



VISHAY INTERTECHNOLOGY, INC.

Click on product pictures, pages 4 - 7,  
to see specification sheets

# WEB TENSION MEASUREMENT AND CONTROL

Vishay BLH

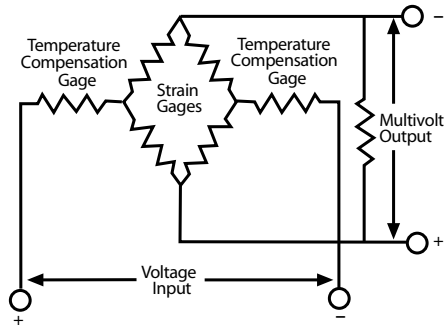


Advanced Technology,  
Long-Term Reliability



PRODUCT OVERVIEW

## Designed Specifically for Web Tension



**Full Wheatstone Bridge**

Vishay BLH offers web tension solutions for ultra-low, low-, and high-tension applications. Most web tension transducer manufacturers rely on semiconductor strain gages which, unfortunately, have many limitations. In high-tension applications, they can be severely affected by temperature, steam, corrosive gases, chemicals, and many other common contaminants. In low-tension applications, they offer very limited rangeability. Vishay BLH transducers incorporate SR-4® foil strain gages connected to a full Wheatstone bridge that is temperature-compensated and dead-weight calibrated to deliver accuracy, and reliability. They feature superior sealing that stands up to the hostile environments of high-tension applications. In low-tension applications, they provide rangeability that is often 10 times greater than that of transducers built with semiconductor strain gages, with no need for recalibration. And, because all Vishay BLH transducers are factory-calibrated, installation and setup is quick and easy with no need for on-site calibration. All web tension transducers represent over 50 years of experience in bonded strain gage technology.

## They Perform Better Because They're Built Better

Vishay BLH Systems incorporate the following features:

- SR-4® foil strain gages for accuracy and wide rangeability
- Full Wheatstone bridge for higher overall performance
- Full temperature compensation to eliminate drift
- Matched outputs for simple replacement
- Factory calibration for repeatability, reliability, and low installation cost

Full Wheatstone bridge advantage:






- 0.02% repeatability
- 0.002% load/°F temperature effect
- 0.05% combined error
- 0.25% matched outputs



Visit our website at  
[www.webtension.com](http://www.webtension.com)

## Transducer Selection Guide

The following selection table will help you to determine which transducer is most appropriate for your application. Once you identify the right transducer for your application, please go to the following pages for more information.

Vishay BLH Web Tension Transducers	Ultra-Low Tension		Low Tension	High Tension	
	LTN	LTW	GLT/LTT	HTU	HTZ-3
					
Capacity	600 g – 3 kg	6 kg – 35 kg	20 – 500 lbs	2,000 – 20,000 lbs	500 – 50,000 lbs
Web Width	Filament – 2”	9” – 12”	12” – 150”	Wide	Wide
Wrap Angle	All	All	All	All	Symmetrical up/down
Pillow Block Mount			Yes	Yes	Yes
Bolt Pattern				Adapter Plate	Adapter Plate
Dead Shaft Rollers			Yes		
Cantilever Mount	Yes	Yes	Yes (pulley)		
Pulley Option	Yes		Yes		
Stub Axle Option	Yes		Yes		
Environmental Seal	Yes	Yes	Yes		
NEMA 4, IP 65/67				Yes	Yes
Conduit Fitting				Standard	Standard
Intrinsically Safe*	Yes	Yes	Yes	Yes	Yes
Rated Output	1 mV/V	2 mV/V	2 mV/V	2 mV/V	2 mV/V
Accuracy	0.02%	0.02%	0.05%	0.10%	0.10%

\* FM approved intrinsically safe for Class I, II, and III, Div.1, Groups A-G, when installed in accordance with Vishay BLH drawing #468872-2; or, Class I, Div.2, Groups A-D and Class III, Div.2, Groups F&G, when installed in accordance with Vishay BLH drawing #468873-2.

## Low-Tension Systems – Dead Shaft/Cantilever Mount



Vishay BLH ultra-low and low-tension transducers incorporate the mechanical symmetry of a differential bending beam design to reduce adverse load effects, while providing excellent performance for high-speed applications. The GLT/LTT transducers are available for dead shaft mounting configurations. The LTN, because it is designed to measure single strand tensions, is cantilever mounted.

