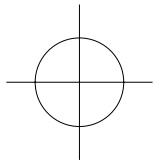


WEB CONTROL PRODUCTS

User Manual



Tension Controller

Models TC240, TC440, and TC640



MAGZA
DIST. AUTORIZADO

MEX (55) 53 63 23 31 MTY (81) 83 54 10 18
QRO (442) 1 95 72 60 ventas@industrialmagza.com

In accordance with Nexen's established policy of constant product improvement, the specifications contained in this manual are subject to change without notice. Technical data listed in this manual are based on the latest information available at the time of printing and are also subject to change without notice.

Technical Support:
800-843-7445
(651) 484-5900

www.nexengroup.com



WARNING

Read this manual carefully before installation and operation.

Follow Nexen's instructions and integrate this unit into your system with care.

This unit should be installed, operated and maintained by qualified personnel **ONLY**.

Improper installation can damage your system or cause injury or death.

Comply with all applicable codes.

Nexen Group, Inc.
560 Oak Grove Parkway
Vadnais Heights, Minnesota 55127



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INTRODUCTION

Read this manual carefully, making full use of its explanations and instructions. The “Know How” of safe, continuous, trouble-free operation depends on the degree of your understanding of the system and your willingness to keep all components in proper operating condition. Pay particular attention to all NOTES, CAUTIONS, and WARNINGS to avoid the risk of personal injury or property damage. It is important to understand that these NOTES, CAUTIONS, and WARNINGS are not exhaustive. Nexen cannot possibly know or evaluate all conceivable methods in which service may be performed, or the possible hazardous consequences of each method. Accordingly, anyone who uses a procedure that is not recommended by Nexen must first satisfy themselves that neither their safety or the safety of the product will be jeopardized by the service method selected.

THEORY OF OPERATION

Tension Controllers receive an input signal from each tension sensor and compare it with a desired or set tension level. The difference between the sensed and set signals is called deviation. Tension Controllers reduce the deviation to zero by increasing or decreasing their output signal.

The sensed input signal is generated by two Nexen MB Tension Sensors. Sensing narrow webs or wire may be done interface with one Nexen Tension Sensor. Two MB Tension Sensors are normally used to provide sensing at both ends of a sensor roll, eliminating any error caused by a difference in tension from one side of the web to the other.

The output signal of the tension control depends on the model number. The TC240 has a 4-20mA output. This signal is used with the Nexen Electro-Pneumatic Converter. It varies output air pressure in direct relation to the variable input signal from the TC240. This output air pressure can be used to actuate a pneumatic clutch, brake, or motor.

TC440 provides a 0-8VDC output signal to interface with variable speed motors.

The output signal from the TC640 is 24VDC (0-6A). This signal is compatible with 24V electromagnetic clutches and brakes.



OPERATION

The signal adder section receives the input signal from each MB Tension Sensor. These signals are 0-400 mV. Each signal is amplified and the amplified signals are added. The added signal (0-10VDC) is displayed at the Tension Indicator on the front panel of the Tension Controller as a total tension reading. The tension being sensed by either MB Tension Sensor may also be displayed on this Tension Indicator by using the Selector Switch located inside the Tension Controller door.

The added signal is then compared to the target value, which is set with the Set Point pot on the front panel of the Tension Controller. Any difference (deviation) between the added signal and Set Point is transmitted to the PI calculator section.

The PI Control section performs P (Proportional), I (integral), and exponential calculations based on the deviation signal. The integral and exponential calculations are essential to the stability of the system. Proportional and exponential calculations ensure quick response. The output signal from the PI section is 0-6VDC. This signal is fed to the output amplifier section.

The output amplifier receives the signal from the PI section and amplifies it to the correct output signal level. This output level is displayed on the Output Meter located on the front panel.

