SUNX

Product is discontinued -
Laser Sensors

SUNX

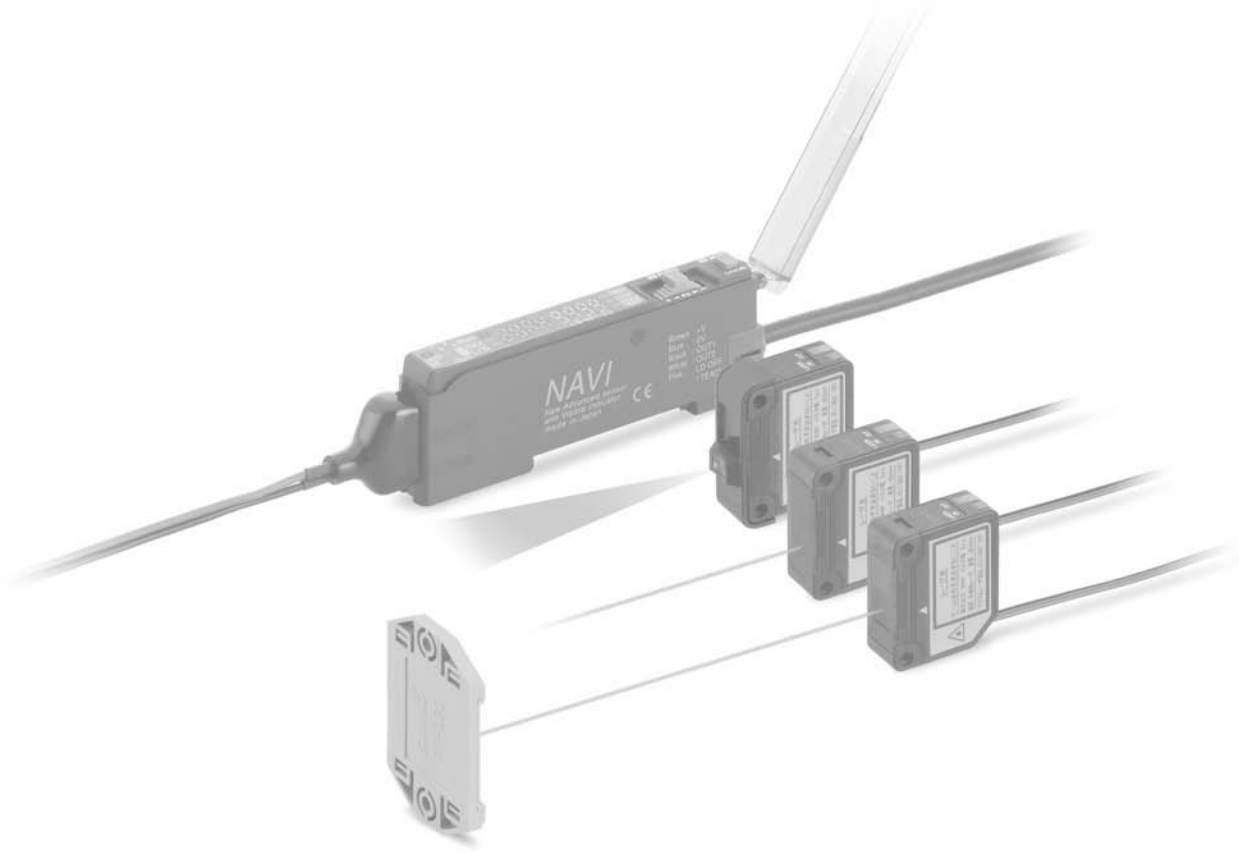
Laser Sensors

SUNX – Sensors by Panasonic Electric Works

04/2008

SUNX

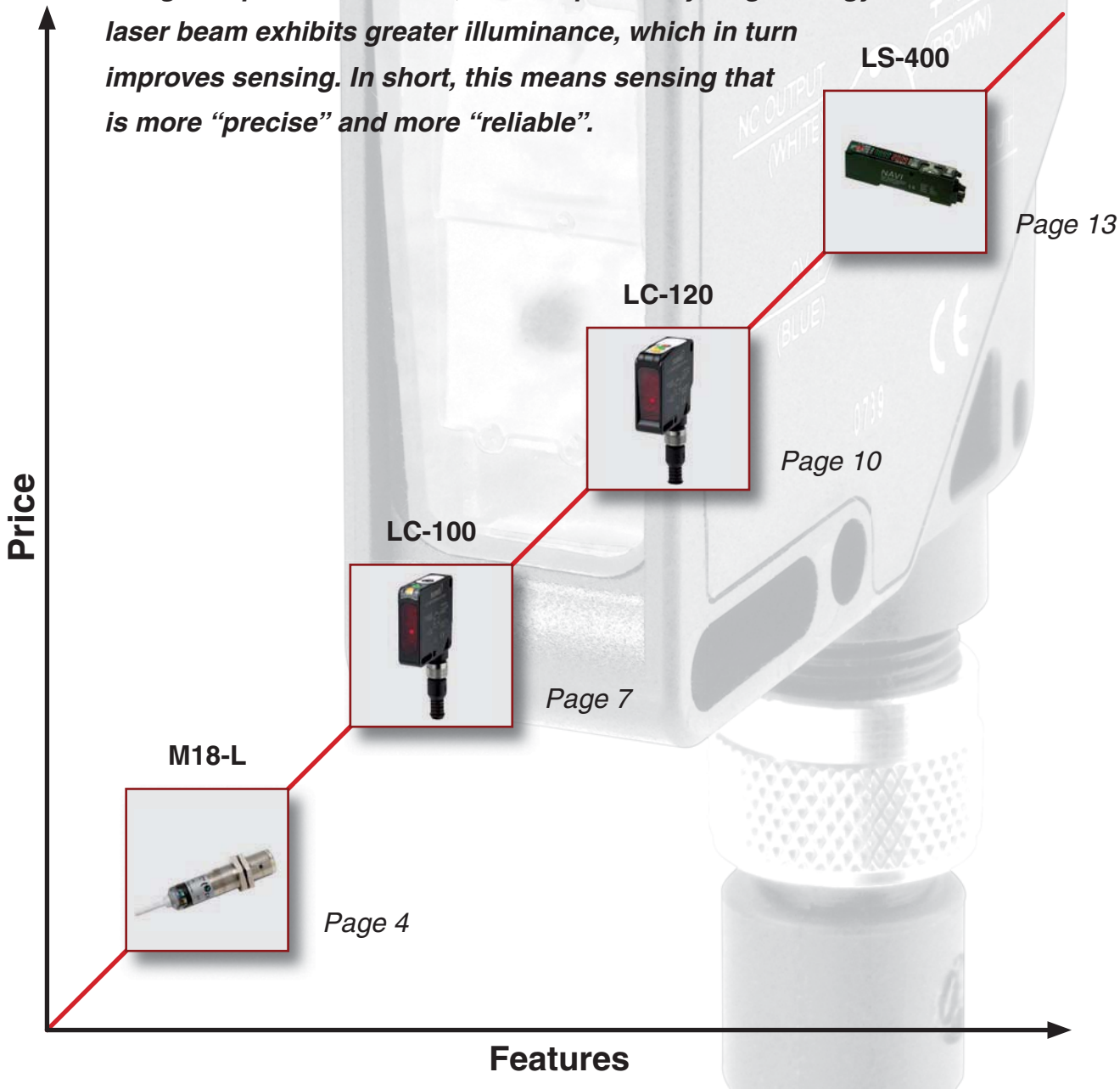
Laser Sensors



04/2008

With laser technology—precision on the dot

Compared to sensors that use LED light, laser sensors offer many decisive advantages. Due to its very nature, the laser beam ends in a point of light on the objects being sensed that is much smaller than that of LED sensors. This yields markedly higher accuracy, allowing machines to work more precisely and at higher speeds. Moreover, the comparatively "high energy" laser beam exhibits greater illuminance, which in turn improves sensing. In short, this means sensing that is more "precise" and more "reliable".



Multifunction optical sensors

M18-L

One for all: M18-L Series

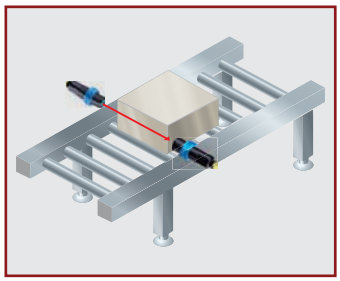
Features

Great lineup of 48 models

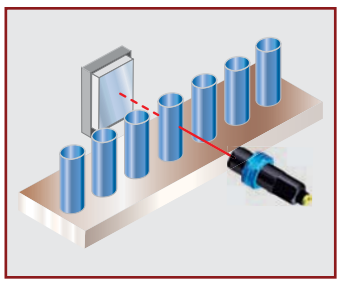
The M18-L series offers all optical functions in an M18 housing. The visible laser light spot makes the sensor simple to align. It is easy to install and requires little space due to its ultra-compact size.

- Available types: Thru-beam laser sensor up to 60m, retro-reflective type up to 16m, diffuse reflective type up to 350mm
- Complete range of optic functions, laser class 1
- Flat plastic tubular housing for improved versatility, or metal cylindrical housing
- Cable or M12 connection
- NPN or PNP
- Radial and axial versions

Typical Applications



Packaging

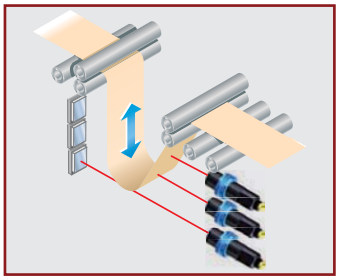


Precise object detection

