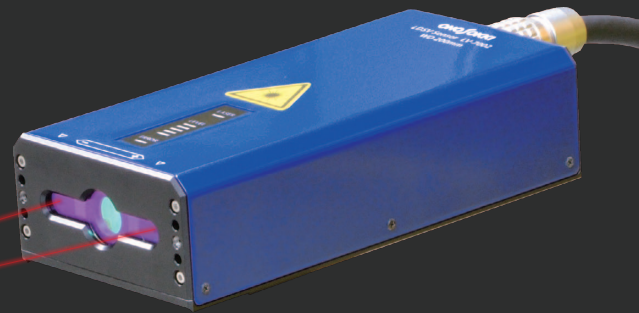


LV-7000 series

## Laser Doppler Surface Velocity Meter

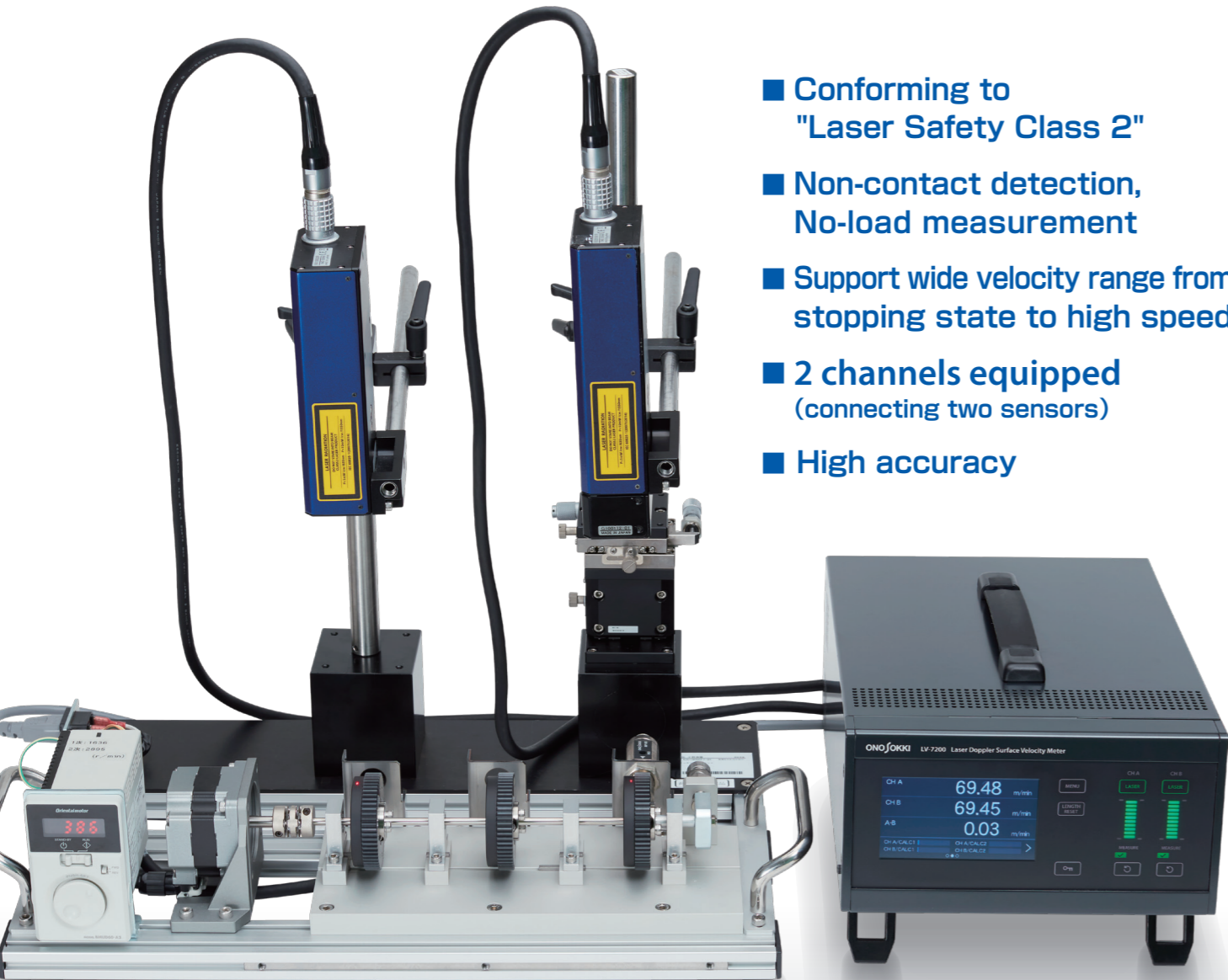
Anytime, Anywhere,  
Easy measurement



# LV-7000 series Laser Doppler Surface Velocity Meter

The LV-7000 series detects speed, uneven speed, distance, length of moving object or rotating object without contact.

- Conforming to "Laser Safety Class 2"
- Non-contact detection, No-load measurement
- Support wide velocity range from stopping state to high speed
- 2 channels equipped (connecting two sensors)
- High accuracy



## Laser Doppler Surface Velocity Meter LV-7000 series

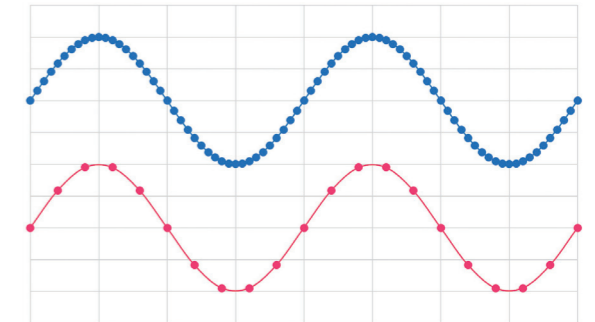


### Inter-channel difference measurement



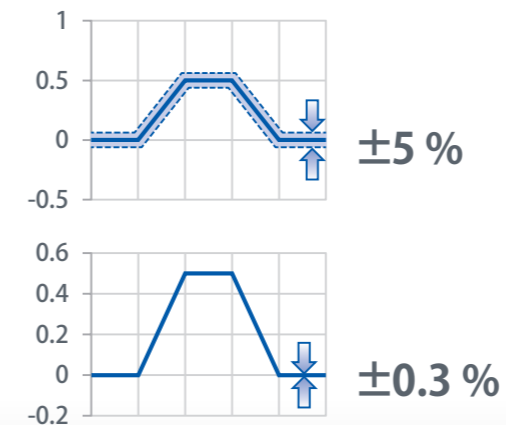
By connecting two sensors to one main unit, it enables to calculate and output difference in velocity/length between the two points. It measures the slip measurement between the roller and conveyed object in real time.

