LSV-1000 Laser Surface Velocimeter

Polytec Laser Surface Velocimeter

- **LSV-1000**
  Laser Surface Velocimeter
- LSV-300
  Laser Surface Velocimeter
- LSV Series 6000
  Laser Surface Velocimeter

Non-contact Precision Speed & Length Measurement

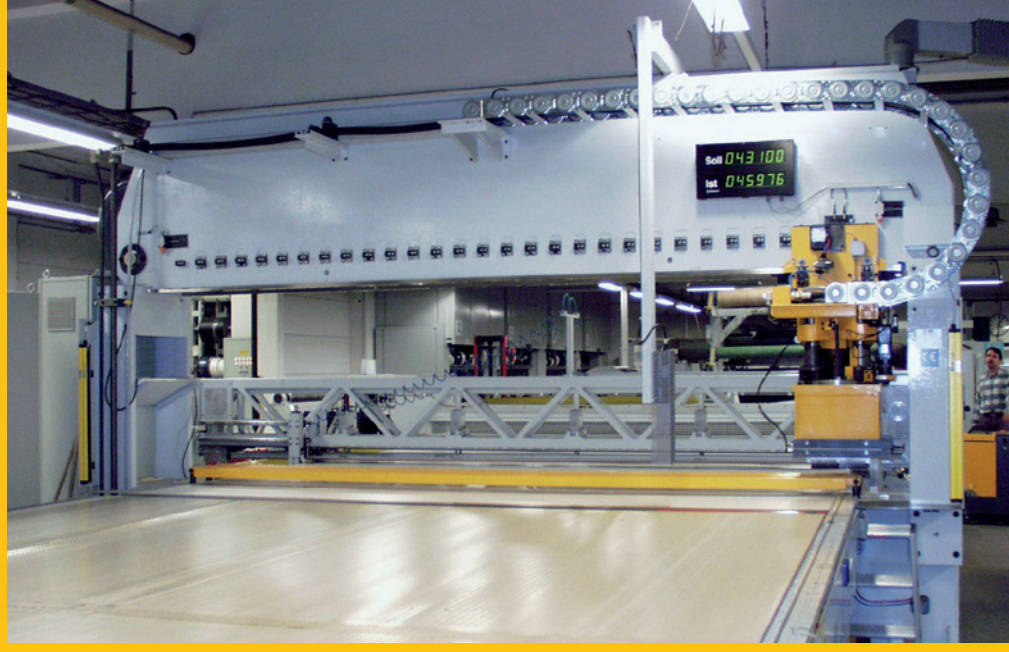
Precision speed and length measurements are critical for optimization of continuous or quasi-continuous production processes such as those used in rolling and paper mills. Proper utilization of these measurements can lead to lower production costs and higher product quality. The ideal sensor must exceed traditional contact encoder performance, increasing reliability and survivability in adverse industrial environments while minimizing maintenance requirements and cost.

The LSV-1000 compact Laser Surface Velocimeter was designed by Polytec as the ideal next generation sensor for non-contact length and speed measurement. It provides precise length and velocity data quickly and reliably for both process control and cut-to-length applications. Optimized for core measurement tasks, the sensor offers an excellent Return on Investment (ROI). The new LSV-1000 measures reliably on almost any solid surface, whether controlling processes utilizing carbon steel, shiny aluminum or oily sheets, or producing round wire and cable, or manufacturing paper, cardboard or tissue.

Compact, Reliable, Inexpensive & Profitable

- Reduced operating and maintenance costs
- Attractive ROI, fast payback
- All-in-one system, easy integration into production processes and control environments
- Easy to operate and no re-calibration required
- Visible laser for easy alignment in the field
- Compact design fits into other measurement frames, like radiometric C-frames
- Robust sensor technology for reliable operation even under harsh conditions, protection classes IP 66 and IP 67
- Optional cooling, air-purge and heavy-duty housing for measurement tasks in challenging environments
- Fast, state-of-the-art signal processor with powerful command set for efficient system communication via serial or Ethernet interface
- Includes two trigger inputs for additional light barriers or other switches for high precision edge detection and offset length compensation
- Hardware status signals for remote diagnostic functions available
- User-selectable full quadrature pulse output and interfacing as LAN & RS-422/-232
- Various standoff distances available

Accuracy, versatility and reliability make the LSV-1000 the perfect solution for a variety of measurement tasks in the metals and non-metals industries where precise, real-time speed and length data are critical. In addition, the LSV-1000 Laser Surface Velocimeter can reduce production costs by minimizing material scrap and optimizing product and process quality. In processes where the feed material is optically accessible, the LSV-1000 can be applied easily and will replace less accurate and unreliable contact tachometer technology. The savings in maintenance costs alone justifies its installation.



