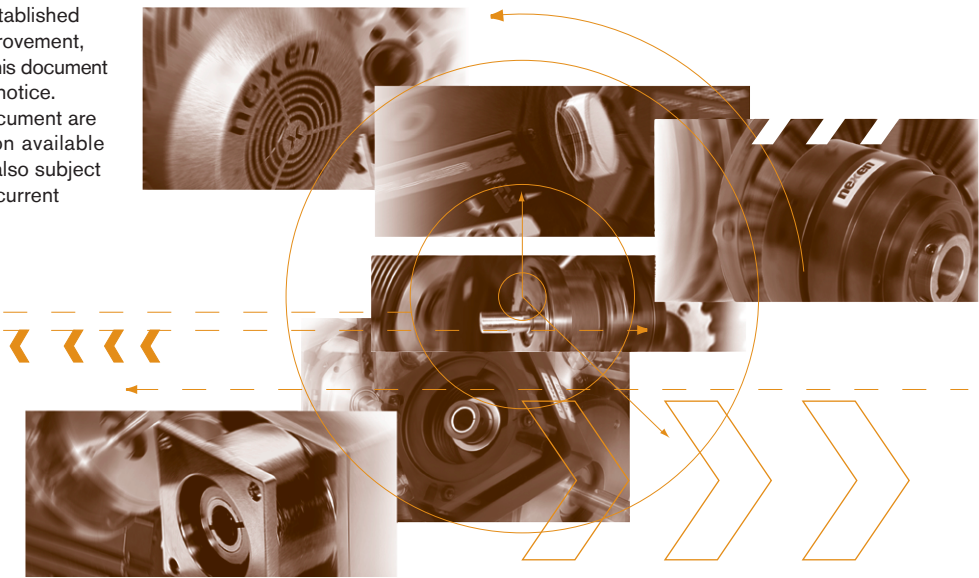


In accordance with Nexen's established policy of constant product improvement, the specifications contained in this document are subject to change without notice. Technical data listed in this document are based on the latest information available at the time of printing and are also subject to change without notice. For current information, please consult: www.nexengroup.com



TENSION CONTROLS

This Section Contains:Page

TENSION CONTROL SYSTEMS	
RSTC 1000 Tension Controller	294
TC 820 Tension Controller	295-296
MB Series Tension Sensors	297-301
Sidewall Mount Tension Sensor	302-303
Electro-Pneumatic Converters	304-306
Auxiliary Pneumatic Controls	307
TCD 600 Diameter Tension Controller . .	308-309
Dancer Control System	310
Digital Dancer Controller	
RSD100, RSD100P	311
Digital Dancer Controller	
RSD200, RSD200P	311
Dancer Control System Power Supply . . .	311
RSD250 Unwind Dancer Package . . .	312-313
Dancer Sensors DPS30 & DPS60	313
TA 100/TA 110 Tension Amplifiers . . .	314-315
SC100 Signal Conditioner	316
TM 210 Tension Meter	317

TENSION CONTROLS

Web Products

RSTC1000 Tension Controller

Nexen's RSTC Tension Controllers are a closed loop, load cell based tension control products which use torque to control the tension of paper, film, foil, or fabric in all zones of web processing machines.

The RSTC uses an adaptive control algorithm to adjust internal gain values, resulting in a simple system with the inherent robustness of more complicated systems that rely on many external sensors and signals.

The RSTC1000 can be DIN rack mounted or panel mounted inside a machine control cabinet alongside other controllers. The RSTC1000 with Modbus RTU and the RSTC1100 with Profibus DPV1 communication protocols can communicate with HMIs and PLCs. For machines without a HMI, the RSTC Operator Panel (ROP), used with the RSTC1000, can be installed in a convenient location for the operator.



Features and benefits

- Tune once, then forget
- Smart Splicing — splice different size rolls without adjustment
- RSTC controls the torque output of brakes, clutches, and AC/DC drives
- Controller setup and tuning are performed at initial start-up from a customer's PC or HMI
- RSTC utilizes an adaptive control algorithm
- Software to set, tune and diagnose the RSTC is downloadable from the Nexen website
- ROP can be mounted anywhere on the machine
- RSTC and ROP are CE compliant
- The ROP has a text display with no menus, therefore, operators do not have to navigate menu structures or decode cryptic messages
- Each control on the ROP has only one function, simplifying operator training and use
- ROP supports easy storage and retrieval of parameters for frequently run jobs
- The ROP adjusts job parameters only, so operators cannot modify controller setup or tuning parameters
- Power supply, +24 VDC



Product Part Numbers

964523	RSTC1000 (Modbus)
964528	RSTC1100 (Profibus)
964537	RSTC Operator Panel (ROP) English - Spanish
964538	RSTC Operator Panel (ROP) English - French
964539	RSTC Operator Panel (ROP) English - German
964540	RSTC Operator Panel (ROP) English - Italian

Specifications

POWER	24VDC @ 500mA
OPERATING TEMPERATURE	
RSTC 1000	0° - 60° C (32° - 140° F)
RSTC Operator Panel	0° - 45° C (32° - 113° F)
DIGITAL SIGNALS	
Alarm Outputs	5-24 VDC, 140 mA sinking current
Control Inputs	12 - 24 VDC, 20 mA Max
ANALOG SIGNALS	
Diameter Sensor Input	0 - 12 VDC Max
Load Cell Inputs	2 channels, 0-1 VDC
Control Output 1	0 - 10 VDC, 4-20 mA
Control Output 2	0 - 10 VDC, 4-20 mA
SENSOR EXCITATION	
Load Cell	6 VDC
Diameter Sensor	12 VDC & 24 VDC @100 mA Max

MOBUS RTU COMMUNICATIONS

Network Address Range	1-247
Baud Rates	4800, 9600, 14400, 19200, 38400, or 56,000
Parity	None, Odd, Even
Stop Bits	1 (Odd or Even Parity) 2 (No Parity)

PROFIBUS DPV1 COMMUNICATIONS

Device Address	1-125
Baud Rates	Auto Detect

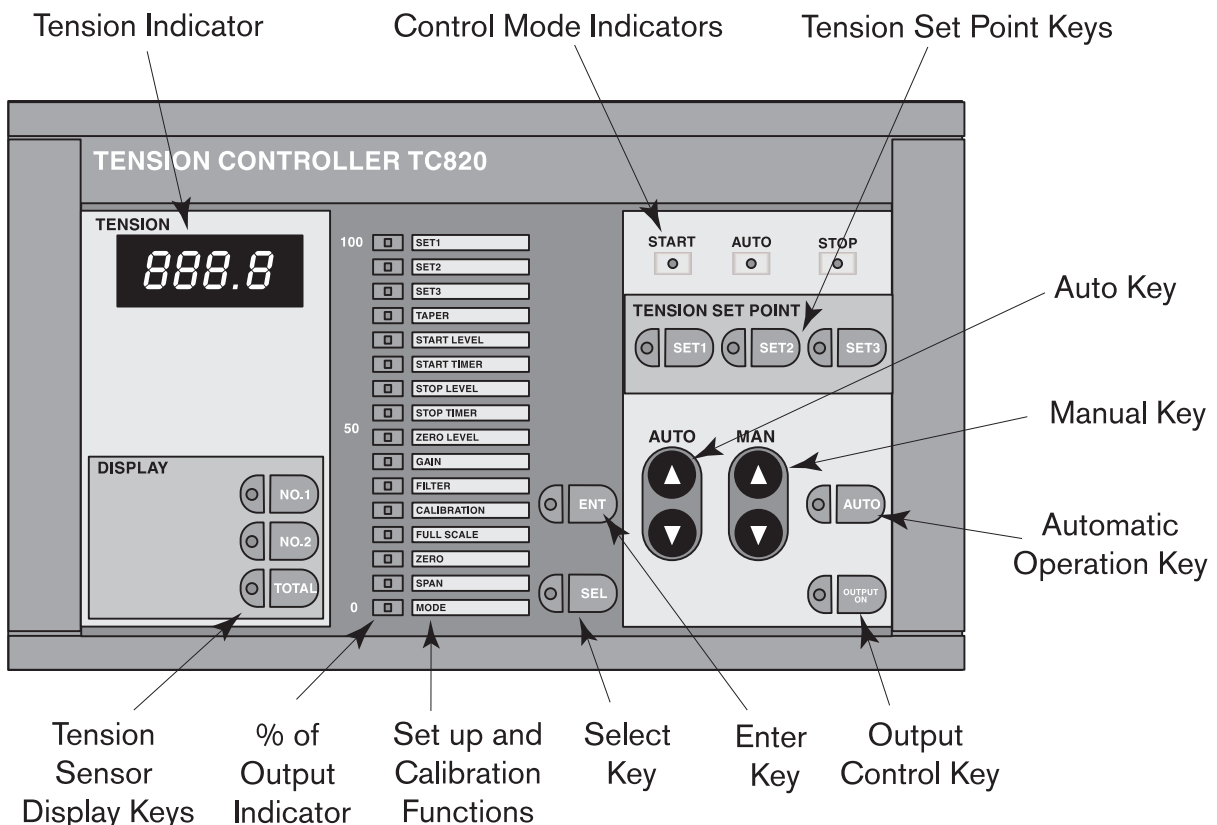
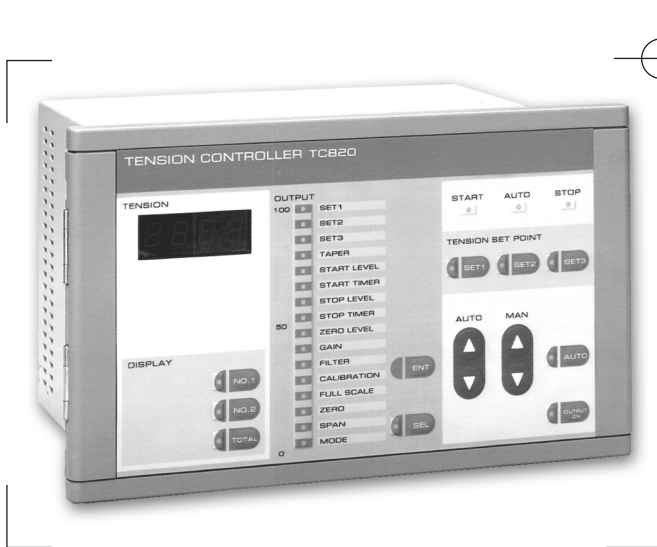
TC 820 Tension Controller

Nexen's TC 820 Tension Controller is the central component of a closed loop tension control system that includes the controller, tension sensors, external controls and indicators and a clutch, brake or drive. The

system maintains uniform web tension in machinery that prints or converts web materials including paper, film, foil, cellophane, textiles, non-wovens, metal strip and rubber.

Features and benefits

- Both 4-20 mA and 0-10 VDC outputs in one unit—one controller for all your needs. Interface with pneumatic, hydraulic or electric clutches, brakes or drives.
- Tension selection at the push of a button—easy to operate.
- Remote tension inputs—Set tensions directly from external sources. (PC's, PLC's)
- Simple to setup, calibrate and operate—no need for costly external technicians.
- 16 LED control output display—keeps operator informed.
- Calibration lockout circuitry is standard— prevents unauthorized calibration changes.
- Operates using LVDT or strain gauge tension sensor signals—one controller for all sensors.
- Affordable—easy to justify cost.
- Set up and calibration from central control panel—ease of set up and calibration.
- Digital tension display—easy to read.



How the TC820 Tension Controller works.

The TC 820 Tension Controller receives an input signal from one or two Nexen tension sensors. These sensors can be LVDT or strain gauge-type sensors. The controller amplifies and adds both these signal values together. The sum of these combined signals is then compared to the desired setpoint tension level. The difference

between these two signals is the "deviation." The TC 820 reduces the deviation to zero by increasing or decreasing the output signal.

Two tension sensors are normally placed one on either end of a sensing roll. This eliminates errors caused by a difference in tension from one side of the

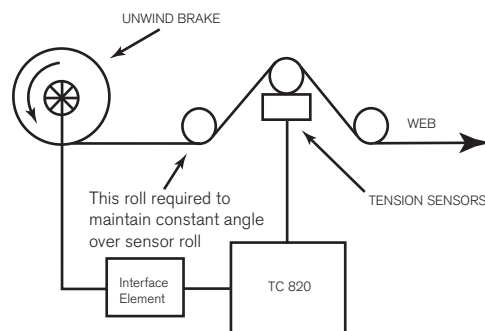
web to the other. Narrow web sensing can be done using only one sensor.

You choose whether the output signal is 4-20, mA, or 0-10 VDC depending on the needs of the interface element. The 4-20 mA signal is used with the Nexen Electro-Pneumatic Converters, which vary output

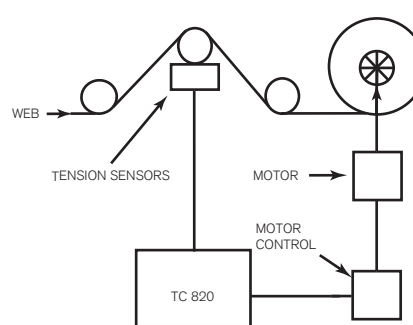
air pressure in direct relation to the variable input signal from the TC 820. This output air pressure can be used to actuate a pneumatic brake, clutch or motor. The 4-20 mA or 0-10 VDC output signal can interface with variable speed motors, controllers, or other elements such as the power supply for electric brakes or clutches.

