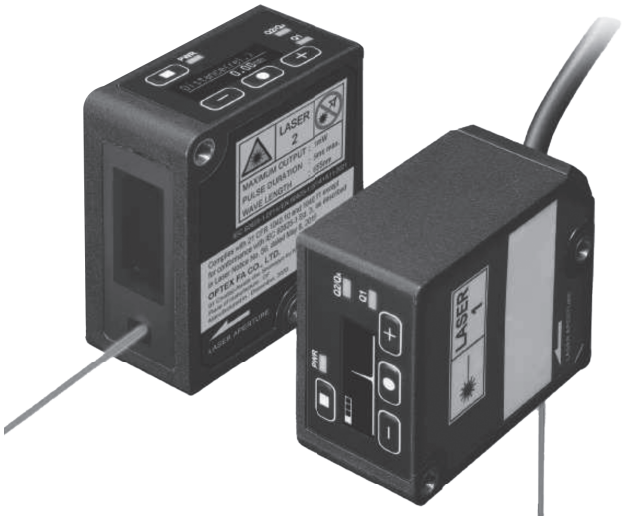


คุณสมบัติ

Highest-in-class* Repeat Accuracy and Sampling Period are achieved by originally developed ultra-sensitive C-MOS image sensor. These features contribute quality improvement and faster operation of production lines in a broad range of manufacturing.

CD2H-Series is the C-MOS Laser Displacement Sensor that achieves the Fastest-in-class* Repeat Accuracy of 0.25 µm and Sampling Period up to 133.3 µs. The long-range models that are capable to measure in a distance up to 1,200 mm can be used in a wide range of application, such as measurement of a sheet-roll diameter and stack height. The OLED display and IO-Link are supported as standard. These are high-performance displacement sensors that support measurement requirements for high accuracy.

*Among laser displacement sensors with the repeat accuracy of 1 µm (Investigated by OPTEX FA in November 2021)

■ Lineup

Reflection mode	Measurement range	Repeat Accuracy	Linearity	Light source Laser class	I/O	Connection	Model
Diffuse	30±5 mm	0.25 µm	±0.1% of F.S.	Red semiconductor laser CLASS 1/Class I	Analog output 2 control outputs External input IO-Link	Cable	CD2H-30A
						Pigtail cable	CD2H-30M12A
					RS-485 Control output External input	Pigtail cable	CD2H-30-485M12A
	50±10 mm	0.25 µm	±0.1% of F.S.		Analog output 2 control outputs External input IO-Link	Cable	CD2H-50A
						Pigtail cable	CD2H-50M12A
					RS-485 Control output External input	Pigtail cable	CD2H-50-485M12A
	130±70 mm	4 µm	±0.1% of F.S.		Analog output 2 control outputs External input IO-Link	Cable	CD2H-130
						Pigtail cable	CD2H-130M12
					RS-485 Control output External input	Pigtail cable	CD2H-130-485M12
	245±175 mm	10 µm	±0.1% of F.S.	Red semiconductor laser CLASS 2/Class II	Analog output 2 control outputs External input IO-Link	Cable	CD2H-2452
						Pigtail cable	CD2H-245M122
					RS-485 Control output External input	Pigtail cable	CD2H-245-485M122
	350±250 mm	20 µm	±0.1% of F.S.		Analog output 2 control outputs External input IO-Link	Cable	CD2H-3502
						Pigtail cable	CD2H-350M122
					RS-485 Control output External input	Pigtail cable	CD2H-350-485M122
	700±500 mm	100 µm	±0.1% of F.S. (200 to 700 mm)		Analog output 2 control outputs External input IO-Link	Cable	CD2H-7002
						Pigtail cable	CD2H-700M122
			±0.3% of F.S. (700 to 1200 mm)		RS-485 Control output External input	Pigtail cable	CD2H-700-485M122

● Purchase of an optional connector cable is necessary for pigtail cables.