Application Fields

Speed Measurement
- Measurement of speed variations on production lines
- Dynamic speed control of rolling processes such as strip production and mass flow control
- Speed measurement of strip in slitting lines

Slippage Detection and Speed Synchronization
- Measurement of slippage between product and transport casters
- Synchronization of casters

Elongation/Speed Ratio Measurement
- Differential speed measurement to determine elongation ratio on strip skin pass and temper mills and in hot rolling mills
- Differential speed measurement to determine stretching ratio in a tension and leveling line
- Elongation or shrinkage of non-metal materials during production

Speed Calibration
- Speed measurement for calibration of process machinery like drives and encoders

Part Length Measurement for Goods in Pieces
- Construction materials such as gypsum board and timber
- Paper board, corrugated paper, corrugated steel
- Length of metal blanks and sheets

Cut-to-length Control
- Speed dependent control of cutting devices
- Extrusion of ceramic, plastics and rubber
- Cut to length in rolling mills
- Flying cutter optimization with speed synchronization
- Useful for foils, non-woven textiles, coated fabrics , films, laminates, foams, insulation material, abrasives, wood, paper, paperboard and cardboard

Encoder Calibration
- Calibration of encoder equipment on process lines
- Length calibration for processing machines

Spool Length
- 1D materials as cable, wire, fiber
- 2D materials, woven (textiles) and non-woven fabrics such as rock wool

Ink-jet Marker Control
- Integration in testing facilities
- Length marking on continuous goods such as pipes and cables

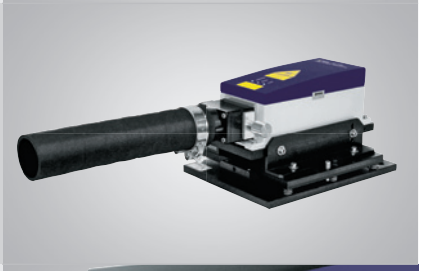
Speed Balancing
- Combined measurement on different components for balancing production speeds

Speed & Length Measurements in Hot Environments
- Optional cooled, protective housing protects sensor performance in harsh environment
- Long standoff distance sets sensor back from hot materials

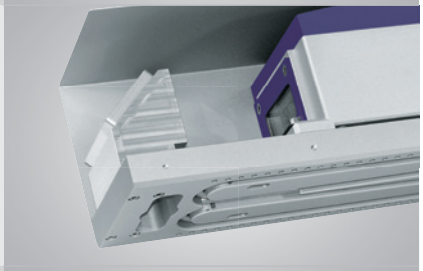
Accessories

LSV-A-110 Connection Box
The Connection Box is completely wired for instant operation and contains a full terminal block, an universal power supply and LAN connector.

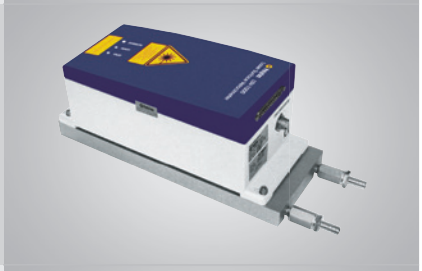
LSV-A-120 Air Wipe with quick exchange window
A front-mounted, aerodynamically optimized air wipe unit keeps the sensor's optical window free of dust and steam. For cleaning or replacement, the quick release window can be easily exchanged.



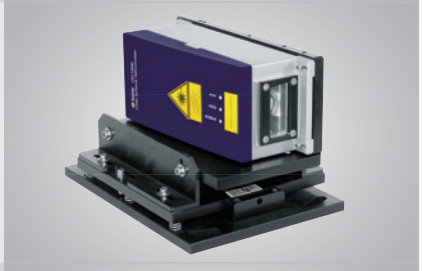
LSV-A-124 C-Frame Accessory Kit
The C-Frame Accessory Kit allows for an easy and straightforward integration in the C-housing of any radiometric thickness gauge. A built-in cooling plate keeps the sensor within its operational temperature range.



LSV-A-122 Cooling Plate
The cooling plate keeps the sensor in its operational temperature range, even under hot ambient conditions.



LSV-A-130 Mounting Platform
The 3-axis adjustable mounting platform simplifies the precise alignment of the LSV-1000 sensor in relation to the measurement object.



LSV-A-121 Cooled Protective Housing
To handle hot and hostile environments in rolling mills and continuous casters, Polytec has developed a Cooled Protective Housing consisting of an aluminum housing with integrated stainless steel cooling coils. The coolant can either be water, rolling coolant, paraffin oil or kerosene. An optional heat shield protects the system from radiated heat from the measurement object itself or other heat sources.

