



PRODUCT GUIDE

TENSION MEASUREMENT, DISPLAY & CONTROL



Tension Transducers • Amplifiers • Indicators
Controllers • Brakes • Idler Rolls

2022



Fast Delivery



Responsive Tech Support



5 Year Warranty



Premiere Quality Assurance

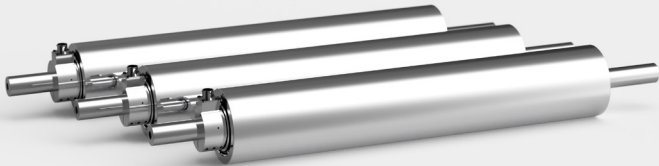


Designed & Made In The USA

TENSION TRANSDUCERS

- Transducers / load cells measure actual tension in any moving web or filament process
- Output a proportional signal to a tension amplifier, indicator or controller
- Stainless steel and aluminum construction for high strength and corrosion resistance
- 5 year warranty - free of defects in material and workmanship

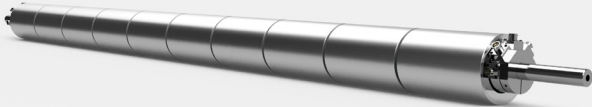
TENSION ROLL® TRANSDUCERS - MODEL TR



Ultimate performance and robust reliability set the Tension Roll® transducer apart from other sensing solutions on the market. A dead-shaft idler roller with tension sensors (load cells) integrated into each roll end, the Tension Roll® transducer is ideal for installation on original equipment or for retrofits since it arrives pre-assembled and ready-to-install between the facing sides of a machine frame.

- Aluminum, steel and stainless steel rolls are available
- Load ratings: 12 - 400 lbs (55 - 1,800 N)
- Roll diameters: 2.25", 3", 4", 5" and 6"
- Roll lengths: 6" - 84"
- Custom roll finishes available

SEGMENTED TENSION ROLL® - MODEL STR



The Segmented Tension Roll® transducer is designed to measure the tension of multiple narrow webs running independently or multiple data points (2 per segment) across a continuous web width. Available with a support frame to minimize shaft deflection.

- Minimum roll segment length: 6" (3" Dia.), 7" (4"-6" Dia.)
- Maximum number of roll segments: 10

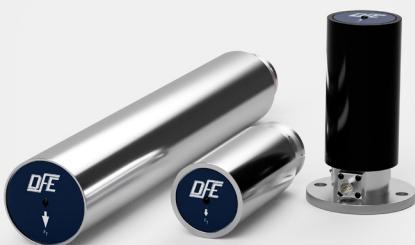
GENERAL PURPOSE TRANSDUCERS - MODEL C



The industry standard in cartridge-style tension load cells. The Model C transducer is available in a variety of sizes, mounting styles and load ratings. Model C's are sealed to prevent ingress from dust and water for long operating life and low maintenance.

- Dead shaft and live shaft models
- Five mounting styles: Screw, Flange, Pillow-Block, Through-Frame and Piloted-Flange
- Dual cantilevered sensing-beam for high accuracy
- Load ratings from 10 - 800 lbs (45 - 3,560 N)
- High overload capacity - up to 2,500 lbs (11,125 N)

NARROW WEB TRANSDUCERS - MODEL NW



The NW transducer combines a cantilevered idler roll and two tension transducers in one integral unit - for fast, easy installation, high accuracy and web tracking performance. Roll widths from 6" (152 mm) to 20" (508 mm). Choose single-bolt mounting or a four-bolt flange.

- Twin load cells and idler roll combined in one unit
- Load ratings from 12 - 400 lbs (55 - 1800 N)
- Optional digital display meter in the end of the roll
- Three roll diameters: 2.25", 3" and 3.5"
- Custom roll finishes available

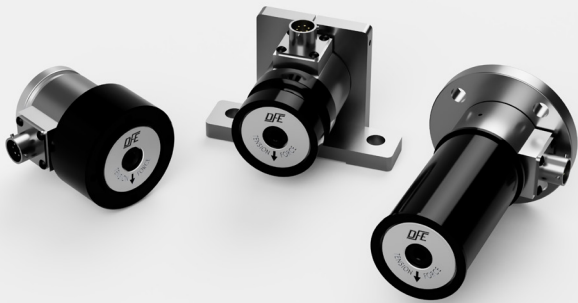
VERY NARROW WEB TENSION TRANSDUCERS - MODEL VNW



The VNW transducer measures process tension in narrow webs (up to four inches wide), ribbon or filament. It mounts cantilevered on process machinery for unwind/payoff, rewind/take-up, or intermediate zone applications. Robust construction and impressive overload capability.

