**SECURITY NOTICE**

*(Ensure to Read before Application)*

<table>
<thead>
<tr>
<th>For the sake of using this product safely</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Before installing and using, please ensure that read this manual particularly and use it appropriately as well as follow all the regulations in this manual with the carefulness.</td>
</tr>
<tr>
<td>2. Based on VDE0160. This tension controller is the electronic equipment adopting CPU controller which is used to control the tension of the equipment. Therefore, it is necessary to strictly follow the relative regulation, principle, application standard of the equipment to convey, install, operate and maintain.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Danger</th>
</tr>
</thead>
<tbody>
<tr>
<td>In case of any mistake in operation, it will cause dangers and result in death or serious injury.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Notice</th>
</tr>
</thead>
<tbody>
<tr>
<td>In case of any mistake in operation, it will cause dangers and result in equipment damage or property loss.</td>
</tr>
</tbody>
</table>

---

**NOTICE**

<table>
<thead>
<tr>
<th>Danger</th>
</tr>
</thead>
<tbody>
<tr>
<td>Please ensure that set emergency-stop circuit outside directly and do not let it get through tension controller.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Danger</th>
</tr>
</thead>
<tbody>
<tr>
<td>Please ensure that set the mechanical-stop circuit outside directly and do not let it get through tension controller, otherwise when tension controller takes wrong operation, it will cause machine out of control and result in accident.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Danger</th>
</tr>
</thead>
<tbody>
<tr>
<td>Please ensure that use the wire meeting the capacity of electric current.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Danger</th>
</tr>
</thead>
<tbody>
<tr>
<td>When wiring, ensure to use wires which meet the capacity of electric current, or it will cause the melting of insulation skin incurring bad insulation or cause electric-shock, creepage, fire and so on.</td>
</tr>
</tbody>
</table>

---

**High Voltage! Danger!!!**

Before preparing for controller's installing and wiring, please shut off power of controller at least five minutes. Correct configuration and installation is the precondition of controller's normal running.

**Pay special attention to following several points:**

1. Admit Protect Level: protect grounding. Only the correctly connecting with protecting grounding can reduce the outside electromagnetic interference.
2. Installation must proceed in the condition of non-electricity.
3. After cutting off from the electricity net, please waiting for the completion of capacitor's discharge and then the operation can be proceeding.
4. Do not let any dust enter the interior of the driver.
5. Before application, please get rid of all coverage to prevent the equipment's over hot.
6. Prohibited to use it in the dangerous environment such as flammable, explosive.
7. Prohibited to install this product in the bad environment of high temperature and humidity.
8. Do not install this product in the environment liable to be shacked and impacted directly.
Index

Chapter I Overview
1.1 Overview ................................................................. 1
1.2 Function and Characteristic ........................................ 1
1.3 Operation Interface .................................................... 2

Chapter II Install and Wire
2.1 Install ........................................................................ 3
2.2 Wire ........................................................................ 4
2.3 Instruction of Connection Terminal ............................. 7

Chapter III Programming
3.1 Form of Menu ............................................................. 9
3.2 Programming ............................................................ 10
3.3 Instruction of Menu .................................................... 11

Chapter IV Debugging and Running
4.1 Steps of Start Up ......................................................... 12
4.2 Adjustment of Tension Controller .............................. 12
4.3 Confirmation of Automatic Running ....................... 16
4.4 Action and Function of Automatic Running .............. 17
4.5 Adjustment of control gain PID .................................. 21
4.6 Function of Taper Control ......................................... 22
4.7 Memory Card ............................................................ 23
4.8 Other Functions ......................................................... 25

Chapter V Fault Elimination and Equipment Maintenance
5.1 Equipment Maintenance ............................................. 28
5.2 Fault Display ............................................................. 28
5.3 Fault Search and Elimination .................................... 29

Chapter VI Specification and Shell Size
6.1 Technique Specification ................................................ 31
6.2 Environment Specification .......................................... 31
6.3 Shell Size ................................................................... 32
Chapter I  Overview

1.1 Overview
The MY9TC-NA Tension Controller is a high-precision digital automatic controller which can automatically control coil tension and tension of materials winding off, feeding, traction and drawing in via load cell based sensors.

1.2 Function and Characteristic

- Adopting High-precision D/A switch, the output precision can reach 0.1% precise tension control.
- Fuzzy PID Control, the output precision can reach 0.1% precise tension control
- Direct control of electromagnetic clutches, breaks and servos.
- Single or double input sensor signal and automatic zero setting
- Individual interface design, easy operation.
- Multi-line LCD display, simple programming, password function
- Parameter backup function
- Robust design
- Easy connection installation.
1.3 Operation Interface

Panel of MY9TC-NA tension controller

[1] Programming Key: use these two keys to select all kinds of menu or confirm the setting. ESC key : press this key to back preview menu or return running mode. OK key : enter programming menu or confirm set parameter.

