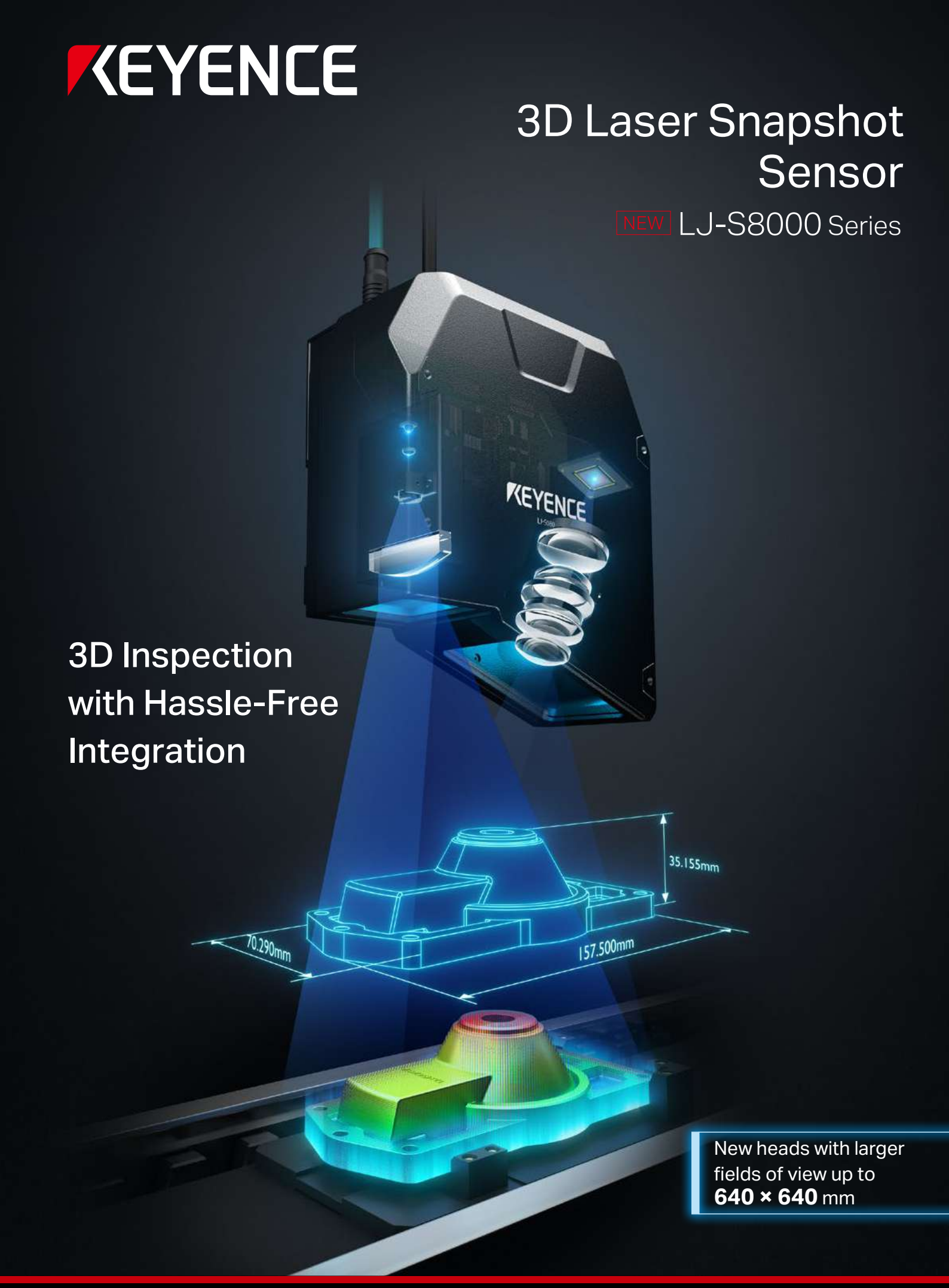
KEYENCE

3D Laser Snapshot Sensor

NEW LJ-S8000 Series



3D Inspection with Hassle-Free Integration

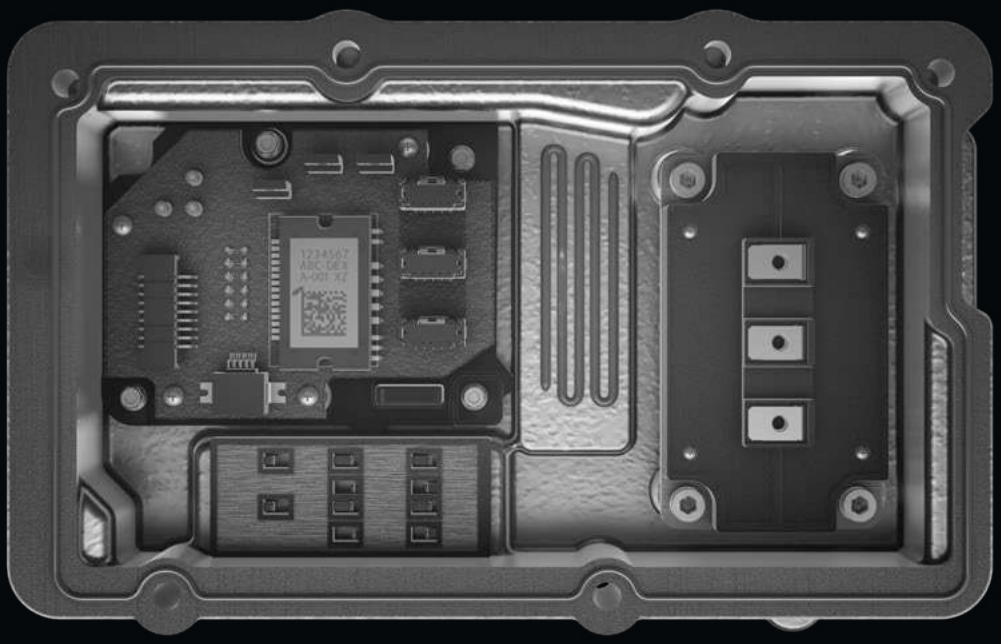
New heads with larger fields of view up to **640 × 640** mm

LJ-S8000 Series

Taking Visual Inspection into the Next Dimension



Flat Contrast-Based Visual Inspection



With two-dimensional XY inspections

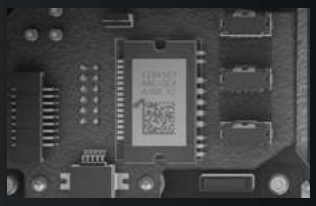
No height or depth measurements

Without height information, it is impossible to properly measure or inspect parts in the z-direction. This makes things like checking sealant volume or shape impossible with just 2D information.



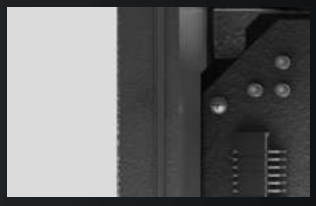
Results are affected by focus and background patterns

Out-of-focus images and images with background patterns—including markings on the surface of components—result in false detections.



Unstable inspection when there are subtle variations in shading

Subtle irregularities/defects with no clear difference in brightness do not result in a sufficient change in shading, making stable detection impossible.

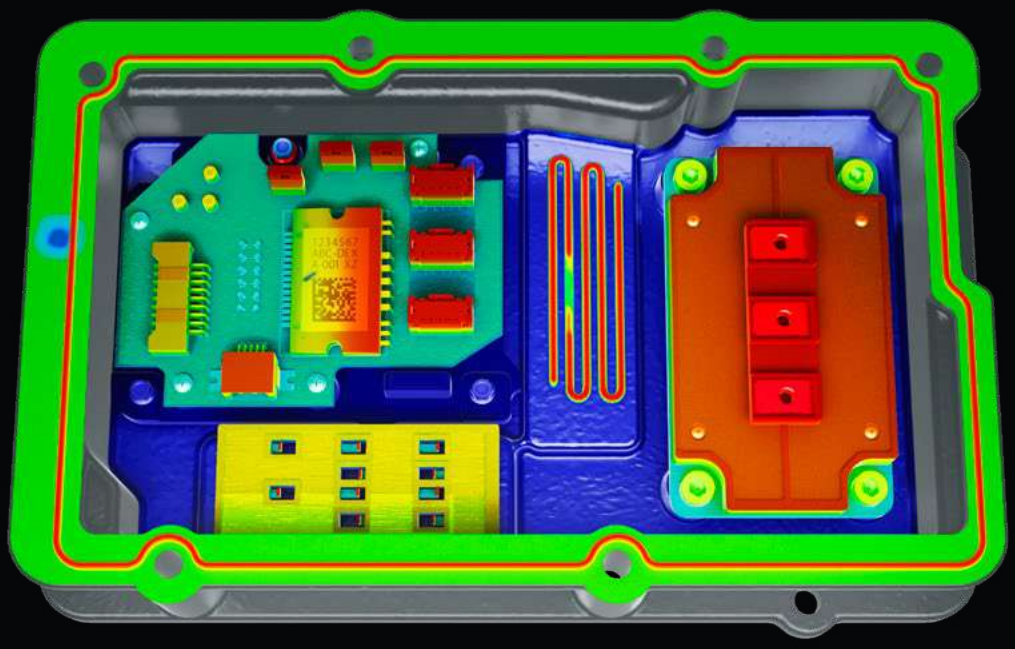


3D Laser Snapshot Sensor
NEW **LJ-S8000 Series**





3D Height-Based Visual Inspection



With three-dimensional XYZ inspections

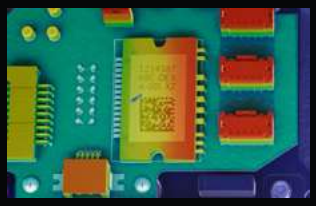
Width, height, area, and volume measurements are possible

Detection of protrusions and indentations as well as numerical measurements of depth, volume, and other characteristics enable stable detection of even minute differences.



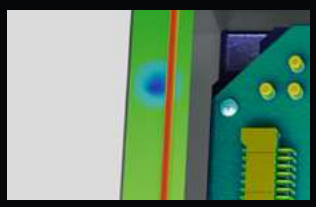
Results are not affected by focus or background patterns

Using height to generate a 3D image means results are not affected by focus or patterns, allowing for clear determination of height differences and accurate detection of tilted targets and defects.



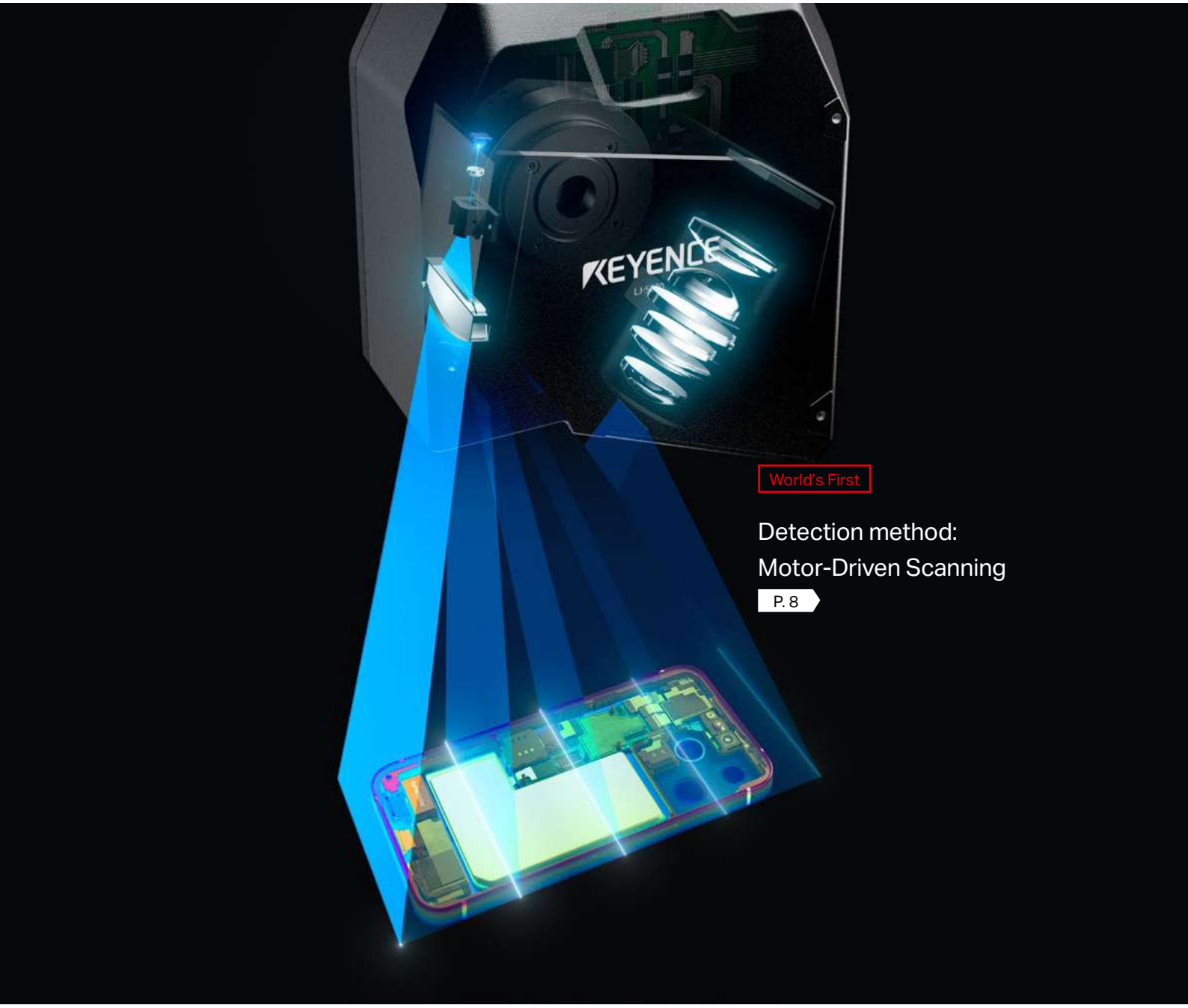
Stable inspection of similarly coloured uneven surfaces

Stable detection is possible even for slight irregularities/defects that are not clearly seen with contrast-based detection by utilising height information.



3D Inspection with Hassle-Free Integration

World's First Profiler with Built-In Scanning Mechanism!



World's First

Detection method:
Motor-Driven Scanning

P. 8

Painless installation and setup

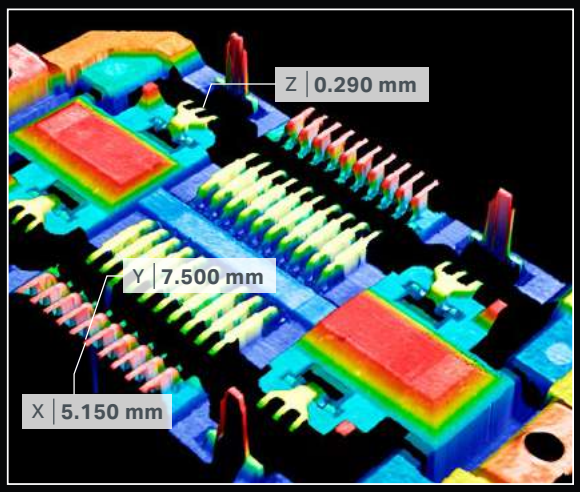
Immediate inspecting is possible without the need for any additional equipment such as lights, lens focus mechanisms, electronic stages, or encoders.

Highly accurate and stable

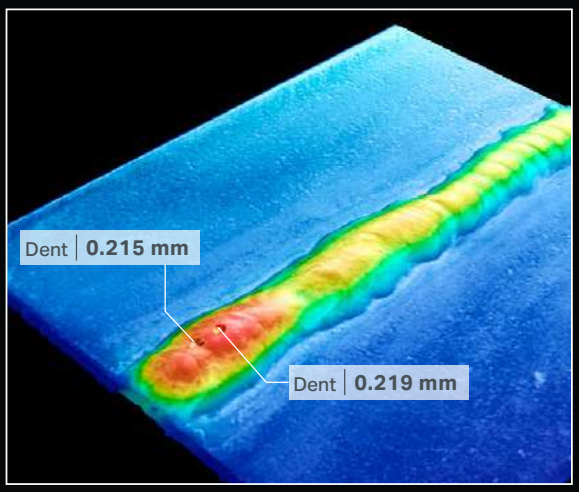
High-accuracy detection of targets featuring multiple materials and shapes is possible, with no focus blurring or errors from equipment operation.

Measurement and Inspection with Just One Device, Beneficial for Countless Applications

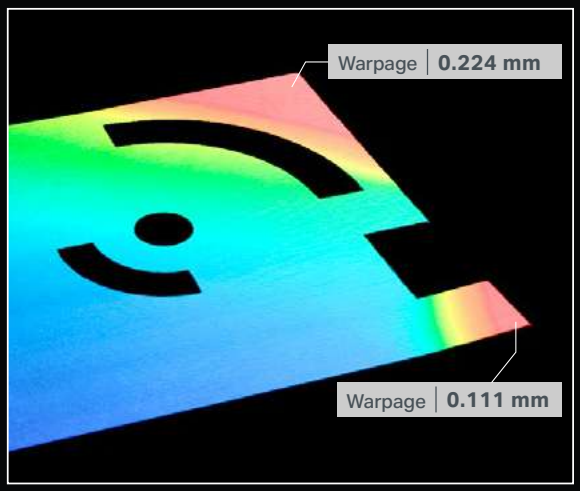
Connector Terminal Coplanarity Confirmation



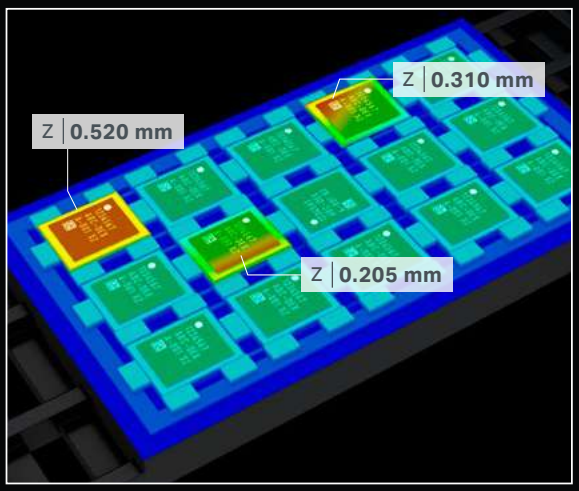
Weld Bead Shape Inspection



Pressed Part Flatness Inspection



IC Chip Seating and Orientation Checks



Dimension measurement

XYZ measurements such as width, position, height, area, volume, and angle can all be determined with a single device.

Appearance inspection

3D imaging ensures stable detection of even slight irregularities in targets without being affected by background or colour differences.

Identification/ differentiation

Simultaneous capturing of 3D measurement and luminance data ensures stable detection of incorrect seating, assembly defects, OCR inspection, and more.

Select from a lineup designed to meet all application requirements

Fastest capturing speed: 0.2 seconds

Maximum XYZ measurement range



Multiple system configuration options to choose from

Standard controller: **LJ-S8000**

The intuitive user interface makes configuring 3D image inspection settings simple. Configuration for inline inspection can be completed in just three easy steps.



Advanced controller: **XG-X2900LJ**

Create fully customised solutions with advanced programming capabilities. Capable of handling difficult 3D inspections or integration with external software.

Direct PC connection

Output the raw positional data for the entire area of the scan. Directly connect to a PC or PLC to create custom programs that fit your needs.





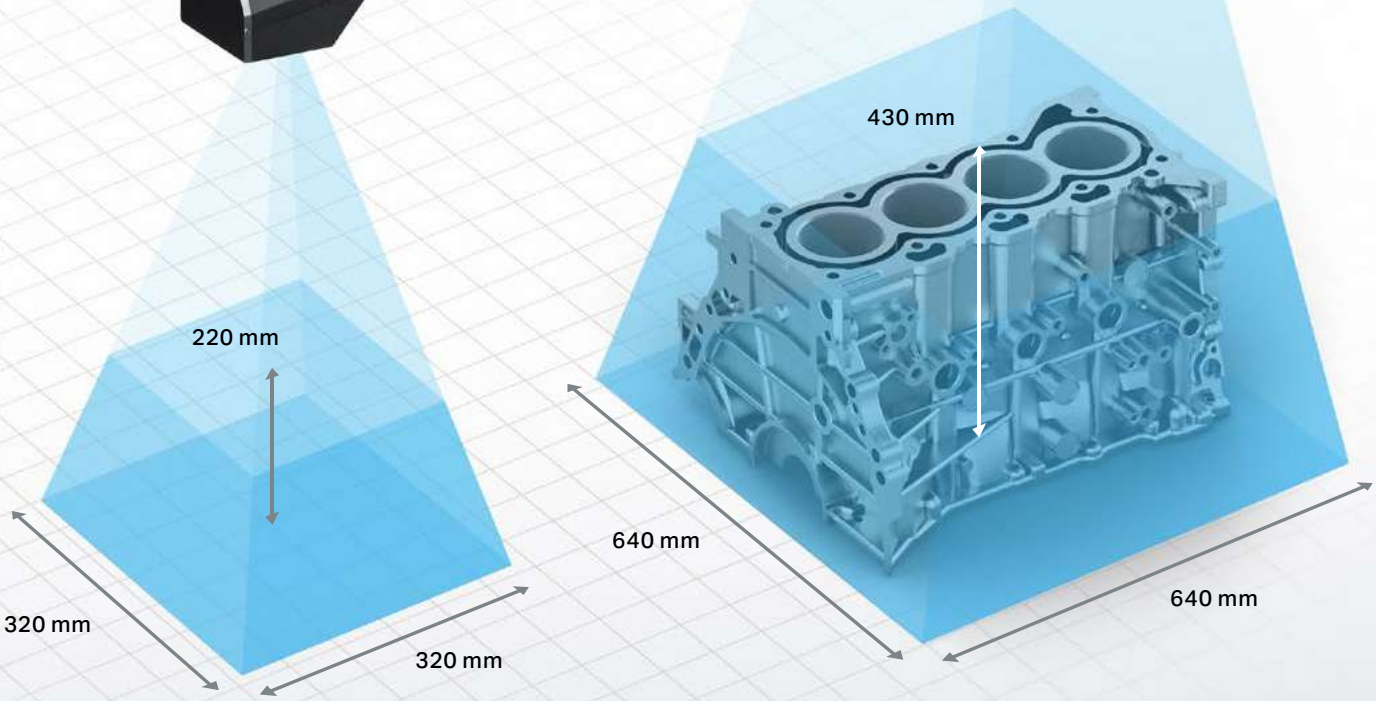
NEW

LJ-S640



NEW

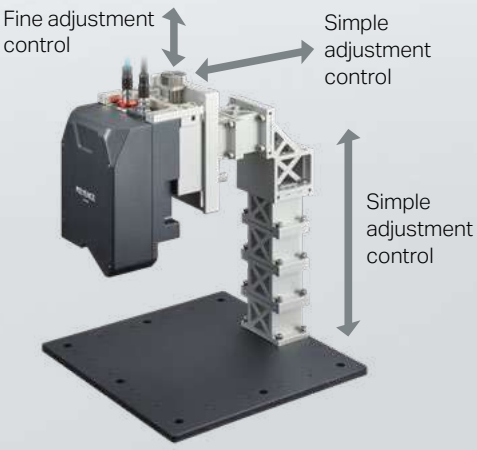
LJ-S320



Custom mounting made easy

Dedicated blocks to create custom stands

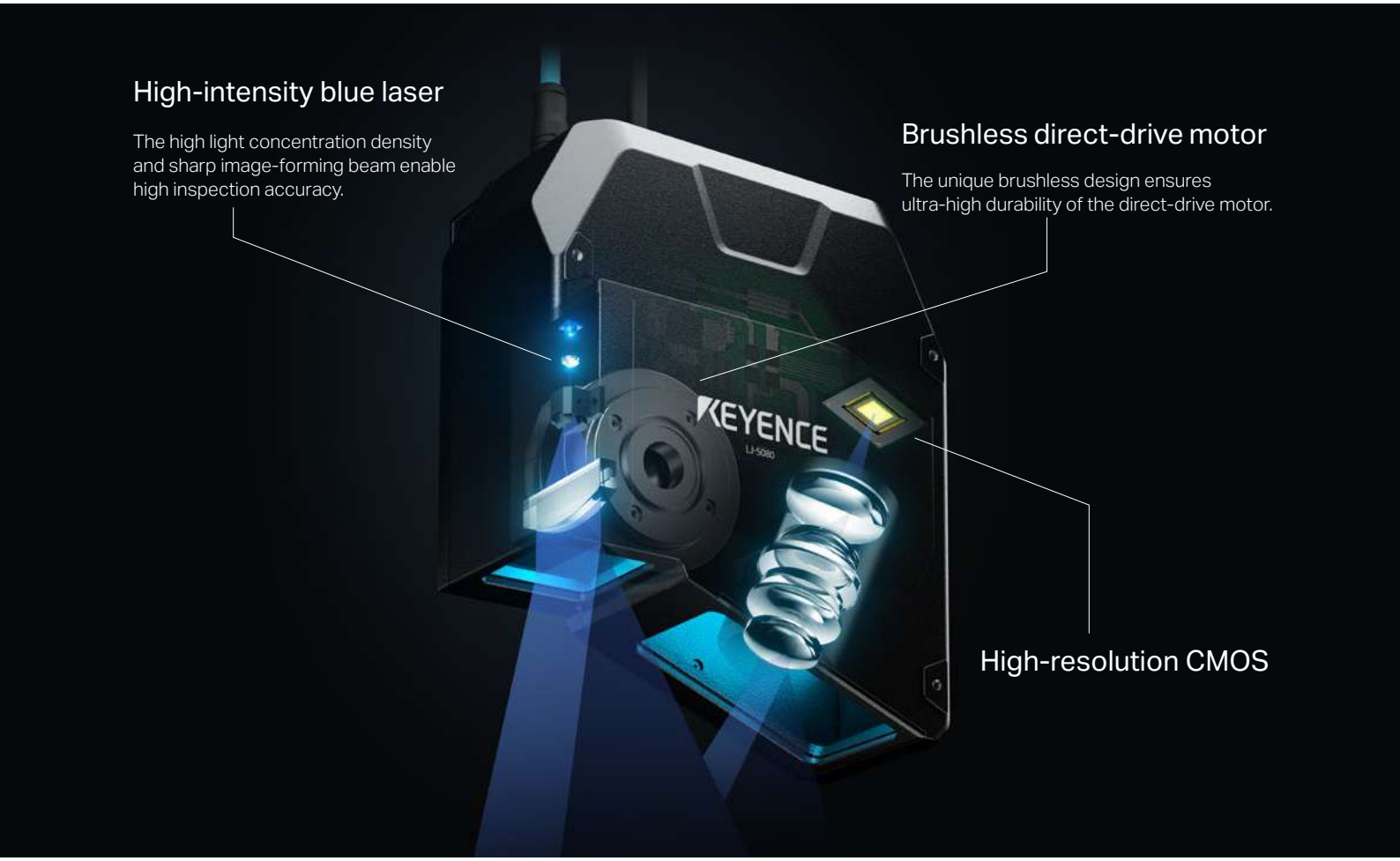
The installation height and position can be adjusted easily according to the target location. These highly rigid mounting blocks ensure safe mounting and adjustment for any applications. Custom mounting fabrications are no longer necessary and inspection can occur almost immediately after installation.



