LH-50 SERIES

LED Type Optical Displacement Sensor

New

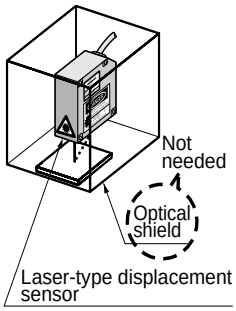
Minute displacements measured with high precision by red LED beam

Conforming to EMC Directive

UL Recognition

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.

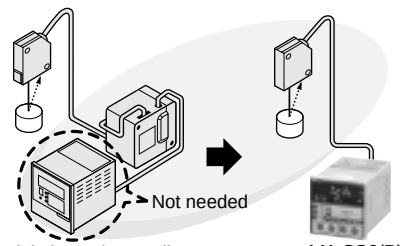


Universal use

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.

Reducing total cost

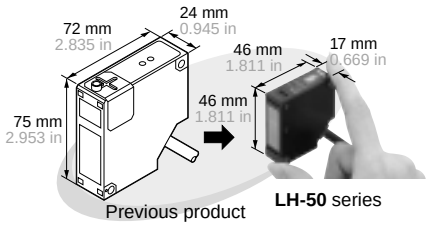
The high-functional controller includes built-in calculation and measurement functions, so that the digital panel controller which was needed previously is no longer required, thus reducing costs.
In addition, it also helps to reduce wiring and space costs.



Compact and lightweight

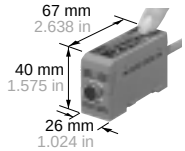
Sensor head

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.

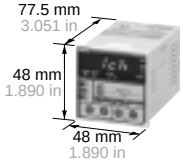


Controller

The general purpose controller is the most compact in its class.
Furthermore, the high-functional controller is a □48 mm □1.890 in panel mounting type which can be mounted on equipment panels.



General purpose controller
(DIN rail mounting type)



High-functional controller
(Panel mounting type)

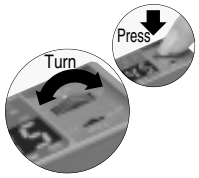
Panel mounting

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.



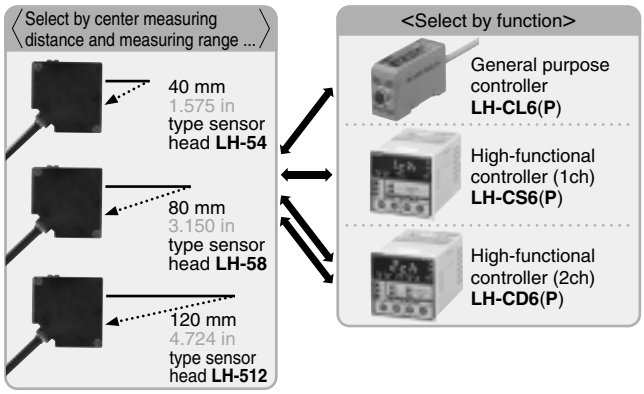
5-digit LED display examples

(Example of measurement value) (Example of settings)

• Flexible combinations

Sensor head **General purpose controller** **High-functional controller**

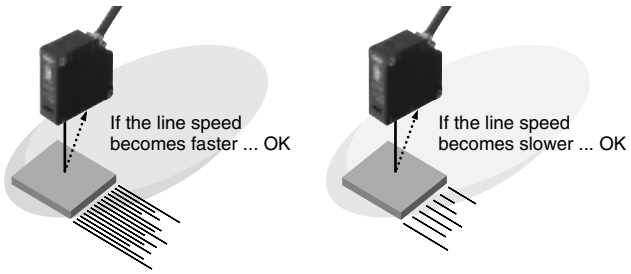
The **LH-50** series can be used in any combination desired. In addition, the sensor head and controller need not be managed as a pair.
Moreover, the **LH-CD6**(**P**) high-functional controller can be connected to two sensor heads of different types.