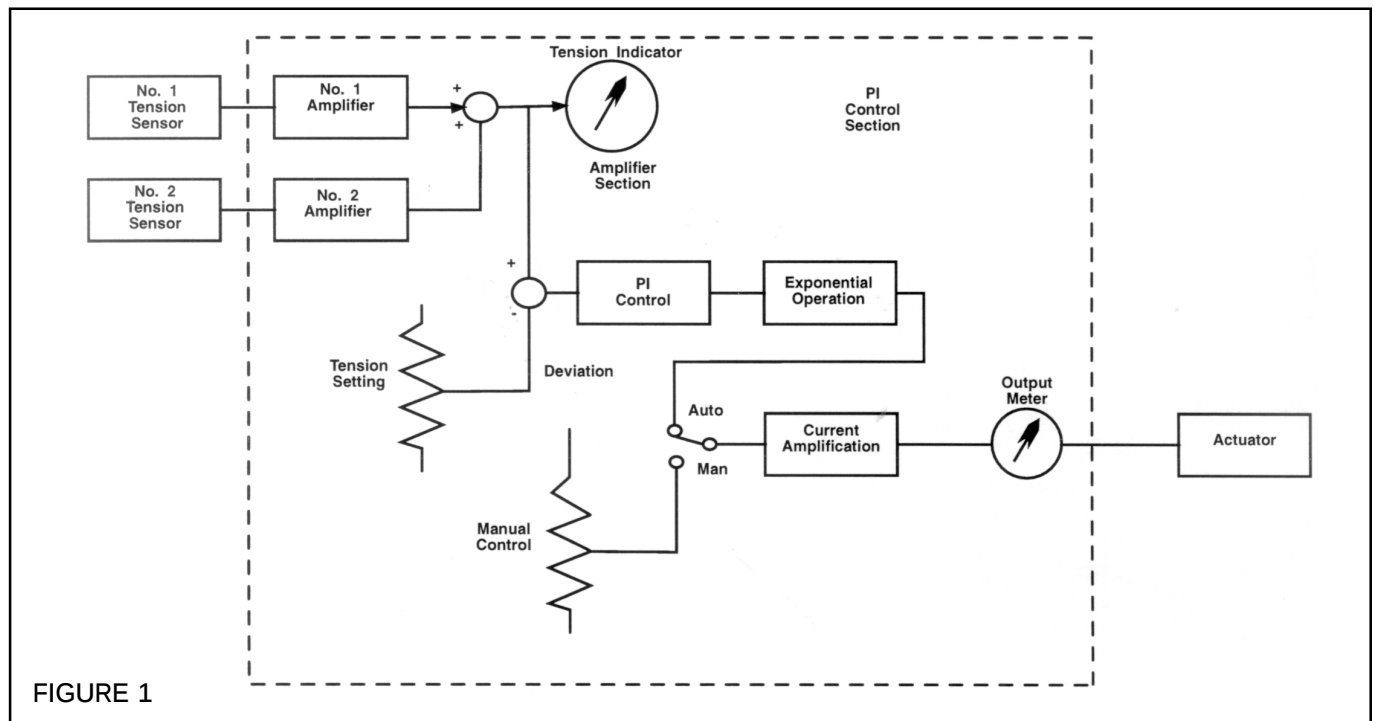


FIGURE 1

INSTALLATION

NOTE: This is an electronic instrument and should not be mounted where it is subject to shock, vibration, excessive heat, or moisture.

The Tension Controller may be mounted at any angle. Refer to the dimensional drawing located in the back of this manual for hole locations. The Tension Controller can be shelf or floor mounted using the mounting feet installed on the Tension Controller. For wall mounting, remove the mounting feet from the Tension Controller base, then remove the rubber pads and reinstall the mounting feet in the rear mounting holes on the Tension Controller sides. For panel mounting, the same feet may be used as above only installed in the forward holes on the Tension Controller.



ELECTRICAL CONNECTIONS

1. Use cables provided with the MB Tension Sensor to connect the MB Tension Sensors to the Tension Controller (See Figure 2).

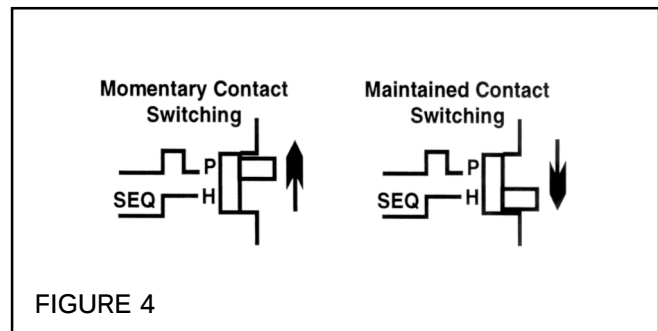
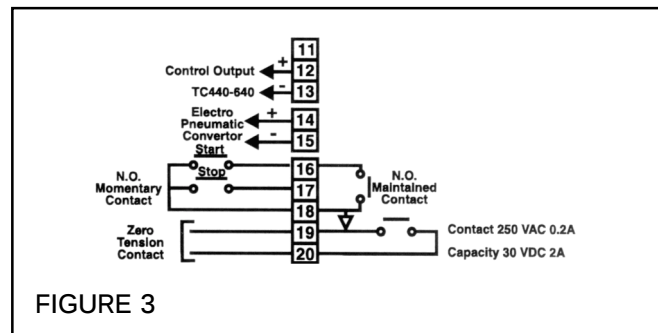
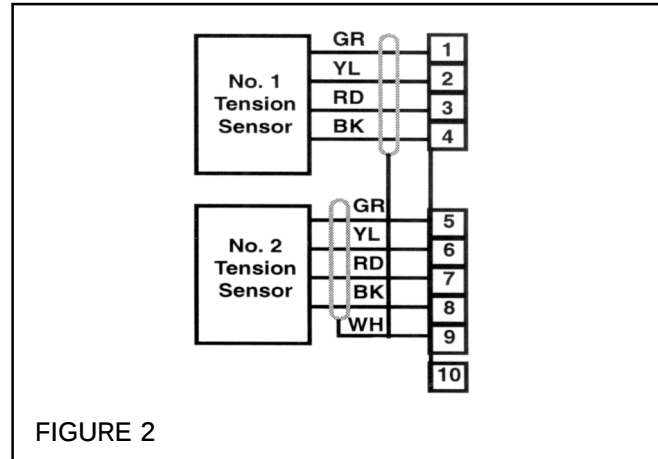
NOTE: Reverse the GREEN and YELLOW or WHITE wires when using MB-05, MB-11, and MB-25 with reverse wrap. For single sensor operation, connect as normal for Sensor No. 1 and provide a jumper wire to short Terminals 5 and 6.

2. Connect the output terminals to the controlled device with two conductor 18 AWG shielded cable (See Figure 3).
3. Start and Stop Terminals 16, 17, and 18 must be connected with customer supplied switches. Choose either momentary or maintained normally open (N.O.) contact. This switching is normally interfaced with the circuitry which starts and stops the flow of material through the process. Depending on the type of switching used, the SEQ Switch on the Tension Controller must be set as shown (See Figures 3 and 4).

NOTE: The Start and Stop Terminals must be connected or the Tension Controller will not be able to control in Automatic Mode.

4. The Zero Tension Relay is a normally open dry contact type which closes when tension falls below 3% of full scale. To trigger a visual or audible web break indicator, or interface with a machine stop relay circuit for instant shut down, wire to Terminals 19 and 20.

NOTE: When using a Machine Stop Relay Circuit, make sure Zero Tension Switch is set to ON. The contacts are rated as follows:
Resistance Load: AC 100 ~ 1A, DC 24V ~ 2A
Induction Load: AC 100V ~ 0.6A, DC 24V ~ 1A.

