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KEYENCE

Online data sheet



CMOS Multi-Function Analog Laser Sensor

Online Data Sheet

IL Series

DOWNLOAD CATALOG
www.keyence.com/il_catalog

SPECIFICATIONS

Sensor heads

Model		IL-030	IL-065	IL-100	IL-300	IL-600	IL-2000
Appearance							
Reference distance		30 mm 1.18"	65 mm 2.56"	100 mm 3.94"	300 mm 11.81"	600 mm 23.62"	2000 mm 78.74"
Measurement range		20 to 45 mm 0.79" to 1.77"	55 to 105 mm 2.17" to 4.13"	75 to 130 mm 2.95" to 5.12"	160 to 450 mm 6.30" to 17.72"	200 to 1000 mm 7.84" to 39.37"	1000 to 3500 mm 39.37" to 137.80"
Light source		Red semiconductor laser, wavelength: 655 nm (visible light)					
	Laser class	Class 1 (FDA (CDRH) Part1040.10) [1.] Class 1 (IEC 60825-1)	Class 2 (FDA (CDRH) Part1040.10) [1.] Class 2 (IEC 60825-1)				
	Output	220 µW	560 µW				
Spot diameter (at standard distance)		Approx. 200 × 750 µm	Approx. 550 × 1750 µm	Approx. 400 × 1350 µm	Approx. ø0.5 mm ø0.02"	Approx. ø1.6 mm ø0.06"	Approx. 1400 x 7000 µm
Linearity [2. 3.]		±0.1% of F.S. (25 to 35 mm 0.98" to 1.38")	±0.1% of F.S. (55 to 75 mm 2.17" to 2.95")	±0.15% of F.S. (80 to 120 mm 3.15" to 4.72")	±0.25% of F.S. (160 to 440 mm 6.30" to 17.32")	±0.25% of F.S. (200 to 600 mm 7.84" to 23.62") ±0.5% of F.S. (200 to 1000 mm 7.84" to 39.37")	±0.16% of F.S. (1000 to 3500 mm 39.37" to 137.80")
Repeatability [4.]		1 µm	2 µm	4 µm	30 µm	50 µm	100 µm
Sampling rate		0.33/1/2/5 ms (4 levels available)					
Operation status indicators		Laser emission warning indicator: Green LED, Analog range indicator: Orange LED, Reference distance indicator: Red/Green LED					
Temperature characteristics [3.]		0.05% of F.S./°C	0.06% of F.S./°C	0.06% of F.S./°C	0.08% of F.S./°C		0.016% of F.S./°C
Environmental resistance	Enclosure rating	IP67					
	Ambient light [5.]	Incandescent lamp: 5000 lux	Incandescent lamp: 7500 lux		Incandescent lamp: 5000 lux		Incandescent lamp: 10000 lux
	Ambient temperature	-10 to +50°C 14 to 122°F (No condensation or freezing)					
	Relative humidity	35 to 85% RH (No condensation)					
	Vibration	10 to 55 Hz Double amplitude 1.5 mm 0.06" XYZ each axis: 2 hours					
	Pollution degree	3					
Material		Housing material: PBT, Metal parts: SUS304, Packing: NBR, Lens cover: Glass, Cable: PVC					
Weight		Approx. 60g	Approx. 75g		Approx. 135g		Approx. 350g

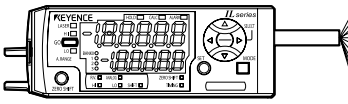
1. The laser classification for FDA (CDRH) is implemented based on IEC 60825-1 in accordance with the requirements of Laser Notice No.50.
2. Value when measuring the KEYENCE standard target (white diffuse object).
3. F.S. of each model is as follows. IL-030: ±5 mm ±0.20" IL-065: ±10 mm ±0.39" IL-100: ±20 mm ±0.79" IL-300: ±140 mm ±5.51" IL-600: ±400 mm ±15.75"
4. Value when measuring the KEYENCE standard target (white diffuse object) at the reference distance, sampling rate: 1 ms, and average number of times: 128. For the IL-300/IL-600, the sampling rate is 2 ms.
5. Value when the sampling rate is set to 2 ms or 5 ms.

