LV-7000 series Laser Doppler Surface Velocity Meter

<table>
<thead>
<tr>
<th>Model name</th>
<th>Product name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LV-7002</td>
<td>Laser Doppler Surface Velocity Sensor</td>
<td>WD=200 mm</td>
</tr>
<tr>
<td>LV-7100</td>
<td>Laser Doppler Surface Velocity Meter Controller</td>
<td>3 m</td>
</tr>
<tr>
<td>LV-7070</td>
<td>Sensor cable</td>
<td>5 m*</td>
</tr>
<tr>
<td>LV-7070</td>
<td>High-velocity module for sensor</td>
<td>Detection velocity range 0 to 3,600 or more</td>
</tr>
<tr>
<td>LV-7071</td>
<td>High-velocity module for controller</td>
<td>Detection velocity range 0 to 3,600 or more</td>
</tr>
<tr>
<td>LV-7072</td>
<td>90-degree beam bending mirror</td>
<td></td>
</tr>
<tr>
<td>LV-7072</td>
<td>Sensor suspension adapter</td>
<td></td>
</tr>
<tr>
<td>LV-7772</td>
<td>Controller connection kit</td>
<td>For connecting two units of LV-7100</td>
</tr>
<tr>
<td>LV-7919</td>
<td>Storage trunk</td>
<td>Storage for 1 set</td>
</tr>
</tbody>
</table>

* Please consult us about cable extension.

Peripherals

**RP-7400 series Roller Encoder**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiple rotary encoder, can be driven in clockwise and counter-clockwise directions</td>
<td></td>
</tr>
<tr>
<td>Digital output (absolute, incremental)</td>
<td></td>
</tr>
<tr>
<td>Output: 10 V (100 ms)</td>
<td></td>
</tr>
</tbody>
</table>

**RV-3150 Multi-functional Reversible Counter**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multi-in one, multiple inputs, can be driven in clockwise and counter-clockwise directions</td>
<td></td>
</tr>
<tr>
<td>Digital output (absolute, incremental)</td>
<td></td>
</tr>
<tr>
<td>Output: 10 V (100 ms)</td>
<td></td>
</tr>
</tbody>
</table>

Anytime anywhere, high sensitivity and high response detection

**LV-7000 Series**

LV-7000 Laser Doppler Surface Velocity Meter Controller LV-7100

**Product Features**

- Detection velocity range 0 to 3,600 or more
- High-velocity module for sensor and controller
- 90-degree beam bending mirror
- Sensor suspension adapter
- Controller connection kit for connecting two units of LV-7100

**Technical Specifications**

- **LV-7002**
  - Laser Doppler Surface Velocity Sensor
  - WD=200 mm

- **LV-7100**
  - Laser Doppler Surface Velocity Meter Controller
  - 3 m

- **LV-7070**
  - Sensor cable
  - 5 m*

- **LV-7071**
  - High-velocity module for sensor
  - Detection velocity range 0 to 3,600 or more

- **LV-7072**
  - 90-degree beam bending mirror

- **LV-7072**
  - Sensor suspension adapter

- **LV-7772**
  - Controller connection kit
  - For connecting two units of LV-7100

- **LV-7919**
  - Storage trunk
  - Storage for 1 set

* Please consult us about cable extension.

**RV-3150 Multi-functional Reversible Counter**

- **Feature**
  - Multi-in one, multiple inputs

- **Specification**
  - **Sensor Input**
    - Input range: ±10 V
  - **Power Supply**
    - 100 V to 240 V AC
  - **Output**
    - 10 V (100 ms)
  - **Power Requirement**
    - Approx. 2.5 W

**RP-7400 series Roller Encoder**

- **Feature**
  - Multiple rotary encoder

- **Specification**
  - **Output**
    - Digital output (absolute, incremental)
  - **Output Signal**
    - 10 V (100 ms)
  - **Power Requirement**
    - Approx. 1 W

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  - E-mail: admin@onosokki.com

- **URL**: https://www.onosokki.co.jp/english/english.htm

*Our appearance and specifications are subject to change without prior notice.
Anytime anywhere
Fast and easy non-contact detection
High sensitivity and high-speed response
Laser Doppler Surface Velocity Meter

The LV-7000 series Laser Doppler Surface Velocity Meter offers non-contact detection of velocity, velocity irregularity and displacement of rotating objects and moving objects.

**Feature**

**High sensitivity detection**
Class 2 Laser product
- Laser protection glass, laser controlled area and laser administrator are no longer required.
- Original optical system and demodulating circuit allow high sensitivity detection. Available to measure wide variety of targets.
- Red visible light allows easy, quick positioning and checking.