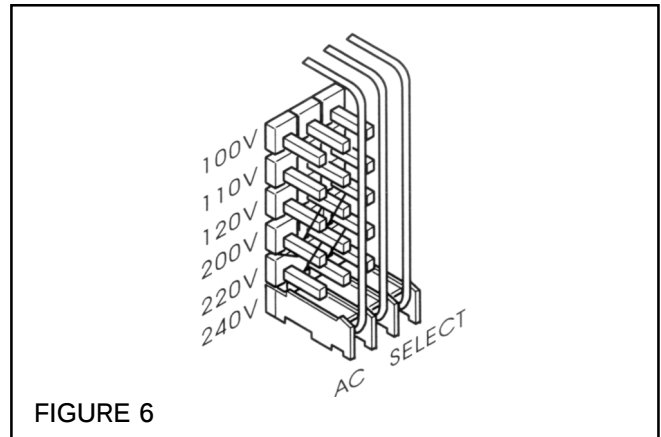
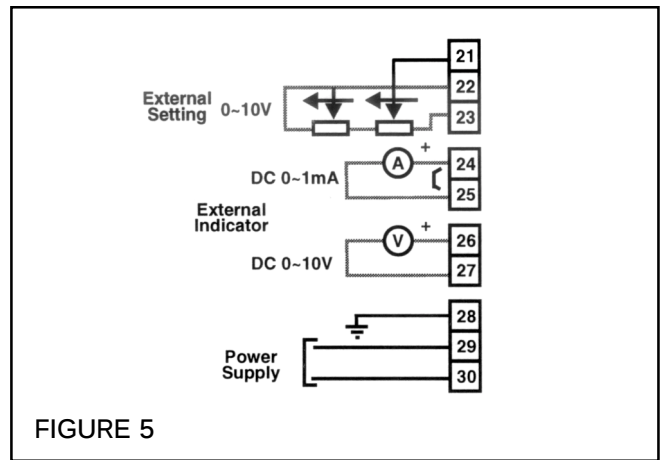


5. Terminals 21, 22, and 23 are used for remote Set Point pots (See Figure 5).

The Set Point pots are rated at 2K ohm (1.2 watt) when using two pots or 5K ohm (5.0 watt) when using one pot. Select the desired voltage at the Voltage Select Jumper located in the controller.

NOTE: Supply voltage is wired to Terminals 29 and 30; Terminal 28 must be grounded. Power supply can be 100, 110, 120, 220, or 240 volts AC and either 50/60 Hz. This selection is made with the Voltage Select Jumper located on the Power Supply PC Board (See Figure 6).

6. A customer supplied tension readout meter may be connected to Terminals 24 and 25 if the meter has a 1 mA movement. Terminals 26 and 27 provide the same readout in a 0-10VDC format.



PNEUMATIC CIRCUIT

Install the air lines and the Electro-Pneumatic Converter per the Instruction Manual provided with the Electro-Pneumatic Converter.

CALIBRATION

NOTE: The system must be calibrated during initial start-up. The system requires no further calibration unless a component is changed. Calibration must be done in the proper order.

NOTE: The Zero Tension Switch must be set to the OFF position during calibration.

The Mode Selection Switch located on the front panel of the Tension Controller can be switched to **MAN** to bypass the automatic control operation and allow manual control of tension with the Manual pot. Total tension can still be read on the Tension Indicator and the output level on the Output Meter when the Tension Controller is in the **MAN** Mode.



ZERO ADJUSTMENT

With One or Two Tension Sensors

1. Set the Power Switch to ON.
2. Make sure the Sensor Roll is mounted to the Tension Sensor or Sensors as described in the Tension Sensor Installation Manual.
3. Make sure the web has been removed and no other objects are sitting or resting on the Sensor Roll.
4. Set the Zero Tension Switch to OFF (See Figure 7).
5. Set the Selector Switch to NO. 1.
6. Adjust the NO. 1 Zero pot until the Tension Indicator on the front panel of the Tension Controller reads 0.

NOTE: If two Tension Sensors are used, proceed with Steps 7 through 10. If only one Tension Sensor is used, go to Step 10.

7. Set the Selector Switch to NO. 2.
8. Adjust the NO. 2 Zero pot until the Tension Indicator on the front panel of the Tension Controller reads 0.
9. Set the Selector Switch to **TOTAL**; the Tension Indicator must still read 0, if not, repeat Steps 2 through 8.

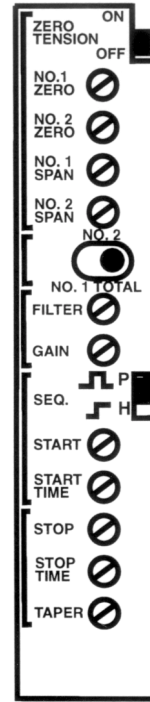


FIGURE 7

10. Set the Zero Tension Switch to ON. If the web break circuit is not being used, leave the Zero Tension Switch in the OFF position.

SPAN ADJUSTMENT

With One Tension Sensor

1. Be sure the Tension Controller is correctly wired for operation with one MB Tension Sensor. Check the installation of the jumper from Terminals 5 to 6.
2. Thread a rope or narrow web over the Sensor Roll in the normal path. Be sure the rope is at the center of the Sensor Roll. Hang a known weight (within the tension range of the system) on the other end of the rope (See Figure 8).
3. Set the Range Switch located on the front panel of the Tension Controller to **LOW** if the weight is less than one-half of the total system capacity. If the weight is greater than half of the system capacity, set the Range Switch to **HIGH**. Read the black scale for high setting and the red scale for low setting.
4. Set the Selector Switch to NO. 1 (See Figure 7).

