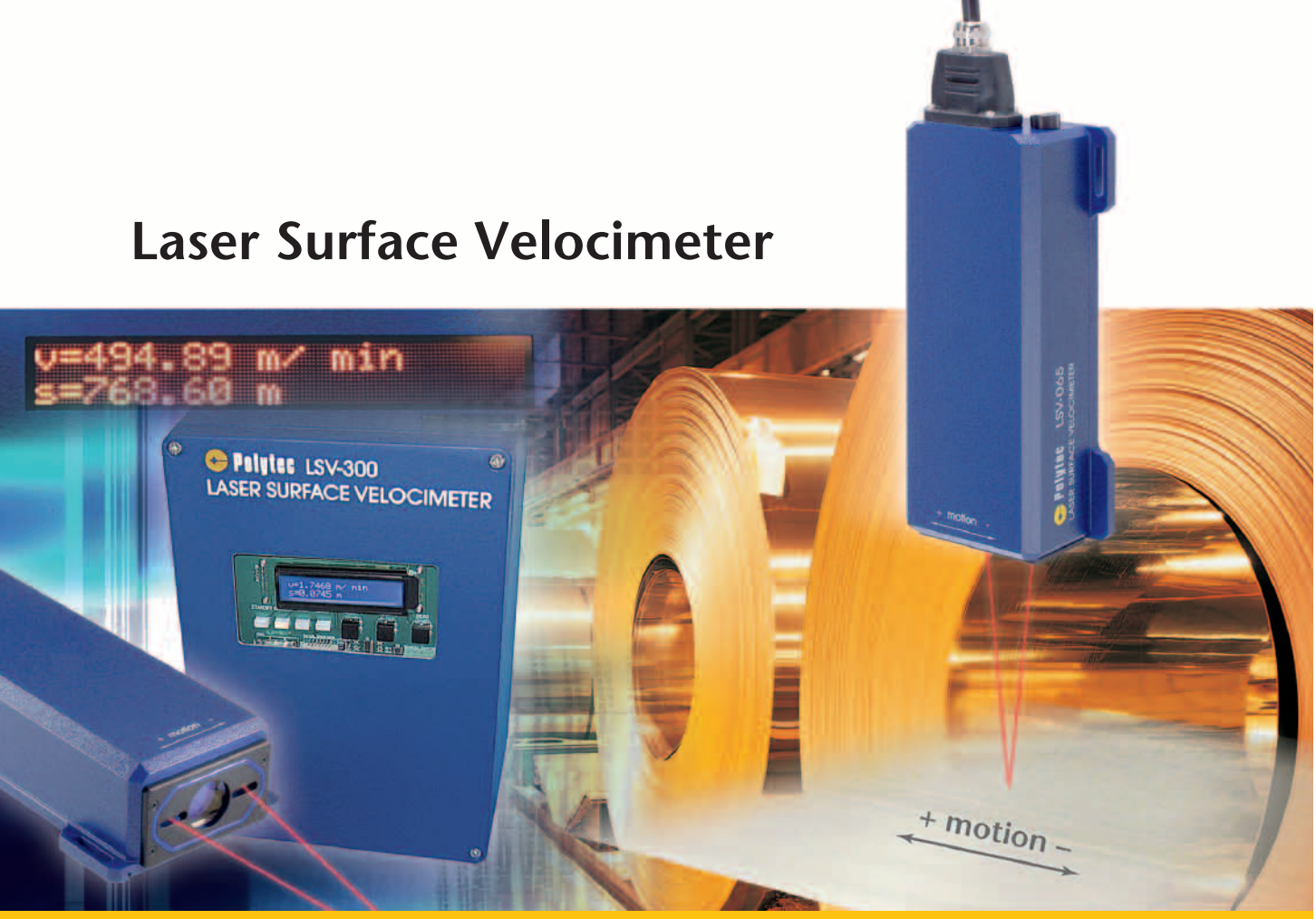
Polytec

LSV-300 Laser Surface Velocimeter

Non-Contact Velocity and Length Measurements

Laser Surface Velocimeter



Compact, Reliable, Rugged and Precise

Polytec's Industrial Laser Surface Velocimeters (LSV) are specifically designed for non-contact, online measurement, inspection and control of velocity and length in continuous process industries such as steel, metals, paper, plastic and building materials. The instruments are easy to install, setup and integrate into control systems and are an essential step to reducing scrap, increasing uptime and improving material throughput. The LSV directly replaces traditional, high-maintenance, problematic contact measurement techniques with accurate, low-maintenance, next-generation, non-contact laser technology.

Efficient On-Line Quality Control

Precision speed and length measurements are critical for controlling production costs and for process optimization of continuous or quasi-continuous production. The ideal sensor must meet or exceed contact sensor performance while increasing dependability, surviving adverse industrial environments and minimizing repairs.

To address each of these important considerations Polytec developed advanced, non-contact laser velocimeter technology that delivers reliable, high-precision measurements with long term stability, ease of maintenance and failsafe operation. When superior performance counts, the LSV-300 delivers.

Non-Contact Speed & Length Measurement

Key Benefits of the LSV-300

- Frequency shifted technology for high precision velocity and length measurements, where forward, reverse and standstill conditions persist
- Rugged, compact controller housing and flexible sensor head (IP67 protected) for harsh industrial environments