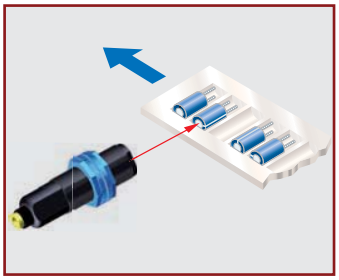
Technical Specifications

NPN-Output	**M18-LT5000-[R]-[M/P]-[J]**	**M18-LT6000-[A]-[M/P]-[J]**	**M18-LP0900-[R]-[M/P]-[J]***	**M18-LP1600-[A]-[M/P]-[J]***
PNP-Output	**M18-LT5000-[R]-[M/P]-PN-[J]**	**M18-LT6000-[A]-[M/P]-PN-[J]**	**M18-LP0900-[R]-[M/P]-PN-[J]***	**M18-LP1600-[A]-[M/P]-PN-[J]***
Sensor type	Thru-beam		Retroreflective	
	Radial	Axial	Radial	Axial
Maximum operation distance	50m	60m	9m	16m
Sensing range	0 to 50m	0 to 60m	0.1 to 9m	0.1 to 16m
Spot diameter	2.5mm at 5m		2mm at 3m	
Standard sensing object	Metal, black			
	Ø 10mm		Ø 5mm	
Detection capability	Opaque		Opaque, translucent	
Hysteresis	–			
Response time	333µs			
Output	Max. 100mA			
Emitting element	Red semiconductor laser, 650nm (class 1)			
Current consumption without load	Emitter: max. 35mA Receiver: max. 30mA		Max. 35mA	
Material	Metal version: nickel-plated brass Plastic version: PBT Lens: PMMA			
Protection	IP67			
Dimensions (H×W×D)	Cable type: M18×89mm Connector type: M18×93.5mm	Cable type: M18×77mm Connector type: M18×81.5mm	Cable type: M18×89mm Connector type: M18×93.5mm	Cable type: M18×77mm Connector type: M18×81.5mm
Connection	Cable 2m or M12 connector			
Supply voltage	10 to 30V DC			
Ambient temperature	Operation: −10 to +50°C, storage: −25 to +70°C			
Weight	Cable type: Emitter and receiver each approx. 75g Connector type: Emitter and receiver each approx. 25g		Cable type: approx. 75g (plastic version) or approx. 110g (metal version) Connector type: Approx. 25g (plastic version) or approx. 60g (metal type)	
[R] = Radial • [A] = Axial [P] = Plastic [M] = Metal • [PN] = PNP [J] = M12 connector				