Application

Options/Accessories

● Connector cables for IO-Link/analog output

Standard cables



YF2A15-020VB5XLEAX Cable length: 2 m
YF2A15-050VB5XLEAX Cable length: 5 m
YF2A15-100VB5XLEAX Cable length: 10 m

Minimum bending radius:
Cable diameter × 5 (when fixed in place)

Bending resistant cables



DOL-1205-G02M-R Cable length: 2 m
DOL-1205-G05M-R Cable length: 5 m

Minimum bending radius:
Cable diameter × 2 (when fixed in place)
Cable diameter × 6 (when movable)

● Connector cables for RS-485 communication

6-wire twisted pair cable



CD-MC1206-G2S Cable length: 2 m
CD-MC1206-G5S Cable length: 5 m

Minimum bending radius:
Cable diameter × 5 (when fixed in place)
Cable diameter × 8 (when movable)

8-wire twisted pair cable for multi-drop



CD-MC1208-G2M Cable length: 2 m
CD-MC1208-G5M Cable length: 5 m

Minimum bending radius:
Cable diameter × 5 (when fixed in place)
Cable diameter × 8 (when movable)

● Mounting bracket



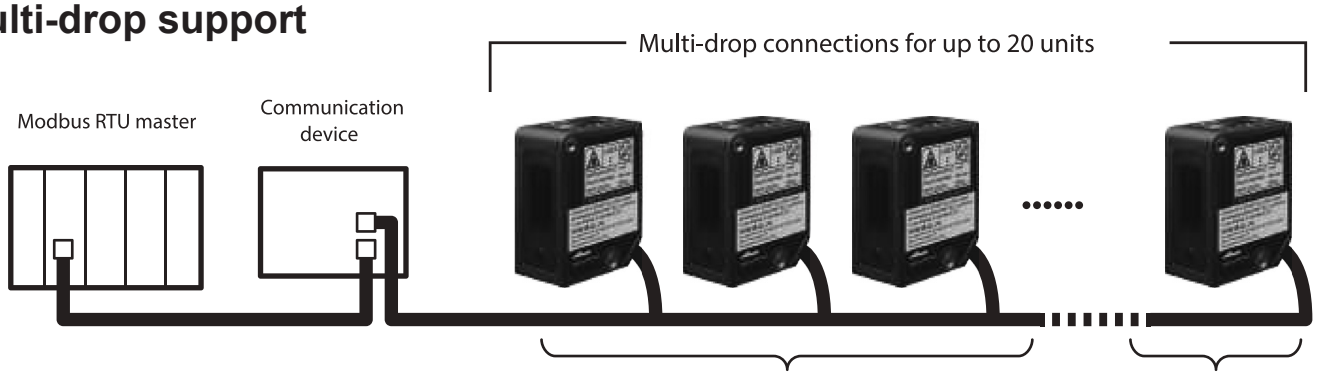
BEF-WN-OD2000-B



Installation example

RS-485 Type

Multi-drop support



Modbus RTU standard

Connection conditions

- Connected units: Maximum 20 units
- Cable length: Maximum total length 70 m
- Baud rate: 1 Mbps or less

*The above connection conditions apply when the OPTEX FA option cable is used and there are no effects from noise. Depending on the cable used and the environment, there is the possibility that the above number of connected units or cable length cannot be fulfilled.