Applications

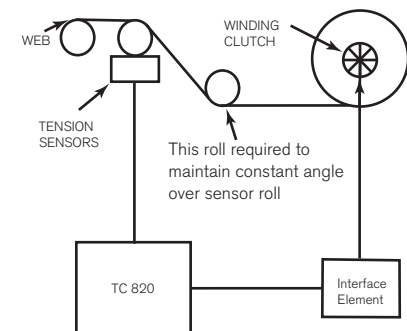
Unwind Control



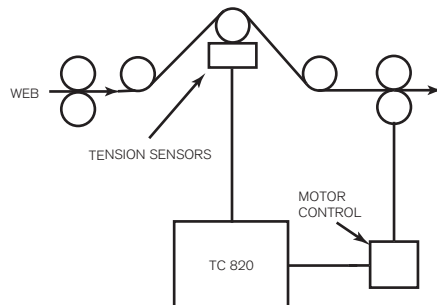
Center Wind Drive Control



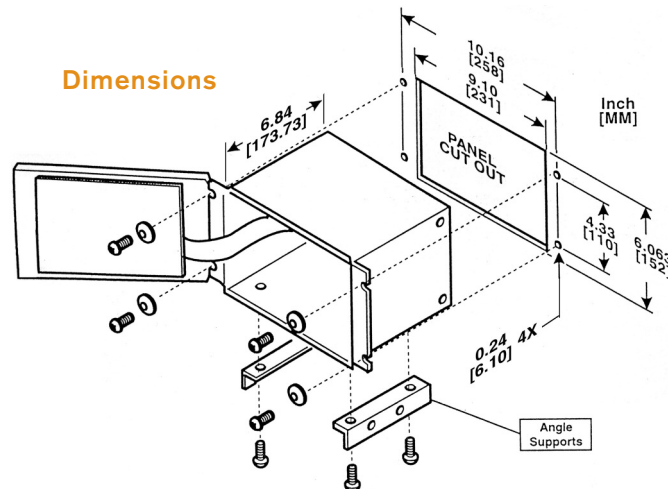
Center Wind Clutch Control



Mid-process Control



Dimensions



Selection Chart

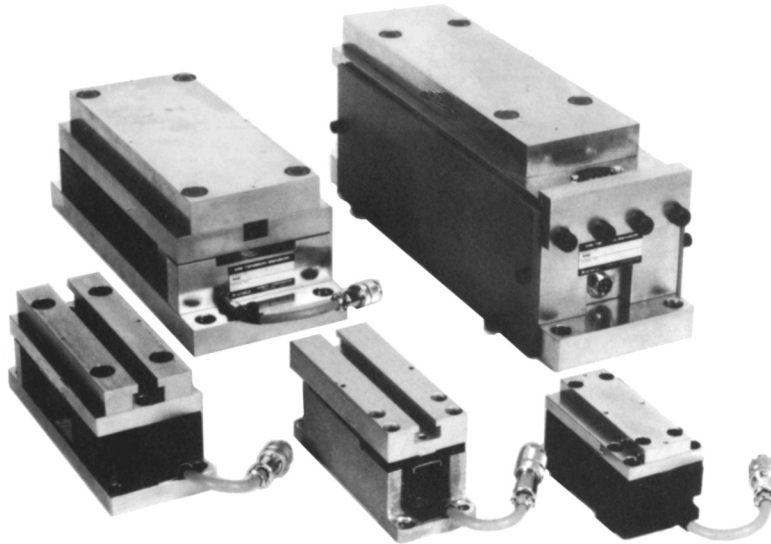
PRODUCT NUMBER	964350
TENSION RANGE SETTINGS	0.5 – 5000 (Pounds, Newtons or Kilograms)
POWER SUPPLY	100-240 V AC, 50/60 Hz
POWER CONSUMPTION	100 VA
AMBIENT TEMPERATURE	32-122° F (0-50° C)
SHIPPING WT.	8.0 lbs. (3,6 kg)
CONTROL OUTPUT	0-10V (<2 mA) 4-20 mA (<500Ω)
PROPORTIONAL TENSION SIGNAL	0-10 VDC 0-1 mA
SYSTEM ACCURACY	Same as sensor accuracy

INPUTS	Sensor Input	MB or SW tension sensors
	External tension setpoint Input*	0 to 10 VDC (input impedance: 200kΩ)
CUSTOMER SUPPLIED INPUTS	Auto trigger	Maintained contact, rated at (30 VDC, <0.2Ω)
	Splicing Contact*	Momentary contact, rated at (30 VDC, <0.2Ω)
OUTPUT	Tension Error Signal*	30V DC 0.2A or 100V AC 0.2A (resistance load)

*Special features not required for typical applications. Use as necessary.

MB SERIES TENSION SENSORS

Precise, accurate measurement of web tension



MB Series Tension Sensors

The MB Series of load cells uses an LVDT type sensor to convert tension into a proportional electrical signal. The LVDT system provides precise, accurate tension measurement while the mechanical design allows for extremely high overloads without damage to the unit.

Features

- Extremely accurate LVDT type sensor
- Mountable at any angle
- Suitable for either symmetrical or asymmetrical web path angles
- Capable of taking extreme overloads without structural damage or loss of calibration
- Simplified mechanical structure
- No calibration or maintenance required

Function

As web tension increases, the resultant force F (see Figure 1) also increases. This causes the load plate to rotate minutely around the pivot point. This pivot point is a torsion bar which resists the force F . Due to leverage advantage, actual sensing roll movement is quite small. Movement of the core in the LVDT is proportionately larger,

LVDT coil, the output of the coil varies directly with the core movement, which varies directly with the force F . The output is thus proportional to F .

The mechanical structure of the torsion bar and the mechanical limit stops on the load plate allow the MB Sensors to survive 100-to-1 overloads without structural failure or variance in calibration.

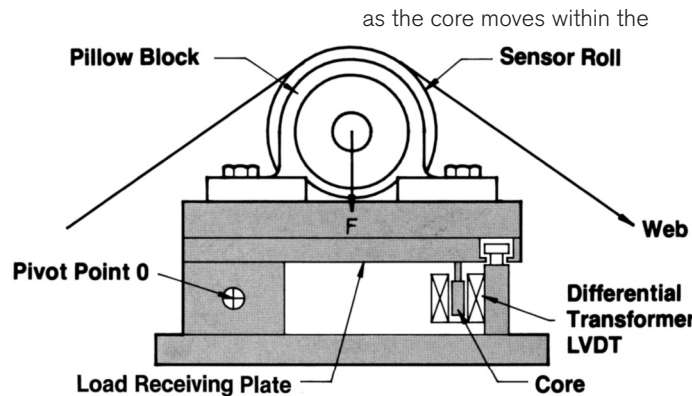
The LVDT housing also contains a high-frequency oscillator circuit which guarantees excellent linearity and a thermal compensating circuit which ensures zero thermal drift when used within the stated temperature range.

Cables

Standard cable (16 ft. [5m]) provided with each sensor. Optional cables listed below, purchased separately.

Part Number	Length
17167	18 in Extension
17168	48 in Extension
2138	16' (5m) Standard
8365	30' (10m)
9428	50' (16m)
9429	75' (25m)
9430	100' (33m)

Figure 1

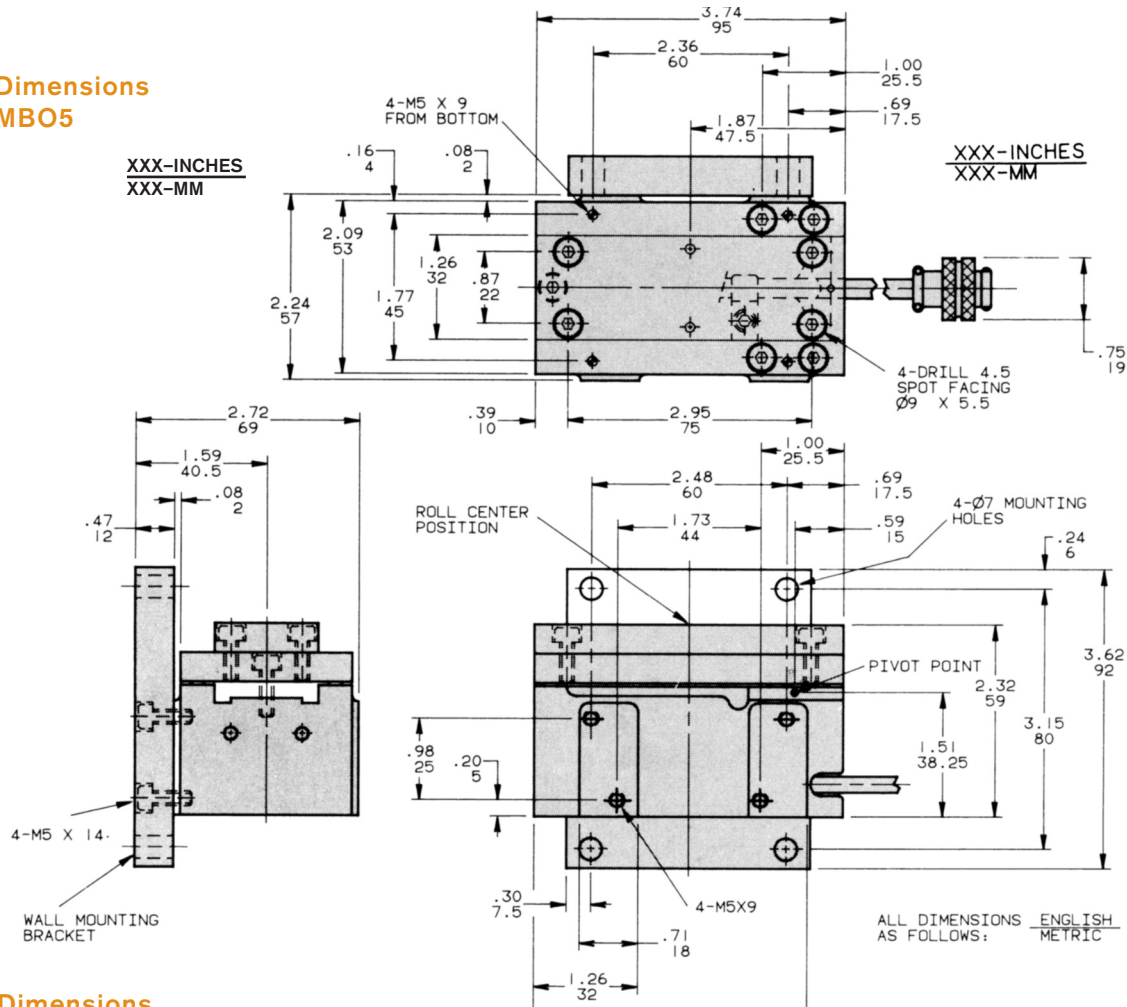


Specifications

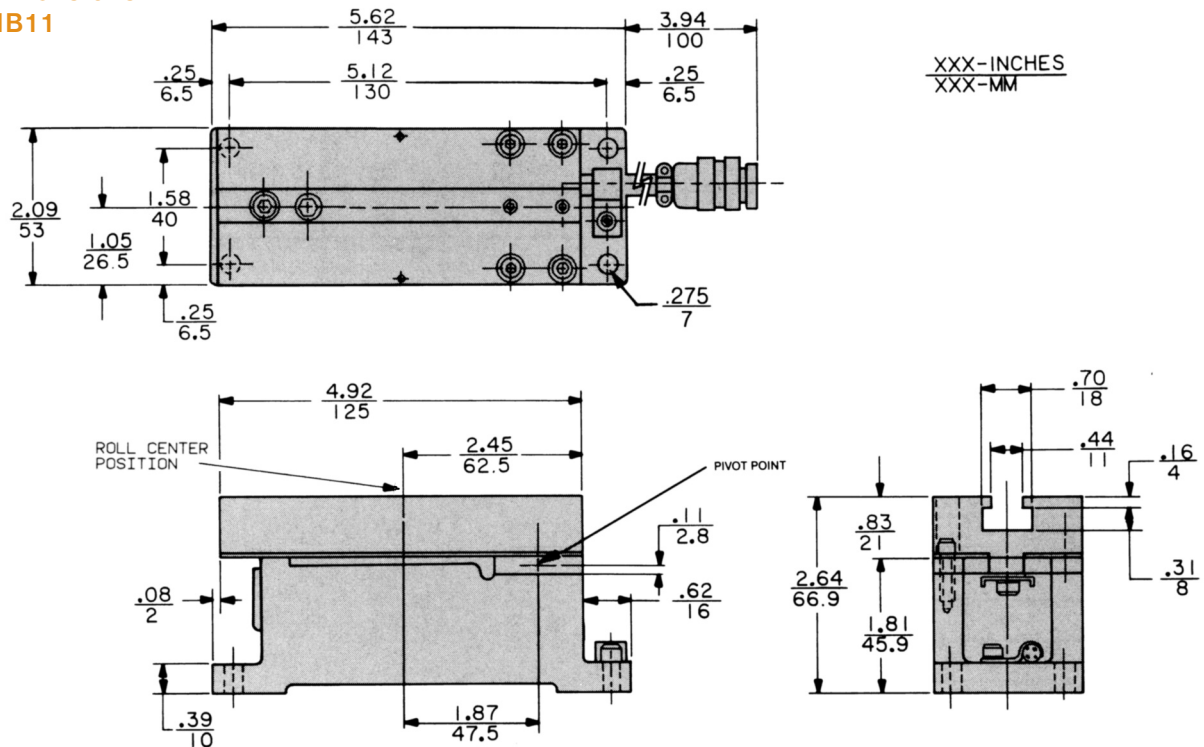
PRODUCT NUMBER	912609	912610	911991	911995	911996	911999	911889	912000	911998
Frame Size	MB05B	MB05A	MB11B	MB11A	MB25B	MB25A	MB33B	MB33A	MB41
Load range per sensor									
LB	22	44	22	44	110	220	660	1100	2200
Kg	10	20	10	20	50	100	300	500	1000
Tare per sensor									
LB	11	22	11	22	55	110	330	385	770
Kg	5	10	5	10	25	50	150	175	350
Accuracy	±1%	±1%	±1%	±1%	±1.5%	±1.5%	±1.75%	±1.75%	±1.75%
WEIGHT lb (Kg)	3.3 (1,5)	3.3 (1,5)	1.8 (0,8)	1.8 (0,8)	7.5 (3,4)	7.5 (3,4)	35 (16)	35 (16)	53 (24)
ELECTRICAL DATA	6 VDC Excitation; 0-400 mV return								
TEMPERATURE RANGE	+14° to +140° F (-10° to +60° C)								