* Reflector not included



Control of sag



Detection of capacitors

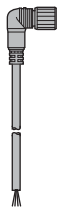
Technical Specifications

NPN-output	M18-LD0025-R-[M/P]-[J]	M18-LD0035-A-[M/P]-[J]
PNP output	M18-LD0025-R-[M/P]-PN-[J]	M18-LD0035-A-[M/P]-PN-[J]
Sensor type	Reflective	
	Radial	Axial
Maximum operation distance	250mm	350mm
Sensing range	0 to 250mm	0 to 350mm
Spot diameter	0.3mm at 50mm	
Standard sensing object	Paper, white	
	100×100mm	200×200mm
Detection capability	Opaque, translucent	
Hysteresis	<1%	
Response time	333µs	
Output	Max. 100mA	
Emitting element	Red semiconductor laser, 650nm (class 1)	
Current consumption without load	Max. 35mA	
Material	Metal version: nickel-plated brass Plastic version: PBT Lens: PMMA	
Protection	IP67	
Dimensions (Ø × L)	M18 × 81.5mm	
Connection	Cable 2m or M12 connector	
Supply voltage	10 to 30V DC	
Ambient temperature	Operation: −10 to +50°C, storage: −25 to +70°C	
Weight	Cable type: approx. 75g (plastic version), approx. 110g (metal version) Connector type: approx. 25g (plastic version), approx. 60g (metal version)	

• [R] = Radial • [A] = Axial • [P] = Plastic • [M] = Metal • [PN] = PNP • [J] = M12 connector

Options

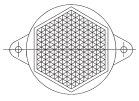
Cables

UZZ81220	UZZ81221	UZZ81250	UZZ81251
2m straight	2m elbow	5m straight	5m elbow
			

Mounting brackets

M18L-ST20	M18-SPM
	

Reflector

M18-RF48


Connections

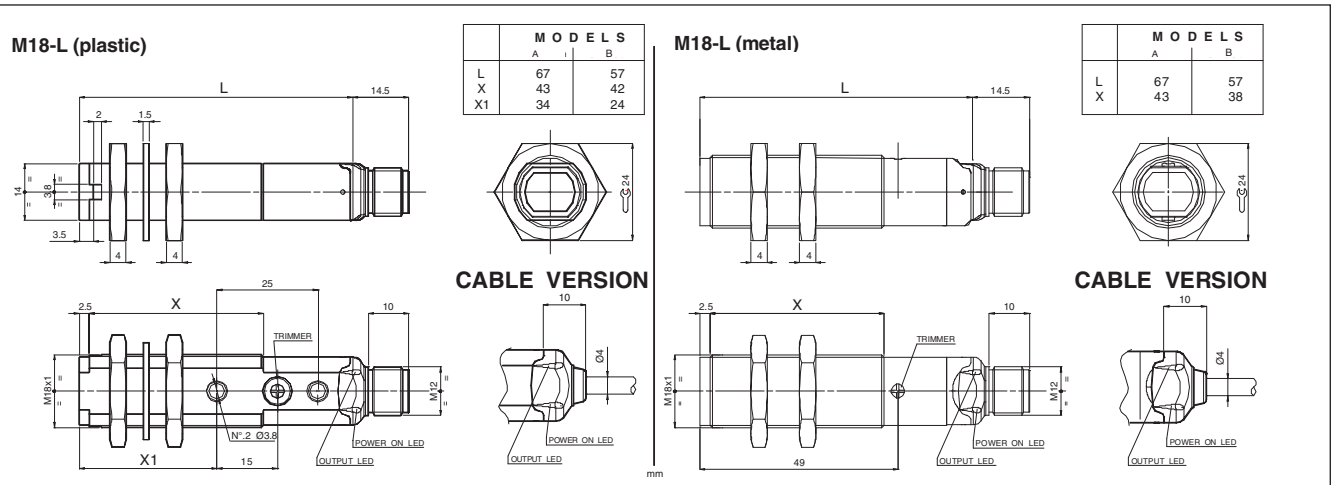
The connections are compliant to the EN 60947-5-2 standard.

M18-LP/LD/LT		M18-LT (emitter)	
BROWN 1	+ 10 … 30 VDC	BROWN 1	+ 10 … 30 VDC
WHITE 2	N.C. OUTPUT	WHITE 2	TEST +
BLACK 4	N.O. OUTPUT	BLACK 4	NOT USED
BLUE 3	— 0 V	BLUE 3	— 0 V

M12 CONNECTOR

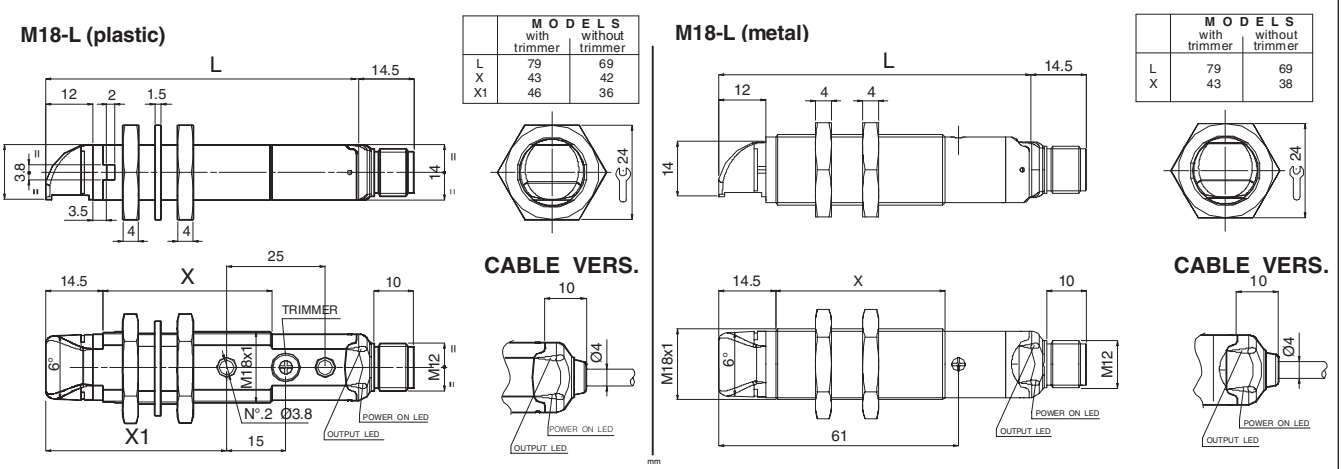
Dimensions

Axial



*Models: A = M18-LP/LD/LT, B = M18-LT (emitter)

Radial



*Models with trimmer: M18-LP/LD/LT; models without trimmer: M18-LT… (emitter)

New

LC-100

Digital Laser Sensor

Features

Multifunction optoelectronic sensors

The **LC100 series**, standard 50×50×15mm compact housing, offers all the most advanced optic functions, as well as the universal, available with safety class 1 laser emission. This series offers versions with cable or M12 connection that can be rotated for either straight or right-angle positions. All versions have NPN or PNP output and standard configuration conforming to the EN 60947-5-2 standard. There are 16 types of LC100 available.