**Non-contact detection, No-load measurement**
- High spatial resolution with small laser-spot. Enables measurement of thin/tiny target including thread and narrow parts.
- No need to worry about defects such as scratch, wrinkle, or transformation by laser detection.
- Hardly affected by flipping, shaking, or eccentricity. Slip or friction is not generated.
- Enables velocity measurement and length measurement over vertical movement, negative gradient movement, which are difficult to detect by contact-type detector.
- Extension speed/direction measurement of extensible materials including rubber, resin, and fabric.

**Simple operation and high function**
- Easy to see numerical values by large LED display and stand jigs. Current setting conditions are clear at a glance.
- Simple and speedy operation with large function button.
- Supports 0 to ±3,600 m/min of velocity, 1,600 m/s² of acceleration*.
- Used for evaluation of various rotating objects.
- *Limited by buzzer and output module for connector LV-0720.
- Selectable output signal format from analog, phase difference, RS-232C according to the usage.
- Difference measurement between two points by setting two velocity meters.

**NEW**
Supports high velocity and high acceleration measurement
- Installing options enable to support twice the velocity and acceleration of the standard specification.
- Velocity range: 0 to ±3,600 m/min, max. tracking acceleration: 1,600 m/s².
- Rotating/moving objects with high speed or with sudden speed change are measured, these are not supported by standard LV-7000 series.
**Function**

Detection, measurement, and control all in one simple, compact unit

**LV-7002**
Laser Doppler Surface Velocity Sensor

- **Sensor cable**
  - LV-0703(3 m) - LV-0705(5 m)
  - Scale factor specific to a sensor is automatically calibrated. No worry of setting error anymore.

- **LASER / LEVEL / ERROR**
  - All the indicators are equipped on a surface of the sensor. Detection conditions and sensor operating conditions are able to be checked at a glance.
  - "*" when moving from the left to the right with respect to the sensor.
  - "*" when moving from the right to the left with respect to the sensor.
  - The polarity of the output/display can be inverted.

- **Conforms to Laser Safety Class 2**
  - You can confirm the focus of the laser, and a detection position in vision by the naked eye.
  - **Conforming Laser Safety Standards**
    - FDA 21CFR Part 1040.10 (CDRH)
    - IEC60825-1:2007,2014

- **Detectable range (Depth)**
  - ±10 mm/±15 mm*
  - *When LV-0710 is installed. Please refer to page 3 for details.
  - Accuracy might be decreased or detection range might be changed according to an object.

**LV-7100**
Laser Doppler Surface Velocity Meter Controller

- **UNIT SELECT**
  - Switches the indication unit to be displayed on the display panel among velocity, distance, and length.

- **LENGTH RESET**
  - Resets (zero reset) the measured value currently displayed in the distance/length measurement.

- **LEVEL OUT**
  - Outputs the DC voltage (0 to +14 VDC) corresponding to the level of measured laser beam displayed in the VELOCITY indicator. Used for monitoring and recording the detection status.

- **VELOCITY OUT**
  - Outputs the voltage corresponding to the velocity (±10 V).

- **RESPONSE**
  - You can select the setting of tracking acceleration from FAST or SLOW.

- **VELOCITY**
  - The detecting velocity range can be selected from 4 ranges. HIGH RESOLUTION range can be set for the target moving with very small velocity.

- **CONNECT IN/OUT**
  - Connects two units of LV-7100 with each other, which allows simultaneous execution of LENGTH RESET.

- **SENSOR**
  - Sensor input connector

- **RS-232C**
  - Changes the settings and reads out the velocity/distance (length) by connecting with a PC or a PLC.

- **SIG A / SIG B OUT**
  - Output connector for output of phase difference signal corresponding to the distance/length. You can retrieve the signal to various counters and PLCs for controlling.

- **ERROR OUT**
  - It notifies unsteady situations (sensitivity error, acceleration over etc.) by the signal output.

- **RESET IN**
  - Input terminal to remotely reset and return the measured distance/length value displayed to zero.

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Please refer to page 3 for details.