MB SERIES TENSION SENSORS

Dimensions MBO5



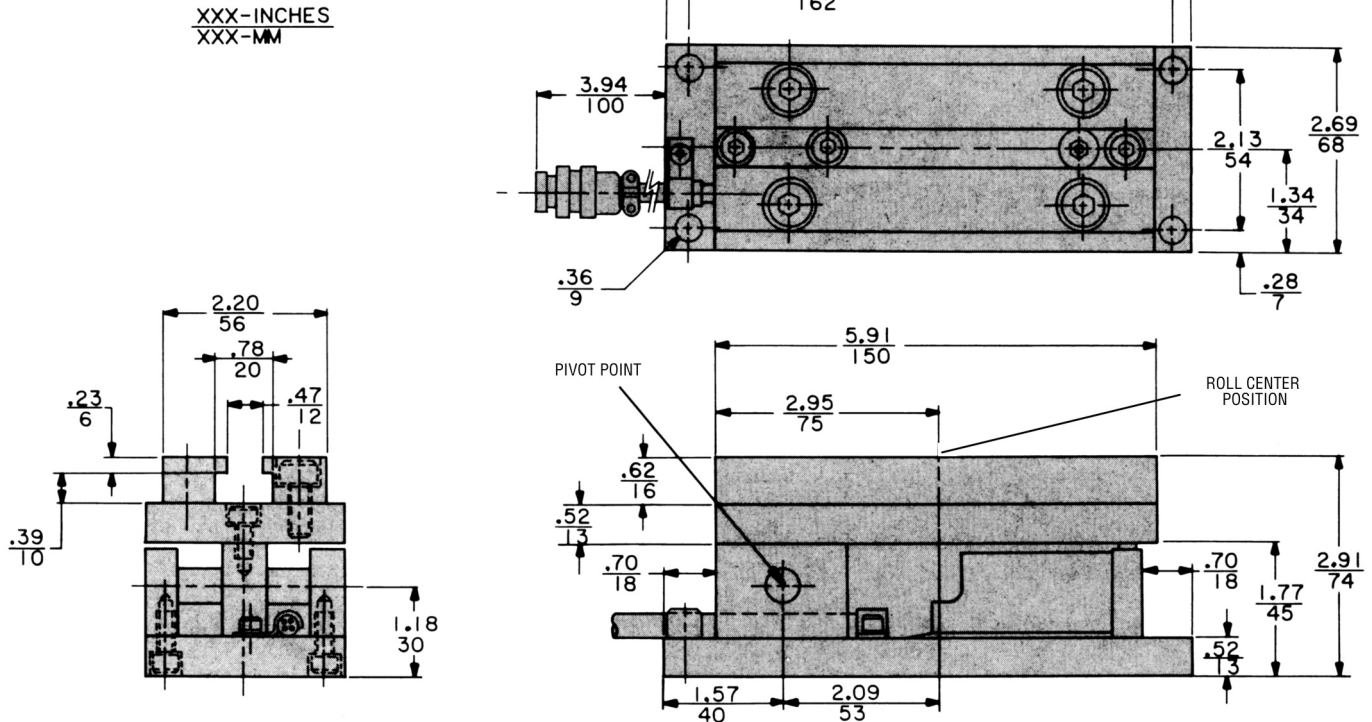
Dimensions MB11



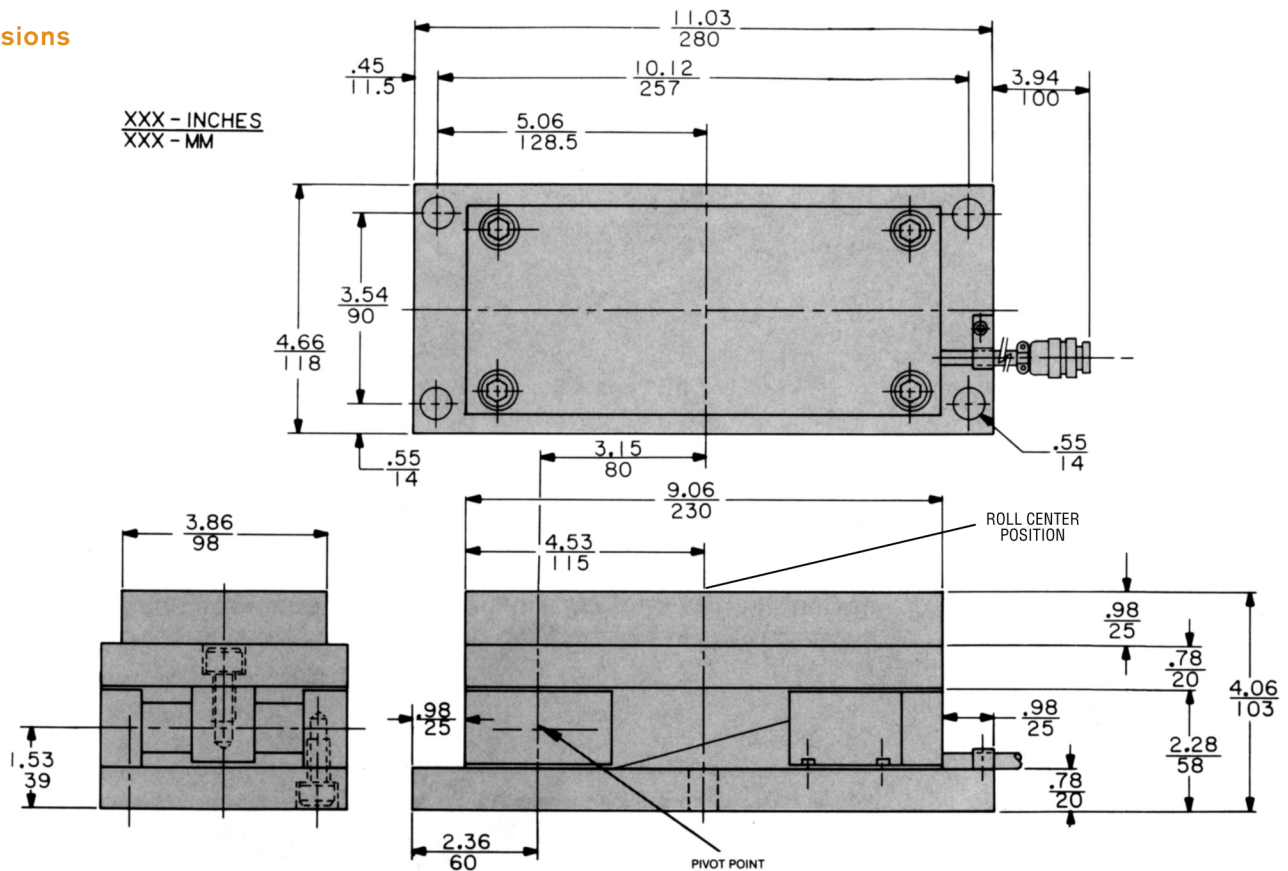
MB SERIES TENSION SENSORS

Precise, accurate measurement of web tension

Dimensions MB25

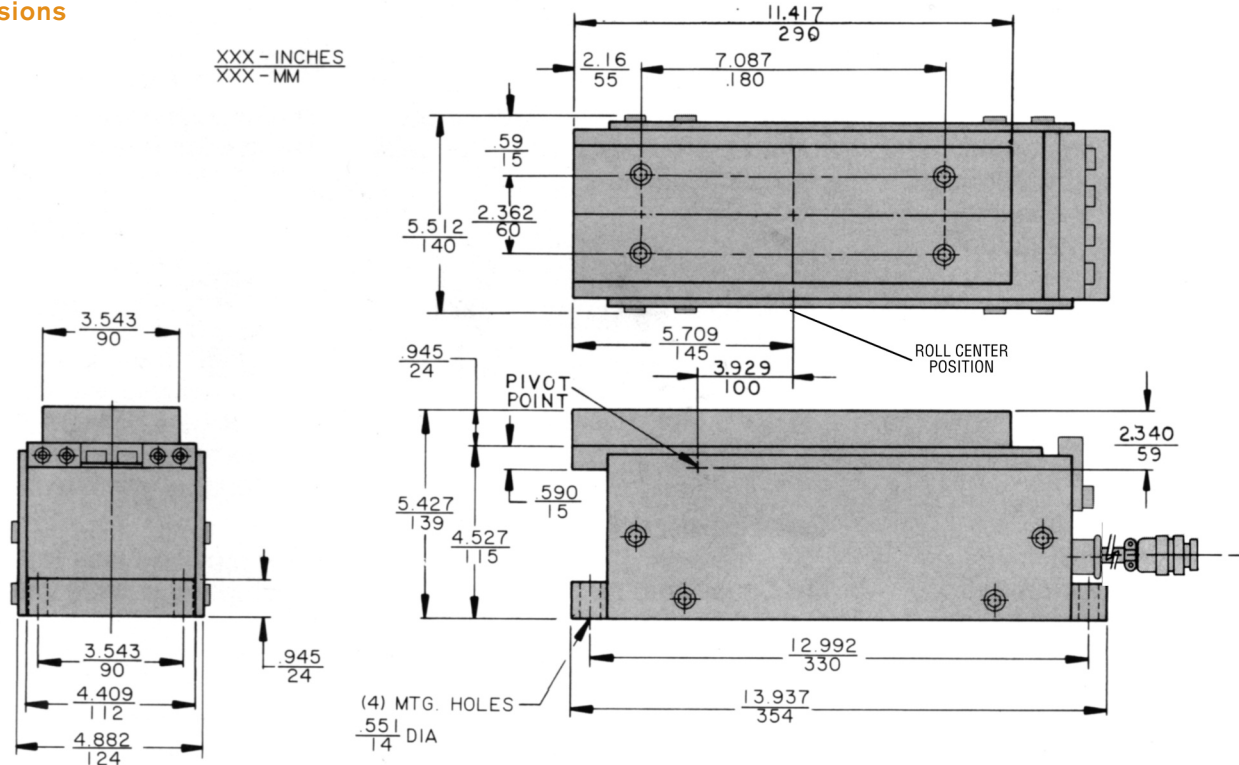


Dimensions MB33



MB SERIES TENSION SENSORS

Dimensions MB41



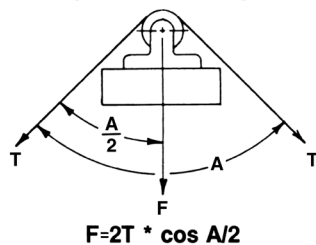
Sizing

Two factors affect Sensor Sizing. The sensor must be able to measure the Force (F) created by the Web Tension (T) wrapping the roll at given angle. The sensor must also support the tare weight of the sensing roll and bearings. These two factors are independent of one another and must be calculated separately.

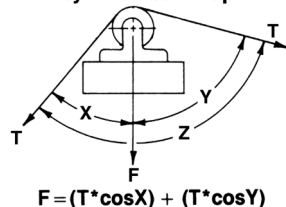
Load range per sensor (see spec. chart next page) is F divided by the number of points supporting the load, i.e. two support points in bilateral, Unilateral or Cantilevered configuration, or one support point in Narrow Web or Wire and Filament configuration. Tare per sensor (see spec. chart next page) is calculated the same way. The tare per sensor is the total weight of the sensor roll and the bearings divided by the number of support points.

Force Calculation

Symmetrical Wrap



Asymmetrical Wrap



Warning

Tare capacity can decrease by up to 50% when sensors are mounted vertically or at an angle (see items B and D under "Sensor Mounting" next page). Reduce tare per sensor rating in spec. chart by 50% or contact the factory.

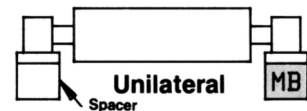
Contact Nexen or your Nexen distributor or representative if you have any question about sensor sizing.

Installation

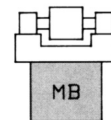
Sensor Configuration



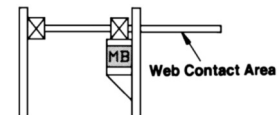
Bilateral - Standard arrangement used on most machines. Sensing tension on both ends provides maximum sensitivity and eliminates sensing errors due to tension variation from edge to edge.



Unilateral - More economical sensing method. Not recommended for webs over 14 inches (355,6mm) wide or on machines where the web is run off center.



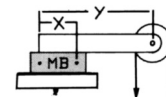
Narrow Web - Useful on narrow web machines. Should not be used where roll face exceeds six inches.



Cantilevered Rolls - MB Sensor mounted on support bracket to machine frame.



Wire or Filament - Similar to narrow web style. For tension in excess of 2 lbs. (0,09 kg).



For tensions less than two pounds multiply the force with leverage. $F = 2T(Y/X)$

MB SERIES TENSION SENSORS

Sensor Mounting

Mounting dimensions for the five frame sizes are given on previous pages. Sensors may be mounted at any angle (see Figures A-D).

All sensors include a 16 ft. (5M) cable which may be extended with 18 AWG 4 conductor shielded cable to as long as 500 ft. (152M). Presized, Extension Cables are also available. (see Page 298).

All sensors must be mounted according to the following guidelines:

1. Flatness must be 0.002" (0.05 mm) over the length of the sensor. This can be achieved by milling of the mounting surface.

NOTE: Any shimming required for sensor roll leveling must be done between sensor and pillow block. Never shim between sensor and sensor mounting surface.

2. Sensor roll span must equal sensor span. This is achieved by securing the sensor to the mounting surface, then the pillow block bearings to the sensors, and finally the bearings to the sensor roll shaft (see Fig. E).

3. When sensors are mounted to a base of material different than that of the sensor roll, i.e. aluminum roll, steel mounting base; secure only one pillow block bearing to the roll shaft. This will allow for different rates of thermal expansion (see Fig. E).

4. Mounting surfaces must be parallel. Self centering pillow block bearings are required to take up any variations in parallelism (see Fig. F).

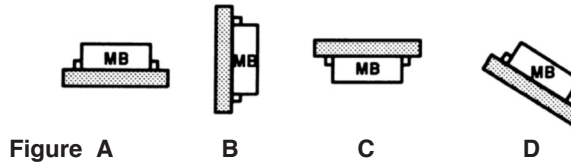


Figure A

B

C

D

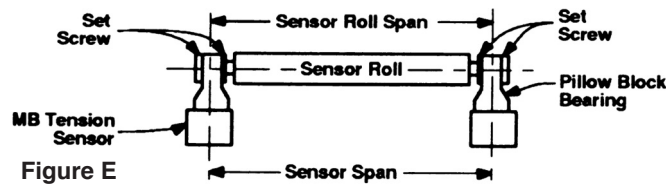


Figure E

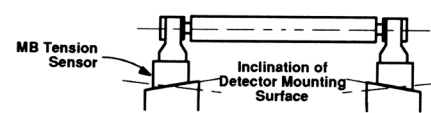


Figure F

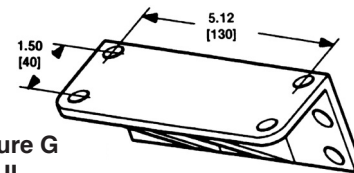


Figure G
MB II

NOTE: Noncompliance with these condi-

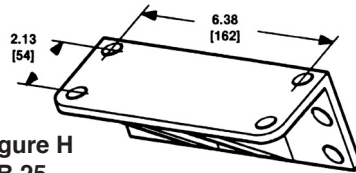


Figure H
MB 25

tions will induce heavy side loads within the sensor. This will cause hysteresis, and the sensor will measure mechanical resistance rather than tension load.