www.primusthai.com

ข้อมูลทางเทคนิค

■ Model Specifications

● IO-Link/analog output Type

Model	Cable	CD2H-30A	CD2H-50A	CD2H-130	CD2H-2452	CD2H-3502	CD2H-7002
	Pigtail cable	CD2H-30M12A	CD2H-50M12A	CD2H-130M12	CD2H-245M122	CD2H-350M122	CD2H-700M122
Center of measurement range		30 mm	50 mm	130 mm	245 mm	350 mm	700 mm
Measurement range		±5 mm	±10 mm	±70 mm	±175 mm	±250 mm	±500 mm
Light source	Medium	Red semiconductor laser					
	Wavelength	655 nm					
	Maximum output	0.39 mW			1 mW		
Laser class	JIS/IEC/FDA*1	CLASS 1/Class I			CLASS 2/Class II		
Spot size*2		ø50 µm	ø70 µm	ø0.3 mm	ø0.5 mm	ø0.6 mm	ø1.0 mm
Linearity		±0.1% of F.S.	±0.1% of F.S.	±0.1% of F.S.	±0.1% of F.S.	±0.1% of F.S.	±0.1% of F.S. (200 to 700 mm) ± 0.3% of F.S. (700 to 1200 mm)
Resolution*3		0.25 µm	0.25 µm	4 µm	10 µm	20 µm	100 µm
Repeat accuracy*4		0.25 µm	0.25 µm	4 µm	10 µm	20 µm	100 µm
Sampling period*5		133.3 µs/150 µs/200 µs/300 µs/500 µs/1 ms/2 ms/5 ms/Auto					
Temperature characteristics*6		±0.06% of FS/°C					
Weight		Cable models: Approx. 140 g Connector models: Approx. 90 g					
IO-Link	Specifications	Rev. 1.1					
	Baud rate	COM3 (230.4 kbps)					
	Number of process input data bytes	6 bytes					
	Minimum cycle time	0.7 ms					
Control output (DO1/DO2*7)	No. of outputs	2 (DO1 can be switched to IO-Link.)					
	Polarity	NPN/PNP, open collector or Push-Pull (selectable by setting) Max. 100 mA/24 VDC, residual voltage 1.8 V or less					
Analog output QA*7	Current	4 to 20 mA, load impedance: 300 Ω or less					
	Voltage	0 to 10 V, output impedance: 100 Ω or less					
External input*8		Switchable between Off, Multi operations, Hold, Zero point teach, and Laser off					
Connection		Cable: ø4.5 mm, 2 m cable Pigtail cable: ø4.5 mm, 300 mm cable with M12 5-pin connector Minimum bending radius: Cable diameter × 2 (when fixed in place), cable diameter × 6 (when movable)					

ข้อมูลทางเทคนิค [ต่อ]

Model Specifications

● RS-485 Type

Model		CD2H-30-485M12A	CD2H-50-485M12A	CD2H-130-485M12	CD2H-245-485M122	CD2H-350-485M122	CD2H-700-485M122
Center of measurement range		30 mm	50 mm	130 mm	245 mm	350 mm	700 mm
Measurement range		±5 mm	±10 mm	±70 mm	±175 mm	±250 mm	±500 mm
Light source	Medium	Red semiconductor laser					
	Wavelength	655 nm					
	Maximum output	0.39 mW			1 mW		
Laser class	JIS/IEC/FDA*1	CLASS 1/Class I			CLASS 2/Class II		
Spot size*2		ø50 µm	ø70 µm	ø0.3 mm	ø0.5 mm	ø0.6 mm	ø1.0 mm
Linearity		±0.1% of F.S.	±0.1% of F.S.	±0.1% of F.S.	±0.1% of F.S.	±0.1% of F.S.	±0.1% of F.S. (200 to 700 mm) ± 0.3% of F.S. (700 to 1200 mm)
Resolution*3		0.25 µm	0.25 µm	4 µm	10 µm	20 µm	100 µm
Repeat accuracy*4		0.25 µm	0.25 µm	4 µm	10 µm	20 µm	100 µm
Sampling period*5		133.3 µs/150 µs/200 µs/300 µs/500 µs/1 ms/2 ms/5 ms/Auto					
Temperature characteristics*6		±0.06% of F.S./℃					
Weight		Connector models: Approx. 90 g					
Communi-cation specifi-cations	Data transmission	RS-485 half-duplex communication, start-stop synchronization					
	Protocol	Modbus RTU					
	Baud rate	9600 bps/19200 bps/38400 bps/57600 bps/115.2 Kbps /230.4 Kbps/1 Mbps/2 Mbps/4 Mbps					
	Data length	8 bit					
	Parity	Even/Odd/None					
	Stop bit	1bit, 2bit					
Control output (DO1)	No. of outputs	1 (switchable to external input.)					
	Polarity	NPN/PNP, open collector or Push-Pull (selectable by setting) Max. 100 mA/24 VDC, residual voltage 1.8 V or less					
External input*7		Teach 1/Teach 2/Offset/Offset clear/Laser off/Input hold/Buffering/ Buffer clear/Rise: Teach 1, Fall:Teach 2/Rise Teach 2, Fall: Teach 1					
Connection		Pigtail cable: ø4.5 mm, 300 mm cable with M12 5-pin connector Minimum bending radius: Cable diameter × 2 (when fixed in place), cable diameter × 6 (when movable)					