- Easy to install
- Provide your own wheel or select a DFE option
- Factory ribbon, filament and adapter wheels available
- Load ratings from 10 - 400 lbs (45 - 1,825 N)
- High overload capacity - up to 1200 lbs (5,338 N)

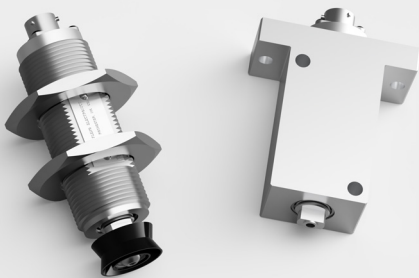
RIBBON FILAMENT TRANSDUCERS - MODEL RFA



Patterned after the legendary Model C transducer, the RFA Ribbon Filament tension transducer's cantilevered form factor is ideal for wire, plastic, rubber, metal, glass, composite and other flexible substrates. Three standard wheels are available - ribbon (1"-4" wide), filament and an adapter wheel which functions as a hub for mounting custom wheels. Three mounting styles are available: Screw, Flange, and Pillow-Block.

- Measure tension of any narrow web, ribbon or filament
- Small, versatile and easy-to-install
- Load ratings from 10 - 150 lbs (45 - 665 N)
- Overload capacity four times the load rating

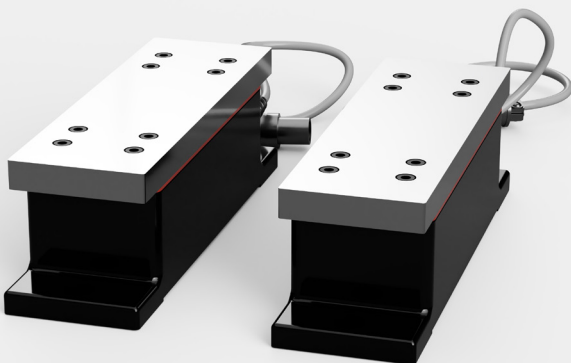
LOW TENSION TRANSDUCERS - MODEL LT



Compact, durable transducers for measuring light tension in fiber, filament or ribbon winding applications. The dual cantilevered beam provides torsional stiffness, strength and accuracy. Available in stackable or threaded through-frame mounting designs.

- Measure low tension accurately in moving ribbon or filament
- Load ratings from 50g - 2000g (0.5 N - 19.6 N)
- Factory 1" ribbon and v-groove filament wheels available
- Custom wheel designs also available

HEAVY-DUTY TENSION TRANSDUCERS - MODEL F



Model F Series transducers mount under pillow-block bearings at each end of an idler roll shaft. Designed for use in demanding tension measurement environments, the F transducer shell has a one-piece aluminum base with a removable stainless steel top plate. A rubber seal between the base and top plate prevents water ingress and dust contamination. The transducer's electrical connector is located at the end of a short cable for simpler access during installation.

- Install under any standard pillow-block bearing
- Corrosion resistant for harsh environments
- Sealed against water intrusion - designed to meet IP65
- Tethered top plate for safety
- Load ratings from 100 - 10,000 lbs (445 - 44,500 N)
- Oversized top plate option to accommodate large bearing blocks

TENSION AMPLIFIERS AND INDICATORS

Tension amplifiers and indicators scale tension return signals from DFE transducers to display actual tension or output a proportional signal. Tension output signals can be used to interface with drive systems, PLCs, computers or data logging devices.

QUIK-CAL™ DIGITAL CALIBRATION

- No tension display needed
- No screwdriver needed
- No second person needed
- Eliminates drift associated with worn cal-pots

ETHERNET/IP™ AMPLIFIER - TA500

ODVA CE



The TA500-EIP tension amplifier is a compact, single channel tension transducer interface with EtherNet/IP™ compatibility. In addition to Ethernet, the TA500 provides simultaneous 0-10 VDC and 4-20 mA isolated tension outputs. Built-in diagnostic capability quickly identifies faulty load cells, incorrect wiring, calibration issues and amplifier ADC/DAC failure.

- DIN rail mount
- Web configuration and monitoring interface
- EDS file support
- ODVA certified
- CE-marked
- **EtherNet/IP™**

TRUETENSION™ AMPLIFIER - TA1

CE



The TA1 TrueTension™ Amplifier is a compact, single-channel tension transducer interface. It can be used with DFE tension transducers (load cells) to monitor tension in any zone of web or filament processing machinery.

