

LH-50 SERIES

LED Type Optical Displacement Sensor

New


Minute displacements
measured with
high precision by red
LED beam

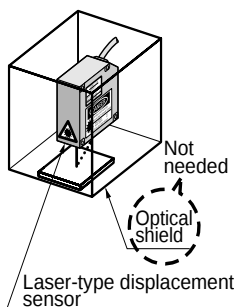


Safety precautions unnecessary

The light source uses a red LED for safety.

As a result, the complicated safety measures which are necessary when using laser light are completely unnecessary.

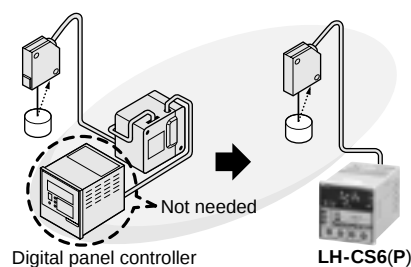
Even though a red LED is used, the degree of performance achieved is the same as for laser-type sensor class (Class 1 to 2), so that high-precision measurement is possible.



Reducing total cost

The high-functional controller includes built-in calculation and measurement functions, so that the digital panel controller which was needed previously is no longer required, thus reducing costs.

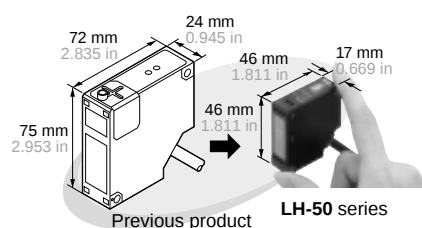
In addition, it also helps to reduce wiring and space costs.



Compact and lightweight

Sensor head

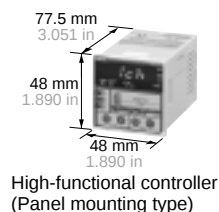
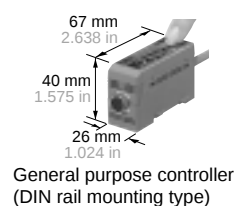
Compared to our previous sensors, the LH-50 series sensors are much more compact and lightweight, so that they can easily be installed even in tight spaces.



Controller

The general purpose controller is the most compact in its class.

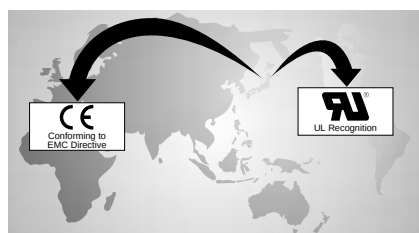
Furthermore, the high-functional controller is a 48 mm x 1.890 in panel mounting type which can be mounted on equipment panels.



Universal use

The LH-50 series complies with EMC directive for the CE marking.

It uses an LED beam which is not subject to FDA restrictions. In addition, it obtains UL recognition.

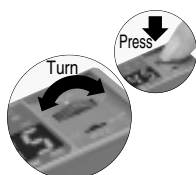


Simple and useful

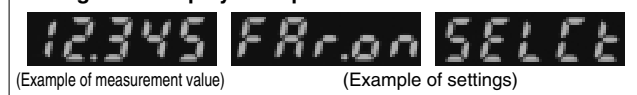
• Uses an easy-to-operate jog switch

General purpose controller

Threshold value settings and other settings can be made easily using the extremely easy-to-operate jog switch. Furthermore, the settings and measurement values are indicated in a 5-digit LED display.



5-digit LED display examples

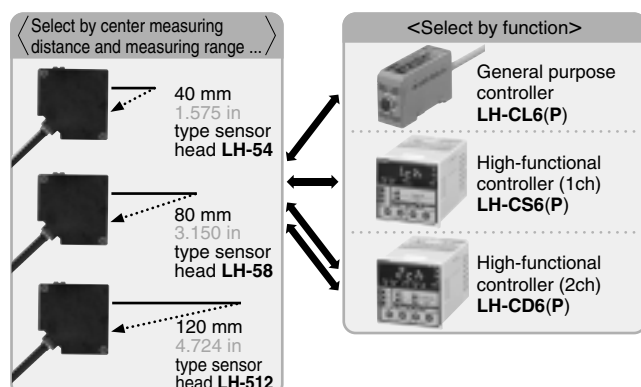


• Flexible combinations

Sensor head General purpose controller High-functional controller

The **LH-50** series can be used in any combination desired. In addition, the sensor head and controller need not be managed as a pair.

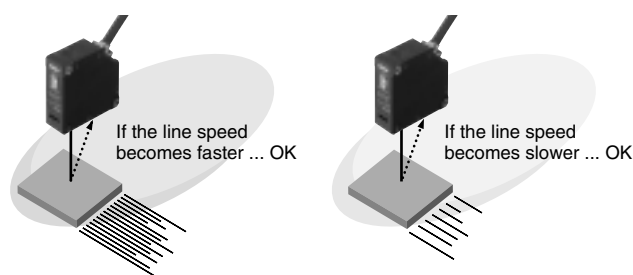
Moreover, the **LH-CD6(P)** high-functional controller can be connected to two sensor heads of different types.



• Automatic response time setting

High-functional controller

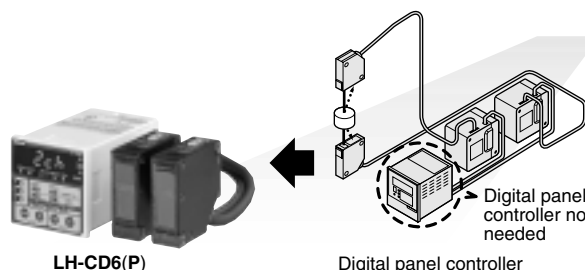
The **LH-CS6(P)** and **LH-CD6(P)** high-functional controllers are equipped with an automatic response time setting function. This function sets the response time automatically in accordance with the object's speed of movement. It ensures accurate measurement even for variable line speeds. In addition, it eliminates the burden of having to set the response time.



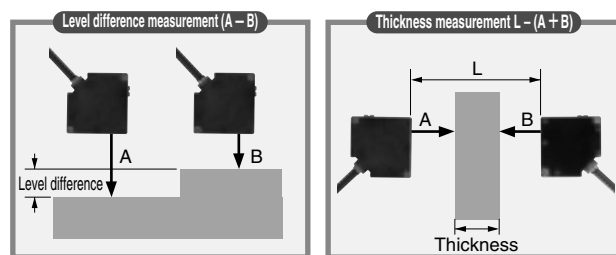
• Full range of 'ready-to-use' and 'useful' functions

High-functional controller

The high-functional controller is equipped with useful calculation functions, so that the digital panel controller which was needed previously is no longer required.