MB 05, MB 11 and MB 25 only

MB05 is normally mounted using the side mounting plate and cap screws provided with the unit.

MB 11 and MB 25 may be mounted on customer supplied wall mounting brackets. (See figures G & H).

All three sizes may be mounted for either normal or reverse web wrap. The tension induced force (F) is calculated the same in both cases and the allowable load range per sensor (see chart page 3) does not change.

MB 33 and MB 41

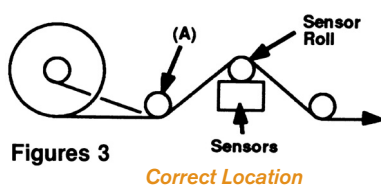
Due to the high forces generated by webs needing MB 33 and 41 load cells, reverse wrap is not recommended.

Due to the high forces generated, side wall mounting is not recommended.

Contact Nexen or your Nexen distributor or representative if you have any question about sensor sizing.

Installation

Sensor Location



Figures 3

Figure (3) illustrates correct sensor location for winding or unwinding control. One transport roll (A) located between the sensors and roll stand serves to fix the web angle over the sensor roll.

Figure (4) illustrates angular changes as the roll changes diameter during processing.

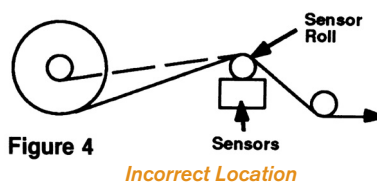


Figure 4

These angular changes will cause incorrect readings from the Tension sensors and must be avoided by use of roll (A) (see Fig. 3).

Figure (5) illustrates a common mistake in sensor mounting. In this configuration, the "S" wrap drive will effectively isolate tension into two zones, T₁ and T₂. A nip roll at the same position would provide the same isolation. The roll stand brake or clutch can only control tension in T₁ zone. Since

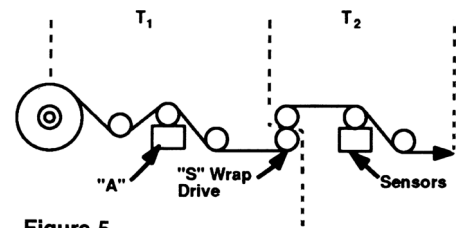


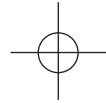
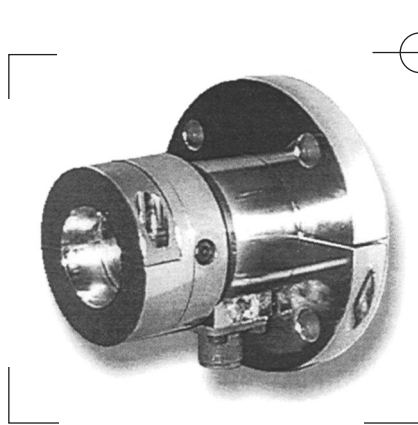
Figure 5

the sensors are mounted in the T₂ zone, they can not sense any tension changes caused by the roll stand and can not be used for closed loop control. The sensors must be moved to position "A" for proper control of the roll stand and T₁ tension.

Contact Nexen or your Nexen distributor or representative if you have any question about sensor sizing.

SIDEWALL MOUNT TENSION SENSOR

Measures web tension in unwind, intermediate and rewind applications



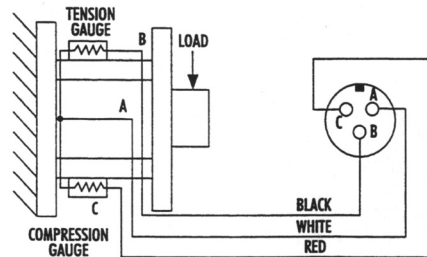
Sidewall mount strain gauges for accurate tension sensing. Nexen's line of sidewall mounting tension sensors measure the web tensions in unwind, intermediate and rewind applications. Use them in applications where sidewall mounting is required in conjunction with Nexen's line of tension controllers.

Features and Benefits

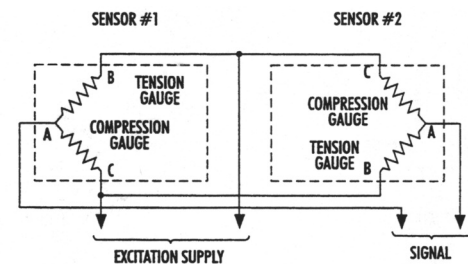
- Accurate tension measurement
—Provides consistent product quality
- Flexible mounting—For easy installation
- Interfaces with Nexen Tension Controls and Meters
—For a quality tension control system

Principle of Operation

Diagram of "Twin Beam" Sensor Gauging and Wiring



Basic Wiring Diagram to Form a Complete Bridge



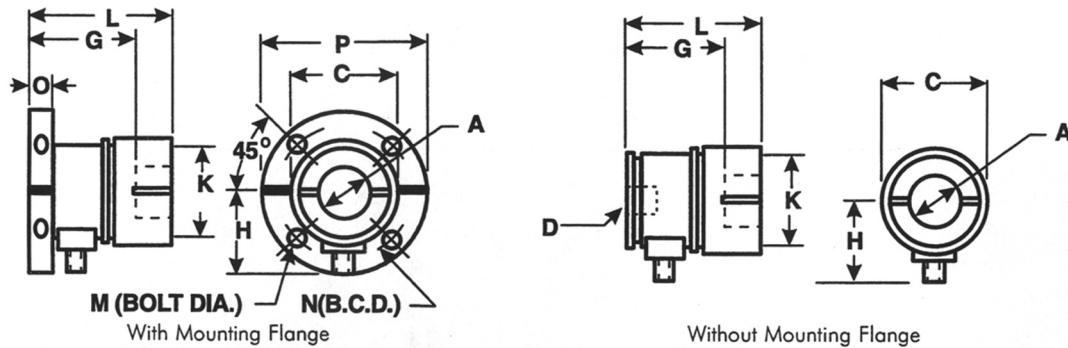
Specifications

Gauge Resistance:	Each sensor contains half a bridge having a nominal resistance of 120 ohms per gauge
Excitation Voltage:	6 VDC or VAC (RMS) maximum
Output Signal at Rated Maximum Force:	250mV nominal per Tension Sensor (1/2 bridge) 500mV nominal per Tension Sensor pair (full bridge)
Operating Temperature Range:	0°F to +200°F (-18° to +93°C)
Sensitivity Change with Temperature:	Less than 0.02%/°F of rated output typical
Humidity:	95% R.H.
Combined Non-linearity and Hysteresis:	±0.5% maximum of rated output
Repeatability:	±0.2% maximum of rated output
Non-destructive Overload Rating:	150% of force
Ultimate Overload Rating:	300% of force typical
"MS" Connectors:	MS-3102A-10SL-3P (3-Pin Connector)
Cable:	16 foot (5 meters) cable included
Input Impedance Required: (Sensor Signal Amplifier if not supplied)	5K ohms per Tension Sensor (1/2 bridge) 10K ohms per pair (full bridge)
Output Impedance:	Approximately 850 ohms per Tension Sensor at 25°C (1/2 bridge) or 1700 ohms per pair (full bridge)
Weight:	3.4 lbs. (1.5 kg) each

All data subject to change without notice.

SIDEWALL MOUNT TENSION SENSOR

Measures web tension in unwind, intermediate and rewind applications



Dimensions

	A	C	D	G	H	K	L	M	N	O	P
WITH FLANGE	1.25 [31,8]	1.95 [49,5]	Not used Not used	2.61 [66,2]	1.77 [45]	2.26 [57,2]	3.18 [80,7]	.4025 [10,3]	3.25 [82,5]	0.59 [14,9]	4.00 101,6
WITHOUT FLANGE	1.25 [31,8]	1.95 [49,5]	1/2-13 x 0.55DP [12,7]-13 x [14]DP	2.45 [62,2]	1.77 [45]	2.26 [57,2]	3.02 [76,7]		Not used Not used		

Notes: • All dimensions shown in inches. [mm] • Allow 2-1/2 inches [63,5] clearance for connector. • Maximum roller shaft length = distance between sidewalls - (2x G)

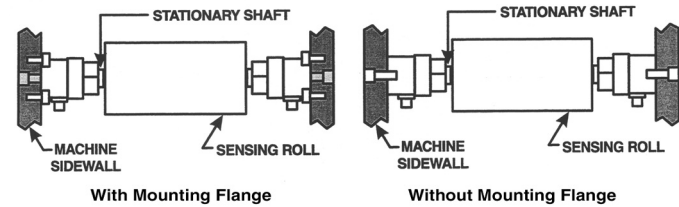
Selection Chart

Sensor			
Force (lbs)	(N)	Product Number	
25	111	803351	
50	222	803352	
75	334	803353	
100	445	803354	
150	667	803355	
200	890	803356	

Cables

Standard Cable			
Provided with each sensor 16 foot [5m]	Product Number		
30518			
Optional Cables			
Length (ft.)	(M)	Product Number	
25	7,6	15596	
30	9,1	15869	
50	15,2	15870	

Installation



Selection of Force Rating

The proper sensor force rating for any application is calculated using known values for maximum web tension, wrap angle and idler roll weight. To calculate the force rating, first select the appropriate wrap configuration, 1, 2 or 3. Then calculate the force using the formula for that wrap configuration.

These formulas allow for a tension transient of 2 times the average tension. Thus, in some cases, it may be appropriate to use a sensor pair with a force rating slightly less than the calculated net force.

In some applications, a transducer roll can be so heavy that its weight takes up the operating range weight of the sensors. If

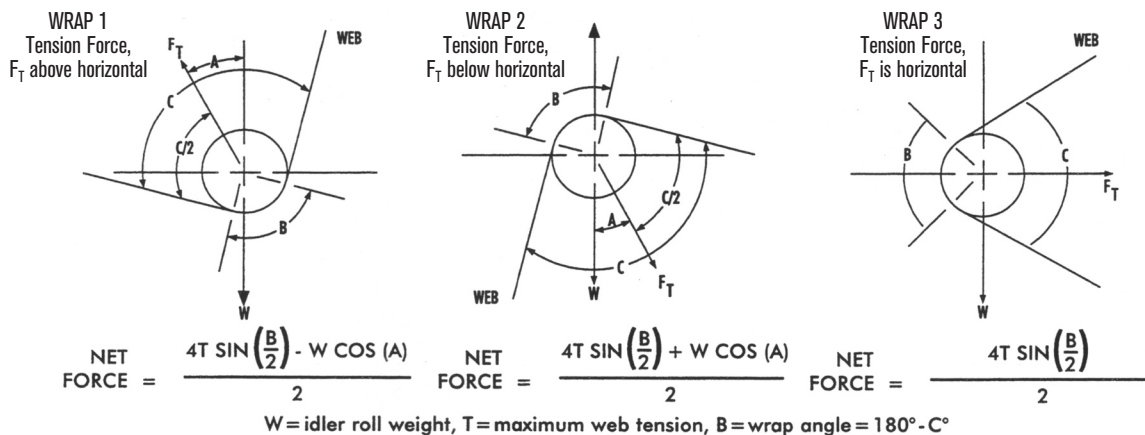
this happens, it may not be possible to zero the tension when the transducer roll is unloaded. This is caused by exceeding the adjustment range of the tension controller or meter.

To determine if your idler roll is too heavy, compare the force rating with the effective weight of the roll using this formula: If $W \cos(A)$ is more than 95%

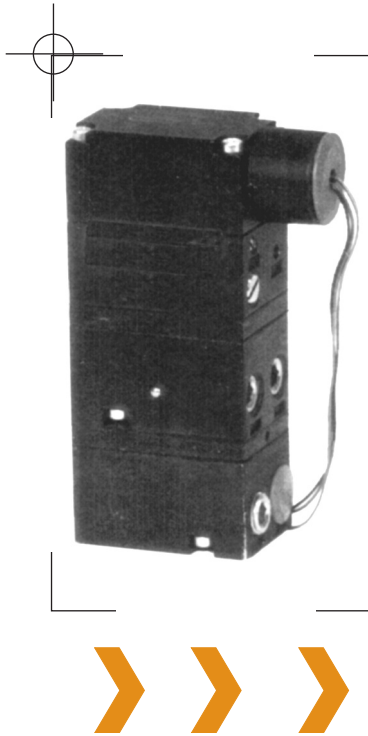
of the force rating selected, the tension meter or controller cannot be adjusted to zero. If this is the case, one or more of these changes must be made to reduce $W \cos(A)$ to less than 95% of the force rating:

- Reduce the sensor roll weight
- Increase angle (A)
- Use the next higher force rating (this is not desirable as sensor signal output is reduced)

Selection of Force Rating



ELECTRO-PNEUMATIC CONVERTERS

Converts an electric current input signal into a pneumatic signal.

EN 50 & EN 40
Dimensions
page 305

EN 50 Electro-Pneumatic Converter

The EN 50 is designed to accept a low power 4-20 mA or 0-10 volt signal, and to convert this signal into a proportional pneumatic pressure.

Standard Features

- High pneumatic pressure output
- Excellent linearity and response
- Temperature compensated
- Compact size
- Simple Installation and Maintenance
- Flexible mounting options
- Field reversible for reverse output operation
- Optional volume booster available for even more flow capacity
- CE marked

Function

The electro-pneumatic converter, Model EN 50, converts a current or voltage signal into a proportional pneumatic output. The typical application is controlling a pneumatic clutch or brake from an electronic controller. Nexen tension controllers, either the open loop or closed loop types, require the EN 50 as an interface to control a pneumatic clutch or brake.

Available in three output ranges

The EN 50 Electro-pneumatic transducer is available in 3 output ranges to match your requirements.

Filtering

Instrument quality air, per ISA Standards D7.3-1981, is required. Use a filter to remove dirt and liquid from the air line ahead of the transducer if necessary. If an air line lubricator is used, it must be located downstream, beyond the transducer.

Product Number	Description
912142	See page 305

Air Volume Booster

For those rare applications where long air lines require extra air volume, a volume booster is available. Order part number 964228.