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Please refer to page 13 for details.
System Configuration

Detection, data processing and analysis. Fully supported by Ono Sokki

**LV-0015**  
XY-axis fine-control stage

**LV-0016**  
Z-axis fine-control stage

**LV-0018A**  
Steel plate

**LV-0017A**  
Large tripod

**LV-0752**  
90-degree beam bending mirror

**LV-0762**  
Sensor suspension adapter

**LV-0030**  
Large magnet stand

**LV-7002**  
Laser Doppler Surface Velocity Sensor (+ LV-0730 High-velocity module for sensor)

**Sensor cable**  
LV-0730 (3 m)  
LV-0730S (5 m)

**LV-0731**  
High-velocity module for sensor

**LV-0731I**  
High-velocity module for controller

**LV-0772**  
Controller connection kit

**LV-7000**  
Laser Doppler Surface Velocity Meter

**LV-7100**  
Laser Doppler Surface Velocity Meter Controller (+ LV-0731 High-velocity module for controller)

**Waveform analysis device**

- Multi-channel Data Station  
- Waveform analysis
- Laser Doppler Surface Velocity Meter
- Laser Doppler Surface Velocity Meter Controller
- Waveform analysis

**Waveform recording device**

- Up to 40 kHz  
- Up to 100 kHz  
- Up to 240 kHz

**Signal processing**

- Time-series data analysis software OS-2000 series
- Waveform analysis
- Laser Doppler Surface Velocity Meter
- Laser Doppler Surface Velocity Meter Controller
- Waveform analysis

**Option**

**LV-0730** High-velocity module for sensor  
**NEW**

**LV-0731** High-velocity module for controller  
**NEW**

**LV-0762** Sensor suspension adapter  
**NEW**

**LV-0752** 90-degree beam bending mirror  
**NEW**

The LV-0730 enhances the detection velocity range and tracking acceleration by installing on the sensor end face. Detection range: ±3.000 mm/min

Max. following acceleration: ±1.000 m/s²

LV-0731 enhances the detection velocity range and tracking acceleration of the LV-100 controller. Detection range: ±3.000 mm/min

Max. following acceleration: ±1.000 m/s²

LV-0752 enables the detection of laser beam at an angle of ±30° at any given point. It is effective for testing vibration in narrow spaces or gaps and enables measurement.

LV-0762 enables fast-suspension when installed in the LV-0762 sensor to be working or crouching with ease.

**LV-0030** Large magnet stand  
- The large magnet stand for sensor suspension
- Laser light can be radiated from various directions by using two joints. You can make the adjustment of detection position when used in combination with LV-0711/0712.

**LV-0015** XY-axis fine-control stage  
- You can perform fine adjustment of detection position in XY directions when used in combination with LV-0740 (Large magnet stand).

**LV-0016** Z-axis fine-control stage  
- This stage enables precise vertical movement in 2-axis direction. You can perform horizontal and make the adjustment of the position in horizontal direction.

**LV-0017A** Large tripod

**LV-0772** Controller connection kit  
- It connects two units of LV-7100 Laser surface velocity meter controller for 2-channel detection. You can output the data of both controllers at the same time.

**LV-0791A** Storage trunk  
- Indicated trunk that is capable of accommodating various accessories including cables and a large magnet stand. In addition to the LV-7000 system.
More correct understanding of phenomena, more precise evaluation, and quality improvement of materials or parts.

- Printing machine/Printer/Office automation equipment
- Carrier machine/Conveyor/Belt
- Building materials/Sheet
- Transmission machine/Pulley/Transmission belt
- Take-off line/Cutting to standard length
- Tire/Roller
- Plastic/Rubber/Resin
- Wire/Copper wire/Thread
- Paper/Fiber

**Torsion / torsional vibration measurement**
Transmission machine, drive-chain, rotating shaft, turbine, forged crankshaft

**Measurement of velocity / behavior between a tire and grounding surface**
Velocity difference, peripheral velocity change/difference, torsion, deformation, slip

**Behavior measurement of pulley/ belt**
Velocity, slipping, expand or contract, and differential of a crane pulley, alternator, compressor, compression machine, and belt

**Measurement for material evaluation**
Material stretching position, difference of stretching position and stretching velocity, behavior of compression/stretching

**Promises a reduction in wasted material**
- Paper: Feeding velocity, irregular velocity, meander amount, length
- Roller: Irregular velocity, irregular rotation, position
- Belt: Irregular velocity, meander amount, length
- Hydraulic cylinder, actuator: Extending and retracting velocity
- Gear reducer: Irregular rotation velocity, transmission error
- Belt: Transmission, slip
- Roll film: slip, velocity difference
- Torsion vibration
- Wire, pipe: Feeding length, return length

**Velocity / Irregular velocity measurement**
Paper, film, rubber, woven fabric, nonwoven fabric, textile, plastic, etc.

**Length measurement when winding**
Thread, wire for communication, copper wire for elevator, hose, harness, coated wire material

**Slipping amount measurement at conveying**
Printer, photo copying, scanner, paper, woven fabric, nonwoven fabric, textile, plastic, etc.