Calculation, level difference and thickness measurements and displacement from the measuring center when using a single sensor head are set to default settings, so that the unit can be used immediately.



• Response time & resolution settings to suit the application

General purpose controller High-functional controller

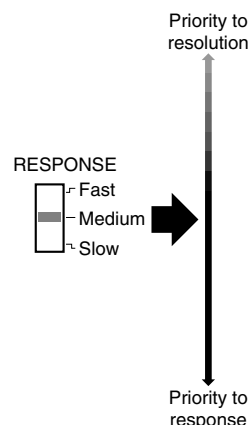
Both the general purpose controller and the high-functional controller let you select the response time from one of eight settings. (The high-functional controller also allows automatic response time setting.)

Conventional displacement sensors generally provided three settings, but the **LH-50** series (8 settings) provides much greater flexibility for response time and resolution. This device allows a highly accurate analog output suited for any application.

Conventional (example) LH-50 series

■ Response time / Resolution (2 σ)

Sensor head Model No.	LH-54	LH-58	LH-512
Controller response time			
300 ms	2 μm 0.079 mil	4 μm 0.157 mil	20 μm 0.787 mil
100 ms	4 μm 0.157 mil	8 μm 0.315 mil	40 μm 1.575 mil
40 ms	5 μm 0.197 mil	14 μm 0.551 mil	65 μm 2.559 mil
30 ms	6 μm 0.236 mil	16 μm 0.630 mil	75 μm 2.953 mil
20 ms	7 μm 0.276 mil	28 μm 1.102 mil	92 μm 3.622 mil
10 ms	10 μm 0.394 mil	40 μm 1.575 mil	130 μm 5.118 mil
1 ms	20 μm 0.787 mil	120 μm 4.724 mil	400 μm 15.748 mil
0.5 ms	40 μm 1.575 mil	160 μm 6.299 mil	580 μm 22.835 mil



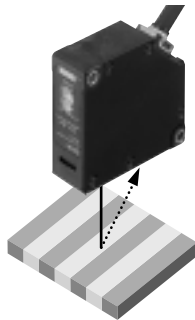
Simple and useful

• AUTO gain setting, SELECT gain setting
General purpose controller
High-functional controller

Two types of gain control are provided: AUTO and SELECT (11 settings), to provide great flexibility for a variety of applications. Furthermore, a 7-segment display is used to indicate whether the gain is set to the optimum level.

AUTO gain setting: For objects with highly variable color and materials

AUTO gain setting ensures accuracy even for patterned objects

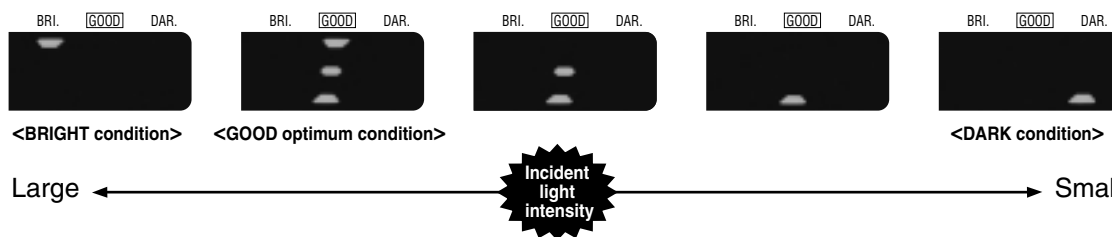


This setting automatically controls the gain so that the incident light intensity is optimized to handle variations in the reflection ratios (variations in the amount of light received) for the measured objects. It is suitable for objects which produce large variations in reflection ratios.

Note: Some fluctuation in resolution and linearity may occur when this setting is used.

SELECT gain setting: For more accurate measurement using the optimum gain

This function lets you set the gain to match the reflection ratio for the measured object. An incoming light status bar (general purpose controller) is provided to assist with setting the gain to the optimum level.

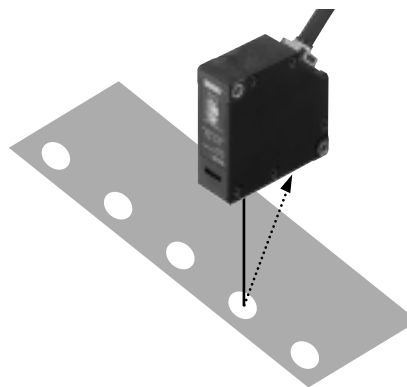
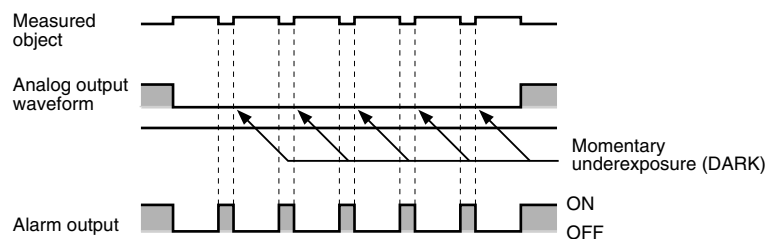


※ The illustrations show the display for general purpose controllers. High-functional controllers are also provided with AUTO gain and SELECT gain settings.

• Analog output hold function
General purpose controller
High-functional controller

If momentary underexposure (DARK) or overexposure (BRIGHT) conditions occur, the value is held at the level immediately before this occurs.

It allows measurement to continue without any breaks in analog output.



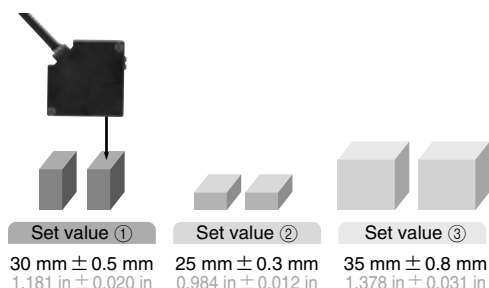
Simple and useful

- 16 types of setting storage memory

High-functional controller

The **LH-CS6(P)** and **LH-CD6(P)** high-functional controllers have 16 types of built-in setting storage memory to provide greater flexibility for production lines where the model variety frequently changes.