Model	Product Number	Signal Input	Air Output
EN 50-15	964229	4-20 mA	0-15 psi (0-100 kPa)
EN 50-60	964230	4-20 mA	0-60 psi (0-420 kPa)
EN 50-85	964231	4-20 mA	0-85 psi (0-595 kPa)
EN 50-85V	964232	0-10 volts	0-85 psi (0-595 kPa)



Specifications

FUNCTIONAL

SPECIFICATIONS

	EN 50-15	EN 50-60	EN 50-85	EN 50-85V
Output Range	0-15 psig (0-100 kPa)	0-60 psig (0-420 kPa)	0-85 psig (0-595 kPa)	0-85 psig (0-595 kPa)
Supply Pressure	20-150 psig (140-1050 kPa)	65-150 psig (455-1050 kPa)	90-150 psig (630-1050 kPa) ^①	90-150 psig (630-1050 kPa)
Effects on Output	.5 psig (4 kPa) @ 25 psig (175 kPa)	1.0 psig (7 kPa) @ 25 psig (175 kPa)	1.5 psig (10.5 kPa) @ 25 psig (175 kPa)	1.5 psig (10.5 kPa) @ 25 psig (175 kPa)
Minimum Span	12.5 (84)	25 (175)	50 (350)	50 (350)
Air Consumption (SCFM)	12.0 (0.34m³/Hr)	13.0 (0.36m³/Hr)	6.0 (0.48m³/Hr)	6.0 (0.48m³/Hr)
Flow Rate (SCFM)	11 SCFM (3.19 m³/Hr) @ 150 psig (1050 kPa) and 9 psig (63 kPa) output			
Impedance/Input Signal	250 Ohms	256 Ohms	270 Ohms	893 Ohms

① If the supply pressure is less than the lower pressure, The maximum output pressure is reduced proportionally.

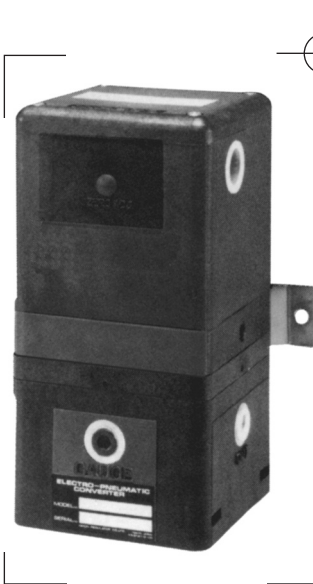
PERFORMANCE

SPECIFICATIONS

	EN 50-15	EN 50-60	EN 50-85	EN 50-85V
Impedance/Input Signal (%FS)	±0.75	±1.0	±1.0	±1.0
Hysteresis and Repeatability	<1.0% FS @ 35 psig supply	<1.0% FS @ 65 psig supply	<1.0% FS @ 125 psig supply	<1.0% FS @ 125 psig supply
Temperature Range	-20° F to +150° F (-30° C to +65° C)			
Materials of Construction	Body and Housing: Aluminum, Orifice: Sapphire, Trim: Stainless Steel, Brass, and Zinc Plated Steel			

ELECTRO-PNEUMATIC CONVERTERS

Converts an electric current input signal into a pneumatic signal.



EN 40 Electro-Pneumatic Converter

The EN 40 is designed to input a DC signal in the ranges of 4-20 mA or 10-50 mA, and to convert this signal into a proportional pneumatic pressure.

Standard Features

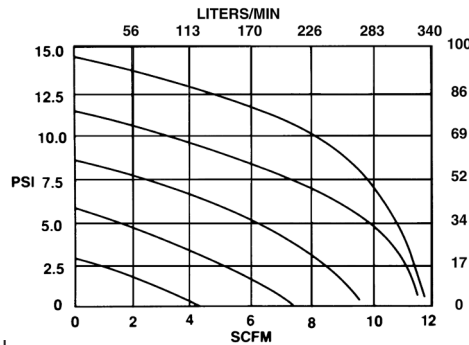
- High pneumatic pressure output
- Excellent linearity and response
- Compact size
- Simple installation and maintenance
- External zero adjustment
- Can be mounted at angles of up to 15°
- Temperature compensated
- Volume booster incorporated
- Can be applied to manifold circuits

Function

The electro-pneumatic converter, Model EN 40, converts a current signal into a proportional pneumatic output. It also incorporates a volume booster to assure the flow rate and pneumatic pressure required by pneumatic equipment for industrial use.

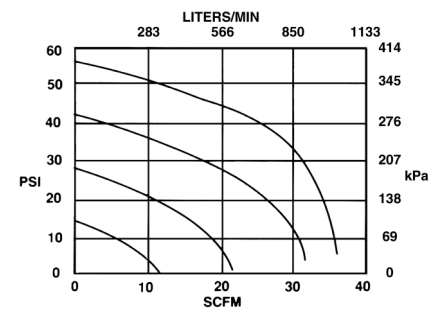
Flow vs. Pressure

EN 40-1D @ 20 psi input-138 kPa



Flow vs. Pressure

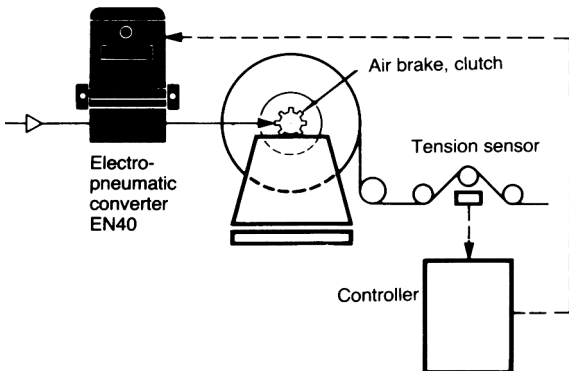
EN 40-1A @ 70 psi input-483 kPa



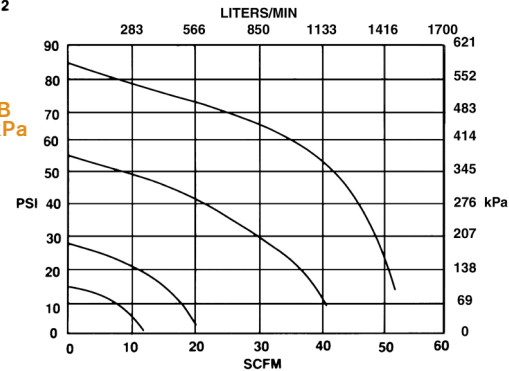
Applications

Tension Control

Model EN 40 is employed in web tension control systems using an air brake or clutch.

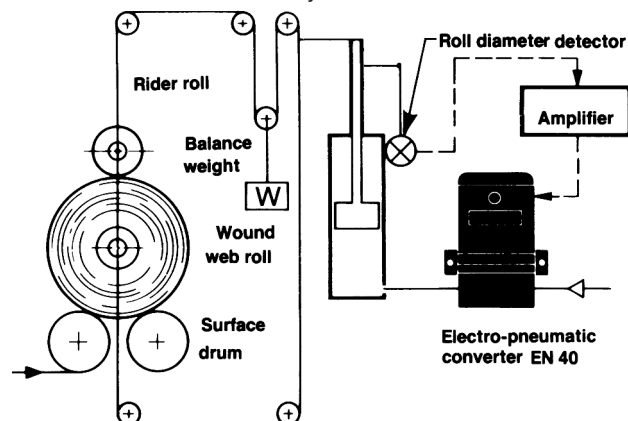


EN 40-1B & EN 40-2B @ 92 psi input-634 kPa



Rider Roll Control

Control roll hardness at the winder by means of a rider roll.



Specifications EN 40

Product No.	Model No.	Current Input	Air Output	Air Input Maximum	Air Consumption
912001	EN 40-1D	4-20 mA	0-15 psi 10-100 kPa	20 psi 138 kPa	.18 SCFM @20 psi 5 kPa
912004	EN 40-2B	10-50 mA	0-85 psi 0-595 kPa	100 psi 690 kPa	.42 SCFM @85 psi 12 kPa
912028	EN 40-1B	4-20 mA	0-85 psi 0-595 kPa	100 psi 690 kPa	.42 SCFM @85 psi 12 kPa
912035	EN 40-1A	4-20 mA	0-57 psi 0-343 kPa	70 psi 483 kPa	.32 SCFM @57 psi 9 kPa

Load Resistance 450 Linearity $\pm 1\%$ Weight 4.4 lbs

Filtration

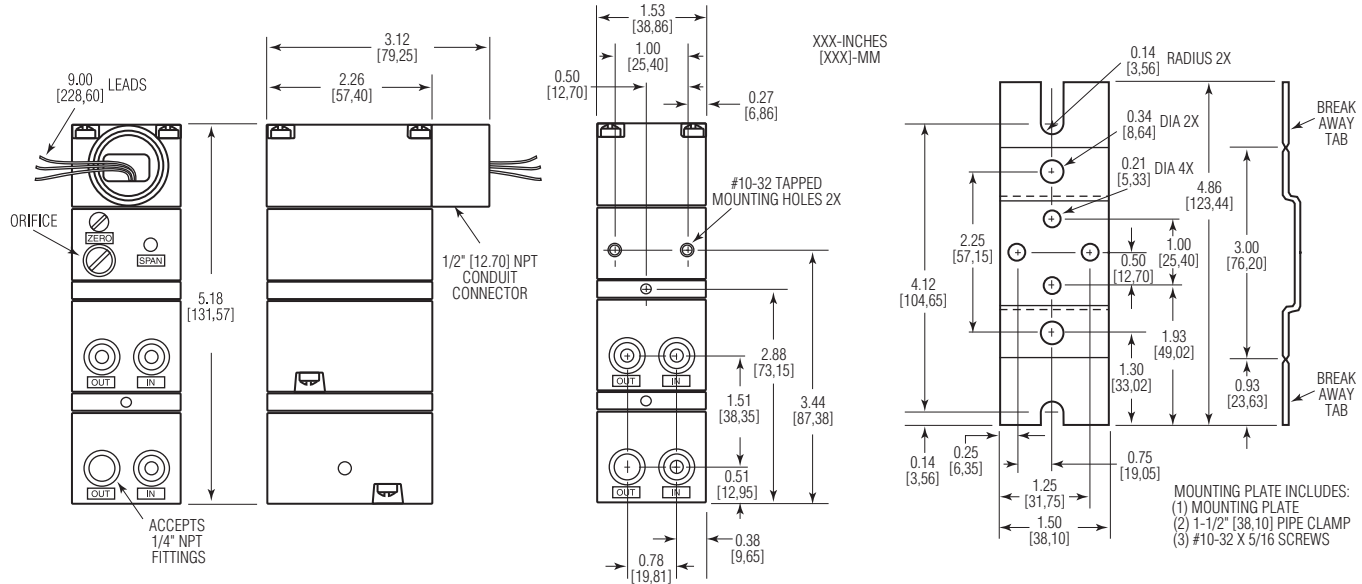
This converter must be used with an air supply filtered to 0.10 micron. We recommend Nexen filters.

Product Number	Description
912142	3 micron prefilter and .1 micron final filter

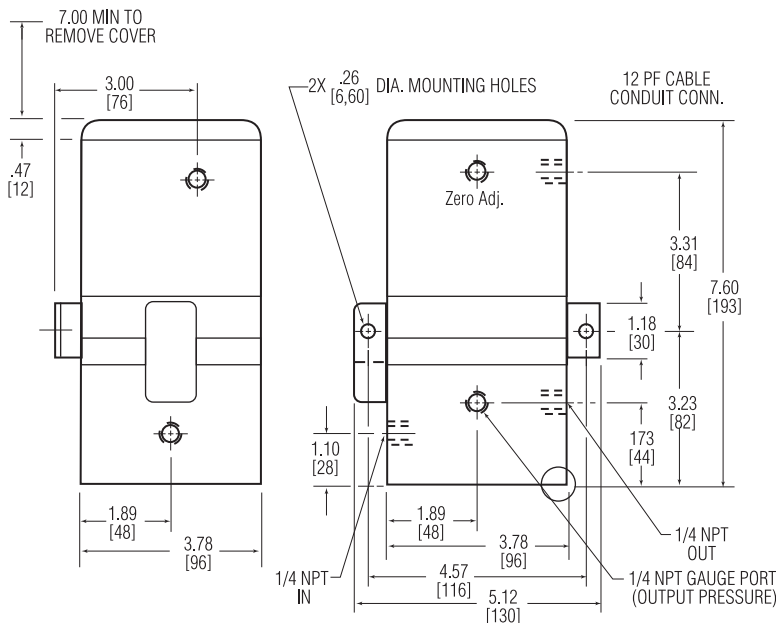
ELECTRO-PNEUMATIC CONVERTERS

Converts an electric current input signal into a pneumatic signal.

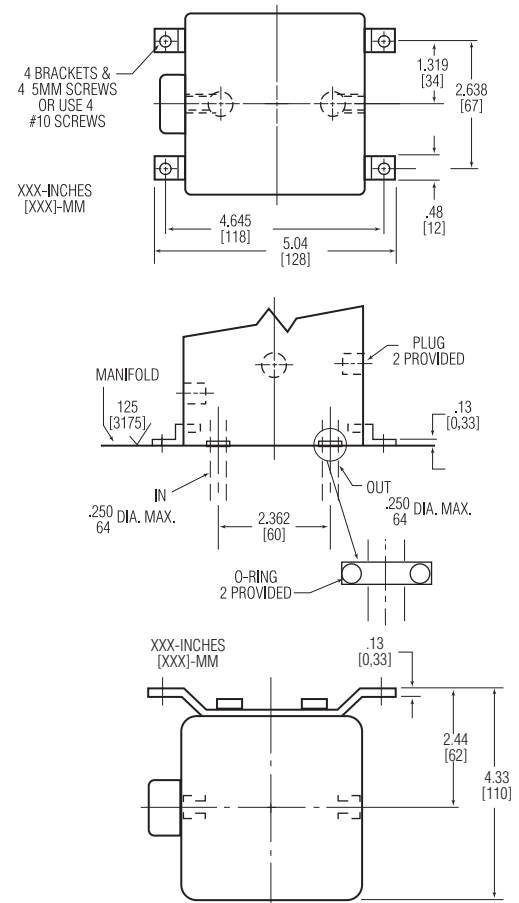
Dimensions EN 50



Dimensions EN 40



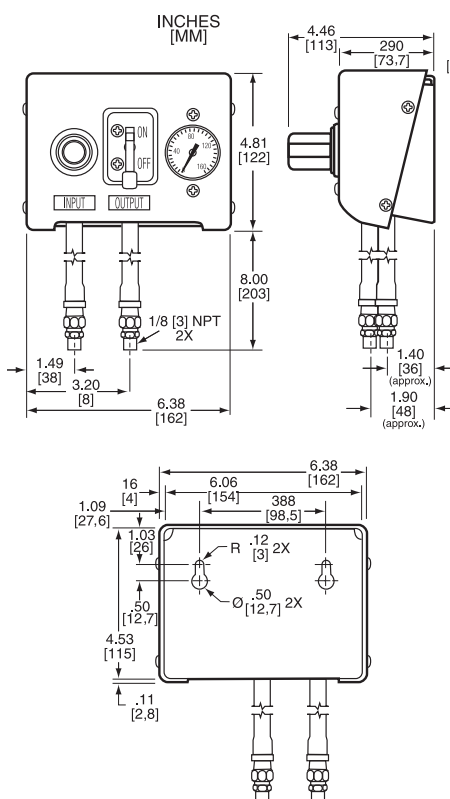
Base Mounting Dimensions



AUXILIARY PNEUMATIC CONTROLS

Single Stage Caliper Control

This simple, easy-to-use control is ideal as a manual brake control. Simply connect inlet and outlet lines and set the regulator to desired starting air pressure. Turn the regulator down as roll diameter decreases to maintain constant tension. Turn the toggle valve on or off to allow airflow to the brake calipers.

