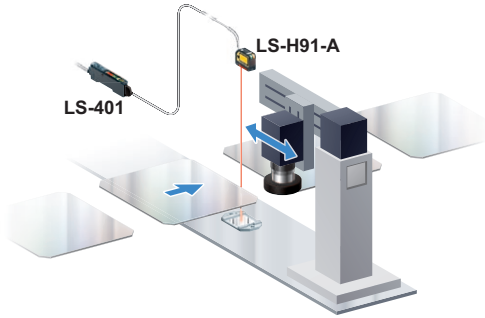


Make sure to confirm detection with an actual product.

1 Sensing of photovoltaic cell wafer

If it is a coaxial retroreflective type laser sensor, presence confirmation / sheet count, as well as stable sensing, can be performed even for photovoltaic cell wafers of different surface conditions.

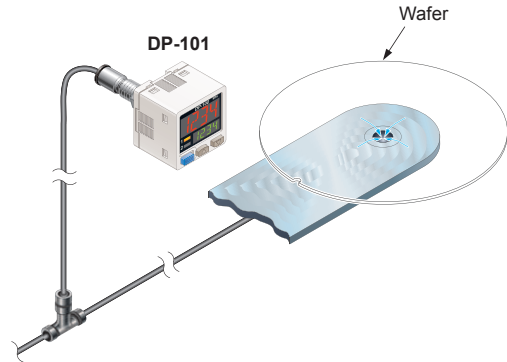


SEMICONDUCTOR / LIQUID CRYSTAL

Digital laser sensor **Amplifier-separated** **LS series** **CP.265**

2 Confirming suction of wafer

While a wafer is carried, the pressure sensor checks the vacuum level in the vacuum pad to verify if the wafer is securely gripped or not.

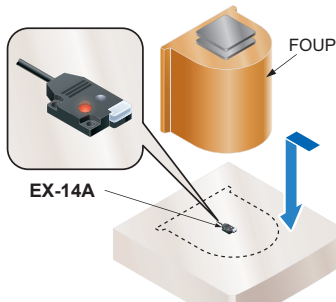


SEMICONDUCTOR / LIQUID CRYSTAL

Dual display digital pressure sensor **For gas** **DP-101** **CP.667**

3 Confirming arrival of FOUP

The convergent reflective sensor reliably detects wafer cassettes of different colors. In addition, since the sensor is an ultra-slim type with a thickness of only 3.5 mm **0.138 in**, very little space is needed to mount the sensor.

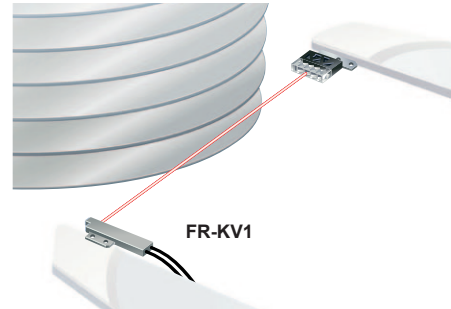


SEMICONDUCTOR / LIQUID CRYSTAL

Ultra-slim photoelectric sensor **Amplifier built-in** **EX-14A** **CP.319**

4 Wafer sensing (Retroreflective type)

A retroreflective type fiber is used, so that an aperture angle of less than 3° produces an ultra-narrow beam, but still with extended angular deviation characteristics compared to thru-beam types. This allows stronger curvatures in robot hands and reduces the work required for beam axis alignment.

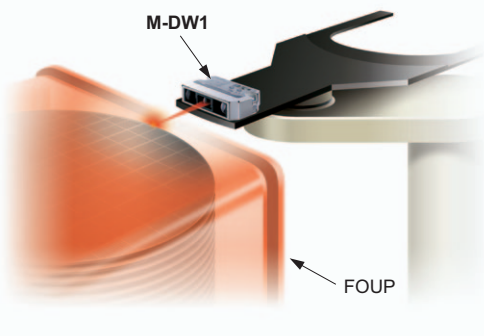


SEMICONDUCTOR / LIQUID CRYSTAL

Wafer mapping fiber **Retroreflective type** **FR-KV1** **CP.21**

5 Address sensing within a FOUP (Reflective type)

By using a LED light source, safety has been enhanced. Also, because the wide wavelength band of the LED source has a considerable width, nitride-coated wafers can be accurately detected.

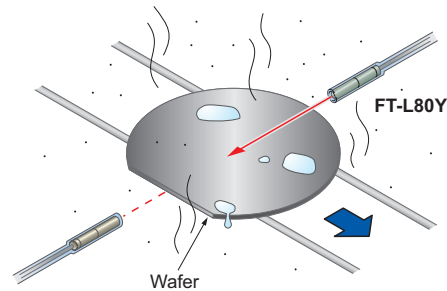


SEMICONDUCTOR / LIQUID CRYSTAL

Wafer mapping sensor **M-DW1** **CP.833**

6 Sensing wafer in corrosive environment

The fiber cable is totally covered by fluorine resin so that it can be used in a corrosive environment. Lenses at the ends of the fiber heads expand the long range sensing of 3,500 mm **137.795 in**.



SEMICONDUCTOR / LIQUID CRYSTAL

Chemical-resistant fiber **Thru-beam type** **FT-L80Y** **CP.22**

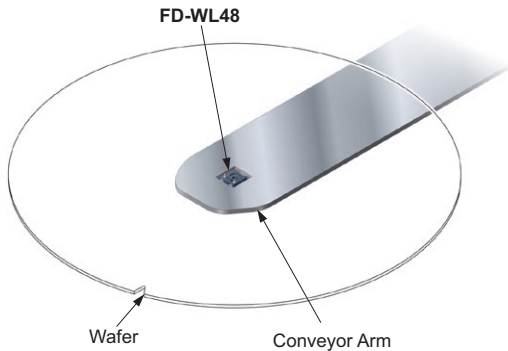
Presence
Transparent
Object Detection
Liquid Detection
Positioning
Safeguard
Color Detection
Examination and Measurement
Static Electricity Prevention
Marking
Endscope

Make sure to confirm detection with an actual product.

TYPICAL APPLICATIONS

7 Seating confirmation of wafer

The **FD-WL48** stores a convergent reflective optic system in an extremely small size of $W7.2 \times H7.5 \times D2$ mm $W0.283 \times H0.295 \times D0.079$ in. The compact-size supports advancing wafer conveyor devices.



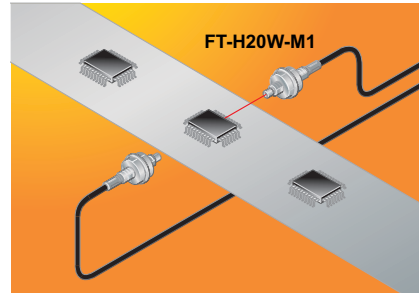
SEMICONDUCTOR / LIQUID CRYSTAL

Ultra-compact / convergent reflective fiber

FD-WL48 ▶P.20

8 IC detection within a high temperature handler

We've realized a bending radius of R10 mm $R0.394$ in or more even under 200°C 392°F temperatures rendering IC detection inside high temperature handlers in high temperature environments possible.

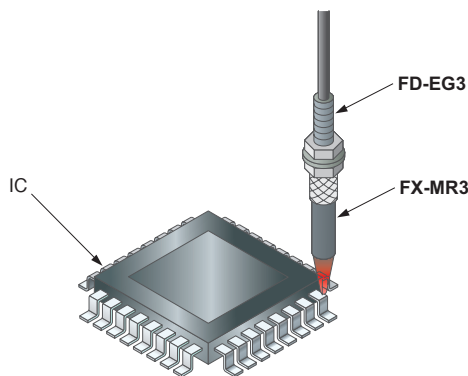


SEMICONDUCTOR / LIQUID CRYSTAL

Flexible heat-resistant fiber **Thru-beam type** **FT-H20W-M1** ▶P.27

9 Number of IC pins checking

The ultra-small spot of $\phi 0.15$ mm $\phi 0.006$ in can makes it possible to detect IC pins one by one.

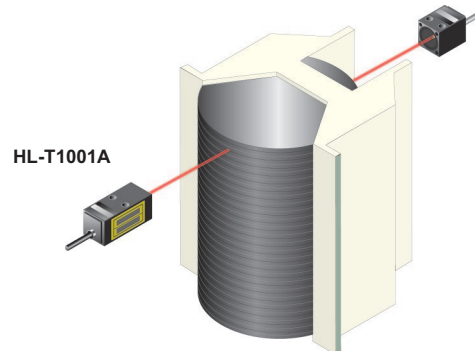


SEMICONDUCTOR / LIQUID CRYSTAL

Finest spot lens / High-precision fiber **Reflective type** **FX-MR3 / FD-EG3** ▶P.15

10 Sensing wafer position in wafer cassette

Because we've realized a minute $\phi 1$ mm $\phi 0.039$ in beam with 2 m 6.562 ft long range sensing, narrow pitch wafers can also be detected at a long distance.

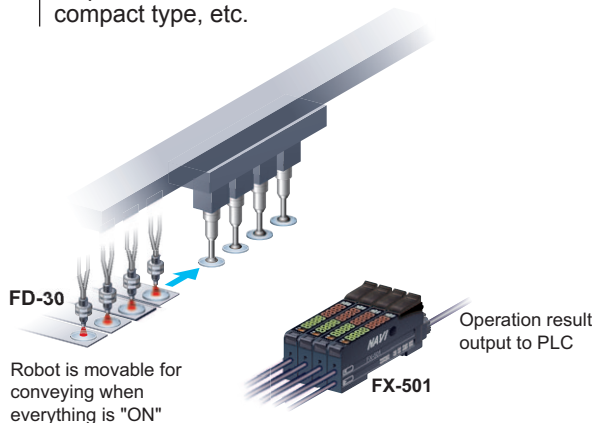


SEMICONDUCTOR / LIQUID CRYSTAL

Ultra-compact laser collimated beam sensor **HL-T1 series** ▶P.1041

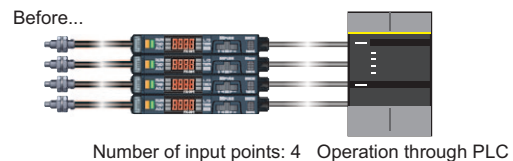
11 Detecting optical lens

Using super quality fibers can decrease scattering of the incident light intensity and standardize the maintenance work through numerical value management. And by using the logical calculation function of **FX-501**, output can be consolidated into 1 using AND. Thus, reduction in the number of I/O points can be planned. This will contribute to cost reduction in total devices by which PLC can be managed with a compact type, etc.



Robot is movable for conveying when everything is "ON"

Operation result output to PLC



Number of input points: 4 Operation through PLC

FX-501 One output through the logical operation function!



Number of input points: 1 Operation results stored in the PLC

AUTOMATIC ASSEMBLY / MOUNTING

Super quality fiber **Reflective type** / Digital fiber sensor

FD-30 / FX-501 ▶P.9 / P.115

Presence

Transparent

Object Detection

Liquid Detection

Positioning

Safeguard

Color Detection

Examination and

Measurement

Static Electricity

Prevention

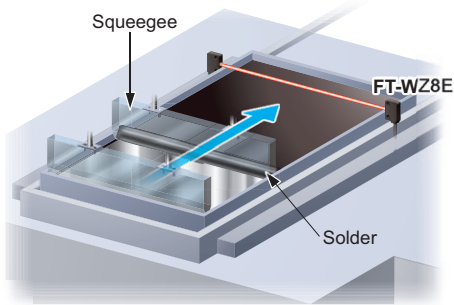
Marking

Endscope

Make sure to confirm detection with an actual product.

12 Sensing over-soldering of solder paste printer

When the solders on the mask is leveled using squeegees, over-soldering, when solder quantity is large, can be detected in advance because bulging solders is detected by zonal beams.

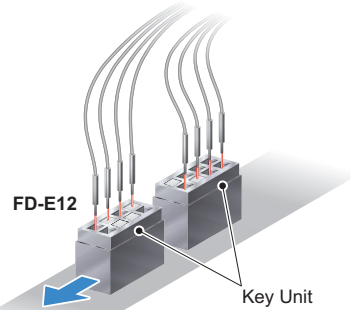


AUTOMATIC ASSEMBLY / MOUNTING

Space-saving fiber / Sharp bending fiber Thru-beam type **FT-WZ8E** **P.14 / P.33**

13 Detecting narrow pitch holes of the key unit

It is possible to set up multiple units adjacent to each other by using $\phi 1.5 \text{ mm } \phi 0.059 \text{ in}$ sleeve type, ultra small diameter fibers, making the presence of narrow pitch holes detectable. The fiber amplifier's interference prevention function is useful in installing fibers adjacently.

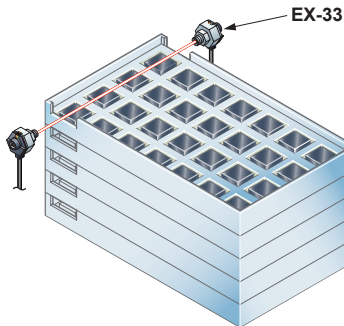


AUTOMATIC ASSEMBLY / MOUNTING

Ultra small diameter fiber Reflective type **FD-E12** **P.16**

14 Detecting IC height

Detects whether ICs are accurately placed in IC trays. Designing can be performed easily since the sensing axis is equal to the mounting hole.

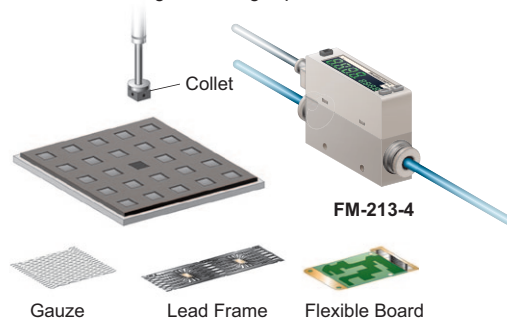


AUTOMATIC ASSEMBLY / MOUNTING

Threaded miniature photoelectric sensor Amplifier built-in **EX-33** **P.347**

15 Confirming suction with low vacuum

Senses the presence of an object, even in conveyors that have normally weak adsorption pressures caused by flowing air (collet conveyors, reticulated work conveyors, etc.). The flow sensor can sense minute pressure differences that would be otherwise difficult to distinguish using a pressure sensor.

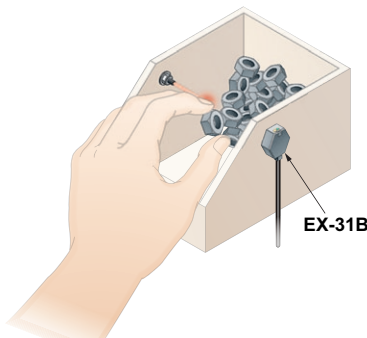


AUTOMATIC ASSEMBLY / MOUNTING

Integrated display type digital flow sensor For gas **FM-200 series** **P.737**

16 Confirmation if parts have been taken out or not

Install sensors to check if parts have been taken out. Since trays are very small, the small-size **EX-31B** can be mounted even in places where picking sensors cannot be installed.

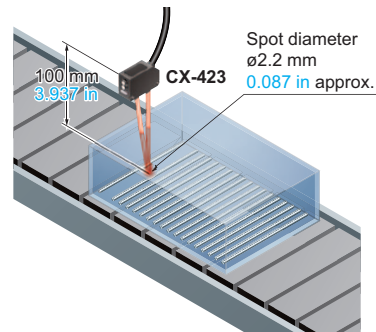


AUTOMATIC ASSEMBLY / MOUNTING

Threaded miniature photoelectric sensor Amplifier built-in **EX-31B** **P.347**

17 Pin detection in case

The **CX-423** can perform pinpoint detection due to its small spot light of $\phi 2.2 \text{ mm } \phi 0.087 \text{ in}$ approx. at a set distance of $100 \text{ mm } 3.937 \text{ in}$. In addition, the detection position can be found easily at a glance due to its high-intensity red spot light, making installation easy to perform.



AUTOMATIC ASSEMBLY / MOUNTING

Narrow-view diffuse reflective photoelectric sensor Amplifier built-in **CX-423** **P.291**

Presence

Transparent

Object Detection

Liquid Detection

Positioning

Safeguard

Color Detection

Examination and

Measurement

Static Electricity

Prevention

Marking

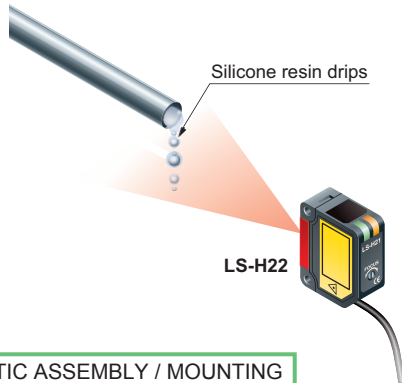
Endscope

Make sure to confirm detection with an actual product.

