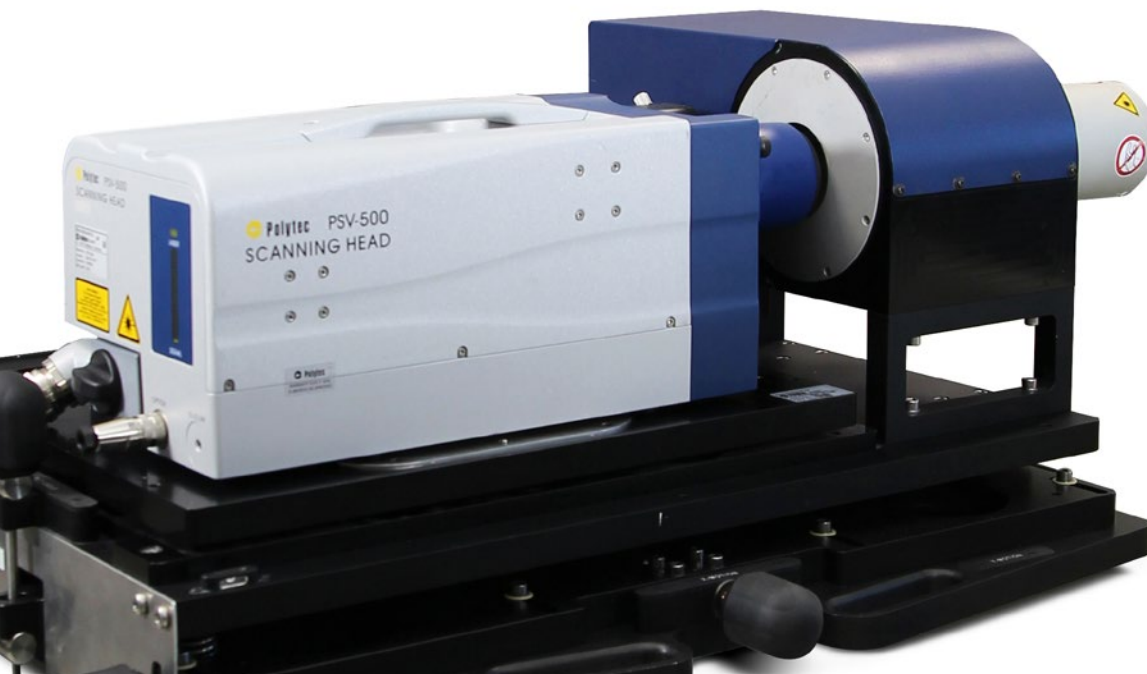


## PSV-A-440 Optical Derotator

The PSV-A-440 Optical Derotator simplifies non-contact vibration measurements on rotating parts with laser vibrometers. Thus it extends the applications of the full-field PSV Scanning Laser Vibrometer. The validation of numerical simulations of structural dynamics and durability gets more reliable based on test data acquired under realistic load conditions.

Order analyses and measurements of the operating deflection shapes at rotational speeds can be realized in this way without the necessity of complex telemetry or altering the inertial mass. Sophisticated control electronics track the motion of the rotating object, resulting in a steady position of the laser beam. The actual measurement is astonishingly simple. Due to the synchronized speed of the derotator the object appears to stand still.



### Highlights

- Measure realistic vibration data under operating conditions
- Visualization of deflection shapes
- Run-up and coast-down measurements
- No telemetry necessary
- Simple synchronization with standard encoder signals

## PSV-A-440 Optical Derotator

Non-contact vibration measurement  
on rotating objects

Datasheet



# Technical data



## PSV-A-440 Standard scope of delivery

PSV-O-440 Rotation Unit	Prism unit with drive and protective guard SUB-D jack for encoder signals
PSV-A-410-DER Close-Up Unit	Attachment for PSV-I-500 and PSV-I-400 scanning heads. Brings camera image and laser beam onto a common optical axis. Additional beam splitter for reference beam.
PSV-E-440 Controller	Control electronics for Rotation Unit
PSV-S-DER Control Software	Software for setting the parameters of the control electronics and to adjust to the reference encoder. Software is installed on the Data Management System of the PSV.
PSV-A-P44 Adjustor	Allows close-up adjustability of the derotator to the axis of rotation of the object and adjustment of the reference laser beam.
PSV-A-T44 Tripod System	To move the entire derotator slightly and to hold the controller.