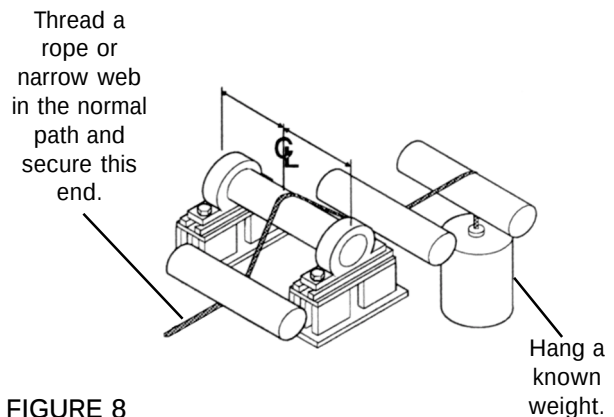


FIGURE 8

5. Adjust the NO. 1 SPAN pot until the Tension Indicator reads the known weight.
6. Fully rotate the NO. 2 SPAN pot counterclockwise to 0.
7. Set the Selector Switch to **TOTAL**. The Tension Indicator should read the same as NO. 1 (total weight).



SPAN ADJUSTMENT

With Two Tension Sensors

1. Be sure the Tension Controller is correctly wired for operation with two MB Tension Sensors.
2. Thread a rope or narrow web over the Sensor Roll in the normal path. Be sure the rope is at the center of the Sensor Roll. Hang a known weight (within the tension range of the system) on the other end of the rope (See Figure 9).
3. Set the Range Switch located on the front panel of the Tension Controller to **LOW** if the weight is less than one-half of the total system capacity. If the weight is greater than half of the system capacity, set the Range Switch to **HIGH**. Read the black scale for high setting and the red scale for low setting.
4. Set the Selector Switch to **NO. 1** (See Figure 7).
5. Adjust the NO. 1 SPAN pot until the Tension Indicator reads one-half the known weight.

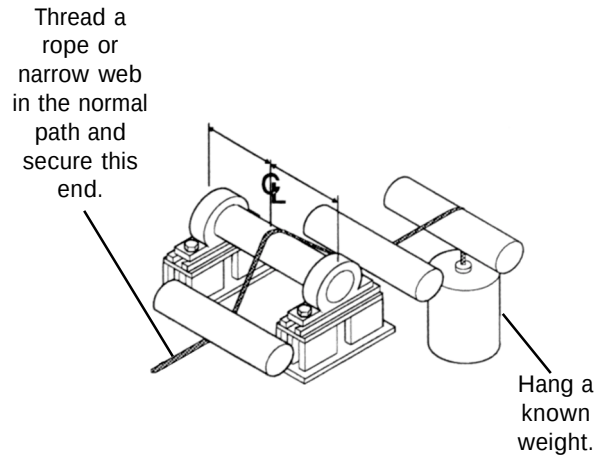


FIGURE 9

6. Set the Selector Switch to **NO. 2**.
7. Adjust the NO. 2 SPAN pot until the Tension Indicator reads one-half the known weight.
8. Set the Selector Switch to **TOTAL**. The Tension Indicator must read the known weight.

TUNING

GAIN AND FILTER ADJUSTMENTS

NOTE: These adjustments must be made with the web moving.

1. Set the GAIN and FILTER pots to the middle position (between 0 and 10) for initial setting.
2. Use the FILTER pot to compensate for imbalance in the Sensor Roll.
3. The GAIN pot can be increased towards 10 if high line speeds are causing rapid Tension Indicator needle fluctuations. Hunting or oscillation in the output signal can be controlled by decreasing the gain settings.

SEQUENCE SWITCH SETTING

This switch is normally interfaced with the circuitry which starts and stops the flow of material through the process. Depending on the type of switching used, the SEQ Switch on the Tension Controller must be made as shown (See Figure 10 and ELECTRICAL CONNECTIONS, Step 3).

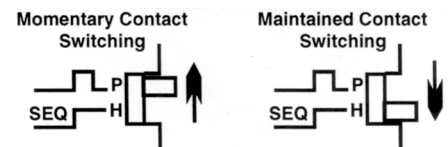


FIGURE 10

START AND START TIME ADJUSTMENT

The START pot controls the amount of brake torque applied as a hold back to prevent web sag from drawing material off the unwind roll while the machine is standing idle (See Figure 11).

The START TIME pot allows this START pot controlled torque to be maintained for a period of time after the machine is started.

Start torque (stall torque) can be changed with the START pot (See Figure 7). Normally this torque is set so that the roll will not unwind due to web sag while the machine is standing idle.

The time delay after the machine start button has been pushed until the Tension Controller goes from START to AUTO can be controlled from the START TIME pot and can be set from 1-10 seconds.

For rewind and midrange control, the START and START TIME pots are normally set to zero (See Figure 7).

STOP AND STOP TIME ADJUSTMENT

When the machine is stopped, the output signal immediately rises to brake an unwind roll to prevent run on or coasting. This will prevent web spillage and maintain tension in the web (See Figure 11).

1. The rise in the output signal is controlled with the STOP pot (See Figure 7). If the STOP pot is set at 0 the output signal will not rise, it will stay the same 1:1 ratio. If the pot is set at maximum, the output will triple (3:1 ratio). A midrange setting equals (2:1 ratio) (See Figure 11).
2. This braking level is maintained for a period of 0-10 seconds as selected by the STOP TIME pot (See Figure 7).
3. When the time selected with STOP TIME has elapsed, the Tension Controller output returns to the start torque level. At this time, the start lamp lights and the machine is ready to start (See Figure 11).
4. For rewind and mid-process control, STOP and STOP TIME pot are normally set to zero.

