MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

KEYENCE

LJ-X8080

2D/3D LASER PROFILER SENSOR HEAD

Used with the applicable LJ-X8000 Series system configuration.

REFERENCE PACKAGE

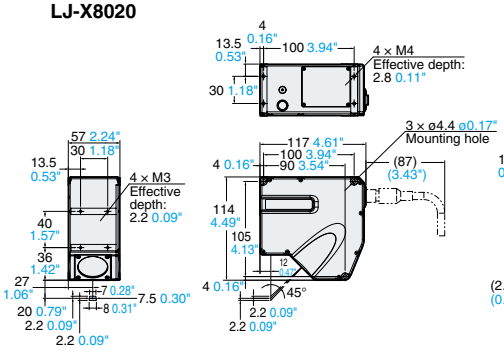
OFFICIAL DOCUMENT

Selected official pages follow this cover with source pagination retained.

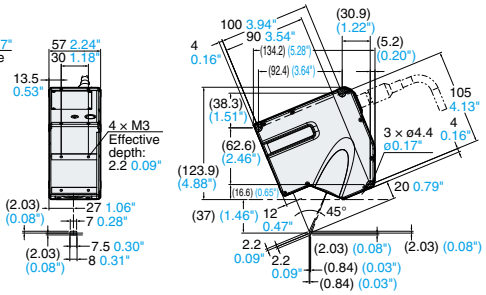
Source: KEYENCE LJ-X8000 Series catalog; model LJ-X8080.

Sensor head LJ-X Series

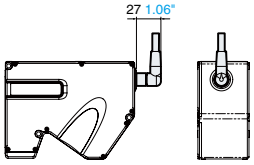
LJ-X8020



LJ-X8020 in specular reflection configuration

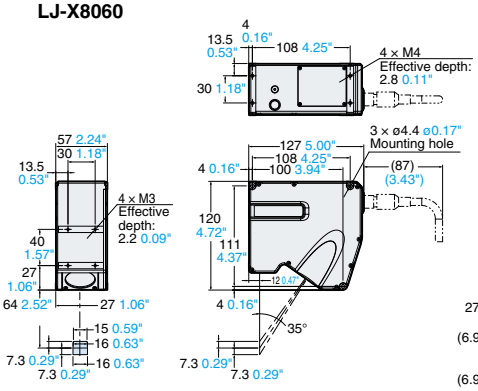


With CB-B05LU (L-shaped cable) connected

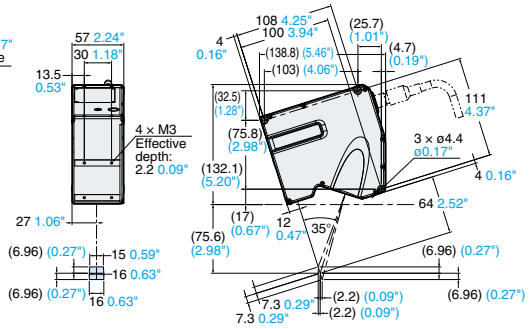


*The value inside parentheses is a reference value calculated by tilting the dimensions during installation by 22.5 degrees.

