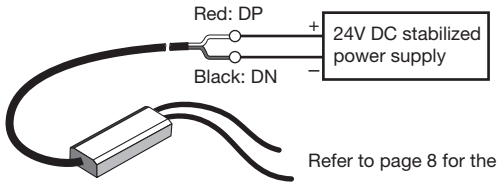
With the sensor at the adjusted position (page 5), set the amplifier with the MONITOR LED (orange) lit.

Which sensor head, CH0 or CH1, to be set depends on the parameter 10 setting. ＊Refer to page 8.



＊This sensor does not have the SET OFF operation.

It is also possible to perform teaching by supplying a 24V power directly to the DP and DN terminals. (Debug mode)



Refer to page 8 for the debug mode.

＊Note that supplying a 24V power directly to the DP and DN terminals on the master unit may result in a failure.

Parameter setting

■Threshold setting

By modifying the threshold of ASLINKSENSOR sensing, it is possible to change the range in which the detection is performed. Modify this setting to change the detection timing or let the sensor detect in narrower range.

- Address Writer (ARW-04, ARW-03): Parameter 01, 04

Parameter 01: CH0 threshold
Parameter 04: CH1 threshold

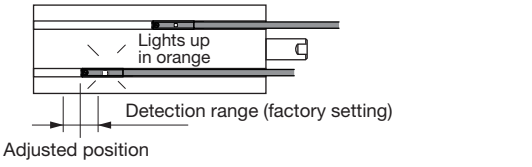
Variable
0 to 100

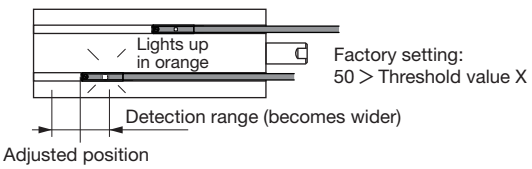
Factory Setting: 50

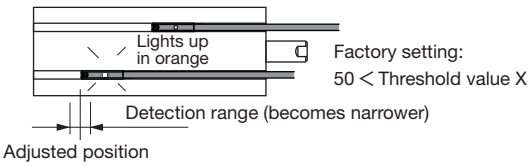
Threshold value X	Behavior
50 > X (0 to 49)	The detection range becomes wider than the factory setting
50 < X (51 to 100)	The detection range becomes narrower than the factory setting

[Images of threshold and detection range]

An example with the piston on the head side







■Hysteresis setting

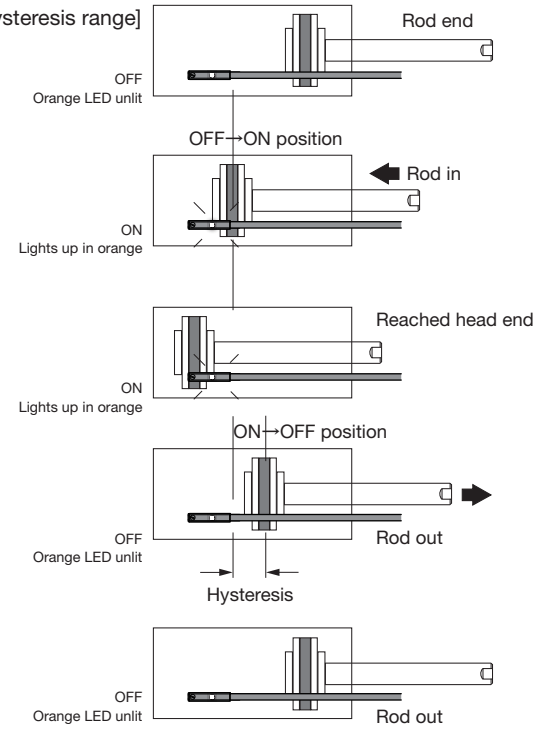
- Address Writer (ARW-04, ARW-03): Parameter 02, 05

Parameter 02: CH0 hysteresis
Parameter 05: CH1 hysteresis

Variable
0 to 100

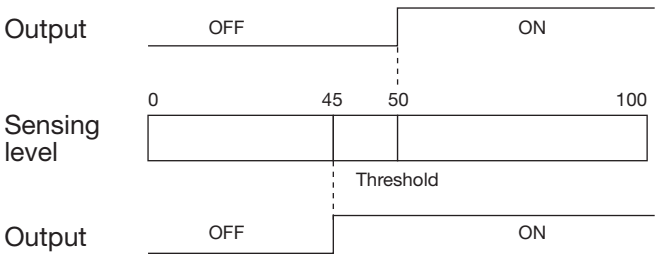
Factory Setting: 5

[Image of hysteresis range]



An example with the threshold of 50 and hysteresis of 5

OFF→ON



OFF←ON

■Alarm Hi setting

This parameter determines the upper limit for alarm determination.