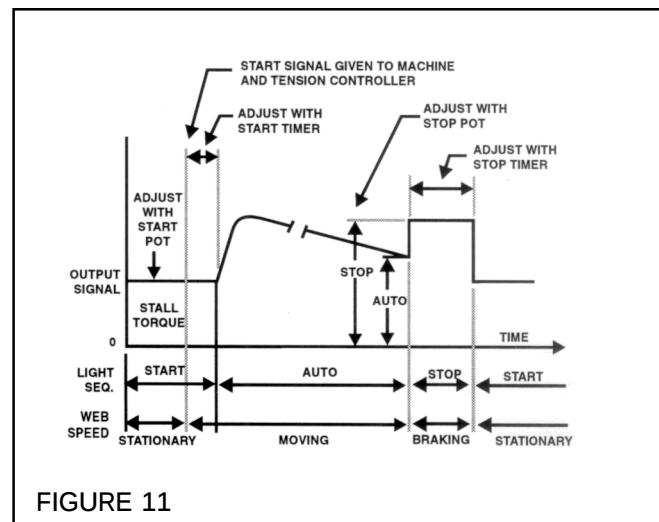


FIGURE 11

TAPER TENSION ADJUSTMENT

1. For unwind and mid-process control, the TAPER pot must be set to 0.
2. It is often necessary to have tapered tension (more tension at the start of rewind, gradually decreasing as the roll builds up) to prevent telescoping. In a rewind application, the output signal from the Tension Controller gradually increases as the roll diameter increases. Taper is achieved in the control system by automatically increasing the output to less than normal.

The TAPER pot adjustment can be found through experimentation by running a roll at 0 on the TAPER pot to give a constant tension wound roll then gradually increase the TAPER pot setting on subsequent rolls until an acceptable roll is formed.

NOTE: The taper tension circuit is designed for use with center wind clutches only. To use taper tension with a variable speed drive control, contact your authorized Nexen Web Controls Representative.



JUMPER SELECTION

There are several jumper wires on the Main PC Board and Power Board. These wires must be installed on the proper pins. Model Select Jumpers are set at the factory.

NOTE: The Tension Controller model can not be changed with the Model Select Jumper. Check this jumper to be sure that it is on the correct pin.

SET SELECT JUMPER

This jumper is used to select the manner of setting the target tension value for automatic operation. It is normally set on the INT pin to allow setting with the AUTO Set Point pot located on the front panel of the Tension Controller. The EXT pin is connected when an external adjustment pot is connected to Terminals 21, 22, and 23, or when receiving an isolated set point signal from a process controller.

SM SELECT JUMPER

The SM Select Jumper is normally set to the S pin. When the START level is changed frequently, the jumper can be set to the M position. This allows the start level to be controlled with the manual pot located on the front panel of the Tension Controller.

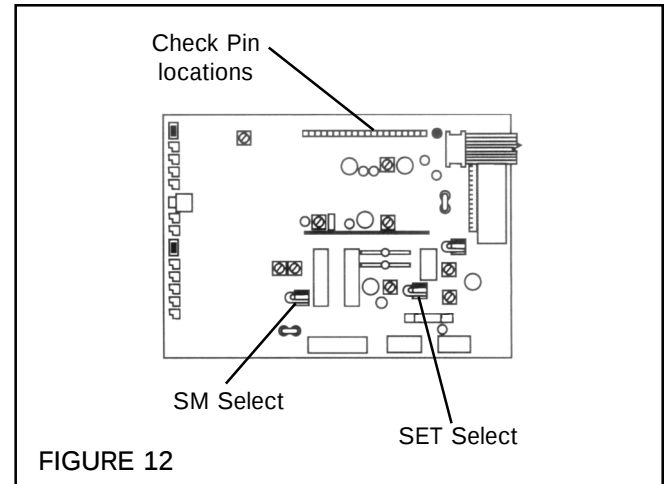


FIGURE 12

TEST RUN

After system calibration, make a test run using the lowest tension web that will be used in normal operation. The lower the web tension, the more sensitive the web will be to system stability. If low tension control is successful, there will not be any trouble with higher tension settings.

CAUTION

Prior to making the test run, perform the following checks:

- Be sure that no wires, cables, or air lines are in contact with rotating parts of the machine.
- All mechanical parts of the machine must move freely, without rotational friction.
- Recheck all electrical connections.
- Check the air supply to the Electro-Pneumatic Converter.

1. Set the Mode Switch to MAN.
2. Adjust the Manual Control pot to a low output level. The START lamp will light.

3. Start the machine. The START lamp should go out after several seconds as set with the Start Time pot.
4. Adjust the web tension to the desired level using the Manual Control pot.
5. Set the desired tension level using the Set Point pot. The Scale on the Set Point pot is keyed to the Tension Indicator and each graduation on the Scale Meter reads 10% of the total meter value.
6. Change the Mode Switch from MAN to AUTO. The AUTO lamp should light. If there is any variation between Set Point and the Tension being maintained in MAN, there will be a ramped increase or decrease when going from MAN to AUTO.

CAUTION

Never change from AUTO to MAN while the machine is running. Doing so will cause an abrupt change in output, possibly breaking the web. Once the Tension Controller is in AUTO, it will return to the set point tension every time the machine is started.



OPERATING PROCEDURE

NOTE: The Mode Selector must be In the AUTO position.

1. Set the Power Switch to ON. Both the POWER and START lamps will light. This verifies that the power is on, the Control Signal is at the start level, and the machine is ready to start.
2. Set the desired tension level using the Set Point pot. The scale on the pot is keyed to the indicator and each graduation on the scale reads 10% of the total indicator value.
3. Start the machine. The AUTO lamp will light after several seconds, as set with the Start Time pot, and the START lamp will go out as the Tension Controller begins Automatic Tension Control.
4. When the machine is stopped, the AUTO lamp goes out and the STOP lamp lights. The output signal from the Tension Controller immediately increases according to the position of the STOP pot.
5. The STOP condition will be maintained for a preset time as set with the STOP TIME pot.
6. At the end of the STOP TIME, the START lamp will light, the STOP lamp will go out, and the output signal will return to the start level. The machine is now ready to restart.
7. Repeat Steps 3 and 4. The Tension Controller will repeat the sequence operation.