ข้อมูลทางเทคนิค [ต่อ]

■ Common specifications

Supply voltage		18 to 24 VDC (±10%*1, including ripple)
Current consumption*2		80 mA (at 18 VDC), 70 mA (at 24 VDC)
Display		0.9-inch OLED display Menu languages: English, German, Spanish, Japanese, Simplified Chinese, Traditional Chinese, Korean
Indicators		Power indicator (green), Output indicators (orange x 2), IO-Link communication indicator (flashing green)
Protection circuit		Reverse connection protection, overcurrent protection
Environmental resistance	Degree of protection	IP67 (including M12 connector of pigtail cable type)
	Ambient temperature/humidity	-10 to +50°C/35 to 85% RH (without freezing or condensation)
	Storage temperature/humidity	-20 to +60°C/35 to 85% RH (without freezing or condensation)
	Ambient illuminance	Incandescent light: 10000 lx Max. Fluorescent light: 10000 lx Max.
	Vibration resistance	10 to 55 Hz Double amplitude 1.5 mm, 2 hours in each X, Y, Z direction
	Shock resistance	500 m/s² (Approx. 50 G) 3 times in each X, Y, Z direction
Applicable regulations	EMC	EMC Directive (2014/30/EU) UK EMC (Electromagnetic Compatibility Regulations 2016)
	Environment	RoHS Directive (2011/65/EU),UK RoHS (The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012), China RoHS (MIIT Order No.32)
	Safety	FDA Regulations (21 CFR 1040.10 and 1040.11)*3
Applicable standards		EN 60947-5-2, IEC 60825-1
NRTL certification		UL Recognized Components Proximity Switch Certified for US and Canada.
Company standards		Noise resistance: Feilen Level 3 cleared
Warm-up time		Approx. 30 minutes
Material		Housing: PBT, Front window: PMMA

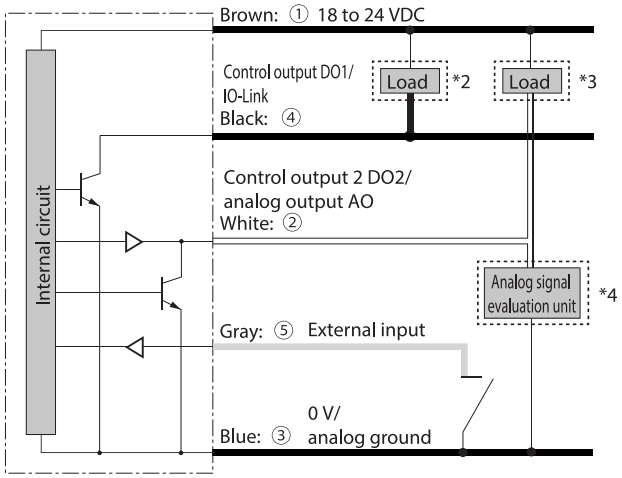
*1: When used as an IO-Link device, do not use it at less than 18 VDC.
*2: For IO-Link/analog output type, value when DO2 is set to analog output (current) and measurement is not possible (outputting a current of 21 mA).
*3: Excluding differences per Laser Notice No. 56.