Example: Measurement of products with variable heights and good / bad judgment

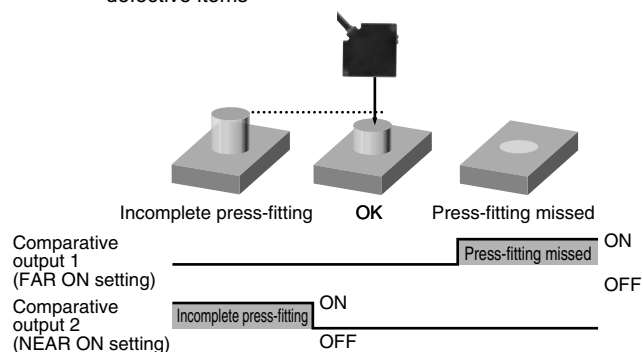


- **Two-in-one functionality**

General purpose controller

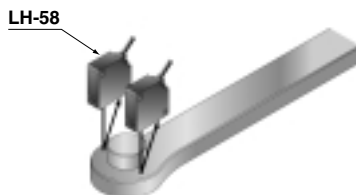
The **LH-CL6(P)** general purpose controller has two independent comparison outputs, making it suitable for use in applications where two sensor units were previously required.

Example: Dimension checking after press-fitting, separation of defective items

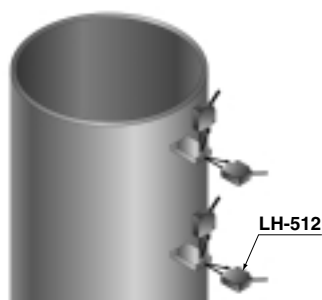


APPLICATIONS

Work seating confirmation



Pipe exterior distortion detection



Measuring wheel eccentricity

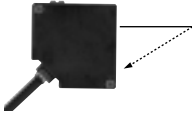
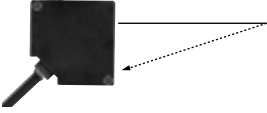
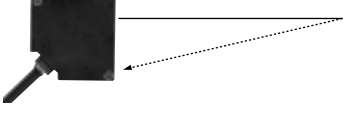


Magnetic Displacement		Light / Thru-beam Type			Light / Reflective Type	
GP-A	GP-X	LD	LA	LA-300	HL-T1	LM10
						HL-C1
						LH-50

LH-50

ORDER GUIDE

Sensor heads

Type	Appearance	Measurement center distance	Model No.	Spot diameter (Note 1)	Resolution (Note 2)
40 mm 1.575 in type		 40 mm 1.575 in (Measuring range ±10 mm ±0.394 in)	LH-54	φ1.6 mm φ0.063 in or less	2 μm 0.079 mil
80 mm 3.150 in type		 80 mm 3.150 in (Measuring range ±20 mm ±0.787 in)	LH-58	φ2.0 mm φ0.079 in or less	4 μm 0.157 mil
120 mm 4.724 in type		 120 mm 4.724 in (Measuring range ±30 mm ±1.181 in)	LH-512	φ3.0 mm φ0.118 in or less	20 μm 0.787 mil

Notes: 1) The spot diameter is a typical value for the measurement center distance given, and is based on the definition of 1/e² (13.5 %) of the beam axis intensity.
2) The resolution values were obtained under the following measurement conditions.
24 V DC supply voltage, +20 °C +68 °F ambient temperature, SELECT gain setting, 300 ms response time setting, measurement center distance, interference prevention function not used and white ceramic board object, set to 2 σ.

Controllers

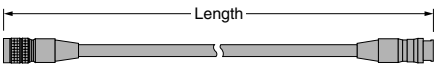
Type	Appearance	Model No.	Comparative output	No. of sensor heads connected
General purpose		LH-CL6	NPN open-collector transistor (OUT1, OUT2)	1 No.
		LH-CL6P	PNP open-collector transistor (OUT1, OUT2)	
High-functional	 The photo shows the LH-CD6	LH-CS6	NPN open-collector transistor (HI, GO, LO)	1 No.
		LH-CS6P	PNP open-collector transistor (HI, GO, LO)	
		LH-CD6	NPN open-collector transistor (HI, GO, LO)	1 No. or 2 Nos.
		LH-CD6P	PNP open-collector transistor (HI, GO, LO)	

OPTIONS

Designation	Model No.	Description	
Extension cable	LH-CCJ2	Length: 2 m 6.562 ft Weight: 130 g approx.	0.22 mm ² cabtyre cable, with connector on both ends • Cable outer diameter: φ6 mm φ0.236 in • Connector outer diameter: φ14.7 mm φ0.579 in max.
	LH-CCJ5	Length: 5 m 16.404 ft Weight: 270 g approx.	
	LH-CCJ10	Length: 10 m 32.808 ft Weight: 480 g approx.	

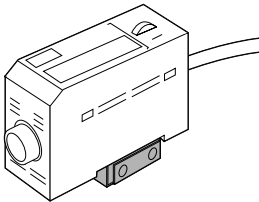
Extension cable

- LH-CCJ2
- LH-CCJ5
- LH-CCJ10



Accessory

- MS-DIN-3
(Mounting bracket for general purpose controller)



SPECIFICATIONS

Please refer to the separate 'User's Manual' for more details pertaining to specifications. (Refer to [p.916](#))

Sensor heads

Type			40 mm 1.575 in type	80 mm 3.150 in type	120 mm 4.724 in type
Item	Model No.		LH-54	LH-58	LH-512
Applicable controller			LH-CL6(P), LH-CS6(P), LH-CD6(P)		
Measurement center distance			40 mm 1.575 in	80 mm 3.150 in	120 mm 4.724 in
Measuring range			± 10 mm (30 to 50 mm) ± 0.394 in (1.181 to 1.969 in)	± 20 mm (60 to 100 mm) ± 0.787 in (2.362 to 3.937 in)	± 30 mm (90 to 150 mm) ± 1.181 in (3.543 to 5.906 in)
Emitting element			Red LED (modulated)(Peak wavelength: 650 nm 0.026 mil)		
Spot diameter (Note 2)			φ 1.6 mm φ 0.063 in or less	φ 2.0 mm φ 0.079 in or less	φ 3.0 mm φ 0.018 in or less
Resolution (Note 3)	Controller response time	300 ms	2 μm 0.079 mil	4 μm 0.157 mil	20 μm 0.787 mil
		100 ms	4 μm 0.157 mil	8 μm 0.315 mil	40 μm 1.575 mil
		40 ms	5 μm 0.197 mil	14 μm 0.551 mil	65 μm 2.559 mil
		30 ms	6 μm 0.236 mil	16 μm 0.630 mil	75 μm 2.953 mil
		20 ms	7 μm 0.276 mil	28 μm 1.102 mil	92 μm 3.622 mil
		10 ms	10 μm 0.394 mil	40 μm 1.575 mil	130 μm 5.118 mil
		1 ms	20 μm 0.787 mil	120 μm 4.724 mil	400 μm 15.748 mil
		0.5 ms	40 μm 1.575 mil	160 μm 6.299 mil	580 μm 22.835 mil
Linearity (Note 4)			Within ± 0.2 % F.S.		
Ambient temperature			0 to + 45 °C + 32 to + 113 °F (No dew condensation), Storage: − 20 to + 60 °C − 4 to + 140 °F		
Ambient humidity			35 to 85 % RH, Storage: 35 to 85 % RH		
Protection (excluding connector part)			IP67 (IEC)		
Cable			0.22 mm² 11-core composite cabtyre cable, 0.2 m 0.656 ft long, with a connector at the end		
Cable extension			Extension up to total 10.2 m 33.465 ft is possible, with optional cable		
Weight			70 g approx. (including cable), 45 g approx. (excluding cable)		