Press this key, the manual indicator light (6) in controller panel will light and the controller enters manual control mode. At that time, it is not controlled by the interior setting parameter. Press and key to change output value directly.

[3] Automatic Control Mode Key
Press this key, the controller enters automatic control mode. At that time, the automatic indicator light (5) in the panel will light. The controller is in the condition of automatic control. The output value is controlled by interior parameter and P, I, D. In the mode of automatic control, press and key to change tension setting value.

[4] Output Control Key
Controlling output ON/OFF option, press this key repeatedly, thus the output is shifted between ON and OFF.

[5] Value Setting Dial
Rotating Dial (13) is used to adjust the value of setting parameter or selecting menu.
2.1 Install

The controller has two ways of installation

[1] Wall installation
[2] Panel installation

⚠️ Danger

⚠️ In the case of machining screw thread and wiring, it is prohibited to let scrap iron drop and scrap wire into the product. Otherwise, it will cause the danger e.g. product damage, smoking, fire, mistaken operation etc

⚠️ Please ensure that before installing and wire, all the phases of power outside must be shut off. In case that they were not shut off, it will has the dangers of electric-shock or product damage etc

⚠️ NOTICE

⚠️ Prohibited to install control in the environment with dust, lampblack, electric dust or corrosive gas as well as in the environment of high-temperature and humidity.

⚠️ Controller can not be installed in the environment liable to be shacked and impacted.
Chapter II  Install and Wire

Notice: Installation Method of the Tension Sensor

It is suggested to adopt horizontal or wall method to install sensor except ceiling installation. If hanging installation is adopted, the terminal with four snails must be upturned.

![Horizontal installation](image1.png)

![Wall Installation](image2.png)

The terminal with snail is upturned

2.2 Wire

1. Wiring Method and Notice

The operating power of MY9TC-NA tension controller is 24VDC and the current is not more than 4A. DC power which is connected with controller via non-delayed fuse. Before getting through the electricity, please ensure that the power voltage and polarity are correct avoiding damaging controller.

[1] Emergency-stop circuit shall be installed out of tension controller. In case of fault in tension controller, power supplier can be cut off to ensure the security.

[2] The interior of tension controller adopts miniature computer system. When illegal command or exterior electromagnetic spurious-wave enters main system, it is possible to cause CPU out of control.

[3] Prohibited to plan input/output wire and other power wire in the same plane or are packed together.

[4] The tighten torque of the terminal is 0.5~0.8Nm. Ensure that tighten them avoiding generating mistaken action.

<table>
<thead>
<tr>
<th>Danger</th>
</tr>
</thead>
<tbody>
<tr>
<td>▲ Please apply over 2 mm² wire to the shell to proceed D type grounding, otherwise it will cause electricity shock.</td>
</tr>
<tr>
<td>▲ When wiring, please ensure to use wires which meet the capacity of electric current. If the wire is too thin, it will cause the melting of insulation skin incurring bad insulation or cause electric-shock, fire and so on.</td>
</tr>
<tr>
<td>▲ Please ensure that before installing and wire, all the phases of power outside must be shut off. In case that they were not shut off, it will has the dangers of electric-shock or product damage</td>
</tr>
</tbody>
</table>

Meyer Industrie-Electronic GmbH – MEYLE
Carl-Bosch-Straße 8  Tel.: (+49) 5481-9385-0  Internet: www.meyle.de
49525 Lengerich/Germany  Fax: (+49) 5481-9385-12  E-Mail: sales@meyle.de
2. Basic Wire

The basic wiring is shown in the left figure:

[1] System Power: Connect 24 VDC power between terminal 27 and 28, and the current shall not lower than 4A and the polarity cannot be reversed.

[2] Sensor: Please follow the left figure to connect in order to have normal application. If only one sensor is used, please just to short-circuit terminal 02 and 07, terminal 03 and 08.

[3] Execute machine: Connect DC24V, 4A less magnetic powder clutch/arrester or electromagnetic clutch/arrester.


Notice: Some machines are running but the material does not. At that time, run-stop switch shall be off avoiding that the tension is too large to cause the parting of the material.


[6] Please refer to relative chapter in this manual for other application functions.
3. advanced Wire

The basic wiring is shown in the left figure:

[1] System Power: Connect 24 VDC power between terminal 27 and 28, and the current shall not lower than 4A and the polarity can not be conversed.

[2] Sensor: Please follow the left figure to connect in order to have normal application. If only one sensor is used, please just to short-circuit terminal 02 and 07, terminal 03 and 08.

[3] Control Volta Signal out: output DC 0~10v below 10mA, connection transducer, servosystem

[4] Execute machine: Connect DC24V, 4A less magnetic powder clutch/arrester or electromagnetic clutch/arrester.


[6] Run/stop switch: connect the terminal 18 and 19. Notice: Some machines is running but the material does not. At that time, run-stop switch shall be closed avoiding that the tension is too large to cause the parting of the material.