TYPICAL APPLICATIONS

18 Detection of silicone resin drips

Silicone resin drips can be detected even if the dripping positions are off center due to the wide line spot light. Furthermore, the OFF-delay timer that is built in to the amplifier can extend output signals of quick drops, making accurate detection possible.

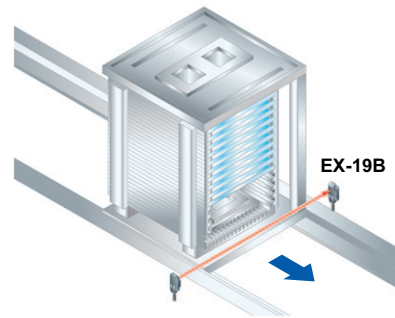


AUTOMATIC ASSEMBLY / MOUNTING

Digital laser sensor **Amplifier-separated** **LS-H22** **P.265**

19 Sensing PCB rack

Ultra-thin size of 3.5 mm **0.138 in.** Though it is extremely small, the thru-beam type sensor offers a sensing range of 1 m **3.281 ft** that is long enough to detect wide PCB racks.

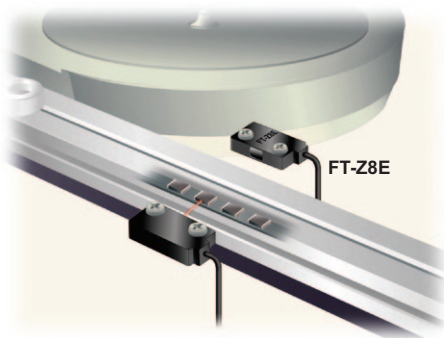


AUTOMATIC ASSEMBLY / MOUNTING

Ultra-slim photoelectric sensor **Amplifier built-in** **EX-19B** **P.319**

20 Parts feeder surplus detection

The head is rectangular and mountable with just two M2 screws enabling easy installation and beam axis alignment. In addition, space can be saved due to its small size of W3 × H12 × D8 mm **W0.118 × H0.472 × D0.315 in.**

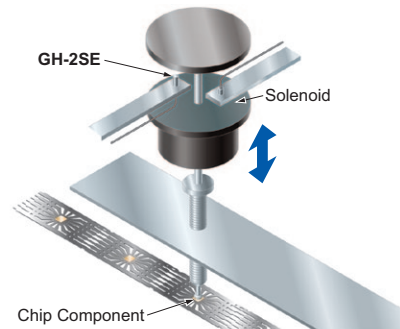


AUTOMATIC ASSEMBLY / MOUNTING

Flexible rectangular head fiber **Thru-beam type** **FT-Z8E** **P.13**

21 Verifying operation of solenoid valve

The inductive proximity sensor checks for the operation of the solenoid valve which places chip components on the embossed tape. The smallest sensor head **GH-2SE** is just $\varnothing 2.8$ mm **$\varnothing 0.110$ in.**, so that it can be mounted in a tight space.

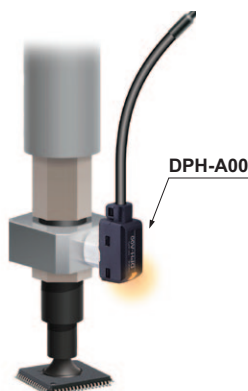


AUTOMATIC ASSEMBLY / MOUNTING

Micro-size inductive proximity sensor head **Amplifier-separated** **GH-2SE** **P.821**

22 IC suction confirmation

With an approx. 6g lightweight head and a 1 ms high-speed response time, you can use it with a high-speed mounter.

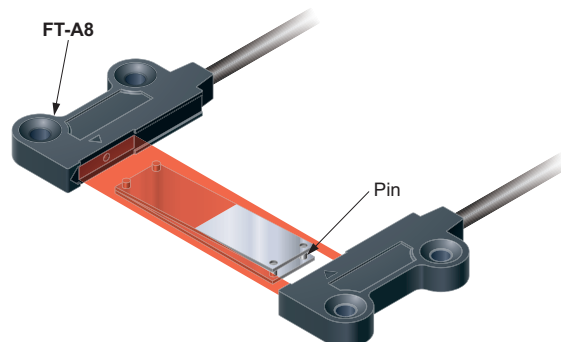


AUTOMATIC ASSEMBLY / MOUNTING

Head-separated digital pressure sensor **For gas** **DP5 / DPH series** **P.723**

23 Detecting the protrusion of stainless plate

The wide beam fiber senses up to 1 mm **0.039 in** floats when the position of the stainless plate is off-point and is not in the pin. The **FT-A8** can even sense subtle floats by a beam over the line.



AUTOMATIC ASSEMBLY / MOUNTING

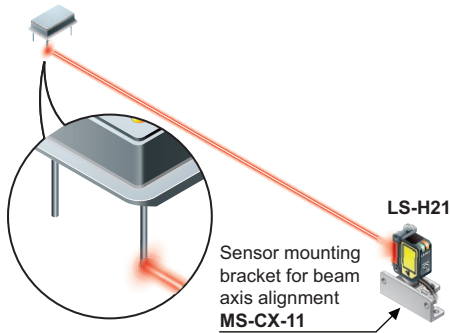
Wide beam fiber **Thru-beam type** **FT-A8 / WA8** **P.17**

Presence
Transparent Object Detection
Liquid Detection
Positioning
Safeguard
Color Detection
Examination and Measurement
Static Electricity Prevention
Marking
Endscope

Make sure to confirm detection with an actual product.

24 IC pin check from remote position

Bright red ultra-small spot light can detect the IC pins of minute electronic parts from a long distance away. Moreover, adjustment after mounting can be easily performed by using a sensor mounting bracket for beam axis alignment.

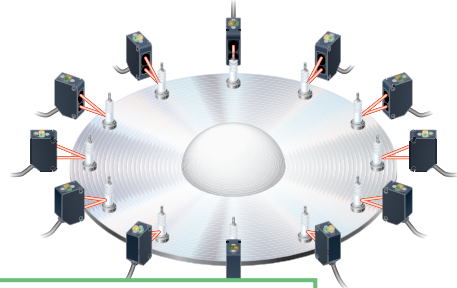


AUTOMATIC ASSEMBLY / MOUNTING

Digital laser sensor **Amplifier-separated** **LS series** **P.265**

25 Confirming of chuck for plug on the index table

The sensor senses the presence of spark plugs (chuck confirmation) to prevent 12 pieces of spark plugs from falling from the index table. Semi-spherical background objects are placed in the center of the table for interference prevention. Aligning the beam axis is simple since the CX-441 emits a bright red spot beam. Since the spot beam is $\varnothing 2\text{ mm } \varnothing 0.079\text{ in}$, it reliably senses even small parts.

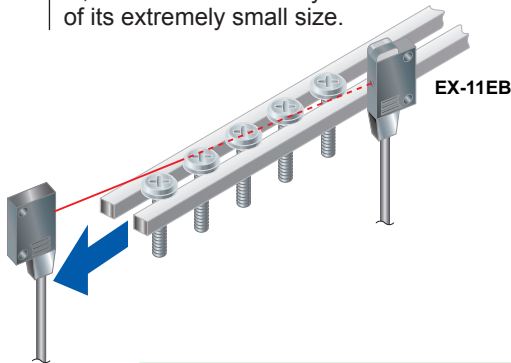


AUTOMATIC ASSEMBLY / MOUNTING

Adjustable range reflective / Compact photoelectric sensor **Amplifier built-in** **CX-441** **P.359**

26 Detecting end of screw supply

The miniature thru-beam type sensor detects the end of supply of screws on a parts-feeder. Since the sensor is an ultra-small type with a thickness of only 3.5 mm 0.138 in , it does not cause any obstruction because of its extremely small size.

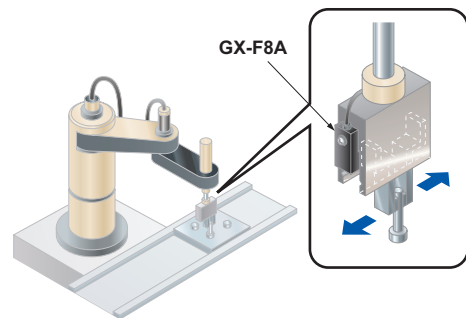


AUTOMATIC ASSEMBLY / MOUNTING

Ultra-slim photoelectric sensor **Amplifier built-in** **EX-11EB** **P.319**

27 Verifying clamping by robot hand

The miniature inductive proximity sensor does not disturb the movement of the chuck, and reliably detects if the object is clamped. Size: $W8 \times H24 \times D7.4\text{ mm } W0.315 \times H0.945 \times D0.291\text{ in}$

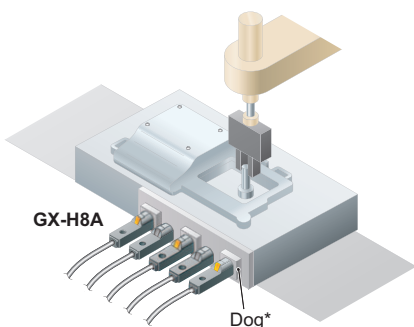


AUTOMATIC ASSEMBLY / MOUNTING

Rectangular-shaped inductive proximity sensor **Amplifier built-in** **GX-F8A** **P.761**

28 Identifying type of workpiece by palette dogs*

The inductive proximity sensors detect the dogs* (metal plates) on the palette and by their ON / OFF combination determine the type of workpiece, enabling suitable robot operation.

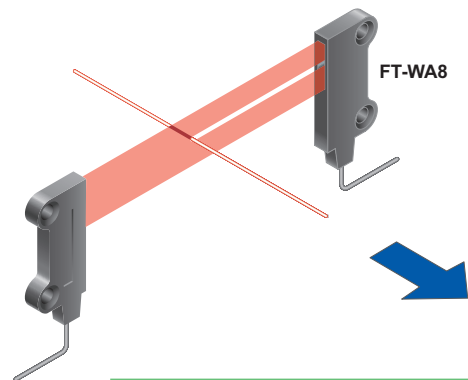


AUTOMATIC ASSEMBLY / MOUNTING

Rectangular-shaped inductive proximity sensor **Amplifier built-in** **GX-H8A** **P.761**

29 Wire breakage detection

Since the fiber has a wide sensing width of 11 mm 0.433 in , even if the wire vibrates, its breakage can be reliably detected.



AUTOMATIC ASSEMBLY / MOUNTING

Sharp bending wide beam fiber **Thru-beam type** **FT-WA8** **P.17**

* The sensing object is a metal plate called a "dog".

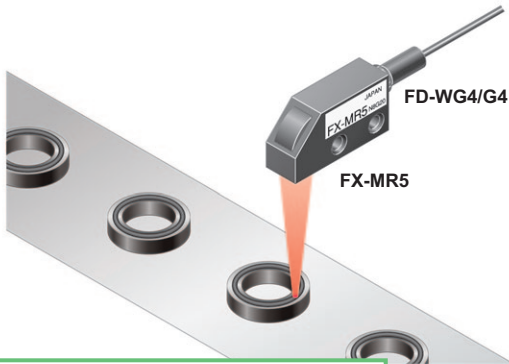
Presence
Transparent Object Detection
Liquid Detection
Positioning
Safeguard
Color Detection
Examination and Measurement
Static Electricity Prevention
Marking
Endscope

Make sure to confirm detection with an actual product.

TYPICAL APPLICATIONS

30 Packing detection

Because it's a side-view type, it can be mounted even in narrow spaces. Even thin packing can be detected with the smallest spot diameter of $\varnothing 0.5\text{ mm}$ $\varnothing 0.020\text{ in.}$

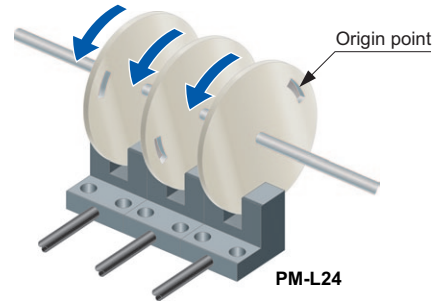


AUTOMATIC ASSEMBLY / MOUNTING

High precision fiber **Reflective type** / **FD-WG4 / G4, FX-MR5** **P.15**

31 Sensing rotating bodies

By incorporating a slit in the rotating body, the origin point can be sensed. Space can be saved due to its small size of $W13.4 \times H12 \times D10.5\text{ mm}$ $W0.528 \times H0.472 \times D0.413\text{ in.}$

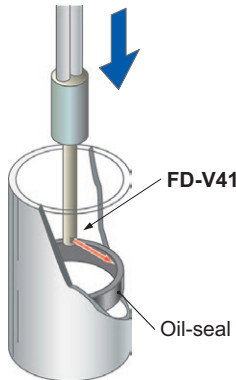


AUTOMATIC ASSEMBLY / MOUNTING

U-shaped micro photoelectric sensor **Amplifier built-in** **PM-24 series** **P.451**

32 Confirming presence of oil-seal

The side-view fiber can detect an oil-seal inside a pipe due to its tip diameter of $\varnothing 1.5\text{ mm}$ $\varnothing 0.059\text{ in.}$

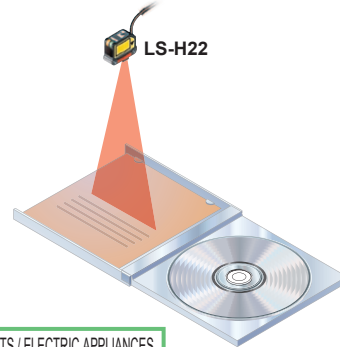


AUTOMATIC ASSEMBLY / MOUNTING

Side-view fiber **Reflective type** **FD-V41** **P.61**

33 Sensing presence of leaflet in DVD case

The sensor detects the presence of leaflets included in DVD cases. The **LS-H22** is a line reflective type; hence the difference in the amount of light received from a DVD case and paper can be accurately sensed, making detection stable compared to the spot reflective type.

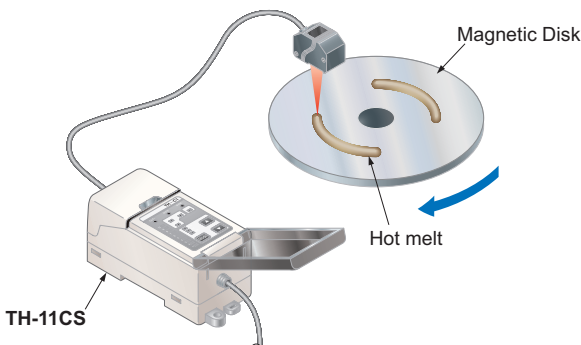


ELECTRONIC PRODUCTS / ELECTRIC APPLIANCES

Digital laser sensor **Amplifier-separated** **LS-H22** **P.265**

34 Sensing hot-melt for bonding magnetic disk

The sensor senses hot-melt for bonding magnetic disks.



ELECTRONIC PRODUCTS / ELECTRIC APPLIANCES

Hot melt glue detector **TH serie** **P.885**

35 Parts picking verification in cell production

Large job indicator lights show what should be picked by personnel preventing the occurrence of mistaken selections.



ELECTRONIC PRODUCTS / ELECTRIC APPLIANCES

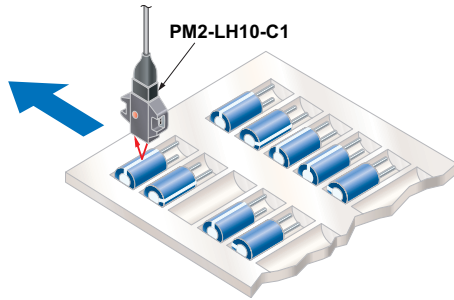
Picking sensor **NA1-PK5 / PK3 series** **P.487 / P.497**

Presence
Transparent Object Detection
Liquid Detection
Positioning
Safeguard
Color Detection
Examination and Measurement
Static Electricity Prevention
Marking
Endscope

Make sure to confirm detection with an actual product.

36 Detecting capacitors in tray

The convergent reflective type sensor reliably detects capacitors in a tray without being affected by their color, characters, marks, or glossiness.