LJ-X8060

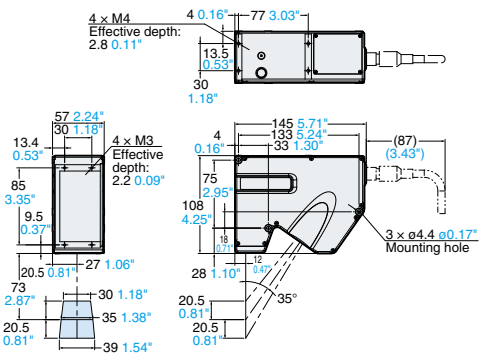


LJ-X8060 in specular reflection configuration

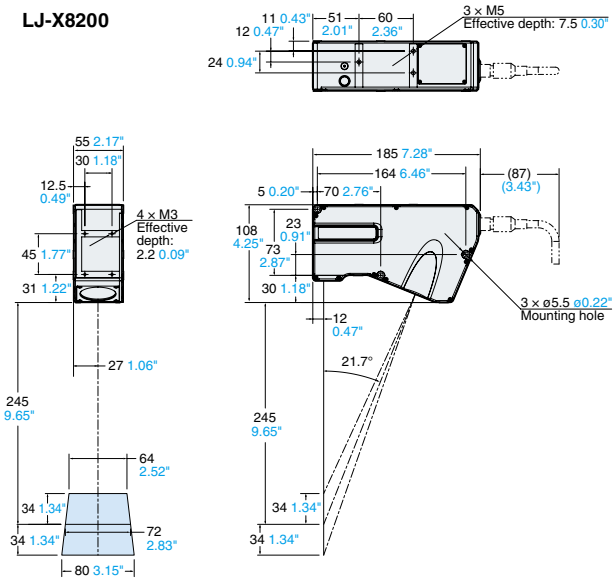


*The value inside parentheses is a reference value calculated by tilting the dimensions during installation by 17.5 degrees.

LJ-X8080



LJ-X8200



Sensor head LJ-X Series

Model			LJ-X8020	LJ-X8060	LJ-X8080	LJ-X8200	LJ-X8400	LJ-X8900
Reference distance			20 mm 0.79"	64 mm 2.52"	73 mm 2.87"	245 mm 9.65"	380 mm 14.96"	980 mm 38.58"
Measurement range	Z-axis (height)		±2.2 mm 0.09" (F.S.=4.4 mm 0.17")	±7.3 mm 0.29" (F.S.=14.6 mm 0.57")	±20.5 mm 0.81" (F.S.=41 mm 1.61")	±34 mm 1.34" (F.S.=68 mm 2.68")	±60 mm ±2.36" (+95 to -220 mm +3.74" to -8.66"*11) (F.S.=315 mm 12.40")	±400 mm 15.75" (F.S.=800 mm 31.50")
	X-axis (width)	NEAR side	7 mm 0.28"	15 mm 0.59"	30 mm 1.18"	64 mm 2.52"	180 mm 7.09" (163 mm 6.42"*11)	300 mm 11.81"
		Reference distance	7.5 mm 0.30"	16 mm 0.63"	35 mm 1.38"	72 mm 2.83"	210 mm 8.27"	510 mm 20.08"
		FAR side	8 mm 0.31"	16 mm 0.63"	39 mm 1.54"	80 mm 3.15"	240 mm 9.45" (320 mm 12.60"*11)	720 mm 28.35"
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 0.63" × 0.0013"	Approx. 25 mm × 49 µm 0.98" × 0.0019"	Approx. 44 mm × 72 µm 1.73" × 0.0028"	Approx. 115 mm × 116 µm 4.53" × 0.0046"	Approx. 275 mm × 249 µm 10.83" × 0.0098"	Approx. 622 mm × 566 µm 24.49" × 0.0223"
Repeatability*2	Z-axis (height)*3		0.3 µm 0.000012"	0.4 µm 0.000016"	0.5 µm 0.000020"	1 µm 0.000039"	5 µm 0.000197"	10 µm 0.0004"
	X-axis (width)*4		0.3 µm 0.000012"	0.5 µm 0.000020"	1.0 µm 0.000039"	3 µm 0.000118"	10 µm 0.0004"	25 µm 0.0010"
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%)	Reference distance: ±60 mm ±2.36" ±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 0.000098" (2 µm 0.000079"~)	5 µm 0.000197" (4 µm 0.000157"~)	12.5 µm 0.0005" (10 µm 0.0004"~)	25 µm 0.0010" (20 µm 0.0008"~)	75 µm 0.0030" (50 µm 0.0020"~) 100 µm 0.0039" (50 µm 0.0020"~)*11	225 µm 0.0089" (100 µm 0.0039"~)
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./°C					
Environmental resistance	Enclosure rating*6		IP67 (IEC60529)					
	Ambient operating illuminance*7		Incandescent lamp: 10,000 lux or less					
	Ambient temperature*8		0 to +45°C 32 to +113°F					
	Operating ambient humidity		85% RH or less (no condensation)					
	Vibration resistance		10 to 57 Hz, double amplitude 1.5 mm 0.06"; 3 hours each for X, Y, and Z axes					
	Impact resistance		15 G / 6 msec					
Material			Aluminum					
Weight			Approx. 1000 g	Approx. 1000 g	Approx. 1100 g	Approx. 1200 g	Approx. 1300 g	Approx. 1600 g

*1 Classification performed based on IEC60825-1 in accordance with FDA (CDRH) Laser Notice No. 56. *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.