DFE's **Quik-Cal™** push-button zero and calibration eliminates pot adjustments and associated drift to make calibrating the TA1 simple, fast and reliable. Powered by 24 VDC, the amplifier boosts a millivolt-level tension signal from the tension transducer (load cell) and outputs an isolated 0-10 VDC and 4-20 mA proportional signal to a PLC, drive or display meter.

Built-in diagnostic capability quickly identifies faulty load cells, incorrect wiring, calibration issues and amplifier ADC/DAC failure. The compact size and ease-of-installation make the TA1 amplifier a natural choice for the OEM or end user seeking value in web tension monitoring or control applications.

TRUETENSION™ AMPLIFIER - TI17C / TI18C

CE UL



The TI17C/TI18C TrueTension™ amplifier outputs a proportional tension signal to a PLC, drive, controller or other device. Packaged in a rugged steel enclosure, these TrueTension™ amplifiers are designed for maximum longevity and reliability.

- **Quik-Cal™** push-button zero and calibration
- 0-10 VDC or 4-20 mA isolated outputs (selectable)
- Choice of mounting styles - DIN rail or keyhole
- Adjustable meter damping
- UL-listed
- CE-marked in enclosure version with optional cover

IAMP2™ INLINE TENSION AMPLIFIER - TI22



Simplify web tension measurement with iAmp2™ amplifier modules. These enclosed miniature tension amplifiers are powered by 24 VDC and output 0-10 VDC signals proportional to tension. The iAmp2™ connects to transducers and external devices via terminal strip or cannon-style connectors.

- Compact installation footprint
- Rapid, simple installation
- 0-10 VDC isolated signal output for PLC, drive or data logger
- Includes 0-1 mA isolated output for a tension meter
- CE-marked

TRUEVIEW™ TENSION INDICATOR - 1100TV



The TrueView™ 1100 is an easy-to-use, rugged, touchscreen tension indicator designed for use with high-sensitivity semiconductor strain-gage load cells. It features a bright 500 nit, impact-resistant touch screen display suitable for industrial environments.

Housed in an alloy enclosure, it is machined from solid 6061-T6 billet aluminum for superior strength and durability. Engineered with flexibility in mind, DFE's newest indicator can be DIN rail-mounted, panel-mounted (with included bezel) or affixed to a vertical column with a band-style clamp. The TrueView™ 1100 is backward-compatible with all DFE tension transducers manufactured since 1974.

- Operator lockout code
- Simple 3 step calibration procedure
- Simultaneous 0-10 VDC and 4-20 mA isolated tension outputs

TRIVIEW™ LRT TENSION INDICATOR - TI31



In addition to displaying average tension across the width of a running web, the TriView™ indicator also reads independent tension on both edges of a web process. This multi-zone monitoring allows the TriView™ to alert machine operators if manual adjustments are needed to equalize side-to-side tension and maintain optimum quality. Minimum and maximum tension limits can also be set to warn operators of potential web breaks, stretching or wrap-up incidents.

- **Quik-Cal™** Zero and Calibration saves setup time
- 5-inch, high-visibility touchscreen display interface
- High and low Tension Limit Switch (TLS) capability
- 0-10 VDC and 4-20 mA isolated tension outputs

FIREGUARD™ 2 INTRINSICALLY SAFE TENSION AMPLIFIER



An intrinsically safe interface between transducers and a tension controller, indicator, drive system or computer. The FireGuard™ 2 reduces risk of fire or explosion in plant environments where combustible vapor may be present. Used when tension transducers and optional analog tension meter are located in a hazardous Class I Division 1 or 2 area.

- UL-listed, CE-marked transducer interface
- Reduces risk of fire and explosion
- Dual Calibration for two calibration settings
- Protected in a compact, steel enclosure

AUTOMATIC TENSION CONTROLLERS

Set your desired tension and the controller will maintain it. Easy-to-configure DFE controllers automatically compensate for variations in roll diameter, speed and web material characteristics.

- Choice of output modes to be used with a pneumatic brake or clutch, eddy current clutch, electric brake or variable speed drive
- Large, easy-to-view tension displays
- Choice of metal enclosure or panel-mount form factors
- Standard emergency stop, auto/manual control modes, bumpless switching and soft start features

DIGITAL TENSION CONTROLLER - STEADYWEB™ 6



With closed-loop load cell feedback, our flagship SteadyWeb™ 6 tension controller maintains a precise tension setpoint in any zone to improve process consistency. The 5" color touchscreen display simplifies setup and operation.