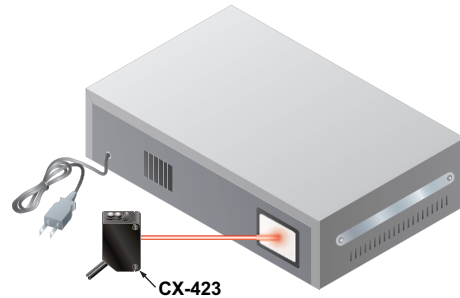


ELECTRONIC PRODUCTS / ELECTRIC APPLIANCES

Convergent reflective micro photoelectric sensor **PM2 series** **P.467**
Amplifier built-in

37 Detecting label

The sensor detects the presence / absence of a label by the difference in reflectivity between the label and the base. The sensor projects a visible red spot so that setting is simple.

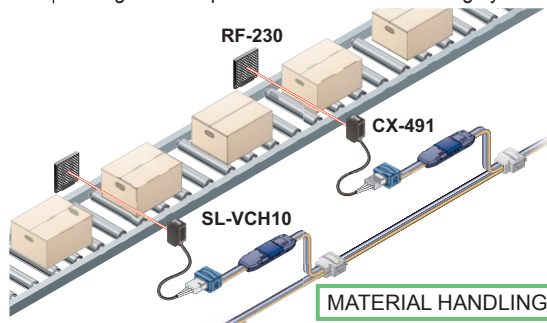


ELECTRONIC PRODUCTS / ELECTRIC APPLIANCES

Compact photoelectric sensor **CX-423** **P.291**
Amplifier built-in

38 Conservative wiring for conveyor passage confirmation

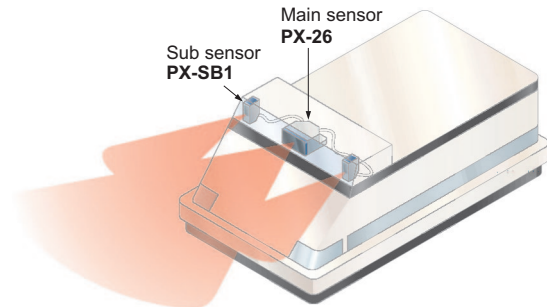
Wiring man-hours in long-distance conveyor lines can be extensive. However, the wiring man-hours can be reduced by half of the thru-beam type by adopting a retroreflective type sensor. In addition, wiring work/maintenance and sensor replacement is easier through the adoption of a conservative wiring system.



Compact photoelectric sensor **RF-230** **CX-491 / S-LINK V** **P.291 / P.943**
Retroreflective type / **Flexible wire-saving system**

39 Detecting an object in front of AGV

In addition to its wide sensing area, two auxiliary sensors can be connected so that the sensor can detect obstacles even better than conventional sensors.

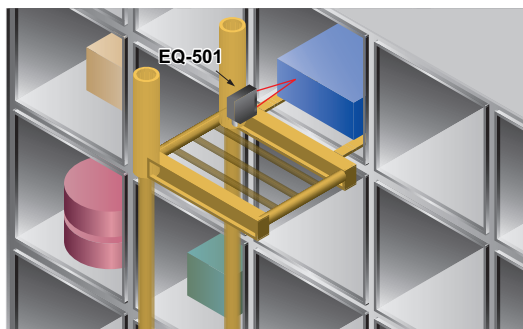


MATERIAL HANDLING

Long range & wide area photoelectric sensor **PX-2 series** **P.899**

40 Detection of objects when using a stacker crane

Due to the adjustable range method using a two-way segment photodiode, the sensor is sensitive to changes in object colors and angles, making detection stable.

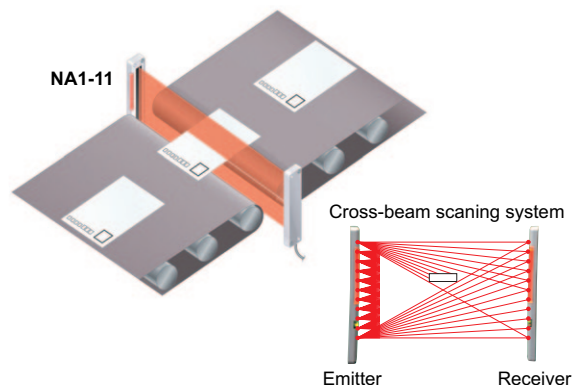


MATERIAL HANDLING

Adjustable range reflective photoelectric sensor **EQ-500 series** **P.369**
Power supply built-in **Amplifier built-in**

41 Detecting post-cards

NA1-11 can detect slim post-cards due to its cross-beam scanning system.



MATERIAL HANDLING

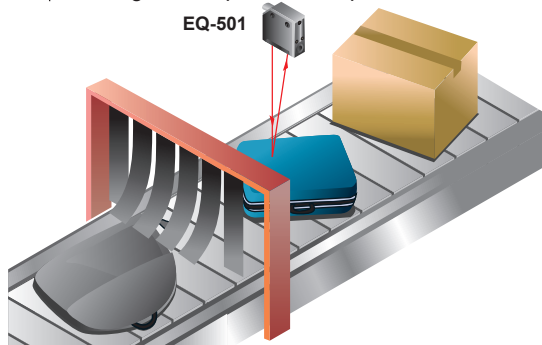
Small / Slim object detection area sensor **NA1-11** **P.891**

Presence
Transparent Object Detection
Liquid Detection
Positioning
Safeguard
Color Detection
Examination and Measurement
Static Electricity Prevention
Marking
Endscope

Make sure to confirm detection with an actual product.

42 Confirmation of the passage of packages on a conveyor belt

Can accurately detect packages even if they vary in size and color. In addition, long range sensing can be performed up to 2.5 m 8.202 ft.

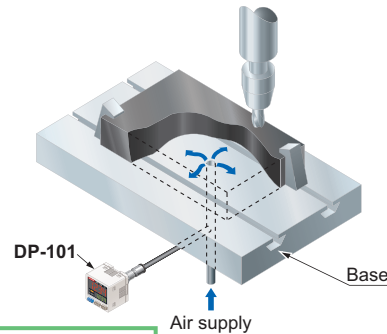


MATERIAL HANDLING

Adjustable range reflective photoelectric sensor **EQ-500 series** ▶ **P.369**
Power supply built-in Amplifier built-in

43 Verifying proper workpiece seating

Air is supplied from under the base, and the pressure sensor checks for air leakage from any gap between the base and the workpiece. If there is no leakage, the workpiece is seated perfectly, but if the air leaks, the seating is improper.

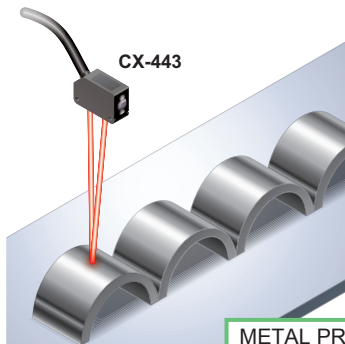


METAL PROCESSING

Dual display digital pressure sensor **DP-101** ▶ **P.667**
For gas

44 Detecting the presence of semicircle bimetal

The sensor detects the presence of semicircle bimetal on a manufacturing conveyor. The sensor uses the FGS function that is effective for detecting glossy or uneven objects. Congestion of the bimetal line can be detected.

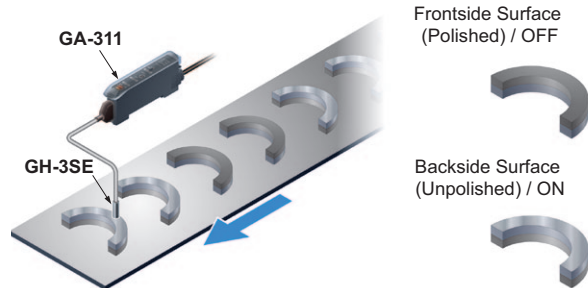


METAL PROCESSING

Adjustable range reflective compact photoelectric sensor **CX-443** ▶ **P.359**
Amplifier built-in

45 Distinguishing the sides of bonded metal plate

Since the proximity sensor distinguishes the material of the metal plates, it is not dependent on surface conditions like photoelectric sensors. Moreover, since it is an amplifier-separated type, it can be installed in narrow places.

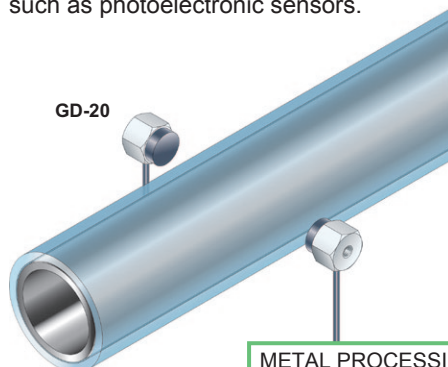


METAL PROCESSING

Compact inductive proximity sensor **GA-311 / GH-3SE** ▶ **P.821**
Amplifier-separated

46 Steel pipe detection in pipes

The sensor can detect if there is a metal pipe inside the pipe from the outside. The GD series use magnetism to perform detection, so it can be used for applications where detection is difficult using other sensors, such as photoelectric sensors.

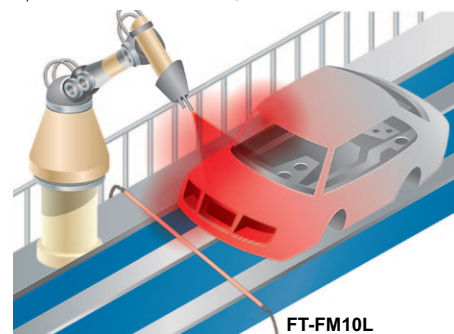


METAL PROCESSING

Metal-sheet double-feed detector **GD series** ▶ **P.1065**

47 Object sensing during the painting process (within an explosive atmosphere)

Because of a 19.6 m 64.308 ft sensing range (FX-501 LONG mode) and a 10 m 32.808 ft fiber length, it can be lead through explosive atmospheres freely.



AUTOMOBILES

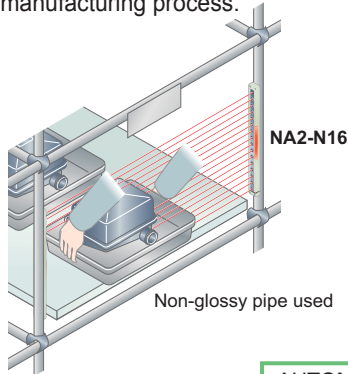
Long sensing range fiber with lens **Thru-beam type** **FT-FM10L** ▶ **P.10**

Presence
Transparent Object Detection
Liquid Detection
Positioning
Safeguard
Color Detection
Examination and Measurement
Static Electricity Prevention
Marking
Endscope

Make sure to confirm detection with an actual product.

48 Large-scale engine component wrong picking prevention

A large job indicator with a width of 102 mm 4.016 in prevents mistaken selections by showing which workpiece is to be picked during the manufacturing process.

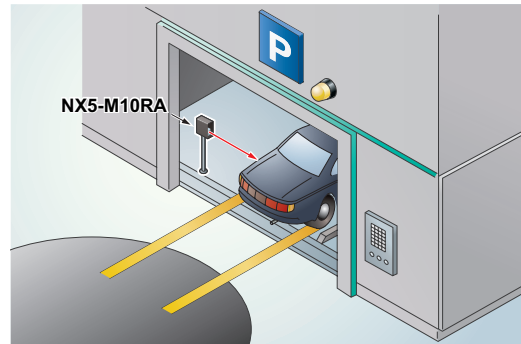


AUTOMOBILES

General purpose & slim body area sensor **NA2-N series** **P.477**

49 Verifying position of car at multistoried parking

Detects whether the car is protruding from the elevator door. The sensor has long range sensing of up to 10 m 32.810 ft, so it can even be set up in places with a wide frontage.

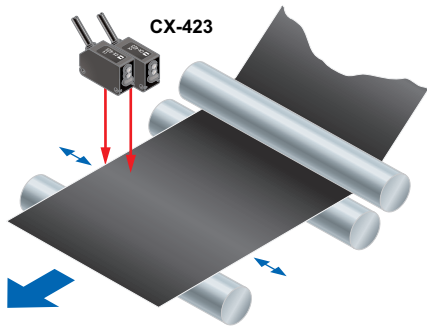


MULTISTORIED PARKING

Compact multi-voltage photoelectric sensor **NX5-M10RA** **P.407**
Power supply built-in

50 Controlling edge of sheet

Two sensors can be mounted close together by using interference prevention function to stably sense the edge of a sheet.



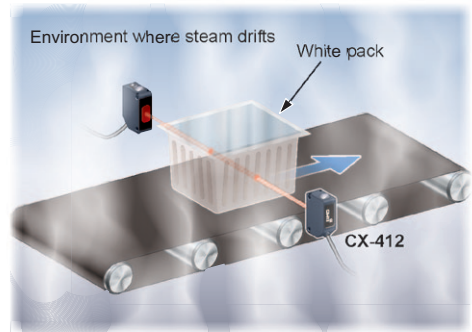
RUBBER / PLASTIC

Compact photoelectric sensor **Amplifier built-in** **CX-423** **P.291**

51 White pack sensing under a steam environment

The sensor's penetrating power is strong even in environments where steam is drifting. The **CX-412** incorporates the sensitivity adjuster, so that passage of white packs on weight sorting equipment can be sensed.

* The operating ambient temperature is -25 to +55°C -13 to +131°F.

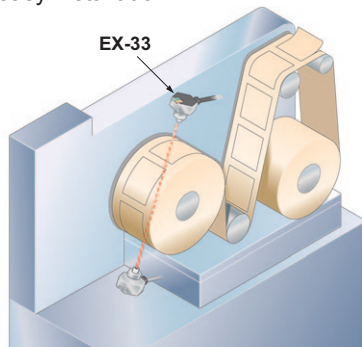


PHARMACEUTICAL AND FOOD PROCESSING / PACKAGING

Compact photoelectric sensor **Amplifier built-in** **CX-412** **P.291**

52 Detecting quantity of labels in label magazine

Detects the remaining amount of labels by the thickness of the roll. Its sensing range is 800 mm 31.496 in, leaving enough space for easy installation.

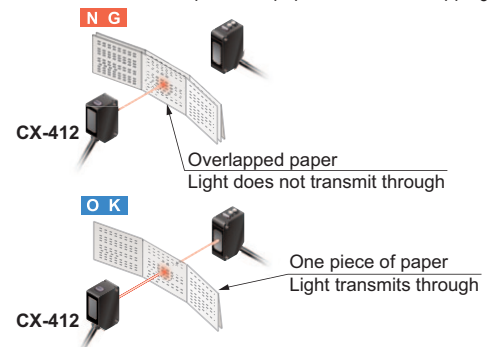


PHARMACEUTICAL AND FOOD PROCESSING / PACKAGING

Threaded miniature photoelectric sensor **EX-33** **P.347**
Amplifier built-in

53 Detection of overlapped papers

The sensor detects overlapped package inserts that come with medicines. The **CX-412** uses infrared light that passes through paper. When there is only one piece of paper, the light transmits through. However, the sensor detects when there are two or more pieces of paper that are overlapping.



PHARMACEUTICAL AND FOOD PROCESSING / PACKAGING

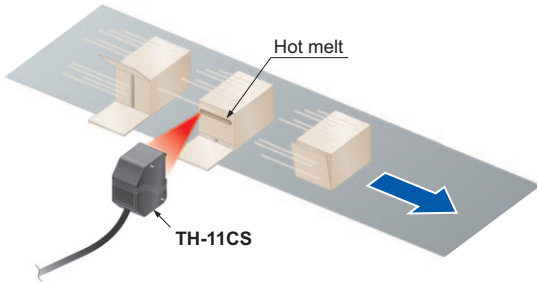
Compact photoelectric sensor **Amplifier built-in** **CX-412** **P.291**

Presence
Transparent
Object Detection
Liquid Detection
Positioning
Safeguard
Color Detection
Examination and Measurement
Static Electricity Prevention
Marking
Endscope

Make sure to confirm detection with an actual product.

54 Sensing of hot melt

The sensor can make stable sensing even in high-speed packing lines because it has a high-speed response of 1ms.



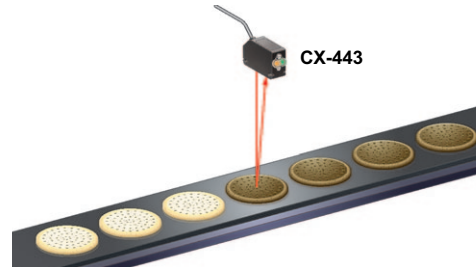
PHARMACEUTICAL AND FOOD PROCESSING / PACKAGING

Hot melt glue detector

TH series **P.885**

55 Detection of biscuits with different colors

The sensor is an adjustable range type, which will detect objects with different colors at almost the same distance. The adjuster is not required to be changed upon a tooling change.