Notes: 1) Conditions which have not been specified are to be taken as: 24 V DC supply voltage, + 20 °C + 68 °F ambient temperature, SELECT gain setting, 300 ms response time setting, measurement center distance, interference prevention function not used and white ceramic board object.

2) This is the value at the measurement center distance, and is based on the definition of 1/e² (13.5 %) of the beam axis light intensity. Take care that some amount of light spreads out of the specified spot diameter and, depending on the conditions around the measured object, may affect the measurement accuracy.

3) This is the typical value at the measurement center distance for a white ceramic board object. The given values are for the analog output of the applicable controller.

4) This is the value for white ceramic board object. The linearity may differ depending on the measured object. The given value is for the analog output of the applicable controller.

LH-50

SPECIFICATIONS

Please refer to the separate 'User's Manual' for more details pertaining to specifications. (Refer to [p.916](#))

Controllers

Item	Model No.	General purpose	
		NPN output	PNP output
		LH-CL6	LH-CL6P
Applicable sensor head		LH-54, LH-58, LH-512	
Connectable sensor heads (Max.)		1 No.	
Supply voltage		24 V DC $\pm$ 10 % Ripple P-P 10 % or less	
Current consumption (Note 2)		250 mA or less	
Analog output		Analog voltage • Output voltage: -5 to $+5$ V/F.S. • Output impedance: 100 Ω	Analog current • Output current: 4 to 20 mA/F.S. • Load resistance: 300 Ω or less
	Response time (10 to 90 %)	0.5 ms / 1 ms / 10 ms / 20 ms / 30 ms / 40 ms / 100 ms / 300 ms selectable by jog switch	
	Temperature characteristics	Within ± 0.04 % F.S./ $^{\circ}$ C	
	Span adjustment / Shift adjustment	Within ± 10 % F.S. (Note 2)	
Comparative output		Independence two outputs (OUT1, OUT2) NPN open-collector transistor • Maximum sink current: 100 mA • Applied voltage: 30 V DC or less (between comparative output and 0 V) • Residual voltage: 1.5 V or less (at 100 mA sink current) 0.4 V or less (at 16 mA sink current)	Independence two outputs (OUT1, OUT2) PNP open-collector transistor • Maximum source current: 100 mA • Applied voltage: 30 V DC or less (between comparative output and + V) • Residual voltage: 1.5 V or less (at 100 mA source current) 0.4 V or less (at 16 mA source current)
	Output operation	ON or OFF when threshold level is reached (selectable by jog switch)	
	Short-circuit protection	Incorporated	
Alarm output		Incorporated	
Ambient temperature		0 to $+50$ $^{\circ}$ C $+32$ to $+122$ $^{\circ}$ F (No dew condensation), Storage: -20 to $+60$ $^{\circ}$ C -4 to $+140$ $^{\circ}$ F	
Ambient humidity		35 to 85 % RH, Storage: 35 to 85 % RH	
Cable		0.22 mm ² 13-core composite cabtyre cable, 2 m 6.562 ft long.	
Weight		160 g approx.	
Accessory		MS-DIN-3 (Controller mounting bracket): 1 pc.	

Notes: 1) Conditions which have not been specified are to be taken as: 24 V DC supply voltage, $+20$ $^{\circ}$ C $+68$ $^{\circ}$ F ambient temperature, SELECT gain setting, 300 ms response time setting, measurement center distance, interference prevention function not used and white ceramic board object.

2) Including the sensor head.

3) The linearity of the sensor head and the controller has been adjusted at the time of factory shipment. Carry out the shift adjustment and the span adjustment to suit the operating conditions.

Item	Model No.	High-functional			
		NPN output		PNP output	
		LH-CS6	LH-CD6	LH-CS6P	LH-CD6P
Applicable sensor head		LH-54, LH-58, LH-512			
Connectable sensor heads (Max.)		1 No.	2 Nos.	1 No.	2 Nos.
Supply voltage		24 V DC $\pm$ 10 % Ripple P-P 10 % or less			
Current consumption (Note 2)		300 mA or less	350 mA or less	300 mA or less	350 mA or less
Analog output		Analog voltage • Output voltage: -5 to $+5$ V/F.S. • Output impedance: 100 Ω		Analog current • Output current: 4 to 20 mA/F.S. • Load resistance: 300 Ω or less	
	Response time (10 to 90 %)	0.5 ms / 1 ms / 10 ms / 20 ms / 30 ms / 40 ms / 100 ms / 300 ms selectable by key (Automatic response time setting is possible.)			
	Temperature characteristics	Within ± 0.04 % F.S./ $^{\circ}$ C			
	Span adjustment / Shift adjustment	Within ± 30 % F.S. (Note 3)			
Comparative output		Three outputs (HI, GO, LO) NPN open-collector transistor • Maximum sink current: 30 mA • Applied voltage: 30 V DC or less (between comparative output and 0 V) • Residual voltage: 1.0 V or less (at 30 mA sink current) 0.4 V or less (at 16 mA sink current)		Three outputs (HI, GO, LO) PNP open-collector transistor • Maximum source current: 30 mA • Applied voltage: 30 V DC or less (between comparative output and + V) • Residual voltage: 1.0 V or less (at 30 mA source current) 0.4 V or less (at 16 mA source current)	
	Output operation	ON when threshold level is reached			
	Short-circuit protection	Incorporated			
Alarm output		Incorporated			
Strobe output		Incorporated			
Ambient temperature		0 to $+50$ $^{\circ}$ C $+32$ to $+122$ $^{\circ}$ F (No dew condensation), Storage: -20 to $+60$ $^{\circ}$ C -4 to $+140$ $^{\circ}$ F			
Ambient humidity		35 to 85 % RH, Storage: 35 to 85 % RH			
Weight		120 g approx.			
Accessory		ATA4811 (Controller mounting frame): 1 set.			