• Automatic response time setting

High-functional controller

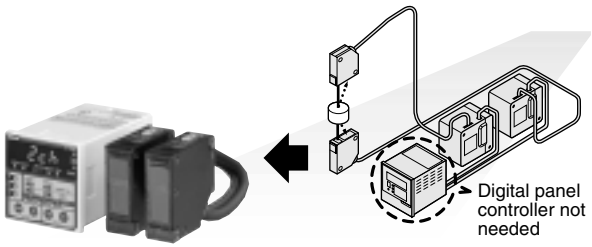
The **LH-CS6**(**P**) and **LH-CD6**(**P**) high-functional controllers are equipped with an automatic response time setting function. This function sets the response time automatically in accordance with the object's speed of movement. It ensures accurate measurement even for variable line speeds.
In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



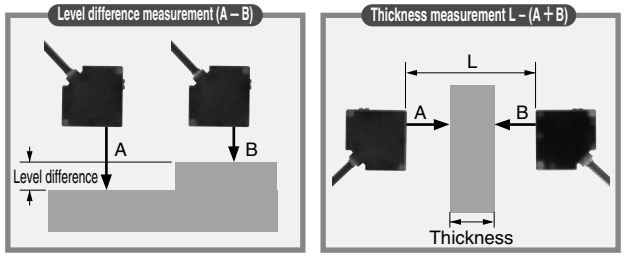
• Full range of 'ready-to-use' and 'useful' functions

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.

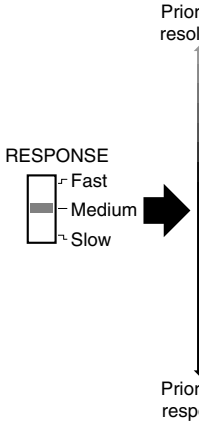


• Response time & resolution settings to suit the application

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. / Controller response time	LH-54	LH-58	LH-512
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

LH-50

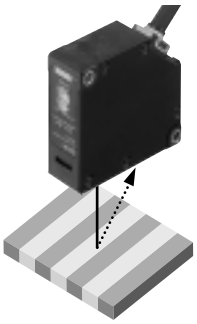
Simple and useful

• 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

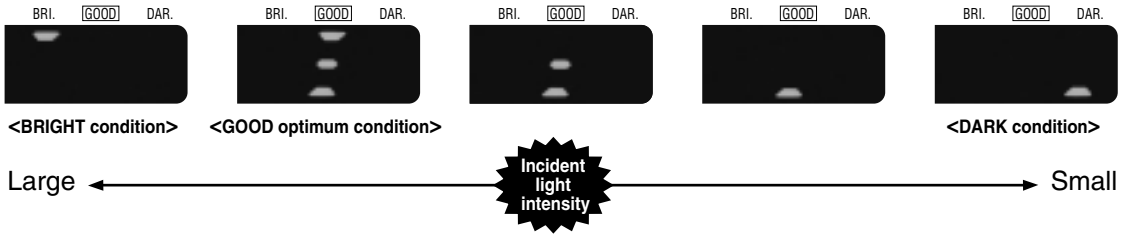


This setting automatically controls the gain so that the incident light intensity is optimized to handle variations in the reflection ratios (variations in the amount of light received) for the measured objects.
It is suitable for objects which produce large variations in reflection ratios.

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

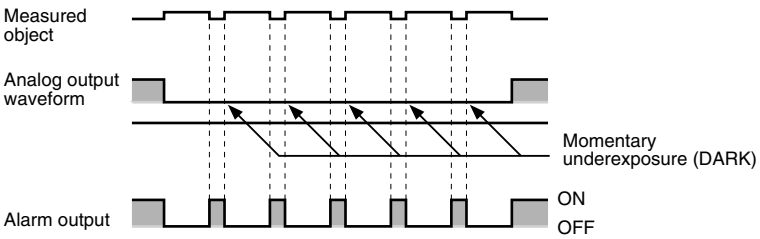
This function lets you set the gain to match the reflection ratio for the measured object.
An incoming light status bar (general purpose controller) is provided to assist with setting the gain to the optimum level.