### High frequency response



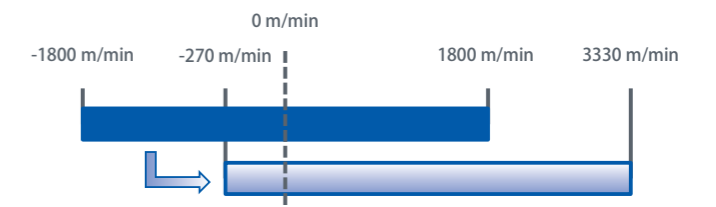
Provides the wide band mode that improves the frequency response up to 20 kHz\*. The minute velocity changes are detected instantly.  
\*Approximately 4 times of the LV-7100(previous model)

### Analog output



Up to four types of analog output (two types for each channel) can be selected from velocity, distance, velocity difference, and distance difference.  
Linearity: Max.  $\pm 0.3\%$  (LV-7100: Max.  $\pm 5.0\%$ )  
DC offset:  $\pm 0.3\%$  (LV-7100:  $\pm 5.0\%$ )

### Additional velocity range (optional)



The maximum detection velocity range is extended by shifting the velocity range to the positive side. The velocity range from -270 to 3,330 m/min\* can be measured.  
\* It can be further extend to -540 to 6,660 m/min when high-velocity module for sensor mounted.