Notes: 1) Conditions which have not been specified are to be taken as: 24 V DC supply voltage, $+20$ $^{\circ}$ C $+68$ $^{\circ}$ F ambient temperature, SELECT gain setting, 300 ms response time setting, measurement center distance, interference prevention function not used and white ceramic board object.

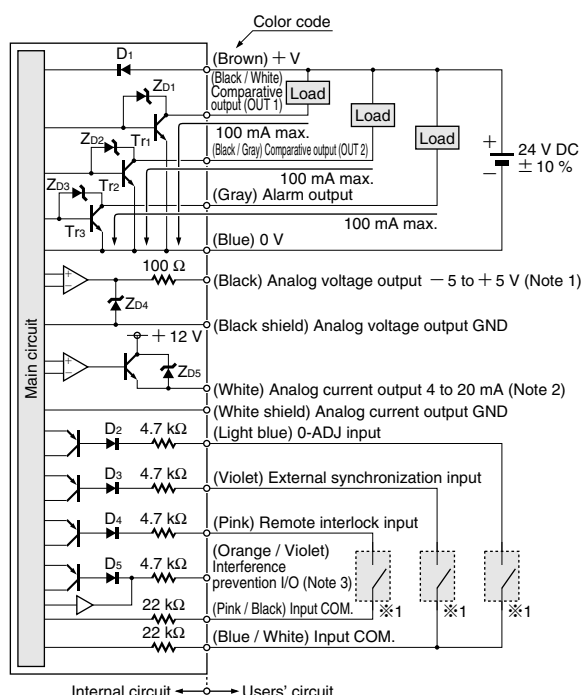
2) Including the sensor head.

3) The linearity of the sensor head and the controller has been adjusted at the time of factory shipment. Carry out the shift adjustment and the span adjustment to suit the operating conditions.

I/O CIRCUIT DIAGRAMS (CONTROLLER)

LH-CL6

NPN output type

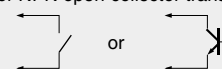


- Notes: 1) The device connected to the analog voltage output (black) should have an input impedance of 1 MΩ or more.
 2) The device connected to the analog current output (white) should have a load resistance of 300 Ω or less.
 3) Do not connect an interference prevention I/O wire other than that of **LH-CL6(P)** to the interference prevention I/O (orange / violet). Further, do not connect together two controllers which have both been set as masters during interference prevention setting, as this will cause a fault.

Symbols ... D1: Reverse supply polarity protection diode
 D2 to D5: Input protection diode
 ZD1 to ZD5: Surge absorption zener diode
 Tr1 to Tr3: NPN output transistor

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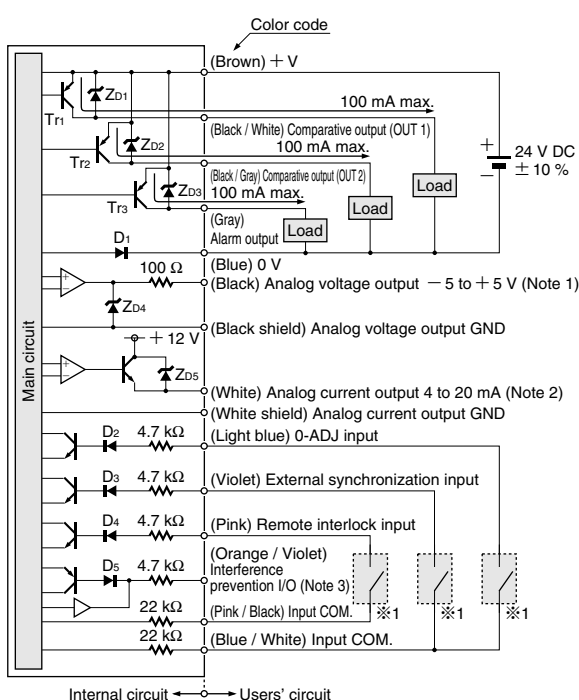
Non-voltage contact or NPN open-collector transistor



- 0-ADJ input, External synchronization input
 Low (0 to 1 V): Effective
 High (+ V or open): Ineffective
- Remote interlock input
 Low (0 to 1 V): Emission
 High (+ V or open): Emission halt

LH-CL6P

PNP output type

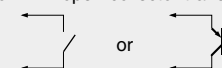


- Notes: 1) The device connected to the analog voltage output (black) should have an input impedance of 1 MΩ or more.
 2) The device connected to the analog current output (white) should have a load resistance of 300 Ω or less.
 3) Do not connect an interference prevention I/O wire other than that of **LH-CL6(P)** to the interference prevention I/O (orange / violet). Further, do not connect together two controllers which have both been set as masters during interference prevention setting, as this will cause a fault.

Symbols ... D1: Reverse supply polarity protection diode
 D2 to D5: Input protection diode
 ZD1 to ZD5: Surge absorption zener diode
 Tr1 to Tr3: PNP output transistor

※1

Non-voltage contact or PNP open-collector transistor

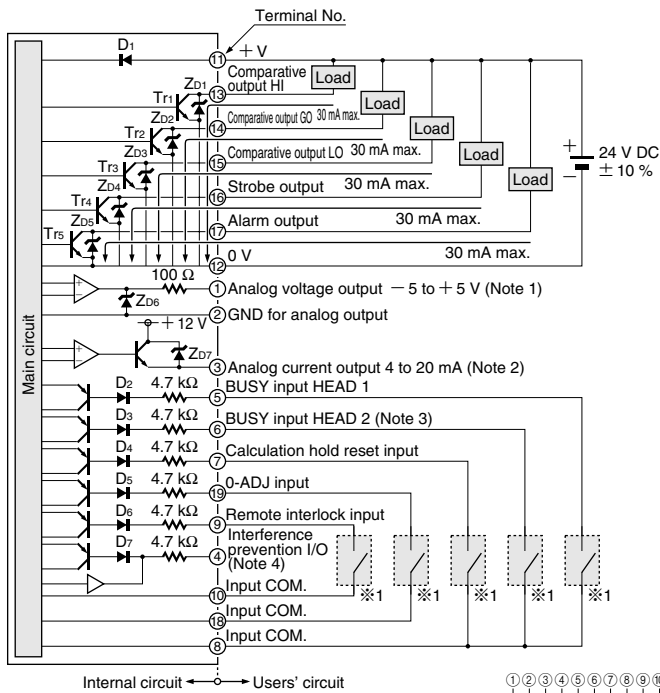


- 0-ADJ input, External synchronization input
 Low (0 to 1 V, or open): Ineffective
 High (+ V): Effective
- Remote interlock input
 Low (0 to 1 V, or open): Emission halt
 High (+ V): Emission