- 5" touchscreen display
- Choice of enclosure or panel-mount form factor
- Storage and recall for up to 30 job setups
- 0-10 VDC, 4-20 mA, 0-24 VDC, 0-45 VDC, 0-90 VDC and pneumatic control output options
- Diameter, taper and acceleration compensation
- Diameter min/max alarm trip

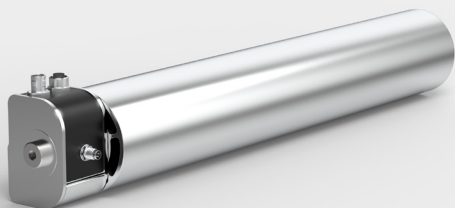
DIGITAL TORQUE CONTROLLER - EASYWEB™



A budget-friendly open-loop controller, the EasyWeb™ calculates the change in roll diameter throughout a winding or unwinding process and adjusts the torque output of your drive, clutch or brake to compensate. This web tension management helps prevent breaking, stretching, wrinkling or curling. The EasyWeb™ uses an input signal from line-speed and roll-speed tachs or from an ultrasonic sensor or rider roll.

- For center-driven unwind or rewind applications
- Simple-to-use interface with OLED display, scroll knob and soft keys
- Choice of inputs and isolated control output
- Diameter min/max alarm
- Taper tension

COMING SOON - TENSION ROLL® WITH INTEGRATED ETHERNET/IP™



Augment your next-generation printing press or converting machinery with the most advanced tension measurement system available. With the addition of integrated EtherNet/IP™, the popular Tension Roll® transducer has evolved into a more sophisticated platform capable of providing expanded sensing capability.

- Orientation sensor for precise articulation of force direction
- Remote Zero and Calibration functionality
- Remote diagnostic capability
- Well-suited for OEM machine builders
- Patent-pending I/O architecture

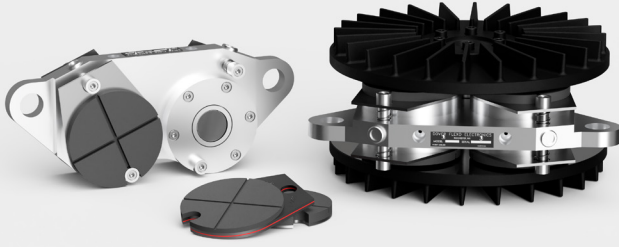
Available In 2022

PNEUMATIC TENSION BRAKES

DFE brakes are an integral part of a high-performance unwind package, features include:

- Patented anti-squeal Silencer™ friction pads
- Limited-travel pistons that never scratch the disks
- Time-tested industrial design
- Stress-relieved iron disks
- Hassle-free friction pad removal and installation - no tools required
- Asbestos-free friction pads available in high or low coefficients of friction

HEAVY DUTY DUAL DISK BRAKE - 90 - 1800 SERIES



High-output brakes capable of up to 17,990 lb-in of torque. Designed for hassle-free operation, enabling friction pad changes in seconds, without tools. Cylinders can be actuated individually. Piston return springs prevent diaphragm puncture, increasing brake reliability and longevity.

- Heavy-duty brake for unwind applications
- Wide torque range
- Large heat dissipation capacity
- Available in four sizes

STANDARD DUAL DISK BRAKE - 60 SERIES



Smaller, high performance dual disk brakes capable of low to moderate torque. Easy to install and use, the 60 series brake was designed for lower tension unwind applications. The 60 series brake can be configured with one to six cylinders.

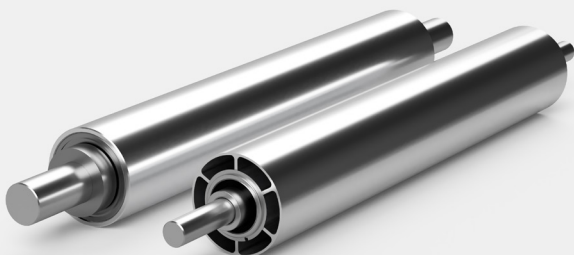
- Torque range from 3 lb-in (one cylinder) to 1,000 lb-in (six cylinders)
- Replace worn pads in seconds, without tools

