# Dual Axis Web Tension Transducer

## FEATURES

- Capacities from 2K to 20K pounds (9 to 89 kN)
- Dual axis transducer design enables measurement of resultant force in all directions without limitation to horizontal or vertical components
- Functional to 250°F (121°C)
- Sealed to IP67 - field proven design
- Low profile - direct load cell replacement with simple retrofit installation
- Factory calibrated for minimum start-up time

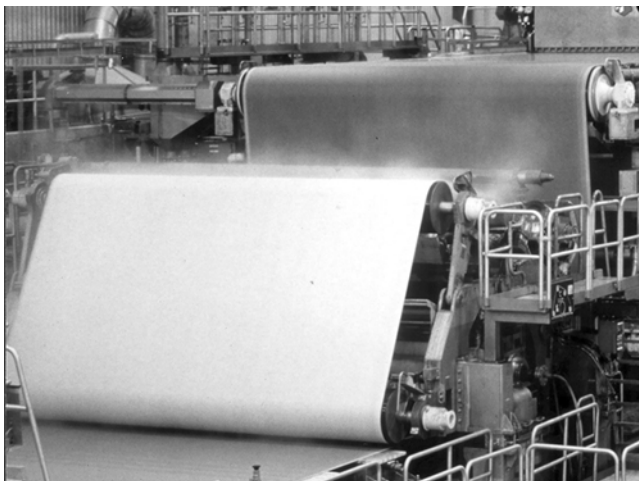
## DESCRIPTION

Patented HTU Web Tension Transducers measure web tension forces applied across a roll, using integral horizontal and vertical axis sensors. This innovative and exclusive two-dimensional approach to web tension force measurement enables accurate determination of the true resultant force, as well as the applied angle. Not only does this permit installation and measurement at any mounting angle or roll orientation, it also combines to form an expert diagnostics system that produces the highest level of web tension measurement confidence available today.

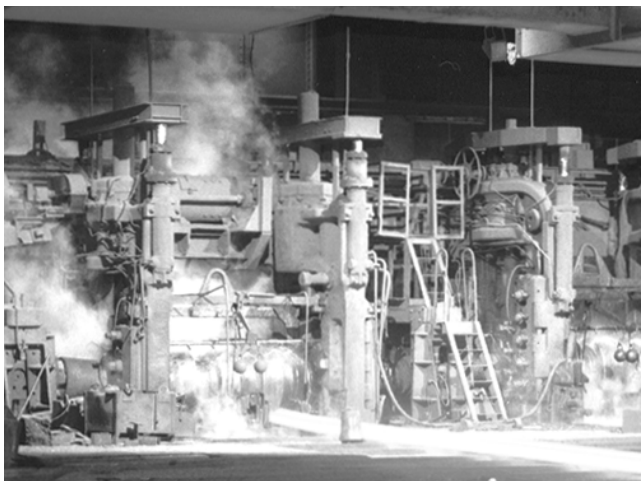
The Model HTU is machined from a high strength corrosion resistant stainless steel to yield a low profile single piece construction that incorporates tubular sensing sections at each end. Two full Wheatstone Bridges are mounted internally to each sensor and provide output signals in the X and Y plane that are externally, vectorially summed to determine the magnitude and direction of the resultant force. Each bridge is functional to 250°F (121°C), and dead weight calibrated for precision accuracy. The cylindrical sensing sections are sealed to meet IP67 requirements. Environmental sealing ensures long-term reliability for humid, wet, or washdown locations.