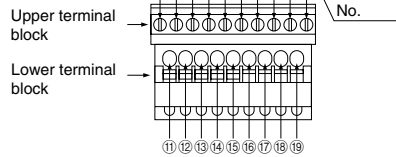
I/O CIRCUIT DIAGRAMS (CONTROLLER)

LH-CS6
LH-CD6

NPN output type



Terminal arrangement diagram

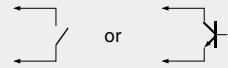


- Notes: 1) The device connected to '① Analog voltage output' should have an input impedance of 1 MΩ or more.
 2) The device connected to '③ Analog current output' should have a load resistance of 300 Ω or less.
 3) In case of **LH-CS6**, terminal No. ⑥ is not used.
 4) Do not wire an interference prevention I/O other than that of **LH-CS6(P)** or **LH-CD6(P)** to the interference prevention I/O. Further, do not connect together two controllers which have both been set as masters during interference prevention setting, as this will cause a fault.

Symbols ... D1: Reverse supply polarity protection diode
 D2 to D7: Input protection diode
 Zd1 to Zd7: Surge absorption zener diode
 Tr1 to Tr5: NPN output transistor

※1

Non-voltage contact or NPN open-collector transistor

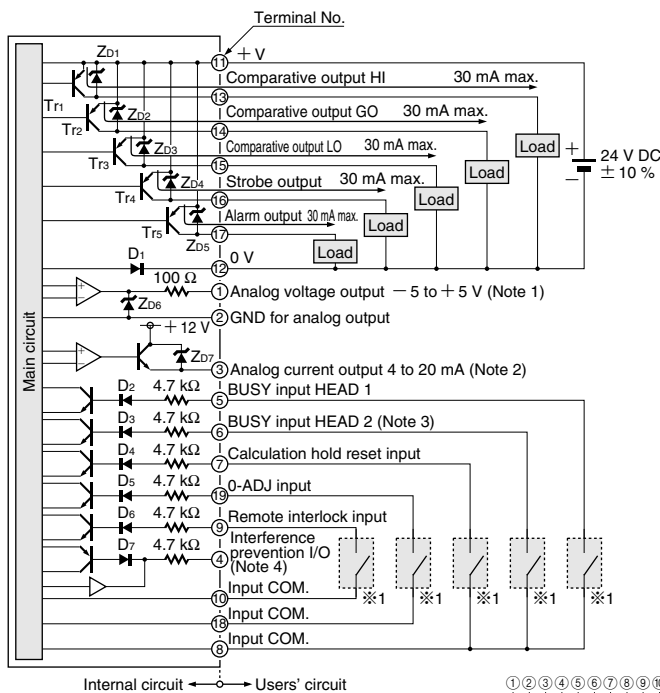


- 0-ADJ input, BUSY input
Calculation hold reset input
Low (0 to 1 V): Effective
High (+ V or open): Ineffective
- Remote interlock input
Low (0 to 1 V): Emission
High (+ V or open): Emission halt

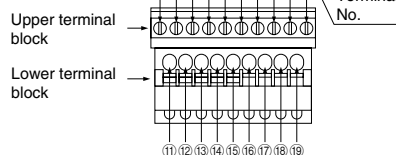
Upper terminal block		Lower terminal block	
Terminal No.	Description	Terminal No.	Description
①	Analog voltage output	⑪	+ V
②	GND for analog output	⑫	0 V
③	Analog current output	⑬	Comparative output HI
④	Interference prevention I/O	⑭	Comparative output GO
⑤	BUSY input HEAD 1	⑮	Comparative output LO
⑥	BUSY input HEAD 2 (Note)	⑯	Strobe output
⑦	Calculation hold reset input	⑰	Alarm output
⑧	Input COM.	⑱	Input COM.
⑨	Remote Interlock input		
⑩	Input COM.		

Note: Not for the **LH-CS6**LH-CS6P
LH-CD6P

PNP output type



Terminal arrangement diagram

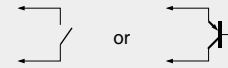


- Notes: 1) The device connected to '① Analog voltage output' should have an input impedance of 1 MΩ or more.
 2) The device connected to '③ Analog current output' should have a load resistance of 300 Ω or less.
 3) In case of **LH-CS6P**, terminal No. ⑥ is not used.
 4) Do not wire an interference prevention I/O other than that of **LH-CS6(P)** or **LH-CD6(P)** to the interference prevention I/O. Further, do not connect together two controllers which have both been set as masters during interference prevention setting, as this will cause a fault.

Symbols ... D1: Reverse supply polarity protection diode
 D2 to D7: Input protection diode
 Zd1 to Zd7: Surge absorption zener diode
 Tr1 to Tr5: PNP output transistor

※1

Non-voltage contact or PNP open-collector transistor



- 0-ADJ input, BUSY input
Calculation hold reset input
Low (0 to 1 V, or open): Ineffective
High (+ V): Effective
- Remote interlock input
Low (0 to 1 V, or open): Emission halt
High (+ V): Emission

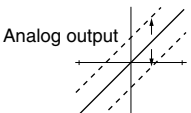
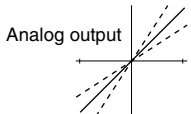
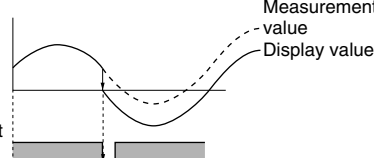
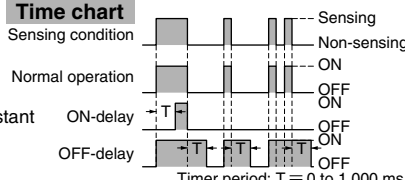
Upper terminal block		Lower terminal block	
Terminal No.	Description	Terminal No.	Description
①	Analog voltage output	⑪	+ V
②	GND for analog output	⑫	0 V
③	Analog current output	⑬	Comparative output HI
④	Interference prevention I/O	⑭	Comparative output GO
⑤	BUSY input HEAD 1	⑮	Comparative output LO
⑥	BUSY input HEAD 2 (Note)	⑯	Strobe output
⑦	Calculation hold reset input	⑰	Alarm output
⑧	Input COM.	⑱	Input COM.
⑨	Remote Interlock input		
⑩	Input COM.		