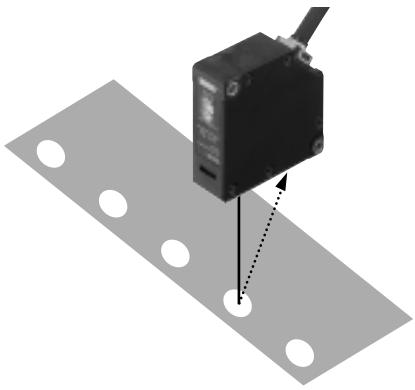


※ The illustrations show the display for general purpose controllers. High-functional controllers are also provided with AUTO gain and SELECT gain settings.

• 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.





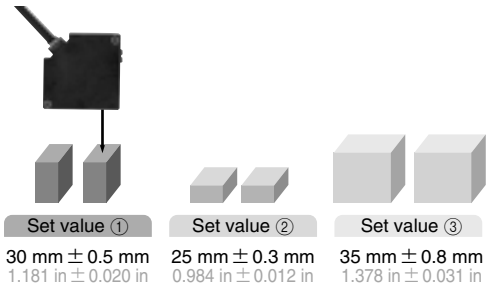
Simple and useful

• 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

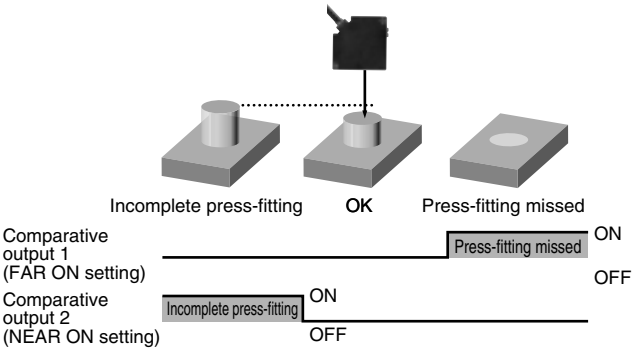


• Two-in-one functionality

General purpose controller

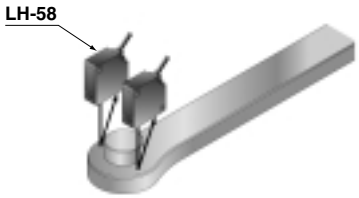
The **LH-CL6**(**P**) general purpose controller has two independent comparison outputs, making it suitable for use in applications where two sensor units were previously required.

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

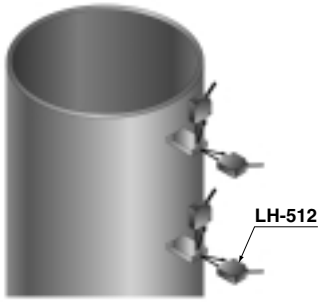


APPLICATIONS

Work seating confirmation



Pipe exterior distortion detection

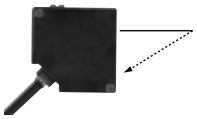
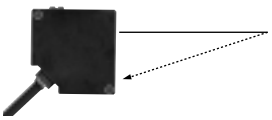
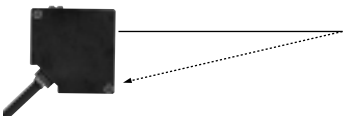


Measuring wheel eccentricity

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 $1/e^2$ (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.

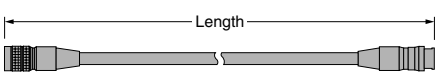
Controllers

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

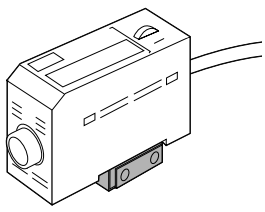
Designation	Model No.	Description	
Extension cable	**LH-CCJ2**	Length: 2 m 6.562 ft Weight: 130 g approx.	0.22 mm² cabtyre cable, with connector on both ends • Cable outer diameter: ϕ6 mm ϕ0.236 in • Connector outer diameter: ϕ14.7 mm ϕ0.579 in max.
	LH-CCJ5	Length: 5 m 16.404 ft Weight: 270 g approx.	
	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