การต่อใช้งาน

■ I/O Circuit Diagrams

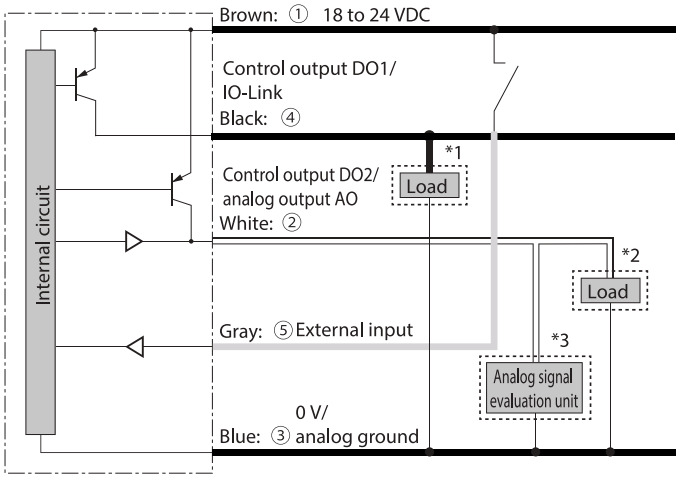
● IO-Link/analog output Type

NPN setting*1



*1. When using NPN settings for an IO-Link connection, use OPTEX FA's IO-Link Master UR Series or IO-Link Master with sink support.
*2. When used as control output DO1
*3. When used as control output DO2
*4. When used as analog output AO

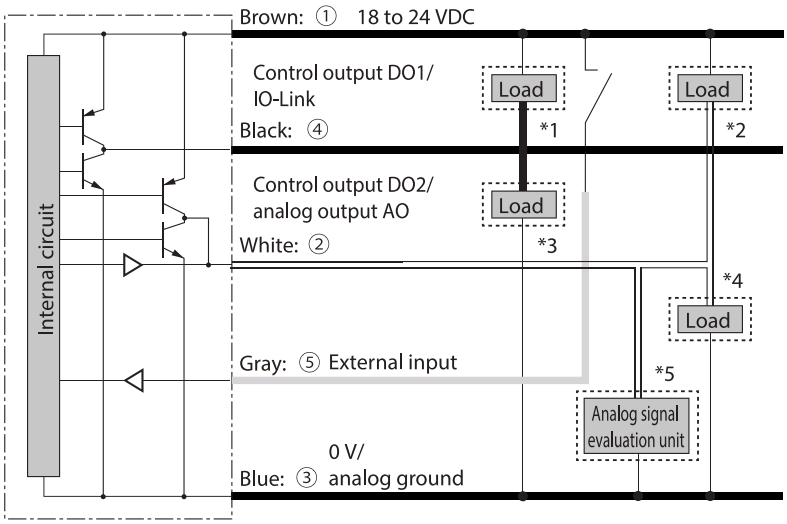
PNP setting



*1. When used as control output DO1
*2. When used as control output DO2
*3. When used as analog output AO

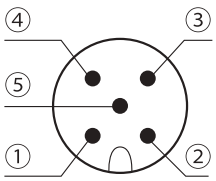
การต่อใช้งาน [ต่อ]

Push-pull setting



*1. When used as control output DO1 with NPN connection
*2. When used as control output DO2 with NPN connection
*3. When used as control output DO1 with PNP connection
*4. When used as control output DO2 with PNP connection
*5. When used as analog output AO

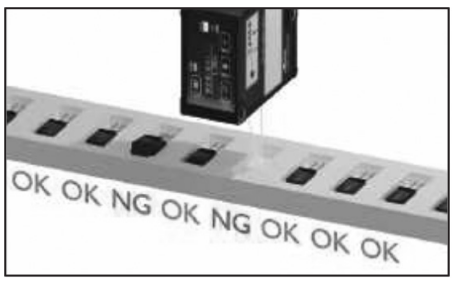
■ M12 connector pin assignments



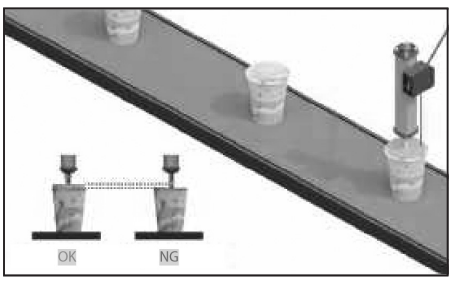
① 18 to 24 VDC
② Control output DO2/Analog output AO
③ 0 V/Analog ground
④ Control output DO1/IO-Link
⑤ External input