World's First Profiler with Built-In Scanning Mechanism!

Highly accurate, stable inspection with no need for troublesome adjustments

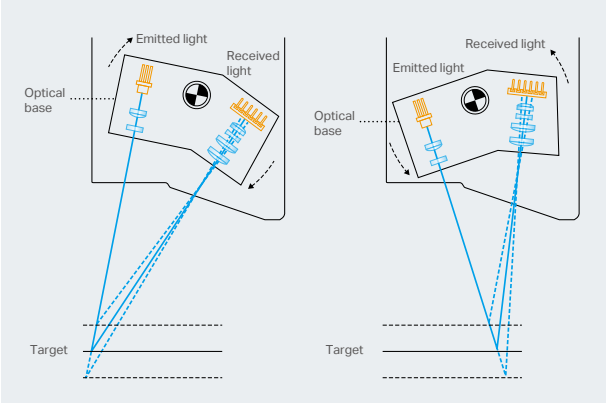
The built-in scanning mechanism allows for easier-than-ever, highly accurate and stable 3D inspection over a maximum area of 640 × 640 mm.



World's First

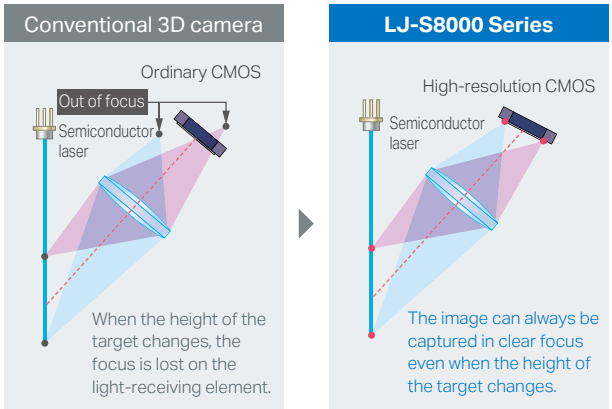
Motor-Driven Scanning Detection Method

The LJ-S Series utilises a one-of-a-kind design that allows for scanning of parts by moving the components internally and eliminating the need to move the part of sensor head. This not only makes installation a breeze, but also creates a large depth of field.



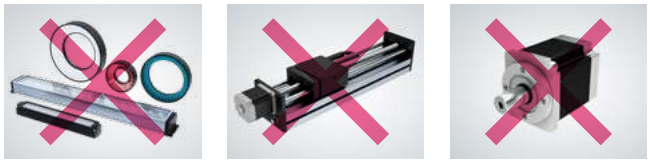
Large Depth of Field with Zero Focus Adjustment Needed

The advanced optical system ensures clear focus throughout the measurement range. This means that regardless of target height, the measurements and image stay in focus.



No Lighting, Motion, or Encoders Needed

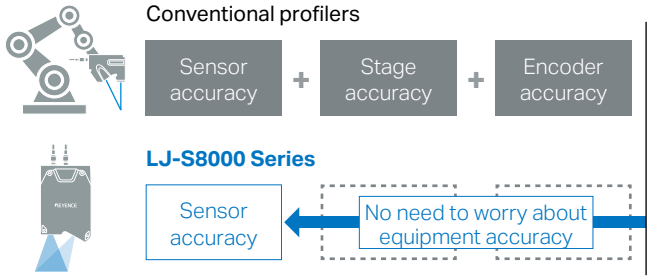
The built-in laser light source and scanning mechanism eliminate the need for lighting, stages, encoders, or other auxiliary parts. This dramatically reduces installation costs and time associated with setting up these devices. Inspections can be performed simply by mounting the device and setting up the program in 3 easy steps.



No lighting required　No stage required　No encoder required

Simplified Setup Helps Maintain Accuracy

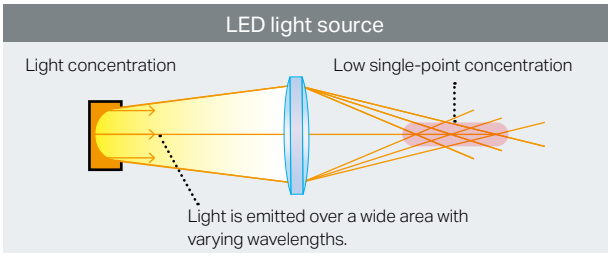
With conventional systems, selecting an inspection machine meant thinking about not only the accuracy of the sensor but also any potential problems with the encoder, electronic stage, or robot needed to move the sensor. The LJ-S8000 Series' built-in scanner ensures high-accuracy inspection without having to worry about auxiliary equipment accuracy, as that additional equipment has been eliminated.



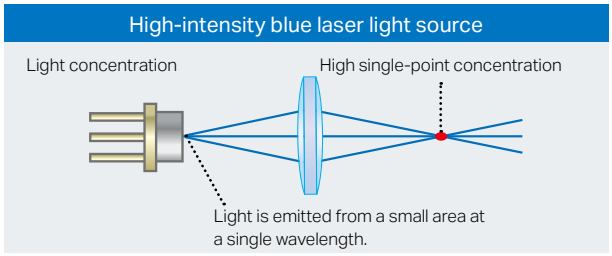
Stable Inline Inspection Regardless of Colour or Surface Finish

High intensity blue laser

Conventional vision systems generally use LED light sources for illumination. The high light concentration and sharp image-forming beam of the high-intensity blue laser used in the LJ-S8000 Series allow for an increased amount of received light, improving detection performance and measurement accuracy, while also ensuring greater ambient light resistance.



The wide emission area and multiple wavelengths of the LED light source results in increased lens aberration, preventing the light from being focused on a single point and lowering the density of light at the focal point.



The small emission area and single wavelength of the blue laser light source allows light to be focused on a single point, increasing the light concentration at the focal point.

Single-shot HDR

The profiler is equipped with an ultra-high-sensitivity CMOS receiving element featuring KEYENCE's single-shot HDR function. This provides the sensor with a dynamic range wide enough to reliably measure targets with multiple surface types (or areas of low reflectance and high reflectance) in a single shot.

The Single-Shot HDR function enables highly accurate measurement even of targets that are difficult to measure with conventional models.



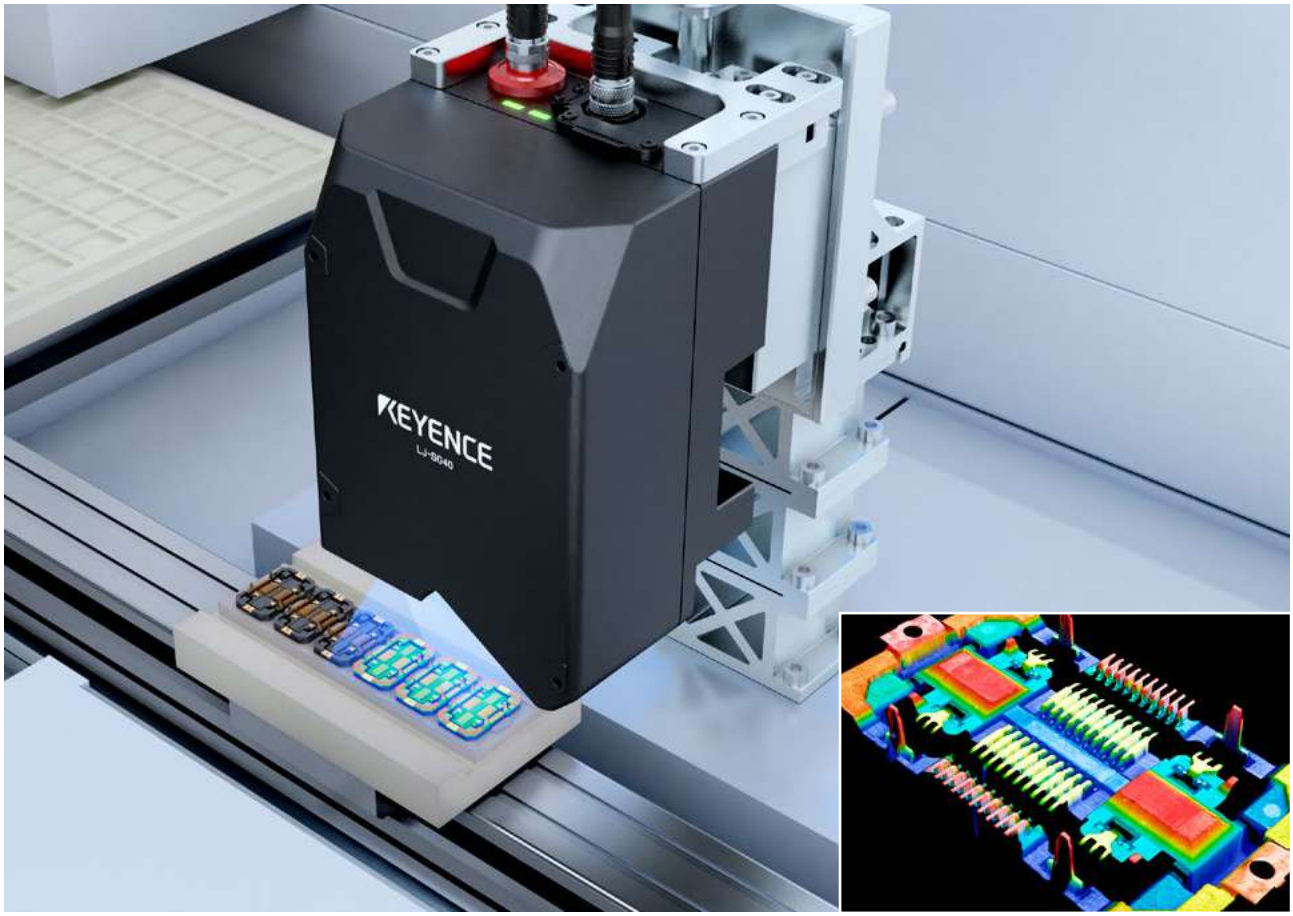
Milky white resin　Metal mirror-finished surface　Multiple reflective surfaces　Black rubber

Versatile Applications

3D Dimensional Measurement

A wide variety of measurement tools are available in addition to height and flatness, including position, width, area, volume, angle, and GD&T tools.

Connector terminal coplanarity measurement

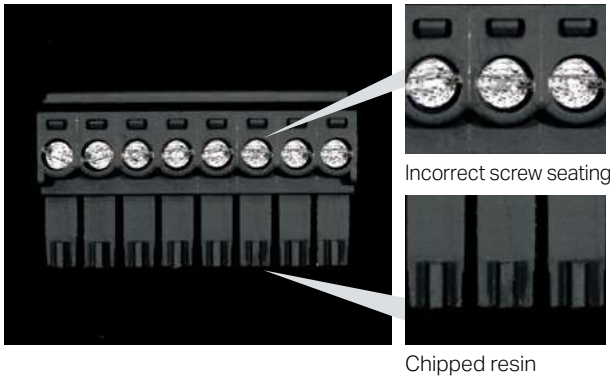


X, Y, and Z information with a single device

Inspections are performed not only with the contrast information but with the height information as well, enabling stable measurements and detection.

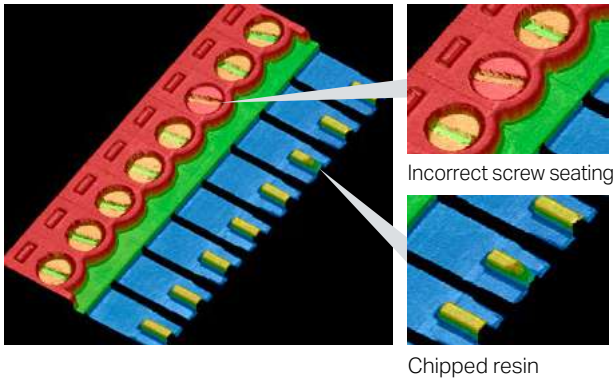
Conventional method: Vision camera

Determining defects and height is difficult using only a camera aimed from above the target.

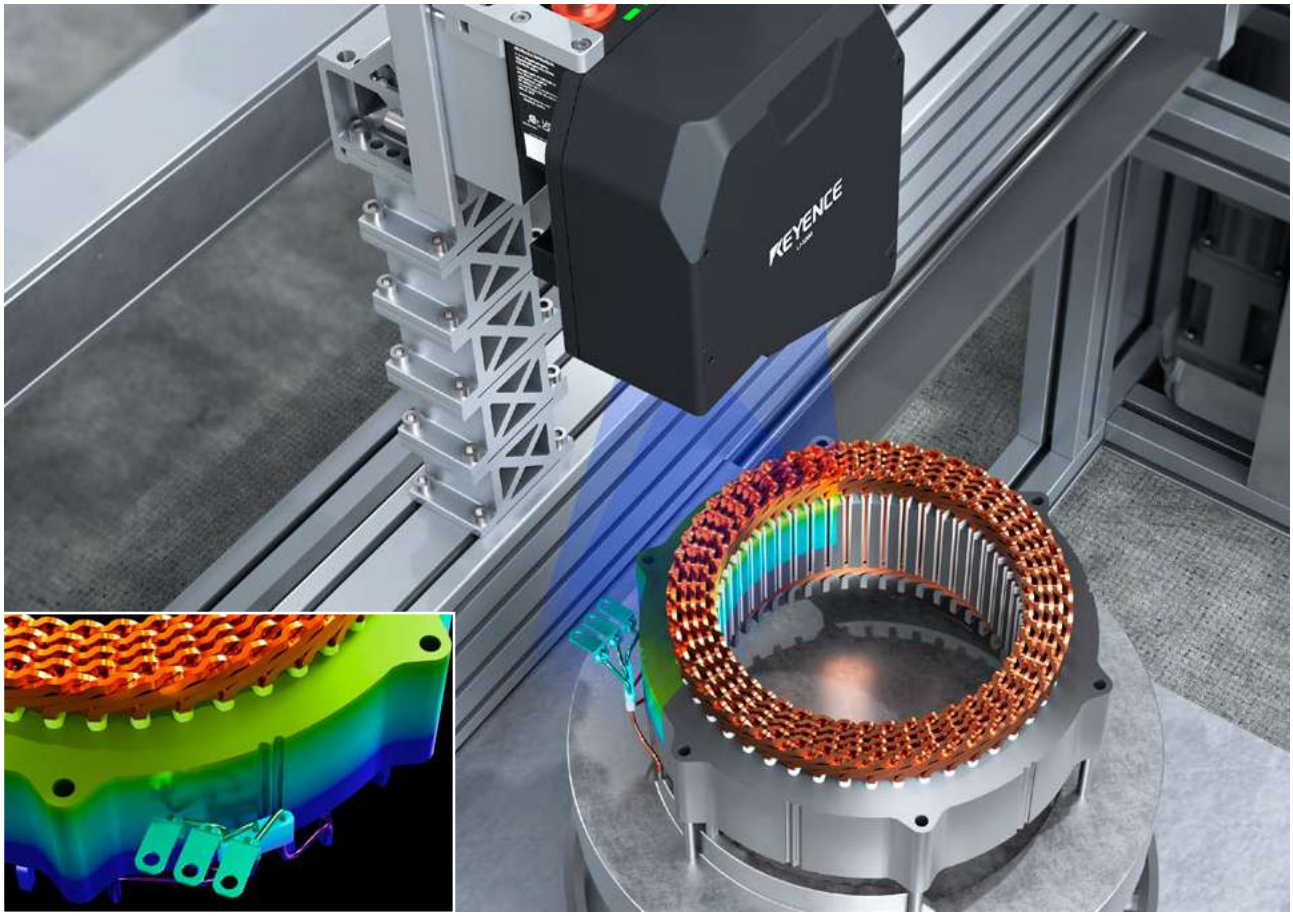


3D inspection

The addition of Z-direction data enables recognition of 3D shapes for easy judgement based on height.

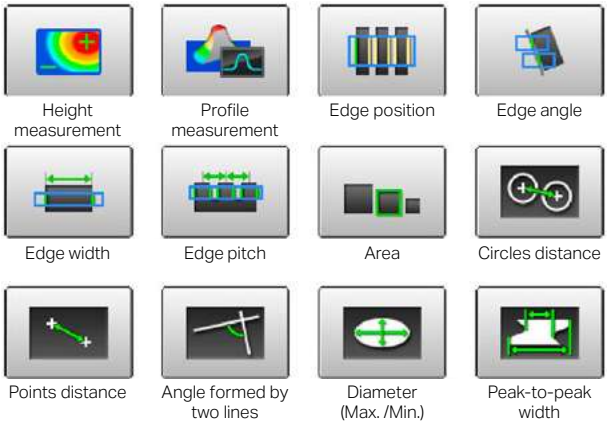


3-phase stator terminal height and position measurement



Intuitive inspection tools

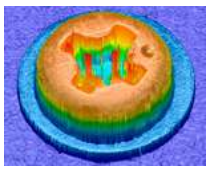
Adding inspection tools is simple and easy with a wide variety of tool options and visual icons for simple selection.



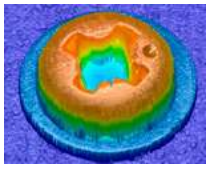
NEW FUNCTION

Stray Light Control function

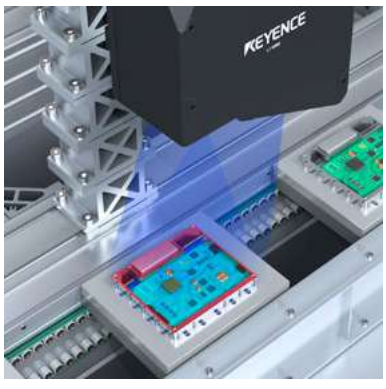
With conventional systems, inspection of uneven shapes with glossy metal surfaces is often affected by stray light from the multiple reflective surfaces and scattered light. The new Stray Light Control function minimises the effects of stray light so accurate shape images can be captured.



Stray light control OFF



Stray light control ON



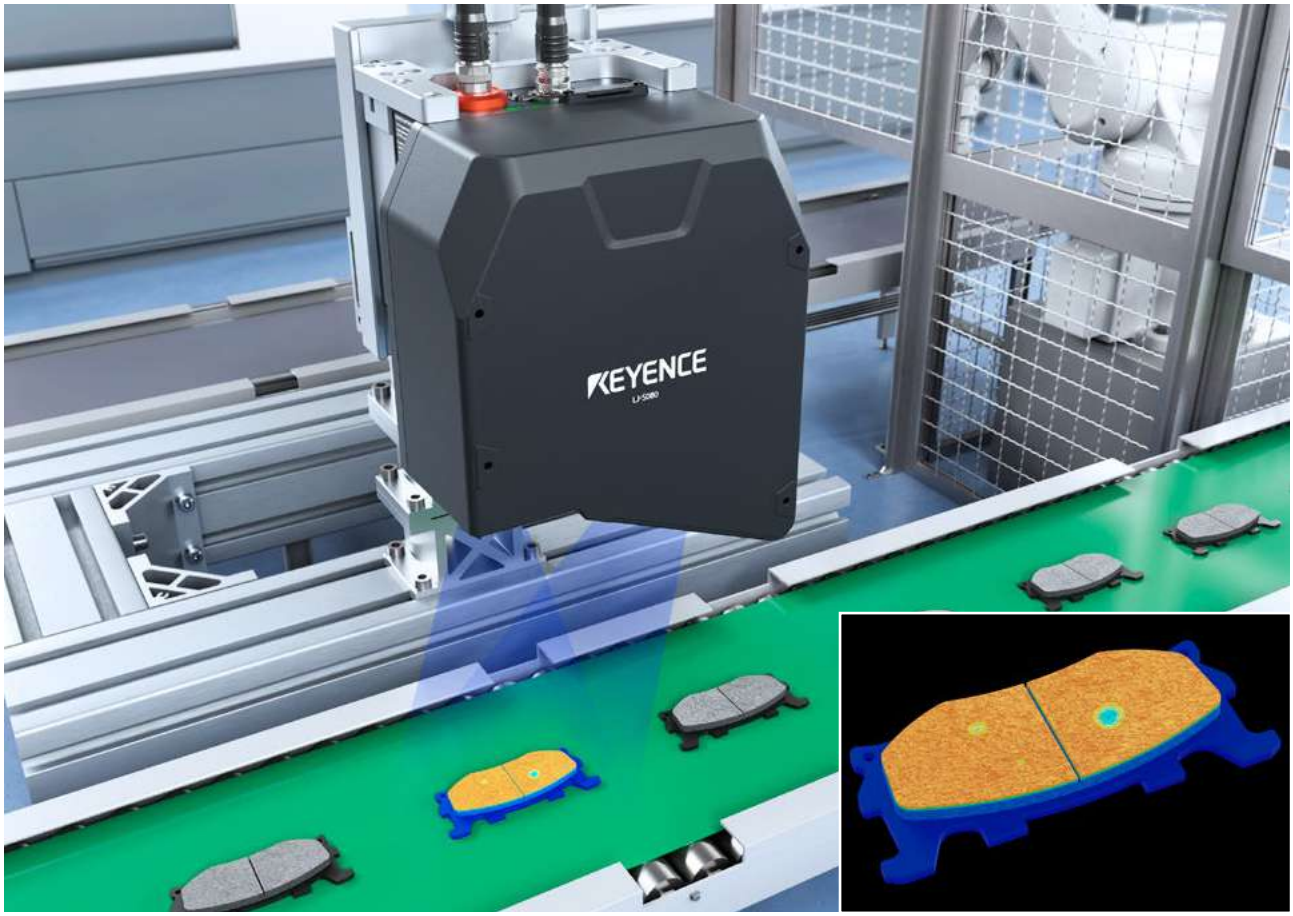
ECU PCB screw tightening height inspection

Versatile Applications

3D Appearance Inspection

Various tools for inspecting welding defects, incorrect sealant application, dents, and other defects are available.

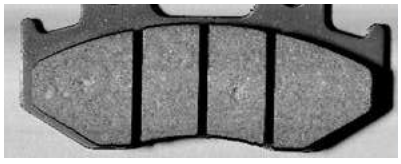
Brake pad dent inspection



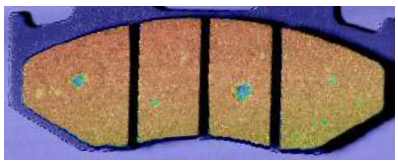
Reliable detection on patterned surfaces

Height-based images are created by scanning the target and using colour to represent height changes.
Patterns or markings on the surface do not impact the height-based image, making it easy to detect indentations or other defects that would typically be impossible to identify.

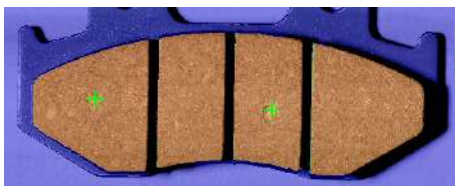




Greyscale image

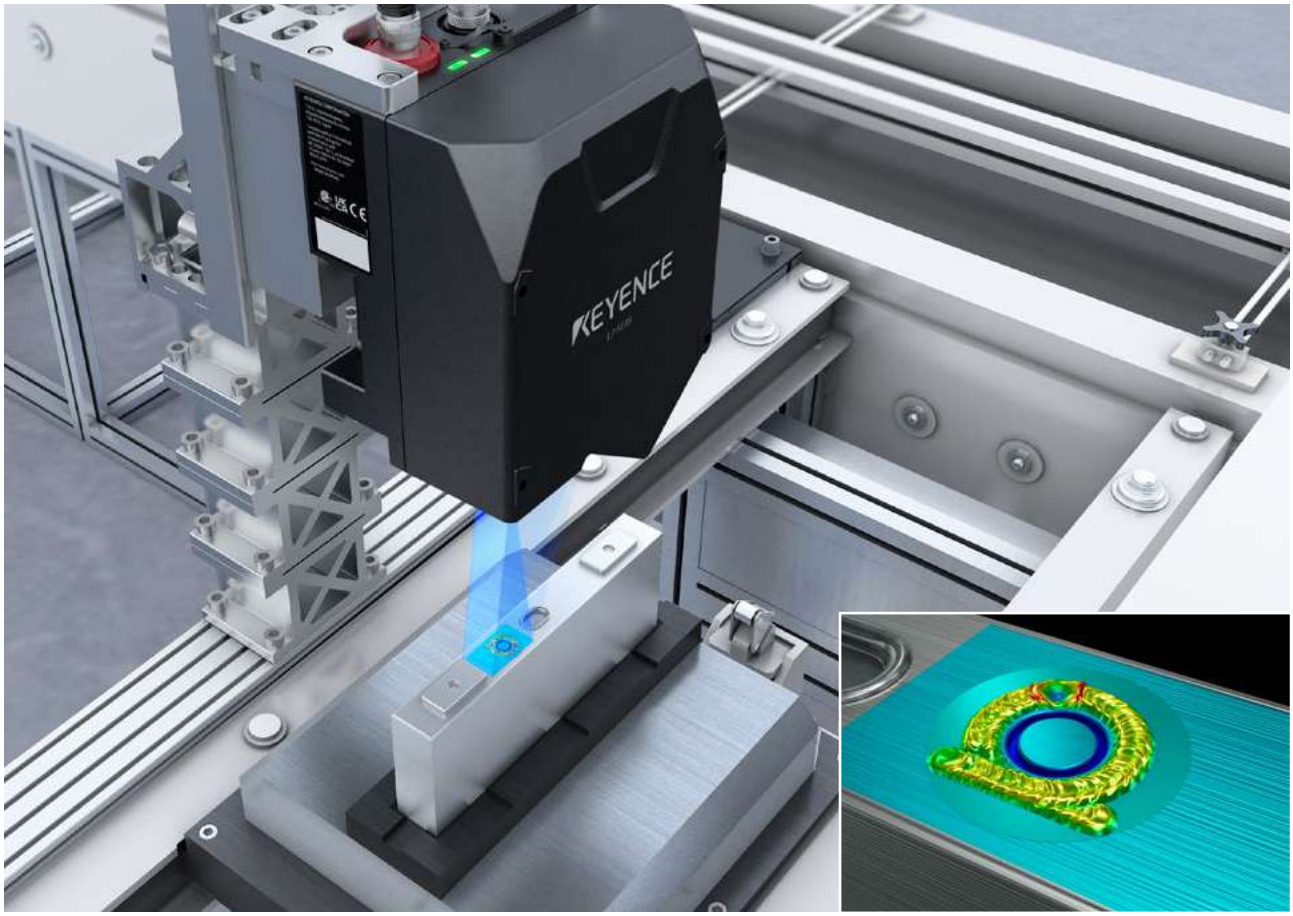


Height-based image



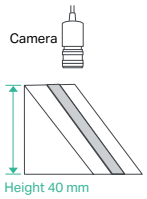
Defect/indent detection results

Inlet weld appearance inspection



Stable detection of targets with height differences

Clear images can be captured even when looking at targets with height variations or where the distance relative to the sensor could change. Stable detection over a large Z-range is possible, resulting in a more flexible and responsive inspection solution than a standard 2D camera.