- Attractive price performance ratio and excellent ROI
- Easy integration with process control systems using standard Ethernet, encoder or other process interfaces
- Includes "Material Present" Function to detect the presence of material in the field of view and for offset length compensation
- Various protective housings and air purge devices are available for harsh environments
- Includes an RS-422 interface for optional, large-area panel display

Features

- Maximum velocity ±7,100 m/min; accuracy 0.05 % of measured value
- Measurement value output rate up to 1024 s^{-1}
- Stand-off distances ranging from 150 mm to 2,500 mm with up to ±100 mm depth-of-field
- Two-line LCD display of velocity and length data – English or Metric units can be configured via RS-232 interface
- Fast, state-of-the-art signal processor with powerful command set for efficient system communication via serial interface
- High speed RS-232 or RS-422 interface (max. 230 kbit/s)

The LSV-300 Laser Surface Velocimeter

The value-engineered, LSV-300 Laser Surface Velocimeter utilizes Polytec's industry-proven technology to deliver the highest quality speed and length measurement at an extremely attractive price performance ratio. All features considered, the LSV-300 is the optimum choice for many applications where cost-of-ownership is as important as measurement accuracy.

This velocimeter is comprised of the industry-proven LSV-E-300 Signal Processor and the family of LSV-065 measurement heads. Based on heterodyne demodulation, the LSV-300 measures forward, reverse and standstill motion conditions making it the most versatile velocimeter on the market.

To learn more about the details of Polytec's robust LSV technology visit **www.velocimeter.us.**