Available in 4 versions

Laser through-beam

- Visible class 1 laser red light emission (typ. 650nm)
- Operating distance up to 60m
- Resolution better than 6mm at 0.5m and 10mm over 2m
- Very high switching frequency up to 1.5kHz
- Double NO-NC output with NPN or PNP version
- Test input
- Plastic housing with compact dimensions 50×50×15mm

Laser polarized retroreflective

- Visible class 1 laser red light emission (typ. 650nm)
- Operating distance up to 20m
- Resolution better than 10mm
- Trimmer setting for fine sensitivity adjustment
- Very high switching frequency up to 2kHz
- Double NO-NC output with NPN or PNP version
- Plastic housing with compact dimensions 50×50×15mm

Diffuse reflective

- Visible class 1 laser red light emission (typ. 650nm)
- Operating distance 0 to 60cm
- Resolution approx. 0.2mm at 15cm
- Trimmer setting for fine sensitivity adjustment
- Very high switching frequency up to 2kHz
- Double NO-NC output with NPN or PNP version
- Plastic housing with compact dimensions 50×50×15mm

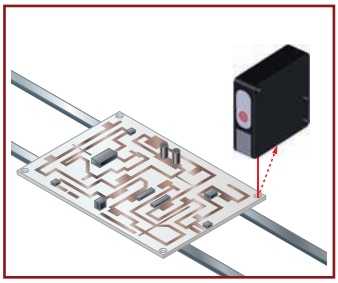
Background suppression

- Visible class 1 laser red light emission (typ. 650nm)
- Operating distance 5 to 10cm
- Resolution approx. 0.5mm at 6cm
- Teach-in setting
- External teach-in

Typical Applications

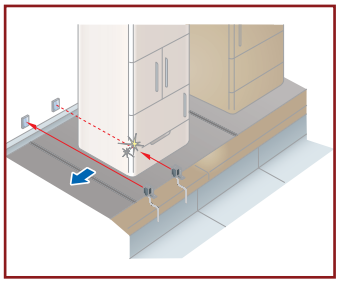
Positioning of printed circuit boards

Electronic industry



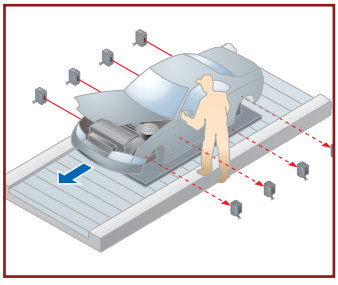
Detection of Refrigerators

Packaging industry



Detection of automobiles on conveyers

Automotive industry



Technical Specifications

NPN-Output	LC-100-TL6000-A-P-[J]	LC-100-PL2000-A-P-[J]*	LC-100-DL0060-A-P-[J]	LC-100-BL0010-A-P-[J]
PNP-Output	**LC-100-TL6000-A-P-PN-[J]**	**LC-100-PL2000-A-P-PN-[J]***	**LC-100-DL0060-A-P-PN-[J]**	**LC-100-BL0010-A-P-PN-[J]**
Sensor type	Thru-beam	Retroreflective	Diffuse reflective	Diffuse reflective with BGS
Maximum operation distance	60m	20m	600mm	100mm
Sensing range	0 to 60m	0.1 to 20m	0 to 600mm	50 to 100mm
Standard sensing object	Metal, black		Paper, white	
	Ø 6mm		200 x 200mm	100 x 100mm
Detection capability	Opaque	Opaque, translucent	Opaque, transparent	
Hysteresis	–	–	<1 %	
Response time	Approx. 333µs	Approx. 250µs		500µs
Output	Max. 100mA			
Emitting element	Red semiconductor laser, 650nm (Class 1)			
Current consumption without load	Emitter: max. 35mA Receiver: max. 35mA	Max. 35mA		Max. 60mA
Material	Enclosure: Plastic			
Protection	IP67			
Dimensions (H×W×D)	Cable type: approx. 50×50×15mm Connector type: approx. 50×66×15mm			
Connection	Cable 2m or M12 connector			
Supply voltage	10 to 30V DC			
Ambient temperature	Operation: −10 to +50°C, storage: −25 to +70°C			
Weight	Cable type: approx. 90g Connector type: approx. 40g			
[PN] = PNP • [J] = M12 connector				

* Reflector not included

Options

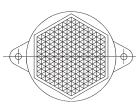
Cables

UZZ81220	UZZ81221	UZZ81250	UZZ81251
2m straight	2m elbow	5m straight	5m elbow
			

Mounting brackets

LC1-ST60	LC1-ST26
	

Reflector

M18-RF48


Connections

LC-100-PL/DL/TL

The connections are compliant with the EN 60947-5-2 standard.