## APPLICATIONS

Paper and Roofing Machines



Strip Mill Force Measurement

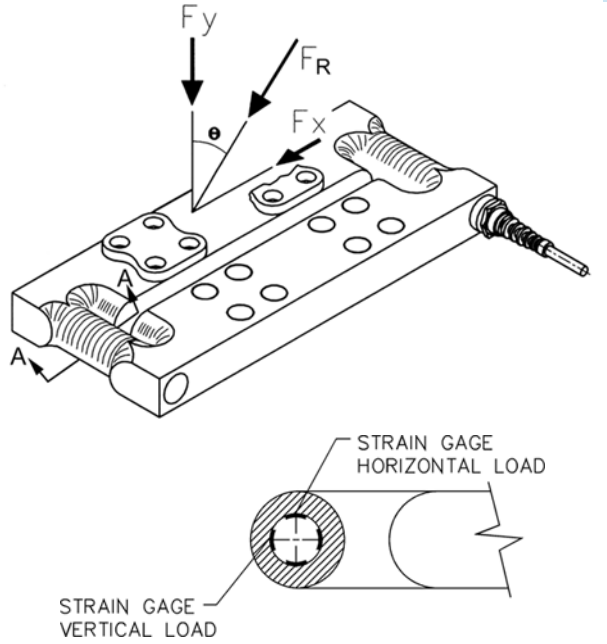


## HTU DESIGN ADVANTAGES

The HTU Load Cell incorporates a symmetrical, universal design that measures the resultant force FR and angle θ of any web tension system, independent of wrap angle, with a horizontal or vertical installation. Special orientation or the selection of a horizontal or vertical transducer is not required.

Force sensing elements located on each end of the transducer measure the components $F_X$ and $F_y$ of $F_R$ applied along the X and Y axes. Resultant output signals can be used to determine the magnitude and direction (θ) of the overall force ($F_R$) applied by the web. Two full Wheatstone Bridges are mounted internally to each tubular cross section to provide independent sensing for each axis as well as protection from hostile environments.

HTU transducers are typically installed beneath the pillow blocks using top and bottom adapter plates. These plates mount on integral loading surfaces designed to produce shear forces in the sensing element. Loading surfaces are located on either side of the longitudinal center slot and include drilled and counterboard holes to maintain a low profile assembly.




**Force sensing gage diagram (for both ends of module)**

## SPECIFICATIONS

**Performance (% Rated Output)**

| | |
|---|---|
| Available Capacities | 2K, 6K, 10K, 20K lb (9, 27, 45, and 89 kN) |
| Rated Output (RO) | 2.0 mV/V (X & Y bridges) |
| Repeatability | 0.02% RO |
| Combined Error (best fit) | 0.10% RO |
| Zero Balance | 1.0% RO |
| Creep (20 Minutes) | 0.05% RO |
| Temperature Effects: | |
| Zero Balance | 0.0025% RO/°F (0.0044%/°C) |
| Output- % Reading | 0.0050% RO/°F (0.0089/°C) |

**Electrical**

| | |
|---|---|
| Excitation Voltage | 10 Vac-dc recommended<br>15 Vac-dc maximum |
| Input Resistance | 185 ±10.0 ohms (all channels) |
| Output Resistance | 500 ±5.0 ohms (per channel) |
| Connection | high temp., 6-Cond. Cable, 33 feet (10 meters) |

**Temperature**

| | |
|---|---|
| Safe Temp. | -+0 to +300°F (-18 to +149°C) |
| Service Temp. | -+0 to +250°F (-18 to +121°C ) |

**Adverse Load Ratings**

| | |
|---|---|
| Safe Load | 150% rated capacity |
| Ultimate Load | 300% rated capacity |
| Safe Sideload | 100% capacity @12 in. (304 mm) C/L height |
| Ultimate Sideload | 300% rated capacity |

**Material**

| | |
|---|---|
| HTU Cell | 17-4PH stainless steel |
| Adapter Plates | mild or stainless steel |

**Sealing**

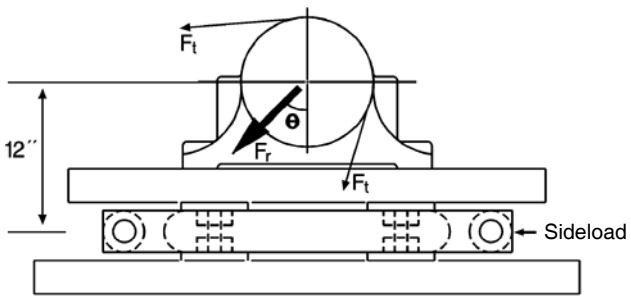
| | |
|---|---|
| Environmental Rating | IEC IP67 |