BRAKE ACCESSORIES



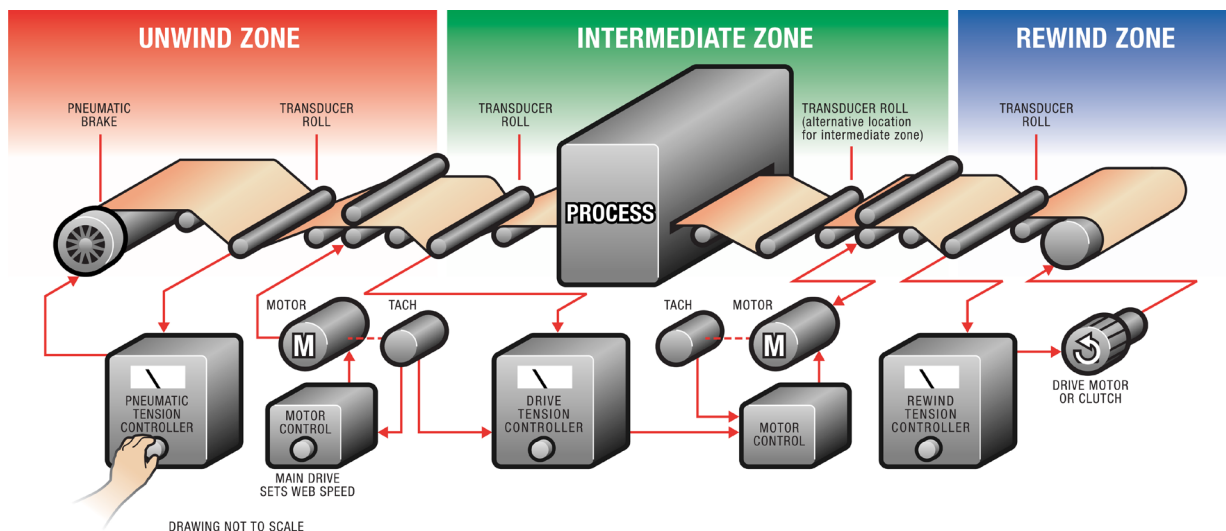
- Brake guards
- Aluminum mounting plates
- Installation kits (bolts, spacers and washers)
- Friction pads and Silencer™ anti-squeal kits
- Pneumatic air valves - slide-valve manifolds, control air supply to individual cylinders

IDLER ROLLS



- Classic or Low-inertia dead shaft idler rolls
- Standard 16 RMS roll finish, with custom roll surfaces available
- TGP steel shaft
- Plain shaft ends, or optional drilled and tapped to your spec
- Classic idlers available in 3, 4, 5, and 6 inch roll diameters
- Low-inertia rolls available in 3 inch diameter
- Shielded bearings

TENSION ZONE DIAGRAM



REPLACEMENT PARTS & ACCESSORIES

To complement DFE's 5 Year Warranty, responsive Technical Support and the rest of our tension-free customer care program, you will find just what you need when it comes to spare parts and accessories. These items are listed in the instruction manuals for your Dover Flexo Electronics products. Order replacement parts quickly, simply and securely by calling or e-mailing our sales department.

- Budget-friendly repair services available
- Tension transducer interface cables
- Spare option boards and plug-in circuit cards
- Analog and digital tension meters
- Brake accessories, actuator assemblies and friction pads
- Fast turnaround
- Reasonable prices
- All major credit cards accepted

TYPICAL RUNNING TENSIONS OF COMMON WEB MATERIALS

Material	English		Metric		Material	English		Material	English	
	Weight (points)	Tension (lbs/lin. inch)	Weight (g/m ²)	Tension (kg/cm)		Tension (lbs/in/mil)	Tension (kg/cm/mm)		Copper Wire (15,000 psi)	Tension (lbs)
Paperboard	8	3.0	105	0.54	Aluminum Foils	0.5	3.52	#16 (.051 inches)	30.00	13.6
	12	4.0	157	0.72	Cellophanes	0.75	5.27	#20 (.032 inches)	12.00	5.5
	15	4.5	196	0.90	Acetate	0.5	3.52	#24 (.020 inches)	4.50	2.0
	20	5.5	260	1.26	Mylar (Polyester)	0.75	5.27	#28 (.013 inches)	1.75	0.79
	25	6.5	326	1.62	Polyethylene	0.25	1.76	#30 (.010 inches)	1.25	0.57
	30	8.0	391	1.98	Polypropylene	0.25	1.76	#34 (.006 inches)	0.50	0.23
Paper (based on 3,000 sq. foot ream)	15	0.40	25	0.135	Polystyrene	1.0	7.03	#36 (.005 inches)	0.25	0.11
	20	0.50	30	0.180	Saran	0.15	1.05	#40 (.003 inches)	0.10	0.045
	30	0.75	50	0.270	Vinyl	0.25	1.76	Run aluminum wire at ½ - 2/3 these values. 15,000 psi = 103.42 MPa		
	40	1.25	65	0.360	Nylon	0.25	1.76	1 mil = 25.4 microns = 0.0254 mm		
	60	2.00	100	0.540	Wax Paper	1.0	7.03			
	80	3.00	130	0.720	For laminated webs sum the tensions for the individual webs and add 0.1 lb/in. (0.018 kg/cm) of width.					