When capturing inclined targets with a height difference of 40 mm

Image with tilting

Ordinary 2D camera



Out of focus

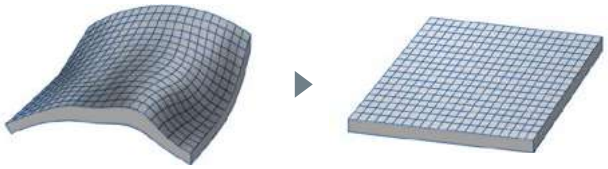
LJ-S8000 Series



Image captured clearly

Identify defects on uneven surfaces using free-form planes

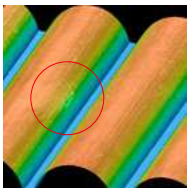
Free-form planes allow the system to pick up on deviations from the typical contour of a surface. This makes stable defect detection possible, even for targets with complex shapes.



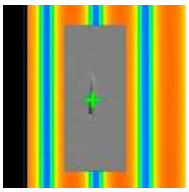
Defect inspection on a rubber curved surface



Picture of target



Height image



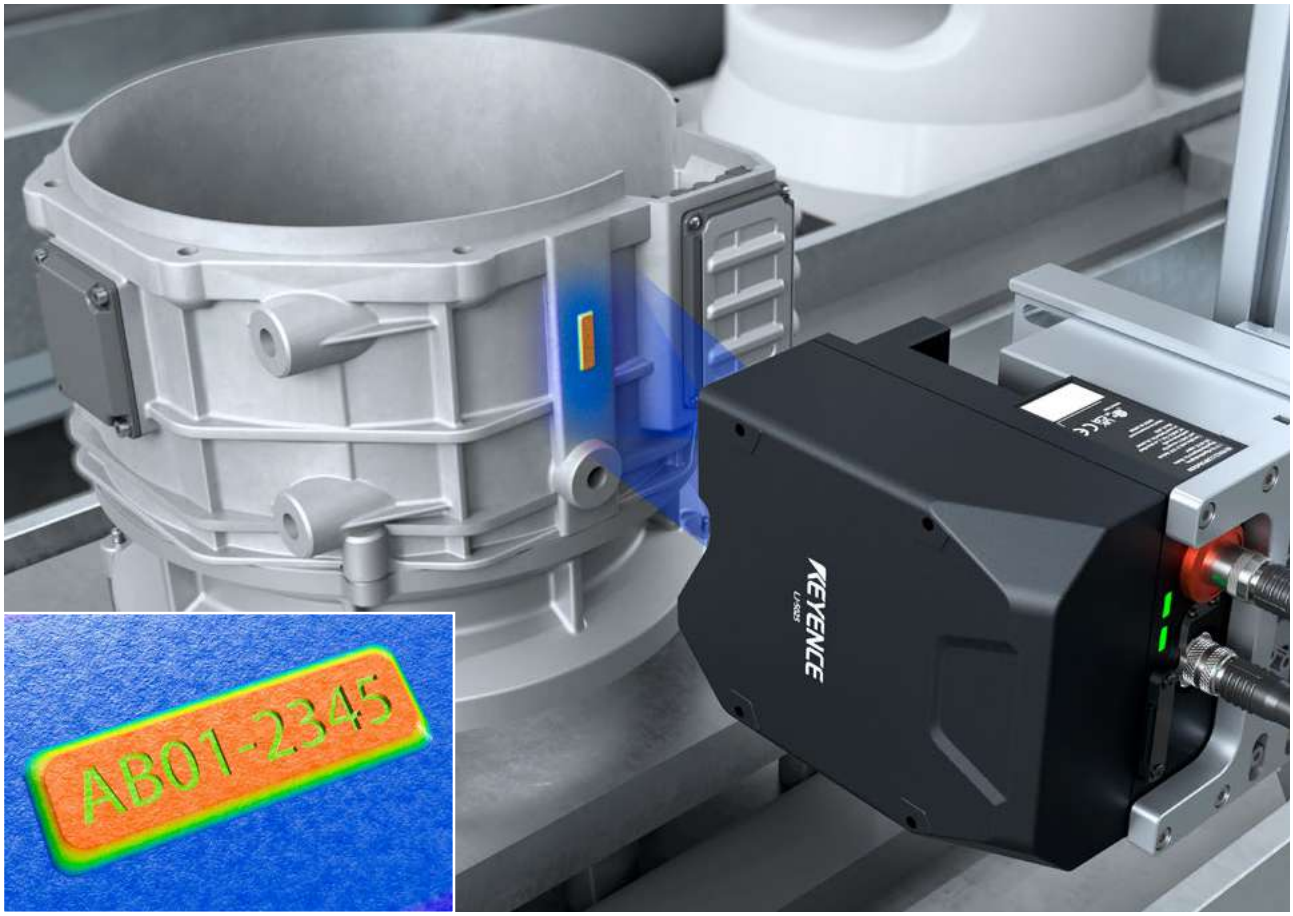
Flattened image to detect defect

Versatile Applications

3D Identification & Differentiation

The LJ-S8000 Series can be used for presence detection, counting, OCR, 2D code reading, and various other applications.

OCR and character depth inspection on motor cases



Stable OCR even on curved or uneven surfaces

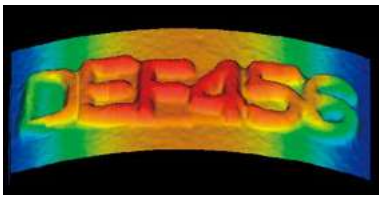
Height extraction

Greyscale images that highlight the necessary height information can be automatically generated using the 3D data, allowing for trouble-free use of conventional character recognition tools. Using this function together with flat surface or free-form surface extraction ensures stable inspection, even for targets that are difficult to accommodate with conventional vision systems.

Picture of target



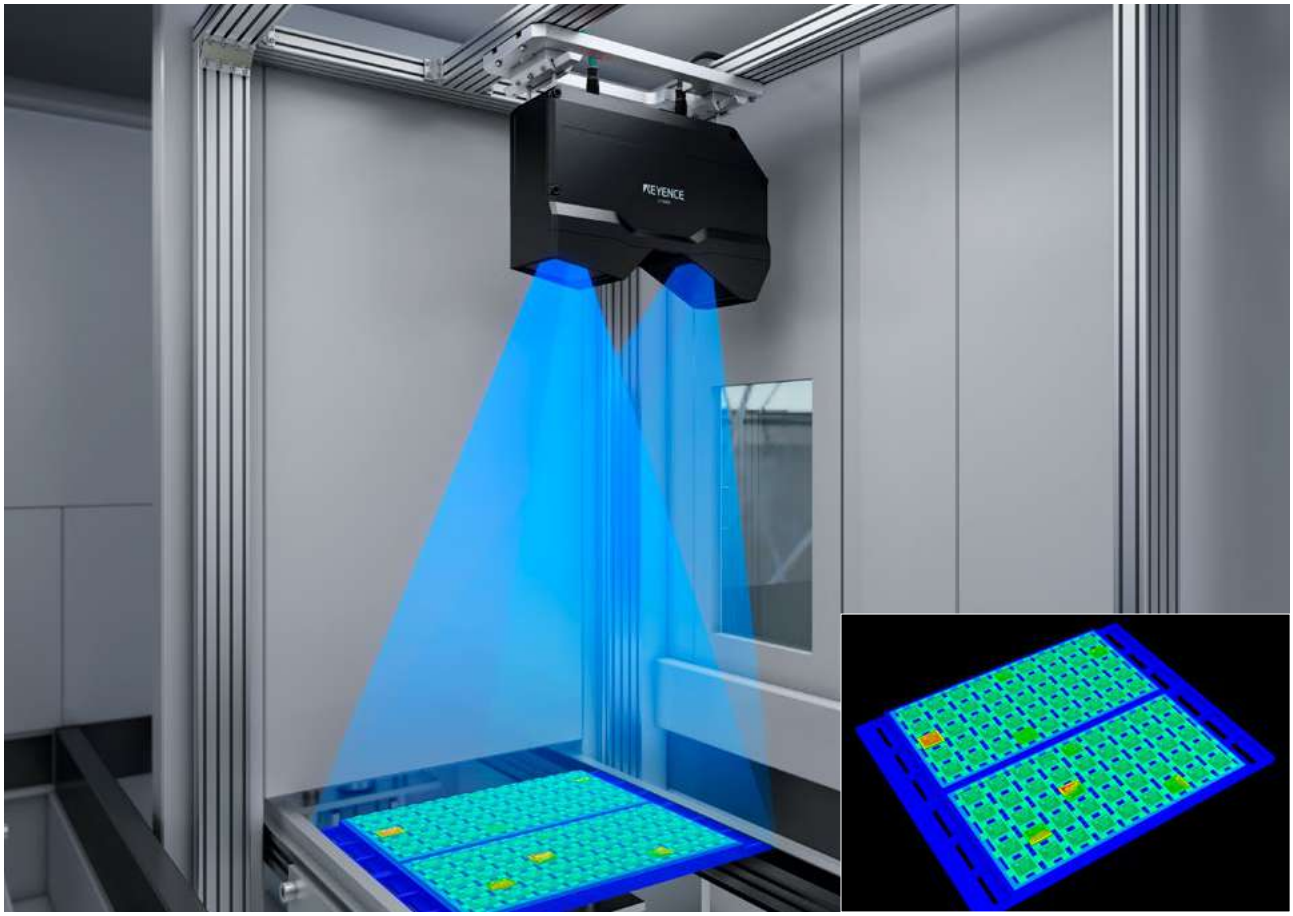
Height data



Detection image



IC chip seating, orientation, and OCR inspection



Shading inspection and 3D inspection in a single device

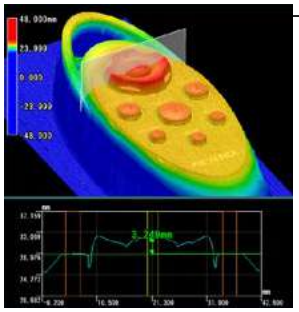
Simultaneous acquisition of greyscale images and height-based images

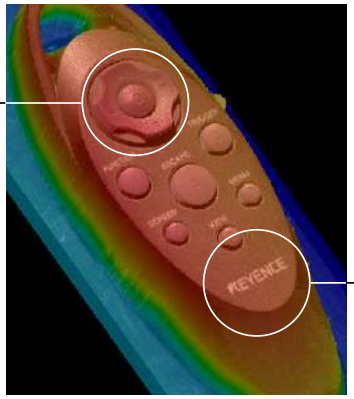
Both height and greyscale images can be captured at the same time. Height inspection can be performed simultaneously without having to change conventional greyscale inspection settings. This helps improve stability and enables support for a wider range of applications.



Height-based image

Height difference inspection based on the height data

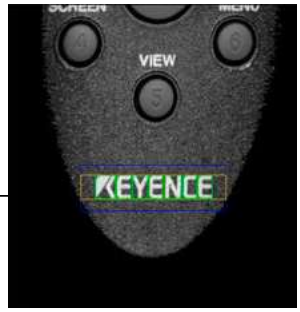




Simultaneous inspections

Greyscale image

Marking inspection based on the greyscale data

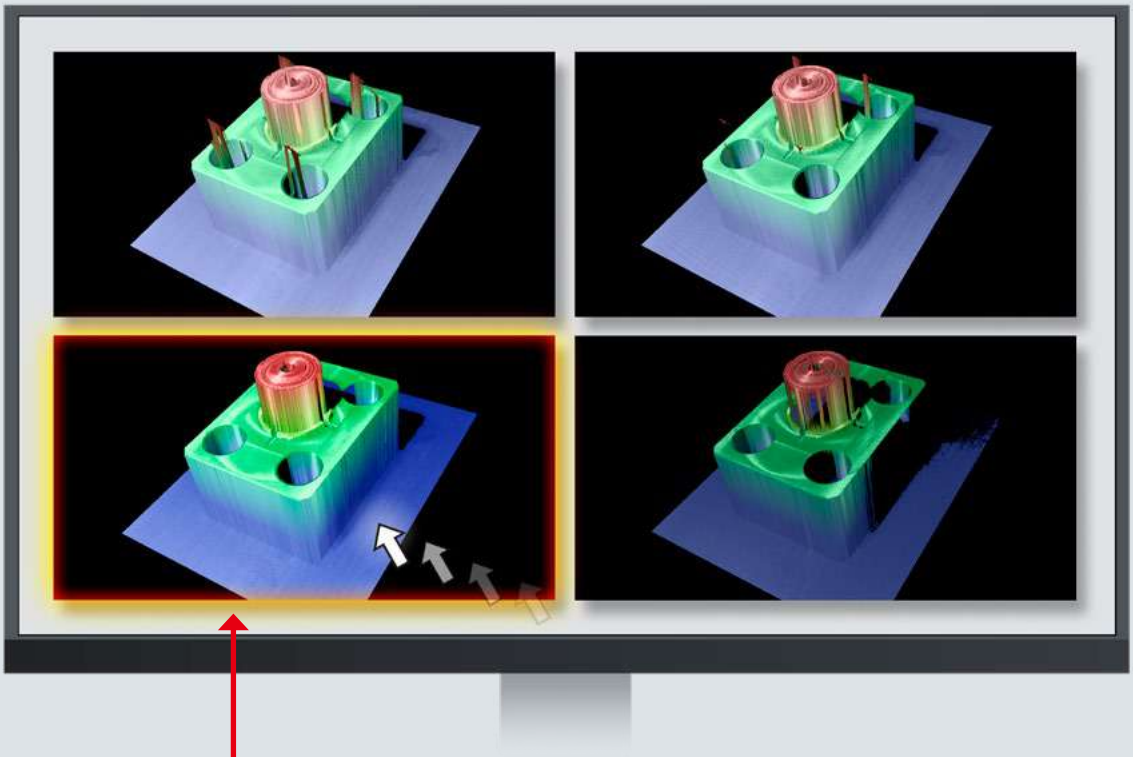


High Quality Images Have Never Been Easier to Obtain

Easy-to-use Imaging Navigation function—ideal settings achieved at the push of a button

With conventional systems, any time the conditions changed, targets had to be placed on the stage and the settings adjusted. With the LJ-S8000 Series, however, adjustment is as easy as selecting the image with the best image quality. This significantly reduces time spent on not only startup but also reconfiguring settings due to changes in the target.

Imaging Navigation function with automatic image display



Simply select the best image

Automatically see different setting results:
Simply choose the best 3D image three times to complete the settings.

Getting started with a conventional system

- Light intensity adjustment
- Target confirmation
- Re-adjust
- Target confirmation
- Noise reduction
- Target confirmation
- Reconfiguration of settings
- Target confirmation
- Filter settings
- Target confirmation
- Reconfiguration of settings
- Imaging settings complete

Settings configured with the LJ-S8000 Series Imaging Navigation function

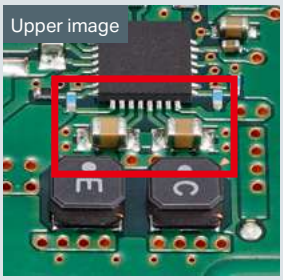
Significantly reduced setup time

- STEP 1 Image selection
- STEP 2 Image selection
- STEP 3 Image selection
- Imaging settings complete

Tilt Correction Ensures Stable Detection

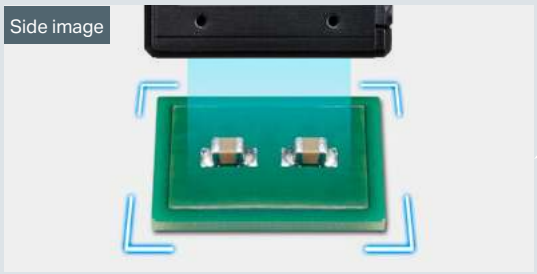
Height inspection of PCB-mounted parts

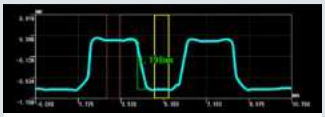
Any variation in part presentation, such as angle or tilt, is automatically corrected to produce stable profile measurements.



Height inspection of PCB-mounted parts

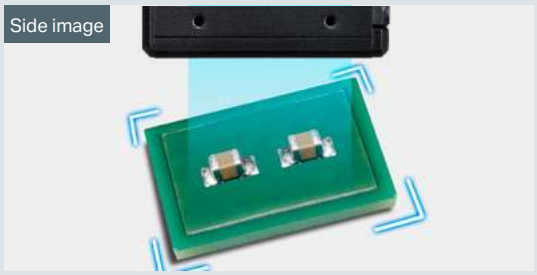
A target that did not become misaligned or tilted during transportation



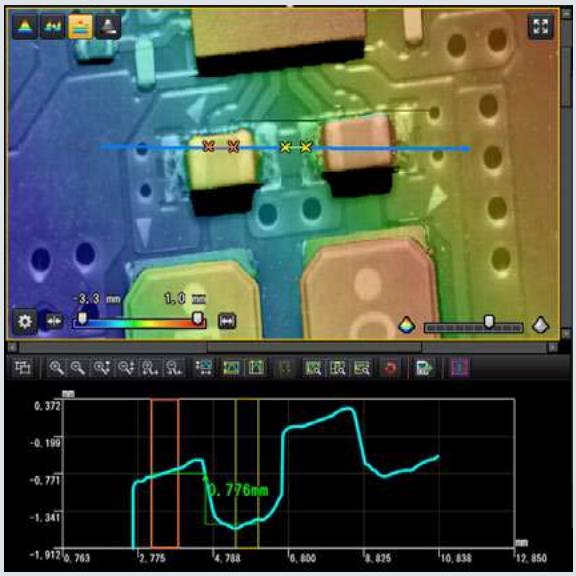


The profile can be accurately extracted.

A target that became misaligned and tilted during transportation

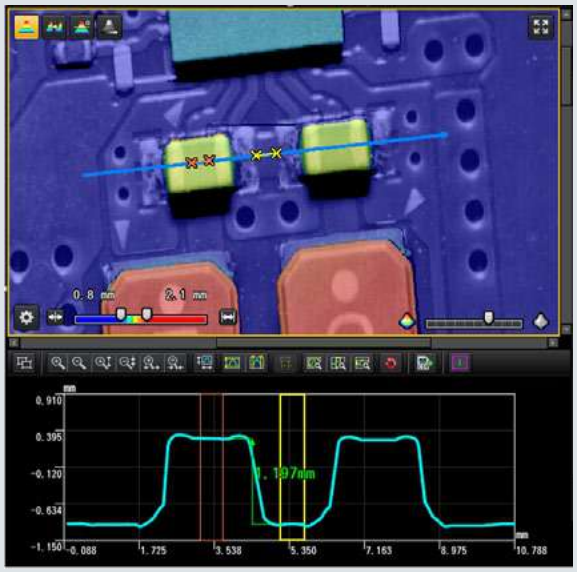


Conventional models



If a PCB is misaligned or tilted, measurements and inspection cannot be performed correctly.

3D position correction with LJ-S8000



The LJ-S8000 Series detects target position shifts and tilt, then automatically performs position corrections, ensuring stable inspection.

Advanced controllers provide maximum inspection capability

"XG-X Series" offers enhanced image processing and functionality XG-X2900LJ

The XG-X Series offers an advanced set of tools for programming 3D inspections. This platform enables users to complete fully customised measurements and inspections using the 3D image generated by the LJ-S sensor head.



Head

Controller **XG-X2900LJ**

Input unit **CA-E300LJ**

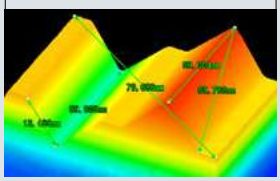
PC configuration software "VisionEditor"

Simply select the desired target and location to perform 1,000+ complex measurements and inspections

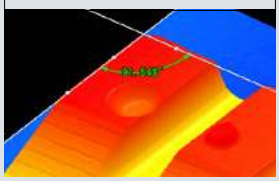
Conduct dimensional inspections that take all XYZ surfaces into account, including height, distance, tilt, and angle. The software provides visual feedback, enabling easy confirmation that the measurement tools function as intended, even for complex shapes.

3D geometry

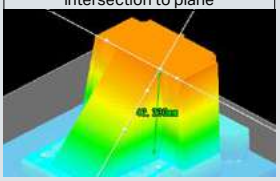
Distance



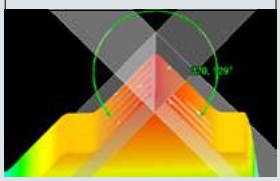
Line-to-line angle



Distance from line intersection to plane



Plane-to-plane angle

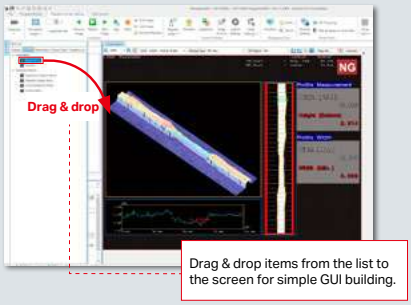


Calculation target	Calculation method
Distance	• Points distance • Point/line distance • Point/plane distance • Lines distance
Angle	• Line/line angle • Line/plane angle • Plane/plane angle
Point	• Point • Two lines intersection • Line/plane intersection • Point between two points • Point between point/line • Point between point/plane • Intersection with dropped perpendicular line from point to line
Line	• Lines • Line linking two points • Point/line centre line • Line projected on to a plane • Plane/plane intersection
Plane	• Planes • Central plane between points • Central plane between point/plane • Plane made by point and line • Plane made by two lines
Sphere	• Spheres

Full customisation of user interface

Custom display screens

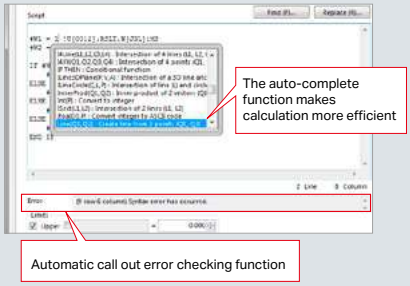
Displays can be optimised with the most relevant images and result data to help operators quickly assess what is happening with the process. During creation, elements can be dragged and dropped into place, making display creation easy. Displays can include anything from measurement data, profile views, and even images of the most recently failed part.



Complex Programming Made Simple

Versatile calculations with variables and scripting

The XG-X offers the flexibility to handle nearly any inspection. Custom calculations can be written to supplement the built-in tools for measurement and inspection. Developers can efficiently create scripts using auto-complete and drag-and-drop functions to quickly reference existing tools while receiving immediate feedback from the error checking function. Additionally, commands and tools can include variables, making it possible to create programs that are flexible and can adapt to many different situations.

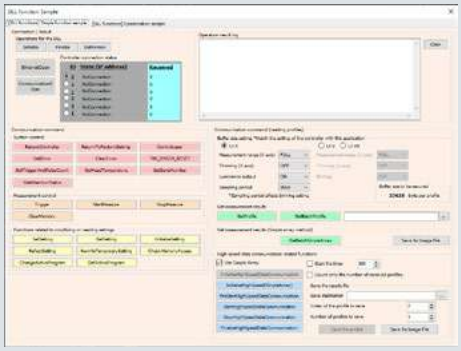


Sensor heads can be connected directly to PCs for use with custom programs or external software



Compatible with various programming languages

Sample programs are available with a comprehensive list of commands for obtaining profile data, issuing triggers, changing various settings, and so on. Sample programs with a wide variety of commands—including 3D data acquisition, trigger generation, and setting changes—and programs for saving in CSV and TIFF formats are available.