SYSTEM INSTABILITY AND CORRECTIVE ACTION

The system may generate hunting in the AUTO Mode due to the following conditions:

CONDITION	DIAGNOSIS	CORRECTIVE ACTION
High friction loss in the machine, rolls hard to move, etc.	Adjust the MAN pot to obtain the same output signal as when in AUTO Mode.	Check the bearings, guide roll alignment, etc.
	If the Tension Indicator still oscillates in MAN Mode, the mechanical loss in the machine is too high.	
Brake torque capacity too great	Tension is properly controlled in AUTO Mode from the beginning of unwind (O.D. of roll) until about mid-roll. This control is achieved with very low output on the Output Meter.	Reduce torque capacity of the brake by installing a friction facing with a lower coefficient of friction or reducing the number of actuators used (if multiple actuator brakes are used).
	At approximately mid-roll, tension becomes unstable and output oscillates from a zero to positive output and back to a zero output.	
	Set the MAN pot to low output.	
	Set the Mode Switch to MAN and attempt to maintain tension, as read on the Tension Indicator at Set Point. Brake torque capacity is too great if it is impossible to maintain set point tension with very little movement of the MAN pot.	
Eccentricity in rolls (egg-shaped)	Observe out of round condition of the unwind roll. Loping of the roll may be observed on the Tension Indicator. The Output Meter will also show the system's constant reaction to changes in roll diameter by fluctuating.	Slowly decrease the GAIN pot setting to eliminate the Output Meter fluctuation. NOTE: The Tension Meter needle will continue to oscillate.

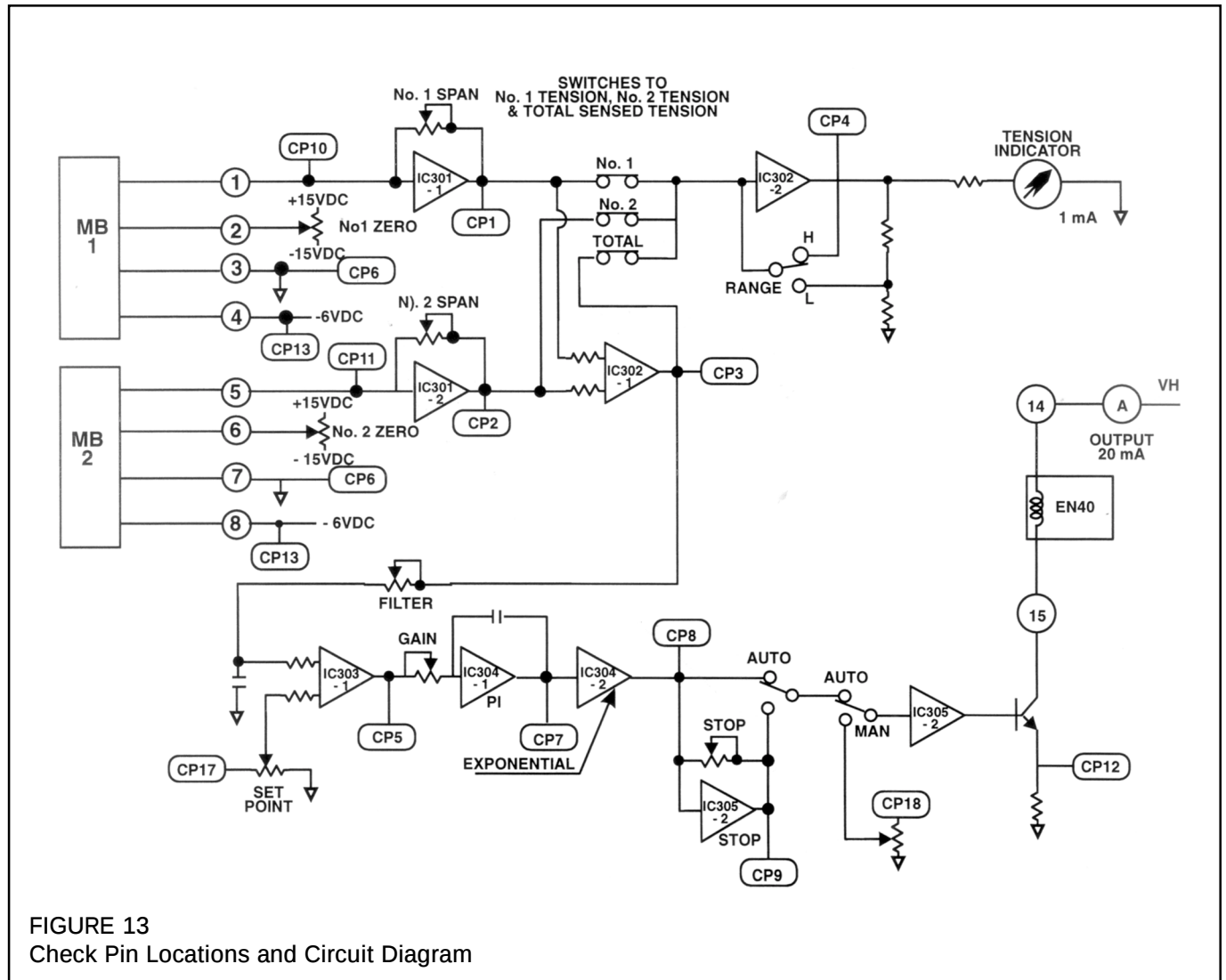
MAINTENANCE

There is no required maintenance as the Tension Controller and MB Tension Sensors have no parts subject to mechanical wear. Proper care must be taken to ensure clean air for the Electro-Pneumatic Converter as outlined in the Installation Manual.