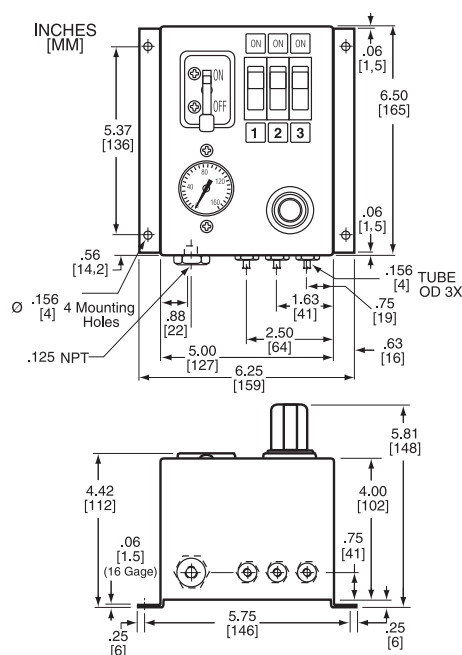


Regulation of air pressure to control brake calipers

- Wall mount
- 5-125 psi (34-862 kPa) range gauge
- 3/32" (4mm) internal flow passages
- 1500 SCFM (42,475 liter/min) flow rate at 100 psi (690 kPa)
- 300 psi (2068 kPa) maximum inlet pressure
- 180° F (82° C) maximum operating temperature
- 1/8 NPT air inlet connection (1)
- On/Off toggle valve control
- Perfect as a manual backup to an automatic tension control system

3-Stage Caliper Control

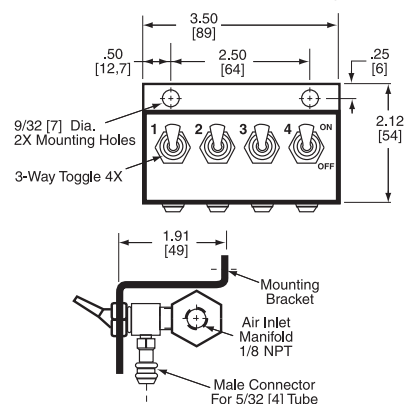
Use this control to direct regulated air pressure to three separate sets of caliper connections. Like the single caliper model, this control has an adjustable regulator, but 3 rocker valves allow you to individually control 3 set of calipers. The sets can be configured as you see fit. You control caliper sets as a single, as a pair, or as a series. This gives you up to 8 different control configurations. This flexibility means you can control lines running delicate tissue or heavy stock without worrying about variations in brake control.



- Wall mount
- 15-125 psi (34-862 kPa) range gauge
- 3/32" (2.38 mm) internal flow passages
- 1500 SCFM (42,475 liter/min) flow rate at 100 psi (690 kPa)
- 300 psi (2068 kPa) maximum inlet pressure
- 180° F (82° C) maximum operating temperature
- 5/32" (4 mm) push-insert output connections (3)
- On/Off toggle valve and 3 rocker control valves
- 8 possible configurations
- Perfect as a manual backup to an automatic tension control system

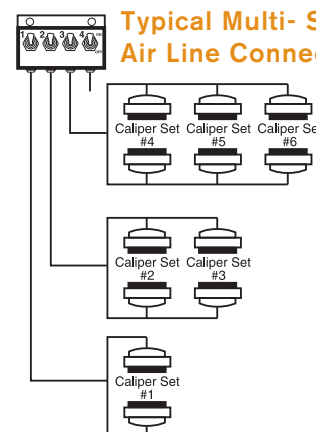
Four Stage Caliper Manifold

This manifold gives you 16 combinations of on/off caliper control. Run pressure-regulated air to the manifold and use the on/off valves to select the correct combination of calipers.



- Mounts directly to guard or wall
- 3/32" (2.38 mm) internal flow passages
- 1500 SCFM (42,475 liter/min) flow rate at 100 psi (690 kPa)
- 300 psi (2068 kPa) maximum inlet pressure
- 180° F (82° C) maximum operating temperature
- 1/8 NPT air inlet connection (1)
- 5/32" (4 mm) push-insert output connections (4)
- 4 on/off toggle valves
- 16 possible configurations (on/off only)

Typical Multi- Stage Air Line Connection



Ordering Information

Model	Product Number	Shipping Wt. Lbs.[kg]
Single Stage Caliper Control	854000	2.5 [1,1]
3-Stage Caliper Control	835120	5.7 [2,6]
Four Stage Caliper Manifold	835134	1.0 [0,45]

TCD600 DIAMETER TENSION CONTROLLER

The central component of a tension control system.



TCD 600 Open Loop Diameter Tension Controller

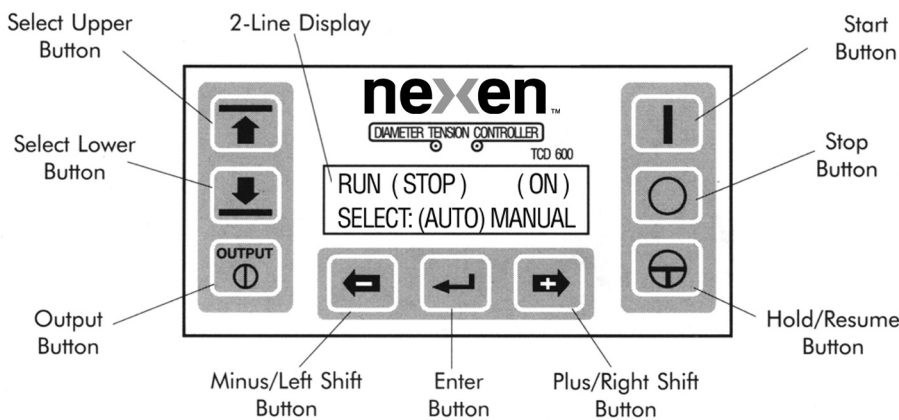
The TCD 600 is the central component of a tension control system that includes controllers, sensors, and a clutch, brake, or drive. The system maintains uniform web tension in an open loop control system for printing or converting web

materials including: paper, film, foil, textiles, non-wovens, metal strip and rubber. The TCD600 provides an easy-to-use operator interface in a non-contact, open loop, tension control system that provides reliable wind and unwind control.

Features and Benefits

- Three measuring systems available:
 1. Ultrasonic Sensor: direct measurement of roll diameter.
 2. Proximity Switch and Optical Encoder: calculates roll diameter.
 3. Proximity Switch only: counts up or down from initial roll diameter.
- Front panel buttons allow operator to change parameter settings of system functions.
- Illuminated two-line display allows easy set-up and continuous operational viewing.
- Automatic or manual mode control.
- Taper tension circuit included for tapered winding.
- 115/230 VAC (50/60Hz) input select switch.
- 0-10 VDC, 4-20 mA outputs for easy interface with the controlled component.
- Automatic control—minimal operator attention.
- Programmable—allows customized operating parameters for up to five jobs in non-volatile memory.
- Can be used with a broad range of web thicknesses.
- Built-in service braking—controls web spillage during deceleration.
- Start Output Control—controls web slack and provides initial tension.
- Flexible installations—Web path alteration not required.
- Sensing elements do not contact the web— helps prevent web surface damage.
- Automatic job recall after power up.
- Press single button to adjust tension set point.

Easy Calibration, Set-up and Operation



Specifications

AC Power	115 VAC/230 VAC, 0.3A/0.6A, 50/60Hz, 1 Phase
Torque Control Output	0-10 VDC @ 10mA, 4-20mA @ 650Ω max.
Diameter Output	0-5 VDC @ 10mA
Alarm Outputs	30 Volts @ 100mA (optically isolated)
Switch Inputs (Start, Stop, Hold)	14 VDC @ 1.5mA (optically isolated)
Ambient Temperature	32°F to 120°F (0°C to 50°C)
Weight	1 pound (1.6kg)

Product List

	Product Number
TCD 600 Controller English/Spanish	912123
TCD 600 Controller English/French	912145
Ultrasonic Sensor	912127
Mounting Bracket for TCD 600	912129
Optical Encoder	912140
Encoder Mounting Bracket	912141
Proximity Switch	912068

TCD 600 DIAMETER TENSION CONTROLLER

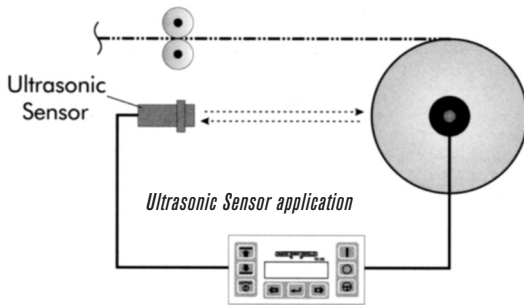
The central component of a tension control system.

How the TCD 600 works.

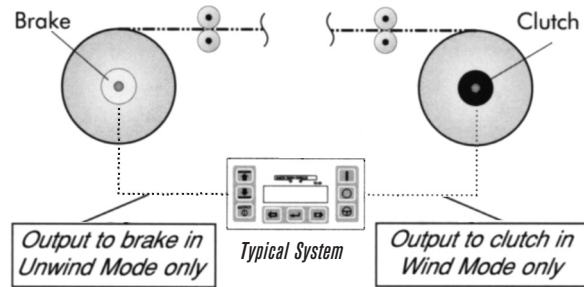
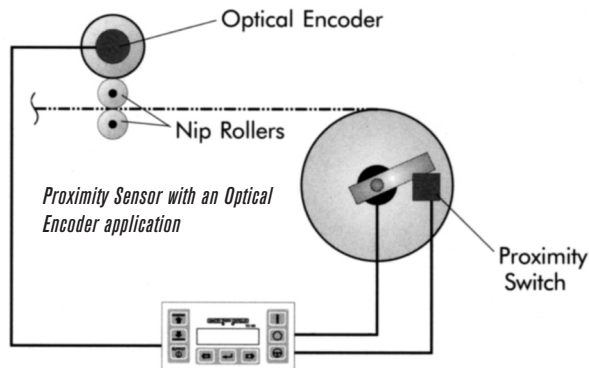
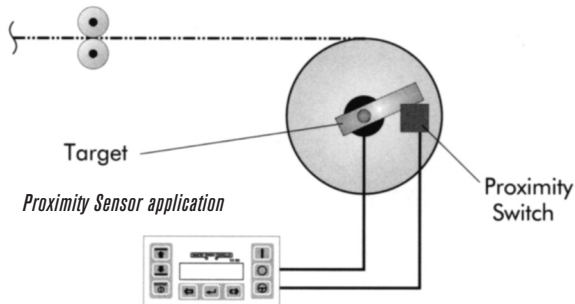
- Maintains constant tension by varying brake or clutch torque proportional to the change in product roll diameter. The setpoint is adjusted for the maximum torque needed at full roll diameter, the TCD600 applies a correction based on its diameter calculation and proportionately increases clutch torque as a wound roll builds up or decreases brake torque as an unwind roll becomes smaller.

Applications

- The TCD 600 determines roll diameter with one of three methods:



1. An ultrasonic sensor measures the distance to the surface of the product roll. A short distance indicates a full roll and a longer measurement indicates a smaller roll.



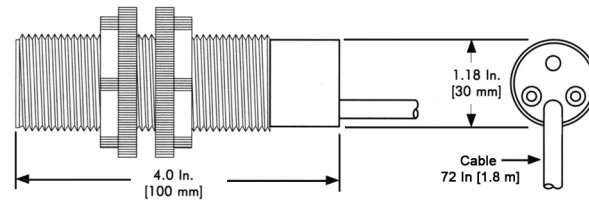
Output to pneumatic clutches and brakes is through an electro pneumatic converter (see pages 305-307). Output to electric clutches and brakes is through an external power supply. Output to a variable speed motor is through the motor control.