Item \ Type / Model No.			40 mm 1.575 in type **LH-54**	80 mm 3.150 in type **LH-58**	120 mm 4.724 in type **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)			ϕ1.6 mm ϕ0.063 in or less	ϕ2.0 mm ϕ0.079 in or less	ϕ3.0 mm ϕ0.018 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 $1/e^2$ (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 \ Type	General purpose	
	NPN output	PNP output
Model No.	**LH-CL6**	**LH-CL6P**
Applicable sensor head	**LH-54**, **LH-58**, **LH-512**	
Connectable sensor heads (Max.)	1 No.	
Supply voltage	24 V DC ± 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./°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 °C + 32 to + 122 °F (No dew condensation), Storage: − 20 to + 60 °C − 4 to + 140 °F	
Ambient humidity	35 to 85 % RH, Storage: 35 to 85 % RH	
Cable	0.22 mm² 13-core composite cabtyre cable, 2 m 6.562 ft long.	
Weight	160 g approx.	
Accessory	**MS-DIN-3** (Controller mounting bracket): 1 pc.	

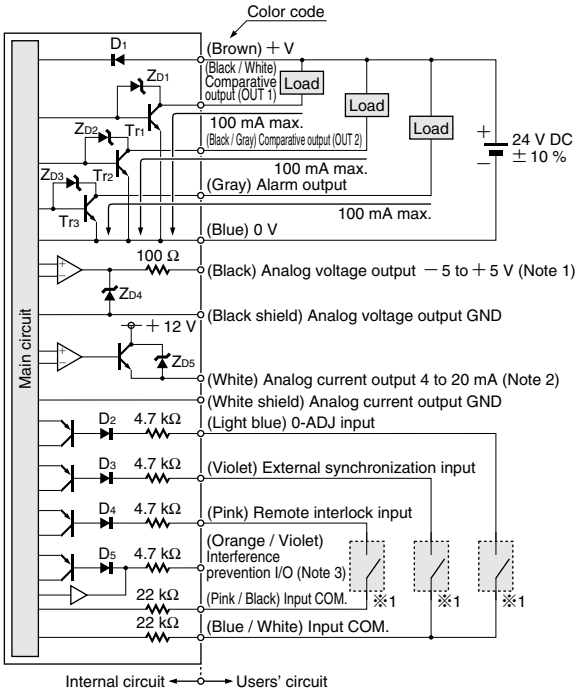
Notes: 1) Conditions which have not been specified are to be taken as: 24 V DC supply voltage, + 20 °C + 68 °F ambient temperature, SELECT gain setting, 300 ms response time setting, measurement center distance, interference prevention function not used and white ceramic board object.
2) Including the 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 \ Type	High-functional			
	NPN output		PNP output	
Model No.	**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 ± 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./°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 °C + 32 to + 122 °F (No dew condensation), Storage: − 20 to + 60 °C − 4 to + 140 °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 °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) 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

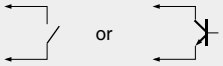


Notes: 1) The device connected to the analog voltage output (black) should have an input impedance of 1 MΩ or more.
2) The device connected to the analog current output (white) should have a load resistance of 300 Ω or less.
3) Do not connect an interference prevention I/O wire other than that of **LH-CL6**(**P**) 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 … D_1: Reverse supply polarity protection diode
D_2 to D_5: Input protection diode
Z_{D1} to Z_{D5}: Surge absorption zener diode
Tr_1 to Tr_3: NPN output transistor

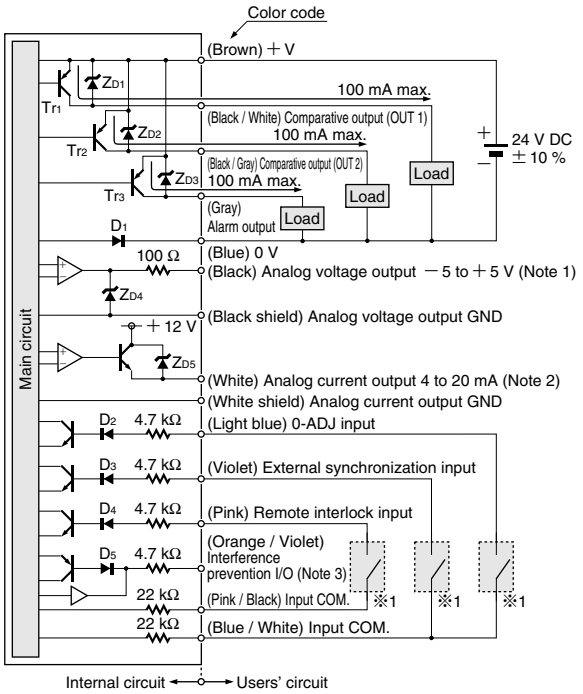
※1

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 (+ V or open): 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 … D_1: Reverse supply polarity protection diode
D_2 to D_5: Input protection diode
Z_{D1} to Z_{D5}: Surge absorption zener diode
Tr_1 to Tr_3: PNP output transistor