Operating elements, brakes, clutches, motors, etc., must be maintained according to manufacturers specifications.

CHECK PIN VALUES

Refer to Figures 13 and Table 1 for check pin locations.





	CHECK PIN	ITEM CHECKED	NORMAL CONDITION
POWER SUPPLY	CP6-CP13	Power supply for Tension Sensors	Approx. +6VDC
	CP14	Power supply for Relay	Approx. +13VDC
	CP15	Power supply for Operational Amplifier	Approx. +15VDC
	CP16	Power supply for Operational Amplifier	Approx. -15VDC
INPUT SIGNAL SECTION	CP1	No. 1 Amplifier Output	CP1 and CP2 should both indicate half of Test Load Value (TLV) Test Load Weight (LB) $\frac{\text{Test Load Weight (LB)}}{\text{Full Scale Reading (LB)}} \times 10 \text{ VDC} = (\text{TLV}) \text{ Test Load Value}$
	CP2	No. 2 Amplifier Output	
	CP3	Total Tension	Total of CP1 + CP2 or TLV
	CP4	Signal to Tension Indicator	Same as CP3 in HIGH range Twice CP3 in LOW range
	CP10	Return Signal from No. 1 Sensor	0-400mV, varies as CP1 and CP2 except formula is changed to: Test Load Weight (LB) $\frac{\text{Test Load Weight (LB)}}{\text{Full Scale Reading}} \times 400 \text{ mV}$
	CP11	Return Signal from No. 2 Sensor	
DEVIATION COMPUTING SECTION	CP5	Deviation	Difference between Sensed Signal and Set Point
	CP7	PI Output	Voltage will increase if CP17 is greater than CP3; voltage will decrease if CP17 is less than CP3
	CP8	Exponential Output	
	CP9	Stop Circuit Output	Same as CP8 in AUTO mode. This value should increase as a multiple of CP8 when STOP switch is energized
	CP12	Buffer Outpu	TC240-IS: 1VDC @ 4 mA output 5VDC @ 20 mA output
	CP17	Set Point Voltage	0-10VDC, depending on Set Point pot position
	CP18	Manual Voltage	0-4VDC, depending on Manual pot position
	CP19	COM	0V