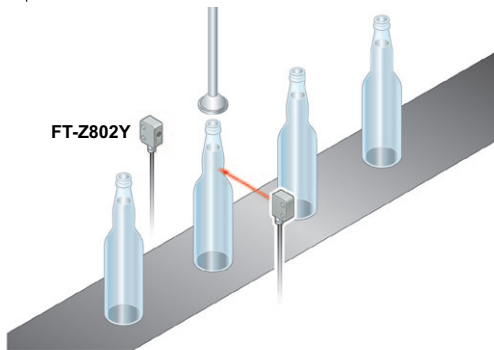
PHARMACEUTICAL AND FOOD PROCESSING / PACKAGING

Adjustable range reflective compact photoelectric sensor **Amplifier built-in**

CX-443 **P.359**

56 Chemical filler

Because it is thru-beam type, there are no malfunctions as a result of the bottle color. Due to the PFA case, it can be used in chemical environments.



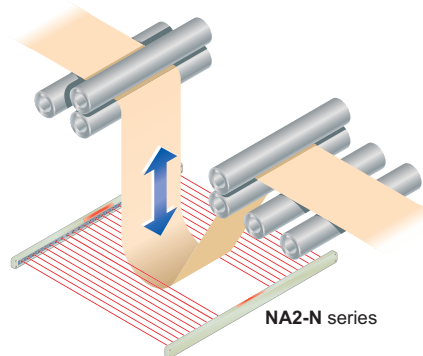
PHARMACEUTICAL AND FOOD PROCESSING / PACKAGING

Chemical-resistant rectangular head fiber **Thru-beam type**

FT-Z802Y **P.22**

57 Detecting a loop

Area sensors control the loop of wide sheets with the longest sensing range of 540 mm 21.260 in.



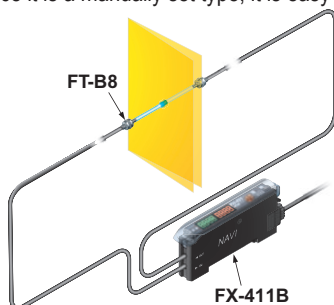
PHARMACEUTICAL AND FOOD PROCESSING / PACKAGING

General purpose & slim body area sensor

NA2-N series **P.477**

58 Sensing the presence of candy wrappers

Since wrapping sheets are semi-transparent, the sensor uses blue LED type that has a greatly attenuated beam intensity. With the FX-411B, you can also simultaneously confirm the incident light intensity and threshold value through a digital display. And since it is a manually set type, it is easy to operate.



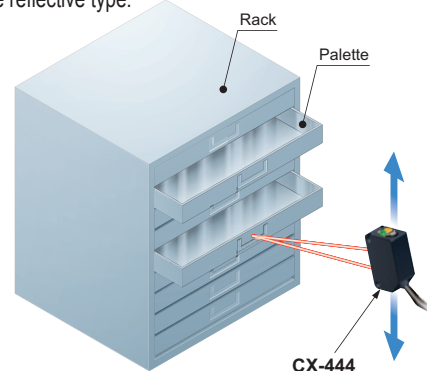
PHARMACEUTICAL AND FOOD PROCESSING / PACKAGING

Digital fiber sensor

FX-411B **P.205**

59 Confirming the popping out of medical pallets

The sensor senses medical pallets inside a rack. A thru-beam type cannot be used because racks are conveyed from above. That is why sensing is done with an adjustable range reflective type.



PHARMACEUTICAL AND FOOD PROCESSING / PACKAGING

Adjustable range reflective / Compact photoelectric sensor **Amplifier built-in**

CX-444 **P.359**

Presence

Transparent

Object Detection

Liquid Detection

Positioning

Safeguard

Color Detection

Examination and Measurement

Static Electricity Prevention

Marking

Endscope

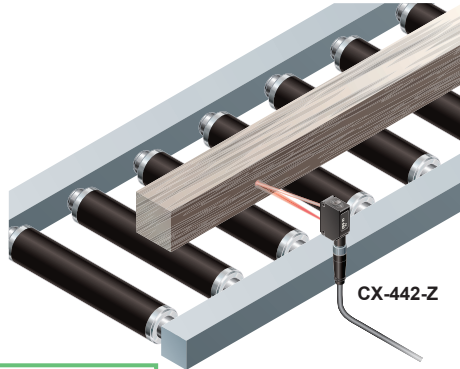
Make sure to confirm detection with an actual product.

TYPICAL APPLICATIONS

60

Wood detection

Spot lights are clearly visible and adjustment of the position is easy. The adjustable range type makes detection stable even when gnarls or veins change the color or when there is a background object.



WOOD PROCESSING

Adjustable range reflective / Compact photoelectric sensor **Amplifier built-in**

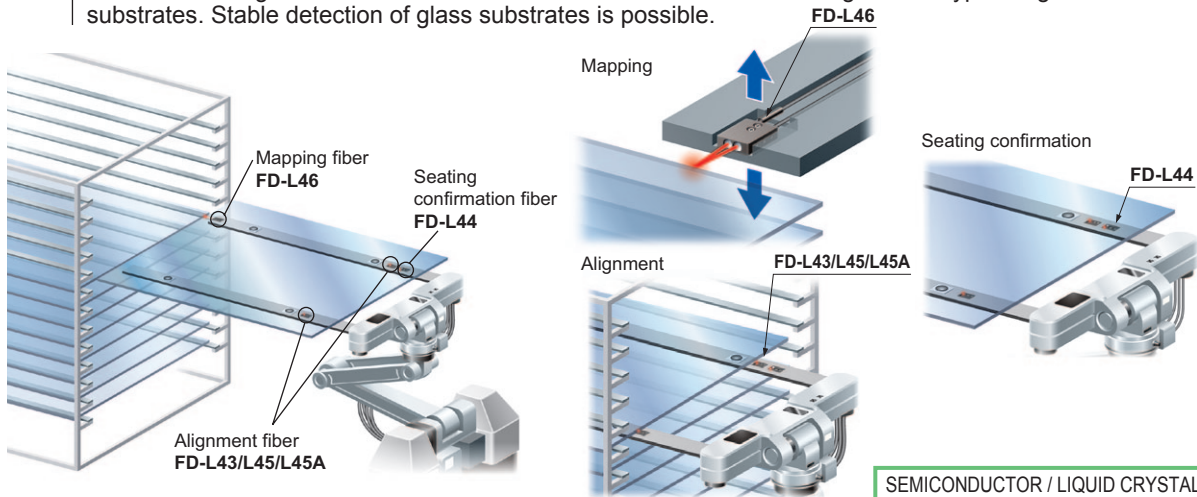
CX-442-Z **P.359**

The applications given here are practical examples. However, their applicability may differ depending upon the actual situation in which the sensors are used. Should you face any difficulty in your sensing application, please contact our office.

61

Mapping, alignment & seating confirmation of glass substrate

This is a convergent reflective fiber that is the most suitable for detecting various types of glass substrates. Stable detection of glass substrates is possible.



SEMICONDUCTOR / LIQUID CRYSTAL

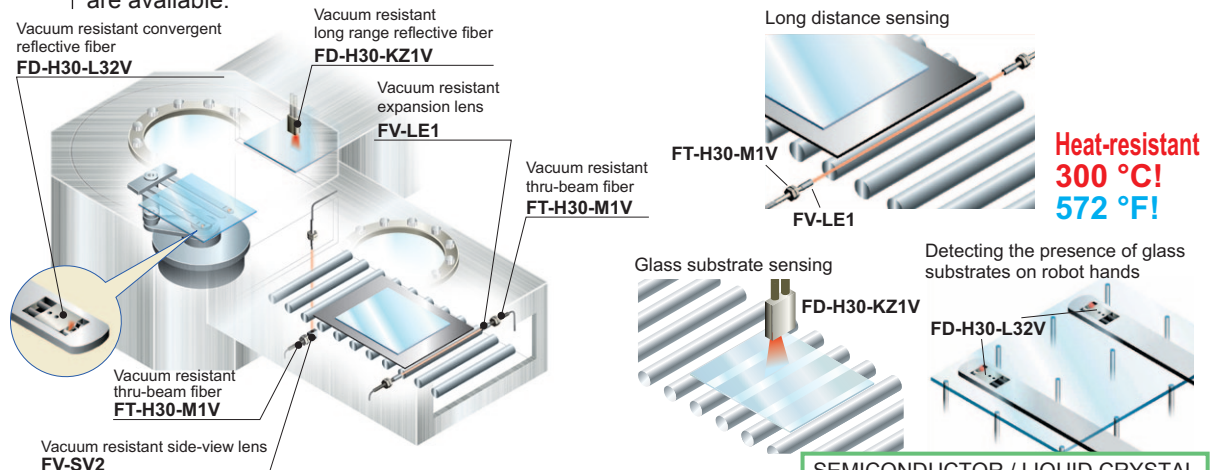
Glass substrate alignment fiber **FD-L43/L45/L45A** Seating confirmation fiber **FD-L44** Mapping fiber **FD-L46**

FD-L40 series **P.19**

62

Detection of glass substrate in vacuum chamber

Various types of vacuum resistant fibers, the most suitable for detection in FPD manufacturing processes, are available.



Heat-resistant
300 °C!
572 °F!

SEMICONDUCTOR / LIQUID CRYSTAL

Vacuum resistant fiber **Thru-beam type** **Reflective type**

FT/FD-V series **P.25**

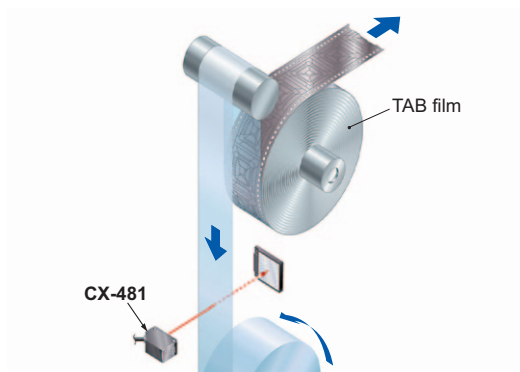
- Presence
- Transparent Object Detection
- Liquid Detection
- Positioning
- Safeguard
- Color Detection
- Examination and Measurement
- Static Electricity Prevention
- Marking
- Endscope

Make sure to confirm detection with an actual product.

63

Detecting transparent film for TAB protection

The sensor reliably detects a thin transparent film by its unique optical system.



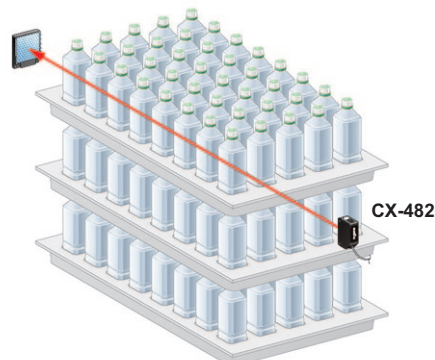
SEMICONDUCTOR / LIQUID CRYSTAL

Compact photoelectric sensor **Amplifier built-in** **CX-481** **P.291**

64

Sensing plastic bottles stacked on pallets

Stable detection is possible due to the unique optical system and special circuit for detecting transparent objects. Its sensing range is 2 m **6.562 ft**, which is long.



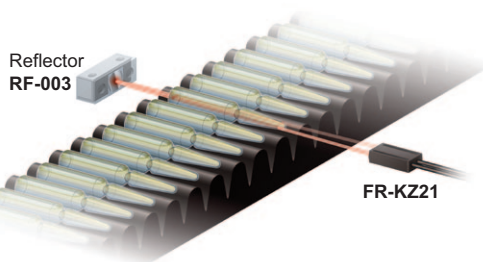
RUBBER / PLASTIC

Compact photoelectric sensor **Amplifier built-in** **CX-482** **P.291**

65

Transparent tube sensing

Due to the unique optical system, stable detection of transparent objects can be performed at a close distance of 200 mm **7.874 in** or less.



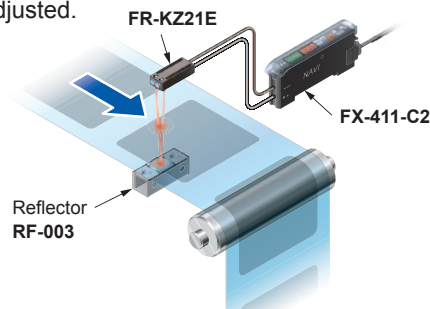
PHARMACEUTICAL AND FOOD PROCESSING / PACKAGING

Narrow beam fiber **Retroreflective type** **FR-KZ21** **P.18**

66

Detection of transparent seals on transparent sheet

Stable detection of transparent seals is possible on a transparent sheet. This is a side-view type fiber, so you can save space when installing it. In addition, the amplifier **FX-411-C2** can be easily operated and adjusted.



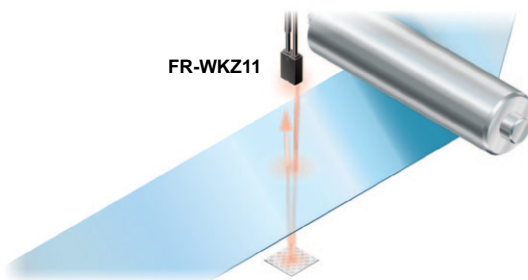
PHARMACEUTICAL AND FOOD PROCESSING / PACKAGING

Narrow beam fiber **Retroreflective type** / Digital fiber sensor **FR-KZ21E / FX-411-C2** **P.18 / P.205**

67

Transparent film sensing

Due to the retroreflective type, light passes through objects (transparent objects) twice, making it easier to obtain differences in the amount of light. Therefore, transparent film detection is possible.



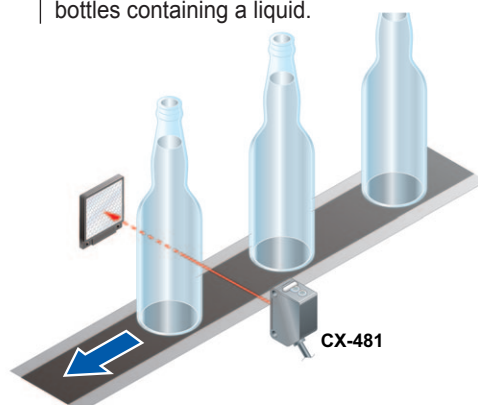
PHARMACEUTICAL AND FOOD PROCESSING / PACKAGING

Rectangular-shaped head fiber **Retroreflective type** **FR-WKZ11** **P.18**

68

Detecting transparent bottles

Due to the unique optical system and special circuit for detecting transparent objects, the retroreflective sensor reliably detects transparent bottles containing a liquid.



PHARMACEUTICAL AND FOOD PROCESSING / PACKAGING

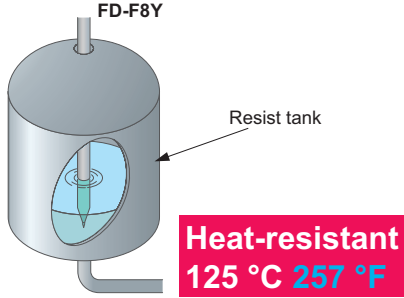
Compact photoelectric sensor **Amplifier built-in** **CX-481** **P.291**

Presence
Transparent Object Detection
Liquid Detection
Positioning
Safeguard
Color Detection
Examination and Measurement
Static Electricity Prevention
Marking
Endscope

Make sure to confirm detection with an actual product.

69 Detecting liquid level in a tank

FD-F8Y is totally covered with fluorine resin; therefore it can be immersed in chemicals. As the fiber is totally enclosed within the fluorine resin tube, no metal ions are generated. In addition, a heat resistance of 125 °C 257 °F has been realized.

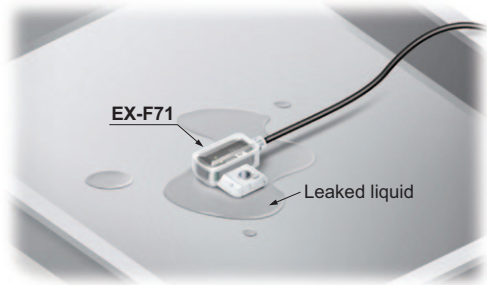


SEMICONDUCTOR / LIQUID CRYSTAL

Contact type liquid level detection fiber **FD-F8Y** **P.24**

70 Leak detection for use in semiconductor device manufacturing

The unique effect of capillarity enables reliable detection of small leaks and viscous liquids.