• Windows

C#	C++	VB.NET	Python

• Linux

C++	Python

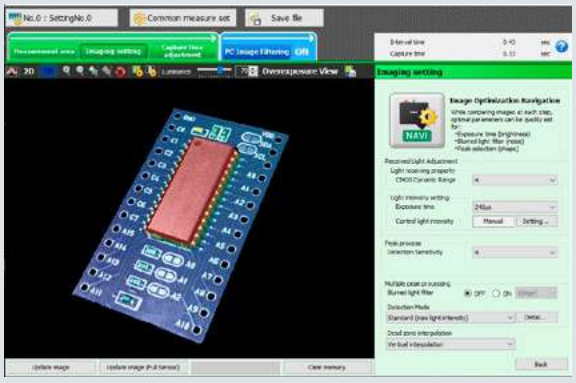
Extensive driver support

HALCON	VisionPro	LabVIEW	Cognex Designer	Aurora Design Assistant*

* Conventional Matrox Design Assistant

Two types of dedicated software included

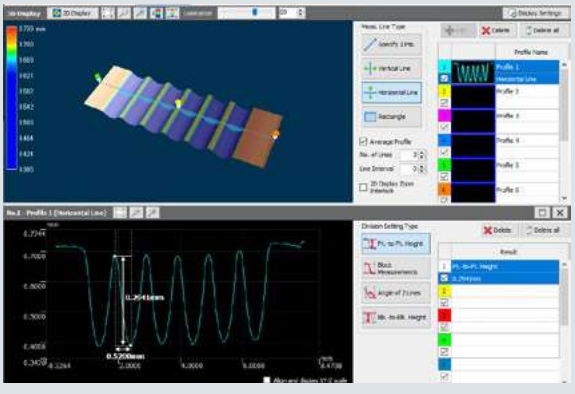
LJ-S Navigator



Optimise capture settings

Adjust capture settings, such as exposure time or sensitivity, while viewing the image to easily ensure performance.

LJ-S Observer



Easy analysis of measurement data

Measured data can be analysed immediately. Measurement results can be verified before a custom program is created.

Applications

Inline 3D Inspection Examples: Installation examples with no additional equipment needed

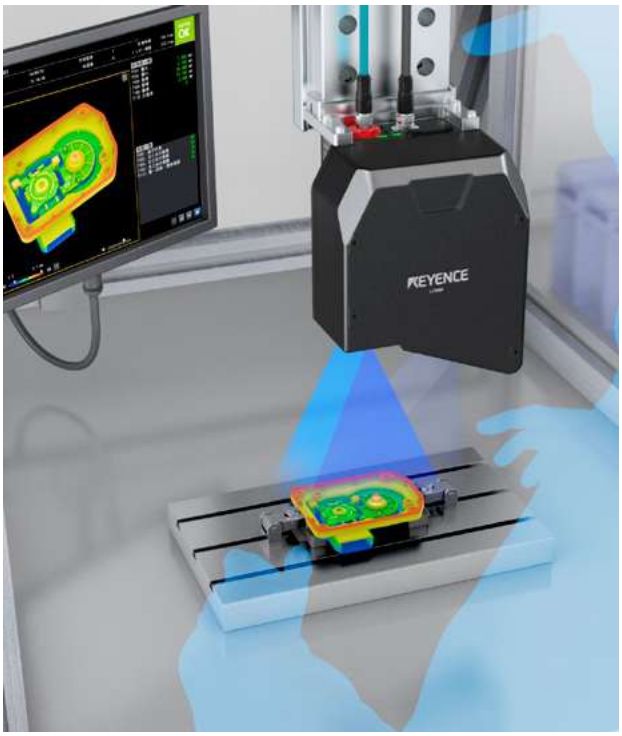
Index table

Inspections can be completed with only short, temporary target stoppage. The LJ-S Series can be easily attached to existing equipment without any additional devices needed.



Stand-alone inspection

Automatic target position and angle detection make inspection possible when simply placing the target down by hand.



Robot mountable

Installing the LJ-S Series on a robot allows for inspection at any angle or location without having to worry about robot vibrations or linearity due to the high inspection stability.



Fixed-pitch transfer feeder

Inspections can be completed with only short, temporary target stoppage, enabling easy 3D inspections on existing equipment lines.



Inspection of any target thanks to a maximum field of view of 640 × 640 mm

Significantly reduce inspection time for inline or near line inspections, especially when multiple varieties of parts are included, by utilising 3D analysis. With the Position Adjustment function, inspection is as easy as placing the target anywhere within the measurement range, regardless of orientation.

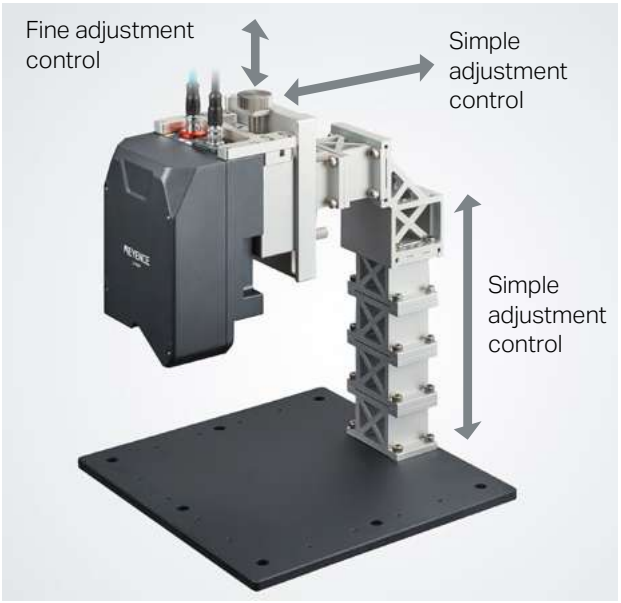


Scan the code for in-depth documentation

Optional jigs for easy installation



KEYENCE's optional jigs make installation on existing equipment incredibly easy. Take advantage of stress-free installation by using attachments that simplify installation significantly.



Dedicated stands are also available for quickly enabling inspection. In addition to easy adjustment of the installation height and length according to the target location, the highly rigid design also ensures safe on-site usability.

Advantages of 3D Inspection

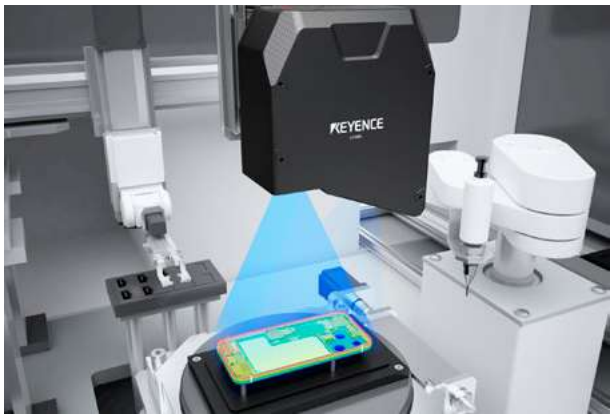
A single device for a variety of inspection needs

With the LJ-S Series, inspections requiring a combination of various displacement sensors, cameras, and other devices can be performed with a single system.
This helps reduce the space needed compared with conventional systems utilising multiple inspection methods.

Conventional models



LJ-S8000 Series



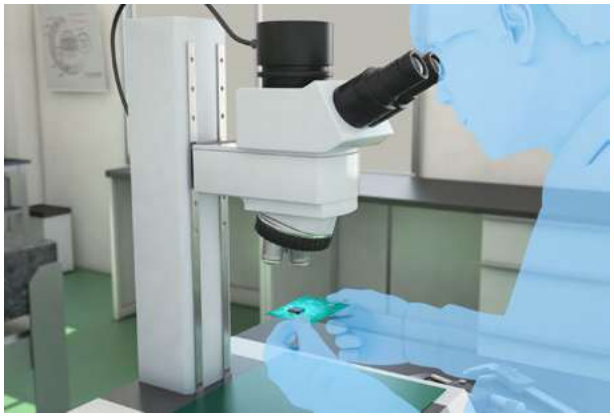




From offline inspection to 100% inline inspection

The LJ-S8000 Series enables 100% inline inspection even for items previously handled through visual inspections or sample inspections with calipers and micrometers.
Automated 3D inspection is also possible for all conventional inspection tasks.

Conventional models



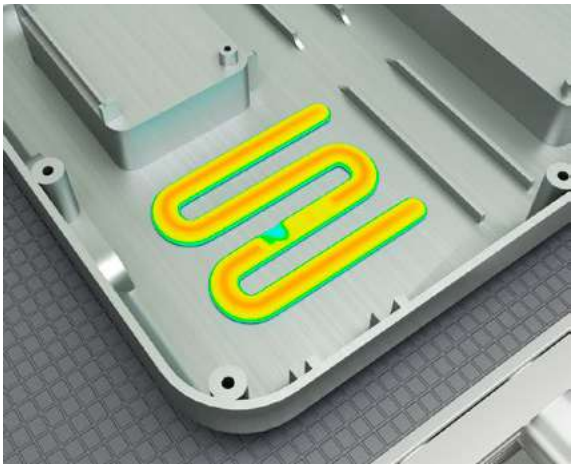
LJ-S8000 Series



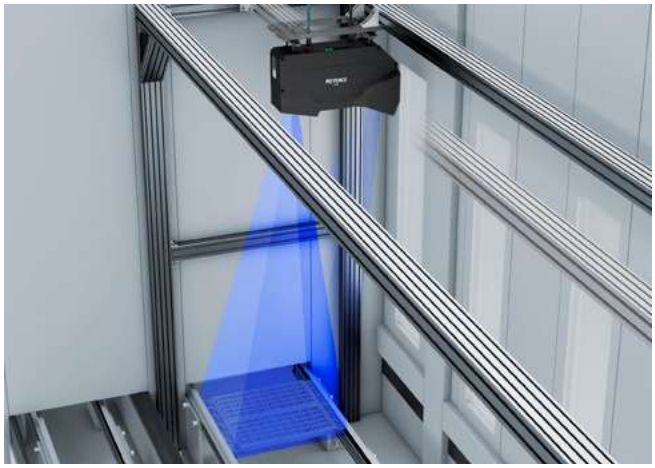
Electrical/Electronic Devices

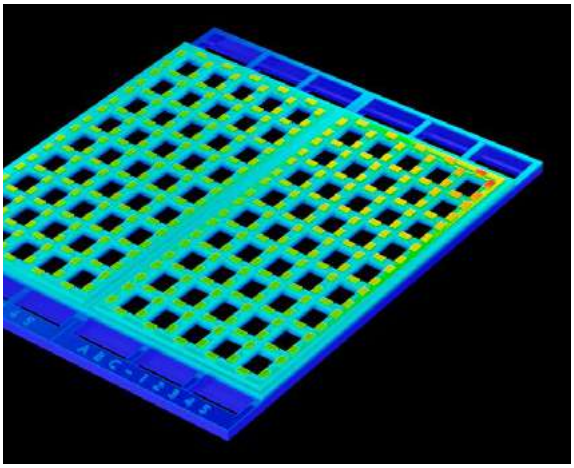
Heat dissipation material (gap filler) width, height, and volume inspection



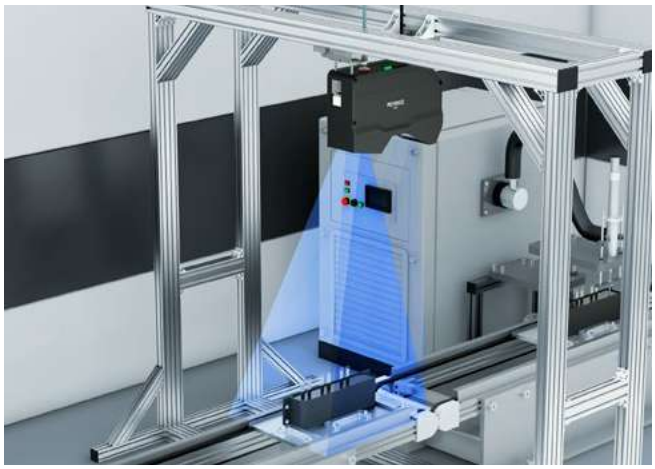


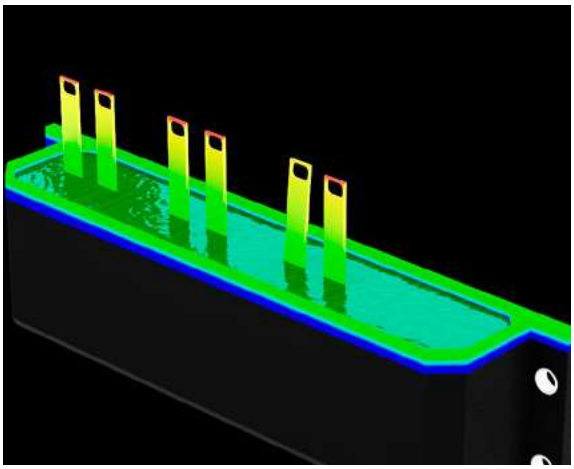
Chip transport tray warpage inspection





Resin fill volume and terminal position inspection for automotive capacitors



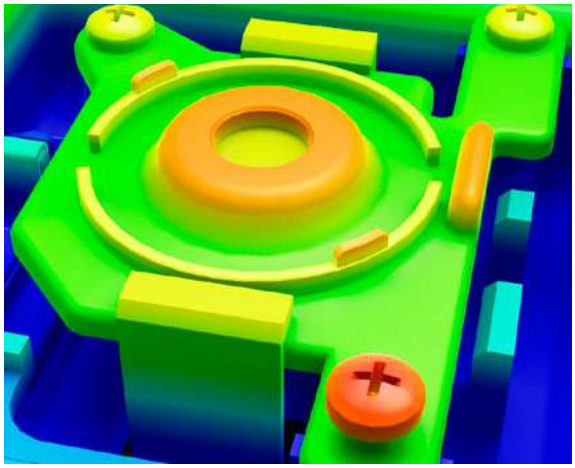


Advantages of 3D Inspection

Automobiles/Metals

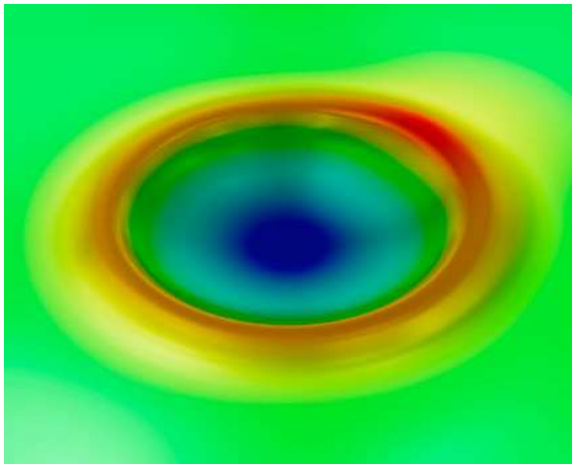
Screw seating inspection for plastic moulded products





Spot welding depth



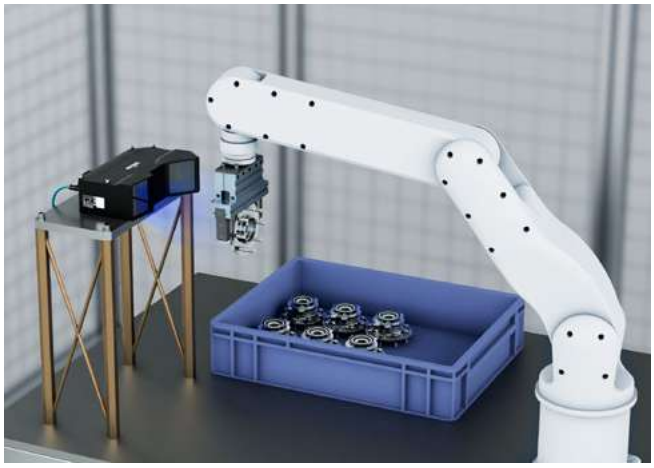


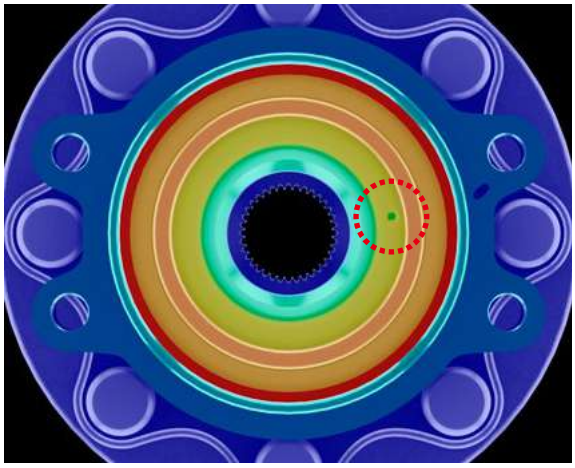
Character recognition (OCR) on die-cast parts



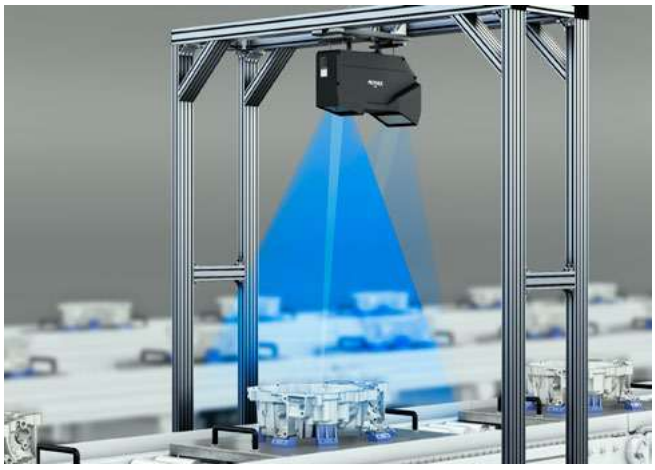


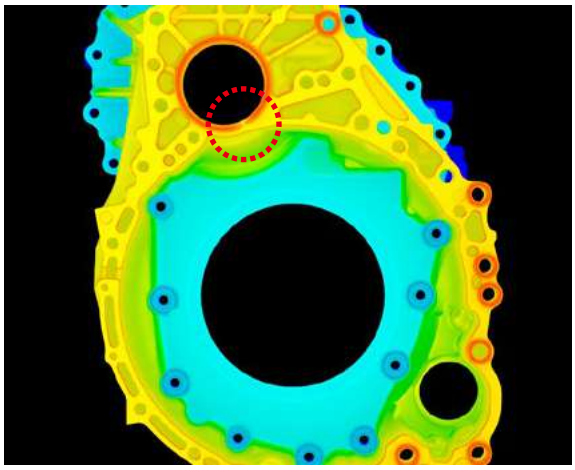
Hub unit assembly and appearance inspection



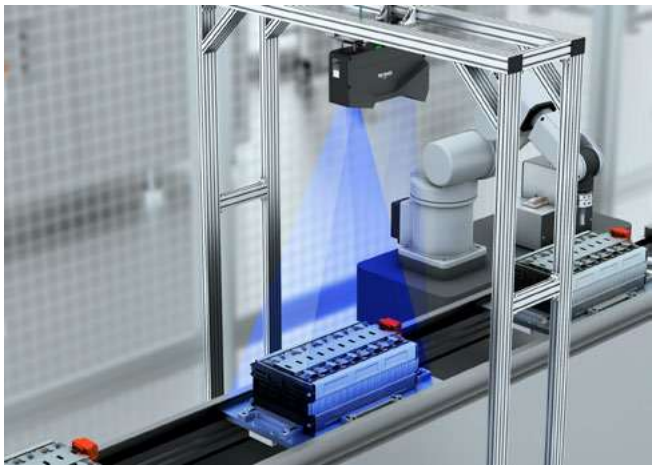


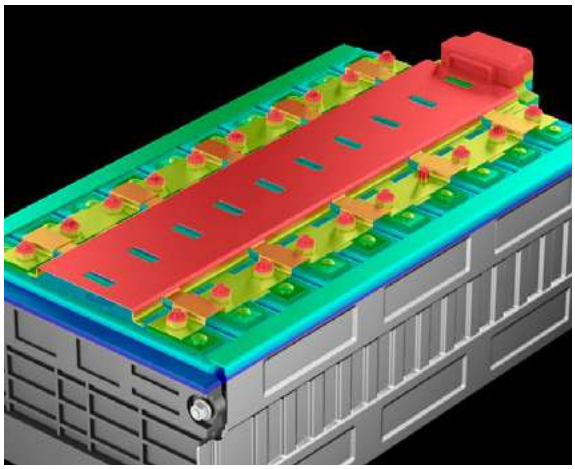
Material application inspection on die-cast automotive components





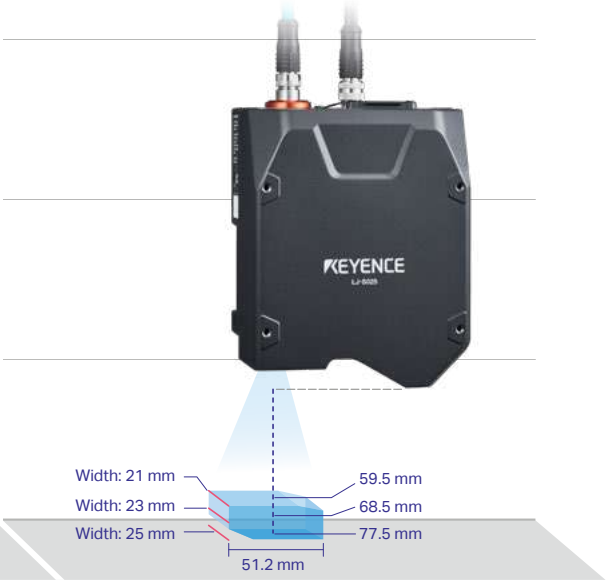
Battery module bolt XYZ position inspection





Sensor head lineup

Sensor heads

	LJ-S015	LJ-S025
		
Measurement range	Z-axis (height) 56.5 ±4 mm X-axis (width) 15 mm Y-axis (length) 25 mm	Z-axis (height) 68.5 ±9 mm X-axis (width) 23 mm Y-axis (length) 51.2 mm
Repeatability	Z-axis (height) 0.3 µm XY (distance) 0.5 µm	Z-axis (height) 0.4 µm XY (distance) 0.7 µm



Required



Head Ethernet cables
OP-88835 (2 m)
OP-88836 (5 m)
OP-88837 (10 m)
OP-88825 (L-shaped/0.2 m)



Head power supply I/O cables
OP-88949 (2 m)
OP-88950 (5 m)
OP-88951 (10 m)
OP-88826 (L-shaped/0.2 m)

Required

Connecting to a controller



Controller
LJ-S8000



XG-X Series Dedicated LJ Series Connection Controller
XG-X2900LJ



Dedicated XG-X2900LJ LJ-S Input Unit
CA-E300LJ

Connecting directly to PC



PC

* The XG-X2900LJ must be used together with the CA-E300LJ.

Monitor

12" LCD colour monitor
CA-MP120



CA-MP120 monitor stand
OP-87262



CA-MP120 pole-mounting bracket
OP-42279



RGB monitor cable
OP-66842 (3 m)
OP-87055 (10 m)



Communication cables

Extension I/O cable
OP-51657 (3 m)

Communication cable conversion connectors
OP-26486 for 9-pin
OP-84384 for 9-pin SYSMAC
OP-86930 for 9-pin MELSEC

* Use the OP-26486 for 9-pin when connecting the MELSEC FX.

RS-232C communication cable
OP-26487 (2.5 m)

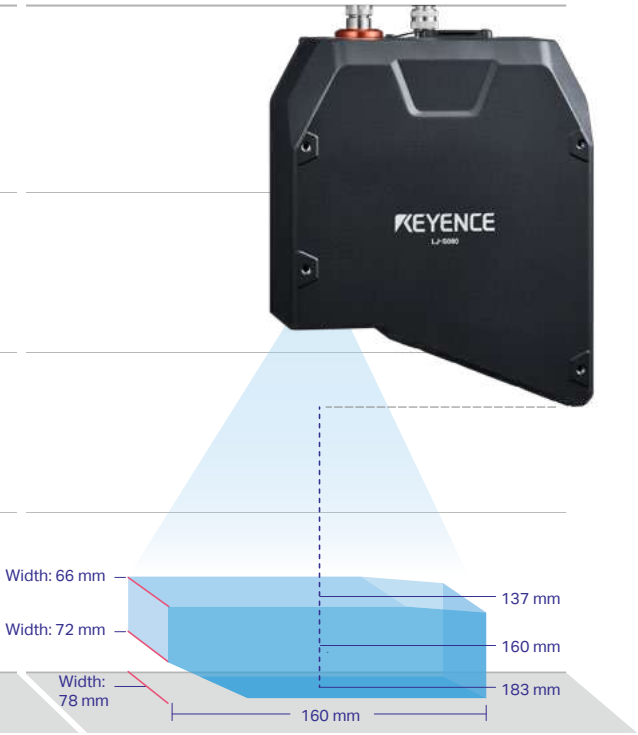
Ethernet cable
OP-66843 (3 m)

USB cable
OP-66844 (2 m)

LJ-S040



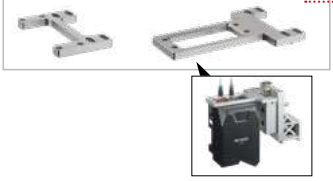
LJ-S080



		LJ-S040	LJ-S080
Measurement range	Z-axis (height)	70 ±18 mm	160 ±23 mm
	X-axis (width)	35 mm	72 mm
	Y-axis (length)	80 mm	160 mm
Repeatability	Z-axis (height)	0.5 µm	1 µm
	XY (distance)	1 µm	3 µm

Dedicated stand (Designed for LJ-S015/025/040/080/160)

Dedicated for LJ-S015/025/040/080
Mounting plate A **OP-88960**
Mounting plate B **OP-88961**

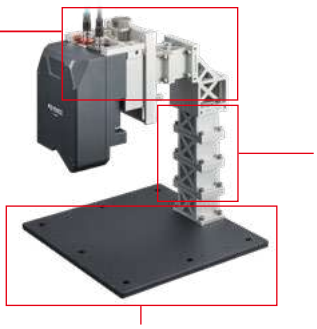


Dedicated for LJ-S160
Mounting plate C **OP-89041**
Mounting plate D **OP-89042**



Adjuster **OP-88956**





Base plate **OP-88957**

Blocks: 1 **OP-88958**



Blocks: 3 **OP-88959**



* Height of 1 block = 50 mm

Aluminium frame mounting jigs

For Any Sensor Heads
Adjuster **OP-88956**

For more detail

Dedicated for LJ-S015/025/040/080
Mounting plate A **OP-88960**
Mounting plate B **OP-88961**

Dedicated for LJ-S160/320/640
Mounting plate C **OP-89041**
Mounting plate D **OP-89042**



Mounting rail set **OP-89040**



Expansion units



EtherCAT® unit
CB-NEC20E
(for LJ-S8000)
CA-NEC20E
(for XG-X2900LJ)



PROFINET module
CB-NPN20EA
(for LJ-S8000)
CA-NPN20E
(for XG-X2900LJ)



EtherNet/IP™ module
CB-NEP20E
(for LJ-S8000)
CA-NEP20E
(for XG-X2900LJ)

EtherCAT® is a registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.