[7] Simulate Input: Long-range adjustment sets up the tension size, switch in 0~10 VDC in the terminal between 20, 22, corresponding zero tension to entirely measuring range setting up

[8] Shell Grounding Terminal shall proceed with D type grounding.

[9] Please refer to relative chapter in this manual for other application functions.
2.3 Instruction of Connection Terminal

1. +UCELL
   Output +5VDC, working power of sensor (positive Polarity).

2. CELL1+
   sensor I single input.

3. CELL1-
   sensor I single input.

4. GND 0V
   Working power of sensor (minus polarity).

5. SHIELD
   Shielding Terminal, connect to tension sensor shielding wire To prevent the interference of electromagnetic.

6. +UCELL
   Output +5VDC, working power of sensor (positive polarity).

7. CELL2+
   sensor II single input.

8. CELL2-
   sensor II single input.

9. GND 0V
   Working power of sensor (plus polarity).

10. SHIELD
    Shielding Terminal, connect to tension sensor shielding wire To prevent the interference of Electromagnetic.

11. OUT 0~10V
    Controller outputs standard control voltage Signal.

12. COM
    Controller outputs control voltage COM terminal and is used with Terminal 11 or 12 together

13. NC*
    Standby

14. NC*
    Standby

Grounding terminal in shell
# Chapter II Install and Wire

## Instruction of Connection Terminal (following upper page)

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>+UCELL</td>
</tr>
<tr>
<td>02</td>
<td>CELL1+</td>
</tr>
<tr>
<td>03</td>
<td>CELL1-</td>
</tr>
<tr>
<td>04</td>
<td>GND</td>
</tr>
<tr>
<td>05</td>
<td>SHIELD</td>
</tr>
<tr>
<td>06</td>
<td>+UCELL</td>
</tr>
<tr>
<td>07</td>
<td>CELL2+</td>
</tr>
<tr>
<td>08</td>
<td>CELL2-</td>
</tr>
<tr>
<td>09</td>
<td>GND</td>
</tr>
<tr>
<td>10</td>
<td>SHIELD</td>
</tr>
<tr>
<td>11</td>
<td>0~10V</td>
</tr>
<tr>
<td>12</td>
<td>COM</td>
</tr>
<tr>
<td>13</td>
<td>AO</td>
</tr>
<tr>
<td>14</td>
<td>COM</td>
</tr>
<tr>
<td>15</td>
<td>MI 1</td>
</tr>
<tr>
<td>16</td>
<td>MI 2</td>
</tr>
<tr>
<td>17</td>
<td>MI 3</td>
</tr>
<tr>
<td>18</td>
<td>RUN/STOP</td>
</tr>
<tr>
<td>19</td>
<td>MIC</td>
</tr>
<tr>
<td>20</td>
<td>ANG 1</td>
</tr>
<tr>
<td>21</td>
<td>ANG 2</td>
</tr>
<tr>
<td>22</td>
<td>ANG COM</td>
</tr>
<tr>
<td>23</td>
<td>0~24V</td>
</tr>
<tr>
<td>24</td>
<td>COM</td>
</tr>
<tr>
<td>25</td>
<td>NC</td>
</tr>
<tr>
<td>26</td>
<td>NC</td>
</tr>
<tr>
<td>27</td>
<td>DC 24V+</td>
</tr>
<tr>
<td>28</td>
<td>DC COM</td>
</tr>
</tbody>
</table>

- **Grounding terminal in shell**

---

15. MI 1
Jogging signal input terminal, matched with terminal 19. Press it once, this function can be triggered.

16. MI 2*
Standby

17. MI 3*
Standby

18. RUN/STOP
Run/stop single input terminal. When the controlled material is normally running, cut the run/stop switch; when the switch on (STOP), the tension controller enters stopping procedure.

19. MIC
Digital input public terminal, matched with terminal 15, 16, 17, 18.

20. ANG 1
Analog input signal 1.

21. NC*
Standby

22. ANG COM
Analog input signal public terminal, together used with terminal 20

23. 0~24V
Controller outputs 0~24VDC voltage (current is not more than 3A) and it can directly drive magnetic powder clutch/brake or electromagnetic clutch/brake.

24. COM
Controller outputs control voltage COM Terminal and is matched with terminal 23.

25. NC*
Standby

26. NC*
Standby

27. DC 24V IN
Working power input terminal of controller is DC24V positive polarity and the current is not less than 4A.

28. DC COM
Working power input terminal of controller is DC24V.
3.1 Form of menu

- Switch Sig NO1
- MI1 MI2 MI3 R/S
- [ ] [ ] [ ]
- ESC. Enter.

- 11 Dev. Set
- D = 0
- Cancel. Enter.

- 12 Out. Level
- Min = 0%
- Max = 100%
- Cancel. Enter.

- 13 Preset Out
- SP = 20%
- Cancel. Enter.