# LV-7210/7220

## Laser Doppler Surface Velocity Meter Main Unit

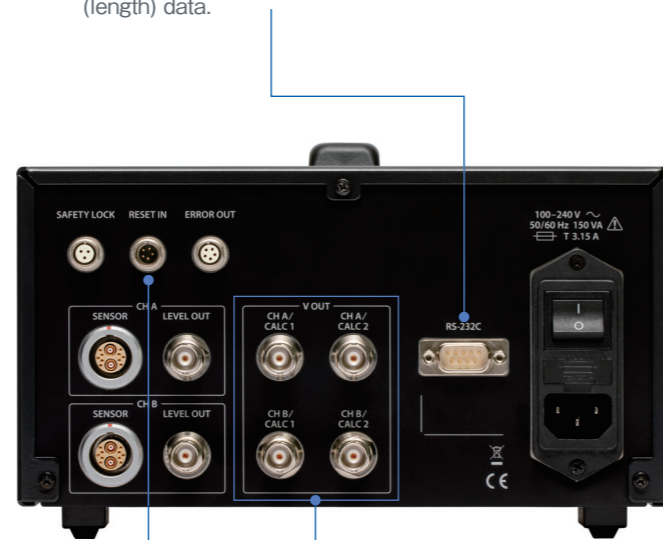
### User-friendly operability

The touch-button enables easy handling for the frequently used operation in measurement. The advanced settings can be also operated with the LCD touch panel.



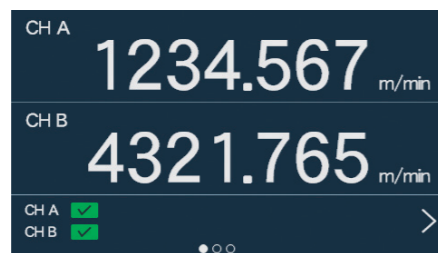
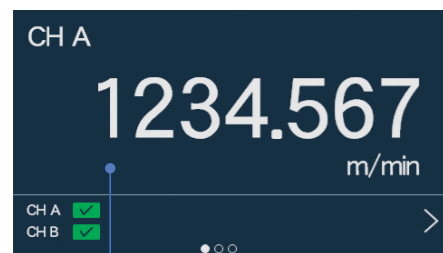
### RS-232C communication

You can control the LV-7200 main unit from the PC or PLC connected via RS-232C communication, such as changing setting, reading velocity/distance (length) data.



### Remote reset function

You can reset the measured distance/length value remotely by connecting a PLC etc. to this RESET IN terminal.



### Flexible screen layout

The display mode can be selected between 1,2 and 3 lines according to the purposes. Flexibly used in the scene such as reading from a distance, comparing data, etc.

### Analog output (up to 4 output)

Outputs a voltage corresponding to velocity, distance, velocity difference, and distance difference at  $\pm 10V$ .

### Easy to notice measurement condition

Outputs a signal when it cannot be detected (sensitivity error occurs, excessive acceleration occurs).

# LV-7002

## Laser Doppler Surface Velocity Meter Sensor

### Indicators

Three indicators are centrally designed on the sensor. Enables to capture the detection status and sensor operation status at a glance.



### High-velocity module for sensor

Detection velocity range : 0 to  $\pm 3600\text{m/min}^*$   
Max. tracking acceleration:  $1600\text{ m/s}^2$   
\*Twice of the LV-7100



### Detection range (depth of focus) $\pm 10\text{ mm} / \pm 15\text{ mm}^*$

Even if the laser focal point is slightly away from the detection position it can be measured as long as it is within the detection range. (\*when the LV-0730 mounted)

### Conforming to "Laser Safety Class 2"

No protection glasses required. You can directly check the focal point and detection position of the laser beam.