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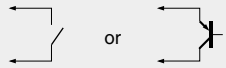
Non-voltage contact or PNP open-collector transistor



- 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

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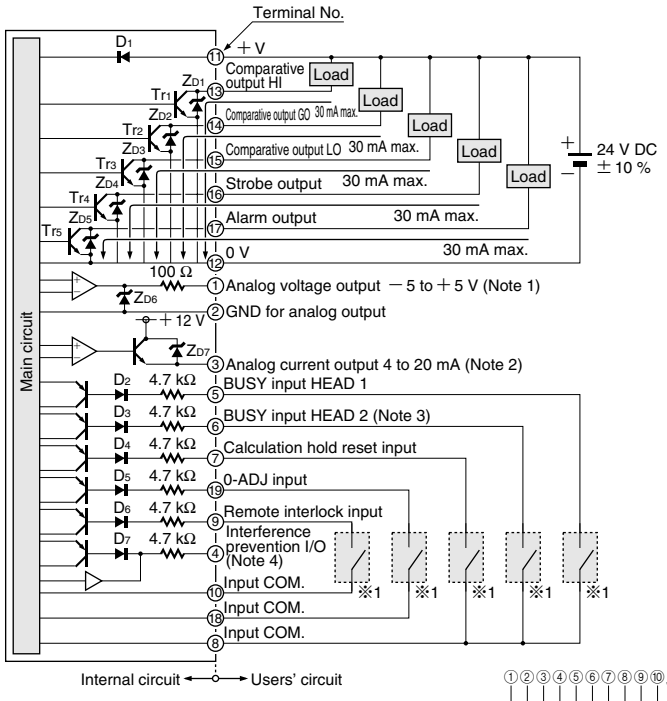
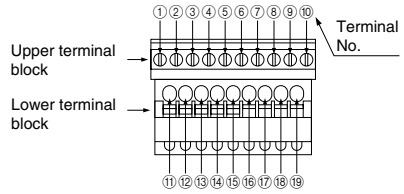
I/O CIRCUIT DIAGRAMS (CONTROLLER)

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 … D_1: Reverse supply polarity protection diode
D_2 to D_7: Input protection diode
Z_{D1} to Z_{D7}: Surge absorption zener diode
Tr_1 to Tr_5: NPN output transistor

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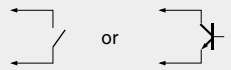
Non-voltage contact or NPN open-collector transistor

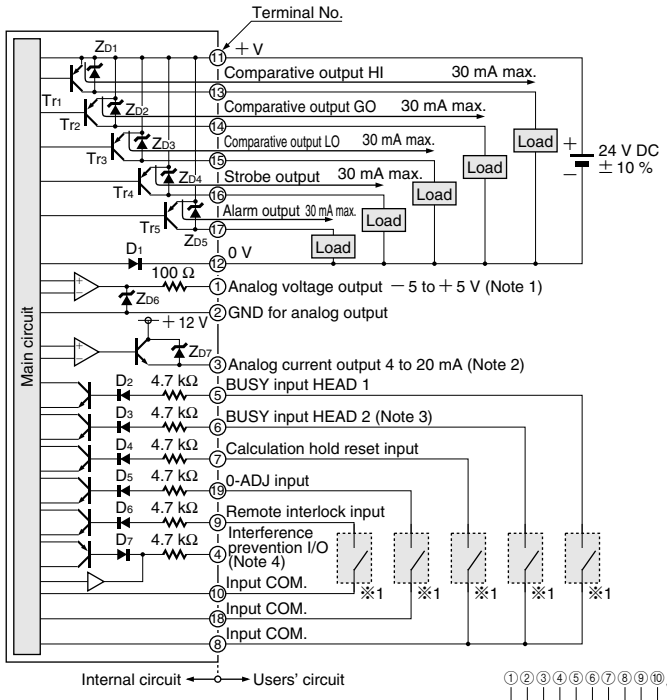


- 0-ADJ input, BUSY input
  Calculation hold reset input
  Low (0 to 1 V): Effective
  High (+V or open): Ineffective
- Remote interlock input
  Low (0 to 1 V): Emission
  High (+V or open): Emission halt