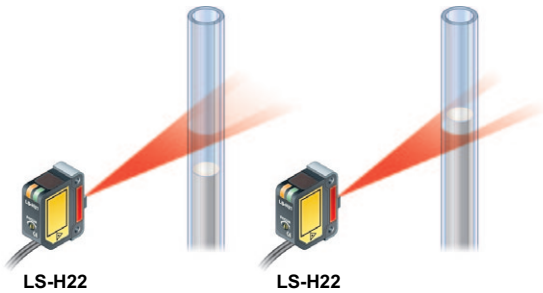


SEMICONDUCTOR / LIQUID CRYSTAL

Leak detection sensor **Amplifier built-in** **EX-F70 series** **P.853**

71 Sensing liquid levels in glass tubes

The sensor detects the liquid level in a glass tube used for backlighting. Since it has a line sensing area, stable detection of liquid is possible.

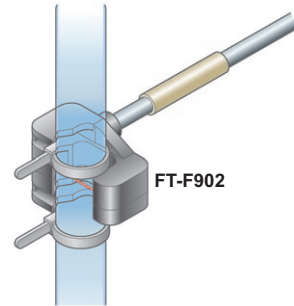


SEMICONDUCTOR / LIQUID CRYSTAL

Digital laser sensor **Amplifier-separated** **LS-H22** **P.265**

72 Liquid sensing utilizing pipe-mountable type

The beam axis center is always on the pipe diameter line even if the pipe diameters or thicknesses differ. Therefore, there is almost no influence from the installation conditions.

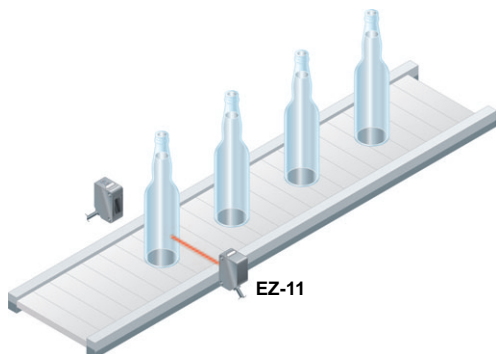


SEMICONDUCTOR / LIQUID CRYSTAL

Liquid detection fiber **FT-F902** **P.23**

73 Liquid detection in color bottle

Liquids including water from a semi-transparent container are stably sensed because the sensor is equipped with a dedicated water detection optical system/circuitry.

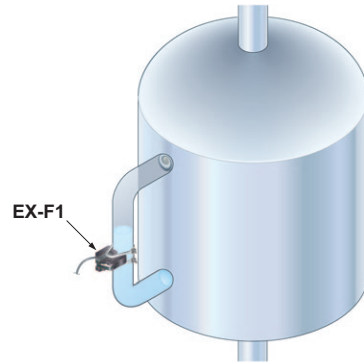


PHARMACEUTICAL AND FOOD PROCESSING / PACKAGING

Water detection sensor **EZ-10 series** **P.867**

74 Detecting clear liquid level

The sensor can detect the level of clear liquid inside a transparent pipe. The sensor can be mounted on the pipe with the tying bands, and the position is easily adjustable after mounting.



PHARMACEUTICAL AND FOOD PROCESSING / PACKAGING

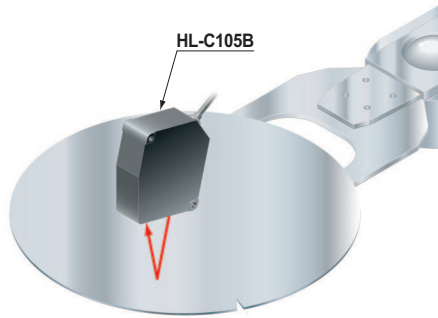
Pipe-mountable liquid level detection sensor **Amplifier built-in** **EX-F1** **P.863**

Presence
Transparent Object Detection
Liquid Detection
Positioning
Safeguard
Color Detection
Examination and Measurement
Static Electricity Prevention
Marking
Endscope

Make sure to confirm detection with an actual product.

75 Positioning wafer

Stable detection is possible even on specular objects, such as wafers.

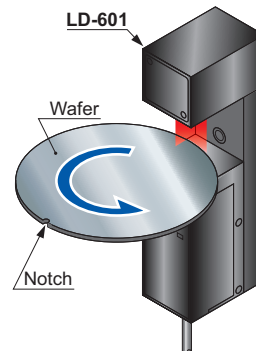


SEMICONDUCTOR / LIQUID CRYSTAL

Ultra high-speed laser displacement sensor **HL-C1 series** ▶ **P.997**

76 Sensing wafer eccentricity/notch

High-precision positioning can be achieved using a 15 mm **0.591 in** wide linear beam. Since the emitter and receiver are combined in one unit, there is no need for tedious beam axis adjustments.

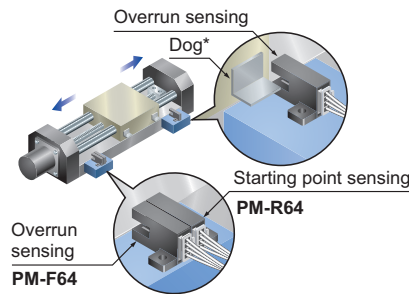


SEMICONDUCTOR / LIQUID CRYSTAL

Laser type edge detection sensor **LD series** ▶ **P.1059**

77 Sensing the starting point and overrun of a moving body

High-speed response of 100 μs. Starting point and overrun is sensed using the dog* on the base.



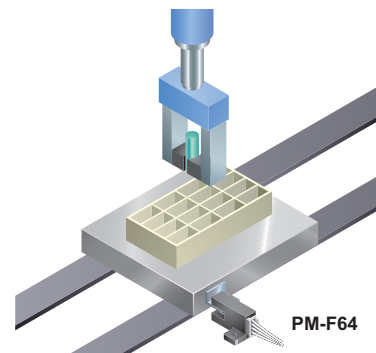
AUTOMATIC ASSEMBLY / MOUNTING

Connector built-in type U-shaped micro photoelectric sensor **PM-64 series** ▶ **P.443**

* The sensing object is most often a metal plate called a "dog".

78 Determining the pallet position

Pallet is stopped by sensing the dog*. You can neatly mount the sensor to the side of a conveyor due to it being a connector type.



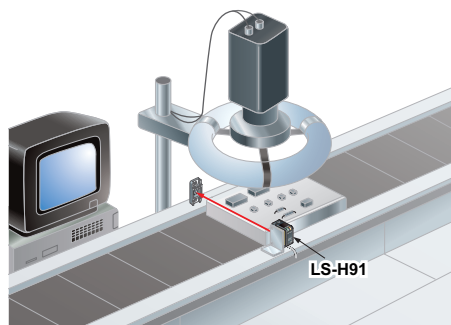
AUTOMATIC ASSEMBLY / MOUNTING

Connector built-in type U-shaped micro photoelectric sensor **PM-64 series** ▶ **P.443**

* The sensing object is most often a metal plate called a "dog".

79 Synchronized sensing for image processing systems

Pinpoint sensing is possible from a far distance of up to 7 m **22.967 ft**, so positioning of objects can be performed from outside the camera's field of vision.

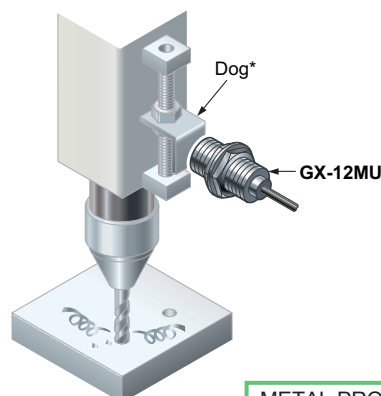


AUTOMATIC ASSEMBLY / MOUNTING

Digital laser sensor **Amplifier-separated** **LS-H91** ▶ **P.265**

80 Controlling depth of drilling

The sensor detects the dog* (metal plate) that determines the depth of drilling.



METAL PROCESSING

DC 2-wire cylindrical inductive proximity sensor **Amplifier built-in** **GX-U series** ▶ **P.795**

* The sensing object is a metal plate called a "dog".

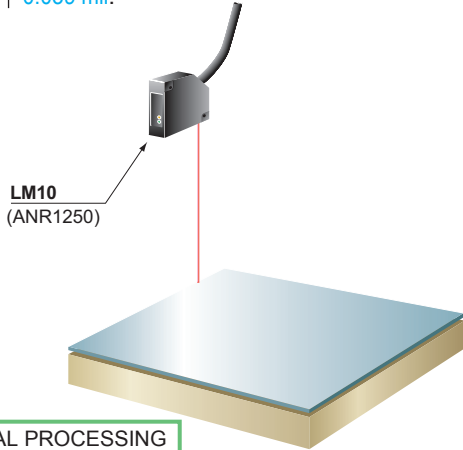
Presence
Transparent Object Detection
Liquid Detection
Positioning
Safeguard
Color Detection
Examination and Measurement
Static Electricity Prevention
Marking
Endscope

Make sure to confirm detection with an actual product.

81

High-precision positioning

High-precision positioning is possible using the **LM10** due to its high resolution of 1 μm 0.039 mil.



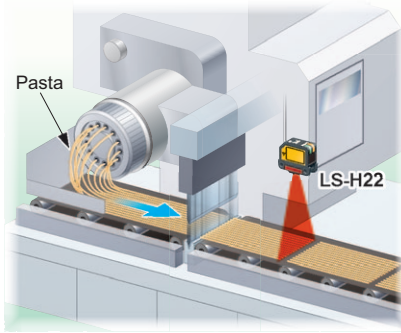
METAL PROCESSING

Micro laser displacement sensor **LM10** P.1011

82

Sensing pasta position in pasta making machines

The line reflective type can sense an extensive area. Since the difference from beam intensity of the conveyor and one of the pasta is large, it can sense the tip of the pasta even if pasta width changes.



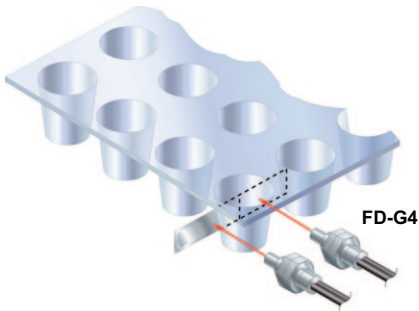
PHARMACEUTICAL AND FOOD PROCESSING / PACKAGING

Digital laser sensor **Amplifier-separated** **LS-H22** P.265

83

Positioning syrup containers

Two fiber sensors with one reflector tape determine the position of a container before pouring in of syrup. They save space, and provide accurate positioning.



PHARMACEUTICAL AND FOOD PROCESSING / PACKAGING

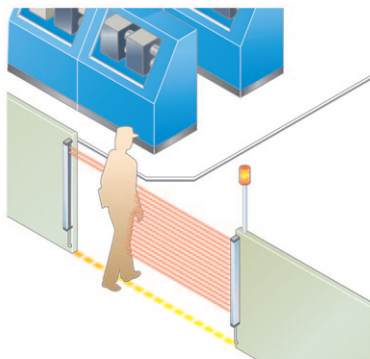
High precision fiber **Reflective type** **FD-G4** P.15

The applications given here are practical examples. However, their applicability may differ depending upon the actual situation in which the sensors are used. Should you face any difficulty in your sensing application, please contact our office.

84

Detection of entry through the no-entry line

The enhanced safety features of the Type 2 light curtain **SF2B** series include intruder detection as well as machine halting.



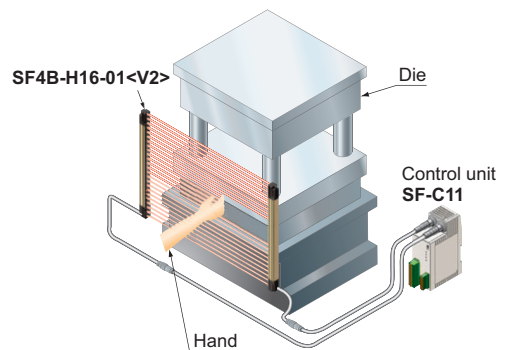
AUTOMATIC ASSEMBLY / MOUNTING

Light curtain **Type 2** **SF2B series** P.599

85

Safeguard for press machine

The **SF4B-01** series complies with international safety standards, so only one product number is necessary for European, U.S., and Japanese press machines.



METAL PROCESSING

Light curtain **Type 4** **SF4B-01 series** P.553

Presence
Transparent Object Detection
Liquid Detection
Positioning
Safeguard
Color Detection
Examination and Measurement
Static Electricity Prevention
Marking
Endoscope

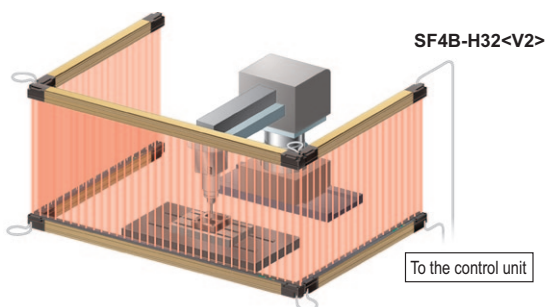
Make sure to confirm detection with an actual product.

TYPICAL APPLICATIONS

86

Safeguard for processor

Using the optional cable for series connections, three sets at maximum can be connected in a series with no dead space. Organized wiring can reduce cost and prevent interference.



METAL PROCESSING

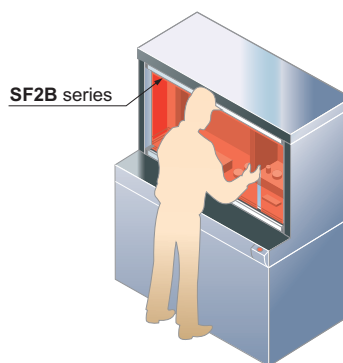
Light curtain **Type 4**

SF4B series **P.553**

87

Safeguard for special purpose machine

The operator has to access the special purpose machine to change the workpieces. The light curtain maintains a high level of safety without decreasing the productivity.



AUTOMOBILES

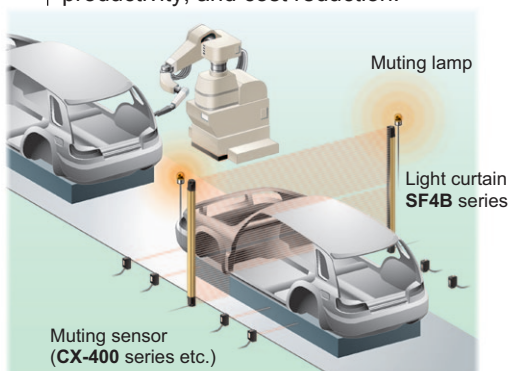
Light curtain **Type 2**

SF2B series **P.599**

88

Intrusion detection in areas with moving robots

The **SF4B** series that complies with international safety standards has a built-in muting control function, contributing to safety, productivity, and cost reduction.



AUTOMOBILES

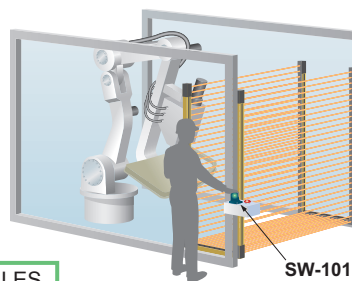
Light curtain **Type 4**

SF4B series **P.553**

89

Robot activation input

A push-button switch was previously used for activation input, but it may lead to inflammation of the tendon sheath due to the burden on hands or fingers. Since the **SW-101** is a beam type, simply touching the sensing side with your hand shields the light and starts up the device. In addition, it has been designed to reduce malfunctions caused by dirt or falling objects.



AUTOMOBILES

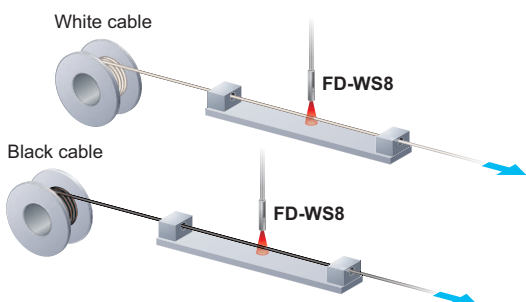
Optical touch switch

SW-100 series **P.651**

90

Distinguishing color when there is background object

The sensor distinguishes whether a cable is black or white in places where there is a background object. It will be difficult for background objects to affect sensing because beam intensity is reduced through the fiber amplifier's emitter intensity variable function. It only stably senses white cables.