### GLT/LTT Low-Tension Transducers 20 – 500 lbs (9 – 226 kg)



GLT/LTT transducers provide precision accuracy and repeatability for low-force web-tension applications with a wide range of operating tensions, a small wrap angle, or a high roller-weight-to-tension-force ratio. Factory calibration, with closely matched output signals, eliminates field calibration and costly recalibration after the initial setup. Zero and span settings remain stable for tension forces operating at the low end of wide rangeability applications. Scribe marks at the single bolt mounting end allow for quick alignment of the GLT/LTT with the resultant tension force. Mounting configurations can be supplied for dead shaft roller assemblies.

Applications:

- Laminators
- Coaters

- Printing Presses
- Winders

- Rewinders
- Unwinders

Request product data sheets numbers 12199 and 12195

### LTN – Ultra-Low Tension Transducer 1.3 – 6.6 lbs (600 g – 3 kg)



LTN transducers are designed to measure single strands or narrow web tensions in materials that require ultra-low force measurement with high accuracy. They offer excellent sensitivity in working ranges of less than 150 grams and permit accuracy resolution at the milligram level. All LTN units are designed to withstand overloads of 300% rated capacity and are temperature-compensated and calibrated to permit on-site pushbutton calibration.

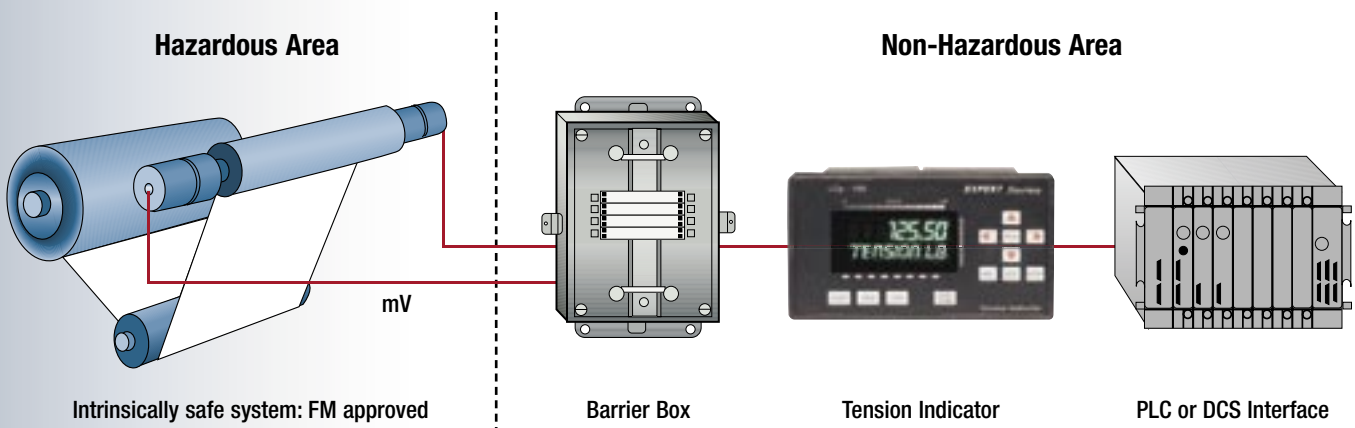
Applications:

- Fiber Optic Cable
- Wire

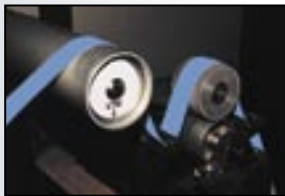
- Labels
- Filament

- Cable
- Thread

Request product data sheet number 12198



## Narrow Web Systems – Cantilever Mount



Vishay BLH narrow web tension transducers are designed to measure single strand or narrow web tensions in any moving web material that requires low force measurement with high accuracy. They provide repeatable tension signals regardless of wrap angle.

### LTW - Narrow Web (9" – 12") 13 - 77 lbs (6 – 35 kg)



LTW narrow web tension transducers mount in-line perpendicular to the roll axis and accommodate web widths up to 12 inches. They are used on single side machines equipped with cantilevered idler rollers. They install easily with a single bolt and are factory-calibrated to eliminate on-site test weights.