**Deflection**

| | |
|---|---|
| 2000 lb Unit | 0.007 inches (0.17 mm) |
| all others | 0.035 inches (0.89 mm) |

**Weight and Mounting**

| | |
|---|---|
| Weight | all capacities - 18 lb (8.2 kg) |
| Mounting | horizontal or vertical |




**Safe sideload at centerline height**



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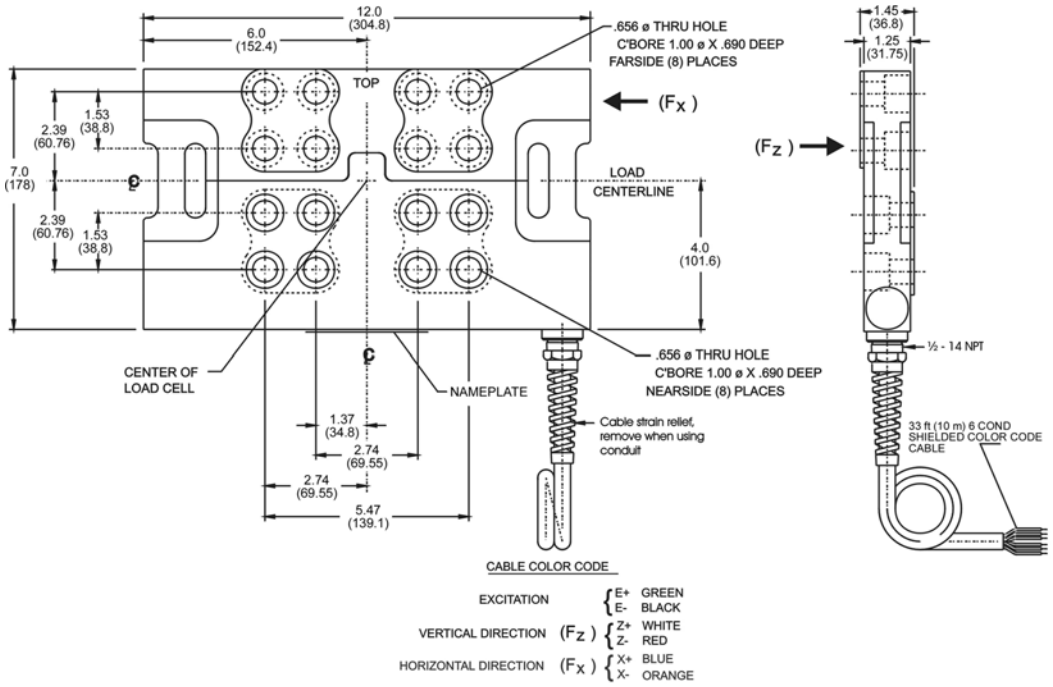
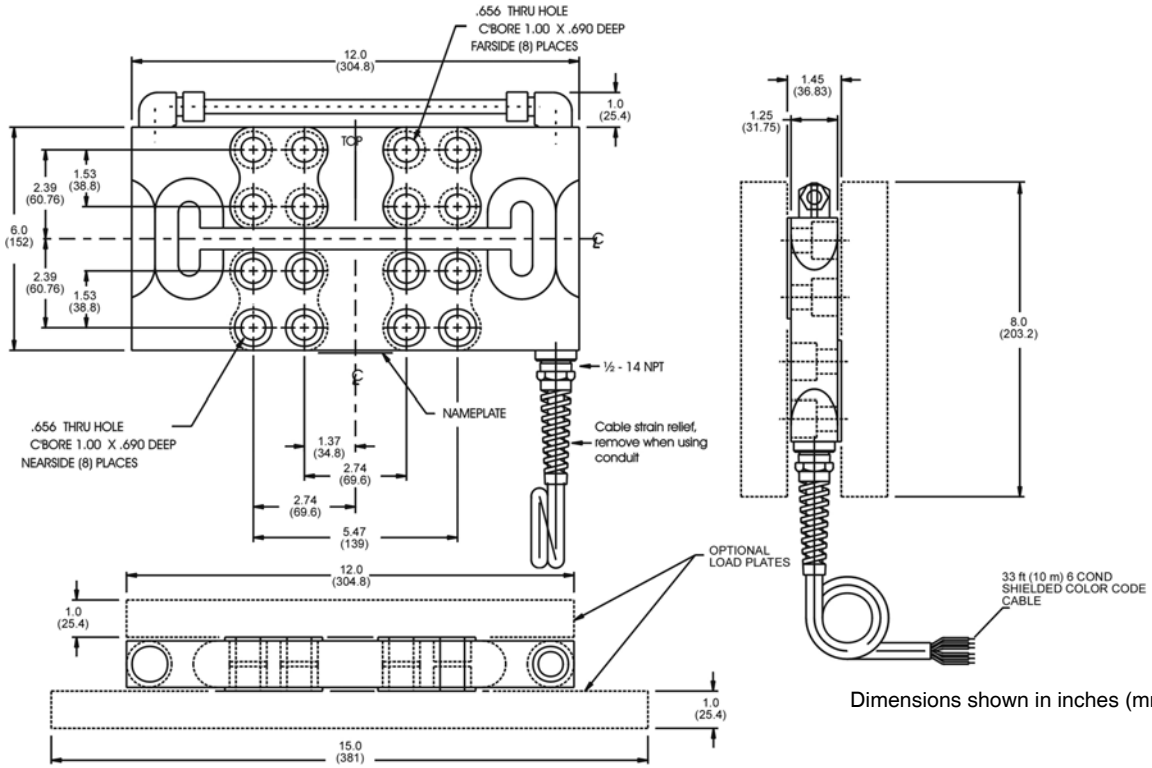
## OUTLINE DIMENSIONS: 2000 LB (9 kN)