Amplifier unit

Model		IL-1000	IL-1500	IL-1050	IL-1550
Appearance					
Type		DIN-rail mount	Panel mount	DIN-rail mount	Panel mount
Main unit/expansion unit		Main unit		Expansion unit	
Head compatibility		Compatible			
Display	Minimum displayable unit	IL-030: 1 µm, IL-065/IL-100: 2 µm, IL-300: 10 µm, IL-600: 50 µm, IL-2000: 100 µm 3.94"			
	Display range	IL-030/IL-065/IL-100: ±99.999 mm to ±99 mm (4 levels selectable), IL-300/IL-600: ±999.99 mm to ±999 mm (3 levels selectable), IL-2000: ±9999.9 mm to ±9999 mm (2 levels selectable)			
	Display rate	Approx. 10 times/sec.			
Analog voltage output [1.]		±5 V, 1 to 5 V, 0 to 5 V Output impedance 100 Ω		None	
Analog current output [1.]		4 to 20 mA Maximum load resistance of 350 Ω			
Control input [2.]	Bank switch input	Non-voltage input			
	Zero-shift input				
	Stop emission input				
	Timing input				
	Reset input				
Control output [3.]	Judgement output	Open collector output (NPN, PNP changeover possible/N.O., N.C. changeover possible)			
	Alarm output	Open collector output (NPN, PNP changeover possible/N.C.)			
Current	Power voltage [4.]	10 to 30 VDC ripple (P-P) 10% included, Class 2		Supplied by main unit	
	Power consumption	2300 mW or less (at 30 V: 77 mA or less)	2500 mW or less (at 30 V: 84 mA or less)	2000 mW or less (at 30 V: 67 mA or less)	2200 mW or less (at 30 V: 74 mA or less)
Environmental resistance	Ambient humidity	-10 to +50°C 14 to 122°F (No condensation or freezing)			
	Ambient temperature	35 to 85% RH (No condensation)			
	Vibration	10 to 55 Hz Double amplitude 1.5 mm 0.06" XYZ each axis: 2 hours			
	Pollution degree	2			
Material		Case / Front sheet: Polycarbonate; Key tops: Polyacetel; Cable: PVC			
Weight (including attachments)		Approx. 150g	Approx. 170g	Approx. 140g	Approx. 160g

1. Select and use one of ±5 V, 1 to 5 V, 0 to 5 V or 4 to 20 mA.
2. Assign an input of your choice to the 4 external input lines before using.
3. – The NPN open collector rated output is: 50 mA max./ch (20 mA when adding an expansion unit) less than 30 V, residual voltage less than 1 V (less than 1.5 V when adding over 6 units including the main unit)
   – The PNP open collector rated output is: 50 mA max./ch (20 mA/ch when adding expansion units), less than power voltage, and less than 2 V residual voltage (less than 2.5 V when adding over 6 units including the main unit)
4. If there are over 6 additional expansion units, please use a power voltage of 20 to 30 V.

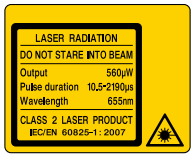
WIRING DIAGRAM



Brown [1.]	10 to 30 VDC [4.]
Blue [1.]	0 V
Black	HIGH judgement output
White	LOW judgement output
Gray	GO judgement output
Green	Alarm output
Light blue [1.] / Orange [2.]	Analog output +
Shield [2.]	Analog output GND
Pink [3.]	External input 1 (zero shift input)
Yellow [3.]	External input 2 (reset input)
Pink/purple [3.]	External input 3 (timing input)
Purple [3.]	External input 4 (not used)

1. The brown, blue, and light blue cables are not provided in a IL-1050/IL-1550 unit (expansion unit).
   The power is supplied to the expansion unit from the IL-1000/IL-1500 unit (main unit).
2. For an analog output, OFF (not used), 0 to 5 V, ±5 V, 1 to 5 V, or 4 to 20 mA can be selected.
3. For an external input, bank A input, bank B input, laser emission stop input, or OFF (not used) can also be selected.
   For details, refer to the User's Manual.
4. If there are over 6 additional expansion units, please use a power voltage of 20 to 30 V.

Warning/explanatory label for class 2 laser product



RECOMMENDED ACCESSORIES

Sensor head cables (sold separately)

The cable does not come attached with the sensor head and must be purchased separately.