LC-100-PL/DL/TL...		LC-100-TL... (emitter)	
BROWN 1	+ 10 ... 30 VDC	BROWN 1	+ 10 ... 30 VDC
WHITE 2	N.C. OUTPUT	WHITE 2	TEST +
BLACK 4	N.O. OUTPUT	BLACK 4	NOT USED
BLUE 3	– 0 V	BLUE 3	– 0 V

M12 CONNECTOR

LC-100-BL

BROWN — + 10 ... 30 VDC

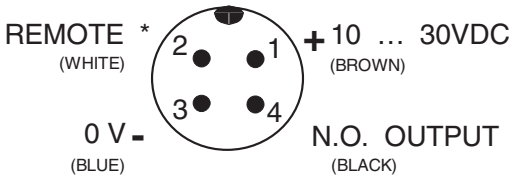
WHITE — REMOTE *

BLACK — N.O. OUTPUT

BLUE — 0V

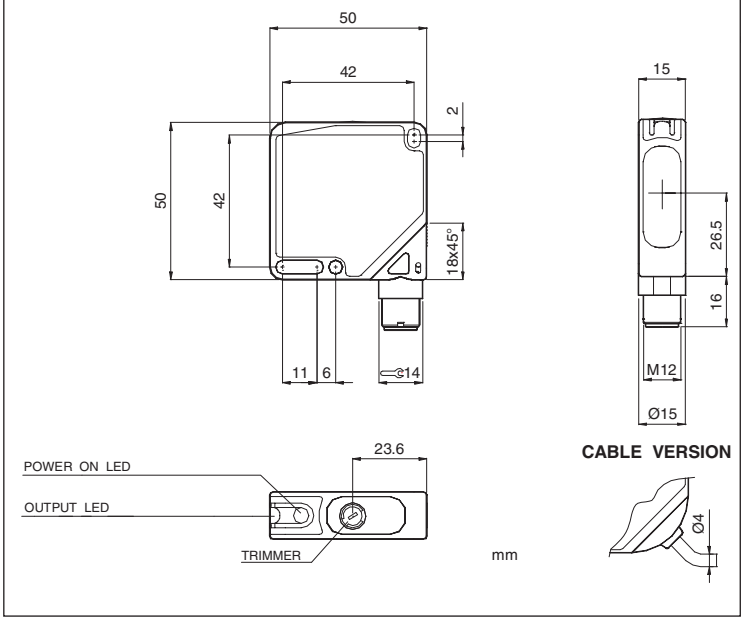
* = Connect to 0 V the REMOTE wire if not used.

M12 CONNECTOR

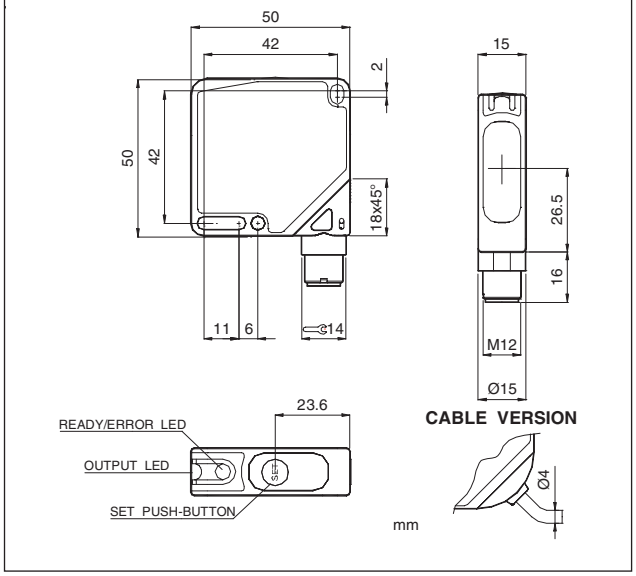


Dimensions

LC-100-PL/DL/TL



LC-100-BL



LC-120

High-performance sensors

Features

Maximum performance in compact housing

The **LC120 series**, developed in the 50×50×18mm compact plastic housing, offers the maximum performance of optic detection functions for industrial automation.

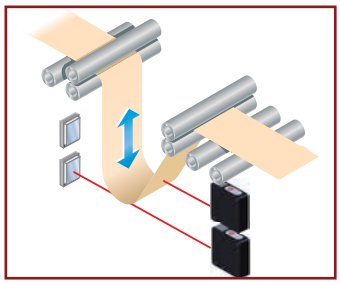
Furthermore, versions with visible red laser emission are available with 5–35cm background suppression and polarized retroreflex reaching more than 20m.

These laser sensors are characterized by a very small light spot as well as a low response time that guarantee excellent detection repeatability, even of very small objects or movements.

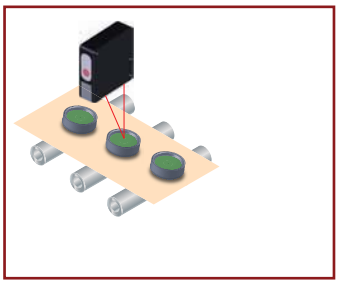
- High-resolution sensors with LED or laser emission
- Background suppression models ranging up to 350mm
- Polarized retroreflex with operating distance of up to 20m
- Plastic housing with compact dimensions of 50×50×18mm
- NPN or PNP double output with standard NO-NC
- Visible class 2 laser red light emission (typ. 658nm)
- Very fast response time less than 200µs
- Very high switching frequency of up to 2.5kHz

Typical Applications

Foil detection



Pharmaceutical industry



Technical Specifications

NPN-Output	LC-120-PL2000-A-P-J*	LC-120-BL0015-A-P-J	LC-120-BL0035-A-P-J
PNP-Output	**LC-120-PL2000-A-P-PN-J***	**LC-120-BL0015-A-P-PN-J**	**LC-120-BL0035-A-P-PN-J**
Sensor type	Retroreflective	Reflective with BGS	
Maximum operation distance	20m	150mm	350mm
Sensing range	0.3 to 20m	30 to 150mm	50 to 350mm
Spot diameter	Ø 0.5mm (at 0.5m)	0.2mm (at 60mm)	0,4mm (at 150mm)
Standard sensing object	Metal, black Opaque, translucent	Paper, white Opaque	
	Ø 6mm	100 x 100mm	
Detection capability	Opaque	Opaque	Opaque
Hysteresis	—	<1%	
Response time	200µs	140µs	200µs
Output	Max. 100mA		
Emitting element	Red semiconductor laser, 645 to 665nm (Class 2)		
Current consumption without load	Max. 30mA		
Material	Enclosure: Plastic		
Protection	IP67		
Dimensions (H×W×D)	Approx. 50×66×18mm		
Connection	M12 connector		
Supply voltage	10 to 30V DC		
Ambient temperature	Operation: −10 to +50°C, storage: −25 to +70°C		
Weight	Approx. 40g		
[PN] = PNP • [J] = M12 connector			