Other

SD cards (industrial-grade)
16 GB **CA-SD16G**
4 GB **CA-SD4G**
1 GB **CA-SD1G**
512 MB **OP-87133**

Dedicated mouse
OP-87506
Mouse stand
OP-87601

* The mouse is included with the controller.

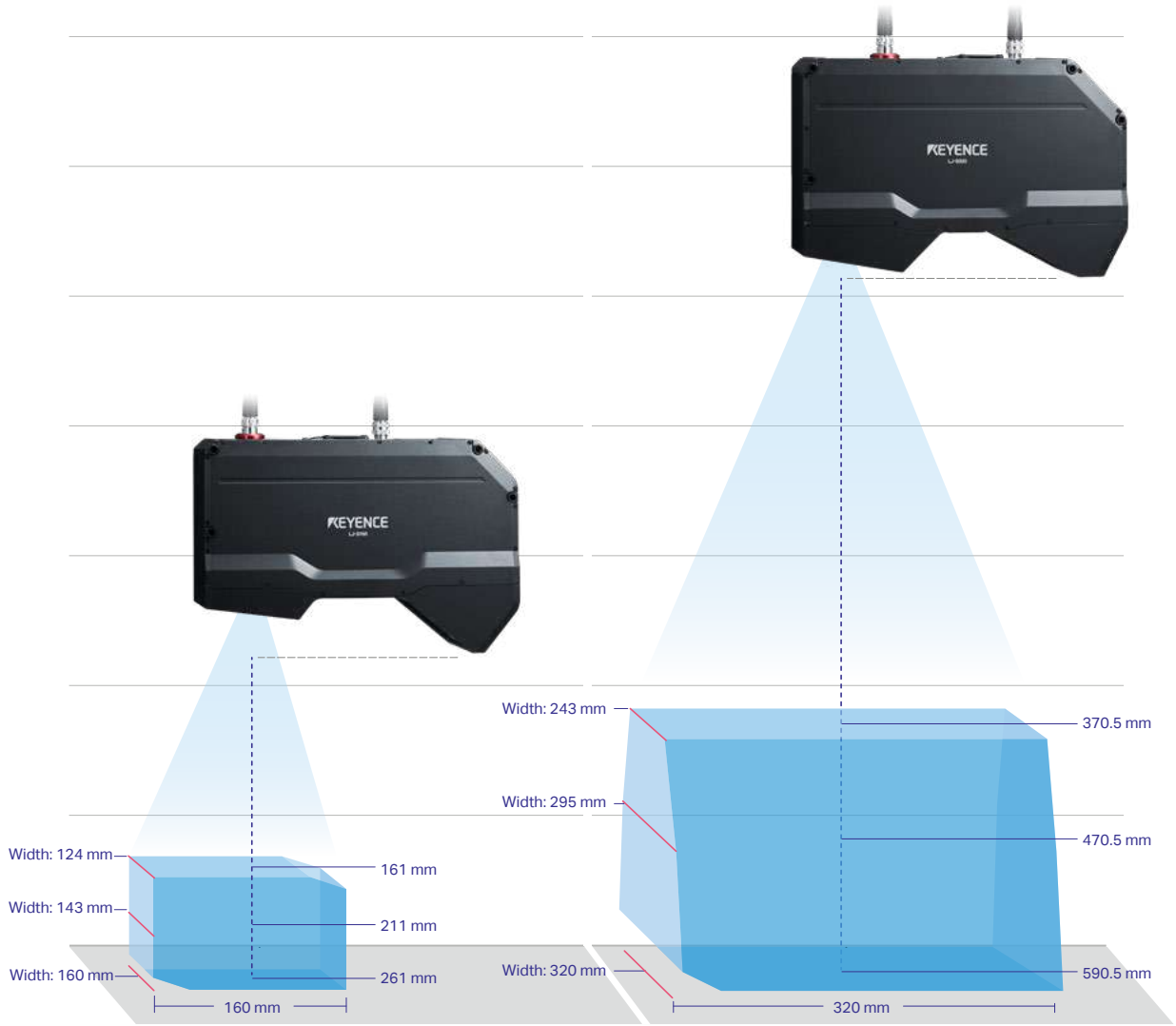
USB console for XG-X Series
OP-87983

24 VDC power supplies
CA-U4
(Rated current: 6.5 A)
CA-U5
(Rated current: 12.5 A)

Sensor head lineup

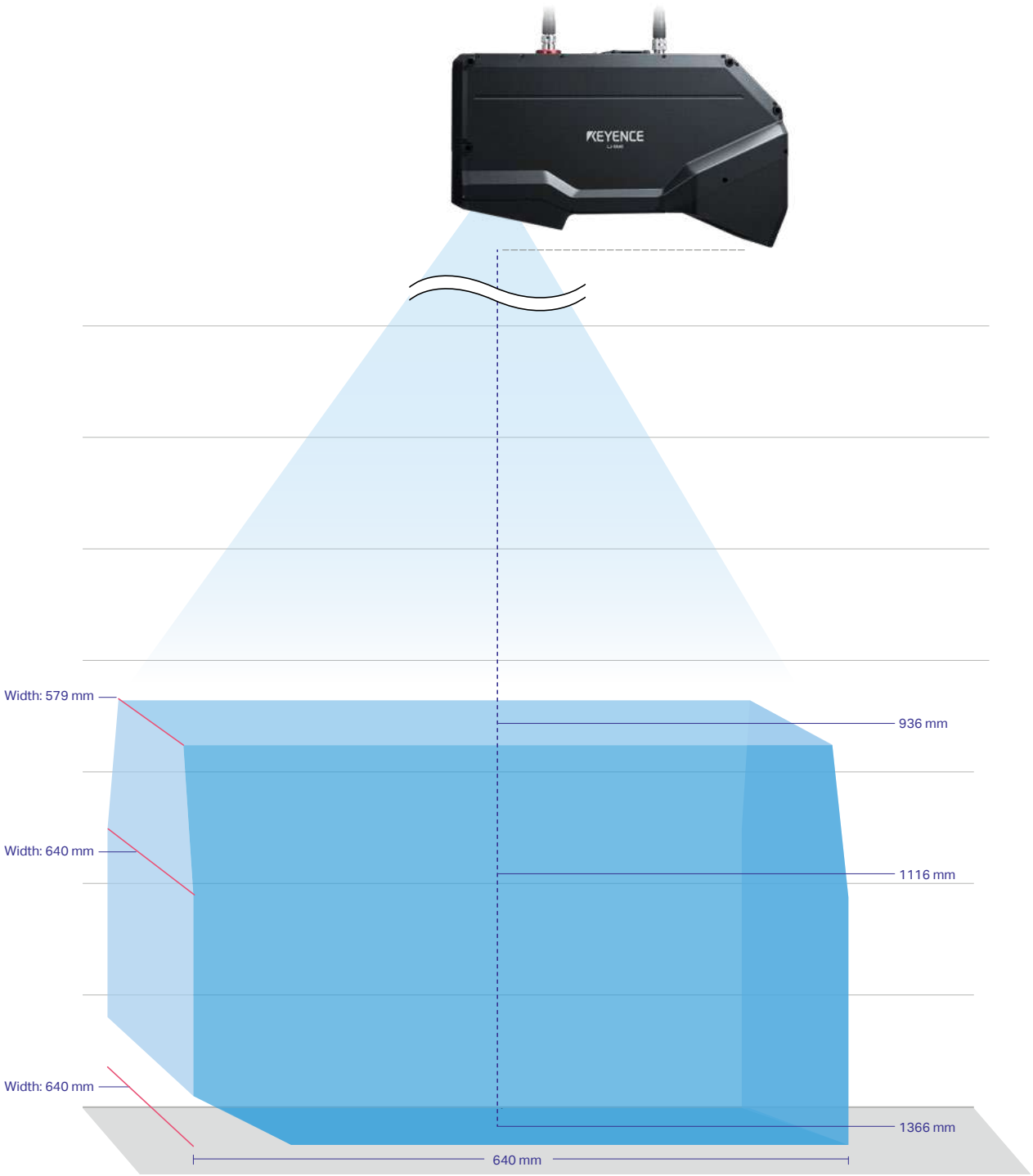
Sensor heads

NEW LJ-S160	NEW LJ-S320



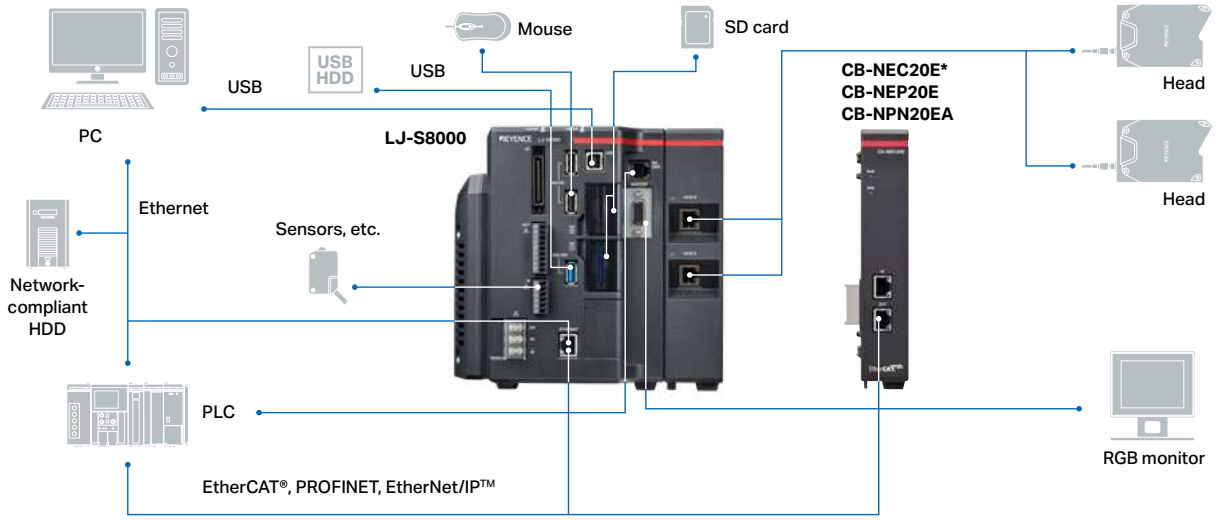
		LJ-S160	LJ-S320
Measurement range	Z-axis (height)	211 ±50 mm	470.5 +100/−120 mm
	X-axis (width)	143 mm	295 mm
	Y-axis (length)	160 mm	320 mm
Repeatability	Z-axis (height)	3 µm	5 µm
	XY (distance)	5 µm	10 µm

NEW LJ-S640



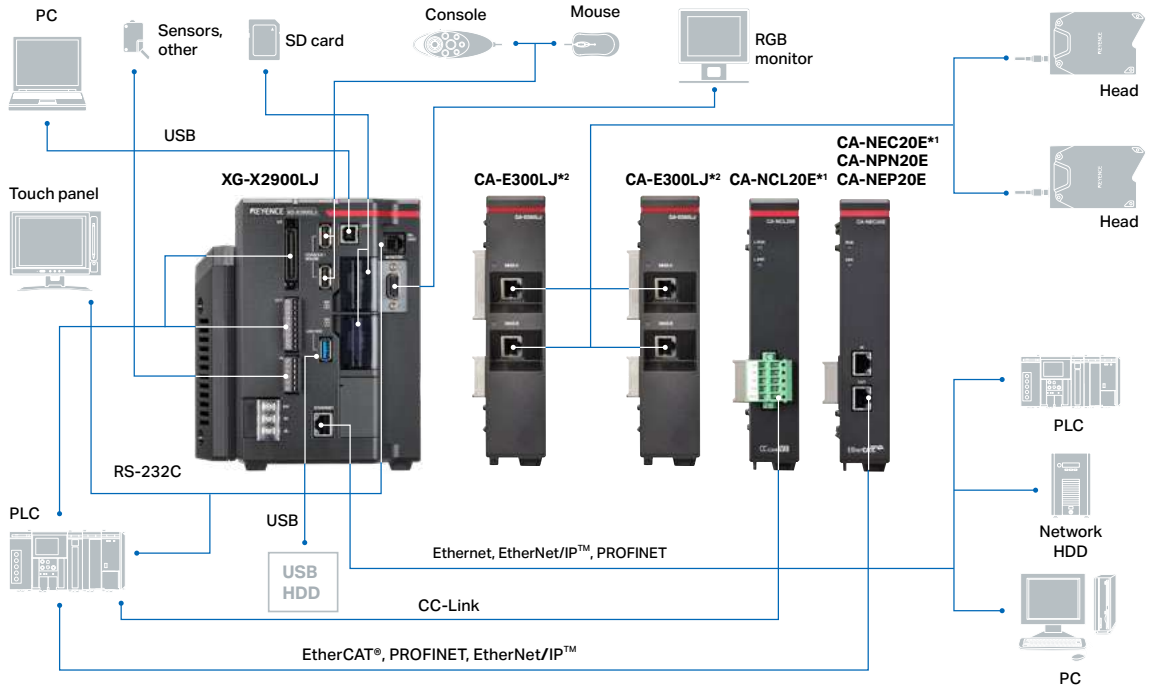
Measurement range	Z-axis (height)	1116 +180/−250 mm
	X-axis (width)	640 mm
	Y-axis (length)	640 mm
Repeatability	Z-axis (height)	10 µm
	XY (distance)	25 µm

Dedicated controller system



* Only one communication expansion unit (CB-NEC20E/NEP20E/NPN20EA) can be connected.

LJ-S Series + Image Processing System



*1 Only one communication expansion unit (CA-NCL20E/NEC20E/NEP20E/NPN20E) can be connected.
*2 When two input units are connected, one head can be connected to each unit. In such configurations, the heads can be different models.

Calibration certificates available

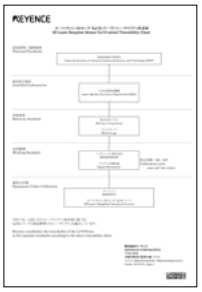
A calibration certificate can be issued for guaranteed accuracy as an inspection device. All LJ-S8000 Series systems are calibrated before shipment, ensuring reliable usability upon delivery.



Calibration certificate



Inspection report



Full traceability system diagram

Specifications

Controller

Model		LJ-S8000*1
Head input		Up to two LJ-S8000 Series head units * When using two units, heads A and B must be the same model.
Number of inspection setting registrations		Up to 1000 settings (depending on SD card capacity and setting contents) for each of SD card 1 and SD card 2; External switching possible
Number of reference images		Up to 400 per setting (depending on SD card capacity)
Memory card		• SD card slot × 2 • Supports OP-87133 (512 MB), CA-SD1G (1 GB), CA-SD4G (4 GB; Equipped as standard for SD1 slot), and CA-SD16G (16 GB)
Number of tools		Up to 100 per setting
Interface	Control input	20 points (Input terminal block: 5 points, Parallel I/O: 15 points)
	Control output	• 28 points (Output terminal block: 6 points, Parallel I/O: 22 points) • Photo MOSFET*2
	RS-232C	• Numerical value output and control I/O (When in use, PLC Link using the RS-232C port cannot be used) • Supports baud rates of up to 230400 bps
	PLC link	• Numerical value output and control I/O using Ethernet or RS-232C ports (Cannot be used with EtherNet/IP™; When using an RS-232C port, cannot be used with RS-232C no-procedure communication)
	Ethernet	• Numerical value output and control I/O • In addition to the functions above, uploading/downloading inspection settings, performing various simulations, and sending/receiving images and other data, and using remote desktop connections are possible via KEYENCE PC application software. • Supports FTP client, FTP server, VNC server (for non-PC clients, only monitor screen display is supported), and BOOTP functions supported • 1000BASE-T/100BASE-TX/10BASE-T • Supports jumbo frames
	USB	• In addition to numerical value output, uploading/downloading inspection settings, performing various simulations, and sending/receiving images and other data, and using remote desktop connections are possible via KEYENCE PC application software. • USB 2.0 only
	EtherNet/IP™	• Numerical value I/O and control I/O using the Ethernet port or optional EtherNet/IP™ unit CB-NEP20E (Cannot be used with PLC Link, PROFINET, or EtherCAT®) • Supports cyclic communication (max. 1436 bytes) and message communication • Maximum number of connections: 32 (Ethernet port) / 1: Exclusive Owner, 4: Input Only (CB-NEP20E) • Complies with Version CT19.1 (Ethernet port) / CT19.1 (CB-NEP20E) conformance tests
	PROFINET	• Can input/output numerical values and perform control I/O using the Ethernet port or the optional PROFINET unit CB-NPN20EA (Cannot be used with PLC Link, EtherNet/IP™, and EtherCAT®) • Supports cyclic communication (max. 1408 bytes) (Ethernet port) / 1252 bytes (CB-NPN20EA) • Supports acyclic communication (recorded data) • Complies with Conformance Class A (Ethernet port) / C (CB-NPN20EA)
	EtherCAT®	• Numerical value output and control I/O using optional EtherCAT® unit CB-NEC20E (Cannot be used with PLC Link, EtherNet/IP™, or PROFINET) • Supports cyclic communication (process data object communication) (Input: Max. 536 bytes / Output: Max. 532 bytes) • Supports acyclic communication (mailbox communication) • Supports CoE • Explicit device identification • Complies with Version 2.5.0 conformance test
	Mouse	Various menus can be controlled using the dedicated mouse (included with the controller)
	SNTP	Automatic correction of controller date and time when connected to an SNTP server
	USB HDD	Images and other data can be output by connecting an HDD (2 TB max.) to the dedicated USB port (USB 3.0-compliant, bus-powered, rated output: 900 mA)
	Monitor output	Analogue RGB output, XGA 1024 × 768 (24-bit colour, 60 Hz)
Cooling fan		Available
Display language		Switchable between Chinese (Simplified/Traditional), English, Japanese, Korean, German, French, Italian, Thai, Czech, Hungarian, Polish, and Spanish (Mexico).
Ratings	Power voltage	24 VDC ±10%
	Maximum current consumption	Max. 2.5 A (Typ. 28 W)
Environmental resistance	Operating ambient temperature	0 to 45°C (DIN rail mounting) / 0 to 40°C (Base surface mounting)
	Operating ambient humidity	85% RH or less (no condensation)
Weight		Approx. 2200 g

*1 The LJ-S8000 is marketed as the LJ-S8002 in the United States.
*2 Positive common connection for NPN input devices and negative common connection for PNP input devices supported.

LJ-H1X (LJ Series Simulation-Software/Terminal-Software) operating system environment

LJ Series Simulation-Software

Item	Required Environment
Supported OS	Microsoft Windows® 11 Pro, Windows® 10 Home, Pro, Enterprise (supports 64-bit version only) • The OS supports the following languages: Chinese (Simplified/Traditional), English, Japanese, Korean, German, French, Italian, Thai, Czech, Hungarian, Polish, and Spanish (Mexico). • Cannot be used on an OS that is not listed.
CPU	Intel® Core™ i3 processor equivalent or greater
Memory	8 GB or more
Free space on hard disk	8 GB or more (Separate space is required for storing image)
Display resolution	Minimum: 1024 × 768 pixels, Recommended: 1280 × 1024 pixels or larger

LJ Series Terminal-Software

Item	Required Environment
Supported OS	Microsoft Windows® 11 Pro, Windows® 10 Home, Pro, Enterprise • The OS supports the following languages: Chinese (Simplified/Traditional), English, Japanese, Korean, German, French, Italian, Thai, Czech, Hungarian, Polish, and Spanish (Mexico). • Supports both 32-bit and 64-bit versions • Cannot be used on an OS that is not listed.
Running environment	• CPU: Intel® Core™ i3 processor equivalent or greater • Memory: 2 GB or more • HDD: 500 MB free space or more * Separate space is required for storing image • Display resolution: 1024 × 768 pixels or larger (Recommended: 1280 × 1024 pixels or larger)

Controller

Model		XG-X2900LJ*1
Camera input		CA-E300LJ (LJ-S input unit) With one device connected: Up to two LJ-S Series head units of the same model With two devices connected: Up to one LJ-S Series head unit for each connected device (different models permitted; individual triggers permitted)
Supported cameras/ pixel count	LJ-S Series head	• LJ-S015: 3200 (H) × 5000 (L), 16 megapixels • LJ-S025/040/080: 3200 (H) × 6400 (L), 20.48 megapixels • LJ-S160/320/640: 3200 (H) × 3200 (L), 10.24 megapixels
Main image processor		DSP (high-speed type)
No. of registration settings		Up to 1000 settings (depending on SD card capacity and setting contents) for SD card 1 and SD card 2 individually, external switching is possible
Screen capacity		Up to 1000 screens for each setting on each camera (depending on SD card capacity), Image compression functionality, supports image registration and partial image registration via a position-corrected image, externally switchable by referring to variables
Memory card		• SD card slot × 2 • Supports OP-87133 (512 MB), CA-SD1G (1 GB), CA-SD4G (4 GB: Equipped as standard for SD1 slot), CA-SD16G (16 GB)
Interface	Control input (assignable)	• 20 points (includes 4 high-speed input terminals which can be assigned to trigger input) • Rated input: 26.4 V max., 1.2 mA min. (High-speed input terminals: 2.2 mA min.)
	Control output (assignable)	• 28 points (includes 4 high-speed output terminals which can be assigned to FLASH output linked to external trigger) • Photo MOSFET*2 50 mA max. (30 V max.)
	Monitor output	• Analogue RGB output, XGA (1024 × 768, 24-bit colour)
	Unit indicators	Power supply / ERROR LED display
	RS-232C	• Value output and control I/O can be switched to a CA Series touch panel interface (when this is in use, PLC Link using the RS-232C port cannot be used) • Supports baud rates up to 230400 bps
	PLC link	• Can output numerical values and perform control I/O using the Ethernet or RS-232C ports (CC-Link, EtherNet/IP™, and PROFINET cannot be used with PLC-Link) • The following PLCs are supported via link unit*3 KEYENCE: KV-8000/7000/5000/3000/1000/700 Series, KV Nano Series Mitsubishi Electric: MELSEC iQ-R/L/Q Series, MELSEC A Series (RS-232C only), MELSEC iQ-F Series, MELSEC FX Series (RS-232C only) OMRON: SYSMAC CJ2/CJ1/CS1/CP1 Series, SYSMAC C Series (RS-232C Only) YASKAWA Electric Corporation: MP2000 Series, MP900 Series (RS-232C only)
	Ethernet	• Can output numerical values and perform control I/O • In addition to the above functions, can upload/download inspection settings, perform various simulations, send/receive various data including image data, and be used with remote connection programs via KEYENCE PC application software • Supports FTP client, FTP server, and SFTP client functions • Supports VNC server functions (for non-PC clients, only monitor screen display is supported) • Supports BOOTP functions • 1000BASE-T/100BASE-TX/10BASE-T • Supports jumbo frames (when connected to any of CA-NEC20E/NEP20E/NPN20E)
	USB	• Can output values, perform control I/O, upload/download inspection settings, perform various simulations, send/receive various data, including image data, and can be used with remote desktop connection programs via KEYENCE PC application software • Dedicated USB2.0
	CC-Link	• Connecting the optional CC-Link unit CA-NCL20E enables value output and control I/O (Cannot be used with PLC Link, EtherNet/IP™, PROFINET, or EtherCAT®) • Supports Ver. 1.10 and Ver. 2.00 remote device stations
	EtherNet/IP™	• Value output and control I/O using Ethernet port or the optional EtherNet/IP™ unit CA-NEP20E (Cannot be used with PLC Link, CC-Link, PROFINET, or EtherCAT®) • Supports cyclic communication (max. 1436 bytes) and message communication • Maximum number of connections: 32 (Ethernet port)/1: Exclusive Owner, 4: Input Only (CA-NEP20E) • Complies with Version.CT15 (Ethernet port)/CT16 (CA-NEP20E) conformance test
	PROFINET	• Can output numerical values and perform control I/O using the Ethernet port or the optional PROFINET unit CA-NPN20E (Cannot be used with PLC Link, CC-Link, EtherNet/IP™, and EtherCAT®) • Supports cyclic communication (max. 1408 bytes (Ethernet port) / 1248 bytes (CA-NPN20E)) • Supports acyclic communication (recorded data) • Complies with Conformance Class A (Ethernet port) / C (CA-NPN20E)
	EtherCAT®	• Can output numerical values and perform control I/O by connecting the optional EtherCAT® unit CA-NEC20E (cannot be used with PLC link, CC-Link, EtherNet/IP™, or PROFINET) • Supports cyclic communication (process data object communications) (input: Max. 536 bytes/Output: Max. 532 bytes) • Supports acyclic communication (mailbox communications) • Supports CoE • Explicit device identification • Complies with Version 2.1.0.2 conformance test
	SNTP	Automatic correction of device date and time possible through connection to an SNTP server
	USB handheld controller	• The optional USB handheld controller (OP-87983) allows control of various menus • Supports the assignment of controls to console buttons
	Mouse	Various menus can be controlled using the optional dedicated mouse (OP-87506)
	Touch panel	• Settings can be controlled from the CA Series touch panel using the RS-232C port (when this is in use, no-procedure RS-232C communication and PLC Link using RS-232C cannot be used) • Supports a dedicated touch menu and control buttons
	USB HDD	Images and other data can be output by connecting a HDD (max. 2 TB) to the dedicated USB port (USB 3.0-compliant, bus-powered, rated output: 900 mA)
	VisionDataStorage	Images and other data can be output by connecting the optional VisionDataStorage to the Ethernet port or to a USB HDD port via a dedicated USB cable (OP-88263: optional)
Language		Switch between English/Japanese/Chinese (Simp.)/Chinese (Trad.)/German/Vietnamese (set the default language during initial start-up)
Cooling fan		Equipped as standard with the CA-F100 fan unit
Ratings	Power voltage	24 V DC ±10%
	Maximum current consumption	5.3 A*4
Environmental resistance	Operating ambient temperature	0 to +45°C (DIN rail mount) / 0 to +40°C (base surface mount)
	Operating ambient humidity	85% RH or less (no condensation)
Weight		Approx. 1750 g

*1 The XG-X2900LJ is marketed as the XG-X2902LJ in the United States. *2 Positive common connections for NPN input devices and negative common connections for PNP input devices supported. *3 Models that are equipped with an Ethernet port on the CPU unit support direct connection with the Ethernet port. *4 The maximum current consumption is 2.8 A when an LJ-S Series head unit is connected, 2.5 A with one CA-E300LJ device connected, and 2.8 A with two CA-E300LJ devices connected. Note, however, that each LJ-S Series head unit will require a separate power supply.