Type	Appearance	Cable length	Model	Weight
Straight	1 cable included 	2 m 6.56'	**OP-87056**	Approx. 80 g
		5 m 16.40'	**OP-87057**	Approx. 190 g
		10 m 32.80'	**OP-87058**	Approx. 360 g
		20 m 65.62'	**OP-87059**	Approx. 680 g
L-shaped	1 cable included 	2 m 6.56'	**OP-87660**	Approx. 80 g
		5 m 16.40'	**OP-87661**	Approx. 190 g
		10 m 32.80'	**OP-87662**	Approx. 360 g
		20 m 65.62'	**OP-87663**	Approx. 680 g

This connector is required if the cable is cut.



Connector used to connect to a display unit (2 pcs.)
OP-84338

Optional

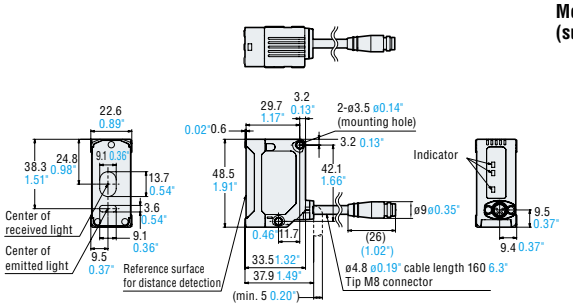
Type	Appearance	Model	Description	Weight
End unit (Optional)		**OP-26751**	To connect an additional expansion unit, use the end units to secure the display units on both ends. When connecting additional units, be sure to use the end units. (2 pcs.)	Approx. 15g
Panel front protection cover [Included in panel mount type amplifier]		**OP-87076**	The panel front protection cover and panel mounting bracket are included in the panel mount type amplifier. If the supplied cover or bracket is lost or damaged, purchase a new one.	Approx. 6g
Panel mounting bracket [Included in panel mount type amplifier]		**OP-4122**		Approx. 7g
Expansion cable		**OP-35361** (300 mm 11.81")	Extension cable used for panel mount type amplifier. Use this cable if the standard cable is not long enough.	Approx. 10g
DIN-rail mounting bracket		**OP-60412**	The mounting bracket is used when the expansion cable is used to connect to the panel mount type display unit, in which case a DIN rail is not provided.	Approx. 12g
Mounting bracket		**OP-87606**	Mounting bracket for IL-2000	Approx. 338 g
Sensor head relay cable		**OP-87431** (3.5 m 11.5')	M8-M8 relay cable	Approx. 165 g
		OP-87432 (7.5 m 24.6')		Approx. 275 g
		OP-87433 (9.0 m 29.5')		Approx. 360 g

Unit : mm inch

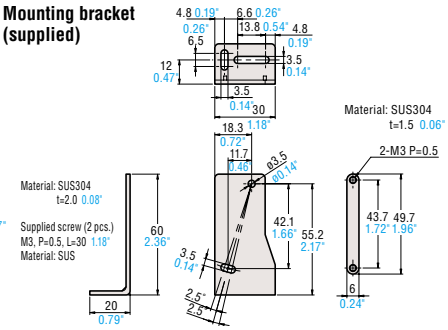
Sensor heads

IL-030



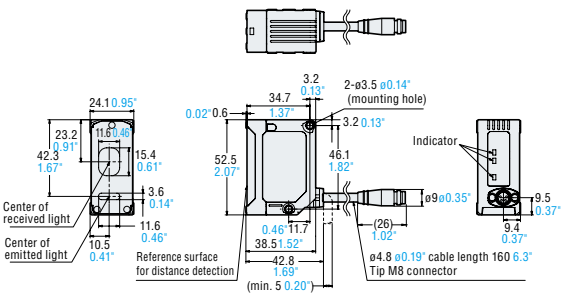


Mounting bracket (supplied)