* Reflector not included

Options

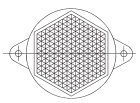
Cables

UZZ81220	UZZ81221	UZZ81250	UZZ81251
2m straight	2m elbow	5m straight	5m elbow
			

Mounting bracket

LC10-ST62	LC12-ST50	LC1-ST60	LC1-ST26
			

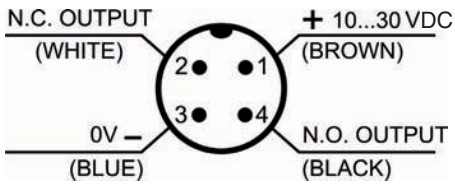
Reflector

M18-RF48


Connections

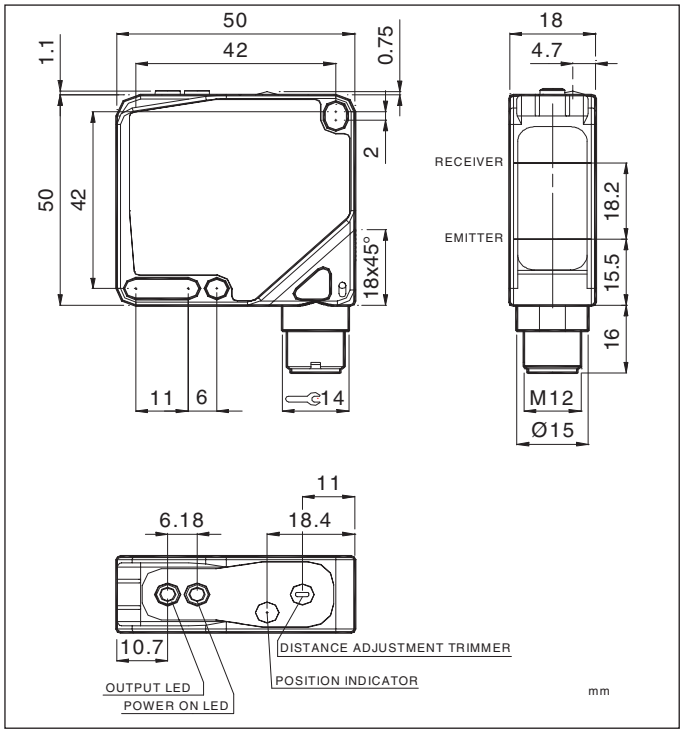
LC-120-BL / LC-120-PL

M12 connector

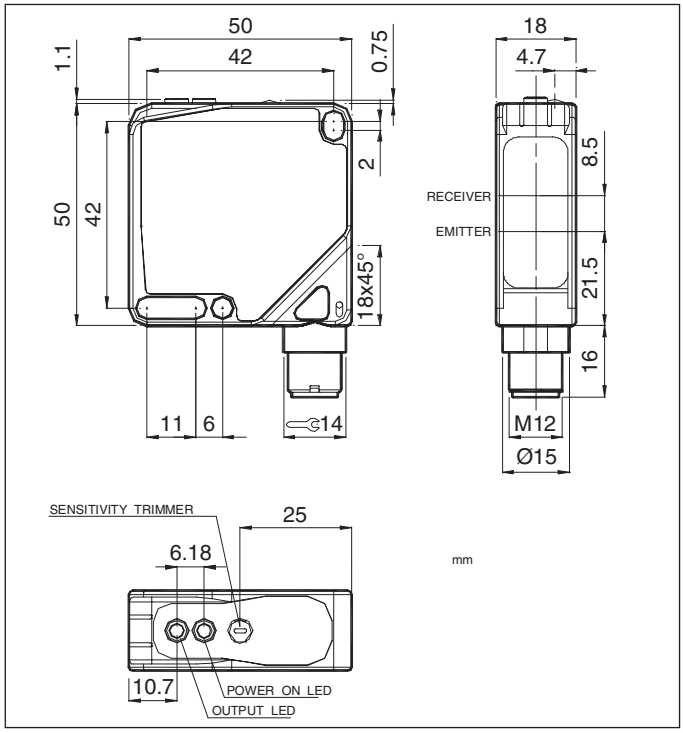


Dimensions

LC-120-BL



LC-120-PL



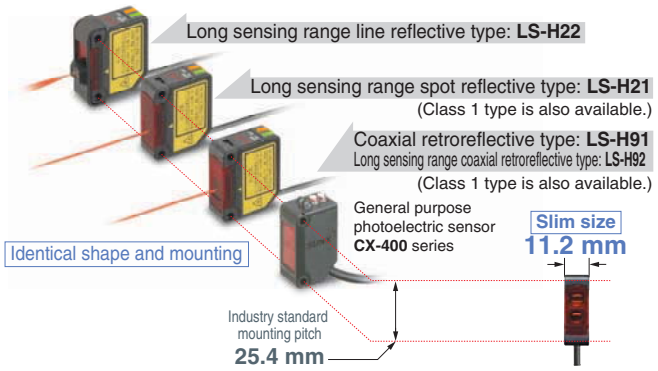
LS

User-friendly, advanced high precision laser sensing!

Features

4 types of identically sized sensor heads available

They are approximately the same size as general purpose photoelectric sensors, and the mounting method is identical.



New coaxial reflective type with a long sensing range of 30m

The introduction of the **LS-H92** long sensing range coaxial reflective type sensor means that even longer sensing ranges are now possible.

Spot size adjustment

The long sensing range spot reflective type and long sensing range line reflective type have a built-in spot-size adjuster that enables spot size adjustment according to the object for optimal setting.

Accurately senses the minutest variations

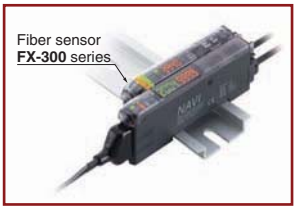
When sensing at close range or when the target objects are transparent or minute, adjust the sensor receiving sensitivity to one of 3 levels for the optimal setting. In addition, changing the receiving sensitivity will not affect the response time.

Easy setting, dual display

Equipped with 2 large 4-digit digital displays. While checking the current light-receiving amount (red display), the optimal threshold value (green display) can be set easily.

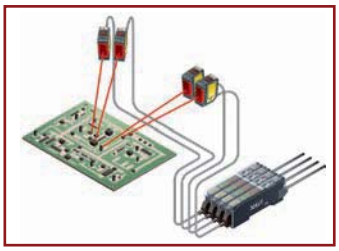
Wiring and space savings

The quick-connection cables enable reductions in wiring (connector type). The connections and man hours for the intermediate terminal block setup can be reduced and valuable space saved. Also, LS series amplifiers can be connected side-by-side with FX-300 series fiber sensors.