Applications

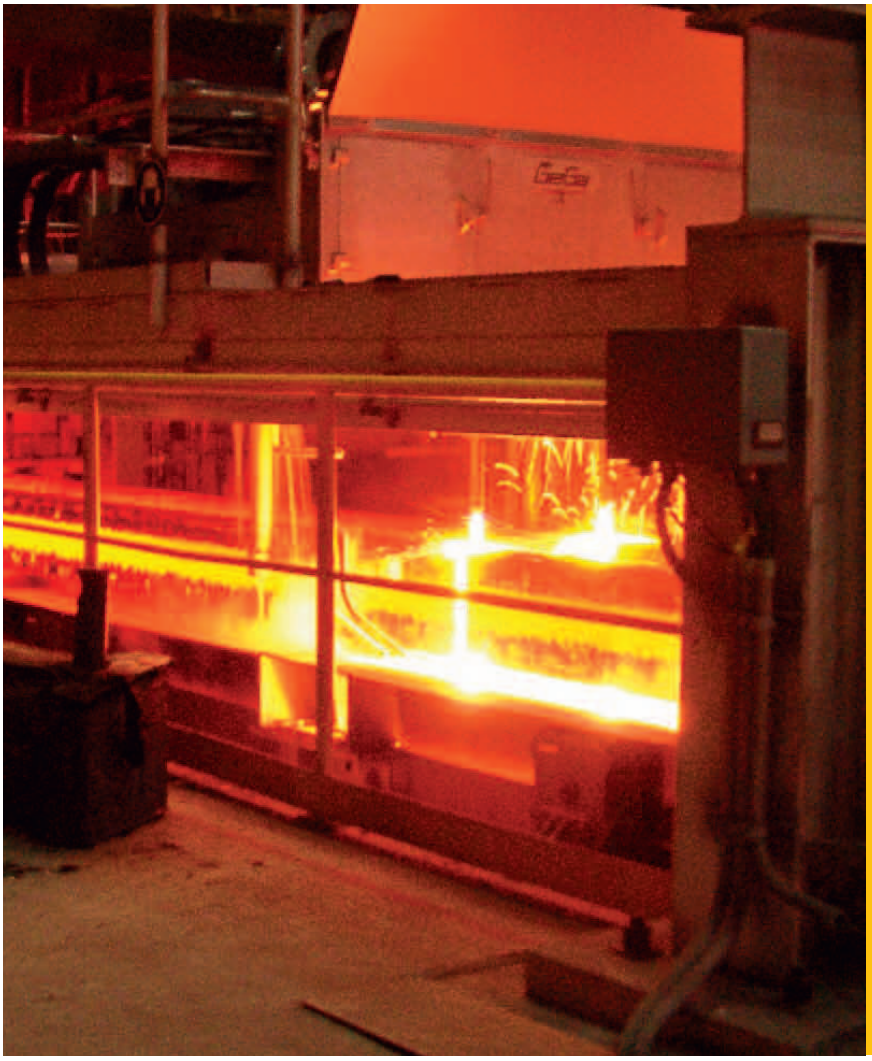


Photo: SMS Schloemann-Siemag AG

Steel, Aluminum and other Metals

- Speed, total length, cut-to-length and length verification in rolling mills
- Mass flow and elongation calculations for automatic gauge control (AGC)
- Crop, shear, cut-to-length and length verification in tube mills
- Cast length and speed for continuous casters

Paperboard Products

- Surface speed and cut-to-length control of paper and cardboard
- Footage counter at winders and speed matching during flying splice and paper machine turn up
- Differential speed for true draw calculations

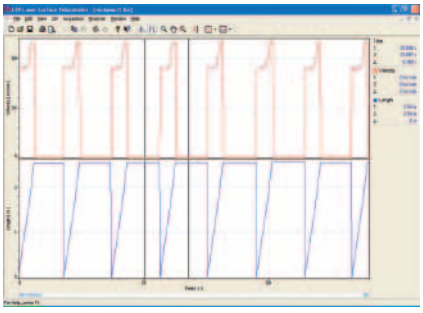
Other Products

- Building materials (gypsum board, roofing materials, insulation products, siding and decking)
- Plastic, ceramic extrusion, rubber, cables, films, textiles and specialty fabric materials

LSV-300 System Components

Sensor Head

The LSV-065 Sensor Head is the watchful eye of the system, measuring the in-plane movement of the material surface with the aid of Laser Doppler Velocimetry.



Its compact size and long stand-off distance (up to 2,500 mm) allows for simple integration into the production line. Optional housings that cool and protect the LSV enable its use in hot, dusty or wet factory environments.

Signal Processor

The robust, IP 66 protected LSV Signal Processor powers the sensor head and provides signal conditioning and processing. It accepts commands from process controllers and can be monitored by a notebook computer via its serial interface. The LSV controller easily integrates with a local area network (LAN) through the optional Ethernet interface. Length and velocity data are simultaneously displayed and updated every millisecond at each output.