＊Set the alarm level so that the threshold would be lower than the Hi value.

- Address Writer (ARW-04, ARW-03): Parameter 03, 06

Parameter 03: CH0 alarm Hi
Parameter 06: CH1 alarm Hi

Variable
0 to 100

Factory Setting: 80

■Alarm monitoring time setting

This parameter determines the monitoring time for alarm determination.

- Address Writer (ARW-04, ARW-03): Parameter 07

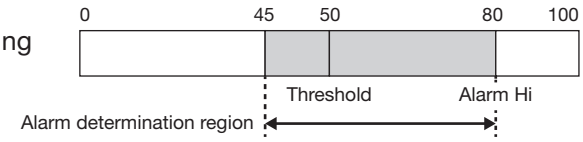
Variable	Unit
3 to 255	100ms

Factory Setting: 50

＜Alarm determination＞

Alarm determination works only when the sensor is ON.

An example with the threshold of 50, hysteresis of 5 and alarm Hi 80



An alarm will be issued if the current sensing level stays in this region longer than the set alarm monitoring time.

■Normally open/Normally closed setting

This parameter determines the normally open or normally closed operation of contacts.
∗Both behaviors of CH0 and CH1 will be determined by this parameter.

- Address Writer (ARW-04, ARW-03): Parameter 08

Variable	Description
0	Normally open
1	Normally closed

Factory Setting: 0

■Operation mode setting

This parameter enables or disables the diagnosis feature.
∗Both behaviors of CH0 and CH1 will be determined by this parameter.

- Address Writer (ARW-04, ARW-03): Parameter 09

Variable	Description
0	Simplified mode (diagnosis feature OFF)
1	Normal mode (diagnosis feature ON)

Factory Setting: 0

■Channel setting

This parameter determines the channels on which teaching is performed and whose sensing level is output.

- Address Writer (ARW-04, ARW-03): Parameter 10

Variable	Description
0	CH0
1	CH1

Factory Setting: 0

■Debug mode setting

Although teaching of this device becomes possible by connecting it to the transmission line (DP, DN) of the master unit, the debug mode makes it possible to perform teaching without the connection.

- Address Writer (ARW-04, ARW-03): Parameter 18

Variable	Description
0	Normal operation
1	Debug operation
2	Not available
3	Teaching setting reset

Factory Setting: 0

If this device is supplied with a 24V DC power (DP: positive; DN: negative) and set to the debug mode, teaching will be possible without the master unit.

Should the LED display on this device becomes unstable by performing teaching on a wrong channel, perform teaching again after resetting the teaching setting.

∗ Teaching setting reset is enabled both in the normal operation or debug mode.
∗ After resetting the teaching setting, always reset the mode to normal operation or debug operation mode.
∗ After resetting the teaching setting, always perform teaching again.

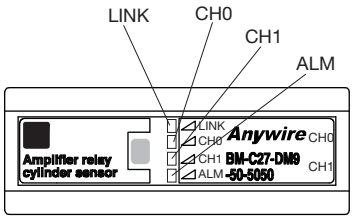
Parameter 11 to 17 and that from 19 onward are those in the system region. Do not modify these parameters.

[Monitor Display]

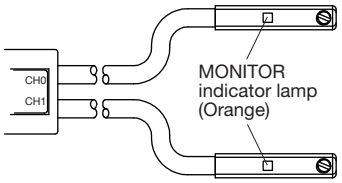
	LED name	Display status	Description
LED display	LINK (Green)	Lit	Transmission error
		Flashing	No transmission signal received
		Unlit	No transmission signal (disconnection and reverse connection of DP and DN lines included)
	ALM (Red)	Lit	Input ON: sensing level drop*
			Input OFF: disconnection or short circuit of sensor cable
		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
	CH0, 1 (Green)	Lit	Input ON (rod detected)
		Unlit	Input OFF (rod not detected)
	CH0, 1 (Red)	Lit	Input ON* (rod detected, unstable region)
		Unlit	Input OFF (rod not detected)
	MONITOR (Orange)	Lit	Rod detected
		Unlit	Rod not detected

∗With the alarm diagnosis feature (parameter 09) enabled

＜Amplifier＞



＜Head＞



[Troubleshooting]

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

LINK	CH1, 2	ALM	Cause	Remedy
○ Unlit	○ Unlit	○ Unlit	- AnyWireASLINK is not connected to the ASLINKSENSOR. - 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).	- Assign an address other than 255.
			- The address of ASLINKSENSOR is duplicated.	- 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	● Lit	- The sensing level is low.	- Check the condition of ASLINKSENSOR and check and adjust its installation condition.
◎ Flashing	○ Unlit	● Lit	- There is a disconnection or short circuit in the cable connecting the amplifier and head.	- Check the cable between the amplifier and head and replace it.