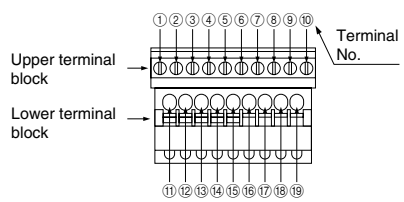
Upper terminal block		Lower terminal block	
Terminal No.	Description	Terminal No.	Description
①	Analog voltage output	⑪	+V
②	GND for analog output	⑫	0 V
③	Analog current output	⑬	Comparative output HI
④	Interference prevention I/O	⑭	Comparative output GO
⑤	BUSY input HEAD 1	⑮	Comparative output LO
⑥	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	⑲	0-ADJ 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 … D_1: Reverse supply polarity protection diode
D_2 to D_7: Input protection diode
Z_{D1} to Z_{D7}: Surge absorption zener diode
Tr_1 to Tr_5: PNP output transistor

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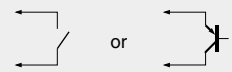
Non-voltage contact or PNP open-collector transistor



- 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

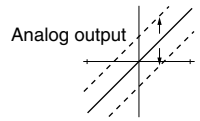
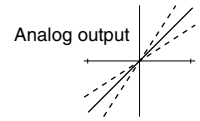
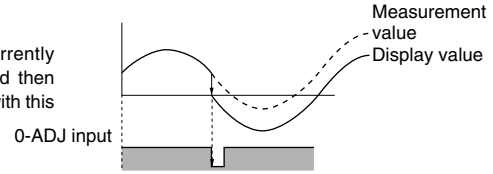
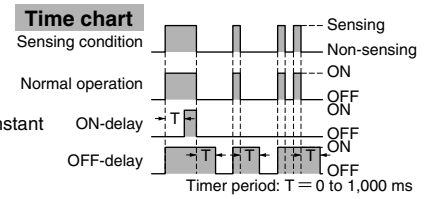
Upper terminal block		Lower terminal block	
Terminal No.	Description	Terminal No.	Description
①	Analog voltage output	⑪	+V
②	GND for analog output	⑫	0 V
③	Analog current output	⑬	Comparative output HI
④	Interference prevention I/O	⑭	Comparative output GO
⑤	BUSY input HEAD 1	⑮	Comparative output LO
⑥	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	⑲	0-ADJ 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 caries 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	ON-delay: Disables short-term detection. OFF-delay: Extends the output signal for a constant length of time. 
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.

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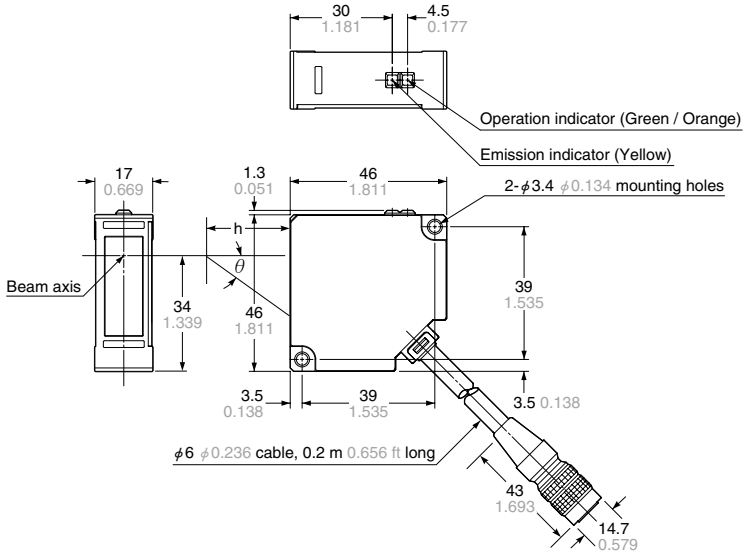
DIMENSIONS (Unit: mm in)