Applications:

- Tapes
- Fabrics

- Tags
- Film/foil

- Labels
- Plastics/paper

*Request product data sheet number 12197*



### LTT - Narrow Web (2" – 4") Wire/Cable 20 - 100 lbs (9 – 45 kg)

Cantilever-mounted narrow web LTT transducers provide high accuracy web tension measurements of single strands or webs up to 4" wide. Accurate tension signals are provided even in applications with small wrap angles. The compact LTT design with high overload capability adapts to customer-supplied rollers, pulleys, or rods.



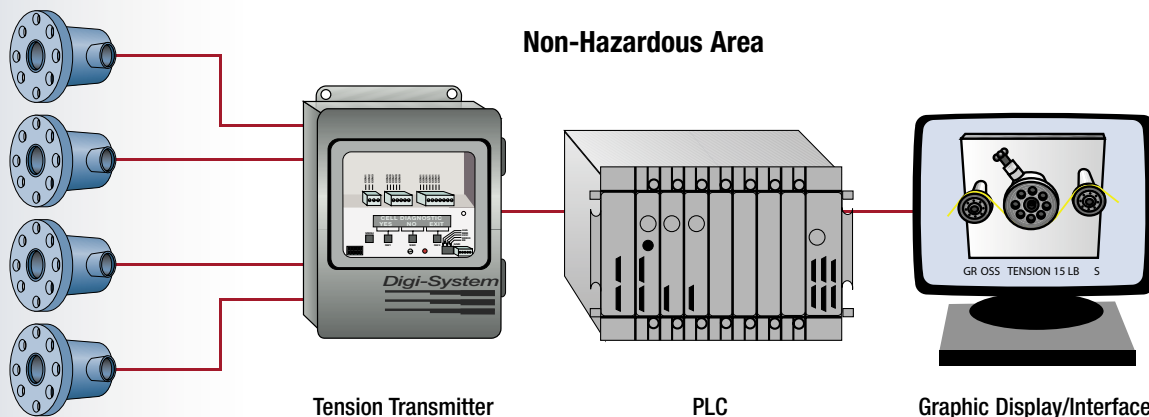
Applications:

- Film
- Wire
- Cable

- Foil
- Labels
- Paper

- Tapes
- Filaments
- Plastic

*Request product data sheet number 12195*



## High-Tension Systems – Pillow Block Mount



### HTU – High Tension Measurement Module 2,000 – 20,000 lbs (907 – 9,071 kg)

The patented Model HTU universal web tension load cell measures the resultant force in any direction and is not limited to horizontal or vertical component force measurement or load cell orientation that is required to achieve maximum sensitivity. This permits the installation of identical load cells at multiple web tension zones regardless of the pillow block mounting or angle configuration of the roller. The low-profile cell is sealed to meet IP67 requirements, temperature-compensated to 250° F, and dead-weight-calibrated to precision accuracy. These features add up to zero maintenance, simple retrofit, and long-term reliability for machines that continuously process material in the paper, steel, rubber, and mining industries.

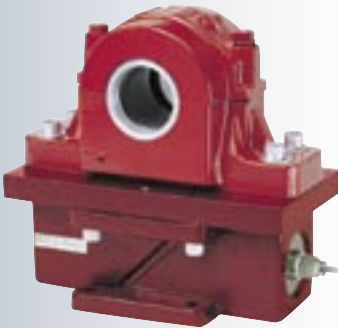


- Applications:
- Calenders
  - Strip Steel Tension
  - Wire Sections
  - Mining Conveyors
- Breakers
  - Winders
  - Coaters
  - Dryers
- Felts
  - Rewinders
  - Laminators

Request product data sheet number 12192

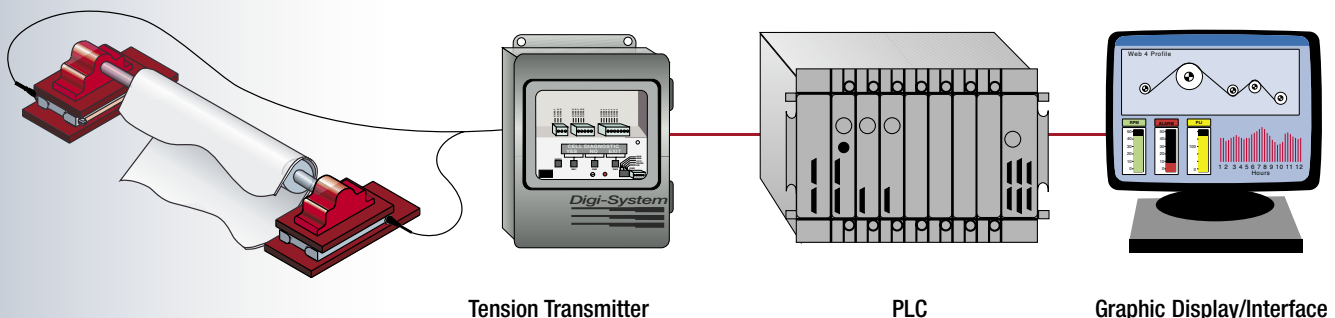
### HTZ-3 – High Tension Measurement Module 500 – 50,000 lbs (227 – 22,680 kg)