Model		CA-E300LJ
Controller		XG-X2900LJ*1
Head input		2 points*2
Supported heads		LJ-S015/LJ-S025/LJ-S040/LJ-S080/LJ-S160/LJ-S320/LJ-S640
Power supply		Supplied from controller
Environmental resistance	Operating ambient temperature	0 to +45°C (DIN rail mount) / 0 to +40°C (base surface mount)
	Operating ambient humidity	85% RH or less (no condensation)
Weight		Approx. 560 g

*1 The XG-X2900LJ is marketed as the XG-X2902LJ in the United States.
*2 When two input units are connected, one head can be connected to each unit. In such configurations, the heads can be different models.

Sensor head

Model		LJ-S015	LJ-S025	LJ-S040	LJ-S080	LJ-S160	LJ-S320	LJ-S640
Reference distance*1		56.5 mm	68.5 mm	70 mm	160 mm	211 mm	470.5 mm	1116 mm
Measurement range Z		±4 mm (F.S.=8 mm)	±9 mm (F.S.=18 mm)	±18 mm (F.S.=36 mm)	±23 mm (F.S.=46 mm)	±50 mm (F.S.=100 mm)	+100/−120 mm (F.S.=220 mm)	+180/−250 mm (F.S.=430 mm)
Measurement range XY	X: Near side	14 mm	21 mm	31 mm	66 mm	124 mm	243 mm	579 mm
	X: Reference distance	15 mm	23 mm	35 mm	72 mm	143 mm	295 mm	640 mm
	X: Far side	16 mm	25 mm	39 mm	78 mm	160 mm	320 mm	640 mm
	Y: Reference distance	25 mm	51.2 mm	80 mm	160 mm	160 mm	320 mm	640 mm
XY data interval		5 µm	8 µm	12.5 µm	25 µm	50 µm	100 µm	200 µm
Number of XY data points		3200 × 5000	3200 × 6400	3200 × 6400	3200 × 6400	3200×3200	3200×3200	3200×3200
Repeatability	Z (height)*2	0.3 µm	0.4 µm	0.5 µm	1 µm	3 µm	5 µm	10 µm
	XY (distance)*3	0.5 µm	0.7 µm	1 µm	3 µm	5 µm	10 µm	25 µm
Linearity*4	Standard area	±0.035% of F.S.	±0.03% of F.S.	±0.02% of F.S.	±0.055% of F.S.	±0.02% of F.S.	±0.027% of F.S.	±0.058% of F.S.
	High-accuracy area	—	—	—	±0.03% of F.S.	—	—	±0.023% of F.S.
Imaging time*5		Min. 0.2 sec				Min. 0.3 sec		
Light source	Laser light source	405 nm (visible light) wavelength blue semiconductor laser						
	Laser class	Class 2M laser product*6 (IEC 60825-1, FDA (CDRH) Part 1040.10*7)						
	Output	10 mW						
Ratings	Power voltage	24 VDC +25%, -20%						
	Current consumption*8 / Power	Max. 4.0 A (at 19.2 V), 3.2 A (at 24 V) / Typ. 17 W				Max. 5.5 A (at 19.2 V), 4.4 A (at 24 V) / Typ. 17 W		
I/F	Ethernet	1000BASE-T, 100BASE-TX						
	Input*9	LASER_ON, TRG, MEM_CLEAR						
	Output*9	READY, EXPOSURE_BUSY, ERROR						
Environmental resistance	Enclosure rating*10	IP65 (IEC60529)						
	Ambient operating illuminance*11	Incandescent lamp: 10000 lux or less						
	Operating ambient temperature*12	0 to +45°C						
	Operating ambient humidity	85% RH or below (no condensation)						
	Vibration resistance	10 to 500 Hz; Power spectral density: 0.033 G2/Hz; X, Y, and Z directions (IEC 60068-2-64)						
	Impact resistance	15 G (IEC 60068-2-27)						
Material		Aluminium						
Weight		Approx. 2300 g	Approx. 2100 g	Approx. 2600 g	Approx. 2600 g	Approx. 3600 g	Approx. 3700 g	Approx. 4300 g

*1 The reference distance is the distance from the bottom edge of the head to the measurement centre of the Z-axis (height). See the Dimensions section for the installation reference plane.
*2 The measured target is a KEYENCE standard target. Sigma value when the average height of 200 × 200 points in the centre of the field of view is measured using the height tool with reciprocating imaging OFF.
*3 The measured target is a KEYENCE standard target. Sigma value when the distance between two circles of 500 points in diameter set 1000 points apart at the centre of the field of view on a greyscale image is measured using the circle and circle distance tool with reciprocating imaging OFF.
*4 The measured target is a KEYENCE standard target. Value when the average height of 200 × 200 points is measured using the height tool with reciprocating imaging OFF. See the Dimensions section for the high-accuracy area reference plane.
*5 With YZ range minimum and Y skipping maximum.
*6 Do not view the beam directly using optical instruments (such as eye loupes, magnifiers, microscopes, telescopes, or binoculars). Observing the laser output using optical instruments is dangerous and may damage the eyes.
*7 The laser classification for FDA(CDRH) is implemented based on IEC60825-1 in accordance with the requirements of applicable Laser Notices.
*8 The maximum value may be exceeded when extreme acceleration is applied.
*9 Laser ON input is enabled only when connected to a controller.
*10 With an OP cable connected.
*11 When measuring white paper, illuminance on the sensor head receiving surface when light is applied to white paper.
*12 The head needs to be mounted to a metal plate to be used.

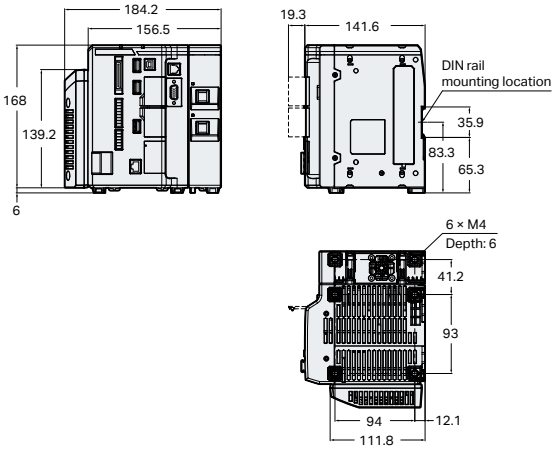
LJ-S Navigator/Observer operating system environment

Item	Required Environment
Supported OS	Microsoft Windows® 11 Pro, Windows® 10 Home, Pro, Enterprise (supports 64-bit version only) • Cannot be used on an OS that is not listed.
Supported languages	English, Japanese, Chinese (Traditional/Simplified), Korean, German, French
CPU	Intel® Core™ i3 processor equivalent or greater
Memory	8 GB or more
Free space on hard disk	10 GB or more

• Windows is either a registered trademark or trademark of Microsoft Corporation in the United States and/or other countries.
• HALCON is a registered trademark or trademark of MVTec Software GmbH.
• VisionPro and Cognex Designer are registered trademarks or trademarks of Cognex Corporation.
• Aurora Design Assistant (formerly Matrox Design Assistant) is a registered trademark or trademark of Zebra Technologies.
• Company and product names mentioned in this catalogue are trademarks or registered trademarks of their respective companies.

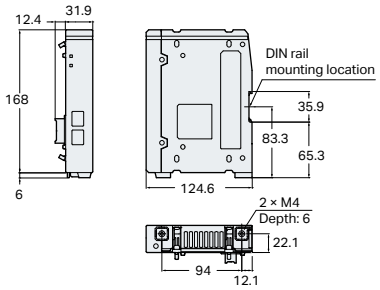
Controller

LJ-S8000 / LJ-S8002



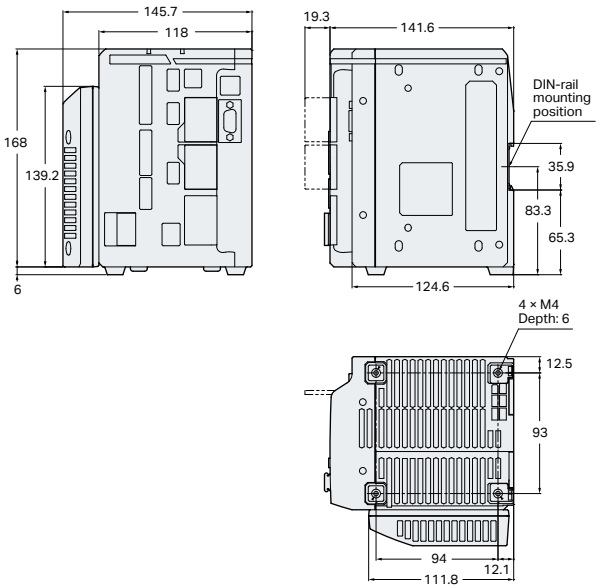
Expansion unit

CB-NEC20E / CB-NEP20E / CB-NPN20EA
CA-NEC20E / CA-NEP20E / CA-NPN20E

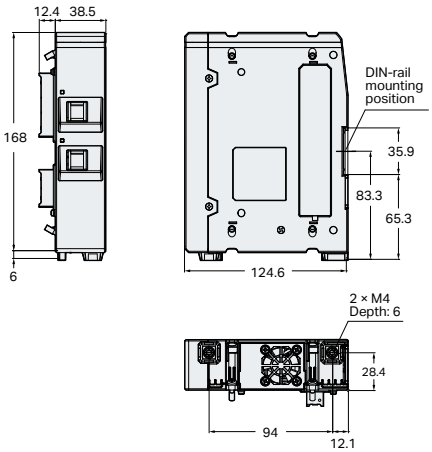


Input unit

XG-X2900LJ / XG-X2902LJ

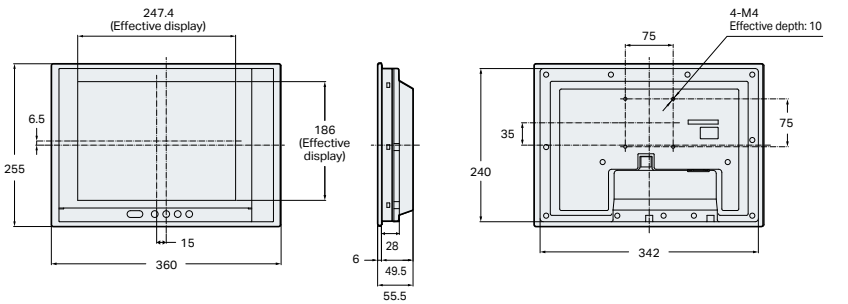


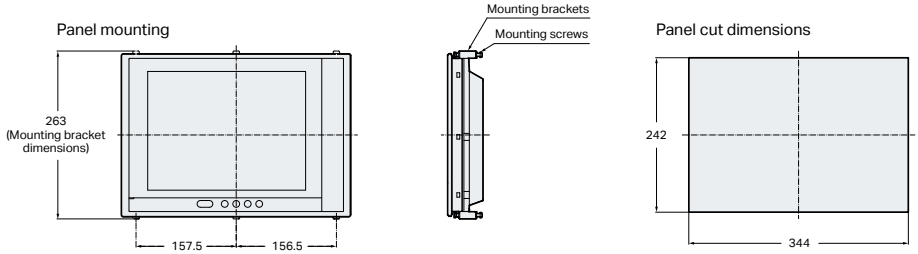
CA-E300LJ



12" LCD colour monitor

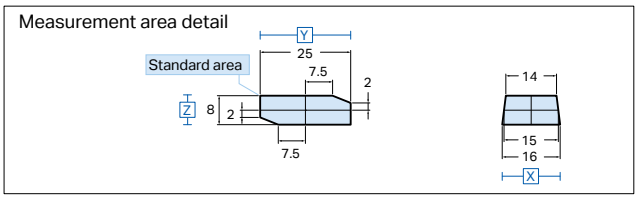
CA-MP120

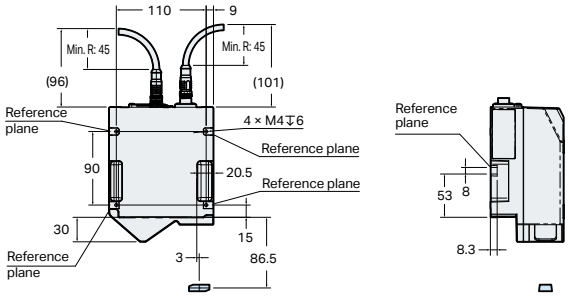


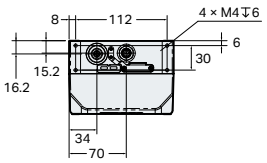


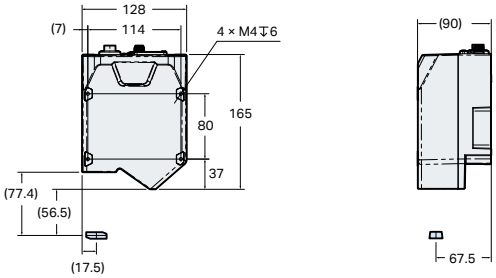
Sensor heads

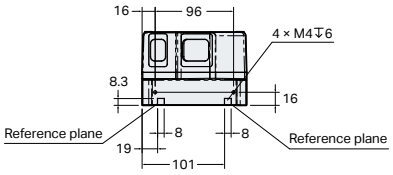
LJ-S015



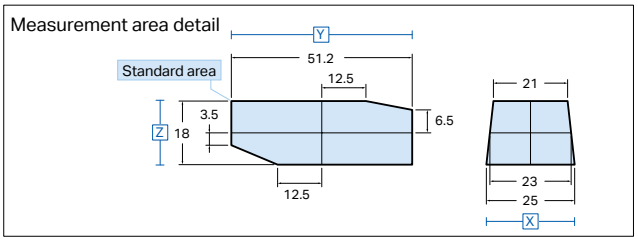


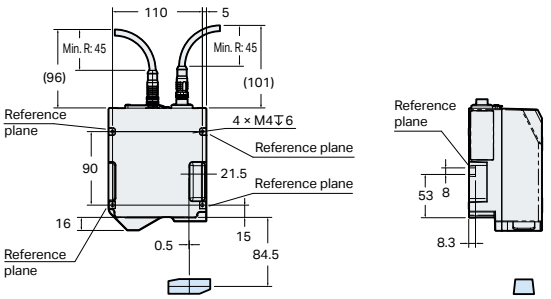


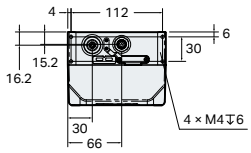


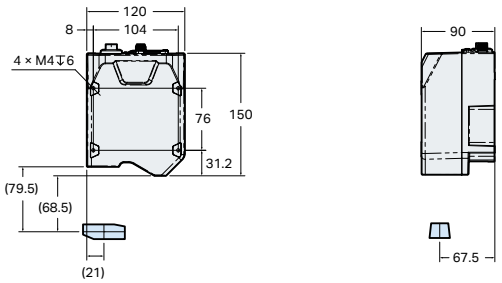


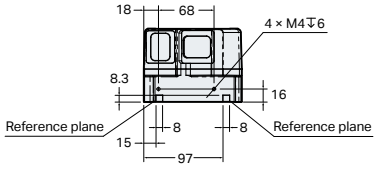
LJ-S025





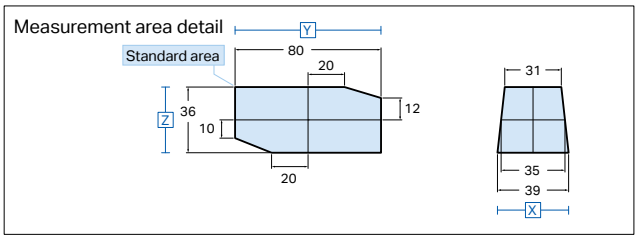


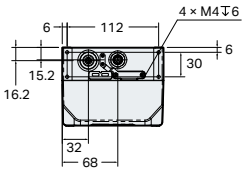


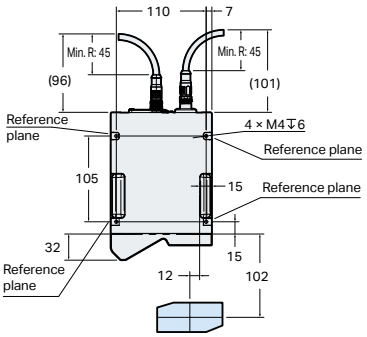


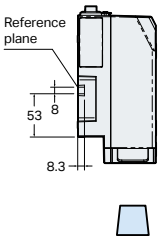
Sensor heads

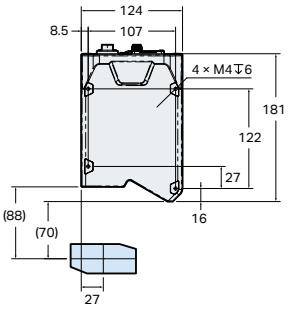
LJ-S040

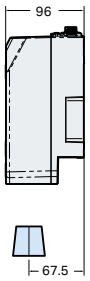


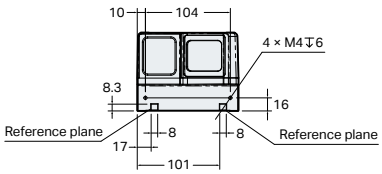




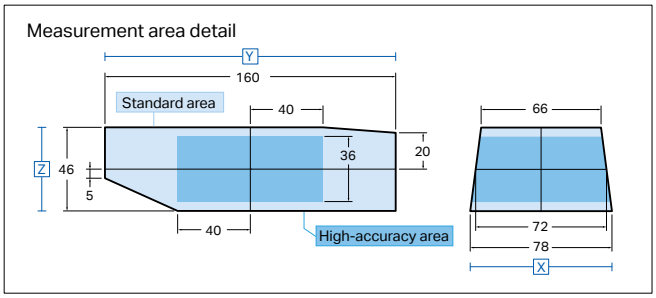


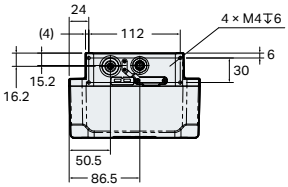


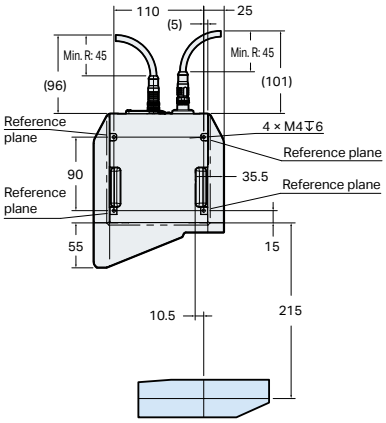


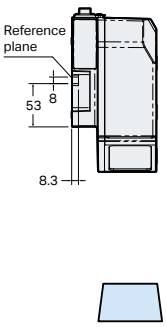


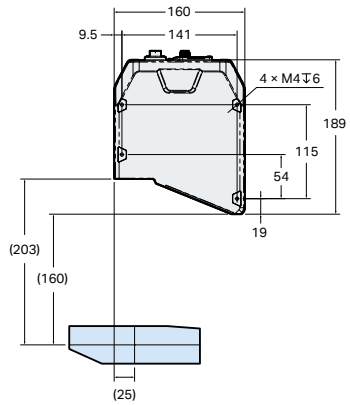
LJ-S080

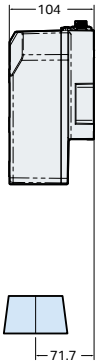


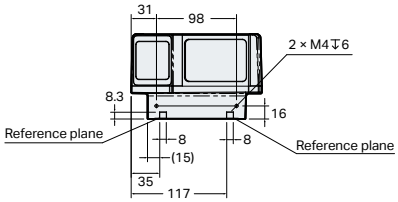




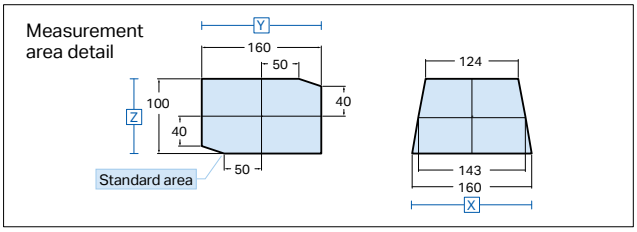


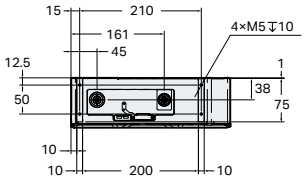


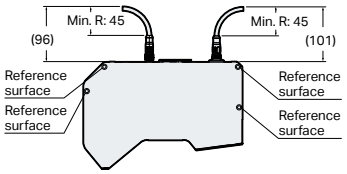


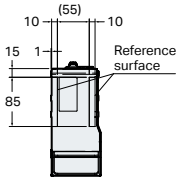


LJ-S160

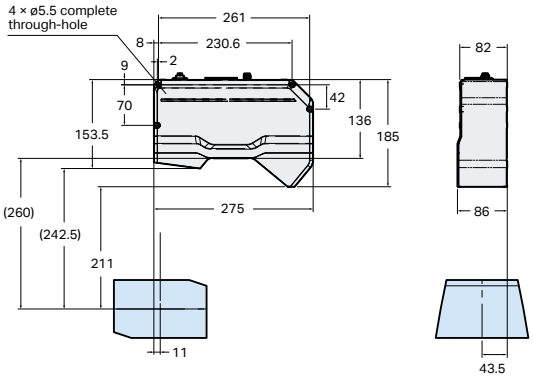


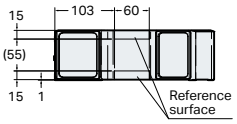




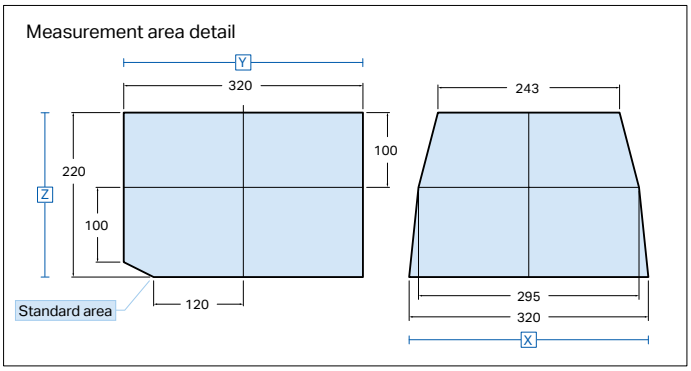


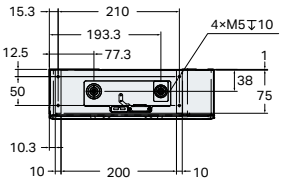


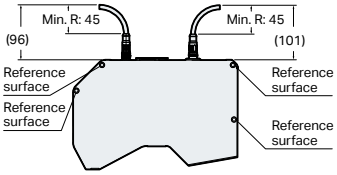


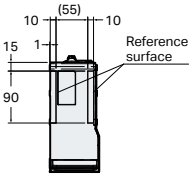


LJ-S320

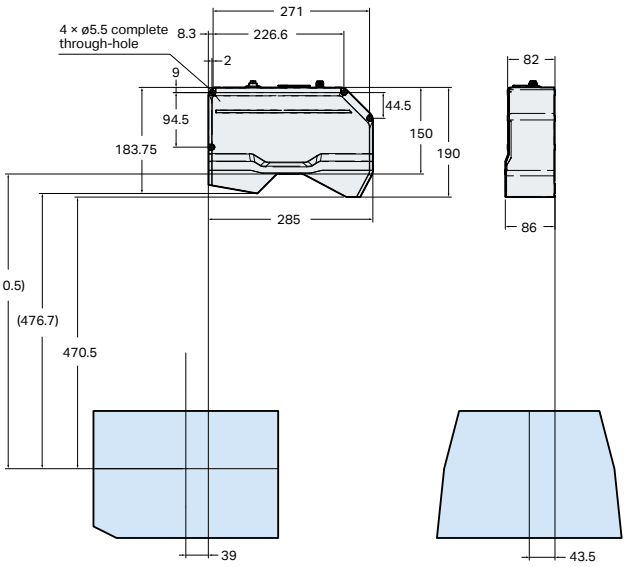


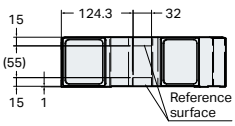






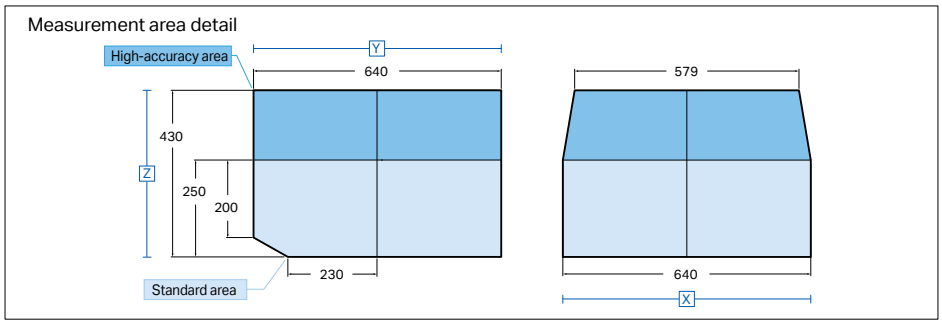


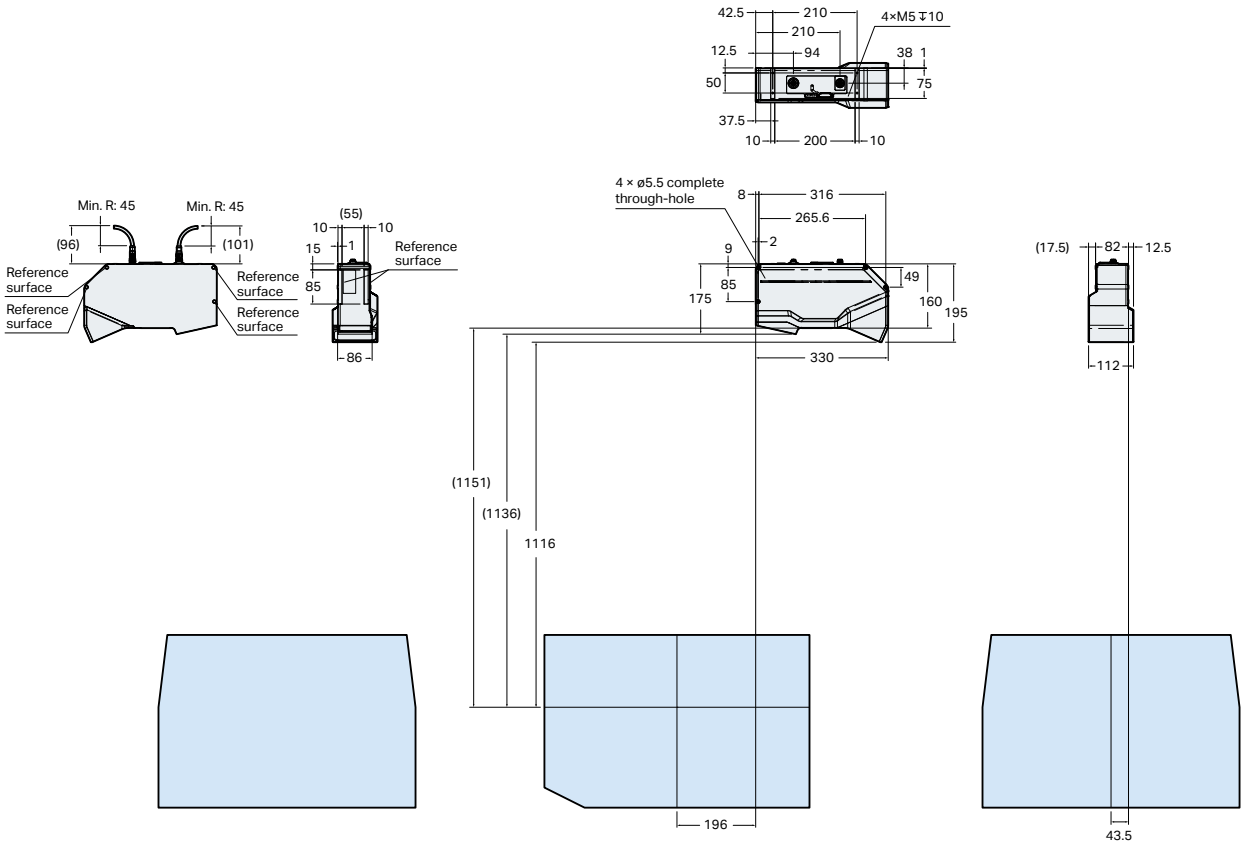




Sensor head

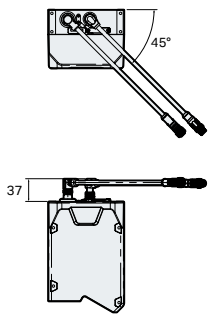
LJ-S640





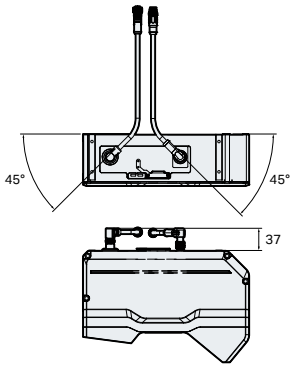
Head connection extension cable (L-shaped connector) For LJ-S015 / 025 / 040 / 080