LASER WARNING/EXPLANATORY LABEL

LJ-X8020/LJ-X8060/LJ-X8080/ LJ-X8200/LJ-X8400/LJ-X8900

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

LJ-X Series Simulation-Software

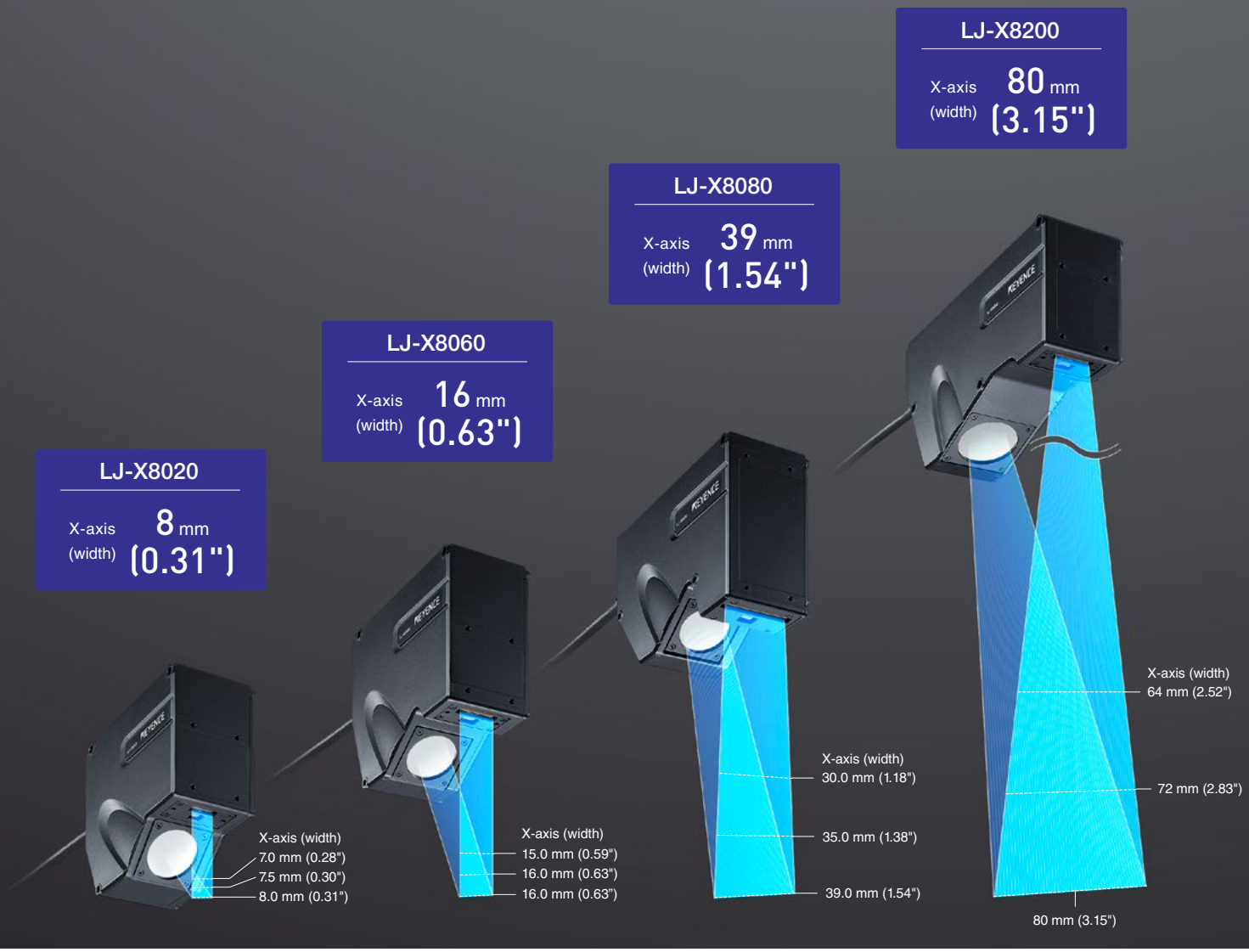
Item	Required Environment
Supported OS	Microsoft Windows11® Pro, Windows® 10 Home, Pro, Enterprise (supports 64-bit version only) Microsoft Windows® 7 Home Premium, Professional, Ultimate, Enterprise (supports 64-bit version only) • Japanese, English, and Chinese (simplified) are supported for the OS. • 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 and profile data)
Display resolution	Minimum: 1024 × 768 pixels or larger, Recommended: 1280 × 1024 pixels or larger