- 14 Out Memory
- Open
- Close
- Cancel. Enter.

- 15 Stop Gain
- Gain = 100%
- Timer = 0.0 S
- Cancel. Enter.

- 16 Stop Gain
- Timer = 2.0 S
- Cancel. Enter.

- 17 Jog Set
- Output = 30%
- Cancel. Enter.

- 18 Sig. Direct
- Normal
- Inverse
- Cancel. Enter.

- 19 Manual Zero
- Left = 0.0
- Right = 0.0
- Cancel. Enter.

- 20 Sig. Direct
- Standing open
- Standing close
- ESC. Enter.

- 21 R/S Signal
- Standing open
- Standing close
- ESC. Enter.

- 22 Remote Set
- Open
- Close
- Cancel. Enter.

- 23 Taper Set
- r = 0%
- Cancel. Enter.

- 24 Dist. Filter
- Timer = 2.0 S
- Cancel. Enter.

- 25 Out. Filter
- Timer = 2.0 S
- Cancel. Enter.

- 26 Sys. Reset
- Lost data...
- Excute
- Cancel. Enter.

- 27 Language
- ENGLISH
- Cancel. Enter.

- 28 Version
- WELCOME
- MY9TC-NA V3.21
- Cancel. Enter.

- 29 Save Param.
- MY9TC -> ParaBox
- Excute
- Cancel. Enter.

- 30 Load Param.
- ParaBox -> MY9TC
- Excute
- Cancel. Enter.
3.2 Programming

[1] When power on, power indicator light (3) lightens.

[2] Controller memory the running mode before the power off, LCD display manual control mode or automatic control mode.


[4] LCD displays “Enter Password”, rotate dial to adjust password to 28 and then press Key.

[5] Enter Programming menu and rotate value setting dial to select detailed menu. Press Key to enter the setting menu to program.
3.3 Instruction of Menu

The instruction of menu:

[1] Menu of automatic control mode

A. Setting taper value $\tau = 0$ and the automatic running menu without Taper control function.

<table>
<thead>
<tr>
<th>Automation</th>
<th>SetPt. 10.0 Kg</th>
<th>Sensor 9.9 Kg</th>
<th>Output 50.0 %</th>
</tr>
</thead>
</table>

- Setting value, use $\uparrow$, $\downarrow$ Key or rotate value setting dial to directly change tension value.
- Actual value, actual tension value of sensor's feedback.
- Output value, 0~100% respectively corresponds to 0~24V or 0~10V voltage output.

B. Setting taper value $\tau > 0$, and the automatic running menu with taper control function.

<table>
<thead>
<tr>
<th>Taper</th>
<th>Set Pt</th>
<th>Sensor</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.0 Kg</td>
<td>10.0 Kg</td>
<td>9.9 Kg</td>
<td>50.0 %</td>
</tr>
</tbody>
</table>

Target Value means the running tension target value according to the different diameter of coil.

The same as the above.


<table>
<thead>
<tr>
<th>Manual</th>
<th>SetPt. 10.0 Kg</th>
<th>Sensor 9.9 Kg</th>
<th>Output 50.0 %</th>
</tr>
</thead>
</table>

- Manual setting value, use $\uparrow$, $\downarrow$ Key or rotate value setting dial to change output value.
- Setting value means the tension value in the automatic control mode.
- Actual value, actual tension value of sensor's feedback.
- Output value, 0~100% respectively corresponds to 0~24V or 0~10V voltage output.


Menu Number Parameter Name

- 01 Unavail
- 02 Unit Choice
- 03 Full Scale
- Cancel. Enter.

Menu option indicating cursor, press $\updownarrow$ Key, thus the menu is selected.

[4] Parameter setting

To select the target parameter press $\updownarrow$ Key, when the $\uparrow$ turns to the $\downarrow$ rotate the value setting to modify the parameter.

- Press $\updownarrow$ to confirm set parameter and back up immediately.
- Press $\uparrow$ Key to abandon amending parameter and back up.
4.1 Steps of Start Up

Before the running of the equipment, the following steps shall be confirmed.

[1] After that the installation and wiring of the controller is confirmed to be correct, connect with the power.

[2] If the parameter of controller has ever been amended before, enter the menu to initialize the system and renew the factory setting.


[6] Adjust PID parameter according to the requirement.


4.2 Adjustment of tension sensor

1. Unit Choice

Unit Choice——This tension controller offers different units, you can choose “N”、“kg” or “%”. The initialization of this parameter is “kg”.

02 Unit Choice
03 Full Scale
04 Auto Zero
Cancel. Enter.

[1] Select “02 Unit Choice” Menu, press key to enter this menu.

02 Unit Choice
Unit → kg
Cancel. Enter.

[2] Rotate value setting dial to select detailed menu. Press Key Rotate dial to choose the unit. Press key to set.
2. Full Scales

Full Scales—there are 2 parameters in this menu:
Range: the max tension of this tension control system. The range of this parameter is 0~999.
   The initialized setting value is 50.
Dot: set the precision of the tension display.