# Application examples

- printing machine, photo copy machine, OA equipment
- conveyer, belt
- building material, sheet

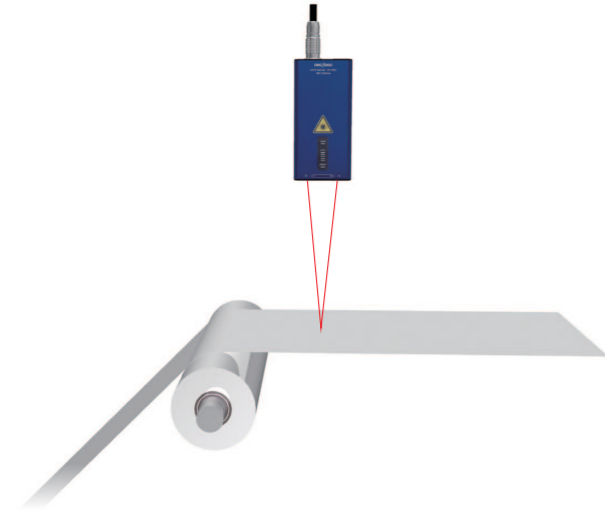
- converting
- high-performance film
- woven fabric, non-woven fabric

- transmission system, pulley
- pick-up line, cutting machine
- tire, roller

- plastic, rubber, resin
- wire, steel wire, thread
- paper, fiber

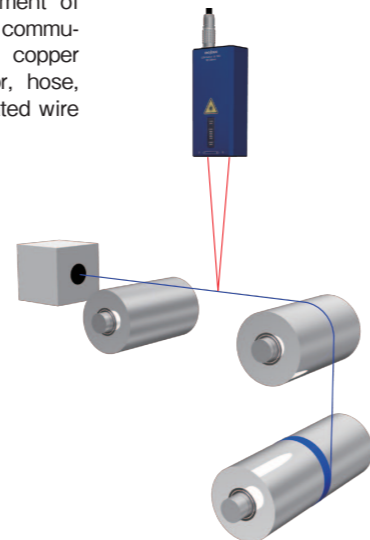
## Speed/uneven speed measurement

Speed/uneven speed measurement of paper, film, rubber, woven fabric, non-woven fabric, and plastic



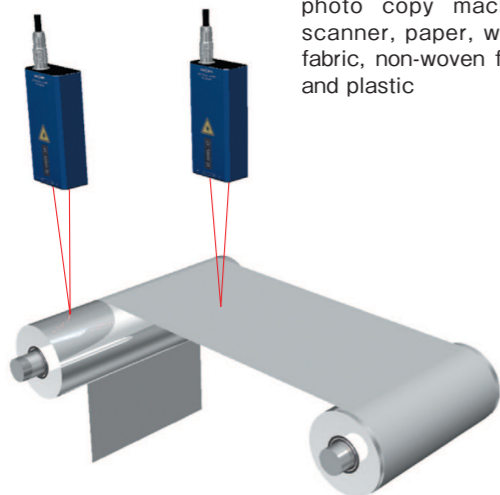
## Measurement of winding length

Length measurement of thread, wire for communication facility, copper wire for elevator, hose, harness and coated wire material



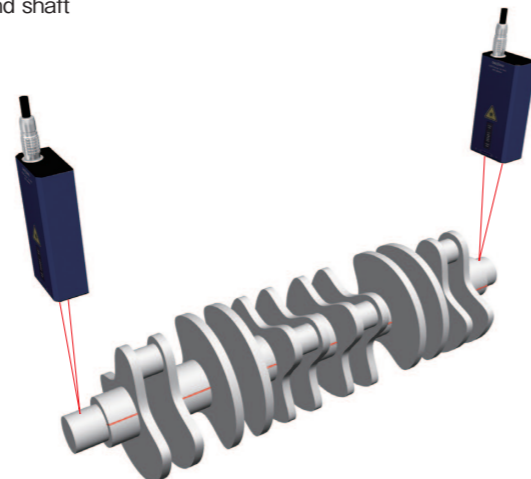
## Conveyance slip amount measurement

Slip amount measurement on conveyance of printer, photo copy machine, scanner, paper, woven fabric, non-woven fabric and plastic



## Torsion/torsion vibration measurement

Torsion or torsion vibration measurement of transmission power train, drive-train, rotation shaft, turbine, forging crank and shaft