Dimensions shown in inches (mm)

## OUTLINE DIMENSIONS: ALL OTHER CAPACITIES

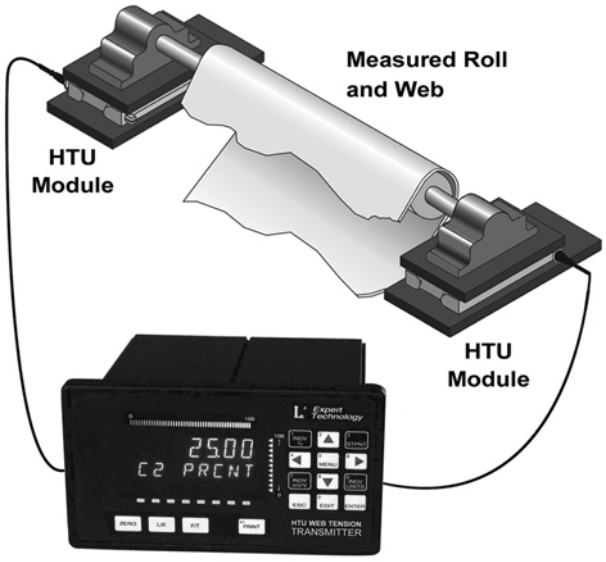



Dimensions shown in inches (mm)

## HTU SYSTEM CONFIGURATION

**Comprehensive Web Tension System**

- Continuous display of left, right, or total tension, wrap angles, or force
- Measures the resultant force for all wrap angles
- Visual display of horizontal and vertical web balance
- Keypad calibration eliminates need for on-site test weights
- 4-20 mA outputs for total tension, total force, and customer configured tension range
- Individually digitized transducer data
- Continuous diagnostic surveillance
- Dynamic Digital Filter
- 750,000 count resolution per channel; 60 updates per second
- Measures the resultant force for all wrap angles
- DeviceNet, Profibus, Allen-Bradley Remote I/O or Modbus Plus Interface to PLC
- Over/under tension setpoint annunciators



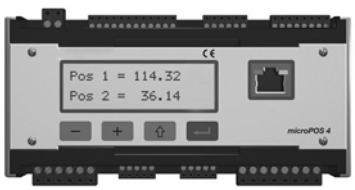

LCt-104 Transmitter

## AVAILABLE INSTRUMENTATION

**LCt-104**


Angle & Tension Display
Left, Right, Total

**microPOS**




Web Tension Controller

**DXt-40**


Tension Display Left,
Right, or Total

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