Application

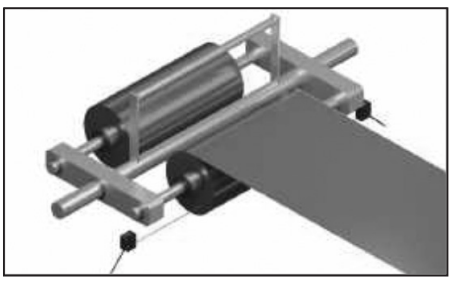
Presence Detection of Electronics Components



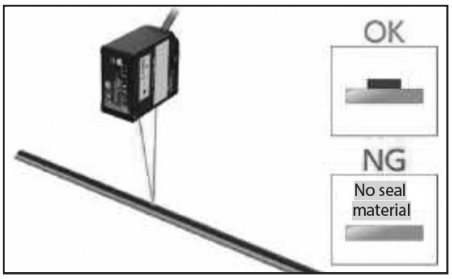
Sealing Inspection of Cupped Foods



Wind-off Measurement of Secondary Battery Film



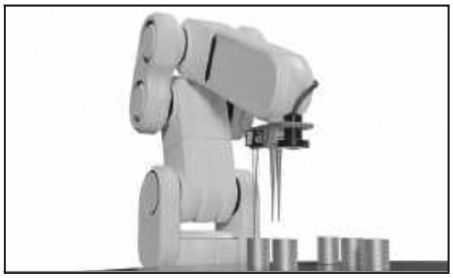
Detecting seal material on pressed products



Measurement of Automobile Body Position



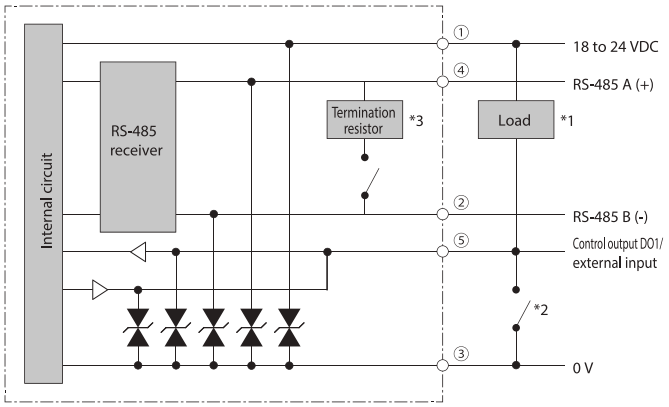
Stacked Bearing Height Measurement



การต่อใช้งาน

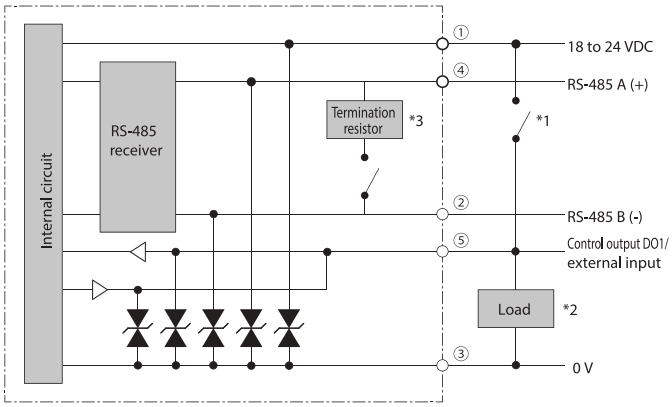
● RS-485 Type

NPN setting (when load is connected by NPN with the push-pull setting)



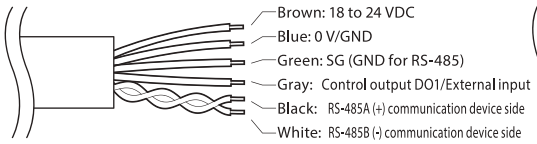
*1. When used as control output
*2. When used as external input
*3. Default setting for the termination resistor is ON.
When multi-drop connections are made, turn the termination resistor OFF at all units except the unit which is connected at the end.