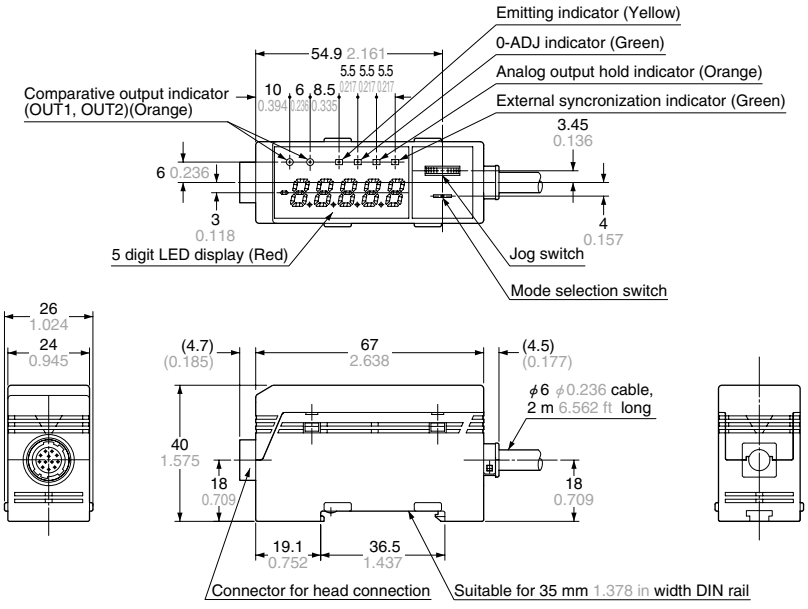
The CAD data in the dimensions can be downloaded from the SUNX website: http://www.sunx.co.jp/

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 °

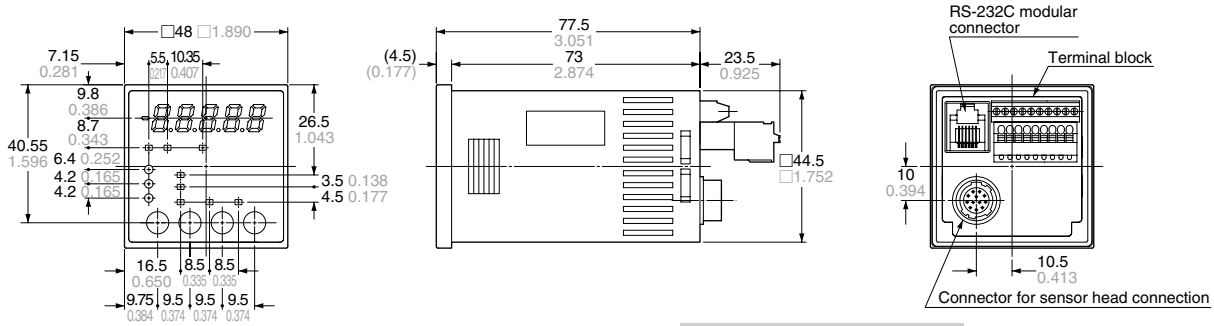
LH-CL6 LH-CL6P Controller

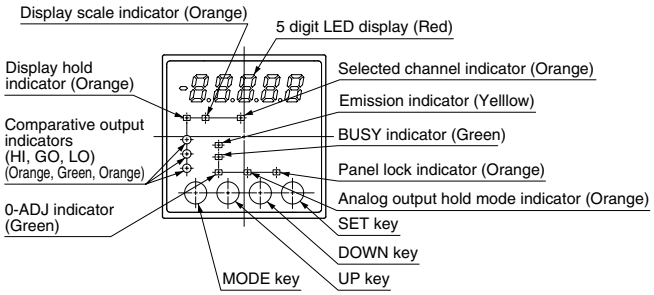


DIMENSIONS (Unit: mm in)