03 Full Scale
   Range → 50.0 ▲
   Dot → 0.0
   Cancel. Enter.

[1] Select “03 Full Scales” menu. Press key to enter this menu.

[2] Rotate value setting dial to select “Range”. Then press key, the cursor from ▲ to ▼ into numerical amended.

3. Adjustment of tension sensor

Zero adjustment—it shall have zero dealing before controllers running. That is to revise the checking roller and axis etc. gross weight load.
Notice: Prohibited to adjust in the condition of running.

04 Auto Zero
05 Auto Span
06 Unavail
Cancel. Enter.

[1] Select Zero Adjustment menu. Press Key to enter zero adjustment menu.

[2] In the condition of only be able to load gross weight of roller and axis etc, press Key.

[3] wait a moment

4. Full Scale Demarcate

Full scales demarcate—the tension of material adds to the load of sensor because of the difference of installation direction and material of the sensor. Therefore, it needs full scale demarcate.

Notice: two sensors shall be installed in the same level.

Line shall be in the middle of roller and let the roller keep rolling

The weight of hanging poise is suggested to be the 1.5~2 times of the maximum controlled tension.

[1] Select Auto Span menu. Press Key to enter menu.

[2] After confirming that the poise has hung well and it is in the static condition, please press Key to confirm.


[4] Display Success or Over Load, the load is too heavy, or Less Load. If the Demarcating fails appears, please refer to P28.
5. **Manual zero**

Manual zero—— In the mechanical operation after the zero-migration, zero can be amended manually. The adoption of the amendment could Display manual proofreading zero. Here to set up a revised test will be added to tension with a tension signal, in accordance with the sum of signal control. (Initial set to "0.0 kg")

[1] Select “07 Manual Zero” menu. Press key to enter the setting menu of manually zero amendment

[2] Choice of sensors on the left to zero amendment, press key, the cursor from to into numerical amended.

6. **Pro.Gain**

Pro.Gain——This feature used to manually amend that range. (Initial set to "100%")

[1] Select “Manual Span” menu, press key to enter the setting menu of manually range amendment

[2] Choice of sensors on the left to range amendment, press key, the cursor from to into numerical amended
4.3 Confirmation of Automatic Running

After the completion of tension sensor's zeroing setting, full scale demarcate setting, unit selection, tension setting adjustment, the basic setting of automatic running is also finished. The next is to confirm the basic action.

1. Enter and Debug Manual Control Mode

[1] Press Manual Control Mode Key (10) to enter the manual control mode. At that time, the manual control indicator light (6) will light and LCD will display menu of manual running.

![Manual Control Menu]

- Manual Setting Value
- Tension Setting Value
- Actual Tension Value
- Tension Output Value

[2] Run machine, press , Key or rotate value setting dial to change manual setting value. The output value will correspondingly change.

2. Enter and Debug Automatic Control Mode

[1] Press automatic control mode key (11) to enter automatic mode. At that time, automatic control indicator light (5) will light and the LCD will display the menu of automatic running.

A. Draw degree slope setting value T=0, and the automatic running menu of non-draw degree control function.

![Automatic Control Menu Non-Draw]

- Tension Setting Value
- Actual Tension Value
- Tension Output Value

B. Draw degree slope setting value T>0, and the automatic running menu of draw degree control function.

![Automatic Control Menu Draw]

- Taper Value
- Tension Setting Value
- Actual Tension Value
- Tension Output Value

[2] Run machine, press , Key or rotate value setting dial to change tension setting value.
4.4 Action and Function of Automatic Running

1. Output of running start

[1] Preset value
In the mode of automatic control, when the RUN/STOP signal is from STOP to RUN, at that time, the controller output value equals to the preset value. When starting, the output is the jumping-off point to enter automatic control.

*Notice: this function is just effective when stop catch is “Close”.

[1] Select menu of “11 preset value”. Press ➩ Key to enter setting menu of pre-start output value.

[2] According to the actual requirement, set the required preset output value. Rotate value setting dial to adjust value. Press ➩ Key to confirm the setting. (Factory setting value is 20%.)

After the delay of the preset value output, when the system receive the RUN signal of the RUN/STOP signal, the controller starts to count down, final group of screen display the value of counting down. When screen to the controller begins to work at 0, the controller stars to work, sends the control signal, the final group of screen display current output value.
[2] Stop Catch
When the Stop Catch is open and the RUN/STOP signal in the mode of automatic control is from STOP to RUN, the control output takes the value when stop as the memory point. When restarting and running the machine, the value is regarded as the jumping-off point to taking automatic control.

In the tension control process of unwind or rewind, when material is exchanged, it intends to have the problem that the tension is too strong or too weak and the scrap is generated. To reduce the waste of material, we can adopt Jog Setting control to solve the problem.