HTZ-3 web tension measurement modules are designed to mount directly below roller pillow blocks in new or existing applications that have symmetrical or 180° wrap angles. The adapter plate design allows upward or downward measurement and provides for safety overload stops at each corner. An integral cable conduit fitting, epoxy-sealed strain gages and stainless steel double cantilever transducer design ensure long-term reliability in wet or washdown locations. HTZ-3 Modules are sealed to meet NEMA-4 and IP65 requirements.



- Applications:
- Roofing Machines
  - Rubber Machines
  - Wire Cord Calender Line
- Paper Machines
  - Steel Strip Tension
- Mining Conveyors
  - Rewinders

Request product data sheet number 12193



## Microprocessor-based • Simple to configure and calibrate • Transmit, Indicate, Control

Vishay BLH offers the industry's broadest line of transmitters, indicators, and controllers to suit virtually any application. Push button set-up and calibration offer quick installation with repeatable results for continuous operation consistently, predictably, and accurately for the long term. Wide rangeability is available with a minimum of 50,000 counts of digital resolution. Response times at the rate of 120 updates per second are provided for high-speed applications.



### DXt-40 Series Web Tension Transmitter/Controllers

- Continuous display of left, right, or total tension
- Individually digitize each transducer in a multicell system for greater resolution and accuracy
- Continuous diagnostics of system performance
- Keypad calibration eliminates the need for deadweight calibration
- Optional Dynamic Digital Filtering continuously analyzes and adjusts for system noise
- Optional 16-bit analog output
- Optional interfaces include: Modbus RTU and Allen-Bradley remote I/O
- Displays the resultant force and angle of inclination for any wrap angle (Model HTU)
- Multiple analog outputs

Request product data sheet number 12200



### DXt-15 Series Web Tension Transmitter

- Microprocessor-based
- 0 – 10 V and 4 – 20 mA analog and RS 485 serial outputs
- 3 1/2-digit front panel display with trailing '0'
- Integral multi-transducer summing circuit
- Dynamic digital filtering dampens vibration without reducing response time
- Push button setup and calibration.
- Optional Modbus or Allen-Bradley remote I/O communications
- FM- and CSA-approved for Division 2 hazardous locations

Request product data sheet number 12201



### LCp-100 Series Web Tension Indicator/Transmitter

- Designed for precise high-speed applications (120 updates/second)
- Connects easily to any PLC, DCS, or PC-based process control system
- Can be configured for use with specialized interfaces such as Allen-Bradley remote I/O, Modbus Plus, or Profibus
- Optional embedded modem provides for online diagnostics and service
- Quick Cal™ calibration for fast setup and calibration
- FM- and CSA-approved for Division 2 hazardous locations
- CE-marked

Request product data sheet number 12202



### PS-2010T and new PS-1010T

PS-2010T is designed for high-performance OEM applications that require a small, simple, full function tension transmitter and controller. PS-2010T can be DIN rail mounted inside an existing cabinet and responds at the rate of 120 updates per second for high-speed applications.

Request product data sheet number 12203



# WORLDWIDE SALES CONTACTS

## THE AMERICAS

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## VISHAY MEASUREMENTS GROUP

**Vishay Transducers:** Vishay Nobel, BLH, Celtron, Sensortronics®, TedeA-Huntleigh

**Vishay Micro-Measurements:** Vishay Micro-Measurements, BLH SR-4®

[www.vishaymg.com](http://www.vishaymg.com)

VISHAY IS ONE OF THE WORLD'S LEADING MANUFACTURERS OF DISCRETE SEMICONDUCTORS AND PASSIVE COMPONENTS