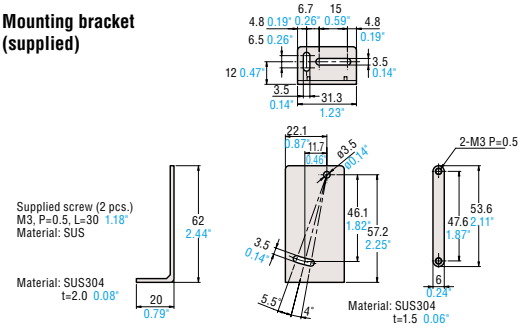


IL-065/100



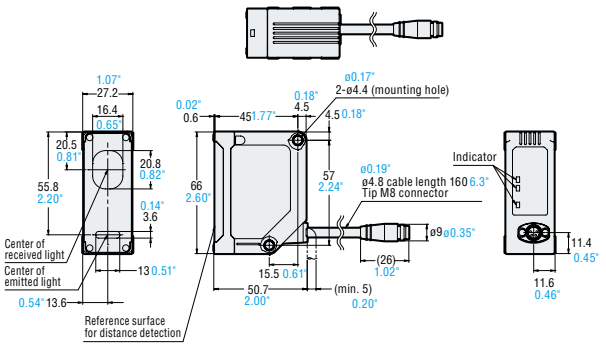


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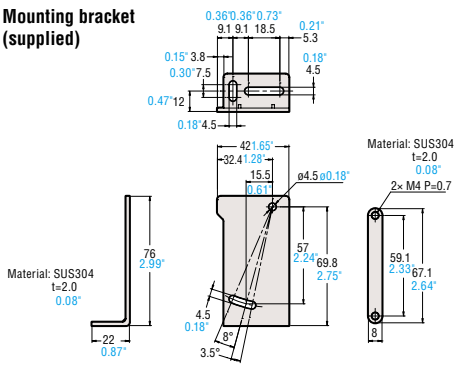


IL-300/600





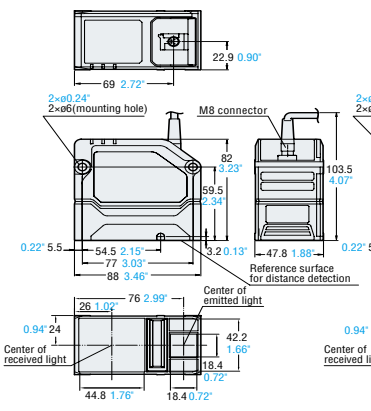
Mounting bracket (supplied)



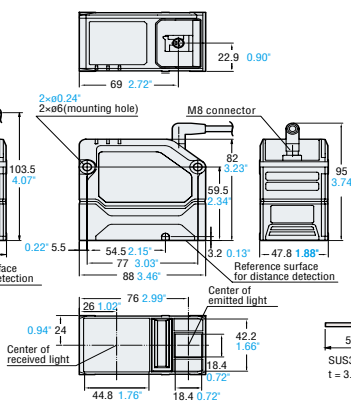
IL-2000



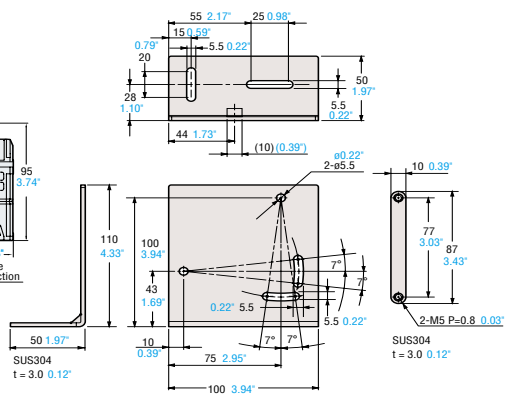
When a straight cable is used



When an L-shaped cable is used



Mounting bracket OP-87606 (sold separately)

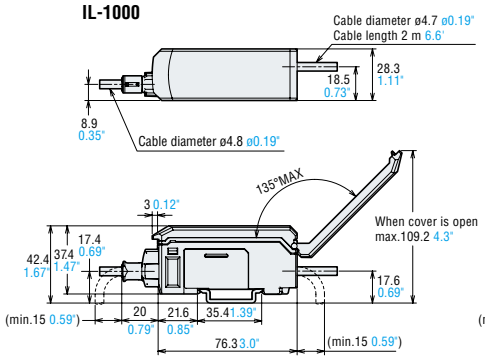


Unit : mm inch

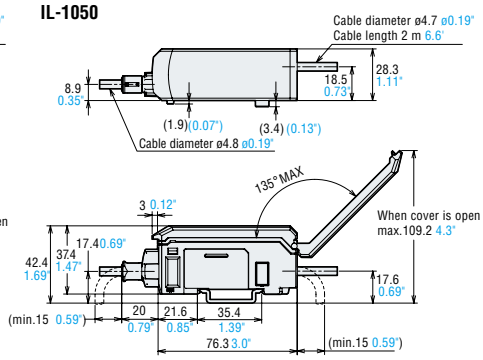
Amplifier unit (DIN-rail mount type)
IL-1000/IL-1050