Ultrasonic Sensor (912127)

Power Supply: 20-30VDC Reverse Polarity Protected

Input Current: 50mA

Operational Range: Adjustable 4" To 40" [100 TO 1000 mm]



Proximity Switch (912068)

Power Supply: 10-30VDC

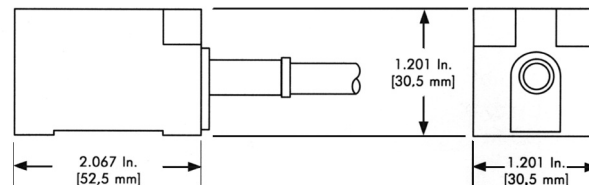
Output: Open Collector

Target: Ferrous Iron

Sensing Distance: <394 in. [10 mm]

Target Size: 1-1/2 x 1-1/2 x .04 in. [40,0 x 40,0 x 1,0 mm]

Cable Length: 80 in. [2 m]



Optical Encoder (912140)

Mounting Bracket (912141)

(Optical Encoder Bracket ordered separately)

Power Voltage:

5-28VDC

Current Draw:

80mA No Output Load

Output Signal:

Open Collector, NPN

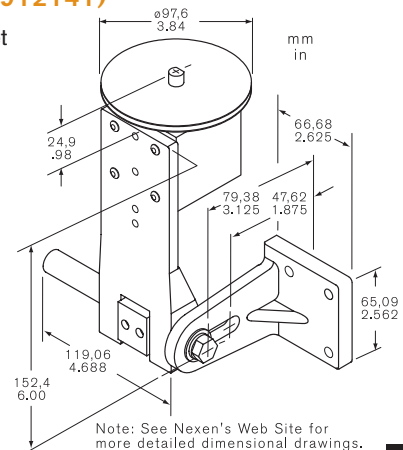
Frequency Response:

20KHz Maximum

(12" circumference wheel provided)

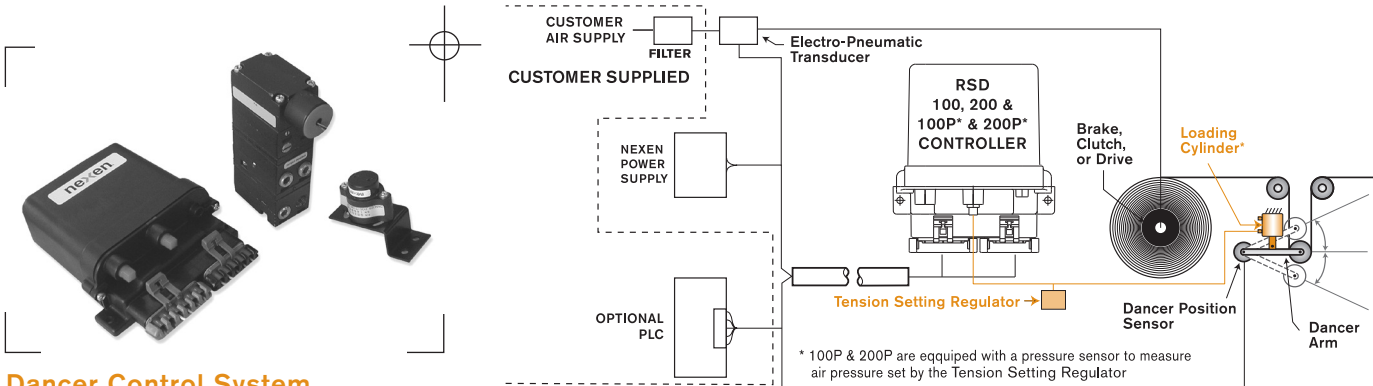
Cable Length:

120 in. [3 m]



RSD DANCER CONTROL SYSTEMS

Advanced Technology for Simple Installation, Precise Control, and No Scheduled Maintenance



Dancer Control System

The dancer arm stores web material in a loop, and maintains constant downstream tension by increasing or decreasing the amount of material in the loop whenever the upstream web tension varies. The dancer arm performs best when it is kept in its mid-range position, where it is always capable of increasing or decreasing the volume of web storage, when reacting to tension changes.

RSD Common Features

All of the controllers are designed to work with the Nexen DPS30 or 60 Hall Effect Sensor to sense dancer arm travel through either 30 or 60 degrees of arm movement.

The controllers can also provide either a 4 – 20 mA or 0-10 VDC control output signal for use with clutches, brakes, or drives.

Each controller is capable of communicating via RS232 that allows commands to be sent and status/data to be received via computer or programmable logic controller.

The RSD system works to maintain constant tension and keep the dancer arm in the center of its travel range. If the dancer arm position changes, Nexen's DPS Dancer Position Sensor, senses the movement and sends a signal to the RSD controller, which provides a corrective signal to the clutch, brake, or drive to increase or decrease web storage and reposition the arm.

Each controller is packaged in a sealed enclosure, operates over a 0 - 60°C [32 - 140°F] temperature range, and is CE and ETL approved.

Communications Software

Set up and calibration of the controllers is performed with the Nexen Communications Software installed on a computer. This Software is Windows 98, and later compatible and can be downloaded from Nexen's website. The software guides you through

Nexen's closed Loop dancer control systems feature the RSD Series of Dancer Controls for consistent web tension that automatically adjusts for changes in roll size and inertia. The four controls in this series are RSD100, RSD100P, RSD200, and RSD200P. The last product in this group is a complete unwind dancer control package for use with pneumatic brakes, the RSD250.

the simple set up steps and even features a diagnostic screen to display, both graphically and digitally, the real time effects of any tuning adjustments.

Once the controller is up and running there should be no need to ever redo the set up. Set it and forget it.

All setup and tuning parameters can be saved to a file and reused to setup an identical machine in the future.

Specifications RSD100, 100P & 200, 200P, Dancer Controllers

POWER SUPPLY		+24 VDC at 500 mA
ISOLATED POWER SUPPLY		15-24 VDC at 150 mA
OPERATING AMBIENT TEMPERATURE		0°C to +60°C [32°F to +140°F]
INPUTS	Digital	12-24 VDC at 24 mA Maximum
	Analog	0-12 VDC at 1 mA Maximum
OUTPUTS	Control (Analog)	0-10 VDC or 4-20 mA
	Position Sensor Excitation Voltage	+12 VDC at 100 mA
ENCLOSURE		Nylon with o-ring seal
CABLE		20 AWG conductors, 2m [78in] long

Model	Product Number
Digital Dancer Controller	RSD100 964520
Digital Dancer Controller	RSD100P 964522
Digital Dancer Controller	RSD200 964531
Mobus RTU	RSD200 964533
Mobus RTU	RSD200P 964536
Digital Dancer Controller	RSD200P 964535
Power Supply	964509
Communications Software	RSD100 964521
Communications Software	RSD200 964527
Dancer Position Sensors	DPS30A 964517
	DPS60A 964518
Roll Diameter Sensor (See page 309)	912127
Electro-Pneumatic Transducer (See page 304)	EN50-85 964231
	EN50-85V 964232
Filter (See page 304)	912142



Conforms to ANSI/UL STD60950
Certified to CAN/CSA-C.22.2 No.60950
+24 VDC, 500 mA max



The Dancer Controller System is CE compliant when used with the following components: RSD100 or RSD100P, RSD200 or RSD200P, EN50. DPS. and Nexen's power supply.

RSD100, 100P, 200 & 200P DANCER CONTROLS

Minimizes dancer arm movement and maintains running position.

RSD100 Specific Features

The RSD100 features automatic control gain adjustment based upon roll diameter change. As the roll diameter changes, the RSD100 can modify its control gains automatically, by observing changes in the output control signal level, or more accurately by using a roll diameter sensor.

The roll diameter sensor is an ultra sonic ranging sensor that senses the distance from the sensor to the surface of the unwind or wind up roll.

The RSD100 uses a PID control algorithm, which is tuned with the Nexen Communications Kit.

RSD100P Specific Features

The RSD100P is an RSD100 equipped with a pressure sensor to sense the air pressure in the dancer arm's loading cylinder. This pressure signal provides the RSD100P with

the ability to adjust control gains automatically as the web tension is changed. This controller is recommended over the RSD100 if web tension is changed more than +/- 20%.

RSD200 Specific Features

The RSD200 features automatic gain adjustment based on changes in roll diameter and inertia. Internally, the RSD200 utilizes a non-linear adaptive algorithm that models an ideal unwind or wind torque control application.

Adjusting tuning parameters allows the RSD200 to adjust that model to fit the actual application. The end result is high performance control without the need for the additional feedback sensors common to many drive systems.

Simplicity is another feature of the RSD200. The basic system only requires a dancer arm position sensor and a machine start/stop signal to deliver high performance.

The adaptive algorithm also provides for Smart Splicing, which allows the RSD200 to accommodate different size rolls during splicing without readjusting settings.

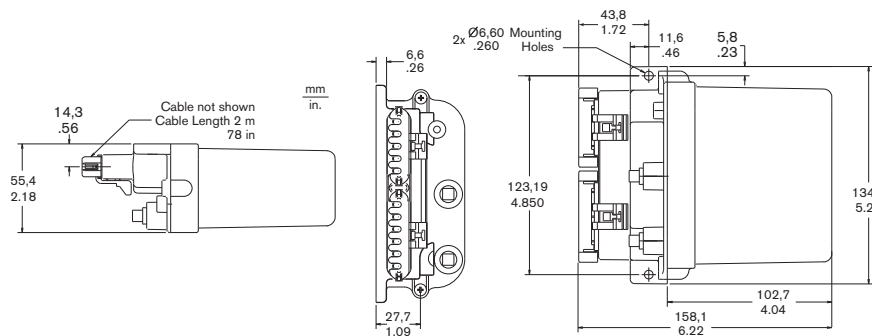
The Super Crawl feature of the RSD200 gives it the ability to maintain stable performance with small roll diameters and slow web speeds.

RSD200P Specific Features

The RSD200P is an RSD200 equipped with a pressure sensor to sense the air pressure in the dancer arm's loading cylinder. This pressure signal provides the RSD200P with the ability to adjust control gains automatically as the web tension is changed. This controller is recommended over the RSD200 if web tension is changed more than +/- 50%.

See next page for RSD250 Unwind Dancer Package Features

RSD100, 100P & RSD200, 200P Approximate Dimensions



Features

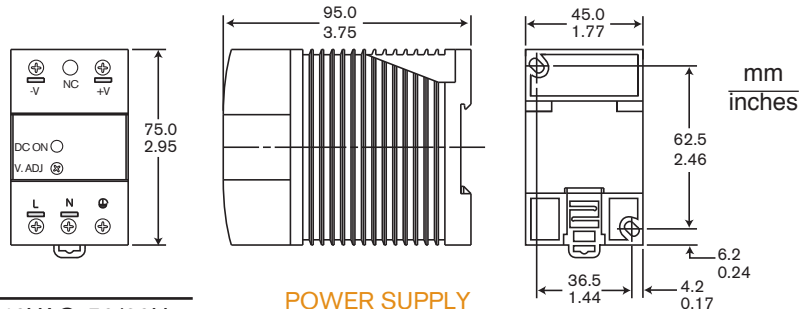
- Control outputs of 4-20 mA and 0-10 V
- 12 VDC reference output for Dancer Arm Position Sensor
- Inertia compensation
- Accommodates Flying Splice Applications
- Operating temperature of 0°-60°C [32°- 140°F]
- PID control algorithm
- Setup parameters adjusted via computer interface - No potentiometers to adjust
- RSD control status available via RS232 communications
- Designed for mounting anywhere on a machine
- Drip proof and dust tight enclosure
- No risk of hazardous voltages with 24 VDC operation
- ETL & CE certified

DANCER CONTROL SYSTEM POWER SUPPLY

Nexen's +24 VDC power supply is compatible with the RSD100, RSD100P, RSD200 and RSD200P Dancer Control Systems



Approximate Dimensions



Specifications

Input	100-240VAC, 50/60Hz
Output	24VDC 0.6A

POWER SUPPLY
P/N: 964509

RSD250 UNWIND DANCER PACKAGE

Includes all the essential components for state-of-the-art dancer arm control.

Unwind Dancer Package



Nexen's RSD250 Unwind Dancer Package includes all the essential components for state-of-the-art dancer arm control. Pre-configured for unwind applications using a pneumatic brake, this closed loop dancer control system features the RSD250 dancer position controller, which automatically adapts to changes in roll size and inertia.

The RSD250 is a modified version of the RSD200. The Communications Kit is not needed for normal operations because calibration and tuning is accomplished with two potentiometers located on the PC

board. For more demanding applications the Communications Kit can be used to configure calibration and tuning parameters for more exacting control.

Each RSD250 Package includes an RSD250 dancer controller, DPS60 dancer arm position sensor, EN50 pressure converter, air supply filter, air line tubing with fittings, and electrical cables with quick connect fittings. This complete package, ideal for paper, film, foil, textiles, rubber, and wire applications, combines high performance with easy installation.

RSD250 Preconfigured System Simplifies Setup and Installation

The RSD250 Package comes preconfigured for unwind pneumatic brake applications, with essential setup parameters set. Installers simply calibrate the dancer arm range and select the start/stopped signal used on the machine. Tuning is also simple with only two potentiometer adjustments. Once tuned and calibrated, it automatically compensates for tension disturbances.

Adaptive Gain Ensures Optimal Tension Control

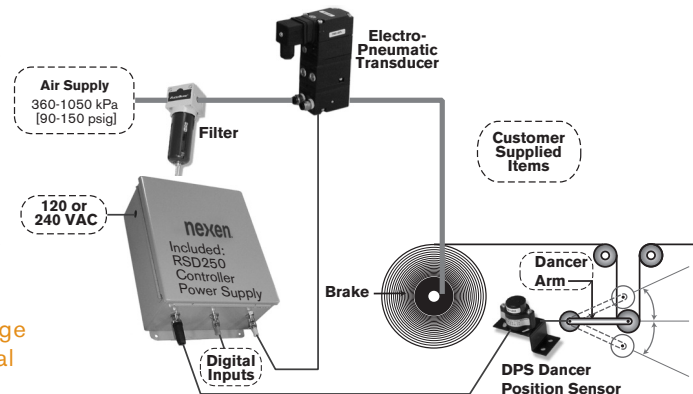
The RSD250 Package features state-of-the-art technology that actually takes into account the changes in both roll diameter and inertia, compensating for these issues before tension disturbances occur. This keeps the dancer arm stable while maintaining constant web tension.

Smart Splicing Reduces Roll Waste

The RSD250 quickly adapts to new rolls without causing tension disturbances, regardless of differences in roll size or speed.

All-Inclusive Package Integrates Individual Components

The RSD250 Package is designed to take care of itself, requiring only dancer arm feedback and a machine start/stop signal to expertly adapt to any tension situation. Electrical connections between each component of the RSD250 system are prewired; pneumatic



Connections feature tool-less quick connect fittings, so making connections is fast and easy with little chance of error.