AUTOMATIC ASSEMBLY / MOUNTING

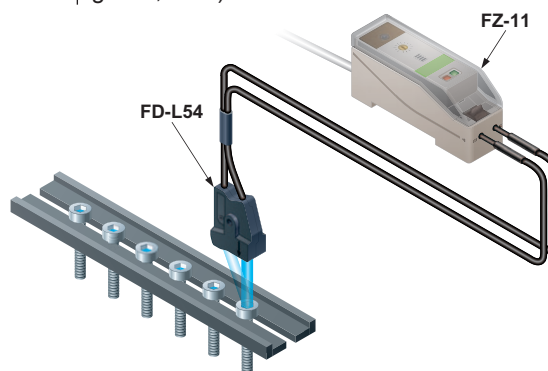
Sharp bending fiber **Reflective type**

FD-WS8 **P.33**

91

Color mark detection of screw head

The **FZ-11** can make extremely accurate color distinctions because it digitally distinguishes each color component (red, green, blue).



AUTOMOBILES

Color fiber sensor

FZ-10 series **P.879**

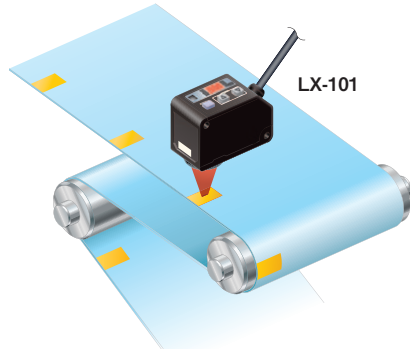
Presence
Transparent Object Detection
Liquid Detection
Positioning
Safeguard
Color Detection
Examination and Measurement
Static Electricity Prevention
Marking
Endscope

Make sure to confirm detection with an actual product.

92

Detecting register marks on a packaging sheet

Marks in various colors can be stably detected due to the unified emitting element with red, green, and blue LED colors and Panasonic Electric Works SUNX's unique coaxial reflective optical system.



PHARMACEUTICAL AND FOOD PROCESSING / PACKAGING

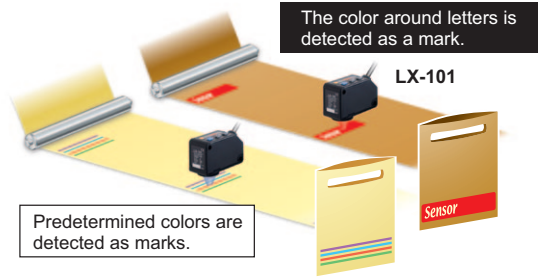
Digital mark sensor

LX-100 series P.869

93

Color mark detection

The color mode can perform high-precision discrimination of mark colors by judging percentages of R (red), G (green), and B (blue). This sensor is the most suitable for sensing films and other objects that have patterns or prints.



PHARMACEUTICAL AND FOOD PROCESSING / PACKAGING

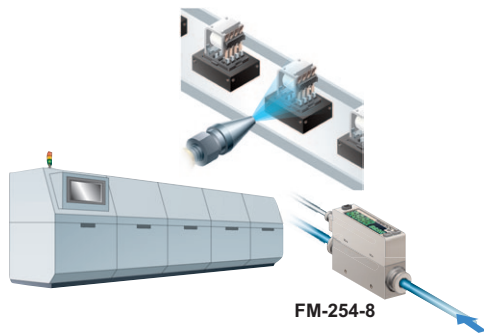
Digital mark sensor

LX-100 series P.869

94

Managing supply of purge gas/air blow

By managing purge gas/air blow, the sensor contributes to maintaining equipment efficiency/quality and preventing wasting valuable N₂.



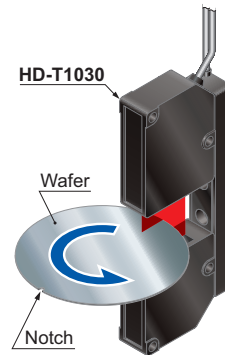
SEMICONDUCTOR / LIQUID CRYSTAL

Integrated display type digital flow sensor For gas FM-200 series P.737

95

Sensing inclination or notch of wafer

High accuracy position detection is possible with a line-shaped optical beam with a width of 30 mm 1.181 in.



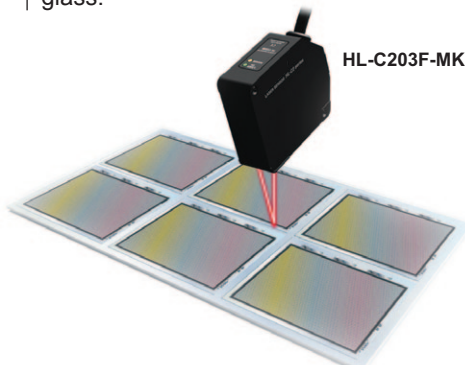
SEMICONDUCTOR / LIQUID CRYSTAL

LED type wafer alignment sensor HD-T1 series P.839

96

Measurement of the positions of patterned glass

The newly developed CMOS sensor and specially-designed high-resolution lens can make measurement stable even on patterned glass.



SEMICONDUCTOR / LIQUID CRYSTAL

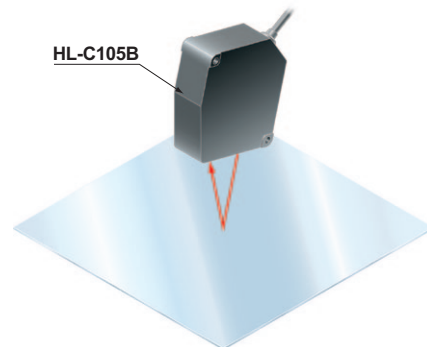
Ultra high-speed high accuracy laser displacement sensor

HL-C2 series P.981

97

Measuring glass substrate thickness

High precision measuring of the glass substrate thickness is possible.



SEMICONDUCTOR / LIQUID CRYSTAL

Ultra high-speed laser displacement sensor

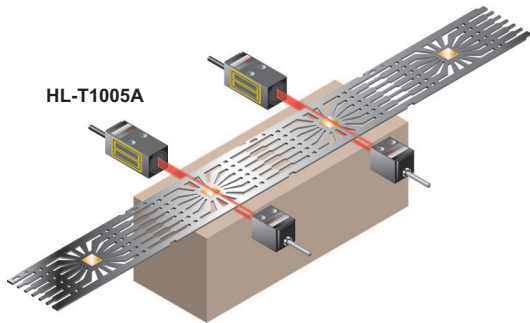
HL-C1 series P.997

Presence
Transparent Object Detection
Liquid Detection
Positioning
Safeguard
Color Detection
Examination and Measurement
Static Electricity Prevention
Marking
Endoscope

Make sure to confirm detection with an actual product.

98 Detecting defective lead frame seating

A line light beam measures the slight protrusion of lead frames. It can verify before applying the mold press to prevent the flow of defective parts or damage to the mold.

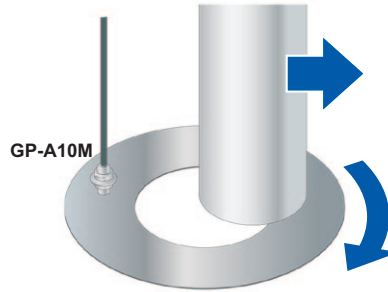


SEMICONDUCTOR / LIQUID CRYSTAL

Ultra-compact laser collimated beam sensor **HL-T1 series** **P.1041**

99 Wafer slicer blade product life detection

As the blade dulls, the work slightly vibrates vertically. This fluctuation can be measured by the **GP-A** series. Because it can even measure minute fluctuations, you can know immediately when the blade needs replacement.



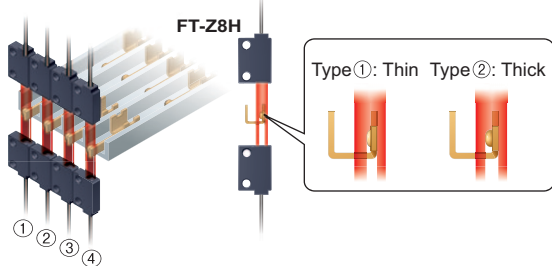
SEMICONDUCTOR / LIQUID CRYSTAL

High accuracy eddy current type digital displacement sensor **GP-A series** **P.1035**

100 Sensing thickness difference of contact points

The fiber sensor judges if the type of electromagnetic switch is correct by confirming the electromagnetic switch's contact point thickness and contact point line sequence. The **FT-Z8H** can distinguish contact point thickness through differences in incident light intensity because it uses zonal beams.

Confirming thickness and sequence of contact points



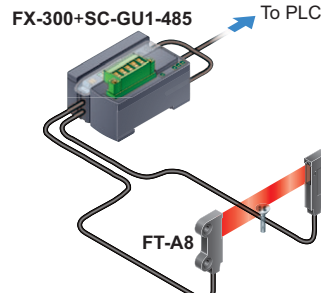
Address is allocated

AUTOMATIC ASSEMBLY / MOUNTING

Space-saving fiber / Flexible fiber **FT-Z8H** **P.14 / P.30**
Thru-beam type

101 Inspecting screw height

In the inspection of screws, setup is frequently changed depending on the type. When communicating with the PLC, etc., through **SC-GU1-485**, there is no need to remember sensor operation and mistakes can be reduced because sensor setup changes can be done via the touch panel. (teaching mistake reduction)

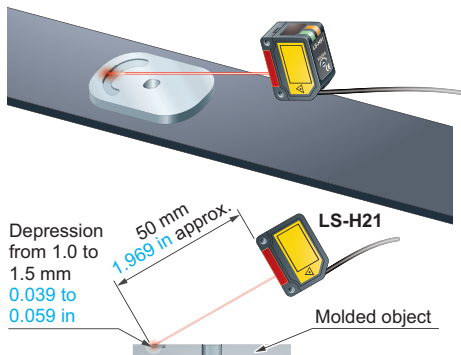


AUTOMATIC ASSEMBLY / MOUNTING

Wide beam fiber / Digital fiber sensor / Upper communication unit **FT-A8 / FX-301 / SC-GU1-485** **P.17 / P.177 / P.935**

102 Confirmation of depressions on molded objects

The laser sensor can detect a slight depression on molded objects. The spot diameter is only $\varnothing 0.2$ mm $\varnothing 0.008$ in approx, so good-precision sensing is possible.

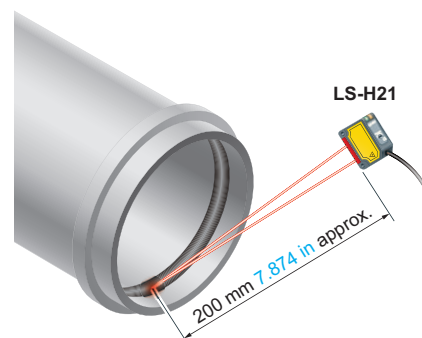


AUTOMATIC ASSEMBLY / MOUNTING

Digital laser sensor **Amplifier-separated** **LS-H21** **P.265**

103 Detecting o-ring at PVC pipe

The laser sensor detects an o-ring fitted inside a pipe, so that visual inspection can be automated. Since the black rubber o-ring has a glossy surface, tilt the sensor when mounting it.



AUTOMATIC ASSEMBLY / MOUNTING

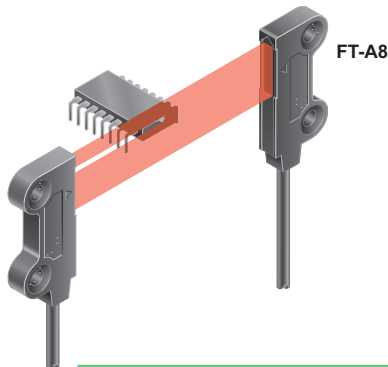
Digital laser sensor **Amplifier-separated** **LS-H21** **P.265**

- Presence
- Transparent Object Detection
- Liquid Detection
- Positioning
- Safeguard
- Color Detection
- Examination and Measurement
- Static Electricity Prevention
- Marking
- Endscope

Make sure to confirm detection with an actual product.

104 Checking ICs for burrs

The wide beam fiber with a width of 11 mm **0.433 in** enables accurate detection even if burrs fluctuate in size and position.



AUTOMATIC ASSEMBLY / MOUNTING

Wide beam fiber **Thru-beam type** FT-A8 **P.17**

105 Detecting the protrusion of pitch connector pins

The slight protrusion of minute pins can be measured due to a high resolution of $0.025 \mu\text{m}$ **0.001 mil** and high-speed sampling of 100 kHz.

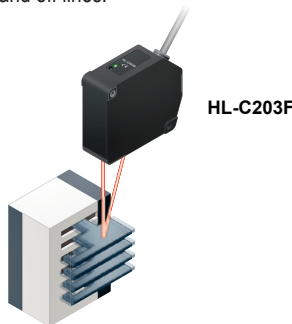


AUTOMATIC ASSEMBLY / MOUNTING

Ultra high-speed high accuracy laser displacement sensor **HL-C2 series** **P.981**

106 Confirming vibration of vibration blades

Vibration blade movements can be confirmed in real-time with "high-speed sampling" and "high resolution" allowance which is **HL-C2's** basic capability. Moreover, high-precision measurement data contributes to more stable quality maintenance / management in production processes and off lines.

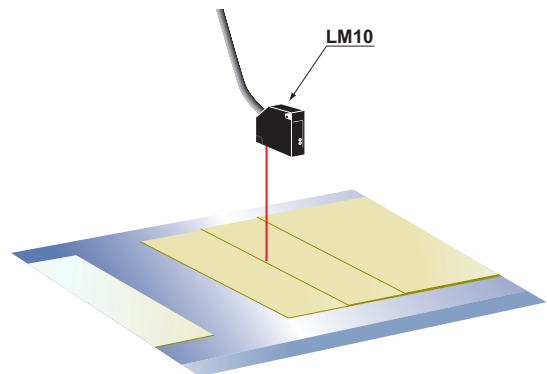


AUTOMATIC ASSEMBLY / MOUNTING

Ultra high-speed high accuracy laser displacement sensor **HL-C2 series** **P.981**

107 Measurement of the difference in levels

Due to the displacement measurement of the micron order, measurement of the differences in the level of thin sheets can be reliably performed.

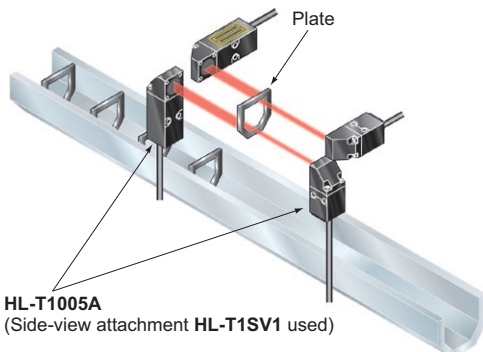


AUTOMATIC ASSEMBLY / MOUNTING

Micro laser displacement sensor **LM10** **P.1011**

108 Confirmation of the type of plates

The sensor discriminates between plates with different inner sizes by the amount of light interruption. This is helpful for reducing the rate of defects. The side-view attachment makes it possible to mount the sensor in a limited space.



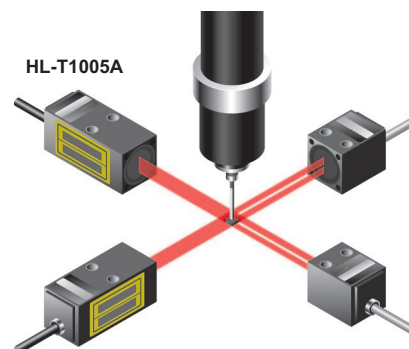
HL-T1005A
(Side-view attachment **HL-T1SV1** used)

AUTOMATIC ASSEMBLY / MOUNTING

Ultra-compact laser collimated beam sensor **HL-T1 series** **P.1041**

109 Checking the positioning of chip components

Two sets of laser collimated beam sensors measure the position of chip components that adhere preventing mounting errors.



AUTOMATIC ASSEMBLY / MOUNTING

Ultra-compact laser collimated beam sensor **HL-T1 series** **P.1041**

Presence
Transparent Object Detection
Liquid Detection
Positioning
Safeguard
Color Detection
Examination and Measurement
Static Electricity Prevention
Marking
Endscope

Make sure to confirm detection with an actual product.

110 Measurement of HDD surface fluctuation

High-speed measurement such as surface fluctuation measurement is possible due to ultra high-speed calculation that produces high-speed sampling of 100 kHz.



ELECTRONIC PRODUCTS / ELECTRIC APPLIANCES

Ultra high-speed high accuracy laser displacement sensor **HL-C2 series** **P.981**

111 Inspection for surface fluctuation of hard disk

The **GP-X** series measures surface fluctuation by rotating a stainless-steel disk. Using three sets makes adjustment easier. In addition, even with the stainless steel surface, a linearity of $\pm 0.3\%$ F.S. is achieved.