IL-1000

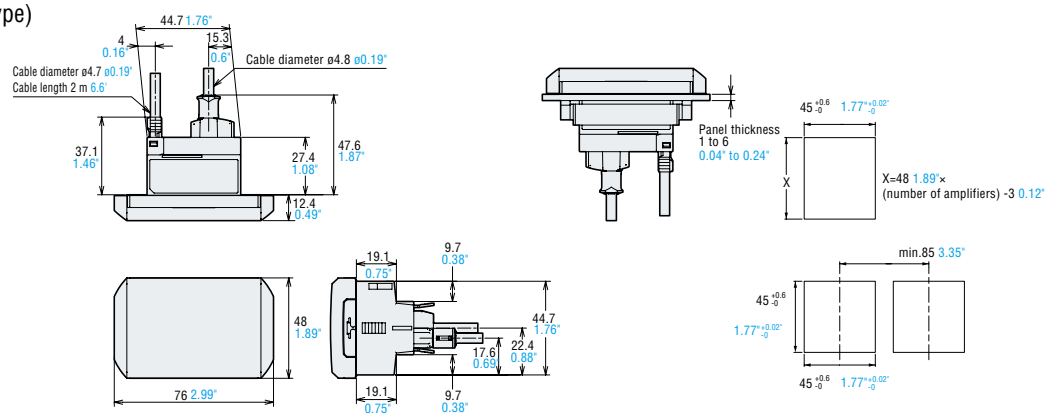


IL-1050



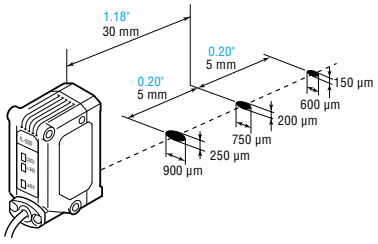
Amplifier unit (Panel mount type)
IL-1500/IL-1550