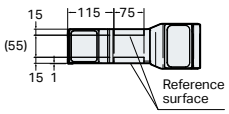
OP-88825/OP-88826



Head connection extension cable (L-shaped connector) For LJ-S160/320/640

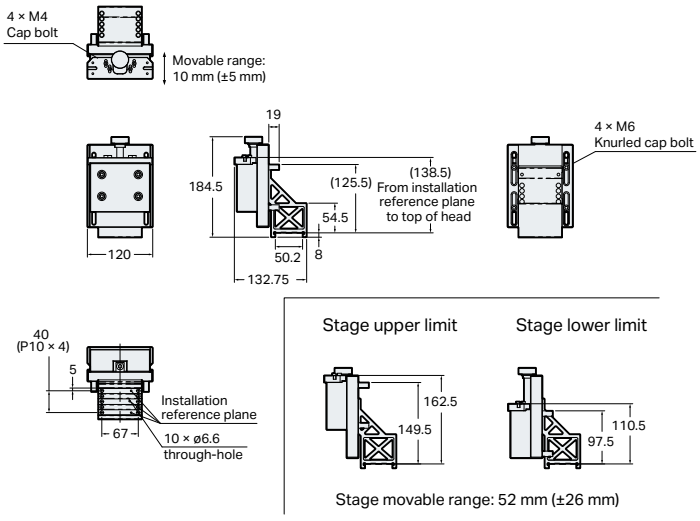
OP-88825/OP-88826



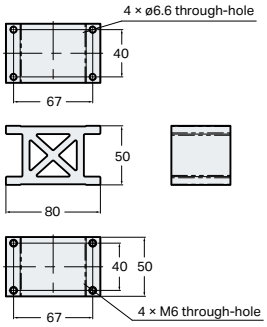


Dedicated stand

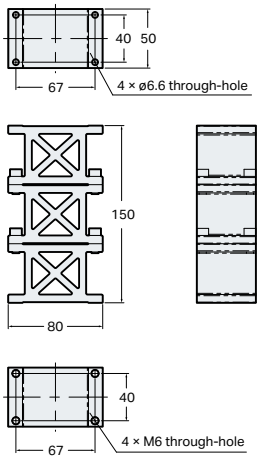
Adjuster OP-88956



Blocks: 1 OP-88958



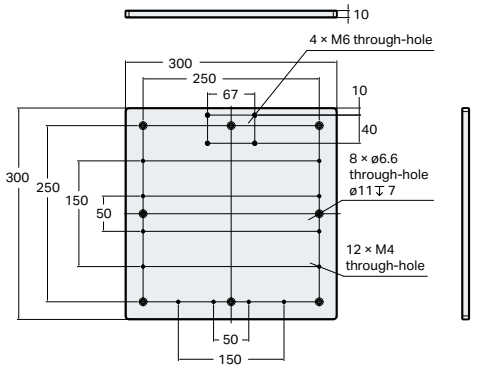
Blocks: 3 OP-88959



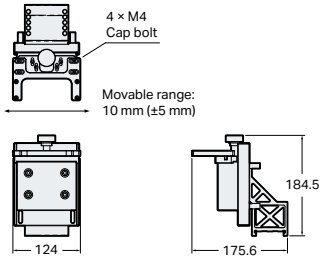
When mounting the sensor head on the dedicated stand, the base plate height should be in the measurement field of view when the number of blocks shown in the table below is used.

	LJ-S015	LJ-S025	LJ-S040	LJ-S080	LJ-S160
Number of blocks	2	2	3	5	6

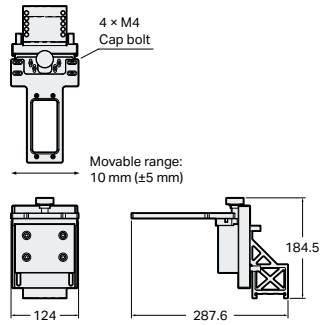
Base plate OP-88957



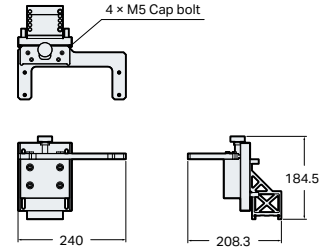
Horizontal installation when using Mounting plate A **OP-88960**



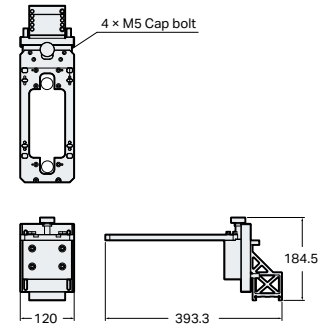
Vertical installation when using Mounting plate B **OP-88961**



Horizontal installation when using Mounting plate C **OP-89041**

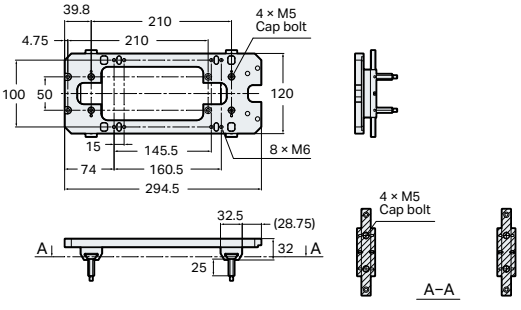


Vertical installation when using Mounting plate D **OP-89042**



When using the mounting rails

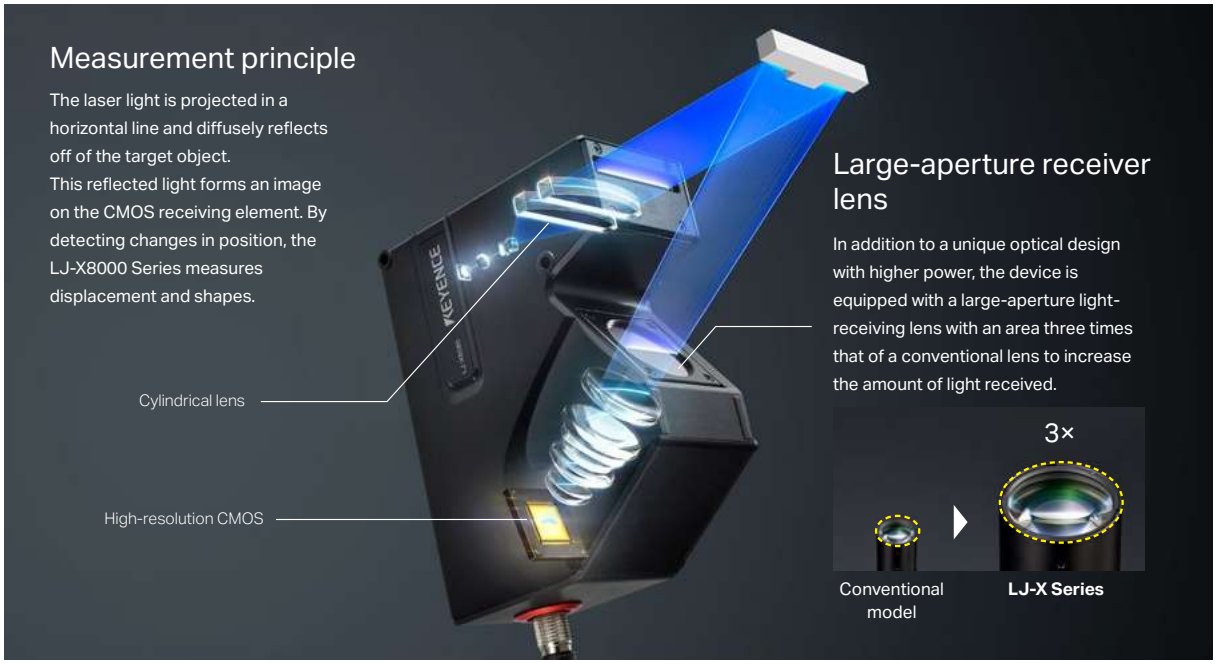
OP-89040 / OP-89042



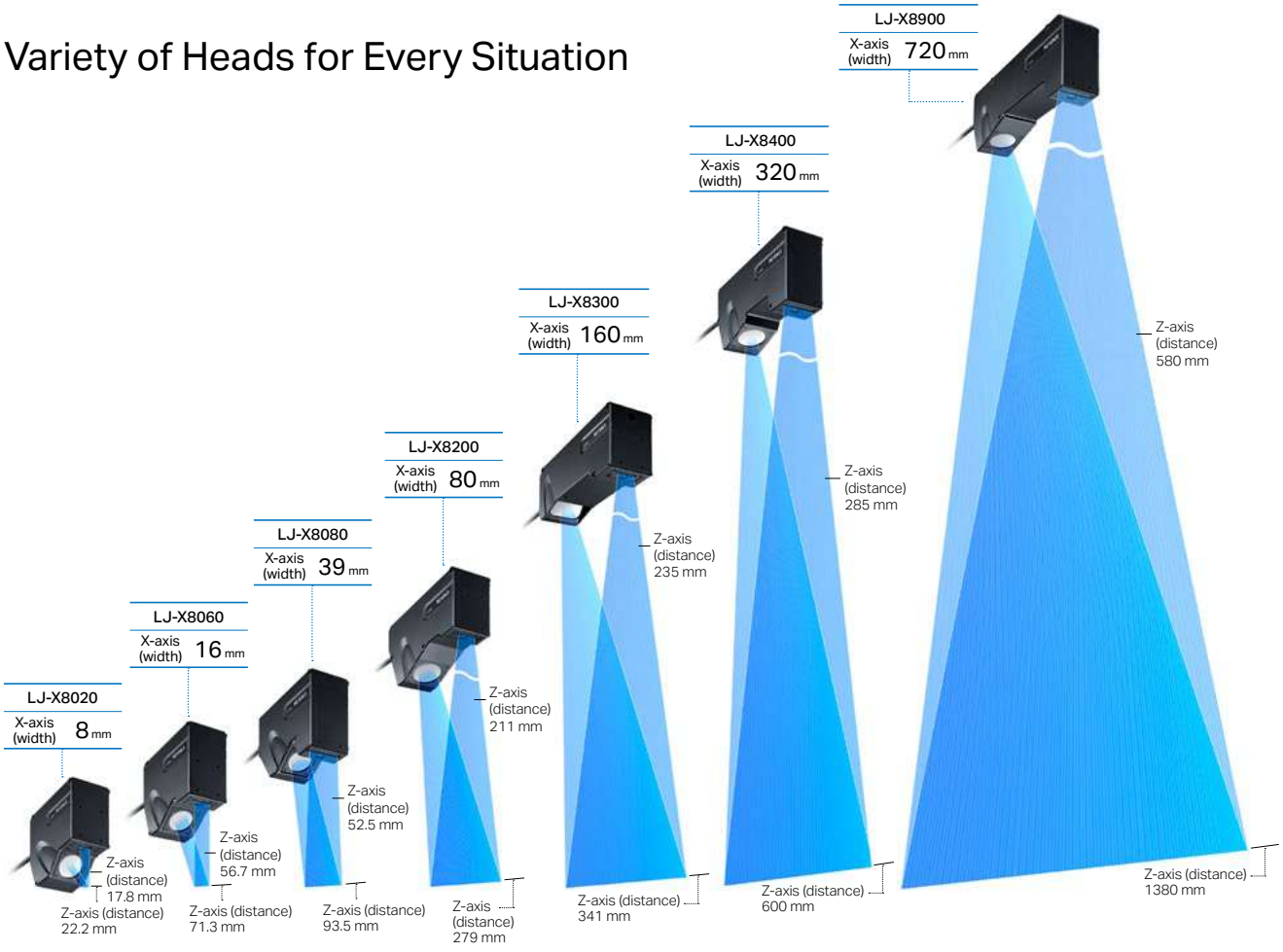
For more information on using the dedicated jig, scan the code on the right to visit KEYENCE's support site.

3D Profiler for Moving Targets

LJ-X8000 Series



Variety of Heads for Every Situation

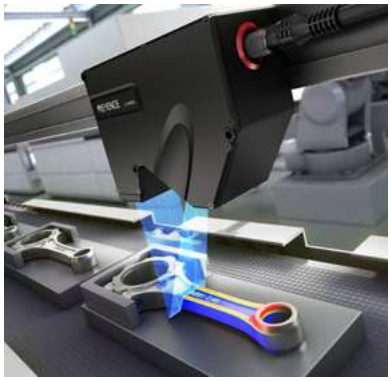




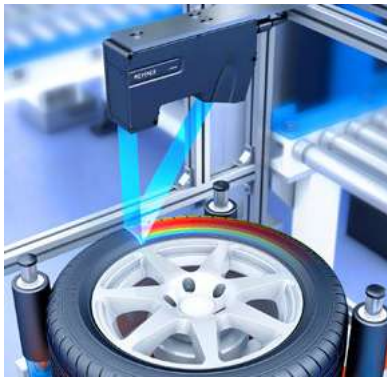
2D/3D Laser Profiler
LJ-X8000 Series

3D inspections without having to stop the target

Inspection is possible for targets being transferred or rotated and for tubes or other long targets.
This allows for a wide variety of inline inspections, including dimensional inspection, appearance inspection, shape inspection, and differentiation.



Dimensional inspection of metal components



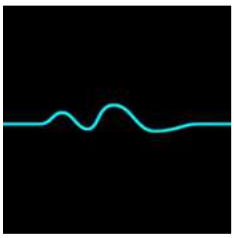
Shape inspection of tyres

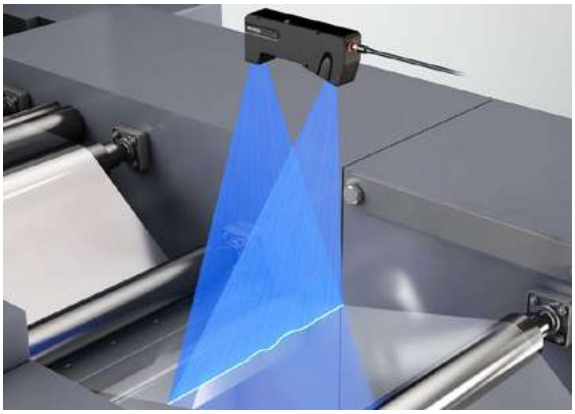


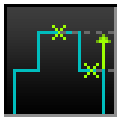
Surface inspection of cables

2D inspection tools

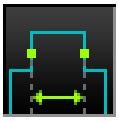
Profile measurement tools are available for inspecting the cross-sectional shape (profile) of the targets using lasers. These tools can be used in various applications, including tracking cross-sectional surface data changes over time.







Height difference



Width



Angle formed by two lines



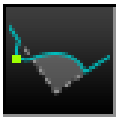
Point/ line distance



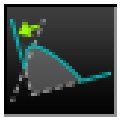
Weld throat thickness



Weld leg length



Undercut



Overlap

High-Accuracy Models

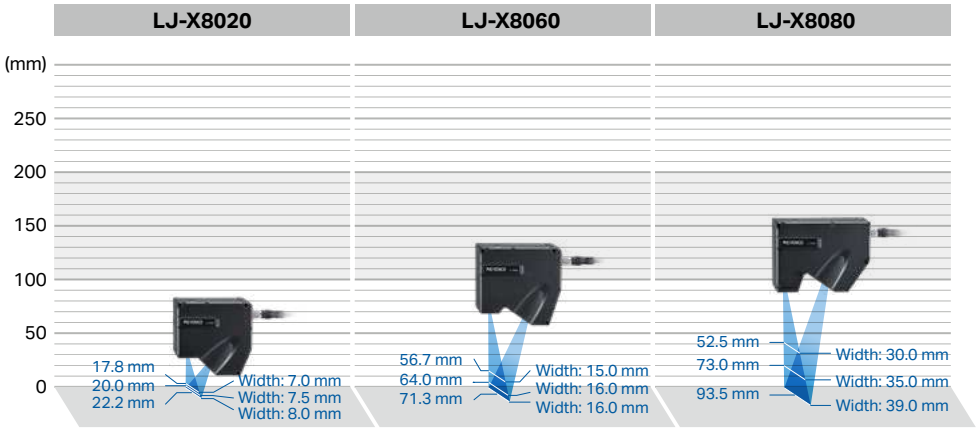
2D/3D Laser Profiler

3200 points/profile

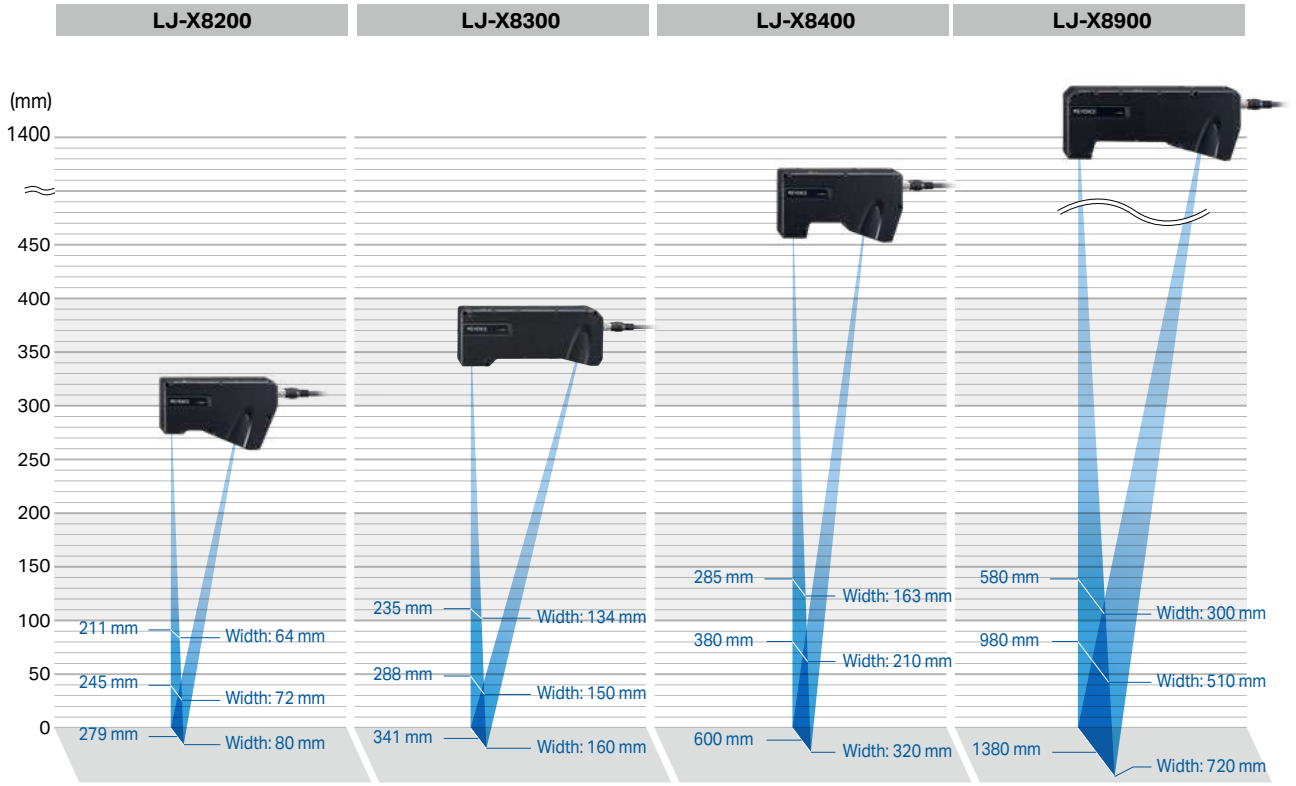
LJ-X8000 Series



Sensor head selection guide



		LJ-X8020	LJ-X8060	LJ-X8080
Measurement range	Z-axis (height)	20 ±2.2 mm	64 ±7.3 mm	73 ±20.5 mm
	X-axis (width)	7.5 mm	16.0 mm	35.0 mm
Repeatability	Z-axis (height)	0.3 µm	0.4 µm	0.5 µm
	X-axis (width)	0.3 µm	0.5 µm	1.0 µm



		LJ-X8200	LJ-X8300	LJ-X8400	LJ-X8900
Measurement range	Z-axis (height)	245 ±34 mm	288 ±53 mm	380+95/-220 mm	980 ±400 mm
	X-axis (width)	72 mm	150 mm	210 mm	510 mm
Repeatability	Z-axis (height)	1 µm	3 µm	5 µm	10 µm
	X-axis (width)	3 µm	5 µm	10 µm	25 µm

High-Speed Models

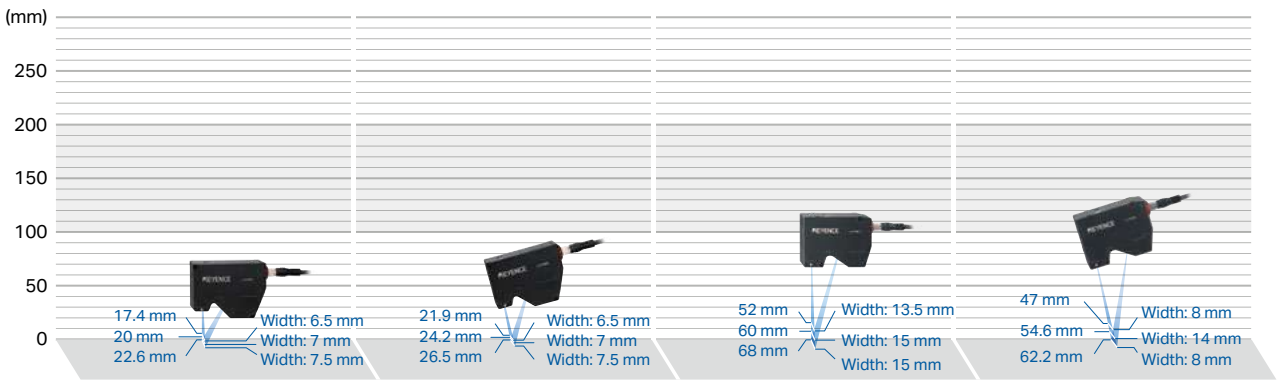
High-speed 2D Laser Profiler
64000 profiles/second