**Vertical / negative gradient of conveyance**
Velocity and velocity irregularity at vertical/negative gradient positions of transport direction for paper, film, rubber, woven fabric, nonwoven fabric, textile, plastic, etc.
Measurement Example

Evaluation of rotation resonance in rotating body

Overview of measurement

Tachometer
Flywheel
Shift
Multi-channel Data Station QX-3000 series

Example of measurement data

Measure the peripheral velocity of the flywheel attached to the shaft with LV-7000. By measuring together with the rotation speed, you can see what rotation speed the rotation resonance is occurred.

In the case of this rotating body, rotation resonance is occurred at around 1,600 rpm. By performing the Hilbert transform of measured data, evaluation including order can be performed.

Measurement of tire rotation speed on chassis dynamometer

Overview of measurement

Measures the actual velocity of wheel and tire by LV-7000.

Example of measurement data

- Time series graph (The speed data of the reference roller is output from the facility)
- Comparison data of tire and wheel

The speed of the tire and the wheel include the acceleration and the deceleration were repeated during operation at the steady-state speed was measured with LV-7000. The roller speed was measured beforehand in the facility. Not only velocity measurement at steady state but also velocity change of acceleration and deceleration were detected.

You can see the difference of velocity when accelerated and decelerated based on the steady-state speed as a reference. In this measurement, it shows the phenomena that the tire rotating speed becomes faster when accelerated, and the wheel rotating speed becomes faster when decelerated.

Measurement Principle

Measurement principle 1

- Detection of moving object velocity

1) Interference fringe is generated in the intersection of 2 laser beams in angle at 2θ.
2) Particle passes through the range of interference fringe. (Particle-target object)
3) When the particle passes through the interference fringe, the laser beam is lighted in an alternate shifts as light > dark > light > dark...

The frequency of the scattering bright and dark fringe caused by the particle can be expressed using the equation:

\[ v = \frac{d}{2 \sin(\theta)} \]

where
- \( d \) is an interval of the fringes,
- \( \theta \) is an angle of the laser beam direction,
- \( v \) is the speed of the target (particle).

4) Based on the scattered light (Back scattering) received by the light detecting part of the sensor, the frequency \( f \) is calculated.

5) The interval of interference fringe is fixed, so the velocity \( v \) is able to be obtained.

Measurement principle 2

- Detection of variation direction / polarity

Unless the direction and polarity of the moving target are known, velocity fluctuation and other irregularities cannot be detected. To solve this issue, the frequency of one of the two laser beams is shifted using an acousto-optic modulator (AOM) so that the interference fringes move at a velocity corresponding to the frequency shift \( \Delta f \) to make it possible to detect the direction and polarity of velocity \( v \).

The direction and polarity are determined by whether the frequency strength \( f \) of the scattered light which has been detected at receiver is higher or lower compared to the shift frequency.

- \( f < \Delta f \): Frequency lower than shift frequency
- \( f > \Delta f \): Frequency higher than shift frequency

Positioning and Associated Error Related to Location between Sensor and Target

Measurements can have errors depending on the location of the sensor relative to the target. By knowing the relationships between the locations of sensor, measurement target, and measurement results, even better results can be obtained.

<table>
<thead>
<tr>
<th>Sensor location relative to the target</th>
<th>Impact on measurement accuracy</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Sensor angled in the direction of travel</td>
<td>Smaller than actual velocity</td>
<td>Velocity smaller by the magnitude of the angle (cosθ)</td>
</tr>
<tr>
<td>B Sensor angled away from the direction of travel</td>
<td>Smaller than actual velocity</td>
<td>Velocity smaller by the magnitude of the angle (cosθ)</td>
</tr>
<tr>
<td>C Sensor angled to the side</td>
<td>None</td>
<td>Signal-to-noise ratio needs to be maintained for a possible drop</td>
</tr>
<tr>
<td>D Out-of-plane displacement / vibration</td>
<td>The greater the vertical displacement, the lower the accuracy</td>
<td>Refer to the specification for the LV-7000.</td>
</tr>
</tbody>
</table>