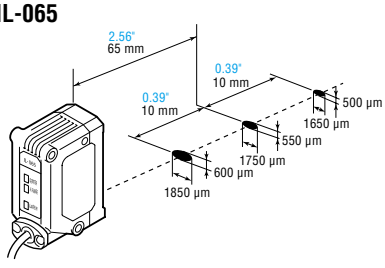


LASER SPOT SIZE

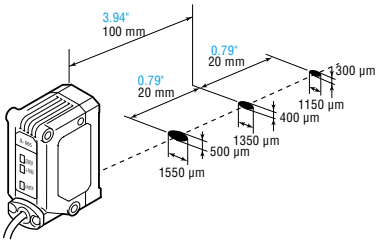
IL-030



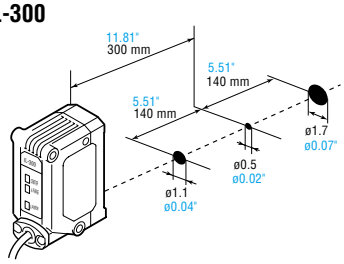
IL-065



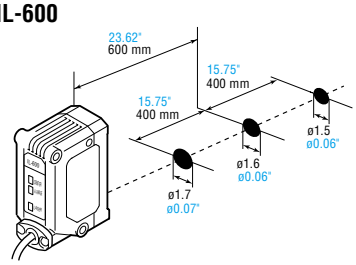
IL-100



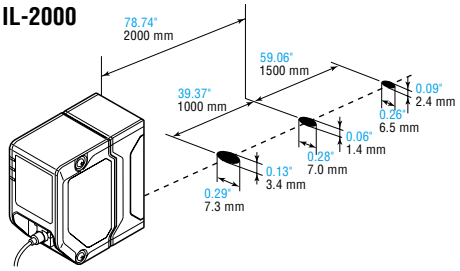
IL-300



IL-600

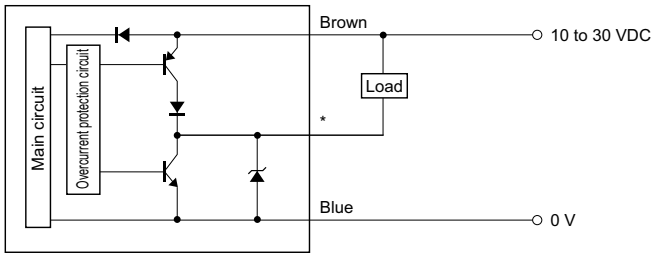


IL-2000



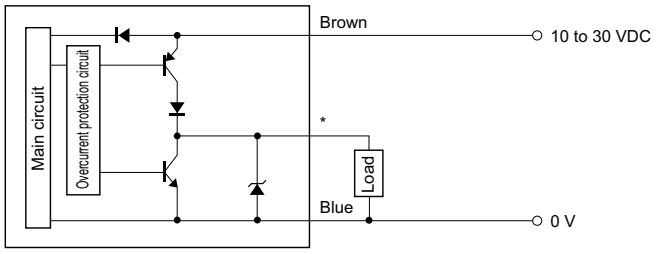
Output Circuit Diagram

When NPN output is selected



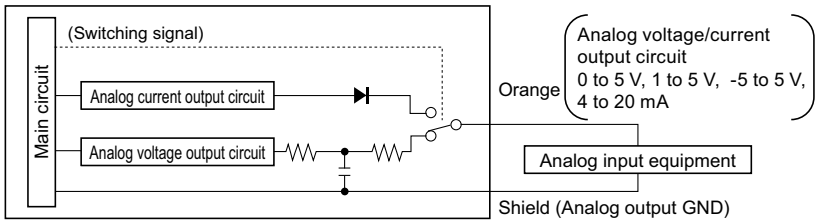
* Black (HIGH judgment output)/White (LOW judgment output)/
Gray (GO judgment output)/Green (alarm output)

When PNP output is selected



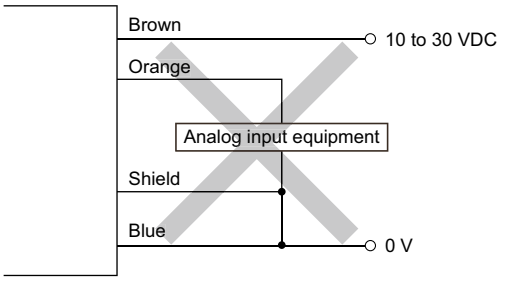
* Black (HIGH judgment output)/White (LOW judgment output)/
Gray (GO judgment output)/Green (edge check output)

Analog Output Circuit



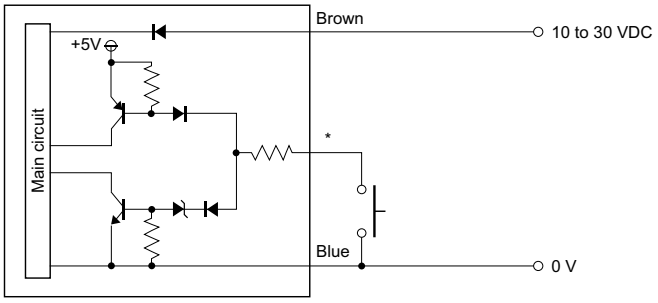
Point

Do not short-circuit the shield (analog output GND) and blue (0 V).



Input Circuit Diagram

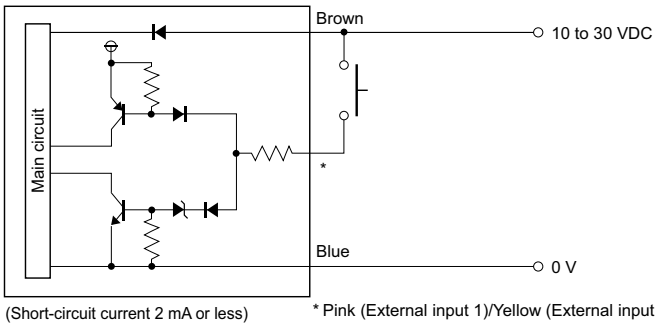
When NPN output is selected



(Short-circuit current 2 mA or less)

* Pink (External input 1)/Yellow (External input 2)/
Pink and Purple(External input 3)/Purple (External input 4)

When PNP output is selected



(Short-circuit current 2 mA or less)

* Pink (External input 1)/Yellow (External input 2)/
Pink and Purple(External input 3)/Purple (External input 4)

KEYENCE

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SAFETY INFORMATION
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