# Specification

## LV-7002 Sensor and LV-0730 High-velocity module

	LV-7002	LV-7002+LV-0730	
Laser beam	Laser safety class	Class2	
	Measuring laser beam	$\lambda=1550$ nm	Less than 10 mW
	Guide laser beam	$\lambda=635$ nm	Less than 1 mW
	Laser spot diameter	2 mm × 1 mm, ellipse	
Detection distance	Detection distance (center) *from the bottom surface of the sensor	200 mm	172 mm
	Detection range (depth)	$\pm 4$ mm Distance accuracy: within $\pm 0.2$ % (of reading)	$\pm 15$ mm Distance accuracy: within $\pm 5.0$ % (of reading)
Sensor	Scale factor (reflected automatically at power-on)	Approx. 7.5 $\mu$ m	Approx. 15 $\mu$ m
	Detection velocity range	0 to $\pm 1800$ m/min	0 to $\pm 3600$ m/min
	Maximum tracking acceleration	800 m/s <sup>2</sup>	1600 m/s <sup>2</sup>
Outer dimensions (W×H×D)	75 mm × 40 mm × 155 mm	76 mm × 40 mm × 183 mm	
Weight of the main unit (not including option/ cable)	Approx. 750 g	Approx. 900 g	

## LV-7200 series Main Unit

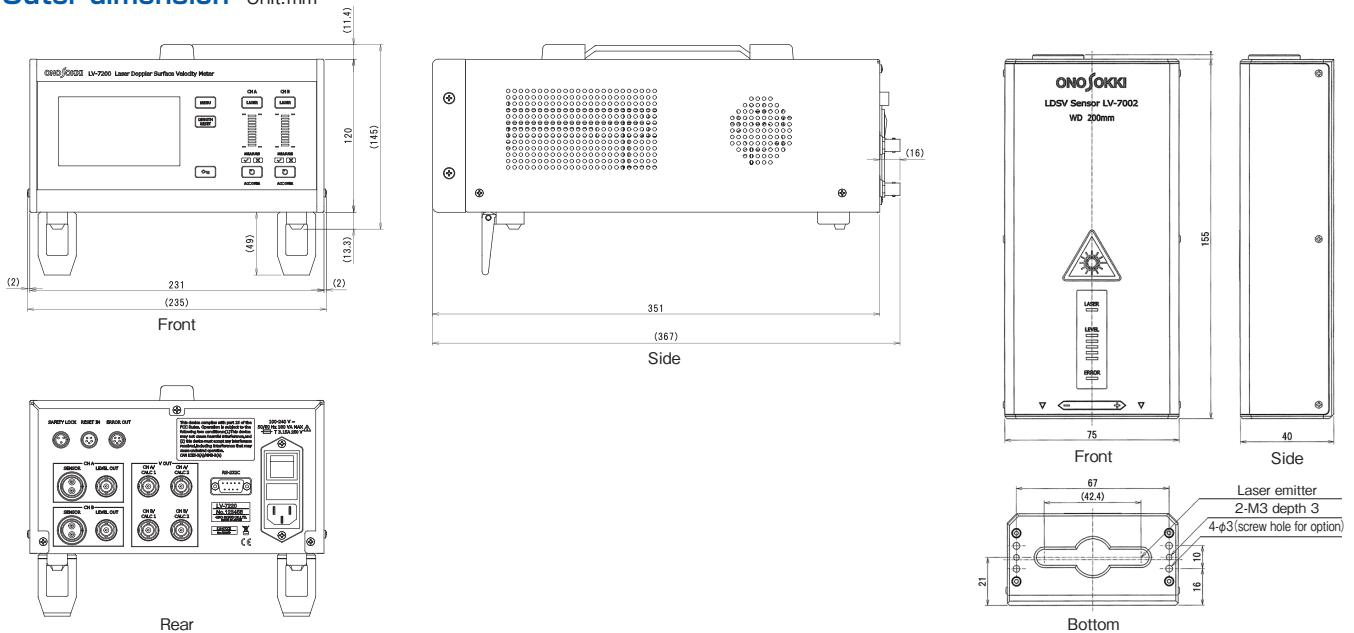
	LV-7210	LV-7220		
Number of Sensor Inputs	1 (CH A)	2 (CH A and CH B)		
Detection	Polarity	Moving from the left of the front of the sensor to the right: + Moving from the right of the front of the sensor to the left: -		
	Detection velocity range	0 to $\pm 1800$ m/min 0 to $\pm 3600$ m/min (with the LV-0730 for sensor added)		
	Measurement mode	Standard/ Wide band		
	Cutoff frequency	Standard mode	5 kHz (LPF GAIN fc = -3 dB)	
Maximum tracking acceleration	Wide band mode	20 kHz (LPF GAIN fc = -3 dB)		
	Standard mode	800 m/s <sup>2</sup> , 1600 m/s <sup>2</sup> *with the LV-0730 for sensor added		
Voltage output	Wide band mode	No upper limit		
	Number of output terminals	2	4	
	Output terminal shape	BNC (receptacle)		
Output voltage	Output voltage		$\pm 10$ V (20 V p-p)	
	Output impedance		50 $\Omega$ or less	
Output item	CH A velocity, CH A length		CH A,B velocity, CH A,B length, A-B velocity, A-B length	
	Voltage range		180(m/min)/V, 50 (m/min)/V, 10(m/min)/V, 1(m/min)/V 360(m/min)/V, 100 (m/min)/V, 20(m/min)/V, 2(m/min)/V(when LV-0730 installed)	