A Sensor angled in the direction of travel

Side View

Measurement velocity: v

B Sensor angled away from the direction of travel

Top View

Measurement velocity: v

C Sensor angled to the side

Front View

Measurement velocity: v

D Out-of-plane displacement / vibration

Side View

Measurement velocity: v
**LV-7002 Laser Doppler Surface Velocity Sensor**

**Detection method**
- Laser Doppler system, backscattering-differential type

**Detection principle**
- "When moving from the left to the right with respect to the sensor"

**Distance accuracy**
- 1 mm or less

**Laser safety class**
- Class 2

**Laser beam**
- Measuring laser beam: 3 mm ±150 nm
- Air laser beam: Je 635 nm 1 mW or less

**Laser beam spot diameter**
- Long diameter parallel to the moving direction of the object

**LD light source (at)**
- Beam diameter: 3 mm ±150 nm

**Detection length**
- Center of detection distance: 200 mm (from the bottom surface of the sensor)
- Detection range (depth): 18 cm (by distance accuracy of 0.5 mm)
- Detection range accuracy: 0.5 mm or less, evaluated by Osa Seiki standard plane at 25°C

**Detection velocity**
- Scale factor: Automatically read out to the computer from the sensor.
- Detection velocity range: 0 to ±8,000 mm/min.
- Maximum tracking acceleration: 500 g or more

**Sensor suspension**
- Screw hole for LV-8490 Large magnet stand: M6
- Thread nominal diameter: M6
- Number of holes: 4
- Position: Sensor reference surface part, front center axis
- Depth: 8 mm or more

**Options**
- Screw hole for LD-7592 90-degree beam bending mirror: M5
- Thread nominal diameter: M5
- Number of holes: 2
- Position: Sensor front surface part
- Depth: 3 mm or more

**Light source sensitivity**
- LED: (Green) lights up when laser for measurement is radiated.

**LV-7100 Laser Doppler Surface Velocity Meter Controller**

**Sensor input**
- 1

**General velocity detection**
- Center of detection distance: 772 mm from the surface of the object
- Detection range: 18 cm (by distance accuracy of 0.5 mm or less), evaluated by Osa Seiki standard plane at 25°C

**Sensor in general**
- Scale factor: Automatic readout from sensor to controller
- Detection velocity range: 0 to ±8,000 or more
- Maximum tracking acceleration: 1,500 g or more

**LV-7030 Laser Doppler Surface Velocity Sensor + LV-7030 High-speed module for sensor**

**LV-7002 Laser Doppler Surface Velocity Sensor**

**LV-7100 Laser Doppler Surface Velocity Meter Controller**

**Specifications**
- Weight of the main unit: Approx. 750 g
- Not including options/cable

**LV-7030 Laser Doppler Surface Velocity Sensor + LV-7030 High-speed module for sensor**

**LV-7100 Laser Doppler Surface Velocity Meter Controller**

**Specifications**
- Weight of the main unit: Approx. 750 g
- Not including options/cable

**LV-7030 Laser Doppler Surface Velocity Sensor + LV-7030 High-speed module for sensor**

**LV-7100 Laser Doppler Surface Velocity Meter Controller**

**Specifications**
- Weight of the main unit: Approx. 750 g
- Not including options/cable

*Note: Specifications may vary depending on the model and application.*
LV-7100 Laser Doppler Surface Velocity Meter Controller

**Display section**
- Display of signal level
- Display of signal level index
- Display of waveform
- Display of peak value
- Display of signal level index

**Light receiving unit**
- Light receiving signal level meter
- Light receiving signal level indicator
- Light receiving signal level indicator
- Light receiving signal level indicator
- Light receiving signal level indicator

**Serial interface**
- Communication interface
- Control interface
- Data interface
- Power interface

**Detector switch**
- Detector switch
- Detector switch
- Detector switch
- Detector switch
- Detector switch

**Operation**
- Operation
- Operation
- Operation
- Operation
- Operation

**LV-7052 90-degree Beam Bending Mirror**

**Detectors**
- Detectors
- Detectors
- Detectors
- Detectors
- Detectors

**Amplitude Detection Range**

**Specification**

<table>
<thead>
<tr>
<th>LV-7100 Laser Doppler Surface Velocity Meter Controller + LV-0731 High-velocity module for controller</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Detection velocity</strong></td>
</tr>
<tr>
<td><strong>Tracking resolution</strong></td>
</tr>
<tr>
<td><strong>Velocity OUT</strong></td>
</tr>
<tr>
<td><strong>Measurable frequency band resolution</strong></td>
</tr>
<tr>
<td><strong>Linearity</strong></td>
</tr>
<tr>
<td><strong>Phase difference view output (360°/360° OUT)</strong></td>
</tr>
</tbody>
</table>