Note: Not for the **LH-CS6P**

LIST OF MAIN CONTROLLER FUNCTIONS

Please refer to the separate 'User's Manual' for more details pertaining to specifications. (Refer to p.916)

Common functions (common to general purpose controller and high-functional controller)

Item	Function	Outline
Measuring condition	AUTO gain setting function	Automatically sets the gain to the optimum level to match changes in the reflection ratio for the measured objects.
	SELECT gain setting function	Lets the user select the gain to match changes in the reflection ratio for the measured objects.
	Response time setting function	Lets the user select the response time to match the line speed for the measured objects.
Adjustment	Shift adjustment function	Adjusts the analog output and the shift value for display values. 
	Span adjustment function	Adjusts the analog output and the span value for display values. 
	0-ADJ function	Forcibly resets the currently measured value to '0' and then carries out measurement with this '0' value as a reference 
	0-ADJ function clear function	Returns the value which was forcibly set to '0' using the 0-ADJ function back to its original value.
	0-ADJ value memory function	Enables the 0-ADJ value to be stored in memory.
	Analog output off-set function	Applies a user-defined offset to the analog output.
Comparative output	Teaching function	Allow the measured value for the measured object to be used to set the threshold value.
	Timer function	Time chart  ON-delay: Disables short-term detection. OFF-delay: Extends the output signal for a constant length of time. Timer period: T = 0 to 1,000 ms
Display	Distance display / Displacement value display select function	Toggles the display between distance and displacement value display.
	Sleep function	Turns off value display.
Others	Analog output hold function	If measurement is not possible, this function maintains analog output at the level output immediately before this occurs.
	Interference prevention function	Prevents mutual interference when using two sensors in close proximity. [If using the LH-CD6(P) high-functional controller, interference can be prevented for up to four sensors.]

Additional functions (high-functional controller)

Item	Function	Outline
Measuring condition	Automatic response time setting function	Automatically sets the response time to match the line speed of the measured objects in order to provide optimum resolution.
Calculation and measurement	Calculation function [LH-CD6(P) only]	Carries out arithmetical processing on the channel A input value and the channel B input value. $A + B$: Calculates the sum of the measured values for channel A and channel B. $A - B$: Calculates the difference between the measured values for channel A and channel B. $L - (A + B)$: Subtracts the sum of the measured values for channel A and channel B from a constant value L. $L - (A - B)$: Subtracts the measured value for channel B from the measured value for channel A, and subtracts the result from a constant value L. $(A + B) / 2$: Obtains the simple average of the measured values for channel A and channel B.
	Measurement function	Peak-to-peak hold: Holds and displays the difference between the maximum and minimum values obtained during the measuring period. Peak hold: Holds and displays the maximum value obtained during the measuring period. Bottom hold: Holds and displays the minimum value obtained during the measuring period.
Set value memory	Set value memory function	Allows setting details to be stored in up to 16 different memory locations.
Communication	RS-232C communication function	Allows measured values and setting values to be transmitted via an RS-232C interface.

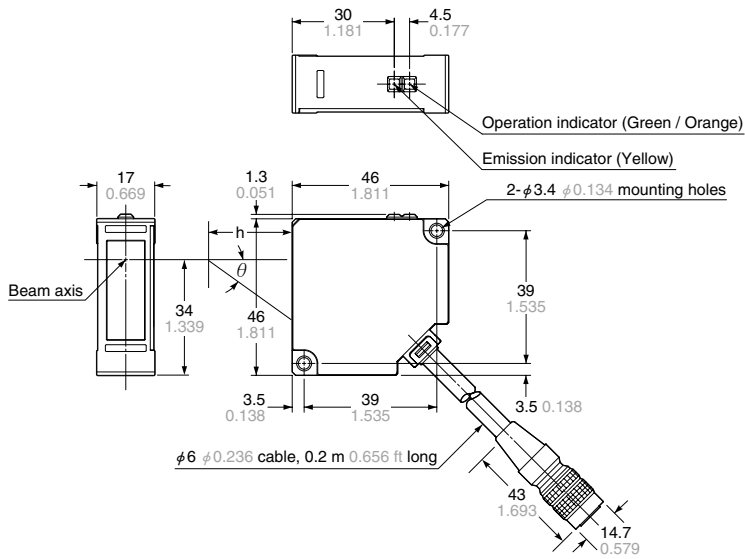
LH-50

DIMENSIONS (Unit: mm in)

The CAD data in the dimensions can be downloaded from the SUNX website: <http://www.sunx.co.jp/>

**LH-54 LH-58
LH-512**

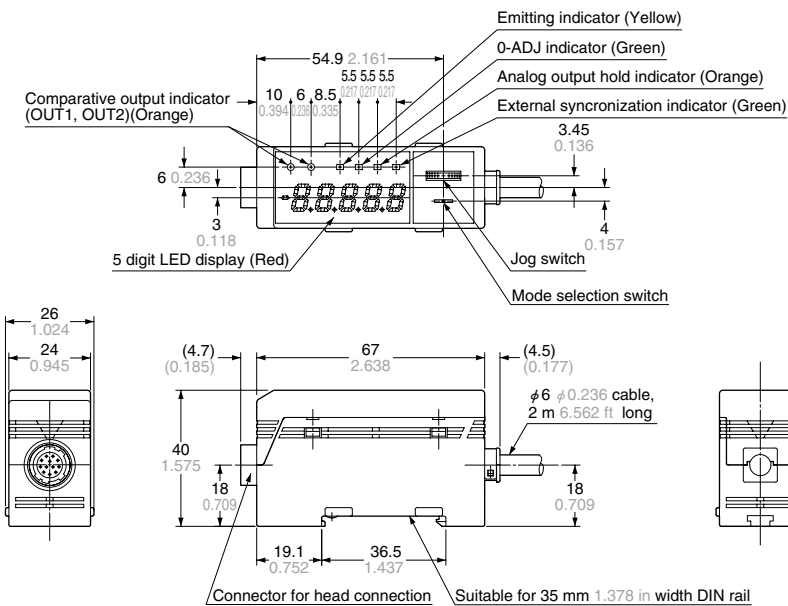
Sensor head



Model No.	Measurement center distance h	Emission / Reception angle θ
LH-54	40 mm 1.575 in	20.5 °
LH-58	80 mm 3.150 in	11.5 °
LH-512	120 mm 4.724 in	8.3 °