LJ-V7000 Series

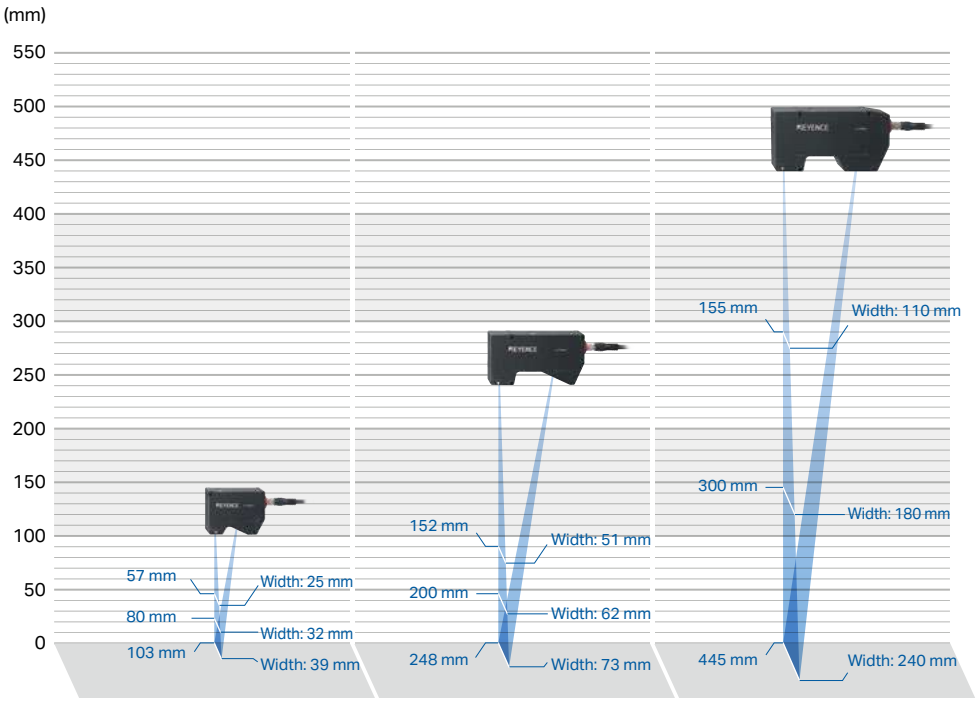


Sensor head selection guide

	Ultra high-accuracy	Ultra high-accuracy specular reflection	High-accuracy	High-accuracy specular reflection
	LJ-V7020/LJ-V7020B	**LJ-V7020K/LJ-V7020KB**	**LJ-V7060/LJ-V7060B**	**LJ-V7060K/LJ-V7060KB**
Measurement range	Z-axis (height) 20 ±2.6 mm X-axis (width) 7 mm	Z-axis (height) 24.2 ±2.3 mm X-axis (width) 7 mm	Z-axis (height) 60 ±8 mm X-axis (width) 15 mm	Z-axis (height) 54.6 ±7.6 mm X-axis (width) 14 mm
Repeatability	Z-axis (height) 0.3 µm X-axis (width) 2.5 µm	Z-axis (height) 0.3 µm X-axis (width) 2.5 µm	Z-axis (height) 0.4 µm X-axis (width) 5 µm	Z-axis (height) 0.4 µm X-axis (width) 5 µm



	Mid range	Long range	Ultra-long range
	LJ-V7080/LJ-V7080B	**LJ-V7200/LJ-V7200B**	**LJ-V7300/LJ-V7300B**
Measurement range	Z-axis (height) 80 ±23 mm X-axis (width) 32 mm	Z-axis (height) 200 ±48 mm X-axis (width) 62 mm	Z-axis (height) 300 ±145 mm X-axis (width) 180 mm
Repeatability	Z-axis (height) 0.5 µm X-axis (width) 10 µm	Z-axis (height) 1 µm X-axis (width) 20 µm	Z-axis (height) 5 µm X-axis (width) 60 µm



Sensor head LJ-X Series

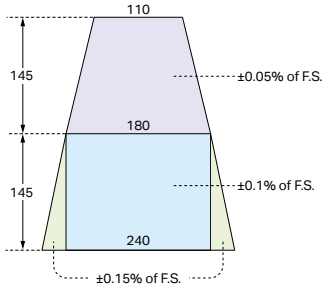
Model			LJ-X8020	LJ-X8060	LJ-X8080	LJ-X8200	LJ-X8300	LJ-X8400	LJ-X8900
Reference distance			20 mm	64 mm	73 mm	245 mm	288 mm	380 mm	980 mm
Measurement range	Z-axis (height)		±2.2 mm (F.S.=4.4 mm)	±7.3 mm (F.S.=14.6 mm)	±20.5 mm (F.S.=41 mm)	±34 mm (F.S.=68 mm)	±53 mm (F.S.=106 mm)	±60 mm (+95 to -220 mm*11) (F.S.=315 mm)	±400 mm (F.S.=800 mm)
	X-axis (width)	NEAR side	7 mm	15 mm	30 mm	64 mm	134 mm	180 mm (163 mm*11)	300 mm
		Reference distance	7.5 mm	16 mm	35 mm	72 mm	150 mm	210 mm	510 mm
		FAR side	8 mm	16 mm	39 mm	80 mm	160 mm	240 mm (320 mm*11)	720 mm
Light source			Blue semiconductor laser						
	Wavelength		405 nm (visible light)						
	Laser class (IEC60825-1, FDA (CDRH) Part 1040.10*1)		Class 2M laser product*9						
	Output		10 mW						
Spot size (reference distance)			Approx. 16 mm × 32 µm	Approx. 25 mm × 49 µm	Approx. 44 mm × 72 µm	Approx. 115 mm × 116 µm	Approx. 215 mm × 108 µm	Approx. 275 mm × 249 µm	Approx. 622 mm × 566 µm
Repeatability*2	Z-axis (height)*3		0.3 µm	0.4 µm	0.5 µm	1 µm	3 µm	5 µm	10 µm
	X-axis (width)*4		0.3 µm	0.5 µm	1.0 µm	3 µm	5 µm	10 µm	25 µm
Linearity	Z-axis (height)*5		±0.05% of F.S. (±0.012%)	±0.04% of F.S. (±0.008%)	±0.03% of F.S. (±0.004%)	±0.04% of F.S. (±0.006%)	±0.033% of F.S. (±0.005%)	Reference distance: ±60 mm ±0.025% of F.S. (±0.003%) Total range: ±0.035% of F.S. (±0.005%)	Near~reference: distance ±0.015% of F.S. (±0.004%) Total range: ±0.05% of F.S. (±0.006%)
Profile data interval*12	X-axis (width)		2.5 µm (2 µm~)	5 µm (4 µm~)	12.5 µm (10 µm~)	25 µm (20 µm~)	50 µm (40 µm~)	75 µm (50 µm~) 100 µm (50 µm~)*11	225 µm (100 µm~)
Profile data count			3200 points						
HDR (high dynamic range)			Single-shot HDR*10						
Laser irradiation position confirmation function	Light source		Blue LED (405 nm)						
Temperature characteristic			0.01% of F.S./℃						
Environmental resistance	Enclosure rating*6		IP67 (IEC60529)						
	Ambient operating illuminance*7		Incandescent lamp: 10,000 lux or less						
	Ambient temperature*8		0 to +45℃						
	Operating ambient humidity		85% RH or less (no condensation)						
	Vibration resistance		10 to 57 Hz, double amplitude 1.5 mm; 3 hours each for X, Y, and Z axes						
	Impact resistance		15 G / 6 msec						
Material			Aluminium						
Weight			Approx. 1000 g	Approx. 1000 g	Approx. 1100 g	Approx. 1200 g	Approx. 1400 g	Approx. 1300 g	Approx. 1600 g

*1 Classification performed based on IEC60825-1 in accordance with FDA (CDRH) Laser Notice.
*2 Values measured by averaging 4096 times at the reference distance.
*3 The measured target is a KEYENCE standard target. Value when the average height of the default setting area is measured with height and position tools. All other settings are default values.
*4 The measured target is a pin gauge. Value when the point of intersection for the pin gauge rounded surface and edge level is measured using height and position tools. All other settings are default values.
*5 The measured target is a KEYENCE standard target. Profile data when measured by smoothing 64 times and averaging 8 times.
All other settings are default values. Values inside parentheses are representative examples of averages for all profile data.
6 The value when a head cable (CB-B) or extension cable (CB-B*E) is connected. Does not include CB-B**L connection.
*7 When measuring white paper, illuminance on the sensor head receiving surface when light is applied to white paper.
*8 The head needs to be mounted to a metal plate to be used.
*9 Do not view the beam directly using optical instruments (such as eye loupes, magnifiers, microscopes, telescopes, or binoculars).
Observing the laser output using optical instruments is dangerous and may damage the eyes.
*10 A characteristic that allows for stable, high-precision measurement with a single capture (exposure) at all levels of reflectance, from black (low) to glossy surfaces (high).
*11 When range is extended.
*12 The profile data interval can be changed. If changed, the measurement range in the X direction will also change.

Sensor head LJ-V Series

Model			LJ-V7020K*1/ LJ-V7020KB*1	LJ-V7020*1/ LJ-V7020B*1	LJ-V7060K/ LJ-V7060KB	LJ-V7060/ LJ-V7060B	LJ-V7080/ LJ-V7080B	LJ-V7200/ LJ-V7200B	LJ-V7300/ LJ-V7300B
Mounting conditions			Specular reflection	Diffuse reflection	Specular reflection	Diffuse reflection			
Reference distance			24.2 mm	20 mm	54.6 mm	60 mm	80 mm	200 mm	300 mm
Measurement range	Z-axis (height)		±2.3 mm (F.S. = 4.6 mm)	±2.6 mm (F.S. = 5.2 mm)	±7.6 mm (F.S. = 15.2 mm)	±8 mm (F.S. = 16 mm)	±23 mm (F.S. = 46 mm)	±48 mm (F.S. = 96 mm)	±145 mm (F.S. = 290 mm)
	X-axis (width)	NEAR side	6.5 mm	6.5 mm	8 mm	13.5 mm	25 mm	51 mm	110 mm
		Reference distance	7 mm	7 mm	14 mm	15 mm	32 mm	62 mm	180 mm
		FAR side	7.5 mm	7.5 mm	8 mm	15 mm	39 mm	73 mm	240 mm
Light source			Blue semiconductor laser						
	Wavelength		405 nm (visible light)						
	Laser class (IEC60825-1, FDA (CDRH) Part 1040.10*2)		Class 2M*3		Class 2	Class 2M*3	Class 2		
	Output		10 mW		4.8 mW	10 mW	4.8 mW		
Spot size (reference distance)			Approx. 14 mm × 35 µm		Approx. 21 mm × 45 µm		Approx. 48 mm × 48 µm	Approx. 90 mm × 85 µm	Approx. 240 mm × 610 µm
Repeatability*4	Z-axis (height)*5		0.3 µm		0.4 µm		0.5 µm	1 µm	5 µm
	X-axis (width)*6		2.5 µm		5 µm		10 µm	20 µm	60 µm
Linearity	Z-axis (height)*7		±0.1% of F.S.						From ±0.05% ±0.15% of F.S.*8
Profile data interval	X-axis (width)		10 µm		20 µm		50 µm	100 µm	300 µm
Profile data count			800 points						
HDR (high dynamic range)			Single-shot HDR*12						
Temperature characteristic			0.01% of F.S./°C						
Environmental resistance	Enclosure rating*9		IP67 (IEC60529)						
	Ambient operating illuminance*10		Incandescent lamp: 10,000 lux or less						
	Ambient temperature*11		0 to +45°C						
	Operating ambient humidity		85% RH or less (no condensation)						
	Vibration resistance		10 to 57 Hz, double amplitude 1.5 mm; 3 hours each for X, Y, and Z axes						
	Impact resistance		15 G / 6 msec						
Material			Aluminium						
Weight			Approx. 410 g		Approx. 450 g		Approx. 400 g	Approx. 550 g	Approx. 1000 g

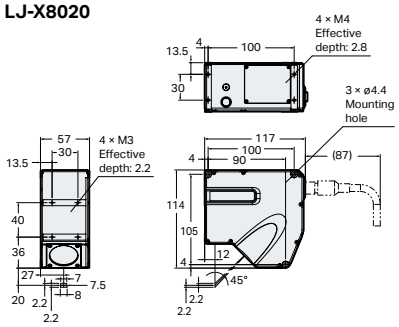
*1 Double polarisation function cannot be used.
*2 Classification performed based on IEC60825-1 in accordance with FDA (CDRH) Laser Notice.
*3 Do not view the beam directly using optical instruments (such as eye loupes, magnifiers, microscopes, telescopes, or binoculars).
Observing the laser output using optical instruments is dangerous and may damage the eyes.
*4 Values measured by averaging 4096 times at the reference distance.
*5 The measured target is a KEYENCE standard target. Value when the average height of the default setting area is measured with height and position tools.
All other settings are default values.
*6 The measured target is a pin gauge. Value when the point of intersection for the pin gauge rounded surface and edge level is measured using height and position tools.
All other settings are default values.
*7 The measured target is a KEYENCE standard target. Profile data when measured by smoothing 64 times and averaging 8 times.
All other settings are default values.
*8 Linearity will vary depending on the measuring area (refer to the figure on the right)
9 The value when a head cable (CB-B) or extension cable (CB-B*E) is connected.
*10 When measuring white paper, illuminance on the sensor head receiving surface when light is applied to white paper.
*11 The head needs to be mounted to a metal plate to be used.
*12 A characteristic that allows for stable, high-precision measurement with a single capture (exposure) at all levels of reflectance, from black (low) to glossy surfaces (high).



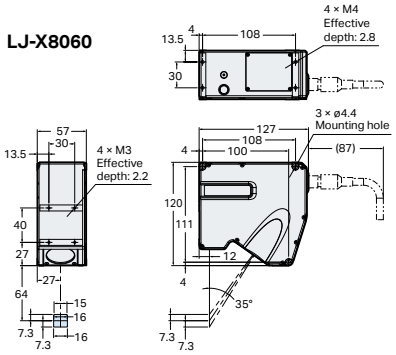
• Model designations ending with B are luminance output types. The multi emission (optimising light) and multi emission (synthesis) imaging modes are not available.

Sensor head LJ-X Series

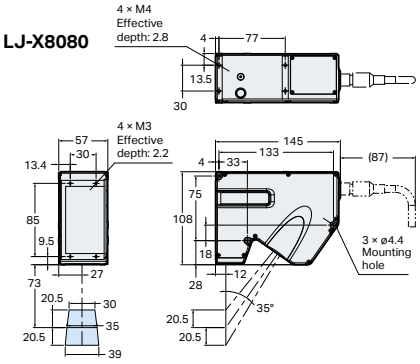
LJ-X8020



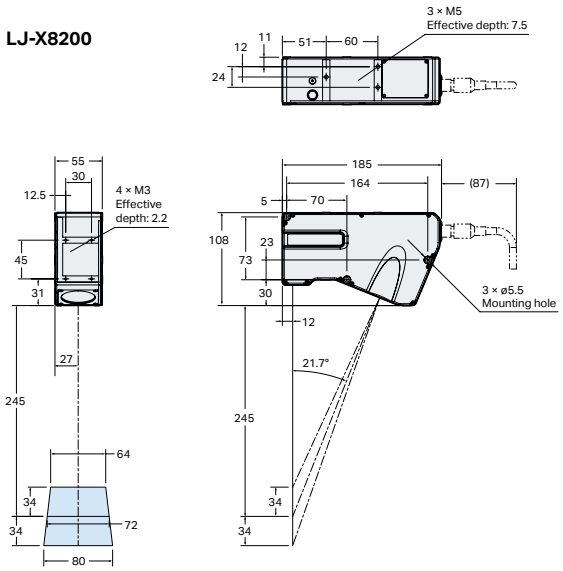
LJ-X8060



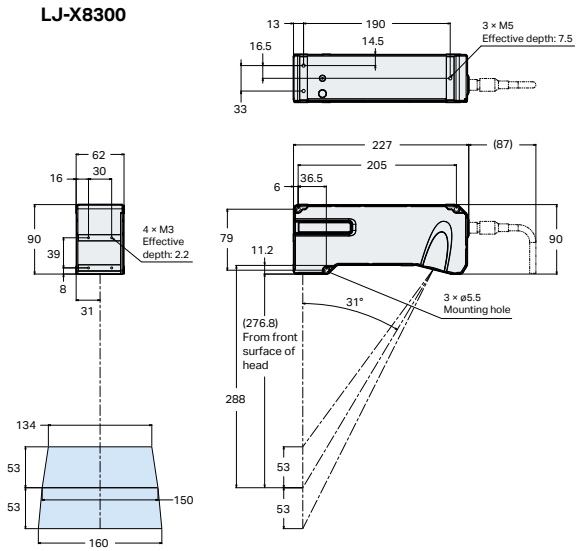
LJ-X8080



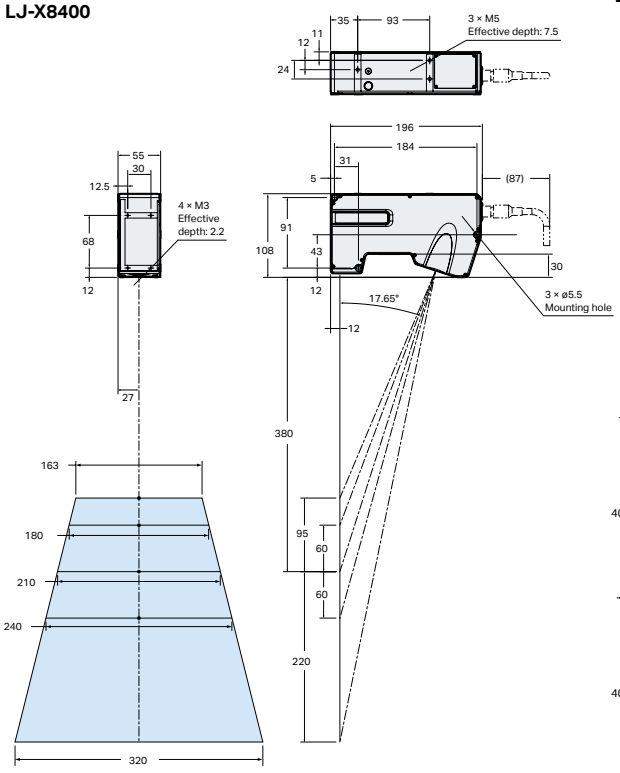
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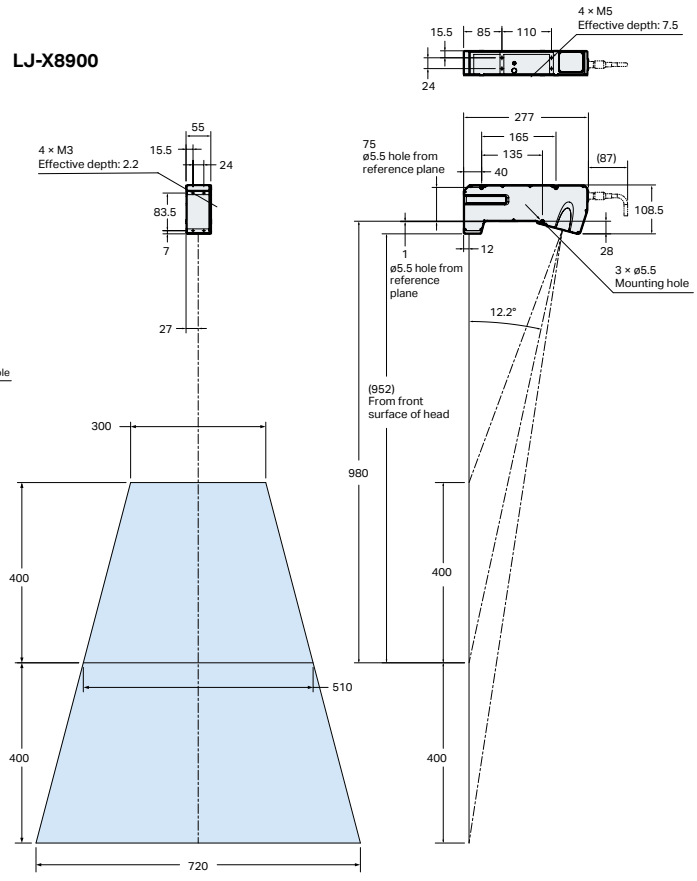
LJ-X8300



LJ-X8400

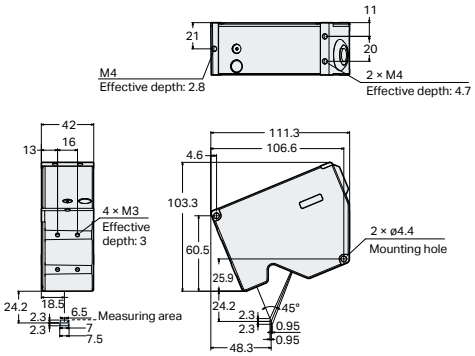


LJ-X8900

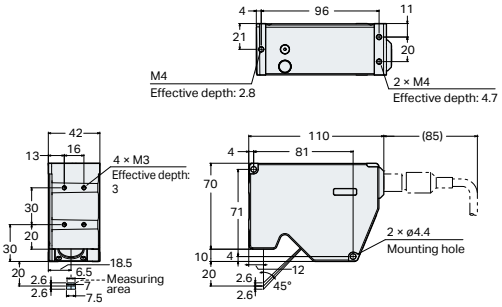


Sensor head LJ-V Series

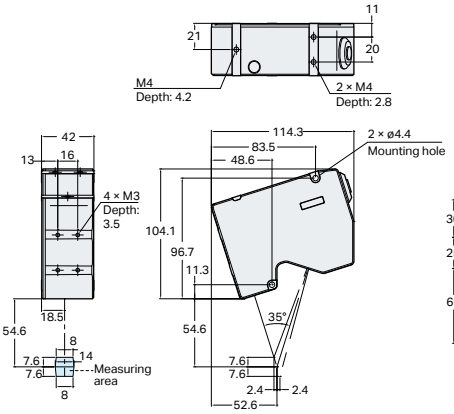
LJ-V7020K/LJ-V7020KB



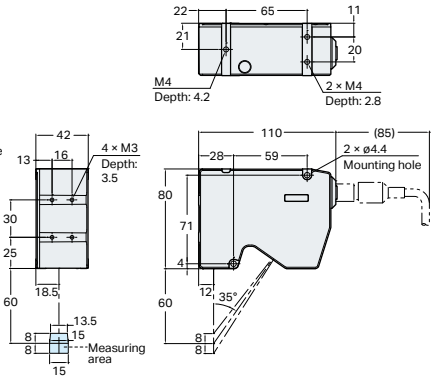
LJ-V7020/LJ-V7020B



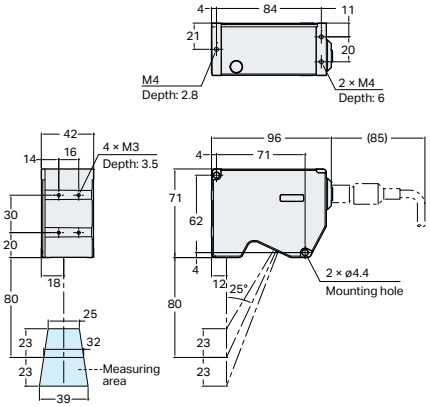
LJ-V7060K/LJ-V7060KB



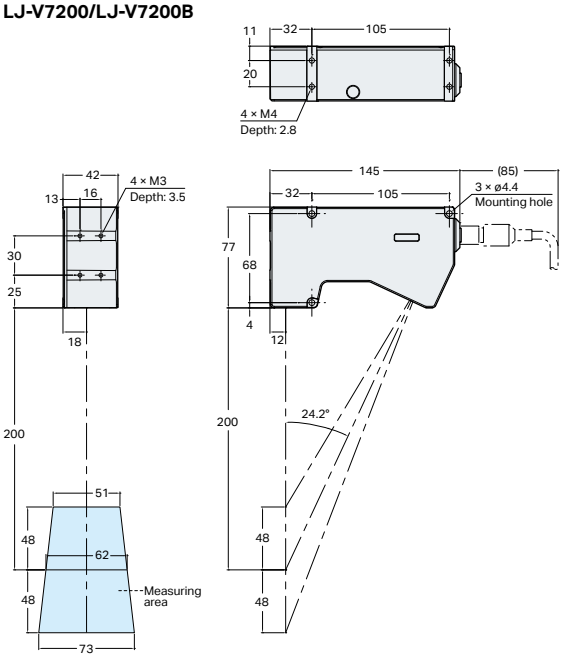
LJ-V7060/LJ-V7060B



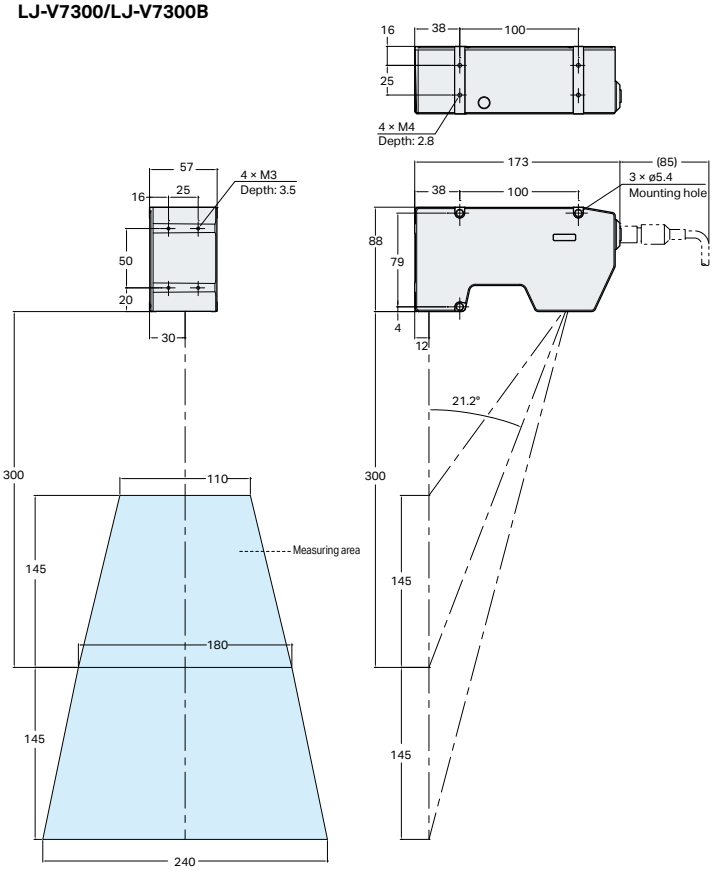
LJ-V7080/LJ-V7080B



LJ-V7200/LJ-V7200B



LJ-V7300/LJ-V7300B



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