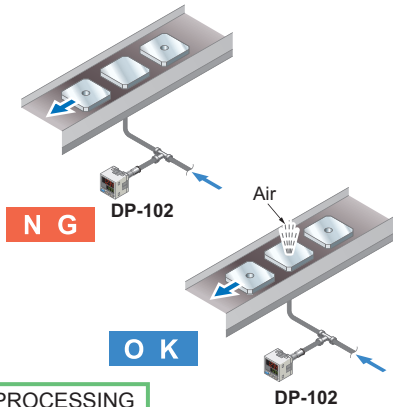


ELECTRONIC PRODUCTS / ELECTRIC APPLIANCES

High speed high accuracy eddy current type digital displacement sensor **GP-X series** **P.1023**

112 Detecting hole drilling error of metal component

The sensor detects the presence of holes in metal parts. For example, if the air escapes from a metal part, it is judged as OK. However, if the air does not escape, it is judged as no good.

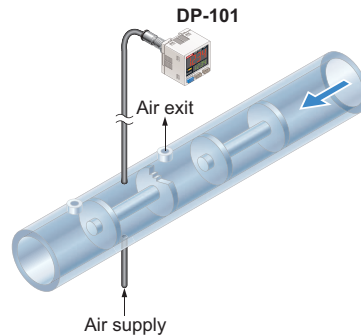


METAL PROCESSING

Dual display digital pressure sensor **For gas** **DP-102** **P.667**

113 Detecting broken spool of film

The pressure sensor detects if a spool is chipped by sensing air leakage in the air-supply system shown below. The **DP-100** series, providing high accuracy and high resolution, detects even a slight air leakage.

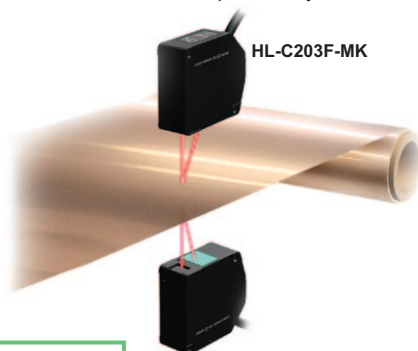


METAL PROCESSING

Dual display digital pressure sensor **For gas** **DP-101** **P.667**

114 Measurement of the thickness of copper clad laminate

Our unique optical system reduces the influences caused by unevenness on rough-surfaced objects. Even more stable measurement is possible for applications in which measurement variations often occurred previously.

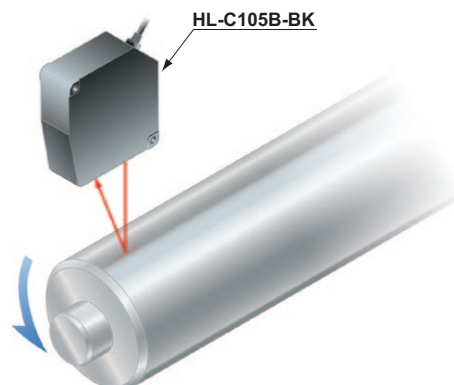


METAL PROCESSING

Ultra high-speed high accuracy laser displacement sensor **HL-C2 series** **P.981**

115 Measuring the eccentricity of metal shaft

By using the filter function, it can quickly and stably measure even workpieces with tiny scratches.



METAL PROCESSING

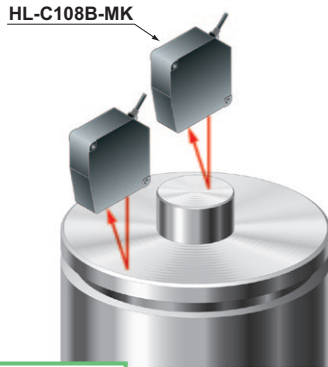
Ultra high-speed laser displacement sensor **HL-C1 series** **P.997**

Presence
Transparent Object Detection
Liquid Detection
Positioning
Safeguard
Color Detection
Examination and Measurement
Static Electricity Prevention
Marking
Endscope

Make sure to confirm detection with an actual product.

116 Measurement of the difference in levels on metal processing parts

The sensor reduces the influences caused by minute unevenness on the surface of metal objects, making measurement more stable.

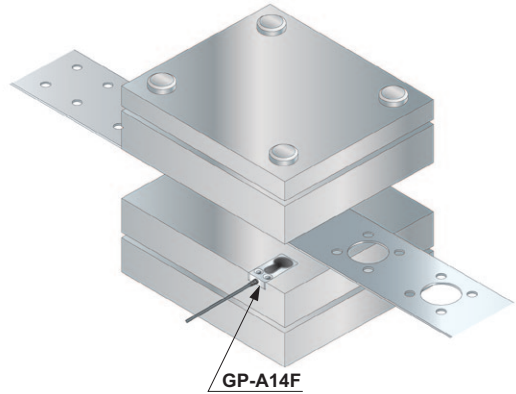


METAL PROCESSING

Ultra high-speed laser displacement sensor **HL-C1 series** **P.997**

117 Stroke end sensing

Origin point misalignments on presses are precisely measured.



METAL PROCESSING

High accuracy eddy current type digital displacement sensor **GP-A series** **P.1035**

118 Rotation / eccentricity sensing

The sensor does not miss high-speed displacement of objects due to high-speed sampling of 25 μs. In addition, a high resolution of 0.04 % F.S. performs high-precision measurement of minute displacement.

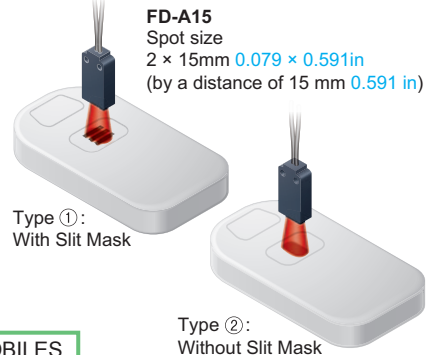


METAL PROCESSING

High speed high accuracy eddy current type digital displacement sensor **GP-X series** **P.1023**

119 Distinguishing automobile console models

The fiber sensor distinguishes the model of overhead consoles for automobiles by differences in shape (presence of slit mask). Since it performs sensing by beam area using wide beam fibers, it can distinguish the model through differences in reflected beam intensity.

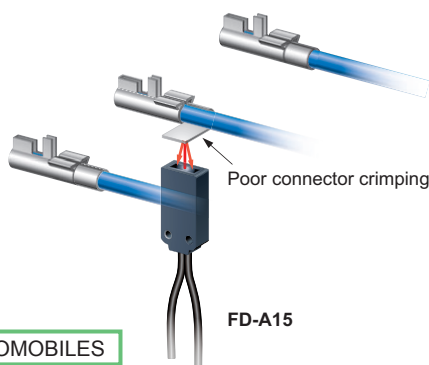


AUTOMOBILES

Wide beam fiber **Reflective type** **FD-A15** **P.17**

120 Detection of a defect connector for automobile

The **FD-A15** has a rectangular spot of 2 × 15 mm 0.079 × 0.591 in with a large beam area. Since the light receiving parts are on the upper and lower positions of the light emitting part, stable detection is possible even if connector positions are a little off.

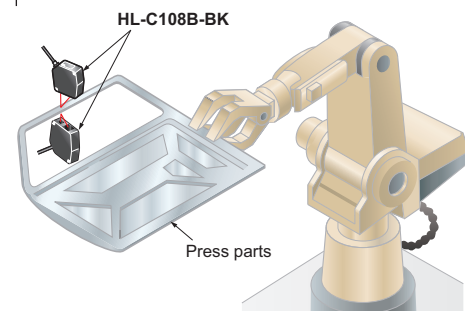


AUTOMOBILES

Wide beam fiber **Reflective type** **FD-A15** **P.17**

121 Detection of overlapped press parts

The **HL-C1** series judges overlapped press parts that are being carried by measuring the thickness using the calculation function. The laser displacement sensor is effective for objects, such as press parts with holes or uneven surfaces, that have limited measurement areas.



AUTOMOBILES

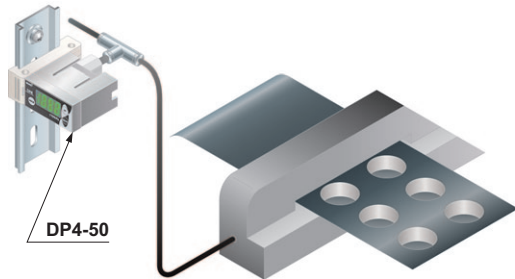
Ultra high-speed laser displacement sensor **HL-C1 series** **P.997**

Presence
Transparent Object Detection
Liquid Detection
Positioning
Safeguard
Color Detection
Examination and Measurement
Static Electricity Prevention
Marking
Endoscope

Make sure to confirm detection with an actual product.

122 Vacuum level confirmation for vacuum molding

The degree of vacuum is checked upon vacuum molding. Using the optional mounting bracket makes it possible to mount a DIN rail as well.

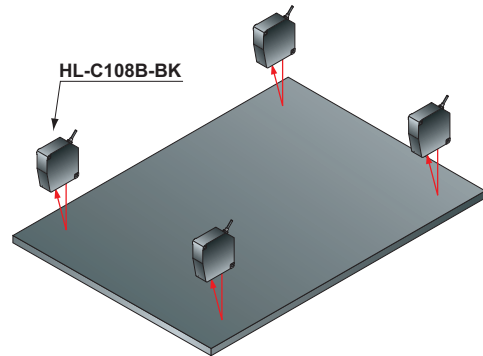


RUBBER / PLASTIC

Compact size digital pressure sensor **DP4 series** **P.747**

123 Detection of black rubber conditions

The sensor detects minute unevenness in black rubber and measures the flatness.



RUBBER / PLASTIC

Ultra high-speed laser displacement sensor **HL-C1 series** **P.997**

124 Inspecting tire form

High precision measurement of object surface irregularities on black rubber or other sensing objects with a low reflected light intensity can be performed with a long sensing range of 350 mm **13.780 in** ± 200 mm **7.874 in**.

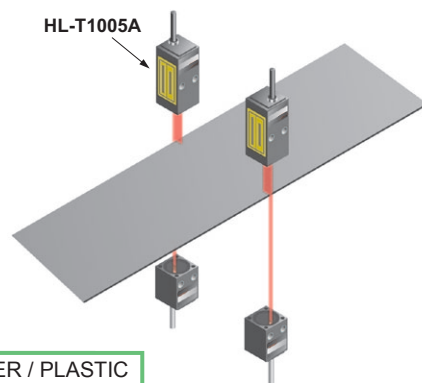


RUBBER / PLASTIC

Ultra high-speed laser displacement sensor **HL-C1 series** **P.997**

125 Sheet width measurement

A digital panel controller is not required since two units of sensors perform calculation (both addition and subtraction) by connecting a calculation unit (optional) between the controllers.

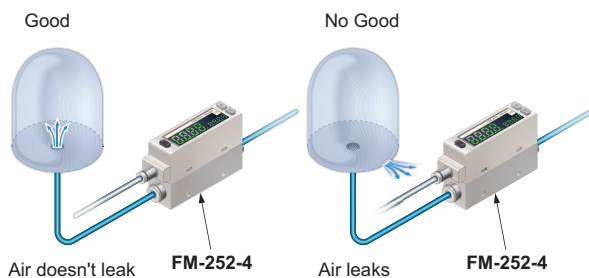


RUBBER / PLASTIC

Ultra-compact laser collimated beam sensor **HL-T1 series** **P.1041**

126 Sensing defects on plastic molded products

The sensor also reliably senses fractional leaks by sensing the flow rate in pressure variance that even pressure sensors cannot detect.



RUBBER / PLASTIC

Integrated display type digital flow sensor **For gas** **FM-200 series** **P.737**

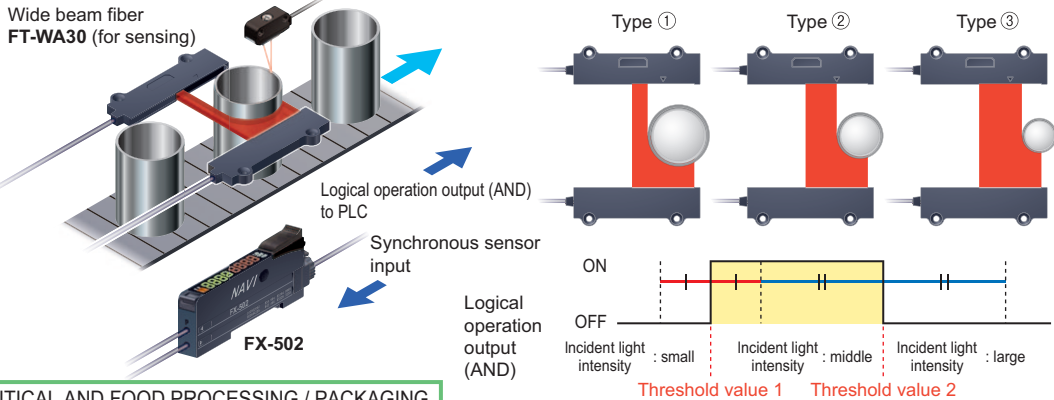
- Presence
- Transparent Object Detection
- Liquid Detection
- Positioning
- Safeguard
- Color Detection
- Examination and Measurement
- Static Electricity Prevention
- Marking
- Endscope

The applications given here are practical examples. However, their applicability may differ depending upon the actual situation in which the sensors are used. Should you face any difficulty in your sensing application, please contact our office.

Make sure to confirm detection with an actual product.

127 Distinguishing types of containers

By using a wide beam fiber, stable sensing is possible because the incident light intensity varies according to differences in container size. **FX-502** can make model distinctions using fewer sensor units and I/O points than that of a conventional setup by using external input and logical operation output and making distinctions by window comparator mode. This contributes to total cost reduction. **EX-26A** (for synchronization)



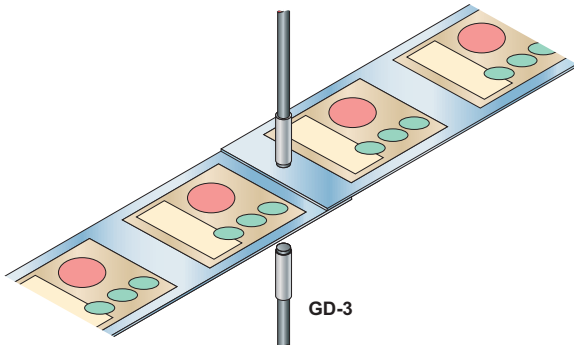
PHARMACEUTICAL AND FOOD PROCESSING / PACKAGING

Wide beam fiber **Thru-beam type** / Digital fiber sensor

FT-WA30 / FX-502 ▶ **P.17 / P.115**

128 Soup bag (sheet) seam detection

Because the **GD series** detects objects using magnetism, it is not affected whatsoever by the color or shape of the bag surface allowing for stable sensing.

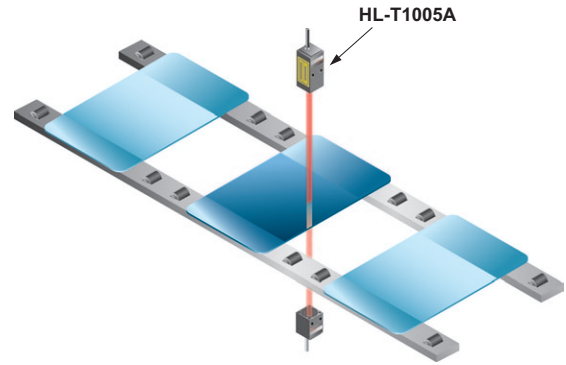


PHARMACEUTICAL AND FOOD PROCESSING / PACKAGING

Metal-sheet double-feed detector **GD series** ▶ **P.1065**

129 Distinguishing opacity of glass

By measuring the amount of light that penetrates through, detects the slightest glass tone discrepancy and discards defective items.

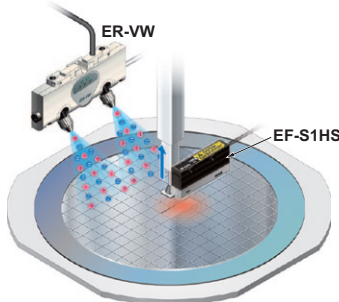


GLASS

Ultra-compact laser collimated beam sensor **HL-T1 series** ▶ **P.1041**

130 Surface potential measurement during chip release electrification

The sensor measures static electricity produced when separating chips and removes it with ionizers. You can check the operation status of the ionizer in real time, inspection time, such as maintenance, can be reduced too.