**LV-7052 90-degree Beam Bending Mirror**

<table>
<thead>
<tr>
<th><strong>Detection distance</strong></th>
<th>Detection distance (when installed in LV-7902)</th>
<th>Detection distance (when installed for LV-7902)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance range (depth)</td>
<td>51 m to 150 m</td>
<td>51 m to 150 m</td>
</tr>
<tr>
<td>Distance range (height)</td>
<td>51 m to 150 m</td>
<td>51 m to 150 m</td>
</tr>
<tr>
<td>Detection acceptance</td>
<td>0.5° to 5°</td>
<td>0.5° to 5°</td>
</tr>
<tr>
<td>Length resolution</td>
<td>0.01 mm</td>
<td>0.01 mm</td>
</tr>
<tr>
<td>Outer dimensions</td>
<td>140.0 (W) x 160.0 (D) x 80.0 (H)</td>
<td>140.0 (W) x 160.0 (D) x 80.0 (H)</td>
</tr>
<tr>
<td>Weight</td>
<td>1.5 kg</td>
<td>1.5 kg</td>
</tr>
<tr>
<td>Operability range</td>
<td>-10°C to 50°C</td>
<td>-10°C to 50°C</td>
</tr>
<tr>
<td>Storage environment</td>
<td>-20°C to 70°C</td>
<td>-20°C to 70°C</td>
</tr>
<tr>
<td>Power requirement</td>
<td>Input Voltage: 100 to 240V AC</td>
<td>Input Voltage: 100 to 240V AC</td>
</tr>
</tbody>
</table>

**Amplitude Detection Range**

- Standard
- With high-power option installed
Outer Dimensions (Unit: mm)

LV-7002 Laser Doppler Surface Velocity Sensor

LV-7002 Laser Doppler Surface Velocity Sensor + LV-0730 High-velocity module for sensor

LV-7100 Laser Doppler Surface Velocity Meter Controller

LV-7100 Laser Doppler Surface Velocity Meter Controller + LV-0731 High-velocity module for controller

Label

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

CLAS 1 LASER PRODUCT

This device complies with Part 15 of the FCC Rules, Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.
Outer Dimensions (Unit: mm)

LV-0752 90-degree Beam Bending Mirror

LV-0762 Sensor Suspension Adapter

LV-0030 Large Magnet Stand

LV-04015 XY-axis fine-control stage
LV-04016 Z-axis fine-control stage

LV-0017A Large Tripod

LV-0791A Storage Trunk
### LV-7000 series Laser Doppler Surface Velocity Meter

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<td>Laser Doppler Surface Velocity Meter Controller</td>
<td>3 m</td>
</tr>
<tr>
<td>LV-7075</td>
<td>Sensor cable</td>
<td>5 m*</td>
</tr>
<tr>
<td>LV-70730</td>
<td>High-velocity module for sensor</td>
<td>Detection velocity range 0 to 3,600 or more</td>
</tr>
<tr>
<td>LV-731</td>
<td>High-velocity module for controller</td>
<td>Detection velocity range 0 to 3,600 or more</td>
</tr>
<tr>
<td>LV-752</td>
<td>90-degree beam bending mirror</td>
<td></td>
</tr>
<tr>
<td>LV-762</td>
<td>Sensor suspension adapter</td>
<td></td>
</tr>
<tr>
<td>LV-772</td>
<td>Controller connection kit</td>
<td>For connecting two units of LV-7100</td>
</tr>
<tr>
<td>LV-791A</td>
<td>Storage trunk</td>
<td>Storage for 1 set</td>
</tr>
</tbody>
</table>

* Please consult us about cable extension.

### Peripherals

#### RP-7400 series Roller Encoder

- **120 P/R**
- **200 P/R**
- **1200 P/R**

#### RV-3150 Multi-functional Reversible Counter

- **Feature**
  - Stationary or moving counter, regardless of direction
  - Dimensions: 77mm (W) x 67mm (H) x 90mm (D)
  - Counter: 10 digits
  - Power supply voltage: 100-240V AC 50/60Hz
  - Rated current: 0.1A
  - Counter accuracy: ±1 in 100,000
  - Operating temperature range: 0°C to 40°C
  - Humidity: 10% to 90% (non-condensing)
  - Power requirement: 10W

### LV-7000 Series

- **Anytime anywhere, high sensitivity and high response detection**

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*Our appearance and specifications are subject to change without prior notice.*

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