LJ-X Series Terminal-Software

Item	Required Environment
Supported OS	Microsoft Windows11® Pro, Windows® 10 Home, Pro, Enterprise Microsoft Windows® 7 Home Premium, Professional, Ultimate, Enterprise • Japanese, English, and Chinese (simplified) are supported for the OS. • 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 and profile data • Display resolution: 1024 × 768 pixels or larger (Recommended: 1280 × 1024 pixels or larger)

Select from a lineup designed to meet any application requirements

The LJ-X Series offers a wide range of sensors to support quality control and process improvement in any industry.



Choose a controller that fits your needs

Standard models

Intuitive user interface designed to make programming simple. Set up for inline inspection in 3 easy steps.

2D/3D Controller
LJ-X8000

2D Controller
LJ-X8000E

2D measurement

Car door flush and gap

Control flush and gap at the micron level. By mounting the sensor on a multi-axial robot, inspections can be performed inline.

3D measurement

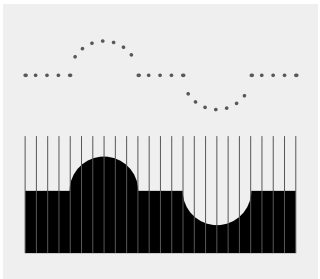
Brake rotor porosity

Using 3D images, it's possible to detect porosity in rough surfaces. High-resolution profiles enable stable detection of even the smallest defects.

Accurately capture target shape

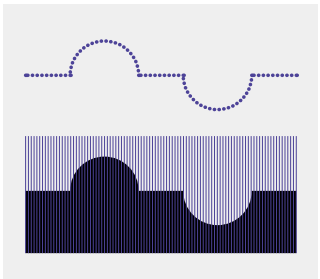
By creating each profile from 3200 data points, inspection can be performed using a profile that captures the shape of a target in more detail, improving measurement precision and defect detection.

Conventional System



Conventional systems have limited profile points which makes the shape rougher. Detecting small dents or protrusions was impossible.

LJ-X Series



With the LJ-X Series, the shape of the target is accurately rendered using 3200 points/profile. Abnormalities, such as small dents or protrusions, can be easily detected.

Ultra-high precision

Improved precision in both the X-axis and Z-axis

Implantable device assembly check

Confirm components are properly seated and soldered connections are intact with high precision.

Ensure long-term reliability by checking 100% of implantable devices in process.

Comparison with conventional product

X-axis (width)

Improved X resolution produces high precision width measurements.

	Conventional KEYENCE product	LJ-X8020
Measurement range	7 mm 0.28" (reference distance)	7.5 mm 0.30" (reference distance)
Profile data count	800	3200
Profile data interval	10 µm 0.0004"	2.5 µm 0.000098"

Measurement precision (X-axis)

4x more resolution

Z-axis (height)

Improved Z-axis precision provides high-accuracy height measurements.

	Conventional KEYENCE product	LJ-X8080
Measurement range	±23 mm ±0.91"	±20.5 mm ±0.81"
Linearity	±0.1% of F.S.	±0.03% of F.S.

Measurement precision (Z-axis)

3x more accurate