Velocity voltage output	Linearity		Max. $\pm 0.3$ % (F.S.)	
	DC offset		Within $\pm 0.3$ % (F.S.)	
	Low-pass filter	Standard mode	Off: 5 kHz, 1 kHz, 100 Hz	
Length voltage output	Wide band mode	Off: 20 kHz, 5 kHz, 1 kHz, 100 Hz		
	Voltage range		1000 m/V, 100 m/V, 1 m/V, 100 mm/V, 10 mm/V, 1 mm/V, 100 $\mu$ m/V	
LCD display	Length detection range		0 to $\pm 10000$ m	
	Type		4.3-inch LCD (touch panel)	
	Number of display digits	7 digits + polarity (1 digit)		
Digital output	Number of display lines	Selected 1 or 2 lines		
	Standard	RS-232C		
General specifications	Connector	D-sub 9-pin		
	Power supply	Input voltage	100-240 VAC, 50/60 Hz	
		Power consumption	Less than 180 VA	
	Outside dimensions (W×H×D)	231 mm × 120 mm × 351 mm (protrusions not included)		
	Weight	Approx. 3.6 kg		Approx. 4 kg
		Operating environment	Temperature range	0 to 40 °C
	Humidity range		20 to 80 % (with no condensation)	
	Storage environment	Temperature	-10 °C to 50 °C	
		Humidity range	20 to 80 % (with no condensation)	

		FDA 21CFR Part 1040.10( CDRH)
	Laser safety	IEC 60825-1: 2007, 2014
		JIS C 6802 : 2007, 2014
Conforming standard		FCC (Part15B): 2015
	EMC	CANADA EMI standard (ICES-003) : 2016
		EN61326-1
	Safety	EN61010-1

## Option

Model name	Product name	Description
LV-0703	Sensor cable	Cable length 3 m
LV-0705	Sensor cable	Cable length 5 m
LV-0730	High-Velocity Module for Sensor	
LV-0732	Additional Velocity Range	Velocity range: -270 to 3330 m/min
LV-0740	Channel modification	
LV-0752	90-Degree Beam Bending Mirror	
LV-0762	Sensor Suspension Adapter	
LV-0773	RESET IN Cable	One side open
LV-0774	ERROR OUT Cable	
LV-0793	Storage Trunk	Common for LV-7210, LV-7220
LV-0015	XY-axis fine-control stage	Stage face: 60×60 mm, travelling amount: ±6.5 mm
LV-0016	Z-axis fine-control stage	Stage face: 60×60 mm, travelling amount: 0 to 13 mm
LV-0030	Large magnet stand	
LV-0018A	Steel plate	

## Outer dimension Unit:mm



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