PNP setting (when load is connected by PNP with the push-pull setting)

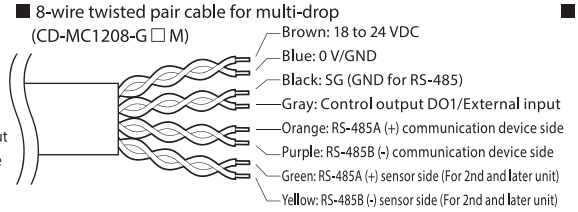


*1. When used as external input
*2. When used as control output
*3. Default setting for the termination resistor is ON.
When multi-drop connections are made, turn the termination resistor OFF at all units except the unit which is connected at the end.

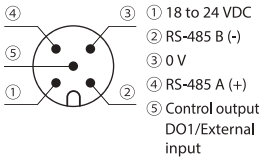
■ 6-wire twisted pair cable
(CD-MC1206-G □S)



■ 8-wire twisted pair cable for multi-drop
(CD-MC1208-G □ M)



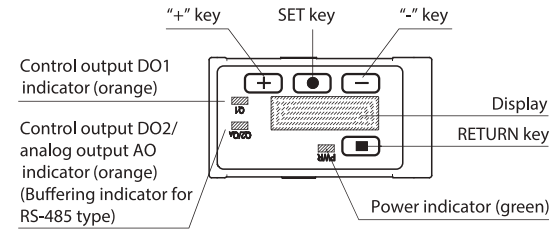
■ M12 connector pin assignments

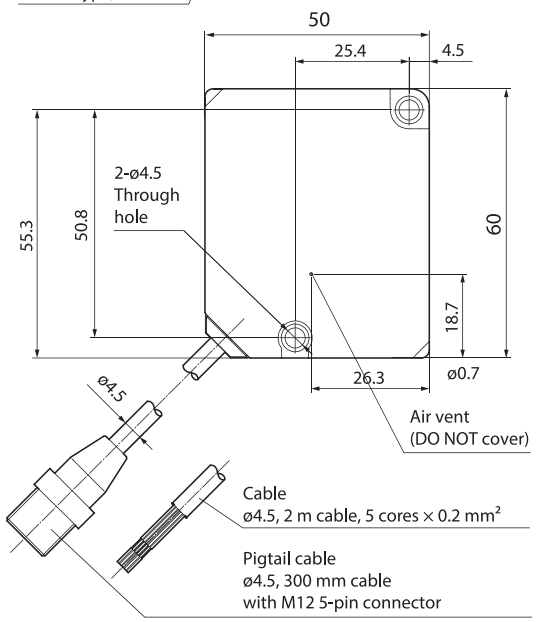


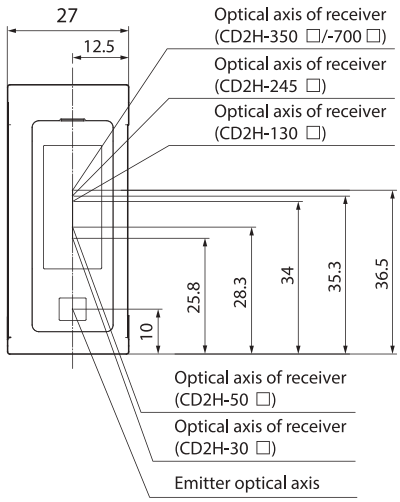
ขนาดและมิติ

■ Dimensions

(Unit: mm)



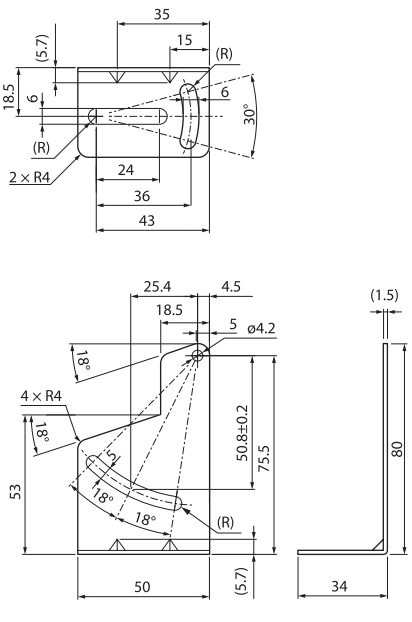




Minimum bending radius
(for both cable and pigtail cable types):
Cable diameter × 2 (when fixed in place)
Cable diameter × 6 (when movable)