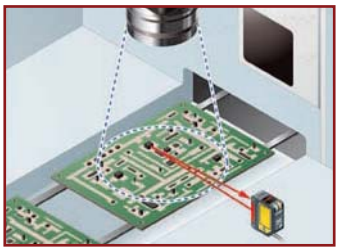
Interference prevention function

The automatic interference prevention function protects against interference among up to 4 sensors.



Emission halt function

Using the emission halt function, the laser beam can be stopped via external input, e.g. when a spot appears within the visual range of an image processor.

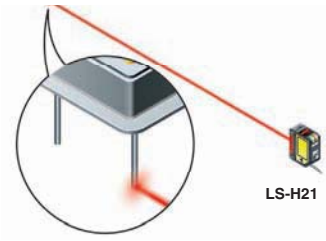


External teaching function

Teaching can be conveniently performed externally for laser sensors installed inside a device.

Typical Applications

IC pin check from remote position



Checking protrusion of glass substrate

Technical Specifications

Sensor heads

Type	Coaxial retroreflective		Diffuse reflective	
		Long sensing range type	Long sensing range spot reflective	Long sensing range line reflective
Model no. (Note 1)	LS-H91(F) (-A)(Note 2)	LS-H92(F)	LS-H21(F) (-A)(Note 2)	LS-H22(F) (Note 3)
Sensing range	0.1 to 7m (U-LG) 0.1 to 5m (STD) 0.1 to 3m (FAST/H-SP)	0.2 to 30m (U-LG) 0.2 to 20m (STD) 0.2 to 10m (FAST/H-SP)	30 to 1000mm (U-LG) 30 to 500mm (STD) 30 to 300mm (FAST/H-SP)	30 to 1000mm (U-LG) 30 to 500mm (STD) 30 to 300mm (FAST/H-SP)
Ambient temperature	−10 to +55°C			
Emitting element	Red semiconductor laser, Class 2 (LS-HM: IEC/JIS/GB, LS-HMF: FDA/IEC/JIS) [LS-H91(F)-A, LS-H21(F)-A: Class 1] [Max. output: 3mW or less (LS-H91(F)-A, LS-H21(F)-A: 1 mW or less), Peak emission wavelength: 655nm]			
Dimensions (W×H×D)	11.2×31×25mm			

Notes:
1) **LS-H□** conforms to IEC/JIS/GB standards.
LS-H□F conforms to FDA/IEC/JIS standards.
2) **LS-H91(F)-A, LS-H21(F)-A**: Class 1 type
3) **LS-H22(F)** is the set model no. for **LS-H21(F)** long sensing range spot reflective type sensor head combined with the **LS-MR1** lens attachment for line reflective.
LS-H21(F) appears on the sensor itself.
4) Sensing range:
LS-H91(F)-A 0.1 to 5m (U-LG), 0.1 to 3m (STD), 0.1 to 1m (FAST/H-SP)
LS-H21(F)(-A) 30 to 500mm (U-LG), 30 to 250mm (STD), 30 to 150mm (FAST/H-SP)

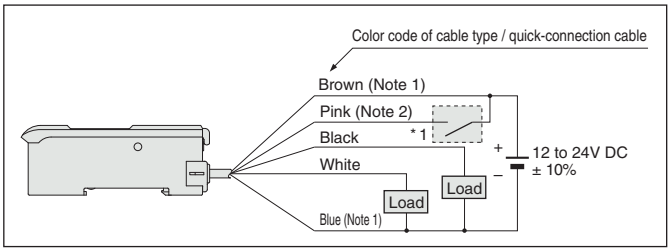
Amplifiers

Type		Connector (Note)	Cable
Model no.	NPN output	LS-401	LS-401-C2
	PNP output	LS-401P	LS-401P-C2
Supply voltage	12 to 24VDC ±10%		
Output (Output 1, Output 2)	NPN output type: NPN open-collector transistor PNP output type: PNP open-collector transistor		
Output operation	Selectable either Light-ON or Dark-ON, with jog switch		
Response time	80μs or less (H-SP), 150μs or less (FAST), 500μs or less (STD), 4ms or less (U-LG), selectable with jog switch		
Sensitivity setting	Normal mode: 2-level teaching/limit teaching/full auto teaching/manual adjustment Window comparator mode: teaching (1-level, 2-level, 3-level)/manual adjustment Hysteresis mode: teaching (1-level, 2-level, 3-level)/manual adjustment Differential mode: 5-level settings		
Digital display	4 digit (green) + 4 digit (red) LED display		
Automatic interference prevention function	Incorporated [up to four sets of sensor heads can be mounted close together (however, disabled when in H-SP mode)]		
Ambient temperature	−10 to +55°C (If 4 to 7 units are mounted close together: −10 to +50°C If 8 to 16 units are mounted close together: −10 to +45°C)		
Dimensions (W×H×D)	10×30×75mm		

Notes: The cable for amplifier connection is not supplied as an accessory with the connector type amplifier. Make sure to use the optional quick-connection cables listed below.
Main cable (4-core): **CN-74-C1** (cable length 1m), **CN-74-C2** (cable length 2m) **CN-74-C5** (cable length 5m)
Sub cable (2-core): **CN-72-C1** (cable length 1m), **CN-72-C2** (cable length 2m) **CN-72-C5** (cable length 5m)
Sensing range:
LS-H91(F)-A 0.1 to 5m (U-LG), 0.1 to 3m (STD), 0.1 to 1m (FAST/H-SP)
LS-H21(F)(-A) 30 to 500mm (U-LG), 30 to 250mm (STD), 30 to 150mm (FAST/H-SP)

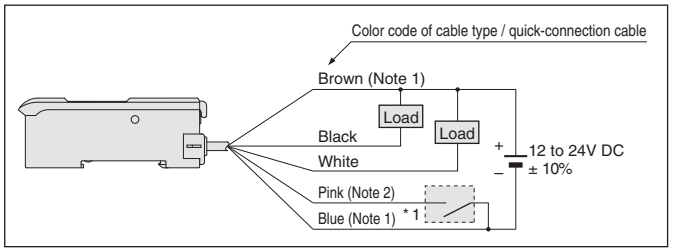
Connections

LS-401P(-C2) PNP Output type



Notes: 1) The quick-connection sub cable does not have brown lead wire and blue lead wire. The power is supplied from the connector of the main cable.
2) The quick-connection cable does not have a pink lead wire.