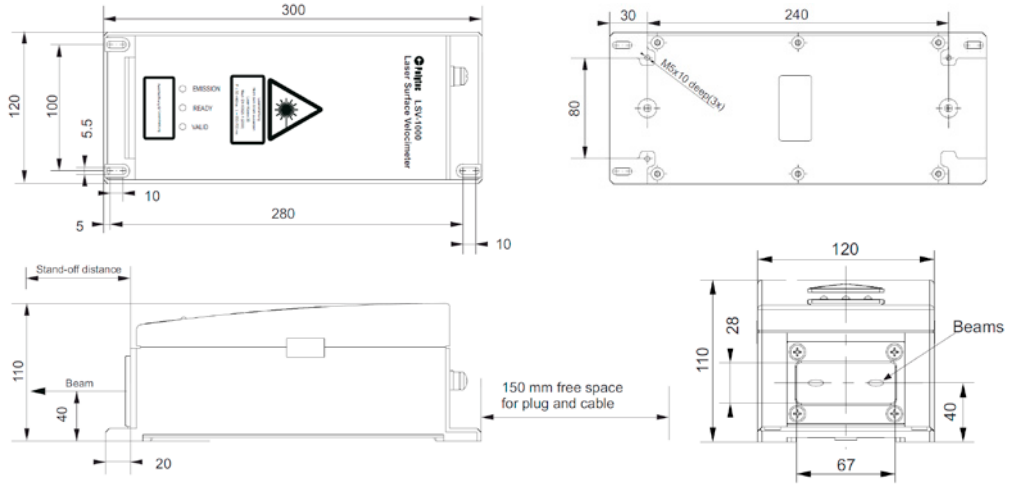
Technical Data

Housing and Power	
Dimensions (L x W x H)	300 mm x 120 mm x 110 mm (see figure below)
Weight	4.3 kg
Protection class	IP 66 and IP 67 (according to EN 60529)
Power consumption	24 V DC / max. 15 W
Operating temperature	+0 ... +45 °C
Relative humidity	max. 80 %, non-condensing

Optics	
Wavelength	690 nm (visible beam)
Laser power	max. 25 mW
Laser class	3B
Beam cross section	2 mm x 4 mm

Metrological Properties						
Working distance [mm]	200	300	500	700	1,000	1,500
0.1% Depth-of-field [mm]	±15	±20	±30	±40	±60	±70
Min. velocity [m/min]	0.3	0.53	0.8	1.05	1.43	2.11
Max. velocity [m/min]	875	1,535	2,296	3,058	4,188	6,211
Measurement units	mm/s, m/min, m or ft, ft/s, ft/min (selectable)					
Accuracy	<0.05 % of reading*					
Repeatability	<0.02 % of reading					
Measurement value output rate	1024 s^{-1}					
Standard interfaces	– RS-422 – LAN (10/100 Mbit/s) – RS-232			– Encoder (user-selectable, max. 500 kHz) – 24 V status I/O		
Optional accessories	– Cooling plate – C-frame accessory kit – Mounting platform			– Air-wipe with quick exchange window – Cooled protective housing		

* Under controlled conditions.



More Information

For more information please contact your Polytec application/sales engineer or visit the LSV homepage **www.velocimeter.us** or **www.velocimeter.co.uk.**

Polytec GmbH (Germany)
Polytec-Platz 1-7
76337 Waldbronn
Tel. +49 (0) 7243 604-0
Fax +49 (0) 7243 69944
info@polytec.de

Polytec France S.A.S.
32 rue Delizy
93694 Pantin Cedex
Tel. +33 (0) 1 48 10 39 30
Fax +33 (0) 1 48 10 09 66
info@polytec.fr

Polytec Ltd.
Lambda House
Batford Mill
Harpenden, Herts AL5 5BZ
Great Britain
Tel. +44 (0) 1582 711670
Fax +44 (0) 1582 712084
info@polytec-ltd.co.uk

Polytec Japan
Arena Tower, 13th floor,
3-1-9, Shinyokohama,
Kohoku-ku
Yokohama-shi, Kanagawa
222-0033 Japan
Tel. +81 (0) 45 478-6980
Fax +81 (0) 45 478-6981
info@polytec.co.jp

Polytec, Inc.
North American Headquarters
16400 Bake Parkway
Suite 150 & 200
Irvine, CA 92618
Tel. +1 949 943 3033
Fax +1 949 679 0463
info@polytec.com

Central Office
1046 Baker Road
Dexter, MI 48130
Tel. +1 734 253 9428
Fax +1 734 424 9304

East Coast Office
25 South Street, Suite A
Hopkinton, MA 01748
Tel. +1 508 417 1040
Fax +1 508 544 1225

www.polytec.com