● Mounting bracket

BEF-WN-OD2000-B

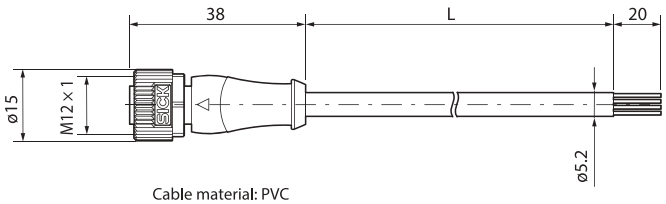


ขนาดและมิติ [ต่อ]

● Connector cables for IO-Link/analog output

Standard cables

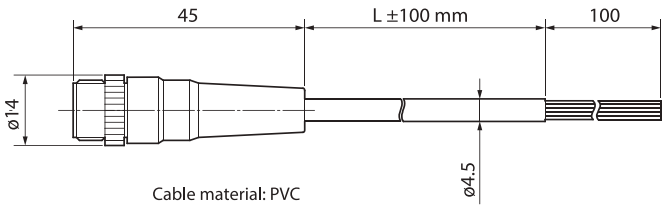
YF2A15-020VB5XLEAX
YF2A15-050VB5XLEAX
YF2A15-100VB5XLEAX
Minimum bending radius:
Cable diameter × 5 (when fixed in place)



Cable material: PVC
Lead wire: 5 cores × 0.34 mm²
L = 2000 mm (YF2A15-020VB5XLEAX)
= 5000 mm (YF2A15-050VB5XLEAX)
= 10000 mm (YF2A15-100VB5XLEAX)

Bending resistant cables

DOL-1205-G02M-R
DOL-1205-G05M-R
Minimum bending radius:
Cable diameter × 2 (when fixed in place)
Cable diameter × 6 (when movable)

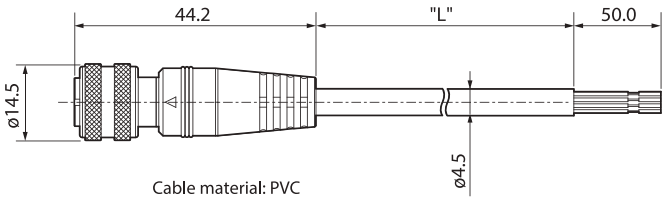


Cable material: PVC
Lead wire: 5 cores × 0.3 mm²
L = 2000 mm（DOL-1205-G02M-R）
= 5000 mm (DOL-1205-G05M-R)

● Connector cables for RS-485 communication

6-wire twisted pair cable

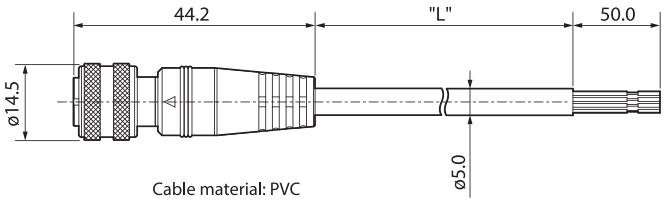
CD-MC1206-G2S
CD-MC1206-G5S
Minimum bending radius:
Cable diameter × 5 (when fixed in place)
Cable diameter × 8 (when movable)



Cable material: PVC
Lead wire: 6 cores × 0.13 mm²
L = 2000 (CD-MC1206-G2S)
= 5000 (CD-MC1206-G5S)

8-wire twisted pair cable for multi-drop

CD-MC1208-G2M
CD-MC1208-G5M
Minimum bending radius:
Cable diameter × 5 (when fixed in place)
Cable diameter × 8 (when movable)



Cable material: PVC
Lead wire: 8 cores × 0.13 mm²
L = 2000 (CD-MC1208-G2M)
= 5000 (CD-MC1208-G5M)