LH-CL6
LH-CL6P

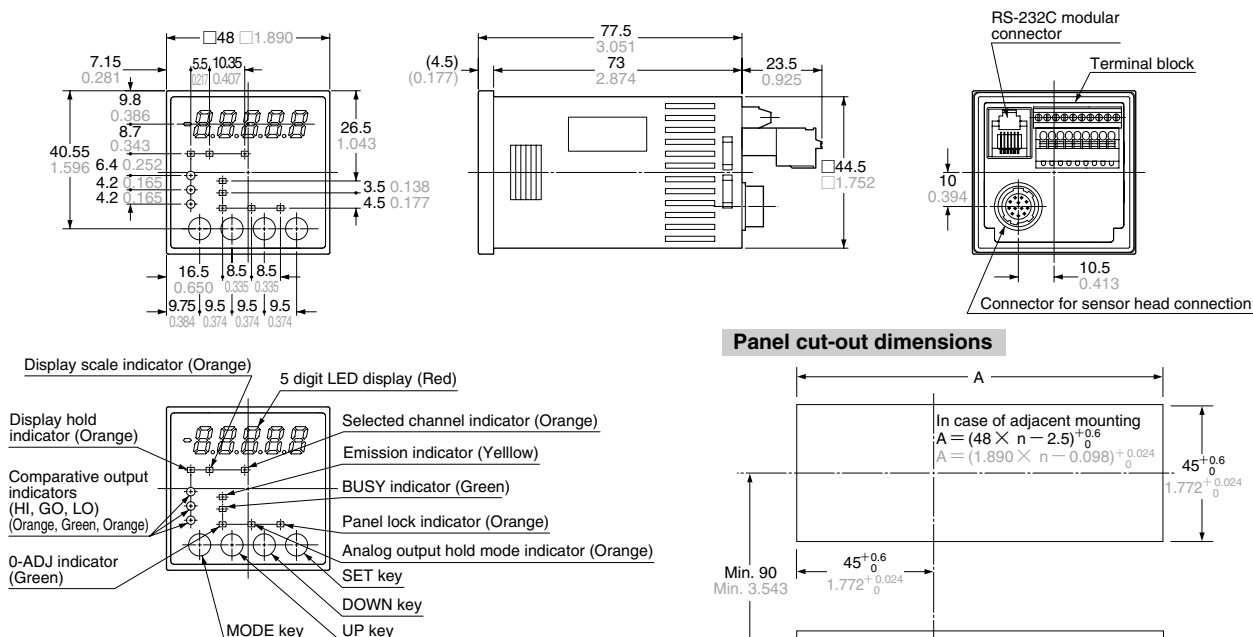
Controller



DIMENSIONS (Unit: mm in) The CAD data in the dimensions can be downloaded from the SUNX website: <http://www.sunx.co.jp/>

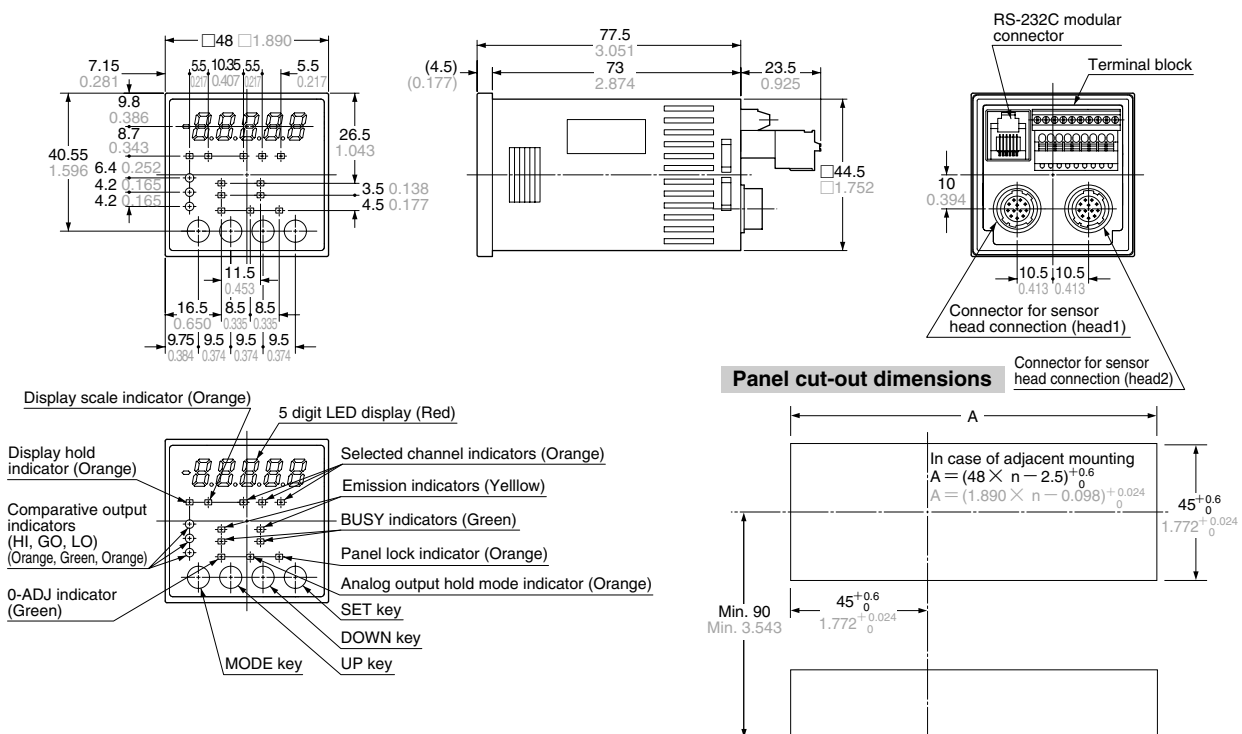
LH-CS6 LH-CS6P

Controller



LH-CD6 LH-CD6P

Controller



LH-50

PRECAUTIONS FOR PROPER USE



This product is not a safety sensor. Its use is not intended or designed to protect life and prevent body injury or property damage from dangerous parts of machinery. It is a normal object detection sensor.

Conditions in use for CE conformity

- The **LH-50** series is a CE conformity product complying with EMC Directive. The harmonized standard with regard to immunity that applies to this product is EN 61000-6-2 and the following conditions must be met to conform to that standard.

Conditions

- This controller should be connected less than 10 m 32.808 ft from the power supply.
- The signal line to connect with this controller should be less than 30 m 98.425 ft.

Note: The EN 50082-2 that previously applied to the products for conforming to EMC Directive was replaced by EN 61000-6-2 starting April 1st, 2002.

Guide to Users Manual and Technical Reference Manual

The separate 'Users Manual' contains details on the functions, applications, operating procedures and notes on use for the various controllers. In addition, a 'Technical Data' which contains technical data which can be used as reference for actual use is also available.

The applications described in this catalog as well as in the user's manuals are reference examples. Make sure to familiarize yourself with the functions of these devices prior to use.