Acquisition and Control Software

The user-friendly LSV PC Software is an integral part of every LSV measurement system. The LSV PC software runs under Windows® XP, Vista, and 7. It not only sim-plifies configuring the LSV system, but also offers excellent process, observation and analysis options.

General Specifications	
Measurement range	Velocity: 0 ... max. ±7,100 m/min, length: 0 ... 99 km
Units	m, m/s, m/min or ft, ft/s, ft/min
Accuracy	<0.05% of the measurement value*
Repeatability	0.02% of the measurement value
Signal acquisition time	≥5 ms, dependent on signal quality
Measurement value output rate	1024 s^{-1}

* At standoff distance.

Technical Data

LSV-065 Sensor Head	
Light source	Visible laser diode, <24 mW, laser protection class 3B
Power consumption	~11W
Ambient Temperature	0 °C … +45 °C (32 °F … 113 °F)
Humidity	max. 100%, non-condensing
Protection class	IP66 and IP67
Dimensions [L x W x H]	240 mm x 120 mm x 64 mm (9.5 in x 4.7 in x 2.5 in)
Weight	2 kg (4.4 lb)

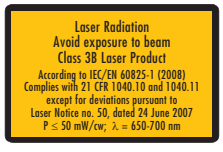
Sensor Head Configurations for LSV-065-XXX				
Model Suffix	**Stand-off distance [mm]**	**Max. depth-of-field [mm]**	**0.1% Error depth-of-field [mm]**	**Max. velocity (both directions) [m/min]**
-156	150	±12	±12	660
-306	300	±20	±20	1,150
-506	500	±30	±30	1,800
-1004	1,000	±75	±60	4,400
-1504	1,500	±100	±70	7,100
-1506	1,500	±75	±60	4,800
-2006	2,000	±100	±60	6,000
-2506	2,500	±100	±60	6,000

LSV-E-300 Signal Processor	
Power	100 VAC … VAC ±10%, 50/60 Hz, 100 W max.
Ambient temperature	+5 °C … +45 °C (41°F … 113 °F)
Dimensions [L x W x H]	230 mm x 330 mm x 184 mm (9.1 in x 13 in x 7.3 in)
Weight	~11kg (24 lb)
Protection class	IP66
LCD display	Velocity, length, status information
Standard interfaces	■ Serial, RS-232 or RS-422, 230 kBit/s max. ■ Process coupling module with "Laser Ready" signal ■ Material detect signal for presence of an object in the measurement volume
Optional interfaces	■ Ethernet interface for direct LAN connection ■ Encoder interface, opto-insulated signal output simulates an encoder wheel ■ Profibus module: makes the measurement data and all status information available with maximum update rate of 10 ms

LSV-300 Optional Accessories	
LSV-A-031	Cooling plate with air purge unit and quick exchange window, operational temperature range +40 °C to +70 °C (104 °F to 158 °F)
LSV-A-024	Cooling plate, operational temperature range +40 °C to +70 °C (104 °F to 158 °F)
LSV-A-026	Cooled housing with air purge unit and quick exchange window. Protection class IP 66. Operational temperature range –20 °C to +200 °C (–4 °F to +392 °F)
LSV-A-027	Mounting plate with 3-axis tip-tilt unit

Please contact your local Polytec sales engineer for more information about products and accessories for your specific application.

For the latest technical specifications and more detailed product information visit
www.polytec.com/lsv
www.velocimeter.us
www.velocimeter.co.uk



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

Polytec France S.A.S.
Bâtiment Orion – 1er étage
39, rue Louveau
92320 Châtillon
Tel. +33 1 496569-00
Fax +33 1 57214068
info@polytec.fr

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

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

Polytec, Inc. (USA)
North American Headquarters
16400 Bake Parkway
Suites 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