MOUNTING DIMENSIONS

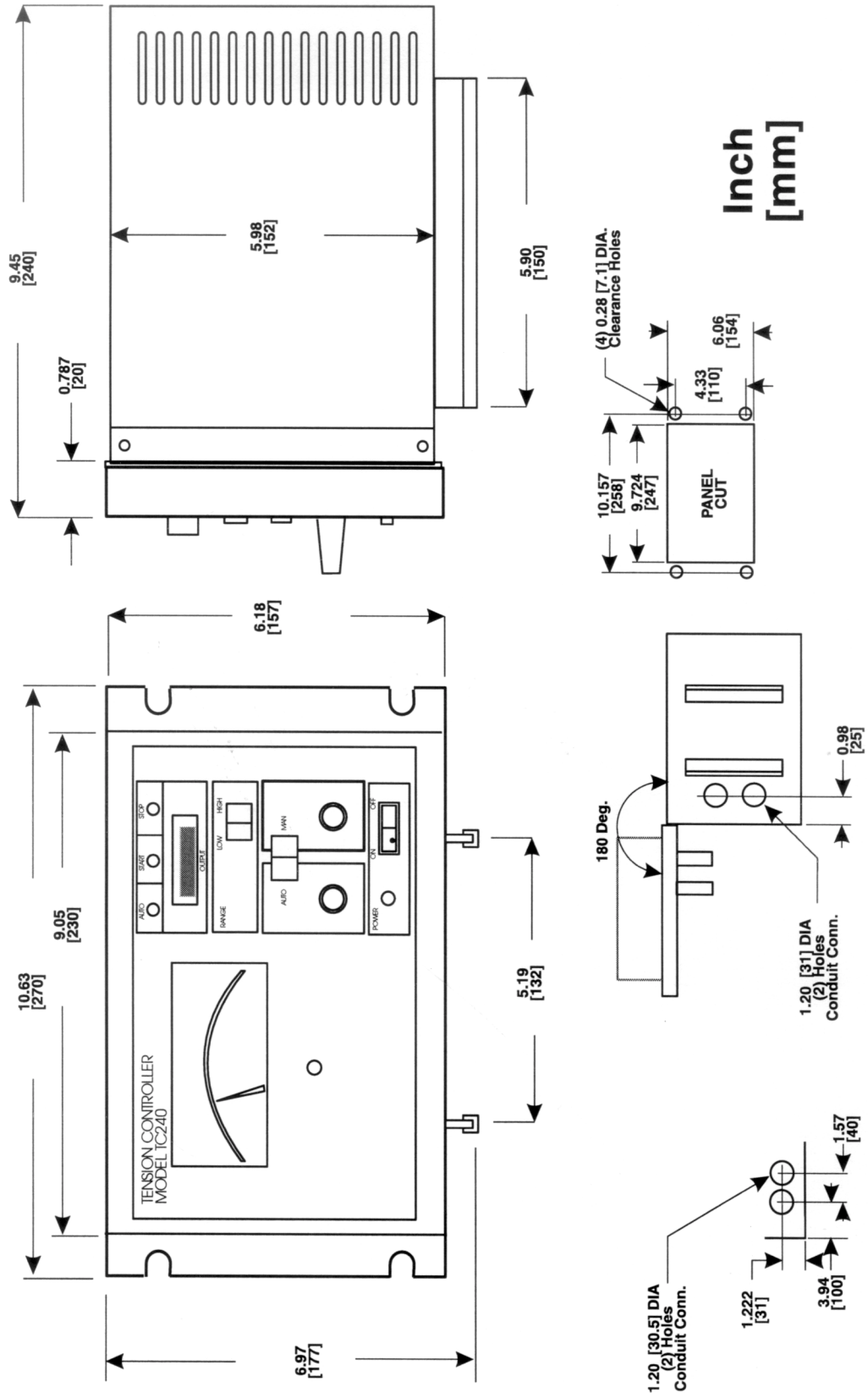


FIGURE 14



REPLACEMENT PARTS

The item or balloon number for all Nexen products is used for part identification on all product parts lists, product price lists, unit assembly drawings, bills of materials, and instruction manuals.

When ordering replacement parts, specify model designation, item number, part description, and quantity. Purchase replacement parts through your local Nexen Distributor.

PARTS LIST

ITEM	DESCRIPTION	P/N
1	Power Supply PC Board (TC240 & TC440)	2503
	Power Supply PC Board (TC640)	2634
2	Main PC Board	2502
3	Transformer Coil (TC240 & TC440)	2636
	Transformer Coil (TC640)	2637
4	Tension Indicator (5 Lb. Meter)	2149
	Tension Indicator (10 Lb. Meter)	2150
	Tension Indicator (20 Lb. Meter)	2151
	Tension Indicator (50 Lb. Meter)	2152
	Tension Indicator (100 Lb. Meter)	2153
	Tension Indicator (200 Lb. Meter)	2154
	Tension Indicator (300 Lb. Meter)	2155
	Tension Indicator (500 Lb. Meter)	2156
	Tension Indicator (1,000 Lb. Meter)	2157
5	Meter Face (5 Lb.)	10207
	Meter Face (10 Lb.)	2141

ITEM	DESCRIPTION	P/N
	Meter Face (20 Lb.)	10218
	Meter Face (50 Lb.)	10222
	Meter Face (100 Lb.)	2144
	Meter Face (200 Lb.)	10227
	Meter Face (300 Lb.)	10231
	Meter Face (500 Lb.)	10236
	Meter Face (1,000 Lb.)	10240
	Meter Face (2,000 Lb.)	10650
6	Output Meter (TC240)	2485
	Output Meter (TC440)	2486
	Output Meter (TC640)	2487
7	Range Switch (High-Low Selector)	2639
8	Set Point Potentiometer (Auto Control)	2640
9	Manual Potentiometer (Manual Control)	2641
10	Mode Switch (Auto-Manual Switching)	2642
11	Power Switch (Front Panel)	2643
12	Flexible Cable Assembly	2644



WARRANTIES

Warranties

Nexen warrants that the Products will be free from any defects in material or workmanship for a period of 12 months from the date of shipment. NEXEN MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED, AND ALL IMPLIED WARRANTIES, INCLUDING WITHOUT LIMITATION, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED. This warranty applies only if (a) the Product has been installed, used and maintained in accordance with any applicable Nexen installation or maintenance manual for the Product; (b) the alleged defect is not attributable to normal wear and tear; (c) the Product has not been altered, misused or used for purposes other than those for which it was intended; and (d) Buyer has given written notice of the alleged defect to Nexen, and delivered the allegedly defective Product to Nexen, within one year of the date of shipment.

Exclusive Remedy

The exclusive remedy of the Buyer for any breach of the warranties set out above will be, at the sole discretion of Nexen, a repair or replacement with new, serviceably used or reconditioned Product, or issuance of credit in the amount of the purchase price paid to Nexen by the Buyer for the Products.

Limitation of Nexen's Liability

TO THE EXTENT PERMITTED BY LAW NEXEN SHALL HAVE NO LIABILITY TO BUYER OR ANY OTHER PERSON FOR INCIDENTAL DAMAGES, SPECIAL DAMAGES, CONSEQUENTIAL DAMAGES OR OTHER DAMAGES OF ANY KIND OR NATURE WHATSOEVER, WHETHER ARISING OUT OF BREACH OF WARRANTY OR OTHER BREACH OF CONTRACT, NEGLIGENCE OR OTHER TORT, OR OTHERWISE, EVEN IF NEXEN SHALL HAVE BEEN ADVISED OF THE POSSIBILITY OR LIKELIHOOD OF SUCH POTENTIAL LOSS OR DAMAGE. For all of the purposes hereof, the term "consequential damages" shall include lost profits, penalties, delay damages, liquidated damages or other damages and liabilities which Buyer shall be obligated to pay or which Buyer may incur based upon, related to or arising out of its contracts with its customers or other third parties. In no event shall Nexen be liable for any amount of damages in excess of amounts paid by Buyer for Products or services as to which a breach of contract has been determined to exist. The parties expressly agree that the price for the Products and the services was determined in consideration of the limitation on damages set forth herein and such limitation has been specifically bargained for and constitutes an agreed allocation of risk which shall survive the determination of any court of competent jurisdiction that any remedy herein fails of its essential purpose.

Limitation of Damages

In no event shall Nexen be liable for any consequential, indirect, incidental, or special damages of any nature whatsoever, including without limitation, lost profits arising from the sale or use of the Products.

Warranty Claim Procedures

To make a claim under this warranty, the claimant must give written notice of the alleged defect to whom the Product was purchased from and deliver the Product to same within one year of the date on which the alleged defect first became apparent.

nexen[®]

Nexen Group, Inc.
560 Oak Grove Parkway
Vadnais Heights, MN 55127

800.843.7445
Fax: 651.286.1099
www.nexengroup.com

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