*Notice: Shut down touch-point switch which connects with terminal 15 (M11) and 19(MIC) once. At that time, the tension controller output is equal to the Jog set value.
Setting Steps:

1. Select menu of “14 Jog Set”. Press Key to enter menu of Jog output setting.

2. Press or Key or Rotate value setting dial to directly amend Jog output setting value. Press key confirm the value. The range of value setting cannot exceed the tension range. (Factory setting value is 50%.)

2. Setting of Running Stop

When the machine stops, stop timer and stop gain shall be started to restrain the tension change which is generated by the inertia caused by web circles pump.

If it is in the automatic running, the input signal from RUN to STOP, thus at the moment of machine stops, the timer begins to work.

At the moment stop timer begins to work, take output value (OUT. t) as base point. During the period of stop timer working, the automatic control keeps working.

When stop time is over, it will take the instant value (K) of machine stopping as basic point to output.

The instant control output when stop timer begins working is shown as following formula (Maximum restrain is 100%).

\[
\text{OUT. T} = K \times Z / 100\%
\]

OUT. t is the instant output value when stop timer begins working.
K is the output value of machine stopping.
Z is stop machine gain setting value.

In the process of automatic control.
[1] Stop Gain - when stopping machine, it can offer a large brake torque for controller which makes equipment quickly became state. User can set according to actual requirement. In normal condition, when it is in rewind, stop gain shall be set less than 100%, and when it is in unwind, it is set more than 100%.

<table>
<thead>
<tr>
<th>13 Stop Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gain</td>
</tr>
<tr>
<td>Time</td>
</tr>
<tr>
<td>ESC</td>
</tr>
</tbody>
</table>

Setting ranges:
- Setting range of stop gain is 0~400%, the initialized is 100%;
- Setting range of stop timer is 0~30S, the initialized is 0S.
4.5 Adjustment of Control Gain PID

The setting of PID is very important to system's stability. In the automatic control, when tension is instable, it shall adjust PID parameter.

1. **Proportion Control P**

   According to the windage proportion between tension setting value and actual tension output value, output emendation. Setting range: 0–999

   The more the proportion P, the stronger the function of control is. It is very fast to reach the tension target value but it is easy to shack and the system is instable.

   
   ![Diagram showing proportion control](image)

   Initialized Value: $P = 10$
   Rotate value setting dial to amend P value

2. **Integral Control I**

   According to the windage between tension setting value and actual value, set time response.

   The larger the Integral I, the stronger the function of integral and the faster the response speed are but it is easier to shack causing system's instability.

   
   ![Diagram showing integral control](image)

   Initialized Value: $I = 10$
   Rotate value setting dial to amend I value

3. **Differential Coefficient Control D**

   It is used to control the change speed of windage between tension setting value and actual value. Setting range: 0–999.

   The larger the differential coefficient control, the stronger the function of differential coefficient but it is easy to cause system's instability. Usually, D is set as 0.

   
   ![Diagram showing differential control](image)

   Initialized Value: $D = 0$
   Rotate value setting dial to amend D value
4.6 Function of Taper Control
Taper control-in the condition of rewind, with the accretion of web’s diameter, the control that making web’s tension reduce is called Taper Control.

![Graph of Characteristics of Tension and web Diameter]

**A.** If setting $\tau=0$, then tension target value equals to tension setting value. At that time, there is no Taper control function. Enter automatic running menu as shown in the left figure.

**B.** If setting $\tau>0$, then tension target value is less or equal to tension setting value. At that time, there is Taper control function. Enter automatic Running menu as shown in the left figure.

Setting Steps:

1. Select menu of “23 Taper Set”, press $\mathbb{E}$ Key to enter menu of Taper slope setting.
2. Rotate value setting dial to directly adjust Taper slope setting value.
4.7 Memory Card

Memory card-the parameter set by user can be read and write between memory card and the controller for saving parameter and loading parameter. The plugging of memory card can be operated with power.

Exterior Structure of Memory Card

1. Saving parameter

Saving Parameter-Read the parameter from controller to memory card.

Setting Steps:

1) Plug memory card.
2) Enter menu of parameter setting, rotate value setting dial to move curse to the function menu of saving parameter.
3) Press Key to enter menu of saving parameter.
4) Press Key to execute saving parameter. At that time, data will be written into memory card from controller.
2. Loading Parameter

Loading parameter—Write subscriber's saving parameter to card

Setting Steps:

1. Plug Memory Card.

2. Enter menu of parameter setting, rotate value setting dial to move curse to the function menu of loading parameter.

3. Press Key to enter menu of loading parameter.

4. Press Key to execute loading parameter. At that time, data will be written into memory-card from controller. Thus, the origin data in controller has been renewed.
4.8 other function

Except the fundamental function that all above introduces, that controller also has many functions like Remote Set, Dis. Filter, Out. Filter and so on. Following introduces work:

1、R/S Signal

Set up a controller "Run/ Stop" state, System default value: Standing open as the right shows:
(This switch receives the controller post 18 and 19 achievement to runs or stops the signal)
This digital input can be set up by the menu of 21 Unavail.