Additional Features/Benefits

- Simple setup and use
- Adaptive gain control
- Drive-like performance without the cost
- Inertia and diameter based gain compensation
- Super crawl: handles very small rolls and low speeds
- Minimal sensor feedback needed
 - Automatically compensates for roll-diameter changes, egg-shaped rolls, and other tension disturbances
 - Low integration and startup costs
- Only two potentiometer adjustments for tuning
- Connectors provided on external components
- All-in-one filter included

RSD250 Specifications

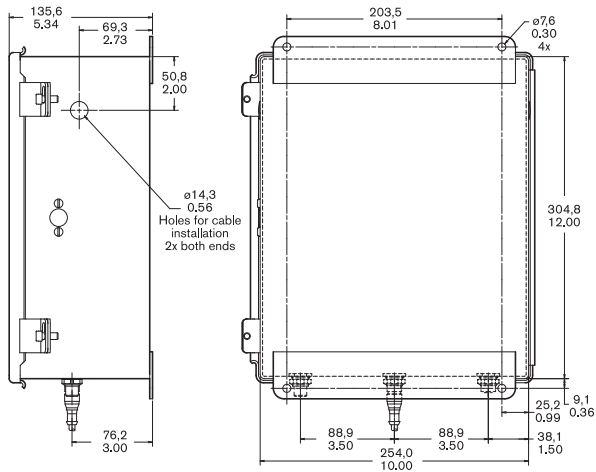
Power Supply	100 – 240 VAC, 12 VA, 50/60 Hz
Ambient Operating Temperature	RSD250 0°C – 60°C [32°F – 140°F] Air Filter 4°C – 50°C [40°F – 120°F]
Air Supply	630 – 1050 kPa [90 – 150 psig]
EN50 & Digital Inputs Cable	6,0 m [236 in] long
DPS60 Cable	4,5 m [180 in] long
Air Line Tubing	6,1 m [240 in] long

Product Numbers

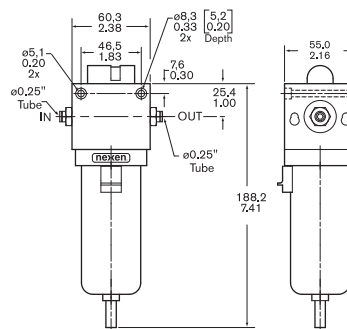
RSD250 Unwind Dancer Package	964260
RSD 200 Communications Software (Optional) (Download from Nexen's website)	964527

RSD250 Unwind Dancer Package Approximate Dimensions

RSD250 Enclosure



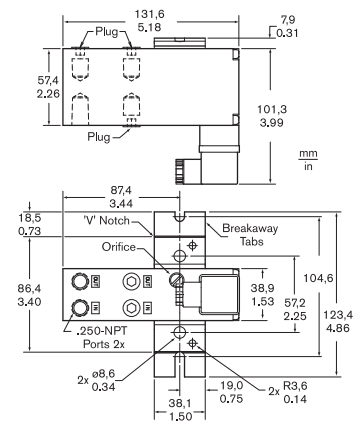
Air Filter



Filter Specifications

Filters: 3 Micron Internal Prefilter and
.1" Micron Outer Coalescing Filter
Temperature Range: 40° F (4° C) to
120° F (50° C)
Maximum Pressure: 150 PSIG (10 BAR)
Flow: 34 SCFM • 80 PSIG Differential
18 SCFM • 20 PSIG Differential

EN50 Electro-Pneumatic Transducer



EN50 Specifications See page 305

RSD100, 100P, 200, 200P & RSD250 Product Compatibility

COMPONENT	SYSTEM TYPE				
	RSD100	RSD100P	RSD200	RSD200P	RSD250
Dancer Position Sensor	N	N	N	N	I
Roll Diameter Sensor	O	O	NN	NN	NN
EN50 Transducer	O	O	O	O	I
Air Filter	O	O	O	O	I
Air Loaded Dancer Arm	NN	N	NN	N	NN
Power Supply	O	O	O	O	I
Communications Kit	N	N	N	N	O

Explanation:

N = Needed Component, NN = Not Needed, I = Included, O = Optional Component; the EN50 and the Filter needed to clean it's air supply are only needed when the RSD system is to be used to control a pneumatic device. The Power supply is only needed when there is not a 24VDC supply available on the machine. The Ultrasonic roll Diameter Sensor is needed for more accurate diameter feedback on the RSD100 and RSD100P controllers.

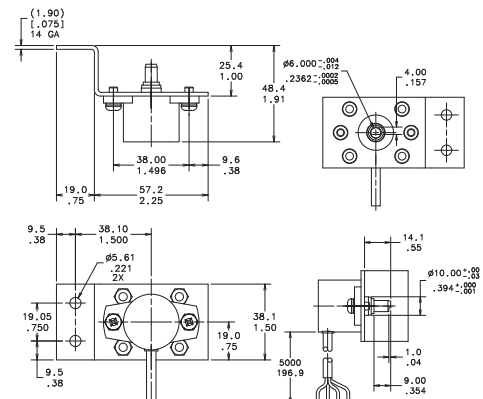
DPS30A AND DPS60A DANCER POSITION SENSOR

Nexen's dancer position sensors are designed to accurately measure the rotational movement of a dancer arm. This family of sensors uses Hall Effect technology for infinite resolution, low drag, and no mechanical wear. The DPS30A and DPS60A offer non-contact operation without the use of potentiometers or gearing. This means smooth operation (low drag), no maintenance, and high accuracy. Its small size makes the DPS easy to install and incorporate into existing systems.

Sensor Specifications

	DPS30A - 964517	DPS60A - 964518
POWER SUPPLY	24 VDC, ± 6 VDC	24 VDC, ± 6 VDC
OUTPUT VOLTAGE	0-10 VDC @ Max angular rotation	0-10 VDC @ Max angular rotation
REVERSE POLARITY PROTECTION	-30 VDC Max	-30 VDC Max
TEMPERATURE	-40°C to +80°C [-40°F to +176°F]	40°C to +80°C [-40°F to +176°F]
ENCLOSURE	IP65	IP65
ACCURACY	$\pm 1^\circ$	$\pm 1^\circ$
ANGULAR ROTATION	$\pm 15^\circ$ Maximum	$\pm 30^\circ$ Maximum

DPS Approximate Dimensions



TA 100/TA 110 TENSION AMPLIFIERS

Superior signal conditioning for web tension sensors.



TA 100/TA 100A and TA 110/TA 110A Tension Amplifiers

These Tension Amplifiers both interface with LVDT tension sensor or strain gauge sensors to measure tension in a continuous web strip or strand of material during converting or printing. The material can be paper, film, foil, rubber, wire, metal strip, non-wovens or textiles used in continuous process.

These amplifiers are ideal when you need low cost, accurate tension measurement of a web process interfaced with machine controls. Applications include input for data loggers, process controllers. Host computers or other applications that require a precise tension interface.

Precision input from either LVDT or strain gauge sensors.

Use either the TA 100 or TA 110 amplifier with any Nexen MB or SW sensors.

They provide an excitation signal to the sensors and then separately amplify the return signals from each sensor. The signals from both sensors are then added to provide the 0-10 VDC or 4-20mA proportional tension output.

Choose chassis-mount model for concealed OEM installations.

The chassis-mount style of the TA 110 makes it ideal for installations in cabinets or enclosures.

Choose fully enclosed model for easy retrofit.

The TA 100 comes complete with a NEMA-12 enclosure, making is a good choice when adding on to an existing tension control drive or other retrofit installation.



Features and benefits

- Low cost signal conditioning for LVDT or strain gauge tension sensors—easy to cost justify
- Wide tension range—flexible installation
- Chassis or enclosed versions—for easy, flexible installation
- Ideal for use with PLC's motor controllers or data logging systems where local readout is not required—saves cost
- Both 0-10 VDC and 4-20 mA outputs—easy to interface
- NEMA-12 enclosure (TA 100 & TA 100A)
- Pre-wired 8 ft. [2.4 m] Power cord included with TA100
- UL and UL_C Listed, Enclosed models only

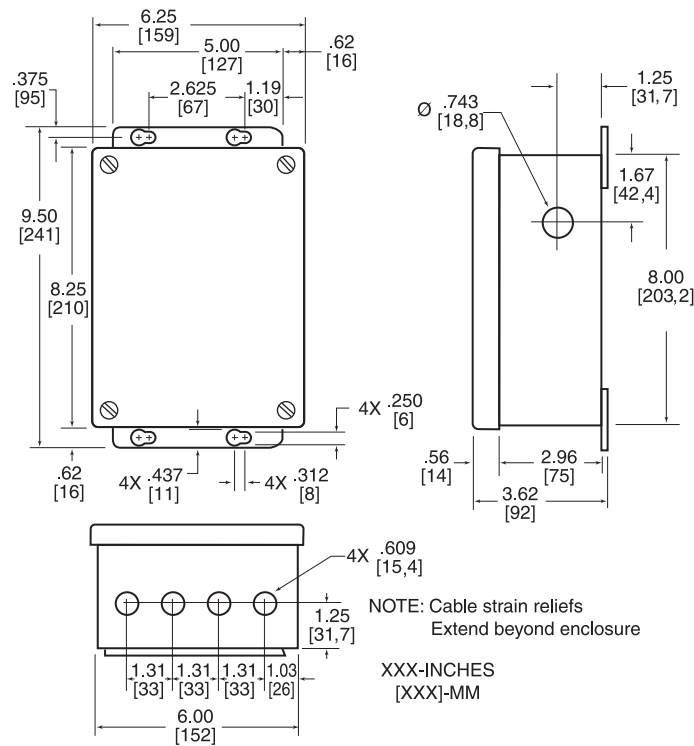
Specifications

Model	TA 100 - 110 VAC, Enclosed	Product Number	964400
Model	TA 100A - 24 VDC, Enclosed	Product Number	964411
Model	TA 110 - 110 VAC, Chassis	Product Number	964401
Model	TA 110A - 24 VDC, Chassis	Product Number	964412
Input power	24 VDC or 110 VAC, 50/60 Hz, 1 Phase, Prewired 8 ft. [2.4 m] power cord for 110 VAC (fused)		
UL and ULC Listed	Enclosed models only		
Sensor compatibility	Any Nexen MB or SW sensors		
Outputs	0-10 VDC, 4-20 mA		
Operating temperature	50°F to 120°F (10°C to 50°C)		
Operating humidity	10% to 90% relative non-condensing		
Storage temperature	-30°F to 150°F (-35°C to 65°C)		
Storage humidity	10% to 90% relative non-condensing		

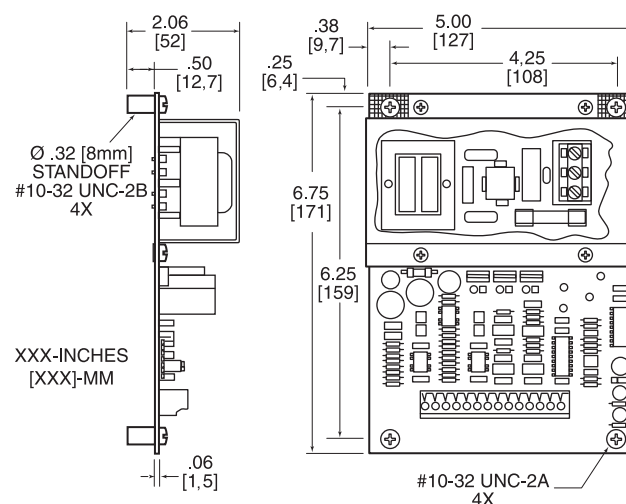
TA 100/TA 110 TENSION AMPLIFIERS

Superior signal conditioning for web tension sensors.

Dimensions TA 100/TA 100A



Dimensions TA 110/TA 110A



SIGNAL CONDITIONER – SC100

Use with indicators, PLCs, PCs, or web controls

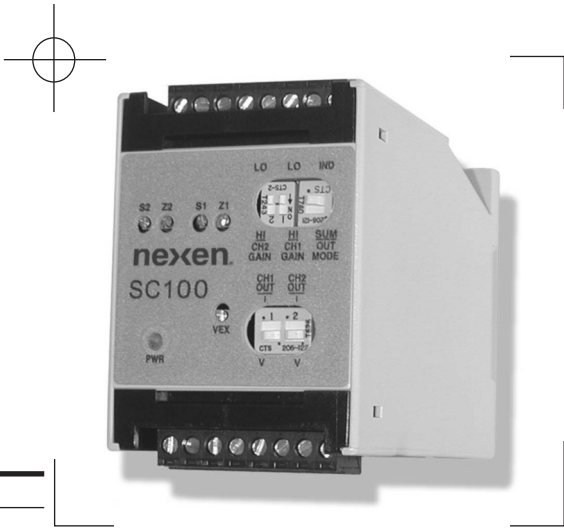
Signal Conditioner–SC100

Nexen's SC100 signal conditioner provides excitation and signal processing to amplify low voltage sensor signals. Signals are amplified to industry standard voltage/current levels and outputs are suitable for use with indicators, PLCs, PCs, and web controls.

The SC line offers two sensor channels and supports two different sensor families: differential signal sensors and single-ended signal sensors. Differential sensors such as strain gauge load cells are used to measure force or tension. Single-ended sensors such as LVDT load cells and web guide sensors are used to measure force, tension or we edge position. Operators can optimize signal conditioner outputs using either the summation of both sensor channels or each channel individually.

Specifications

Model	SC100
Product Number	964420
Power Supply	+24 VDC at 500mA
Isolated Power Supply (Optional)	+24 VDC at 500mA
Analog Inputs	Individual: 0-1 V Max Summed: 0-500 mV Max
Operating Ambient Temperature	0° C [32° F] to 60° C [140° F]
Outputs	Control (Analog) 0-10 VDC Control (Analog) 4-20 mA Sensor Excitation Voltage ± 5 to ± 15 V Adjustable
Enclosure	Polycarbonate, UL94
Din Rail	35 mm



TM 210 TENSION METER

TM 210 Tension Meter

The Nexen TM 210 Tension Meter is ideal for precise, accurate measurement, with digital readout of a tension within a web.

The digital readout can be field adjusted for a maximum reading anywhere from 9 to 1999 pounds or kilograms. The readout is displayed as a four digit number with a decimal point for all ranges up to 100 lb/Kg. Beyond the 100 lb/Kg range, the decimal is deleted as irrelevant.

The TM 210 also provides a 0 - 10VDC analog output signal that is proportional across the full scale tension range. Choose a filtered or unfiltered output signal.

The TM 210 is useful as a tension readout-only device to measure mid-process tension. Its 0 to 10VDC analog output is ideal as a proportional tension data signal to process controllers, data loggers and sophisticated variable speed motor controls.

Features

- Use one or two LVDT type Tension Sensors
- Digital readout
- Panel mount
- Selectable readout of Sensor #1, Sensor #2 or total web tension
- 0 to 10VDC filtered or unfiltered control output, proportional from zero to full scale
- Calibrate digital scale to read out maximum reading anywhere in the 9-1999 range
- Front panel access to calibration controls

How the system works

Use the TM 210 with a pair of MB Tension Sensors to precisely measure web tensions. Use one of the sensors for narrow webs, single strands of wire, or any other narrow material where tension will not vary from one side to another.

The TM 210 provides an excitation signal to the MB Tension Sensors and separately

amplifies the return signals from each sensor. The signals from both sensors are then added to provide the 0 to 10VDC control output.

Use the selector switch on the front panel to display the tension measurement from either sensor or the sum of both sensors.

Specifications

Product Number	912675
Digital Display	0000 to 1999 (pounds or kilograms)
Decimal Point	Used in ranges up to 100 (lb/Kg). Not used in higher ranges
Analog Output	0-10 VDC (5mA) proportional from 0 to full scale tension
Ambient Temperatures	32 to 122°F (0 to 50°C)
Power Supply	100, 110, 200, 220 VAC, 50/60 Hz
Weight	3.5 lb (1.6 Kg)



Dimensions