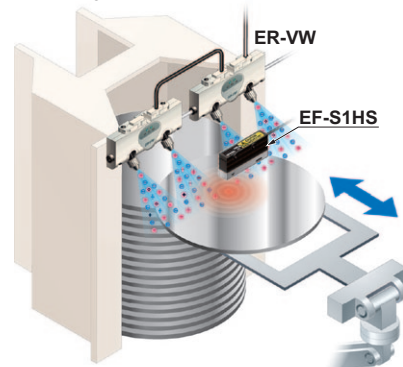


SEMICONDUCTOR / LIQUID CRYSTAL

Electrostatic sensor / Thin type ionizer **EF-S1 series / ER-VW** ▶ **P.1117 / P.1091**

131 Surface potential measurement during loading and unloading

The sensor measures static electricity produced when transferring wafers and removes it with ionizers.



SEMICONDUCTOR / LIQUID CRYSTAL

Electrostatic sensor / Thin type ionizer **EF-S1 series / ER-VW** ▶ **P.1117 / P.1091**

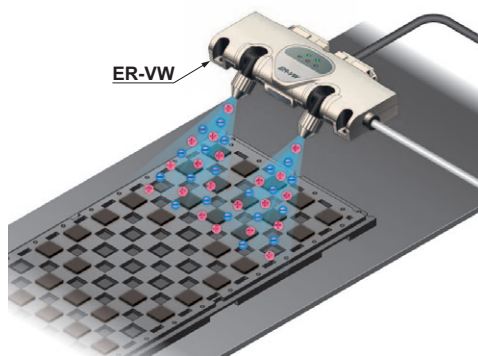
Presence
Transparent Object Detection
Liquid Detection
Positioning
Safeguard
Color Detection
Examination and Measurement
Static Electricity Prevention
Marking
Endoscope

Make sure to confirm detection with an actual product.

TYPICAL APPLICATIONS

132 Removing charges from IC trays

The area where the **ER-VW** removes electric charge from conforms to the standard size of the IC tray. Therefore, it can remove electric charge evenly from objects.

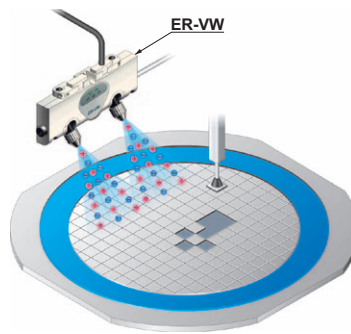


SEMICONDUCTOR / LIQUID CRYSTAL

Thin type ionizer (Static remover) **ER-VW** ▶P.1091

133 Removing charges during pickup from dicing tape

The thickness of the main body is 18.9 mm **0.744 in.** In addition, the nozzle angle can be adjusted so that you can mount the ionizer inside a device, preventing device breakage due to static electricity.

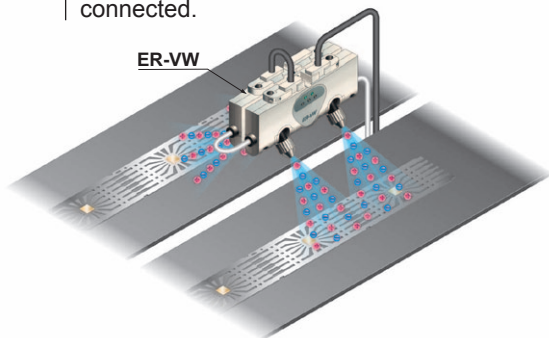


SEMICONDUCTOR / LIQUID CRYSTAL

Thin type ionizer (Static remover) **ER-VW** ▶P.1091

134 Removing charges from adjacent lead frame conveyor lines

The areas where electric charge will be removed can be designed according to the device since a maximum of five units can be connected.

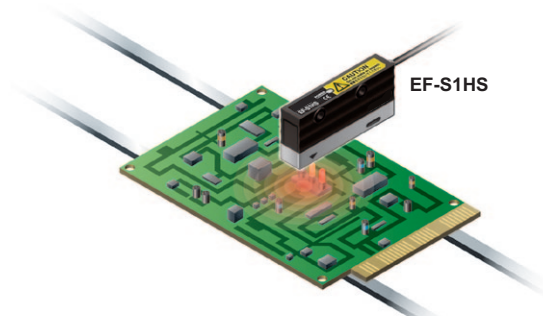


SEMICONDUCTOR / LIQUID CRYSTAL

Thin type ionizer (Static remover) **ER-VW** ▶P.1091

135 Measurement of frictional electrification of printed circuit boards

The sensor measures static electricity produced when transferring boards. The sensor does not take up much space due to its compact size even if you mount it on a line.

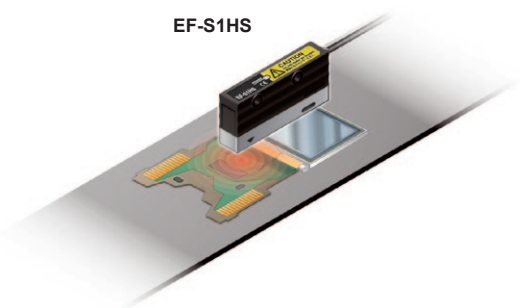


AUTOMATIC ASSEMBLY / MOUNTING

Electrostatic sensor **EF-S1 series** ▶P.1117

136 Measurement of frictional electrification of LCD modules

The status of electrification can be checked in-line. Stable detection can be performed all the time, so no variations will occur in measurements made using handy types.

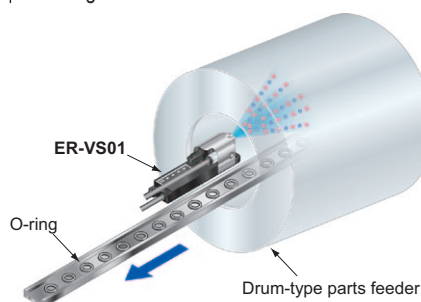


AUTOMATIC ASSEMBLY / MOUNTING

Electrostatic sensor **EF-S1 series** ▶P.1117

137 Removing electric charges from drum-type parts feeders

The **ER-V** series solves the problem of O-rings attaching to the wall inside the separation drum or sticking around the outlet due to static electricity by removing the charge. Maintenance is easy because you can take out the discharge needles from the backside of the main body.



AUTOMATIC ASSEMBLY / MOUNTING

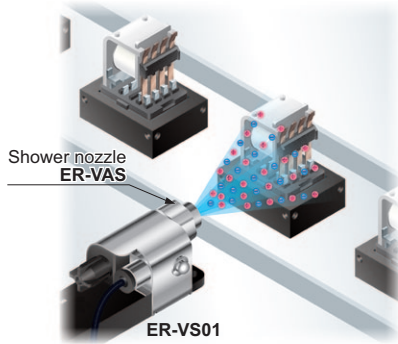
Ultra compact ionizer (Static remover) **ER-V series** ▶P.1099

Presence
Transparent Object Detection
Liquid Detection
Positioning
Safeguard
Color Detection
Examination and Measurement
Static Electricity Prevention
Marking
Endscope

Make sure to confirm detection with an actual product.

138 Charge removal and dust removal of relay and switch contacts

Pinpoint removal of electric charge using a shower nozzle achieves greater neutralization results.

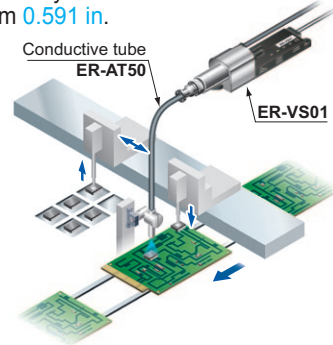


AUTOMATIC ASSEMBLY / MOUNTING

Ultra compact ionizer (Static remover) **ER-V series** [P.1099](#)

139 Pinpoint charge removal of electronic components

Pinpoint removal of electric charge and dust can be achieved at a close distance to the sensing objects due to a conductive tube that allows you to cut freely and bend at the smallest radius of 15 mm 0.591 in.

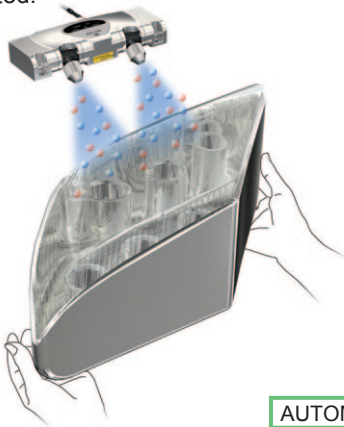


AUTOMATIC ASSEMBLY / MOUNTING

Ultra compact ionizer (Static remover) **ER-V series** [P.1099](#)

140 Dust removal during light cover assembly

The main body is 18.9 mm 0.744 in thick and since the nozzle angle can be adjusted, the ionizer can be used even when space is limited.

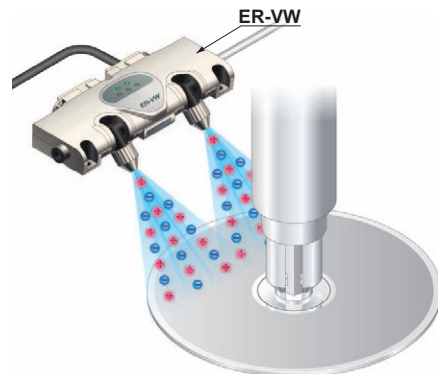


AUTOMOBILES

Thin type ionizer (Static remover) **ER-VW** [P.1091](#)

141 Removing charges surfaces of CDs / DVDs

It is possible to adjust the angles of the nozzles within a range of 190 degrees; therefore, setting the areas for electric charge removal can be performed according to the objects.

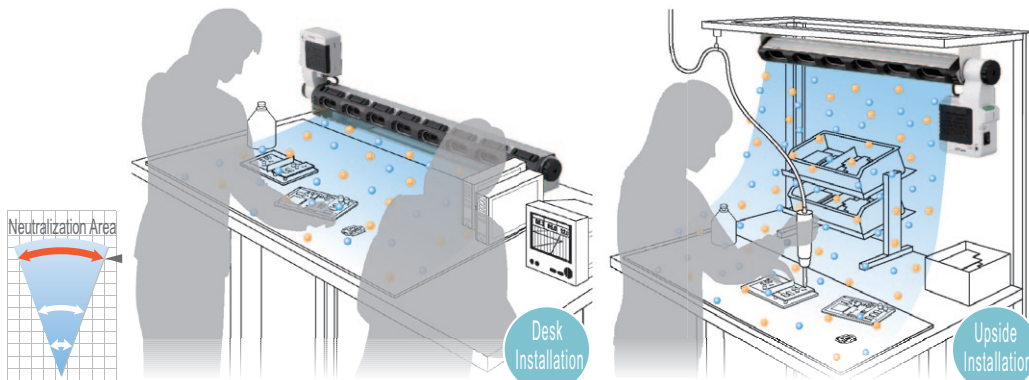


ELECTRONIC PRODUCTS / ELECTRIC APPLIANCES

Thin type ionizer (Static remover) **ER-VW** [P.1091](#)

142 Neutralizing the work area during the cell production assembly process

Conventional ionizers have not been able to fully meet needs in field operation. The wide-area ionizer **ER-TF series** pursues performance in the cell production line in an unprecedented fashion. It solves the dissatisfaction over existing ionizers.



ELECTRONIC PRODUCTS / ELECTRIC APPLIANCES

Wide-area ionizer (Static remover)

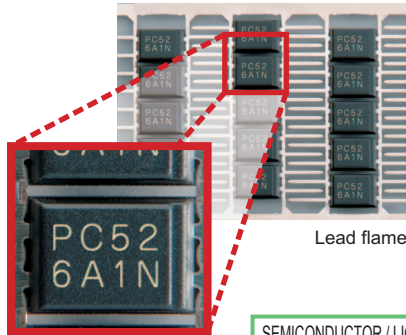
ER-TF series [P.1085](#)

Presence
Transparent Object Detection
Liquid Detection
Positioning
Safeguard
Color Detection
Examination and Measurement
Static Electricity Prevention
Marking
Endscope

Make sure to confirm detection with an actual product.

143 Marking on thin packages

Marking on slim electronic parts, such as chip size packages, requires that the objects are not influenced much. The **LP-W052** uses the laser output control and high-speed galvano scanner; hence shallow marking of 10 μm **0.394 mil** or less is possible.



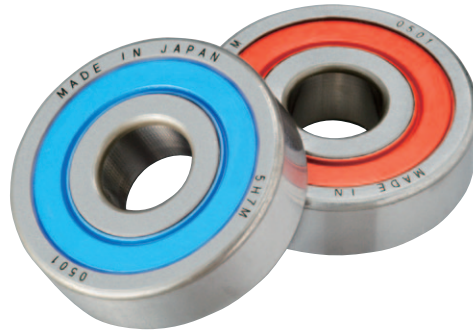
SEMICONDUCTOR / LIQUID CRYSTAL

FAYb laser marker

LP-W series ▶ **P.1139**

144 Marking on automobile parts (bearing)

The **LP-V** series FAYb laser has a high peak power of 20 kW. Now it is possible to perform sharp and deep marking on metals and bright black marking, which requires a great power.



AUTOMOBILES

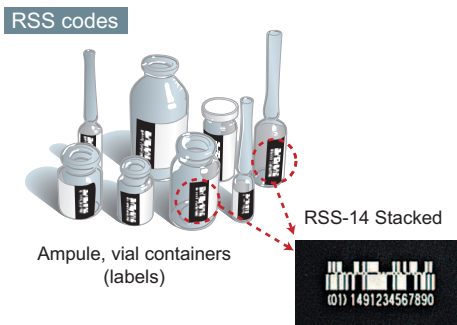
FAYb laser marker

LP-V series ▶ **P.1139**

145 Marking RSS codes

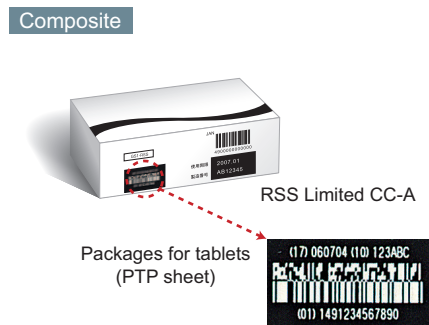
The laser marker can handle RSS codes and Composite markings. Product codes can be marked on small medicines, such as on the ampule and vial containers.

* Other than the products above, the laser marker also can handle bar codes (8 types), 2D codes (QR, Datamatrix), etc. that have been set by the JIS.



PHARMACEUTICAL AND FOOD PROCESSING / PACKAGING

FAYb laser marker / CO₂ laser marker



LP-V series / LP-400 series ▶ **P.1139 / P.1145**

146 Marking on high-speed lines of plastic bottles

Due to high-speed marking, the **LP-400** series significantly contributes to improved productivity by shortening tact time. Marking on products moving fast was achieved by adopting a high-performance galvano scanner and advanced technologies.



PHARMACEUTICAL AND FOOD PROCESSING / PACKAGING

CO₂ laser marker

LP-400 series ▶ **P.1145**

The applications given here are practical examples. However, their applicability may differ depending upon the actual situation in which the sensors are used. Should you face any difficulty in your sensing application, please contact our office.

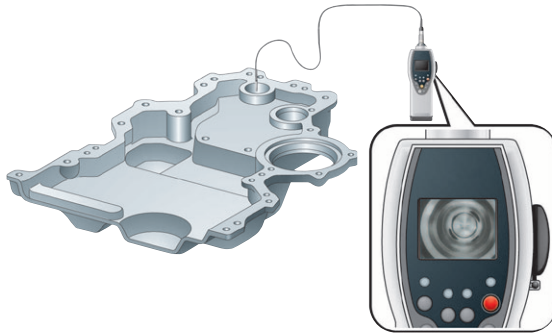
- Presence
- Transparent Object Detection
- Liquid Detection
- Positioning
- Safeguard
- Color Detection
- Examination and Measurement
- Static Electricity Prevention
- Marking**
- Endscope

Make sure to confirm detection with an actual product.

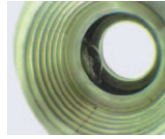
147

Inspecting engine parts

A 350 g compact body that can fit in the palm of your hands. The endoscope is equipped with an image recording function (SD memory card) so additional external devices are unnecessary. You can easily inspect parts that cannot be seen from the outside such as the inside of engine parts and machinery.



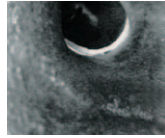
Sample Image



Inside the mechanical components



Board after installation



State within piping



Casting pipe seam

AUTOMOBILES

Handy video endoscope for industrial use

MV-R series P.1125

The applications given here are practical examples. However, their applicability may differ depending upon the actual situation in which the sensors are used. Should you face any difficulty in your sensing application, please contact our office.

- Presence
- Transparent
- Object Detection
- Liquid Detection
- Positioning
- Safeguard
- Color Detection
- Examination and Measurement
- Static Electricity Prevention
- Marking
- Endscope