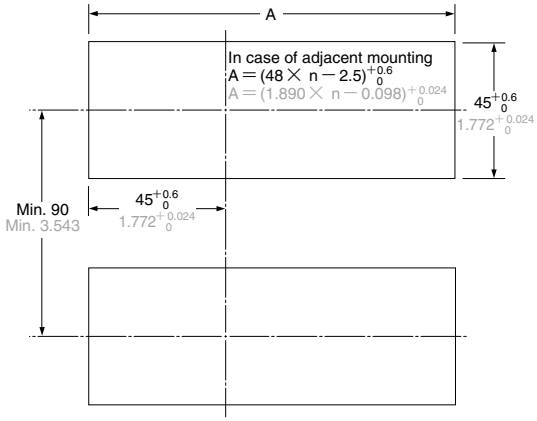
The CAD data in the dimensions can be downloaded from the SUNX website: http://www.sunx.co.jp/

LH-CS6 LH-CS6P Controller



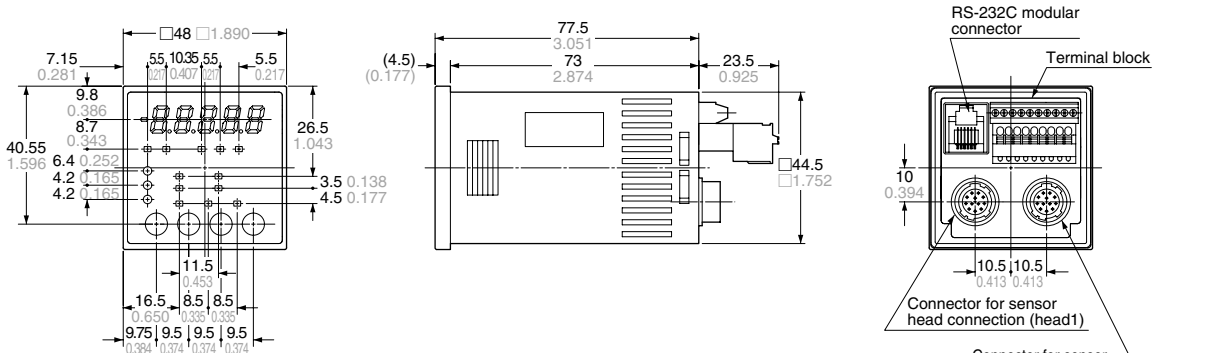


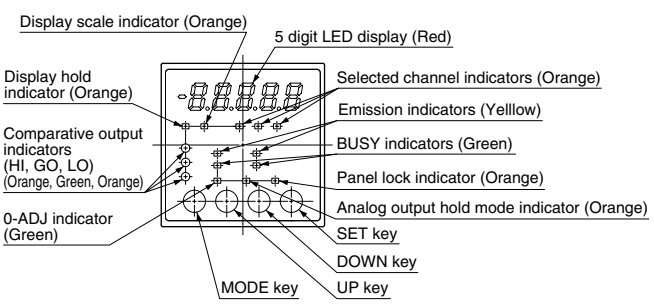
Panel cut-out dimensions



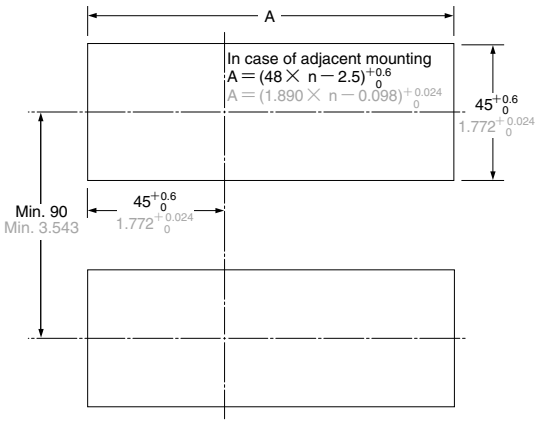
Note: The panel thickness should be 1 to 5 mm 0.039 to 0.197 in.

LH-CD6 LH-CD6P Controller





Panel cut-out dimensions



Note: The panel thickness should be 1 to 5 mm 0.039 to 0.197 in.

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 will with the functions of these devices prior to use.