1 R/S Signal  
2 Remote Set  
3 Taper Set  
ESC. Enter.

[1] select menu of “R/S Signa”, press key to enter unavail hypothesis picture.

21 R/S Signal  
Standing open  
Standing close  
ESC. Enter.

[2] press or rotate value setting dial to move curse to set up the value, press key to make sure.

2、Remote set

Remote set—This tensity controller can set up tensity size remotely, in the post 20, between 22 turn on 0~10VDC (this input voltage maximum value adjustable), corresponding zero to full scale tension. (In the long-distance tensity control opening condition, this time kneading board tensity adjustment invalid).

22 Remote Set  
23 Taper Set  
24 T.Mon Filter  
ESC. Enter.


22 Remote Set Model → Close  
ESC. Enter.

[2] After entering the menu, you can choose to open the remote set(systerm default value is close)

22 Remote Set Model → open  
Max → 10.0V  
ESC. Enter.

[3] After the Remote Set is open, the screen displays “max → 10.0V”, then move curse to Max, press key to modify the Max.
Notice: Max of the Remote Set is corresponding the full scale of system and 0V is to zero.
3. Setting of input phrase

Setting of Input Phase—Relative to the signal of input controller, this function can change sensor’s input phase and make sensor input potential change polarity before enter CPU. Thus, it does not need to change exterior connection. This function mainly applied in the condition of controlling transducer or servo motor.

Instruction:
[1] When it is normal phase and actual tension value is more than tension setting value, the output voltage will reduce.
[2] When it is inverse phase and actual tension value is more than tension setting value, the output voltage will increase.

4. Out. Level

Out. Level—The MY9TC controller can limit out. level to satisfy each kind of equipment technological requirement. Usually initial setting range is ok. (0~100% correspond 0~24V, or 0~100% correspond 0~10V)

Instruction:
[1] Out. Level Min initialization: 0%
[2] Out. Level Max initialization: 100%

5. Tension Display Filter

Tension Display Filter—It is the set parameter according to the response speed of tension display data in normal running. If the value increases, then the response speed will become slow. If it is too small, then the display value will change too fast to be seen clearly. The value do not influence the calculating function in interior controller. Subscriber can set according to the actual effectiveness.

Setting of level: 0.2~4.0 second

Instruction:
[1] Initialized Setting: 1 second
3. Setting of input phrase

Setting of Input Phase—Relative to the signal of input controller, this function can change sensor’s input phase and make sensor input potential change polarity before enter CPU. Thus, it does not need to change exterior connection. This function mainly applied in the condition of controlling transducer or servo motor.

Instruction:
[1] When it is normal phase and actual tension value is more than tension setting value, the output voltage will reduce.
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Setting of level: 0.2~4.0 second
5.1 Equipment Maintenance

Equipment needs to have periodical maintenance:

[1] Ensure that there is no dust or conductive dust entering into the interior of controller shell.
[2] Ensure that there is no looseness or other abnormal phenomenon appearing between wire and terminal.
[3] When having periodical maintenance, it is better to have zeroing adjustment and full scale demarcate again, especially in the condition of using the tension sensor whose rating load is more than using tension. Because the long-term change caused by machinery stress of tension sensor will make its influence greater.

5.2 Fault Display

1. Zeroing

   Overload.  
   Again...  
   Cancel.    Enter.

   It may be due to that the weight of checking roller is heavier than rating load of tension sensor. Please confirm the weight of checking roller and reduce the weight of checking roller or re-select tension sensor according to the requirement.

2. Demarcating Full Scale

   Over Load. 
   Again...  
   Cancel.    Enter.

   [1] Rating load of tension sensor is less than running tension, please confirm the tension value of full scale and rating load of tension sensor.

   Less Load  
   Again...  
   Cancel.    Enter.

   [2] When demarcating full scale, the added load is lower sensor's rating load at less than 30%, please increase load or change a tension sensor with less full scale and execute again.

3. Unbalance

   Unbalance. 
   Again?    
   Cancel.    Enter.

   When the difference of signal voltage from the left and right sensors is higher sensor's rating load at more than 50%, please confirm whether the style and spec from the left and right sensor is the same, the installing of examining roller is out of its way, the sling of weight is in the middle of the examining roller.
5.3 Fault Finding and Maintenance

1. Sig Monitor

This controller has the menu of Sig Monitor. The reason of the fault can be found conveniently when it happens.

- **01Sig Monitor**
  - 02Unit Choice
  - 03Full Scale
  - ESC. Enter.

[1] Select the menu of “01 Sig Monitor”. Press key to enter sig monitor picture.

- **Switch Sig NO1**
  - MI1 MI2 MI3 R/S
  - [ ] [ ] [ ] [ ] [ ]
  - ESC. Enter.