## Metrological specifications derotator

Max. rpm object	22,000 rpm (24,000 rpm on request)
Max. rpm change	550 rpm/s
Useable scanning angle	$\pm 4^\circ$ ; measurement distance approx. 7x object diameter
Radial positional stability	$< \pm 0.035^\circ$ <sup>1</sup>
Phase jitter	Max. $\pm 3\text{cts}$ <sup>2</sup> (corresponds to $\pm 0.54^\circ$ ), measured between master encoder at the object and derotator with constant object speed
Encoder (internal)	500 lpm/rev
Adjustable base frame <sup>3</sup>	<ul style="list-style-type: none"> <li>■ Max. height optical axis: 1,493 mm - 350 mm travel range (1. mounting plane)</li> <li>Min. height optical axis: 958 mm + 350 mm travel range (2. mounting plane)</li> <li>Pan range: <math>\pm 3^\circ</math></li> <li>■ Travel range lateral: <math>\pm 18</math> mm</li> <li>■ Tilt range: <math>\pm 1.5^\circ</math></li> </ul>
Requirements on reference encoder at device under test (reference encoder not included in scope of delivery)	<ul style="list-style-type: none"> <li>■ Recommended 500, 1,000 oder 2,000 lpm/rev</li> <li>■ Master encoder mode output TTL A/B or A, /A, B, /B (recommended)</li> <li>■ Step direction mode: TTL Pulse signal</li> </ul>

<sup>1</sup> At a stand-off distance of 1 m between derotator and measurement object this complies with a maximum absolute radial movement of the laser beam of approx.  $\pm 0.6$  mm.

<sup>2</sup> Below 1,500 rpm a angle sequence error of  $\pm 3$  cts may occur at selected rpm values.

<sup>3</sup> Customer specific versions on request

### Compatible sensor heads

Scanning head	<ul style="list-style-type: none"> <li>■ PSV-I-500 Scanning Head with PSV-G-500 Geometry Scan Unit</li> <li>■ PSV-I-400 Scanning Head with PSV-A-420 Distance Sensor, LR Optics (long range; recommended) or MR Optics (mid range)</li> </ul>
Reference vibrometer	<ul style="list-style-type: none"> <li>■ VibroFlex Neo VFX-I-110 with VFX-O-LRS LR Front Lens (long range)</li> <li>■ VibroGo VGO-200</li> <li>■ OFV-505 or OFV-503 with LR Front Lens (long range; recommended) or MR Front Lens (mid range)</li> </ul>

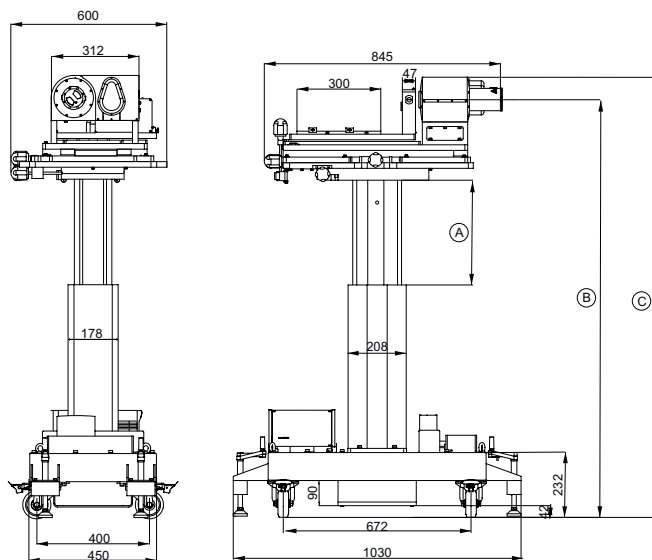
The PSV-A-440 Optical Derotator is not recommended with scanning heads from the PSV-500 Xtra series.

### General data / power supply

Dimensions	1,030 x 600 x 1,225...1,573 mm
Weight	156 kg (not including sensor heads)
Power supply	100 V ... 240 V, 50/60 Hz, control telescope drive 230 V/50 Hz or 115 V/50-60 Hz
Operating temperature	+5...+40 °C (41...104 °F)

### Options and accessories

PSV-A-441 F/U Converter	Converts the internal encoder signal of the derotator into a proportional voltage signal. By means of this voltage the revolutions/min can be recorded in run-up tests in parallel to the vibrometer signal.
PolyWave Software Suite	Scalable post-processing software suite for comprehensive analysis of vibration test data. Comprises modules for experimental modal analysis, operational modal analysis and order analysis.



Dimensions of the derotator (1. mounting plane)  
(dimensions are given in mm)

- (A) Travel range 350 mm
- (B) Max. height optical axis 1,493 mm
- (C) Max. height 1,573 mm



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