If the following error is indicated on ARW-04, 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 installation position appropriate? → Slide the ASLINKSENSOR from the rod side and the head side respectively and adjust its position so that it will be in the middle of two positions at which the indicator turns ON. - Is the wiring correct? → Ensure that the ASLINKSENSOR transmission line is connected to the AnyWireASLINK system transmission line (DP, DN) properly. - Is there a 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 the workpiece to be detected in the operation.
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.

[Parameter and Setting Items]

Parameters	Variable	Description	Factory setting
【01.】 Threshold	0-100	The magnetic level for the detection	50
【02.】 Hysteresis	0-100	The change in the magnetic level required for the detection status to change from ON to OFF	5
【03.】 Alarm Hi	0-100	The upper limit of magnetic level for issuing an alarm	80
【04.】 Threshold	0-100	The magnetic level for the detection	50
【05.】 Hysteresis	0-100	The change in the magnetic level required for the detection status to change from ON to OFF	5
【06.】 Alarm Hi	0-100	The upper limit of magnetic level for issuing an alarm	80
【07.】 Alarm monitoring time	3-255	The time of monitoring the magnetic level for issuing an alarm (1 = 100ms)	50
【08.】 NO/NC	0	Normally open	0
	1	Normally closed	
【09.】 Operation mode	0	Simplified mode (preventive maintenance feature disabled)	0
	1	Normal mode (preventive maintenance feature enabled)	
【10.】 Channel	0	CH0	0
	1	CH1	
【18.】 Operation setting	0	Normal operation	0
	1	Debug operation	

[Specifications]

■General Specifications

Item	Description
Ambient temperature/ humidity use	0 – 55°C, 10 – 90%RH No condensation
Ambient temperature/ humidity storage	-25 – 75°C, 10 – 90%RH No condensation
Withstand voltage	1,000V AC for one minute, between the consolidated cable and the housing
Insulation resistance	20MΩ or higher at 500V DC, between the consolidated cable and the housing
Atmosphere use	No corrosive gas
Altitude use	0 – 2000m
Pollution level	2 or less

■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	Dedicated 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 units that can be connected	Up to 128 units
RAS features	Detection of transmission line disconnection, detection of transmission line short circuit, detection of transmission power drop, detection of duplicated/unregistered ID

■Individual Specifications

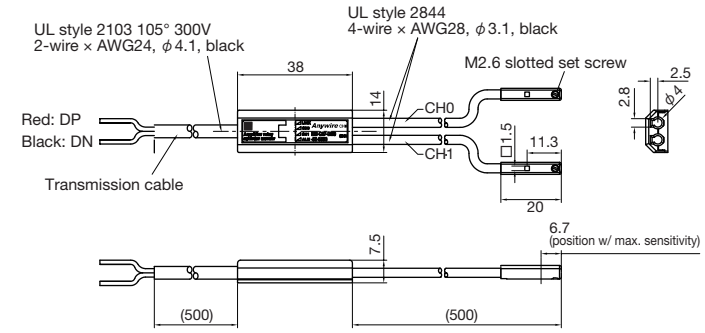
Occupied number of points	2 input points
Response time*1	1.2ms max.
Current consumption	8mA
Weight	BM-C27-DM9-50-5050: 40g
	BM-C27-DM9-3012-5050: 45g
Detection method	Magnetic induction sensing
Compatible cylinder	Integrated magnet type

*1 The time from detecting the ON or OFF condition until the transmission signal is sent. This time plus two transmission cycles will be the transmission delay.

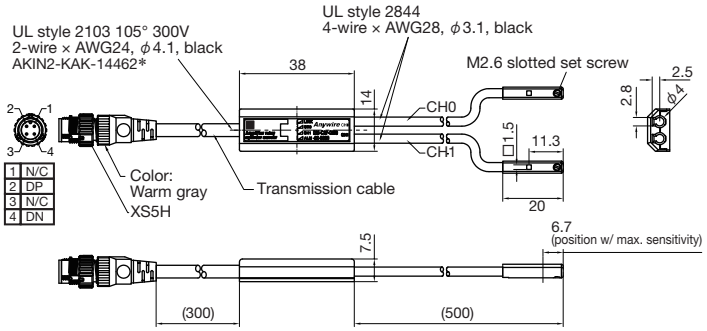
[Outside Dimensions]

Unit: mm

■BM-C27-DM9-50-5050



■BM-C27-DM9-3012-5050



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Printed in Japan 2017,2025 UMA-17666D-EN