Press key to switch the different signal which be monitored, the reason of the fault could be found conveniently when it happens.

- **Sensor Sig No2**
  - L 4mv 1.2kg
  - R 3mv 1.0kg
  - ESC. Enter.

Sensor sig No2; detect the signal of the sensor.

- **Analog Sig NO3**
  - Inp.Vol. -> 0.0V
  - ESC. Enter.

Notice: In No.3 menu of monitor “Analog Sig”, its input voltage is the analog signal of remote set, this voltage is the real current voltage, has nothing with the menu of the range of “22 remote set”.

Notice: this voltage is displayed when the remote set is open, otherwise, the voltage is 0.
## 2. fault maintenance:

<table>
<thead>
<tr>
<th>Item</th>
<th>Phenomena</th>
<th>Resolvent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Power supply</strong></td>
<td>When power source is ON, the power light is not bright</td>
<td>Please confirm what the post 27 and the post between 28 inputs is 24VDC, electric current not small 4A, and carries on the correct wiring. Maybe the unusual loading or other things entering causes the fuse to blow. Make sure and then replaces the fuse.</td>
</tr>
<tr>
<td><strong>Tension abnormal</strong></td>
<td>Tension is not steady in manual model and auto model</td>
<td>Examining roller is not round, the bearing fail, examining roller is curving, or the clutch/brake, the driver part has the problem.</td>
</tr>
<tr>
<td><strong>Tension abnormal</strong></td>
<td>Tension is steady in manual model, but is unsteady in auto model</td>
<td>The installment of Tension sensor has the problem, or the sensor is not match. If the sensor is match, maybe it is because the PID parameter of TC 9000 PID is too much and it needs the reset.</td>
</tr>
<tr>
<td><strong>Output abnormal</strong></td>
<td>After the equipment resets, the tension is very big.</td>
<td>Reference to P5, uses the RUN/STOP signal correctly.</td>
</tr>
<tr>
<td><strong>Output abnormal</strong></td>
<td>When it stops output value rise</td>
<td>Maybe when the equipment stops, the controller is still running. Switch the RUN/STOP signal to make the controller stop.</td>
</tr>
<tr>
<td><strong>Output abnormal</strong></td>
<td>Be unable to control output</td>
<td>When the output key (12) is unable to control output, make sure whether the clutch/brake's current surpasses 3A and whether there is short circuit phenomenon. Dismantles the clutch/brake wiring and if obtains non-voltage between the post 12 and 13, contact with the manufacturer.</td>
</tr>
<tr>
<td><strong>Cannot adjust to zero or full scale</strong></td>
<td>Cannot adjust to zero</td>
<td>Inspects sensor's power and the signal voltage whether normal. Confirm the confirmation tension sensor's rated value and examining roller's weight. If the gross above rated value 80%, please choose the tension sensor again or reduces roller's weight.</td>
</tr>
<tr>
<td><strong>Cannot adjust to zero or full scale</strong></td>
<td>Can not full scale</td>
<td>When full scale is doing, if the load has the change, it will lead to the full scale to be unable to confirm. After confirming completes, if the tension value is not enough to tensi ty sensor's load, the survey tensi ty's precision will not be high, please confirm and replaces the load small tensi ty sensor.</td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td>The controller loses procedure and the calibration information.</td>
<td>Please confirm input, output signal wire not to approach the power line or the electrical lines. Please confirm that the shell earths correctly.</td>
</tr>
</tbody>
</table>
6.1 Technique Specification

<table>
<thead>
<tr>
<th>ITEM</th>
<th>SPECIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power</td>
<td>Working power input: 24VDC, Current is more than 4A.</td>
</tr>
<tr>
<td></td>
<td>Working power output: 5VDC, Tension sensor power.</td>
</tr>
<tr>
<td>Analog Signal</td>
<td>Analog input signal: Two channel of signal input of tension sensor</td>
</tr>
<tr>
<td></td>
<td>Analog output signal: Control output 0<del>10VDC used to control transducer/servo amplifier and so on; Control output 0</del>24VDC used to control 24VDC, magnetic powder (electromagnetic) clutch/arrester with current less than 4A.</td>
</tr>
<tr>
<td>Variable</td>
<td>Variable input signal: There is five digital signal input like M11,M12,M13, RUN/STOP,MIC. Photoelectric separate electrocircuit is used to input every digital value.</td>
</tr>
</tbody>
</table>

6.2 Environment Specification

| Application Environment Temperature | -10~40°C |
| Application Environment Humidity   | 35~85%RH (no dew) |
| Application Environment Grounding  | D type grounding (prohibited to have common grounding with intense electricity) |
Chapter VI Specification and Shell Size

6.3 Shell Size

Appendix:
[1] Main body Installation Board
[2] Fixed screw between main body and installation board
[3] Plugging connection terminal bar