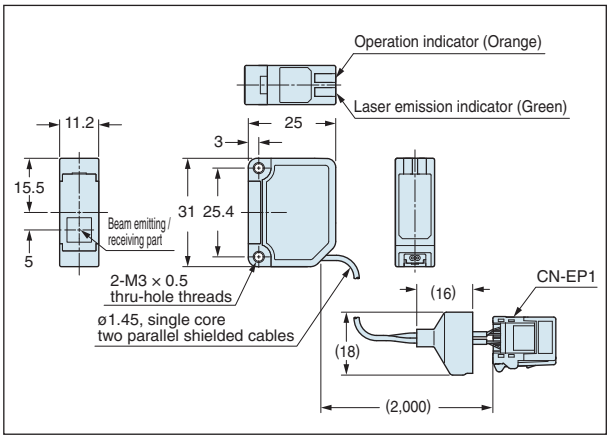
LS-401(-C2) NPN Output type



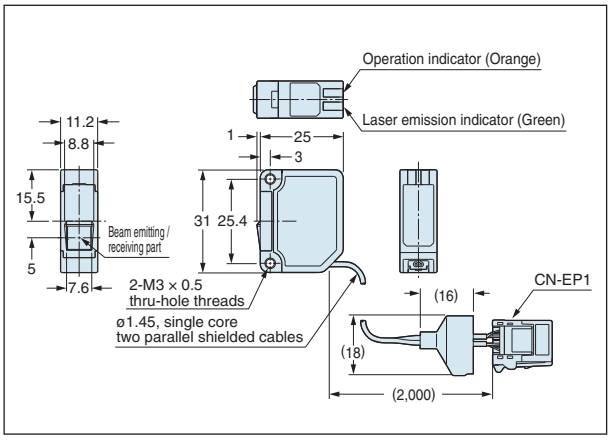
Notes: 1) The quick-connection sub cable does not have brown lead wire and blue lead wire. The power is supplied from the connector of the main cable.
2) The quick-connection cable does not have a pink lead wire.

Dimensions

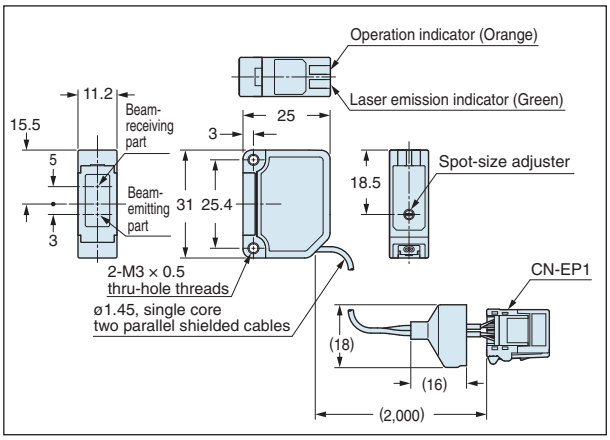
LS-H91(-A) / LS-H91F(-A) Sensor Head



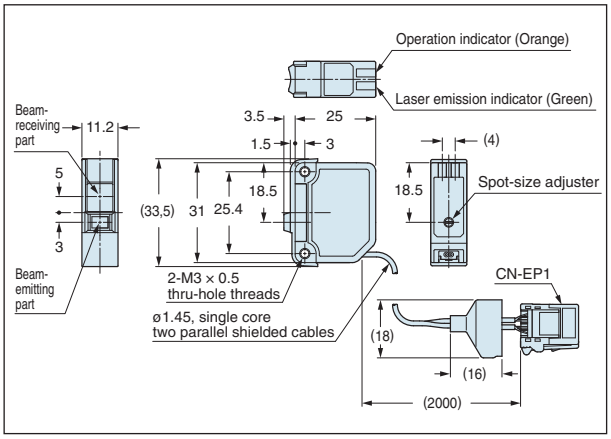
LS-H92 / LS-H92F Sensor Head



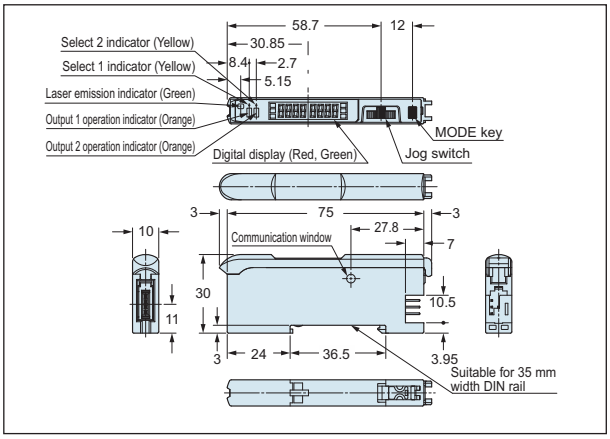
LS-H21(-A) / LS-H21F(-A) Sensor Head



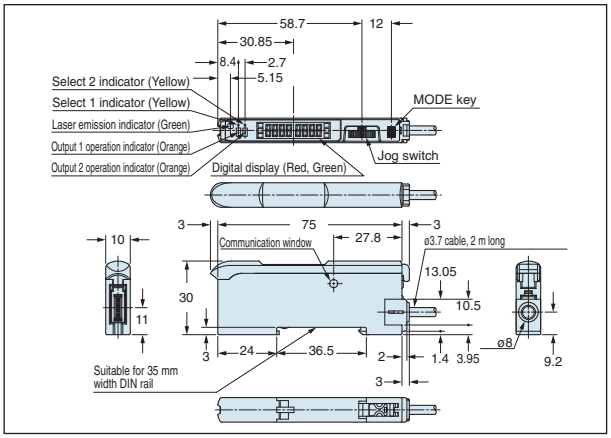
LS-H22(-A) / LS-H22F(-A) Sensor Head



LS-401 / LS-401P Amplifier



LS-401-C2 / LS-401P-C2 Amplifier



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